

# 2013 Research DAY

TURNING SCIENCE INTO  
HEALTH

23<sup>rd</sup> Annual

USF Health  
Research Day

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Morsani College of Medicine, College of Nursing, College of Pharmacy,  
College of Public Health, School of Biomedical Sciences,  
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*23<sup>rd</sup> Annual*  
**RESEARCH DAY**  
**FRIDAY, FEBRUARY 22, 2013**  
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**23<sup>rd</sup> Annual Research Day**  
**Friday, February 22, 2013**  
**Marshall Student Center (MSC)**

**AGENDA**

TIME	EVENT	LOCATION
7:30 a.m. – 9:30 a.m.	Presenters: Registration and Poster Set-up Early registration: Feb 21 <sup>st</sup> 4:00 – 6:00 p.m.	Atrium/Ballroom
7:30 a.m. – 9:30 a.m.	Judges: Registration and Assignments	Atrium
8:00 a.m. – 10:00 a.m.	4th Annual Joseph Krzanowski, PhD USF Health Invited Oral Presentations	Oval Theater
10:00 a.m. – 12:00 p.m.	Poster Judging Session	Ballroom
12:00 p.m. – 1:00 p.m.	Lunch Break	Ballroom Atrium
12:45 p.m. – 1:30 p.m.	Office of Undergraduate Research Presentation to The Villages students	Ballroom Stage
1:00 p.m. – 2:30 p.m.	17 <sup>th</sup> Annual Roy H. Behnke Distinguished Lectureship <b>Dr. Howard L. McLeod</b> Fred Eshelman Distinguished Professor University of North Carolina – Chapel Hill <i>“Using the Genome to Guide Therapy”</i>	Oval Theater
1:00 p.m. – 3:30 p.m.	Posters Available for Viewing Sunshine ERC Posters	Ballroom Plaza Room 2708
2:30 p.m. – 3:15 p.m.	Awards Ceremony	Oval Theater
3:30 p.m. – 4:00 p.m.	Posters Removed	Ballroom
4:00 p.m. – 5:00 p.m.	Reception	Ballroom Atrium

*From the Desk of:*

**Phillip J. Marty, PhD**

Associate Vice President, USF Health  
Professor, Public Health and Medicine



Dear USF Health/University Community:

This year marks the 23<sup>rd</sup> “USF Health Research Day” anniversary that highlights the research work of our students, trainees, staff and faculty across USF Health. This is another banner year for participation with 338 scheduled presentations submitted by students, staff, trainees and faculty. This number includes 16 high school and middle school students presenting from The Villages Charter Schools.

An important aspect of our Research Day Program is the Annual Roy H. Behnke Distinguished Lectureship. This year, Dr. Howard L. McLeod will be delivering the Distinguished Lecture titled "*Using the Genome to Guide Therapy.*" Dr. McLeod is a Fred Eshelman Distinguished Professor & Director of the Institute for Pharmacogenomics and Individualized Therapy at the University of North Carolina, Chapel Hill.

With this 23<sup>rd</sup> Research Day, we continue to acknowledge the importance and value of research to USF Health and the University community. Our goal is to continue to recognize, grow and enhance the research efforts of our students, trainees, staff and faculty. Research Day is but one of those special events during the year as part of ResearchOne that recognizes the hard work of all our researchers and especially our students and trainees, and the great contribution they are making to the scientific advancement of their disciplines. It is an important day for this purpose and one we hope you will enjoy.



## *23<sup>rd</sup> Annual Research Day*

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- ❖ Department of Internal Medicine, Morsani College of Medicine



*A Special Thank You to Our Patron Sponsors:*





**23<sup>rd</sup> Annual Research Day**

*17th Annual*

*Roy H. Behnke Distinguished Lectureship*



**PLACE:**

**Marshall Student Center- Oval Theater**

**TIME:**

1:00p.m.

**SPEAKER:**

Howard L. McLeod, PharmD,  
Fred Eshelman Distinguished Professor  
University of North Carolina – Chapel Hill

**TITLE:**

*“Using the Genome to Guide Therapy”*

*Sponsored by:*

Department of Internal Medicine, Morsani College of Medicine, USF

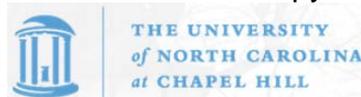
# *17th Annual Roy H. Behnke Distinguished*

## *Lectureship*

## *Keynote Speaker*



Howard L. McLeod, PharmD  
Fred Eshelman Distinguished Professor  
Director, Institute for Pharmacogenomics and  
Individualized Therapy



**H**oward McLeod, PharmD, is the Fred Eshelman Distinguished Professor of Pharmacogenomics and Individualized Therapy at the UNC Eshelman School of Pharmacy at the University of North Carolina at Chapel Hill and the director of the UNC Institute for Pharmacogenomics and Individualized Therapy. He holds additional appointments in the UNC School of Medicine and the Lineberger Cancer Center.

Dr. McLeod is the principal investigator for the CREATE Pharmacogenetics Research Network, a member of the NIH funded Pharmacogenetics Research Network, and is a member of the FDA Committee on Clinical Pharmacology. He directs the Pharmacogenetics for Every Nation Initiative that aims to help developing countries use genetic information to improve National Drug Formulary decisions. McLeod has published more than 350 peer-reviewed papers on pharmacogenomics, applied therapeutics, or clinical pharmacology and continues to work to integrate genetics principles into clinical practice to advance individualized medicine.

Dr. McLeod completed research fellowship training in cancer pharmacology at St. Jude Children's Research Hospital in Memphis and at the University of Glasgow in Scotland before becoming the director of the clinical pharmacology program at the Beatson Cancer Centre in Glasgow. He then became a senior lecturer in medicine and director of laboratory research for the oncology unit at the University of Aberdeen in Scotland. McLeod returned to the United States in 2000 to accept a position at Washington University in St. Louis, Missouri, where he was a professor in the Departments of Medicine, Pharmacology and Molecular Biology, and Genetics and director of the Siteman Cancer Center Pharmacology Core.



## **ADMINISTRATION**

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2012-2013**

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Kevin Nash, PhD

Molecular Pharmacology and Physiology

Dahui Qin, MD, PhD

Oncologic Sciences

Vrushank Davé, PhD

Pathology & Cell Biology

David Kang, PhD

Molecular Medicine

#### **DEAN'S APPOINTMENTS (AT LARGE)**

Svitlana Garbuzova-Davis, PhD

Neurosurgery & Brain Repair

Angel Luciano, MD

Pediatrics

Branko Miladinovic, PhD

Clinical Translational Science

Andreas Seyfang, PhD

Molecular Medicine / Neurosurgery & Brain Repair

Kay-Pong Yip, PhD

Molecular Pharmacology & Physiology

#### **CLINICAL SCIENTISTS**

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Oncologic Sciences

Srinivas Nagaraj, PhD

Internal Medicine

David Johnson, MD

Molecular Medicine

Ling Zhang, MD

Oncologic Sciences

Timothy Friel, MD

Lehigh Valley / Internal Medicine

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Physical Therapy & Rehabilitation Sciences

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Associate VP for Research, Ex Officio



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Betty Persky





## ***23<sup>rd</sup> Annual Research Day***

### **STAFF ACKNOWLEDGEMENTS**

#### ***USF Health Vice President's Office***

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#### ***USF Health Communications***

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#### ***USF Health Office of Research***

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Marlo Crawford



STAFF ACKNOWLEDGEMENTS, CONT'D

***Morsani College of Medicine Information Systems***

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***USF Undergraduate Research Office***

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Dr. Richard Pollenz





## ***23<sup>rd</sup> Annual Research Day***

### **POSTERBOARDS**

<b>Location:</b>	Marshall Student Center 2 <sup>nd</sup> floor Ballroom
<u>Set up:</u>	7:30a.m. – 9:30a.m.
<u>Judging:</u>	10:00a.m. -12:00p.m.
<u>Tear down:</u>	3:30p.m. – 4:00p.m.
<b>Poster Size:</b>	4 ft. high by 3 ft. wide

### **JUDGING OF POSTERS**

Student posters will be judged by faculty members.  
Students ***must be present*** at their poster to be eligible for judging.

#### **Posters will be judged on:**

- 1. Presentation of poster**
  - Organization
  - Readability
  - Appearance
  - Sense Appeal
- 2. Presentation of data**
  - Oral Communication
- 3. Knowledge of subject**
  - Question and answer presentation

### **AWARD CEREMONY**

Student Winners will be announced at the Awards Ceremony following the USF Health Keynote Lecture

#### **Poster Presentations**

**10:00a.m. – 3:30p.m.**



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## Research Day

# Listing of Presenters and Titles

### *Oral Presentations*

<b>Abs #</b>	<b>Name</b>	<b>Abstract Title</b>
O-1	Yin, Juanjuan	<i>Estrogen Anchored multifunctional micelles Designed for Site-Specific Delivery of Doxorubicin prodrug in Breast Cancer Therapy</i>
O-2	Ramirez, Ingrid	<i>The BCL2 Antagonist of Cell Death (BAD) apoptotic pathway and cervical cancer cell sensitivity to cisplatin</i>
O-3	Kasiappan, Ravi	<i>MicroRNA and Vitamin D-Leptin Antagonism on High-fat Diet-Induced Tumor Growth</i>
O-4	Stratton, Lee	<i>Sound Location Processing in Schizophrenia Patients with Auditory Verbal Hallucinations</i>
O-5	Kesayan, Tigran	<i>"Perceptual Magnitude Constriction in Parkinson's Disease"</i>
O-6	Woo, JungA Alexa	<i>Role of Integrin-Dependent Focal Adhesion Complexes in Ab-Induced Neurotoxicity</i>
O-7	Nelson, Nadine	<i>The Role of the Ikaros Transcription Factor in Regulatory T Cell (Treg) Development and Function in a Murine Pancreatic Adenocarcinoma Model</i>
O-8	Mehra, Shabnam	<i>SAS and Excel Go Hand in Hand for Automation: Data Management to Policy Reports</i>
O-9	Anegbe, Evelyn	<i>Prostate Cancer Treatment and Outcomes: 20-Year Experience at a Single Cancer Center</i>
O-10	Bingham, Andrea	<i>Development of a Mosquito Trap that Uses Sugar Feeding to Detect Eastern Equine Encephalitis Virus</i>
O-11	Gordon, Jessica	<i>Stablization of Extra-uterine Life with Skin to Skin Contact</i>

- 1 Aljubran, Salman *A Case of Delayed Anaphylaxis to Beef in Central Florida*
- 2 Bellur, Adarsh *Naegleria fowleri Virulence Factor Nfa-1 is a Hemerythrin with NAD(P)H-dependent Oxidoreductase Activity*
- 3 Boyapalle, Sandhya *Prophylactic potential of Doubly-Stapled Peptides for Inhibiting Fusion of Respiratory Syncytial Virus to Host Target Cells*
- 4 Brown, Jean *Novel Interleukin-7R $\alpha$  (IL-7R $\alpha$ ) Mutations Causing Delayed Onset Isolated T Cell Immunodeficiency Disease*
- 5 Brumley, Jessica *Bacterial Vaginosis, Perceived Racism and Perceived Stress among Black Women*
- 6 Damrongwatanasuk, Rongras *Atopic Dermatitis in Patients with Agammaglobulinemia Is Associated with Cutaneous Staphylococcal Infections*
- 7 Duvalsaint, Marvin *Endogenous production of abscisic acid by erythrocytic stages of Plasmodium falciparum*
- 8 Flores-Torres, Jaime *Bacterial dysbiosis in an unusual model for studies of intestinal immune homeostasis*
- 9 Heinrichs, Jessica *Alloantigen specific CD8+CD25+Foxp3+ Induced T regulatory cells display high potency and selectivity in suppression of Allo-response*
- 10 Hott, Amanda *Defining the elusive artemisinin resistance phenotype in vitro of Plasmodium falciparum*
- 11 Jiang, Amy *VRE Infection in Heme Malignancy Patients*
- 12 Katzman, Adam *Necrotizing Pneumonia in Cancer Patients*
- 13 Knab, Andrea *Viridans Group Streptococci (VGS) bacteremia in neutropenic patients causing Adult Respiratory Distress Syndrome (ARDS)*
- 14 Kubiak, Catherine *MBL Polymorphisms in a US Cohort of Children with Recurrent Infection*
- 15 Lagishetty, Venu *Hyperoxia induced lung injury is associated with alterations in circadian clock genes in mice*
- 16 Laird, Chris *Evidence that the OmpR/EnvZ two component system is a transcriptional regulator of the Trw type IV secretion system genes in Bartonella henselae.*
- 17 Lima, Amorce *Zebrafish Embryo Model of Bartonella henselae Infection*
- 18 Nguyen, Huy *Aging is associated with altered IL-1 $\beta$ , OPN, and antiviral gene expression and enhanced lung pathology in respiratory syncytial virus infections*
- 19 Niebur, Hana *Heterogeneous Pneumococcal Antibody Titers in Patients with Antibody Deficiency Receiving Subcutaneous Hizentra*
- 20 Olson, Daniel *Escherichia coli: An Important Pathogen in Patients with Hematologic Malignancies*
- 21 Parthasarathy, Prasanna Tamarapu *Overexpression of Circadian CLOCK genes alters proinflammatory cytokine production in human alveolar epithelial cells*
- 22 Talreja, Neetu *Successful Desensitization to Agalsidase Beta After Anaphylaxis*
- 23 Tu, Nhan *Characterizing the General Stress Response in Bartonella henselae*

- 24 Wang, Jia-Wang *Lipopolysaccharide (LPS)-Responsive, Beige-Like Anchor (LRBA) is Involved In Autophagy Through Association With Microtubule-Associated Protein Light*
- 25 Whelan, Jillian *Respiratory Syncytial Virus Nonstructural Protein 2 (NS2): Exploitation of the Host Ubiquitin System*
- 26 Woods, David *Histone deacetylase 11 is a negative regulator of cytotoxic T-cell effector function and central memory formation*



## Cancer Biology

- 27 Al Sawah, Entidhar *Perifosine, an AKT inhibitor, modulates ovarian cancer cell line sensitivity to cisplatin induced growth arrest*
- 28 Boutrid, Hinda *Malignant Murmur: A Case of Primary Left Atrial Sarcoma with Pelvic Metastases*
- 29 Clayman, Eric *PTEN deficiency induces VAV protein expression enhancing cytoskeletal remodeling in lung cancer*
- 30 Cruz, Alex *Metabolic Tumor Volume (MTV) is a Predictor of Survival in Borderline Pancreatic Cancers Treated with Neoadjuvant Therapy*
- 31 Engel, Brienne *Molecular Mechanisms of Aggressiveness of Osteosarcomas*
- 32 Fu, Jianing *T-bet Is Critical for Development of Acute Graft-Versus-Host Disease through Controlling T Cell Differentiation and Function*
- 33 Girard, Yvonne *Development of a novel 3D in vitro multicellular tumor spheroid model to screen anti-cancer drugs*
- 35 Kurian, Tony *Survival after Nephrectomy with Concomitant IVC Thrombectomy in the Context of Metastatic Renal Cell Carcinoma*
- 36 Kurtyka, Courtney *An E2F signature predicts benefit of adjuvant chemotherapy in early-stage non-small cell lung cancer*
- 37 Lungchukiet, Panida *Role of Vitamin D and its Receptors in Suppressing Ovarian Cancer Invasion to Omentum*
- 38 Malaney, Prerna *Intrinsic disorder in PTEN and its interactome provides structural plasticity and functional versatility*
- 39 Mallela, Jaya *11NPRA Signaling Regulates Stem Cell Recruitment and Angiogenesis: A Model to Study Linkage Between Inflammation and Tumorigenesis*
- 40 Midha, Shonali *Epigenetic modulation of co-inhibitory molecules in Chronic Lymphocytic Leukemia (CLL)*
- 41 Nelson, Allison *NPRA signaling in myeloid cell differentiation and cancer progression*
- 42 Nelson, Nadine *The Role of the Ikaros Transcription Factor in Regulatory T Cell (Treg) Development and Function in a Murine Pancreatic Adenocarcinoma Model*
- 43 Pathak, Ravi *Systems biology analysis predicts alteration in protein-protein interaction networks following loss of PTEN in the lung epithelium*
- 44 Pina, Yolanda *Chemotherapy with Adjuvant 2-deoxy-D-glucose (2-DG): Role of HIF1 $\alpha$  in p75 Neurotrophin Receptor (p75NTR) in Retinoblastoma and Glioblastoma Multiforme in Minority Populations*
- 45 Poff, Angela *Effects of the Ketogenic Diet, Supplemental Ketone Administration, and Hyperbaric Oxygen Therapy on the VM-M3 Mouse Model of Metastatic Cancer*
- 46 Ramirez, Ingrid *The BCL2 Antagonist of Cell Death (BAD) apoptotic pathway and cervical cancer cell sensitivity to cisplatin*

47	Tao, Jiangchuan	<i>Combined Treatment of BTK and PI3K Inhibitors Synergistically Disrupts BCR-signaling, Overcomes Microenvironment-mediated Survival and Drug Resistance in Mantle Cell Lymphoma</i>
48	Wang, Chunyan	<i>Multifunctional Chitosan Magnetic-Graphene Nanoparticles (CMGs): a Theranostic Platform for Tumor-targeted co-delivery of Drug, Gene and MRI contrast agent</i>
49	Zgheib, Nadim Bou	<i>MK2206, a selective AKT inhibitor, modulates ovarian cancer cell line sensitivity to carboplatin plus paclitaxel</i>
50	Zheng, Yin	<i>Perinephric fat density on pre-operative imaging is predictive of perinephric fat adherence and ease of surgical dissection during partial nephrectomy</i>



### *Cardiovascular*

51	Beard, Richard	<i>Interleukin-1<math>\beta</math>-induced BBB dysfunction involves decreased claudin-5 protein expression and is dependent on non-muscle myosin light chain kinase</i>
52	Donaldson, Erika	<i>Interaction of Apolipoprotein E with ApoER2 and VLDLR modulates MAPK-ERK signaling transduction</i>
53	Galam, Lakshmi	<i>Diindolylmethane Attenuates TGF <math>\beta</math> Mediated Human Lung Fibroblast Proliferation by Suppressing Matrix Metalloprotease-1 and Thrombospondin-2 Gene Expression</i>
54	Haines, Ricci	<i>Role of nmMLCK in VEGF Induced Intestinal Epithelial Monolayer Permeability</i>
55	Hooper, Justin	<i>Cardiac Arrhythmia Evoked by Inhalation of Capsaicin</i>
56	Marcet, Kristen	<i>Small for Gestational Age as a Marker for Postoperative Morbidity and Late Non-Surgical Mortality in Neonates Undergoing Patent Ductus Arteriosus Ligation</i>
57	Reynolds, Jason	<i>Focal Adhesions Regulate Endothelial Junctions via Myosin Light Chain Kinase During Neutrophil-Induced Hyper Permeability</i>
58	Tur, Jared	<i>Role of voltage gated potassium channel subunit Kvb1.1 in cardiac hypertrophy</i>
59	Wu, Mack	<i>Involvement of FAK and Src in Microvascular Hyperpermeability Caused by Fibrinogen-Gamma C-Terminal Fragments</i>
60	Wu, Rongqian	<i>CD44-mediated Src signaling in endothelial barrier dysfunction</i>
61	Yang, George	<i>A Novel Approach to EVAR Simulation Using Patient Specific Modeling</i>



### *Chart Reviews and Other Case Studies*

62	Baumgarten, Adam	<i>Metallic Ureteral Stents: A Cost Effective Management of Chronic Ureteral Obstruction</i>
63	Capitena, Cara	<i>Initial Results of Treatment of Advanced Glaucoma with Ahmed "Wing" Valve</i>
64	DeRespino, Allison	<i>Extra-colonic Clostridium difficile Infection associated with Methotrexate use: A case report</i>
65	Engel, Chad	<i>Normal Variability in the Morphology of the Lumbar Disc Annuli and their Adjacent Endplates</i>
66	Goldman, Jamie	<i>Evaluation of Octreotide LAR Dose Optimization and Clinical Outcomes in Patients with Neuroendocrine Tumors: a Retrospective Chart Review Study</i>

67	Hayman, Lisa	<i>Oxygen Requirement as a Screening Test for Late Pulmonary Hypertension in Extremely Low Birth Weight Neonates</i>
68	Heck, Michelle	<i>Neurotoxoplasmosis: A common initial presentation among HIV-positive patients in the Dominican Republic in the HAART era.</i>
69	Igala, Sindhu	<i>Semi-Comatose Man for Seven Years Wakes Up to Walk out of Hospital</i>
70	Kent, Robert	<i>Peripheral Nerve Stimulation with Inter-lead Crosstalk Leading to Complete Pain Cessation in a Patient Suffering Post-Nephrectomy Syndrome</i>
71	Luria, Lynette	<i>Uncommon Clinical Scenario and Diagnostic Challenge: Primary Gastrointestinal (GI) Plasmablastic Lymphoma</i>
72	Mifsud, Matthew	<i>Treatment of Disseminated Melanoma with Metastasis to the Oropharynx</i>
73	Nguyen, Dat	<i>Understanding Human Rhinovirus Severity in Immunocompromised Bone Marrow Transplant Patients</i>
74	Nguyen, Johnny	<i>Colonic Medullary Carcinoma Mimicking a High Grade Lymphoma</i>
75	Nyanda, Hoka	<i>Linear IgA Bullous Dermatitis</i>
76	Pantazopoulos, Panagiotis	<i>Molecular Studies In Early Detection Of Minimal Residual Disease (MRD) Of B Lymphoblastic Leukemia S/P Transplant Correlated With Risk Of Relapse</i>
77	Patel, Midhir	<i>Primary Carcinosarcoma of the Liver: Radiologic and Pathologic Correlation</i>
78	Patel, Sandip	<i>Multi-Radicular Syndrome Secondary to Air Introduced into the Cervical Epidural Space – A Case Presentation</i>
79	Perrone, Michael	<i>An Advantage to Submuscular Breast Augmentation: Implant-Sparing Mastectomy in Breast Cancer Patients with Previous Augmentation</i>
80	Pham, John	<i>Prognostic Significance of VLA4 and CD44 Expression by Flow Cytometry in Multiple Myeloma.</i>
81	Prithviraj, Gopi	<i>The concomitant diagnosis of acute myelogenous leukemia and multiple myeloma in a patient presenting with hematuria</i>
82	Ramos, Andres	<i>Primary Stenting of Symptomatic Transplant Renal Artery and Ipsilateral Iliac Artery Stenosis.</i>
83	Sosa, Christopher	<i>The First Case of Urinary Tract Infection and Pancreatitis associated with Raoultella planticola in a Pediatric Patient</i>
84	Tahmasbi, Maryam	<i>Synchronous Neuroendocrine Tumor of Small Bowel and Diffuse Large B-Cell Lymphoma Arising from Follicular Lymphoma: A Rare Case Report</i>



### *Clinical Science*

85	Arnold, Elyse	<i>Convergent and Discriminant Validity and Reliability of the Pediatric Anxiety Rating Scale in ASD</i>
86	Bowman, Ty	<i>Precise Measures of Visceral Fat Emphasize the Role of Visceral Fat in the Biology of Pancreatic Cancer</i>
87	Burns, Jack	<i>The Impact of Deliberate Practice on Operative Times of Transverse Rectus Abdominis Myocutaneous (TRAM) Flaps</i>
88	Couluris, Marisa	<i>-POSTER WITHDRAWN-</i>
89	Crawford, Erika	<i>Neuropsychological Impairment in Youth with Obsessive Compulsive Disorder</i>

90	Hanks, Camille	<i>Comparison of Self-Concept and Tic Severity in Youth with Tic Disorders as Assessed by the Piers-Harris Children's Self-Concept Scale</i>
91	Howard, Nicole	<i>MINT I: Multi-Institutional Neo-adjuvant Therapy, MammaPrint Project 1</i>
92	Howell, Mark	<i>Manganese-loaded Lipid-Micellar Nanoparticles (LMNs) for Lung Theranostics</i>
93	Jackson, Ryan	<i>Microbiology of Rhinosinusitis in the Immunocompromised Cancer Population</i>
94	King, Morgan	<i>Relationship Factors in Psychiatric Care Morgan King B.A. Department of Pediatrics and Psychiatry at USF</i>
95	Libous, Jennifer	<i>Assessment of barriers and facilitators to worksite exercise in firefighters</i>
96	Linden, Ellen	<i>Obesity definition in rhesus monkeys: anthropometric measurements, BMI, and human BMI equivalents, and comparative risks</i>
97	McGuire, Joseph	<i>Social Deficits in Children with Chronic Tic Disorders: Phenomenology, Clinical Correlates and Quality of Life</i>
98	Melton, Stephanie	<i>We are in this together: Spouse Perspectives of Living with a Loved One with Diabetes</i>
99	Muhammad, Adnan	<i>Difference in outcome of patients with unresectable Hepatocellular carcinoma (HCC) when treated with Traditional chemoembolization (TACE) alone Vs. combination therapy with Sorafenib</i>
100	Nethers, Kevin	<i>Factors influencing Prostate Specific Antigen (PSA) bounce phenomenon after High Dose Rate (HDR) brachytherapy treatment for Prostate Cancer (PCa)</i>
101	O'Brien, Keith	<i>Exploring New Methods to Capture Patient Satisfaction at the Point-of-Care</i>
102	Ogg, Julia	<i>Mental Health Needs in Medical Foster Care Children</i>
103	Perez, Matthew	<i>Cutaneous Angiosarcoma: A Single Institution Review Matthew C. Perez BS USF Morsani COM and Moffitt Cancer Center (MCC),</i>
104	Pignataro, Rose	<i>The Impact of Diabetic Peripheral Neuropathy: A Qualitative Inquiry</i>
105	Portis, Samantha	<i>The use of the bioflavonoid luteolin as glycogen synthase-3 inhibitor and therapy for fragile X syndrome</i>
106	Rainey, Jessica	<i>Initial examination of the feasibility of a novel approach in tumor therapy using magnetic nanoparticles and a spatially selective magnetic field.</i>
107	Russell, Christopher	<i>Initial Experience With Robotic Assisted Retroperitoneal Partial Nephrectomy</i>
108	Ung, Danielle	<i>POSTER WITHDRAWN</i>
109	Weiss, Amy	<i>The Influence of Primary Care Provider Type on Adolescent Visits to the Emergency Department</i>
110	White, Joseph	<i>Patient expectations and recovery following major head and neck surgery</i>



## *Education*

111	Bruno, Jennifer	<i>The Analytical Hierarchy Process as a Decision-Making Tool in Psychiatry</i>
112	Coover, Sally	<i>Hey, Doc Is That Your Stethoscope? Increasing Engagement in Medical Education and Training with iPads</i>

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**4<sup>th</sup> ANNUAL**

**JOSEPH KRZANOWSKI, PhD**

**USF HEALTH**

**INVITED**

**ORAL PRESENTATIONS SESSION**

***Estrogen Anchored Multifunctional Micelles Designed for Site-Specific Delivery of Doxorubicin Prodrug in Breast Cancer Therapy***

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**Keywords:** Tumor Targeting, Estrogen receptor, Antioxidant, Doxorubicin, Cyclodextrin, Copolymer

**Objective:** The efficacy and applicability of anticancer drugs are greatly restricted by severe systemic toxicities and drug resistance. Targeting drug delivery strategies is an active area of research and it has been developed to prevent the shortcomings of chemotherapy. In this study, multifunctional estrogen anchored polymer micelles have been designed and prepared, and it is aimed to deliver therapeutics as well as accessorial agents such as antioxidants to estrogen positive cancer cells. The multifunctional micelles are expected to enhance the drug uptake by cancer cells and spare normal tissues compared to conventional chemotherapy.

**Methods:** The PEG-PLA di-block co-polymer was functionalized with gossypol in the PEG terminal through reductive amination. Adamantane were also conjugated to the PEG terminal to serve as a guest molecule moiety for the estrogen targeting cyclodextrin which were synthesized and characterized through multi-step reactions and spectral methods. Adamantane doxorubicin prodrug was prepared and encapsulated the polymer micelles. In vitro competition experiment of ER positive and negative for the targeting and non-targeting micelles were assessed. The in vitro drug release profile was determined and targeted drug binding in vitro was quantitated. The cytotoxicity was measured and the biomarkers related to free Dox-induced cardiotoxicity were also examined.

**Results:** Estrogen anchored multifunctional micelles were successfully synthesized. Cellular uptake experiments demonstrated an preferentially targeted delivery of drugs into ER-positive carcinomatous cells.

**Conclusion:** The targeted polymer micelles possess sustained drug release properties with good biocompatibility. It targeted specific to ER positive cancer cells.

***The BCL2 Antagonist of Cell Death (BAD) Apoptotic Pathway and Cervical Cancer Cell Sensitivity to Cisplatin***

Ingrid J. Ramirez MD<sup>1,4</sup>, Michelle Dzung BS<sup>1</sup>, Douglas C. Marchion PhD<sup>1,2</sup>, Entidhar Al Sawah MD<sup>1,2</sup>, Nadim Bou Zgheib MD<sup>1,4</sup>, Xiaomang Ba Stickles MD<sup>1,4</sup>, Sachin Apte MD<sup>1,3</sup>, Robert M. Wenham MD<sup>1,2,3</sup>, and Johnathan M. Lancaster MD, PhD<sup>1,2,3,1</sup>-Department of Women's Oncology, <sup>2</sup>-Experimental Therapeutics Program, <sup>3</sup>-Department of Oncologic Sciences, H. Lee Moffitt Cancer Center & Research Institute, Tampa, FL, <sup>4</sup>-USF Department of Obstetrics & Gynecology 2 Tampa General Circle STC 6th Floor Tampa, FL University of South Florida, Morsani College of Medicine, Department of Obstetrics & Gynecology

**Keywords:** cervical cancer, chemoresistance, BAD pathway

**Objective:** The BCL2 antagonist of cell death (BAD) apoptosis pathway has been associated with cancer cell chemo-response, via the phosphorylation status of the BAD protein. We sought to evaluate the BAD pathway and the phosphorylation status of the BAD protein as a cervical cancer therapeutic target to enhance sensitivity to cisplatin.

**Methods:** The cervical cancer cell lines, SiHa, caski, and C33, were depleted of the kinases and phosphatases known to influence the phosphorylation status of BAD protein, including the kinases, AKT and PKA, and the phosphatase, PP2C, using siRNA. A non-targeting siRNA duplex was used as a control. Depletion of the target protein was confirmed by Western blot analysis. Changes in the sensitivity of cells to cisplatin-induced cell growth arrest and cisplatin-induced apoptosis after depletion of AKT, PKA, and PP2C was then quantified by MTS cell viability and DNA fragmentation assays.

**Results:** Selective depletion of the BAD pathway kinases, AKT and PKA, resulted in a decrease in cellular levels of phosphorylated BAD protein and increased cisplatin sensitivity when compared to cells transfected with non-targeting siRNA. In contrast, depletion of the BAD pathway phosphatase, PP2C, led to increased expression of phosphorylated BAD protein and a corresponding decrease in cisplatin-induced growth arrest and apoptosis.

**Conclusion:** Modulation of BAD pathway kinases and phosphatases influence the phosphorylation status of the BAD protein, and also cervical cancer cell line sensitivity to cisplatin. These data support the BAD pathway as an important determinant of cancer chemosensitivity and a potential future therapeutic target to enhance cisplatin activity for patients with cervical cancer.

***MicroRNA and Vitamin D-Leptin Antagonism on High-fat Diet-Induced Tumor Growth***

Ravi Kasiappan, Yuefeng Sun, Panida Lungchukiet, Waise Quarni, Santo V. Nicosia, Xiaohong Zhang and Wenlong Bai Department of Pathology and Cell Biology, University of South Florida, Morsani College of Medicine Tampa, Fl

**Keywords:** Vitamin D, Leptin, microRNA, obesity, cancer

**Objective:** Obesity is a pandemic in US associated with more than 100 000 incidents of cancers every year. Human studies such as well-publicized multiple-center Cohort Consortium Vitamin D Pooling Project of Rare Cancers revealed an inverse correlation between serum 25-hydroxyvitamin D3 and ovarian cancer (OCa) risk that reached statistical significance in obese women. Our recent study demonstrates that vitamin D (VD) suppresses telomerase activity through the induction of miR-498. The hypothesis of the present study is that VD prevents obese-associated OCa by the up-regulation of miR-498 and suppression of telomerase stimulation by leptin in high fat diet.

**Methods:** In this study, we used estrogen sensitive cancer cells to investigate the effect of VD on the stimulation of hTERT expression by leptin and involvement of microRNA. We used high-fat diet to induce obesity in nu/nu mice. OCa cells marked with luciferase were inoculated into obese mice and tumor growth monitored by bioluminescence imaging.

**Results:** Our studies showed an inverse correlation between hTERT mRNA and miR-498 in response to VD treatments in various estrogen-sensitive cancer cells. The ability of VD to inhibit leptin-induced cell growth and hTERT expressions were compromised when miR-498 was depleted using "sponge". Interestingly, high-fat diet-promoted tumor growth was remarkably suppressed by a VD analogue EB1089 but the suppression was relieved by the expression of miR-498 sponge. The expression of telomerase in the xenografts was increased by high fat diet and suppressed by EB1089.

**Conclusion:** Overall, the studies suggest that down-regulation of telomerase by VD through miR-498 may promise a new therapy for management of obesity related OCa and other estrogen sensitive cancers in women.

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***Sound Location Processing in Schizophrenia Patients with Auditory Verbal Hallucinations***

Lee Stratton, MS II Morsani COM and International Medicine SC, Lucia Alba-Ferrara, Postdoctoral Scholar Department of Psychiatry and Neuroscience, Gabriel de Erausquin, Roskamp Chair in Biological Psychiatry, Associate Professor of Psychiatry and Neurosciences, Neurology and Neurosurgery, Director of Roskamp Laboratory of Brain Development, Modulation and Repair, Director of Center for Neuromodulation, University of South Florida, Morsani College of Medicine Psychiatry and Behavioral Neurosciences

**Keywords:** schizophrenia, sound localization, hallucinations, spatial recognition

**Objective:** To study the deficits in the spatial recognition of auditory stimuli in patients with schizophrenia.

**Methods:** 15 patients with history of AVH, 12 patients without history of hallucinations (NAVH) and 16 controls (C) participated in a combined paradigm of sound localization (task a) and internal/external perception of prosody (task b). Task a) consisted of tunes presented in either the right or the left ear in 2 conditions (located close to or far from the listener). Task b) consisted of numbers spoken in either angry or neutral tones in 2 conditions (IH/OH). Angry/neutral numbers, of which one was virtually inside and the other outside the head, were presented simultaneously and monaurally via headphones. Modification of acoustic stimuli using virtual acoustic space techniques creates the illusion that the sound is "inside the head" (IH) or "outside the head" (OH). Patients responded in both tasks by a keypress.

**Results:** Tasks a) and b) were analyzed in 2 separate 2X3 factorial ANOVAs. In task a) accuracy was above chance level ( $M=75\% \pm SE= 2.7$ ), but without effects of Presentation side (left/right) or Group (AVH, NAVH, C). In task b) stimuli presented to the left ear were located more accurately than to the right ( $F(1,40)=14.19, p<.001$ ). Additionally, C located the source more accurately than patients regardless of AVH traits ( $F(1,40)=12.19, p<.001$ ). Both patients groups did not differ from each other and there was not interaction.

**Conclusion:** Schizophrenia patients have difficulties to distinguish between virtually located IH/OH auditory objects loaded with emotional prosody. Our data suggest that the deficit is associated with schizophrenia itself and not to hallucinations in particular.

**Research supported by:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine, International Medicine Concentration and Department of Psychiatry and Neuroscience.

***The Role of the Ikaros Transcription Factor in Regulatory T Cell (Treg) Development and Function in a Murine Pancreatic Adenocarcinoma Model***

Nadine Nelson<sup>1</sup>, Maya Jerald<sup>1</sup>, Laura Pendleton<sup>1</sup>, Karoly Szekeres<sup>1</sup>, Nasreen Vohra<sup>2</sup>, Shari Pilon-Thomas<sup>3</sup> and Tomar Ghansah<sup>1</sup>.<sup>1</sup>University of South Florida, Tampa, FL; <sup>2</sup>East Carolina University, Greenville, NC; <sup>3</sup>Moffitt Cancer Center, Tampa, FL. University of South Florida, Morsani College of Medicine, Department of Molecular Medicine

**Keywords:** Pancreatic Cancer, Tumor Immunology, Immune suppression, Tregs, Ikaros

**Objective:** Loss of regulatory T cell (Tregs) homeostasis leads to the suppression of anti-tumor immune responses in PC tumor-bearing (TB) hosts. Tregs express the Forkhead BoxP3 (FoxP3) gene that is critical for their suppressive function. The transcription factor Ikaros is crucial for normal T lymphocyte development and function. Our objective is to identify the role of Ikaros in regulating Treg homeostasis and function in a pancreatic tumor microenvironment.

**Methods:** We developed a murine model of pancreatic cancer, isolated splenocytes from TB and control mice and performed flow cytometry and magnetic activated cell sorting (MACS) to immunophenotype and enrich T cells for in vivo and in vitro analyses. We also used real-time PCR (qRT-PCR) and western blot analyses to evaluate Ikaros and FoxP3 mRNA and protein expression in enriched T cells and whole splenocytes from TB and control mice.

**Results:** Our flow cytometry results showed that CD4+ and CD8+ T cell percentages were significantly lower in splenocytes from TB mice compared to control. However, there was a significant expansion of Tregs in splenocytes from TB mice. In addition, enriched TB Tregs suppressed antigen-specific CD8+T cell responses in a dose-dependent manner, in vitro. Preliminary qRT-PCR results revealed no significant difference in Ikaros mRNA expression whereas Ikaros protein expression was reduced in TB whole splenocytes compared to control. In enriched TB CD3+ T cells, Ikaros protein expression was reduced while FoxP3 protein expression was increased, compared to controls.

**Conclusion:** Our results suggest that the PC microenvironment potentially downregulates Ikaros' expression, which may contribute to the expansion of Tregs and their suppression of CD8+T cell (anti-tumor) immune responses.

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***Perceptual Magnitude Constriction in Parkinson's Disease***

Tigran Kesayan BS, USF Morsani College of Medicine, John Williamson PhD, Adam Falchook MD, Michael Okun MD, FAAN, Irene Malaty MD, Ramon Rodriguez MD, Keith White PhD, UF Medicine Dept. of Neurology, Robert Hauser MD, MBA, FAAN, USF Medicine Dept. of Neurology, and Kenneth Heilman MD, FAAN, UF Medicine Dept. of Neurology, University of South Florida, Morsani College of Medicine, Neurology

**Keywords:** Keyword 1: Touch Perception Keyword 2: Parkinson Disease Keyword 3: Executive Function

**Objective:** The purpose of this study was to test the hypothesis that patients with Parkinson disease (PD) are impaired at perceiving the relative magnitude of tactile stimuli. Patients with PD often demonstrate hypometria (e.g., micrographia). Hypometria may be related to defective motor programming or a perceptual disorder where stimulus magnitude is over estimated. Alternatively, people with PD often have frontal lobe dysfunction with an impaired ability to disengage attention which may produce a perceptual grasp such that the perception of stimuli with high or low intensity will be perceived with a reduced range of magnitudes.

**Methods:** Participants were 12 people with PD and 12 matched healthy controls. To assess tactile perception we used von Frey hairs made of nylon monofilaments. For each trial, a standard monofilament was applied to the skin on the palm and the participant was told its magnitude was 100. Then, a second monofilament was applied and the participant provided a numerical estimate of the magnitude of the second stimulus relative to the first. There were 6 experimental stimuli, 3 lower and 3 higher in magnitude than the reference stimulus.

**Results:** When compared to controls, participants with PD over-estimated the magnitudes of the tactile stimuli that were below the standard stimulus and underestimated the magnitudes of stimuli that were above the standard stimulus (p values <.05 in 2-way ANOVA analysis for all stimuli except the one closest to the reference).

**Conclusion:** The results demonstrate that patients with PD have a perceptual grasp for the pressure exerted by tactile stimuli. This perceptual grasp may be a disorder of disengagement induced by frontal executive dysfunction that is often associated with PD.

**Research supported by:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine.

***Role of Integrin-Dependent Focal Adhesion Complexes in A $\beta$ -Induced Neurotoxicity***

Jung A Alexa Woo(University of South Florida,Morsani College of Medicine, Department of Molecular Medicine),Courtney Uhlar (University of South Florida),Vinishaa Ankala(University of South Florida),Taylor Boggess(University of South Florida),David E.Kang(University of South Florida Morsani College of Medicine, Department of Molecular Medicine)

**Objectives:** The binding of A $\beta$  to integrins is required for A $\beta$ -induced neurotoxicity. We hypothesized that the ligation of A $\beta$  to  $\beta$ 1-integrin complexes induces abnormal changes to the structure of integrin-dependent focal adhesions and that such perturbation is critical for its neurotoxicity.

**Methods:** We utilized a combination of biochemical, cell biological and in vivo methods in transfected cells and a mouse model of AD to determine the effects of A $\beta$  on integrin-dependent focal adhesion complexes and neurotoxicity.

**Results:** A $\beta$  oligomers and fibrils, via integrin complexes, induced rapid disruption of focal adhesion complexes prior to cell death in HT22 cells and primary neurons. Specifically, two structural components of focal adhesion complexes, talin and vinculin, were removed from integrin-dependent focal adhesion complexes upon 2-4 hrs of A $\beta$  exposure and replaced with Filamin-A and RanBP9. Such changes were prevented by  $\beta$ 1-integrin blocking antibody and knockdown of cofilin. Overexpression of RanBP9, cofilin, Filamin-A, or vinculin fragments disrupted endogenous talin/vinculin-localized focal adhesions and potentiated A $\beta$ -induced neurotoxicity, and stabilization of talin/vinculin focal adhesions by RanBP9, cofilin, or Filamin-A siRNA antagonized such effects of A $\beta$ . Transgenic mice overexpressing APP/A $\beta$  (PSAPP) demonstrated severe disruption of talin/vinculin focal adhesions specifically surrounding A $\beta$  deposits.

**Conclusions:** A $\beta$ -induced neurotoxicity is mediated initially by disruption of integrin-dependent focal adhesion components by cofilin, RanBP9, and Filamin A. These molecules are hypothesized to be valuable therapeutic targets for AD.

**Research supported by:** NIH, AHAF, Alzheimer's association, WCU Neurocytomics

***The Role of the Ikaros Transcription Factor in Regulatory T Cell (Treg) Development and Function in a Murine Pancreatic Adenocarcinoma Model***

Nadine Nelson<sup>1</sup>, Maya Jerald<sup>1</sup>, Laura Pendleton<sup>1</sup>, Karoly Szekeres<sup>1</sup>, Nasreen Vohra<sup>2</sup>, Shari Pilon-Thomas<sup>3</sup> and Tomar Ghansah<sup>1</sup>. <sup>1</sup>University of South Florida, Tampa, FL; <sup>2</sup>East Carolina University, Greenville, NC; <sup>3</sup>Moffitt Cancer Center, Tampa, FL. University of South Florida, Morsani College of Medicine, Department of Molecular Medicine

**Keywords:** Pancreatic Cancer, Tumor Immunology, Immune suppression, Tregs, Ikaros

**Objective:** Loss of regulatory T cell (Tregs) homeostasis leads to the suppression of anti-tumor immune responses in PC tumor-bearing (TB) hosts. Tregs express the Forkhead BoxP3 (FoxP3) gene that is critical for their suppressive function. The transcription factor Ikaros is crucial for normal T lymphocyte development and function. Our objective is to identify the role of Ikaros in regulating Treg homeostasis and function in a pancreatic tumor microenvironment.

**Methods:** We developed a murine model of pancreatic cancer, isolated splenocytes from TB and control mice and performed flow cytometry and magnetic activated cell sorting (MACS) to immunophenotype and enrich T cells for in vivo and in vitro analyses. We also used real-time PCR (qRT-PCR) and western blot analyses to evaluate Ikaros and FoxP3 mRNA and protein expression in enriched T cells and whole splenocytes from TB and control mice.

**Results:** Our flow cytometry results showed that CD4+ and CD8+ T cell percentages were significantly lower in splenocytes from TB mice compared to control. However, there was a significant expansion of Tregs in splenocytes from TB mice. In addition, enriched TB Tregs suppressed antigen-specific CD8+T cell responses in a dose-dependent manner, in vitro. Preliminary qRT-PCR results revealed no significant difference in Ikaros mRNA expression whereas Ikaros protein expression was reduced in TB whole splenocytes compared to control. In enriched TB CD3+ T cells, Ikaros protein expression was reduced while FoxP3 protein expression was increased, compared to controls.

**Conclusion:** Our results suggest that the PC microenvironment potentially downregulates Ikaros' expression, which may contribute to the expansion of Tregs and their suppression of CD8+T cell (anti-tumor) immune responses.

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***SAS and Excel Go Hand in Hand for Automation: Data Management to Policy Reports***

Shabnam Mehra (COPH), Mittal Nagda (COB) Durga Morpati (COB) University of South Florida, College of Public Health, Department of Environmental & Occupational Health

Keywords: SAS Excel Policy Report Automation

Objective: To automate policy reports using administrative data with multiple dates and overlapping date spans.

Methods: Managing and cleaning administrative data can be challenging, but by using SAS® to manage and analyze the data, it can help overcome some of the challenges. The process can be a simple four step process: 1. Use SAS® 'Data \_NULL\_' to create headers for report; 2. Combine multiple records to single records using RETAIN with IF-THEN-ELSE-DO loops in SAS®; 3. Create Data Summaries using SAS® SQL or Proc Summary; 4. Export SAS® data to pre-formatted Microsoft Excel workbook or templates. The process of generating policy reports can be automated using various methods currently available in SAS®, i.e. DDE, ODS, X-command or Add-In.

Results: In SAS, using the \_NULL\_ and RETAIN with IF... Then...Else...Do loops can alleviate some problems which arise during data management. Often dates in administrative dataset are not in date format, \_NULL\_ can be used to manage dates and put headers log and output reports. RETAIN statement with if-then-else-do loop can be used to combine different overlapping date spans to one unique record. DDE, X-command and Add-In in Excel can be used to export SAS® data to pre-formatted Microsoft Excel workbook or templates.

Conclusion: The methods employed here are simple and can be combined to clean administrative data to desirable format for answering research and policy questions. With the examples and information provided in this presentation/poster, the audience is expected to be able to (1) Combine multiple records to single records efficiently using SAS® ; (2) Automate regulatory reports from data analyzed in SAS® to pre-formatted templates.

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***Prostate Cancer Treatment and Outcomes: 20-Year Experience at a Single Cancer Center***

Evelyn Anegebe University of South Florida, College of Public Health, Department of Epidemiology & Biostatistics

**Keywords:** Prostate cancer, Radical prostatectomy, Radiation therapy, Retrospective cohort study

**Objective:** Radical prostatectomy(RP) and radiation therapy(RT) are the two major treatment recommendations for men diagnosed with clinically localized prostate cancer. The objective of this report is to provide descriptive information on patient outcomes for a study population with prostate carcinoma who underwent standard treatment options including radical prostatectomy and radiation therapy, and other treatment options over a 20-year period at the Moffitt Cancer Center.

**Methods:** Electronic data on demographics, clinical information and outcomes were abstracted retrospectively from the cancer registry and medical records of patients with primary prostate cancer at Moffitt Cancer Center from January 1989 to December 2009. Data were analyzed using multivariate logistic regression, Kaplan-Meier survival analysis, and multivariable Cox proportional hazards regression analysis.

**Results:** During a median follow-up of 8.2 years, a total of 5513 patients received treatment for prostate cancer. The 20-year prostate cancer specific survival rate was 91.2% and 88.7% among patients who received RP and RT respectively. On multivariate analysis, age at diagnosis (hazard ratio[HR]2.76;  $P < 0.0001$ ), tobacco use (HR 1.64;  $P = 0.005$ ), and disease recurrence (HR 2.56;  $P < 0.0001$ ) were associated with a significant risk of prostate cancer death.

**Conclusion:** The review of the 20-year experience at this institution indicates treatment outcomes for patients are comparable to national trends of increase in survival. Treatment with RP and RT offer a real chance of long-term survival to patients diagnosed and treated for prostate cancer. Also, radical prostatectomy was associated with a reduction in mortality rate from prostate cancer.

**Research supported by:** H.Lee Moffitt Cancer Center & Research Institute

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***Development of a Mosquito Trap that Uses Sugar Feeding to Detect Eastern Equine Encephalitis Virus***

Andrea M. Bingham, Nathan D. Burkett-Cadena, and Thomas R. Unnasch, University of South Florida, College of Public Health, Department of Global Health

**Keywords:** mosquito, sugar feeding, virus secretion, eastern equine encephalitis virus

**Objective:** Eastern equine encephalomyelitis virus (EEEV) is the most pathogenic arbovirus endemic to the USA. Prevention of infection relies upon transmission surveillance and community-wide prevention measures to prevent the spread of the virus to humans. Many counties in Florida cannot afford the costs associated with thorough active surveillance, including testing of wild birds, sentinel chickens, and mosquito pools. For mosquito surveillance, sample size is extremely important due to low infection rates in mosquito populations. Current methods rely on mosquito pools with no greater than 50 mosquitoes and can be costly and time consuming.

**Methods:** We designed a surveillance system that exploits virus secretion in saliva during sugar feeding by mosquitoes. Modified collection chambers of CO<sub>2</sub>-baited traps are supplied with honey-coated nucleic acid preservation cards. Mosquitoes that feed upon honey expectorate viral particles onto the card which are then inactivated and preserved by the card. RNA extracted from the cards can then be screened via RT-PCR for arboviruses.

**Results:** In field trials, we found that 1) the modified traps captured as many females with a similar species distribution as did standard CO<sub>2</sub>-baited CDC light traps; 2) nearly all females (91.4%) in traps fed on honey; and 3) traps could run unattended for 3 consecutive days on a single battery and CO<sub>2</sub> tank. Experimental inoculations of EEEV onto honey coated preservation cards demonstrated that viral levels down to 1 PFU were detectable for up to seven days. Additional field trials are currently in progress.

**Conclusion:** This method will allow us to screen more mosquitoes at a time, decreasing the amount of labor and cost.

***Stabalization of Extra-uterine Life with Skin to Skin Contact***

Jessica M Gordon, ARNP, Former Lactation Community Affairs Coordinator at St Jospheh's Women's Hospital,USF CON PhD Student, Victoria Drum, RN, St Jospheh's Women's Hospital Labor and Delivery Charge Nurse, Winta Araya, RN, USF CON Research Intern, University of South Florida, College of Nursing

**Keywords:** hospital research,maternal-child health

**Objective:** Determine if standardization of skin to skin contact (SSC) within one hour of birth positively influences SSC practice, neonatal stabilization, and breastfeeding outcomes.

**Methods:** One month post implementation of a SSC learning module and skills validation, a retrospective chart review was conducted of 84 stable new born babies with gestational age of 35 weeks or more in a birthing facility located in Tampa, Florida. Half of the new born babies were stabilized using SSC (group 1) and the remaining half were stabilized using incubator care (group 2). Outcome measures included: 1) Heart rate and respiratory rate at delivery, 24 hrs, and 48 hrs; 2) admission to intensive care nursery (NICU); and 3) feeding pattern (breast feeding, formula, & mixed) at the time of discharge using t-test and chi-square statistics.

**Results:** Comparison of the two groups showed that SSC was equally effective as that of incubator care in stabilizing temperature ( $t=-2.3$ ,  $p=0.21$ ,  $t=-.6$ ,  $p=0.24$ , &  $t=-2.8$ ,  $p=0.15$ ) and respiratory rate ( $t=-3.7$ ,  $p=0.03$ ;  $t=-0.17$ ,  $p=0.45$ ;  $t=0.29$ ,  $p=0.9$ ) at delivery, 24 hrs, and 48 hours of birth respectively. Both groups did not differ in feeding pattern at discharge ( $X^2=1.14$ ,  $P=0.57$ ). There was no admission to NICU in both groups. Incidence of SSC practice increased from 1 (2.4%) in group 2 to 33 (80.5%) in group 1.

**Conclusion:** The findings show that desirable outcomes were achieved with SSC intervention comparable to conventional incubator care. Implementation of a SSC protocol with proper in-servicing can effectively increase SSC practice. Breastfeeding outcomes on hospital discharge are influenced by more than SSC.

**Research supported by:** March of Dimes



***USF HEALTH***  
***ABSTRACT POSTER***  
***SESSION***

**Abstract #: 1**

**Presented by: Salman Aljubran, MD, Resident**

***A Case of Delayed Anaphylaxis to Beef in Central Florida***

Salman Aljubran, Richard Lockey, Mark Glaum Division of Allergy and Immunology, Internal Medicine, Morsani College of Medicine, University of South Florida, Tampa, FL

**Keywords:** Beef allergy, Alpha gal, Anaphylaxis

**Objective:** Hypersensitivity to food is mediated by IgE and results in immediate signs and symptoms of anaphylaxis. Cases of delayed food anaphylaxis are described. A proposed mechanism for delayed food-induced anaphylaxis implicates specific IgE directed against galactose-alpha 1,3-galactose (alpha-gal). Alpha-gal is an oligosaccharide found in mammalian cells of non-primates. The alpha-gal epitope is present in beef, pork, and lamb. Alpha-gal allergy is associated with delayed anaphylactic reactions after ingestion of red meat. Delayed food anaphylaxis attributable to alpha-gal sensitivity is most commonly reported in the mid-atlantic, southeastern and mid-western United States.

**Methods:** A 17-year old male born and raised in Florida presented with an history of idiopathic anaphylaxis, urticaria, and dermatographism. The patient had urticaria and dermatographism since the age of 3 years that responded to oral antihistamines. At age of 13, these symptoms became more severe and he began to experience episodes of anaphylaxis, cause unknown. He had 2 to 3 episodes per year with following symptoms; abdominal cramping and pain, vomiting, and generalized flushing and urticaria and angioedema. He had eaten beef in the past without difficulty however, at the age of 16 years, he had two sequential episodes of anaphylaxis within 3 to 6 hours after eating hamburger.

**Results:** The patient had negative percutaneous skin tests to beef, pork, and lamb. Beef IgE of 25.6 (<0.34 ku/L), pork IgE of 17 (<0.34 ku/L) and alpha gal IgE of 25.9 (<0.34 ku/L). Tryptase of 3.9(0.4-10.9 ng/ml).

**Conclusion:** A case of delayed food anaphylaxis is reported, most likely due to the ingestion of red meat, in a patient who has lived all his life in Florida.

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**Abstract #: 2**

**Presented by: Adarsh Bellur, MS, Graduate Student**

***Naegleria fowleri Virulence Factor Nfa-1 is a Hemerythrin with NAD(P)H-dependent Oxidoreductase Activity***

Adarsh Bellur, DeAndre Wells and Andreas Seyfang Department of Molecular Medicine, USF Morsani College of Medicine, Tampa, FL

**Keywords:** pathogenic amoeba, Fe-binding hemerythrin, oxidoreductase, virulence factor, drug design.

**Objective:** *Naegleria fowleri* is a free-living pathogenic amoeba that can cause primary amoebic meningoencephalitis (PAM) with a 98% fatality rate since no efficient drug treatment of PAM is currently available. *N.fowleri* Nfa-1 is a virulence factor recognized in patient antiserum and belongs to the Fe-binding hemerythrin protein family. Recombinant Nfa-1 protein was used for its biochemical and pharmacological characterization as potential novel drug target.

**Methods:** We cloned and expressed Nfa-1 as recombinant protein in *E.coli* as intein-chitin binding domain fusion protein in the pTwin vector system. Following purification by chitin-agarose chromatography, cleavage of the purified Nfa-1 protein was accomplished by thiol-induced activation of the intein protease.

**Results:** We could show that Nfa-1 has NAD(P)H-dependent oxidoreductase activity, using NADH or NADPH as substrate and ferricyanide as electron acceptor. Kinetic analysis revealed apparent  $K_m$  and  $k_{cat}$  values for NADH of  $K_m = 54 \mu\text{M}$  and  $k_{cat} = 3.3/\text{sec}$ , and for NADPH of  $K_m = 32 \mu\text{M}$  and  $k_{cat} = 0.53/\text{sec}$ , suggesting that NADH is the preferred substrate for this enzyme. This NADH:ferricyanide assay now opens the door for pharmacological drug screening against *Naegleria fowleri* Nfa-1 activity. Furthermore we have modeled the molecular structure of *N.fowleri* Nfa-1 in silico based on the crystal structure of the hemerythrin from a marine tubeworm at 1.8Å, which now provides the opportunity of molecular modeling for rational drug design against Nfa-1. Hence the core structure of Nfa-1 consists of four parallel alpha-helices with five His residues coordinating the Fe binding.

**Conclusion:** Revealing the enzyme activity of Nfa-1 now provides the opportunity of drug screening against this *N.fowleri* virulence factor.

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**Abstract #: 3**

**Presented by: Sandhya Boyapalle, PhD, Faculty**

***Prophylactic Potential of Doubly-Stapled Peptides for Inhibiting Fusion of Respiratory Syncytial Virus to Host Target Cells***

Sandhya Boyapalle<sup>1</sup>, Terianne Wong<sup>2</sup>, Raminder Bedi<sup>1</sup>, Vivianna Sampayo<sup>2</sup>, Huy Nguyen<sup>1</sup>, Subhra Mohapatra<sup>2</sup>, Loren Walensky<sup>3</sup> and Shyam Mohapatra<sup>1</sup>. <sup>1</sup>Department of Internal Medicine, <sup>2</sup>Department of Molecular Medicine, Morsani College of Medicine, University of South Florida, Tampa, FL; <sup>3</sup>Dana Farber Cancer Institute, Harvard School of Medicine, Boston, MA, University of South Florida, Morsani College of Medicine, Internal Medicine

**Keywords:** RSV hydrocarbon stapled peptide Prophylaxis nanoparticles

**Objective:** Respiratory syncytial virus (RSV) employs three discrete heptad repeat (HR) domains of its fusion protein, RSV-F, to form a six-helix fusogenic bundle enabling the virus to penetrate the host cell membrane. Interference with this fusion can block RSV from entering target cells and infecting them. In this study we tested the prophylactic potential of hydrocarbon-stapled RSV fusion inhibitors in vitro and in vivo.

**Methods:** The Walensky lab designed and synthesized the hydrocarbon-stapled peptides from the HR2 sequence (488-522) to block F-protein fusion. Human alveolar epithelial A549 cells were treated with fusion inhibitor peptide and then infected with RgRSV (RSV expressing green-fluorescent protein), rA2 RSV, or the clinical isolates RSV 2-20 or rA2-Line19F. Effectiveness of the peptide was determined by viral GFP expression, by plaque titers or RSV N gene expression by qPCR. Lead peptides from the in vitro studies were conjugated with nanoparticles and administered intratracheally in mice to test their prophylactic potential in terms of reducing RSV titer by plaque assay and immunostaining of lung sections with anti-RSV N antibody.

**Results:** Hydrocarbon double-stapling effectively decreased proteolytic degradation and increased stability and half-life of the fusion-inhibitor peptides. The doubly-stapled peptides significantly decreased RSV infection both in vitro and in vivo compared to the native peptide without any stapling.

**Conclusion:** RSV fusion inhibitors with hydrocarbon double stapling are effective as prophylactic treatments. The availability of stable fusion inhibitors provides a new tool for studying the mechanism of virus-cell fusion and may lead to novel antiviral therapeutics.

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**Abstract #: 4**

**Presented by: Jean Brown, MD, Resident**

***Novel Interleukin-7R $\alpha$  (IL-7R $\alpha$ ) Mutations Causing Delayed Onset Isolated T Cell Immunodeficiency Disease***

J. Brown, M. Dorsey, J. Sleasman, P. Sriaroon University of South Florida, Morsani College of Medicine, Department of Pediatrics

**Keywords:** IL-7R $\alpha$ , severe combined immunodeficiency

**Objective:** Mutations within the IL-7R $\alpha$  complex are a rare cause of severe combined immunodeficiency disease. Generally infants with this disorder develop fatal opportunistic infection within the first year of diagnosis without hematopoietic cell transplantation (HCT).

**Methods:** We identified a 10 yo female with history of recurrent sinusitis, bronchiectasis, chronic hypoxia, and failure to thrive who had profound T cell lymphopenia, T-B+NK+ phenotype. The patient has been treated for several bacterial and Aspergillus infections of her lungs, but has not been infected with Pneumocystis jiroveci or other opportunistic organisms. Parents are healthy.

**Results:** Investigations revealed profound CD3 lymphopenia (37 cells/mm<sup>3</sup>), and normal B and NK cell enumerations. Lymphocyte response to Candida, phytohemagglutinin, and concanavalin A stimulation was poor (response = 1.7 SI, 4,904 cpm, and 10,127 cpm, respectively), but normal to tetanus (response = 13.1 SI) and moderately low to pokeweed stimulation (response 31,207 cpm), respectively). Her IgG and IgM levels were normal while IgA was elevated. Vaccine responses showed protective tetanus and pneumococcal titers but low to diphtheria vaccine. Her NK function was normal. TREC counts were low. Short tandem repeat analysis showed no evidence of maternal T cell engraftment. Two novel frameshift mutations were identified in two alleles of IL-7R $\alpha$  gene (c.589\_598delCCGGCAGCAA and c.993delA).

**Conclusion:** Mutations in IL-7R $\alpha$  gene can result in a late clinical presentation of recurrent infection with profound deficiency in T cell numbers and function and normal B cell function, suggesting this novel compound heterozygous mutation is associated with partial IL-7R $\alpha$  function that preserves B cell development.

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**Abstract #: 5**

**Presented by: Jessica Brumley, PhD, Staff**

***Bacterial Vaginosis, Perceived Racism and Perceived Stress among Black Women***

Jessica Brumley CNM, PhD Morsani College of Medicine, Department of Obstetrics & Gynecology, Division of Midwifery, University of South Florida

**Keywords:** Bacterial Vaginosis, Stress, Racism, Ethnic Disparities

**Objective:** The objective of this study was to test a predictive model of bacterial vaginosis among Black women.

**Methods:** Participants (N=94) completed a self-administered questionnaire and interview including measures of perceived stress, perceived racism, behavioral responses to stress and specific behavioral responses to racism along with traditional predictors of BV. Bacterial vaginosis was diagnosed utilizing a self-collected vaginal swab which was analyzed utilizing the BVBlue point of care testing kit.

**Results:** Twenty percent (N=19) women screened positive for bacterial vaginosis. Douching, sexual activity in the last three months and education were significantly associated with bacterial vaginosis. Age, income, hormonal contraceptive use and condom use were not associated with bacterial vaginosis. Neither perceived stress nor perceived racism was associated with BV. After completion of logistic regression analysis, only education continued to be a significant predictor of bacterial vaginosis.

**Conclusion:** The lack of an association between BV and the main study variables may have been related to the young age of the sample or the low rates of high perceived stress and high perceived racism. Perceived stress was positively associated with perceived racism and behavioral responses to stress. This association is likely a reflection of the stressful nature of perceived racism. Further research is needed to better understand how the stressful nature of racism and behavioral responses to stressors may influence health outcomes and if interventions can be utilized to promote adaptive behavioral responses.

**Research supported by:** McNair Doctoral Fellowship

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**Abstract #: 6**

**Presented by: Rongras Damrongwatanasuk, MD, Postdoc**

***Atopic Dermatitis in Patients with Agammaglobulinemia Is Associated with Cutaneous Staphylococcal Infections***

R. Damrongwatanasuk, P. Sriaroon, J. Sleasman; Division of Allergy, Immunology and Rheumatology, Department of Pediatrics, All Children's Hospital/University of South Florida, St. Petersburg, FL

**Keywords:** agammaglobulinemia, XLA, Atopic Dermatitis, elevated IgE, Staphylococcal infections

**Objective:** Atopic dermatitis (AD) is most commonly characterized by hypersensitivity to a variety of allergens and elevated IgE levels. However, patients with X-linked (XLA) or autosomal recessive (ARA) agammaglobulinemia may have AD even in the absence of IgE production.

**Methods:** Retrospective medical records review of 37 patients with agammaglobulinemia (defined by non-detectable serum immunoglobulins and circulating blood B cells) to determine the proportions of AD with or without Staphylococcal infections.

**Results:** Among the 37 subjects, 85% were XLA and 15% were ARA. All were receiving replacement gammaglobulin therapy. The average gammaglobulin dose was  $0.65 \pm 0.43$  gm/kg/month and average IgG trough/steady state level was  $903 \pm 296.6$  mg/dL. AD was described in 8 patients (22%) as determined by physical examination. Three of the patients developed AD in infancy, three as children, and two as adolescents. Six of AD patients had chronic cutaneous and one had nasal Staphylococcal carriage. Interestingly, three of the eight AD patients had elevated serum IgE levels of 234, 325, and 532 IU/mL.

**Conclusion:** AD can be seen in patients with agammaglobulinemia, and some patients display elevated IgE levels. Dermatitis is commonly associated with Staphylococcal infections which may play an important role in the pathogenesis. Effective eradication of infection may improve clinical outcomes.

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**Abstract #: 7**

**Presented by: Marvin Duvalsaint, MS, Graduate Student**

***Endogenous Production of Abscisic Acid by Erythrocytic Stages of Plasmodium falciparum***

Marvin Duvalsaint, Ryan Young, Bill A. Baker, and Dennis E. Kyle, Morsani College of Medicine, Florida Center for Drug Discovery and Innovation, Department of Global Health, University of South Florida, Tampa, FL

**Keywords:** Malaria, abscisic acid, plasmodium falciparum, apicoplast, carotenoid

**Objective:** Plasmodium falciparum and Toxoplasma gondii possess a plastid-like organelle called the apicoplast, originally obtained via an endosymbiotic relationship with red/green algae. The apicoplast is an essential organelle that synthesizes the isoprenoid precursor isopentenyl pyrophosphate (IPP) as well as its isomeric form, dimethylallyl pyrophosphate (DMAPP), that are used for a variety of metabolic processes including carotenoid biosynthesis. Abscisic acid (ABA) is a carotenoid catabolite and phytohormone known to be a universal signaling molecule for development and stress response in plants and animals. Interestingly, stress induced ABA synthesis in T. gondii arrested egress of parasites from infected host cells (Nagamune et al, 2008). In this study we investigated the potential role of ABA in the human malaria parasite, P. falciparum.

**Methods:** We measured endogenous production of ABA in erythrocytic stages of P. falciparum by using GC-QqQ MRM.

**Results:** We observed that ABA levels increased during asexual development and that ABA production was significantly inhibited by fluridone as well as antibiotics that target the apicoplast (clindamycin, mirincamycin, and chloramphenicol).

**Conclusion:** This is the first study to demonstrate that isoprenoid biosynthesis leads to endogenous production of ABA in the malaria parasite. The exact role that ABA may play in development and response to stress in P. falciparum remains to be determined.

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**Abstract #: 8**

**Presented by: Jaime Flores-Torres, MD, Resident**

***Bacterial dysbiosis in an unusual model for studies of intestinal immune homeostasis***

Jaime A. Flores-Torres, Pediatrics, University of South Florida, Tampa, FL, Brittany Leigh, College of Marine Science, University of South Florida, St. Petersburg, FL and Larry J. Dishaw, Pediatrics, University of South Florida, Tampa, FL

**Keywords:** Gut microbiota, Gut Immunity, Gut homeostasis, Gut dysbiosis

**Objective:** All animals possess a gut that encounters an enormous diversity of antigens. Details of how the gut discriminates among commensal and potentially pathogenic bacteria remain unknown. We are studying Ciona intestinalis, a protochordate that filters microbial-rich seawater, to understand the gut innate immunity in helping to establish and maintain a stable microbial community and how dysbiosis disrupts homeostasis.

**Methods:** The Ciona gut microbiome was sequenced via 454 pyrosequencing. Compositional changes are being studied via 16s PCR libraries, fingerprinting of 16s, and real time PCR. We are developing gnotobiotic approaches and semi-sterile techniques to regulate microbial colonization. Naïve, as well as colonized, gut are exposed to live bacteria, lysates or products such as lipopolysaccharide to study the role of innate receptors in gut homeostasis.

**Results:** The Ciona gut reveals a core bacterial community made up of at least 13 families and 19 genera (46% of total bacteria) whose composition is affected by both diet and environment. Starvation, stress, or antibiotic use induces reproducible dysbiosis with functional consequences. New evidence is emerging on the role of both microbial exposure and sexual maturity on the development of gut immune tissues (host immune maturation).

**Conclusion:** Key signals in the onset of IBD-like symptomology and Necrotizing enterocolitis in mammals involve primary innate phenomena. Using an alternative model like Ciona intestinalis to study the effects of bacterial dysbiosis in the onset of acute and/or chronic gut instabilities affords us an unrestricted opportunity to study the molecular events governing gut-immune and microbial homeostasis.

**Research supported by:** ACH Foundation, USF Sponsored Research and Dean's Office, Ltman Lab Group

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**Abstract #: 9**

**Presented by: Jessica Heinrichs, BS, Graduate Student**

***Alloantigen Specific CD8+CD25+Foxp3+ Induced T Regulatory Cells Display High Potency and Selectivity in Suppression of Allo-response***

Jessica Heinrichs, Jun Li, M.D., Kelley Haarberg Ph.D, Kane Kaosaard, Claudio Anasetti MD and Xue-Zhong Yu M.D M.S. University of South Florida Morsani College of Medicine, Department of Pathology and Cell Biology

**Keywords:** T regulatory cells Graft-versus-host-disease T effector cells Bone Marrow transplantation

**Objective:** Graft-versus-Host Disease (GVHD) is mediated by donor T effector cells (Teffs), whose functions can be suppressed by T regulatory cells (Tregs). We hypothesize that naïve CD8 T cells can be generated into alloantigen specific induced Treg cells (iTregs), and these cells are functionally suppressive against Teff cells. CD8 iTregs could represent a new biologic modality for the prevention of GVHD.

**Methods:** CD8 iTregs were generated from naïve CD8 T cells cultured with MHC mis-matched CD11chi DCs under polarizing conditions. Suppressive function, potency and specificity of CD8 iTreg were confirmed by mixed leukocyte reaction (MLR). CD8 and CD4 iTreg prophylaxis were tested in an allogeneic murine model of myeloablative BMT, and CD8/CD4-luciferase transgenic cells illustrated expansion in vivo.

**Results:** Under specific polarizing conditions with allogeneic DCs, naïve CD8 T cells were able to obtain Foxp3 expression and differentiate into iTregs. These iTregs displayed a dose dependent suppression of responses against original allogeneic DCs, but not DCs from a third party, indicating high potency and specificity of these alloreactive CD8 iTregs. In vivo study showed that CD8 iTregs were expansive in comparable magnitude to CD4 iTregs. Interestingly, CD8 iTregs were able to suppress the expansion of both CD4 and CD8 Teffs, whereas CD4 iTregs displayed weak suppression over CD8 Teff. Both CD8 iTregs and CD4 iTregs were capable of attenuating GVHD induced by Teffs after allogeneic BMT.

**Conclusion:** Allospecific CD8 iTregs generated from naïve CD8 T cells display high potency and selective suppression of alloresponse and GVHD, indicating CD8 iTregs may potentially be used for the prevention of GVHD.

**Research supported by:** R01 CA118116

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**Abstract #: 10**

**Presented by: Amanda Hott, MS, Graduate Student**

***Defining the Elusive artemisinin Resistance Phenotype In Vitro of Plasmodium falciparum***

Amanda M. Hott, Molecular Medicine, Morsani College of Medicine, University of South Florida Debora Casandra, Lindsay Morton, Kansas Sparks, Amanda Rutter, Matthew Tucker, Dennis E. Kyle, Molecular Medicine, Morsani College of Medicine, University of South Florida; Global Health College of Public Health, University of South Florida, University of South Florida, Morsani College of Medicine Molecular Medicine

**Keywords:** Malaria, Plasmodium falciparum, Drug Resistance, Artemisinin, Southeast Asia

**Objective:** Artemisinin resistance has emerged in Cambodia and Thailand and is observed clinically as a reduced parasite clearance rate in vivo following treatment with an artemisinin derivative alone or in combination. Recent evidence suggests the in vivo phenotype is linked to heritable genetic trait(s), yet to date a clear artemisinin resistance phenotype in vitro has not been defined. Through a series of studies we have begun to define the elusive artemisinin resistance phenotype in vitro.

**Methods:** First, we generated stable artemisinin resistant lines of Plasmodium falciparum, cloned them, and used these clones to assess new in vitro phenotypes assays. Secondly, we applied the new assays to culture adapted isolates of P. falciparum. Isolates with evidence of artemisinin resistance in vitro were immediately cloned and characterized.

**Results:** Results from these studies suggest that both the in vitro generated resistant lines and clones of Thai and Cambodian P. falciparum express stable resistance to artemisinin derivatives in vitro. The highest level of resistance in all resistant lines was to artelinic acid (AL), a compound that has never been used clinically (4-8 fold). A reduced level of resistance was observed to artemisinin and dihydroartemisinin (2-4 fold). In addition, each artemisinin resistant line had a reduced parasite clearance rate in vitro and recrudesced in vitro approximately 10-20 days following treatment. Interestingly, each of the artemisinin resistant lines expressed a ring stage dormancy phenotype and many had a prolonged ring phase in the absence of drug pressure.

**Conclusion:** These new artemisinin resistant phenotypes can be used to monitor emerging resistance in the field and to accelerate the discovery of drug resistance mechanism(s).

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**Abstract #: 11**

**Presented by: Amy Jiang, Med II Student**

***VRE Infection in Heme Malignancy Patients***

Amy Jiang, USF COM, Dr. John Greene, MD, FACP, Chief of Infectious Disease Division, Moffitt Cancer Center, University of South Florida, Morsani College of Medicine, Oncologic Sciences

**Keywords:** vancomycin-resistant enterococci, neutropenia, bacteremia, hematological malignancies

**Objective:** To analyze the outcome for heme malignancy patients with with VRE bacteremia.

**Methods:** Retrospective chart review on 50 patients with heme malignancies admitted to Moffitt Cancer Center between November 1, 2008 and July 30, 2011.

**Results:** An extended period of severe neutropenia (> 2 weeks with ANC <500 cell/ $\mu$ L) at the time of VRE bacteremia was observed in 37 of the patients. Of the remaining 13 patients, 7 had neutropenia lasting between 1 to 2 weeks, while 5 patients were neutropenic for less than 1 week. Of the patients analyzed, 28 patients received prophylactic therapy, (defined as anti-VRE antibiotics given to VRE colonized patients determined from rectal swab on admission) and 22 received empiric therapy, (defined as anti-VRE antibiotic treatment given at the onset of neutropenic fever) in patients colonized with VRE. Of those patients who received prophylactic therapy, 21 were stable at the time of discharge with an overall survival rate of 75%. Of the patients who received empiric therapy, 9 were alive at the time of discharge, with an overall survival rate of 41%. Of these 9 patients, 4 were neutropenic for less than 1 week, and one was neutropenic for 10 days. Refractory leukemia was associated with prolong neutropenia and higher mortality.

**Conclusion:** Severe neutropenia is strongly associated with VRE bacteremia likely due to refractory leukemia. Patients with neutropenia lasting less than two weeks had survival rates of 91.67%.

**Research supported by: Research Scholarly Concentration**

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**Abstract #: 12**

**Presented by: Adam Katzman, BS, Med II Student**

***Necrotizing Pneumonia in Cancer Patients***

Adam Katzman, MS2, Morsani College of Medicine Dr. John Greene, MD, FACP, Chief of Infectious Disease Division, Moffitt Cancer Center University of South Florida, Morsani College of Medicine, Oncologic Sciences

**Keywords:** necrotizing, pneumonia, cancer

**Objective:** To review and analyze the current practice of diagnosing and treating necrotizing pneumonia in cancer patients.

**Methods:** Retrospective chart review

**Results:** 65 cases of necrotizing pneumonia (NP) were identified with 44 (68 %) having positive cultures for one or more organisms. Preliminary results show there was a significant difference between the inciting microorganisms found by type of malignancy; MRSA, Pseudomonas (PSA), Klebsiella, Mycobacterium, Streptococcus and unknown fast-growing infections were more common in lung cancer and obstructive disease than in hematological malignancies (HM) (9.1% to 3.0%, 18.2% to 6.1%, 4.5% to 3.0%, 13.6% to 0, 9.1% to 0, and 13.6% to 12.1%, respectively). Conversely, Aspergillus, Nocardia, slow-growing unknown infections and other rare infections were more common in HM than lung disease (15.2% to 13.6%, 6.1% to 4.5 %, 24.2% to 4.5% and 21.2% to 13.6%, respectively). Neutropenia at the time of NP was observed in 15 of the HM patients (45%), 0 of the lung cancer patients and 1 (9%) of the other solid organ cancer patients. NP in HM cases had significantly more deaths both due to respiratory failure and other causes (18% and 12%, respectively) compared to lung cases (5% and 0%, respectively) and other malignancy had no deaths as of last follow-up. Hospice discharge, however, was more common in lung cancer cases causing NP (27%) than HM (12%) and other malignancy (0). The association between infecting microorganism and speed of progression to NP was not significant ( $p= 0.11$ ).

**Conclusion:** The evaluation of necrotizing pneumonia in cancer patients involves determining the level of immunosuppression, the duration of the illness and the pathogens isolated.

**Research supported by: USF Health Scholarly Concentration Summer Stipend Program**

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**Abstract #: 13**

**Presented by: Andrea Knab, MS, Med II Student**

***Viridans Group Streptococci (VGS) bacteremia in neutropenic patients causing Adult Respiratory Distress Syndrome (ARDS)***

Andrea Knab, MS II, USF Morsani College of Medicine, University of South Florida, Morsani College of Medicine, Oncologic Sciences

**Keywords:** Viridans Group Streptococci, Adult Respiratory Distress Syndrome, corticosteroids (Chart Review)

**Objective:** Adult respiratory distress syndrome (ARDS) is a relatively common and possibly fatal complication in neutropenic patients with viridans group streptococci (VGS) bacteremia. In this study we compared the neutropenic patients with VGS bacteremia who developed ARDS with those who did not and reviewed the benefit of administering corticosteroids in this patient group.

**Methods:** A retrospective chart review of 68 patients with hematologic malignancy admitted to the Moffitt Cancer Center between 1/1/2001 and 4/1/2012.

**Results:** In this study 70 cases of VGS bacteremia in neutropenic patients were reviewed. Two patients developed VGS bacteremia, while being neutropenic, twice. The common adverse effect of VGS bacteremia in this patient group is the development of serious pulmonary complications such as Adult Respiratory Distress Syndrome (ARDS). In our study 8 (12%) patients developed such complications, and all 8 of them received corticosteroids prophylactically. 7 (87.5 %) patients after receiving corticosteroids resolved their symptoms. Only one patient that received corticosteroids deceased 6 months later after the VGS bacteremia (due to chronic host vs. graft disease).

**Conclusion:** Preliminary data suggest that prophylactic administration of corticosteroids to neutropenic patients with VGS bacteremia can prevent serious complications associated with the Adult Respiratory Distress Syndrome.

**Research supported by:** USF Health Scholarly Concentration Summer Stipend Program

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**Abstract #: 14**

**Presented by: Catherine Kubiak, MD, Resident**

***MBL Polymorphisms in a US Cohort of Children with Recurrent Infection***

Dr. Catherine Kubiak, MD, Dr. John Sleasman, MD and Dr. Morna J. Dorsey, MD MMSc FAAAAI, USF/All Children's Hospital, St Petersburg, FL ,University of South Florida, Morsani College of Medicine, Department of Pediatrics

**Keywords:** Atopic Dermatitis/Eczema, Immunodeficiency, Immunology, Mannose binding lectin

**Objective:** Mannose-binding lectin (MBL) deficiency is associated with susceptibility to infectious disease. We sought to characterize MBL levels and genotypes in a US cohort of children referred for recurrent infections.

**Methods:** Using an IRB approved protocol, we retrospectively identified patients referred to allergy/immunology for recurrent infection from January 2009-2012 who had both MBL level and genotype information.

**Results:** Seventy-six subjects were identified with a mean age of 84 months, 39% were female, 65% were white, 26% Hispanic, 10% black, and 3% Asian. Our population had 23 different MBL2 haplotype pairs which we characterized as profoundly-low producers (<200ng/mL, n=35), moderately-low (200-400ng/mL, n=11), and low-normal (>400mg/mL, n=30). LXPA/LYPB was the most common genotype n=12 (16%), followed by HYPD/LYPB n=9 (12%) and HYPA/LYPB n=7 (9%). Of the 9 patients with atopic dermatitis identified, 7 of them were in the profoundly-low MBL producing group.

**Conclusion:** This unique study characterizes MBL genotypes in a US cohort of children with recurrent infections and identifies an association with atopic dermatitis in the profoundly-low MBL producing group.

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**Abstract #: 15**

**Presented by: Prasanna Tamarapu, Staff**

***Hyperoxia Induced Lung Injury is Associated with Alterations in Circadian Clock Genes in Mice***

Venu Lagishetty, Prasanna Tamarapu Parthasarathy, Huynh Bao, Jutaro Fukumoto, Ruan Cox, Jr, Richard Lockey and Narasaiah Kolliputi. Division of Allergy and Immunology, Internal Medicine, Morsani College of Medicine, University of South Florida, Tampa, FL 33612. USA, University of South Florida, Morsani College of Medicine, Internal Medicine

**Keywords:** Circadian rhythms; hyperoxia; inflammation; acute lung injury; DNA methylation

**Objective:** Prolonged exposure to hyperoxia leads to inflammation and hyperoxia-induced acute lung injury (HALI). The master regulators of circadian rhythm, clock genes, have been implicated in inflammation and chronic lung diseases. However the role of clock genes in hyperoxia-induced lung injury has not been studied. This study was designed to determine whether hyperoxia induced inflammation in ALI is mediated by altered expression of clock genes.

**Methods:** To test our hypothesis, mice (n=6) were exposed to hyperoxia or room air (control) for 72 h. Lung clock gene mRNA and protein levels were analyzed by qPCR and western blot analysis respectively. DNA methylation of Per1 gene promoter was measured by methyl specific PCR.

**Results:** The mRNA and protein levels of all clock genes (CLOCK, Bmal1, Per1, Per2, Cry1 and Cry2) and their target genes (Rev-erba and PPARg) were significantly elevated in mice exposed to hyperoxia compared to controls. However, expression of other clock target genes Dbp was suppressed. Alterations in clock genes were associated with increased inflammatory markers (Nfkb 50 & 65, IL-1b, TNFa and NALP3) in hyperoxic mice compared to controls. Further, the promoter region of the Per1 gene in hyperoxic mice was hypomethylated compared to control mice.

**Conclusion:** Our data demonstrates that increased inflammation in HALI may be partly due to hypomethylation of Per1 and increased clock gene expression.

**Research supported by:** This work was supported by the American Heart Association National Scientist Development Grant 09SDG2260957 and NIH R01 HL105932 to N.K. and the Joy McCann Culverhouse Endowment to the Division of Allergy and Immunology.

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**Abstract #: 16**

**Presented by: Chris Laird, MS, Graduate Student**

***Evidence That the OmpR/EnvZ Two Component System is a Transcriptional Regulator of the Trw type IV secretion System Genes in Bartonella henselae.***

Chris Laird, Kellie Larsen, Lisa Smith, and Burt Anderson University of South Florida, Morsani College of Medicine, Molecular Medicine

**Keywords:** Bartonella, erythrocytes, gene regulation, type IV secretion system

**Objective:** Bartonella henselae (Bh) is a zoonotic bacterium that causes cat-scratch disease, relapsing bacteremia, endocarditis and bacillary angiomatosis in humans. The natural reservoir is the domestic cat and the bacterium is transmitted among cats via the cat flea. In the cat, Bh is found inside erythrocytes and invasion of the erythrocytes requires a functional Trw type IV secretion system (T4SS). It has been shown the Trw components L1-L8 act as adhesins required for attachment to the feline erythrocytes. We hypothesize that genes encoding key components of the Trw T4SS, including trwL1-trwL8, are regulated by the OmpR/EnvZ two component regulatory system (TCS).

**Methods:** To test this hypothesis we have constructed an ompR deletion mutant in B. henselae and performed erythrocyte attachment assays, micro array and qRT-PCR analysis to compare the mutant and parental strain.

**Results:** We showed an increased expression of several key trw genes, suggesting that this TCS is a negative regulator of the trw T4SS. We have also shown that the ompR deletion mutant has an increased affinity for cat erythrocytes using an attachment assay, linking cell adherence with this TCS.

**Conclusion:** Our initial findings suggest that OmpR/EnvZ acts as a transcriptional regulator of Trw genes. Establishing an intra-erythrocytic niche has added to the ability of Bartonella species to evade host immune defenses and establish severe chronic infections. Understanding the regulatory processes that control the Trw T4SS and erythrocyte infection process is key to future attempts to develop new therapeutic interventions as well as shed light on these types of complex host pathogen interactions.

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**Abstract #: 17**

**Presented by: Amorce Lima, MS, Graduate Student**

***Zebrafish Embryo Model of Bartonella henselae Infection***

Amorce Lima<sup>1</sup>, Lisa Smith<sup>1</sup>, Byeong Cha<sup>2</sup> and Burt Anderson<sup>1</sup> <sup>1</sup>Department of Molecular Medicine, <sup>2</sup>Department of Pathology and Cell Biology, School of Biomedical Sciences, Morsani College of Medicine, University of South Florida, Tampa, Florida, University of South Florida, Morsani College of Medicine, Molecular Medicine

**Keywords:** Zebrafish; Danio rerio; angiogenesis; bacteria; Bartonella henselae; virulence factors

**Objective:** B. henselae (Bh) is the causative agent of cat scratch disease and bacillary angiomatosis (BA). BA is a systemic disease characterized by tumor-like lesions on the skin resulting from proliferation of the small blood vessels. VirB/VirD4 Type IV secretion system and Bartonella adhesin A (BadA) are two important virulence factors shown to play a critical role in B. henselae infection and angiogenesis in vitro. Progress in Bartonella research has been hampered due to a lack of a practical in vivo model. Therefore, the purpose of this project is to develop a model of Bh infection using the Tg(fli1:EGFP)y1 transgenic line of zebrafish (Danio rerio) embryos in order to test the role of Bh virulence factors in infection and in eliciting a pro-angiogenic host response.

**Methods:** Embryos were microinjected with Bh strains labeled with DsRed2 protein. Confocal microscopy and qPCR analysis were performed to assess live interaction of the bacteria with the embryo and the expansion of bacterial, respectively. ImageJ software was used to analyze images from infected embryos for angiogenic phenotype, and qRT-PCR was used to quantitatively measure host response to Bh infection.

**Results:** Data from our experiments show that zebrafish embryos microinjected with WT Bh become infected and display an angiogenic phenotype. QPCR results show increase in bacterial burden for several days post-inoculation in the embryos; however, those inoculated with virB and badA mutants display an attenuated virulence compared to those infected with WT Bh.

**Conclusion:** The zebrafish embryo model will be invaluable in helping identify virulence factors required for Bh infection and their role in eliciting a proangiogenic response.

**Research supported by:** National Institute of Health grant AI038178 to Burt Anderson

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**Abstract #: 18**

**Presented by: Huy Nguyen, BSc, Staff**

***Aging is Associated with Altered IL-1 $\beta$ , OPN, and Antiviral Gene Expression and Enhanced Lung Pathology in Respiratory Syncytial Virus Infections***

Huy Nguyen, BSc<sup>1</sup>, Terianne M. Wong, MSc<sup>1,2</sup>, Sandhya Boyapalle, DVM, MS, PhD<sup>1,2</sup>, Siddarth Kamath, MS<sup>3</sup>, Subhra Mohapatra, MS, PhD<sup>1</sup> and Shyam S. Mohapatra, PhD<sup>1,2,1</sup> University of South Florida Morsani College of Medicine, Department of Molecular Medicine, Tampa, FL,<sup>2</sup> JA Haley VA Hospital, Tampa, FL,<sup>3</sup> University of South Florida College of Public Health, Tampa, FL

**Keywords:** respiratory syncytial virus, immunology, aging, virology

**Objective:** The elderly are more susceptible to severe bronchiolitis and RSV-induced pneumonia than young persons, but age-associated pathology remains poorly understood. Here we used an aged mouse model of RSV-induced pneumonia to study the effects of age-associated deficiencies in pattern recognition receptor signaling and the inflammatory cytokines IL-1 $\beta$  and osteopontin 1 (OPN) on the response to RSV infection.

**Methods:** Groups of healthy young(1-3 mo.) and aged (>20 mo.) BALB/c mice were intranasally infected with a mucogenic strain of RSV or mock-infected for different periods of time. Total lung RNA was analyzed using quantitative real-time PCR arrays for 84 antiviral genes. The deltaCt served as the response factor in Minitab 2-way experiment analyzing the relationships among age and/or RSV infection. Lung sections were stained for mucus with periodic acid-Schiff (PAS) reagent and immunohistochemistry was performed for detection of RSV, IL-1 $\beta$  and OPN.

**Results:** The expression of 15 antiviral genes was significantly altered in aged mice, while 5 genes were associated with both age and infection. In response to RSV, aged mice had delayed induction of IL-1 $\beta$ , IL-6, and RIG-I gene expression; but aged mice had elevated OPN. OPN was increased in lung sections from RSV-infected aged mice relative to young mice. Immune cell infiltration was also elevated in aged, RSV-infected mice although viral titers and RNA levels remained similar between young and aged mice.

**Conclusion:** We identified several antiviral genes whose expression is down- or up-regulated by age and/or RSV infection. We also observed prolonged inflammatory responses, despite similar viral titers. Thus, anti-inflammatory treatments may help to reduce RSV-induced pathology in the elderly.

**Research supported by:** USF Sign Res to TW

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Abstract #: 19

Presented by: Hana Niebur, MD, Resident

***Heterogeneous Pneumococcal Antibody Titers in Patients with Antibody Deficiency Receiving Subcutaneous Hizentra***

Hana Niebur (USF), Carla Duff (USF), Susan Lukas (USF), Morna Dorsey (USF), John Sleasman (USF) University of South Florida Morsani College of Medicine, Department of Pediatrics

**Keywords:** antibody deficiency, subcutaneous immunoglobulin replacement therapy, Streptococcus pneumoniae

**Objective:** Patients with immunodeficiency receiving subcutaneous immunoglobulin are presumed to receive protection against many pathogens. This study evaluated titers to Streptococcus pneumoniae while on Hizentra®.

**Methods:** A longitudinal study of 32 immunodeficiency patients transitioning to Hizentra® were evaluated over 24 weeks. Plasma total IgG and specific IgG to 10 serotypes of Streptococcus pneumoniae were measured at 24 weeks. Protective pneumococcal titers were defined as  $\geq 0.35$  mcg/mL for invasive disease,  $\geq 2.5$  mcg/mL for pneumonia, and  $\geq 5$  mcg/mL for nasopharyngeal carriage for  $\geq 70\%$  of serotypes. Approval was obtained from the University of South Florida and All Children's Hospital IRBs. Written informed consent or assent was obtained from patients or legal guardians.

**Results:** There was no significant difference in Hizentra® dosage or total IgG among groups. 97% had protective titers against invasive disease, and 6% had protective titers against pneumonia. In XLA/ARAG/SCID, 5/5 had protective titers against invasive disease. 0/5 had protective titers against pneumonia. For CVID, 12/13 had protective titers against invasive disease. 0/13 had protective titers against pneumonia. For SAD and IgG Subclass Deficiency, 12/12 had protective titers against invasive disease. 2/12 had protective titers against pneumonia. In HIGM, 2/2 had protective titers against invasive disease. 0/2 had protection against pneumonia. No patient had protection against nasopharyngeal carriage. Titers were lowest for serotype 4. Except for patients with HIGM, serotype 14 titers were highest.

**Conclusion:** While patients receiving Hizentra® have therapeutic IgG levels, serotype-specific pneumococcal titers may not provide sufficient protection, especially in CVID.

**Research supported by:** CSL Behring

Abstract #: 20

Presented by: Daniel Olson, BS, Med II Student

***Escherichia coli: An Important Pathogen in Patients with Hematologic Malignancies***

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**Keywords:** E.coli, Escherichia Coli, Neutropenia, Bone Marrow Transplant, Hematological Malignancy; This study is a Chart Review.

**Objective:** Escherichia coli is a pathogen of great concern in febrile neutropenic (FN) patients. While prophylaxis with a fluoroquinolone (FQ) has become the standard to prevent FN, the emergence of resistance has some questioning its use. This study describes our experience with E.coli as a pathogen in neutropenic patients with a hematologic malignancy, assesses E.coli antibiotic resistance patterns, examines FQ prophylaxis complications, and addresses future directions of treatment for this patient population.

**Methods:** A retrospective chart review of 245 patients with E.coli bacteremia at Moffitt Cancer Center from 05/18/02 – 05/15/12 was conducted. Patients were identified via microbiology laboratory computerized records.

**Results:** The patients experienced a median hospital stay of 14.7 days due to E.coli bacteremia. Clinical guidelines rated 50% aseptic, 26% septic, 9% severe sepsis, and 15% septic shock. Pressors were required in 19% of cases, and 14% were placed on ventilators. Antimicrobial resistance patterns showed a high prevalence of E.coli resistance to ciprofloxacin(81.58%), levofloxacin(80.26%), trimethoprim/sulfamethoxazole(59.21%), and ampicillin/sulbactam(80.26%). E.coli FQ prophylaxis led to an increase in FQ resistant E.coli; however, this was not associated with increased morbidity.

**Conclusion:** E.coli is a major pathogen in this patient population resulting in extended hospital stays and specialized antibiotic treatment. FQ resistant E.coli bacteremia is a growing problem in patients with FN. Since FQ prophylaxis for the prevention of FN is necessary with no current antimicrobial alternative; earlier detection and prevention strategies are needed to combat this growing problem.

**Research supported by:** USF Health Scholarly Concentrations Program

***Overexpression of Circadian CLOCK Genes Alters Proinflammatory Cytokine Production in Human Alveolar Epithelial Cells***

Prasanna Tamarapu Parthasarathy, Tran Luong, Venu Lagishetty, Oluwakemi Phillips, Ruan Cox, Annie Castillo, Toaa Abuelenen, Richard Lockey and Narasaiah Kolliputi University of South Florida, Morsani College of Medicine, Department of Internal Medicine

**Keywords:** Circadian rhythm,ALI,Inflammatory cytokines

**Objective:** Acute lung injury (ALI) is a devastating clinical syndrome manifested by inflammation and decreased lung compliance. Cytokines such as IL-1 $\beta$ , IL-6 and IL-8 have been implicated in the process of inflammation and in chemokine stimulation associated with ALI. Recent studies suggest that circadian clock genes are involved in inflammation disorders, however, the role of these genes in ALI is yet unknown.

**Methods:** A549 cells were transfected with core clock genes (Bmal1, CLOCK, Cry1/2, Per1, Per2) and subsequently treated with either IL-1 $\beta$  or hydrogen peroxide. Supernatants were analyzed for the production of IL-6, IL-8 and TGF-Beta. Lysates were analyzed for ENaC and other core CLOCK gene expression.

**Results:** There was a significant decrease in IL-8 production in cells transfected with the core CLOCK genes. However, the level of IL-6 was unchanged in these cells. Further, A549 cells treated with IL-1 $\beta$  or hydrogen peroxide after Cry1 and Per2 transfection showed a significant decrease in IL-6 and IL-8. However, no significant changes were observed when transfected with Per-1.

**Conclusion:** Our data suggest that core clock genes may be protective by ameliorating cytokine production thereby offering a potential therapeutic to minimize the clinical severity and mortality of ALI.

**Research supported by:** This work was supported by the AHA 09SDG2260957 and NIH R01 HL105932 grants to N.K.

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***Successful Desensitization to Agalsidase Beta After Anaphylaxis***

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**Keywords:** asthma, LABA, inhaled corticosteroids

**Objective:** Enzyme replacement therapy with recombinant human  $\alpha$ GAL, agalsidase beta (A- $\beta$ ), reduces adverse outcomes in Fabry's disease. However, anaphylactic reactions (1%) occur. Anaphylaxis to A- $\beta$ , followed by successful reintroduction after desensitization, is reported.

**Methods:** A 50 yo Caucasian male with end stage renal disease, status post cadaver kidney transplant on immunosuppressive therapy, developed A- $\beta$  hypersensitivity one year after beginning therapy with monthly intravenous (IV) A- $\beta$  (60 mg at 40 cc/hr). Recurrent hospitalizations resulted in missed doses of A- $\beta$ . He developed a pruritic erythematous macular papular rash on the torso and angioedema of the lips and eyes. Hypotension developed and resolved with IV discontinuation. Oral diphenhydramine (D), methylprednisolone (M) and IV fluids were administered.

**Results:** IgE and IgG antibodies and skin prick test to A- $\beta$  was positive. Several weeks after his systemic reaction, he was desensitized to incremental doses of A- $\beta$ , 70 mg. Premedication with oral prednisone, IV D and IV famotidine were administered prior to successful desensitization. Thereafter, he tolerated IV A- $\beta$  once monthly using the same premedication regimen. However, a few months later, while receiving A- $\beta$ , he again developed pruritus and cough. The infusion was discontinued and same treatment was given. Inpatient desensitization to incremental doses of A- $\beta$ , was accomplished using identical premedication protocol. He now receives IV A- $\beta$  60 mg bimonthly.

**Conclusion:** IgE and IgG antibodies and SPT to A- $\beta$  were positive indicating that IgE and IgG mechanisms may play a role in allergic reactions to A- $\beta$ . Premedication and incremental dosing of A- $\beta$  resulted in the successful desensitization and continuation of therapy to A- $\beta$ .

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**Abstract #: 23**

**Presented by: Nhan Tu, MS, Graduate Student**

***Characterizing the General Stress Response in Bartonella henselae***

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**Keywords:** General stress response, Bartonella henselae, partner-switching mechanism

**Objective:** A specialized regulatory system called the general stress response (GSR) protects bacteria against stress. In some  $\alpha$ -proteobacteria, the GSR is regulated by a partner-switching mechanism where NepR binds to SigH under no stress but releases SigH and switches its binding partner to PhyR under stress. Typically, the phyR and nepR genes are divergent, while sigH is located downstream of nepR, and the histidine kinases located nearby maybe involved. The B. henselae genome reveals two divergent gene clusters (BH13820-BH13860) that are similar to GSRs in  $\alpha$ -proteobacteria. We hypothesize that they are divergently transcribed and encode the GSR components in B. henselae.

**Methods:** To determine arrangement of GSR genes, the promoter of BH13850 was mapped using 5' RACE. A gene deletion mutant of BH13850 was performed and its regulon was compared to the wild-type (WT) using microarray and mass spectrometry analyses. Next, the WT and mutant strains were grown in Schneider's medium at different temperatures because B. henselae infects multiple hosts (cats, cat fleas, humans). gDNA was extracted and quantified using qPCR to determine the genomic equivalence (GE).

**Results:** A putative transcription start site was located 166 bp upstream of the start codon using 5' RACE. Minimal differences in gene expression were observed between the two strains because the bacteria were grown under optimal conditions on agar plates. No significant differences in GE were observed between the two strains.

**Conclusion:** We want to determine the stress conditions that affect gene expressions and how the GSR genes were regulated. We will study the effect of hemin and other potential stressors on the GSR system and map the promoter regions of the GSR locus using RNAseq and qRT-PCR analyses.

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**Abstract #: 24**

**Presented by: Jia-Wang Wang, PhD, Faculty**

***Lipopolysaccharide (LPS)-Responsive, Beige-Like Anchor (LRBA) is Involved In Autophagy Through Association With Microtubule-Associated Protein Light Chain-3 (LC3)***

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**Keywords:** LRBA, Autophagy, immunodeficiency

**Objective:** Deficiency of LRBA causes immunodeficiency and autoimmunity, and suppresses autophagy. Autophagy is a process for the degradation of a cell's own components. Perturbations in autophagy are implicated in the immune disorders. The molecular mechanism of LRBA involvement in autophagy is unknown. We hypothesize that LRBA is involved in autophagy through association with LC3.

**Methods:** Green (GFP) and red (RFP) fluorescent protein genes were fused with LRBA and LC3 genes, respectively, and co-transfected into HeLa cervical cancer, A549 adenocarcinomic alveolar basal epithelial and HEK293 embryonic kidney human cells, and Raw264.7 macrophage tumor mouse cells. Three dimensional structure remodeling, confocal microscopy, and immunofluorescence assays (IFA) were utilized.

**Results:** LRBA has a potential LC3 interaction region (LIR) and ubiquitin binding domain (UBD). Three dimensional structure remodeling shows that the LIR forms a complex with LC3 more stable than p62, a known LC3 binding protein; tyrosine phosphorylation in the LIR destabilizes the complex. Confocal microscopy and IFA show that LRBA is highly co-localized with LC3. Dominant-negatives containing UBD and/or LIR inhibit cell growth.

**Conclusion:** LRBA may serve as an adaptor for ubiquitinated proteins destined for degradation through association with LC3 and ubiquitin by LIR and UBD respectively during autophagy. Tyrosine phosphorylation may impede LRBA binding with LC3, inhibit autophagy, but favor cell growth, agreeing with that LIR is phosphorylated in several cancer types. These results may provide a molecular mechanism for clinical intervention of autophagy and cell growth related to human diseases.

**Research supported by:** The Joy McCann Culverhouse Endowment to the Division of Allergy and Immunology

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**Abstract #: 25**

**Presented by: Jillian Whelan, BS, Graduate Student**

***Respiratory Syncytial Virus Nonstructural Protein 2 (NS2): Exploitation of the Host Ubiquitin System***

Jillian N. Whelan<sup>1</sup>, Kim C. Tran<sup>1</sup>, Ruan R. Cox Jr<sup>1</sup>, Damian B. van Rossum<sup>2</sup>, Randen L. Patterson<sup>2</sup>, Michael N. Teng<sup>1</sup>

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**Keywords:** RSV, ubiquitin, host-pathogen interactions, molecular biology

**Objective:** RSV primarily infects children, causing upper respiratory infections potentially leading to bronchiolitis and pneumonia. The RSV NS2 protein is important for viral replication and disease pathogenesis and is essential for RSV-induced proteasomal degradation of host STAT2. Our aim is to determine the mechanism by which NS2 interacts with the host ubiquitin system during infection.

**Methods:** 293T cells were transfected with plasmid DNA to over-express proteins where indicated. Computational modeling revealed specific residues essential to NS2's ubiquitination function. Mutant NS2 constructs were produced by site-directed mutagenesis. Western blotting was performed for detection of protein expression.

**Results:** Transfection of 293T cells with HA-ubiquitin and HANS2 increased ubiquitination of host proteins as compared to HA-ubiquitin expressed alone. Transfection of HANS2 with the HA-ubiquitin mutation construct inhibiting poly-ubiquitin chain formation maintained ubiquitination of host proteins, indicating mono-ubiquitination. Mutation of residues important in NS2's ubiquitination function limited NS2-induced ubiquitination of host proteins.

**Conclusion:** Our results indicate that RSV NS2 regulates host cell activity by exploitation of the host ubiquitin system to enhance viral replication and pathogenesis. We demonstrate that NS2 induces mono-ubiquitination of host proteins, likely to control their function in the cell's anti-viral processes. Our NS2 mutant constructs show that there are multiple residues essential for NS2-induced ubiquitination. It is possible that NS2 induces ubiquitination of host proteins by interacting with ubiquitin ligase complex components, which is the subject of our current investigations.

**Research supported by:** SIPAID, NIAID, USF Institutional Funds

**Abstract #: 26**

**Presented by: David Woods, MS, Graduate Student**

***Histone deacetylase 11 is a Negative Regulator of Cytotoxic T-cell Effector Function and Central Memory Formation***

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**Keywords:** T-cell, CTL, histone deacetylase, HDAC, immunotherapy

**Objective:** Adoptive transfer of cytotoxic T-cells (CTLs) results in durable anti-tumor responses in a minority of patients with various malignancies. Our lab has identified histone deacetylase 11 (HDAC11) as a negative regulator of CTL effector function and memory formation, and, therefore, a potential therapeutic target for increasing adoptive immunotherapy efficacy.

**Methods:** HDAC11 knockout (HDAC11KO) mice were obtained from Merck Laboratories. Proliferation was determined by cell trace violet staining followed by  $\alpha$ CD3/CD28 stimulation for 72 hours and analysis by flow cytometry. Cytokine production was determined by 72-hour stimulation, collection of supernatant and analysis by cytokine bead array. Surface marker staining and analysis by flow cytometry allowed determination of memory population distributions. mRNA production was determined by qRT-PCR. For in vivo experiments, following establishment of B16 melanoma tumors, mice were sub-lethally irradiated and the following day received adoptive transfers of whole T-cells.

**Results:** HDAC11KO CTLs were hyper-proliferative and secreted significantly higher amounts of IFN- $\gamma$ , IL-2 and TNF. Additionally, HDAC11KO mice had higher percentages of central memory CTLs in young mice, which became more pronounced as the mice aged. Correspondingly, HDAC11KO CTLs expressed higher levels of Eomes, a transcriptional regulator of IFN- $\gamma$  and memory formation. In vivo, adoptive transfer of HDAC11KO CTLs mediated a more robust anti-tumor response, significantly decreasing tumor growth.

**Conclusion:** These results demonstrate HDAC11 as a negative regulator of CTL effector function and memory phenotype. As such, these results highlight HDAC11 as a potential target for increasing the efficacy of adoptive immunotherapy.

**Research supported by:** R01 CA134807-03

***Perifosine, an AKT Inhibitor, Modulates Ovarian Cancer Cell Line Sensitivity to Cisplatin Induced Growth Arrest***

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**Keywords:** Perifosine, Cisplatin, AKT, Ovarian Cancer

**Objective:** AKT is a key regulator of diverse tumor signaling pathways, and has been associated with the progression of many cancers. Here we investigated the influence of AKT on overall survival (OS) from ovarian cancer (OVCA), the activity of the AKT inhibitor, perifosine +/- cisplatin, and the molecular determinants of perifosine-response.

**Methods:** Phospho-AKT expression values and Affymetrix U133a expression data were downloaded from The Cancer Genome Atlas. Genes and biologic pathways associated with perifosine sensitivity were explored in 10 OVCA cells and the NCI60 cancer cell panel. Identified pathways were evaluated for influences on OS in publically available clinicogenomic datasets using principal component analysis (PCA) modeling.

**Results:** Phospho-AKT expression correlated with OS from OVCA ( $P < 0.05$ ) and platinum-response ( $P = 0.004$ ). Perifosine showed anti-proliferative effects in 10 OVCA cell lines and potentiated cisplatin effects in 7/10 (70%). Perifosine-response was associated with the differential expression of 7 signaling pathways ( $FDR < 0.05$ ) in OVCA cells and 64 signaling pathways in the NCI60 cell panel. Three pathways were found in common: 1) Cell adhesion/Chemokines which associated with OS from colon cancer ( $P = 0.0049$ ), 2) Cytoskeleton remodeling/cytoskeleton remodeling which associated with OS from colon ( $P = 0.0061$ ), and 3) Cytoskeleton remodeling-TGF, WNT which it associated with OS from OVCA ( $P = 0.0055$ ), leukemia ( $P = 0.047$ ) and colon ( $P = 0.0038$ ) cancers.

**Conclusion:** AKT signaling is an important determinant of OVCA chemoresponse and OS suggesting a clinical utility to AKT inhibition. Our data provide insights into the molecular basis to perifosine activity and identifies pathways associated with perifosine sensitivity and clinical outcome.

***Malignant Murmur: A Case of Primary Left Atrial Sarcoma with Pelvic Metastases***

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**Keywords:** Sarcoma, cardiac, metastases

**Objective:** Primary cardiac sarcoma is an extremely rare disease, with an incidence of 0.002-0.3% and is difficult to differentiate from myxoma both clinically and pathologically. These tumors primarily develop on the left side of the heart and cause signs and symptoms related to pulmonary congestion, mitral stenosis and pulmonary vein obstruction. We present a case of primary left atrial sarcoma with abdominal and pelvic metastasis.

**Methods:** A 40 year old Puerto Rican female living in Florida without any significant medical background presented with a six week history of fatigue, intermittent dyspnea, palpitations and orthopnea. A two-dimensional echocardiogram demonstrated a large mobile, pedunculated mass at the left atrium measuring 5.1x2.5cm that intermittently prolapsed into the mitral valve obstructing mitral flow.

**Results:** The patient subsequently underwent a right thoracotomy with excision of a pedunculated tumor measuring 4.9x2.7x2.2 cm in size with positive margins. Histological diagnosis was high grade pleomorphic and myofibroblastic sarcoma. Treatment with combination chemotherapy including doxorubicin and ifosfamide was planned at this time. The patient presented one month later, prior to receiving chemotherapy, with exertional dyspnea, abdominal distention and 1+ pitting edema in bilateral lower extremities. She was found to have metastatic abdominal disease.

**Conclusion:** This case of primary atrial sarcoma in an otherwise healthy young woman presenting with symptoms of acute dyspnea, orthopnea and chest pain illustrates the importance of keeping a cardiac myxoma and sarcoma in the differential diagnosis. Cardiac tumors are infrequent, but potentially life-threatening conditions that necessitate prompt diagnosis and aggressive therapy.

**Research supported by:** This research was supported by the Scholarly Concentrations Program at USF Health, Morsani College of Medicine.

**Abstract #: 29**

**Presented by: Eric Clayman, MS, Graduate Student**

***PTEN Deficiency Induces VAV Protein Expression Enhancing Cytoskeletal Remodeling in Lung Cancer***

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**Keywords:** PTEN, Lung, VAV, Cytoskeletal remodeling.

**Objective:** To identify potential molecular targets contributing to cytoskeletal remodeling due to loss of Phosphatase and tensin homolog (PTEN).

**Methods:** mRNA profiling identified altered gene expression following loss of PTEN in lungs harvested from triple transgenic mice SPC-rtTA/TetO-Cre/PTEN $\Delta/\Delta$ . Western blot analysis was performed on selected targets in PTEN-null H1650 human lung cancer cells. Pharmacological inhibitors were used to identify potential involvement of oncogenic signaling pathways in regulating proteins altered by loss of PTEN, which in turn causes cytoskeletal remodeling.

**Results:** mRNA profiling identified 1389 genes altered by PTEN loss. Pathway analysis revealed major perturbations in genes participating in cytoskeletal remodeling; including VAV. VAV-family of proteins actively remodels actin cytoskeleton and is involved in cell invasion during cancer progression. We identify increased expression of VAV-1 and VAV-3 but not VAV-2 in PTEN-null H1650 lung cancer cells, indicating a substantial increase in VAV expression that enhanced oncogenic potential, consistent with our in-vivo data. PI3K/AKT/mTOR pathway directly regulated VAV expression as indicated by treatments with pharmacological inhibitors.

**Conclusion:** Compromised PTEN activity in lung cancer increases levels of VAV-3 oncogene. VAV-3 expression in human lung cancer cells was inhibited after treatment with multiple inhibitors of PI3K/AKT/mTOR signaling pathway. The discovery of oncogenic expression of VAV-3 in lung cancer and the feasibility of inhibiting VAV-3 by pharmacological intervention provides a novel approach for effective targeting and treatment of lung cancers with hyperactive PI3K/AKT/mTOR signaling as seen with K-RAS and EGFR mutant lung tumors.

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**Abstract #: 30**

**Presented by: Alex Cruz, BS, Med II Student**

***Metabolic Tumor Volume (MTV) is a Predictor of Survival in Borderline Pancreatic Cancers Treated with Neoadjuvant Therapy***

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**Keywords:** Metabolic Tumor Volume, Borderline Pancreatic Cancer

**Objective:** PET-CT is an important tool for staging and evaluating treatment response in pancreas cancer. Metabolic tumor volume (MTV) has been reported as a prognostic factor in other malignancies. We evaluated the utility initial staging and post-radiation MTV in borderline pancreatic cancer patients treated with chemoradiotherapy (CRT).

**Methods:** We evaluated pre-and post-treatment PET/CT scans in 72 patients with adenocarcinoma (AC) or adenosquamous carcinoma (ASC) treated with neoadjuvant/definitive intent. We measured the significance of the pre-treatment and post-treatment MTV<sub>2.5-5.0</sub>, which was defined as the metabolic volume above a threshold SUV of x. Cox regression models were used to determine any significance between MTV<sub>2.5-5.0</sub> and disease free survival (DFS) or overall survival (OS).

**Results:** We identified 72 patients (71 AC, 1 ASC) with a median follow up of 14.0 months. Forty-three of the patients (59.7%) underwent surgical resection. Overall, we found pre-treatment SUV<sub>max</sub>, MTV<sub>2.5</sub> and MTV<sub>4.0</sub> to be significant for OS (p=0.0042, p=0.0016, p=0.0111 respectively). We also found post-treatment SUV<sub>max</sub>, but no significance with post-treatment MTV<sub>2.5</sub> or MTV<sub>4.0</sub> to be with OS or DFS (p=0.0183, p=0.2488, p=0.3566 respectively). For patients whom underwent surgical resection, analysis revealed significant correlation between overall survival with pre-treatment SUV<sub>max</sub>, and MTV<sub>4.0</sub>, but no significance with MTV<sub>2.5</sub> SUV<sub>mean</sub> (p=0.0229, p=0.039, p=0.064 respectively). Post-treatment SUV<sub>max</sub>, and MTV<sub>4.0</sub> SUV<sub>mean</sub> were significant for OS, but post-treatment MTV<sub>2.5</sub> SUV<sub>mean</sub> was not (p=0.0325, p=0.0076, p=0.071 respectively).

**Conclusion:** Our data illustrates a significant correlation with MTV and survival.

**RESEARCH SUPPORTED BY:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine and the AOA.

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***Molecular Mechanisms of Aggressiveness of Osteosarcomas***

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**Keywords:** Osteosarcoma, pRb, integrin, cadherin, adhesion

**Objective:** Osteosarcomas (OS) are highly aggressive neoplasms of osteoblastic origin with an early proclivity to metastasize. Only ~10% of patients achieve long-term disease-free intervals. OS aggressivity still remains to be explained.

**Methods:** Experiments included microarrays, promoter/reporter luciferase assays, mutagenesis of the Itga10 promoter, nuclear run-on assays, and ChIP.

**Results:** Rb up-regulates osteoblast-specific cadherins and integrins, while down-regulating several metastasis-associated cell adhesion molecules. 8 of the top 10 cellular processes affected by Rb are related to cell adhesion, with integrin- and adherens junctions-mediated adhesion having the 1st and 4th best p-values. Rb also strongly induced Itga10 in MC3T3 osteoblasts. This induction is transcriptional and independent of Rb phosphorylation status. We identified an Rb-responsive region from -108 to -55bp relative to the start of transcription. We also characterized a second mechanism linking Rb with cell adhesion requiring Rb-mediated transcriptional repression of Pak1, a Rac1-binding kinase that destabilizes cell adhesion when upregulated during carcinogenesis. An Rb-E2F complex binds to an Rb-responsive site in the Pak1 promoter rich in E2F binding sites, showing Pak1 is an E2F target and suggesting that Rb's repressive effect on Pak1 consists of blocking E2F's transactivating activity on Pak1.

**Conclusion:** Rb promotes cell adhesion by inducing the expression of cadherins and integrins necessary for cell adhesion to other cells and to a substrate, and by antagonizing the E2F-induced expression of cell adhesion destabilizers such as Pak1. We propose Rb loss in OS exacerbates aggressiveness by debilitating cellular adhesion, which facilitates tumor cell detachment and metastasis.

***T-bet Is Critical for Development of Acute Graft-Versus-Host Disease through Controlling T Cell Differentiation and Function***

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**Keywords:** T-bet, T cell function, IFN- $\gamma$ , GVHD

**Objective:** Given T-bet is a master regulator for the differentiation into Th1 cells that produce IFN- $\gamma$ , we are trying to determine the underlying mechanisms accounted for the distinct outcomes of GVHD caused by T-bet- versus IFN- $\gamma$ -deficient donor T cells.

**Methods:** We evaluated the roles of T-bet and IFN- $\gamma$  in acute GVHD induced by naive CD4 T cells or polarized Th17 cells using murine model of allogeneic bone marrow transplantation.

**Results:** IFN- $\gamma$ -/- CD4 T cells caused similar GVHD compared with WT cells. In sharp contrast, T-bet-/- CD4 T cells induced much ameliorated GVHD, as significantly higher survival and less body weight loss were observed in the recipients of T-bet-/- T cells. Recipients of T-bet-/- donor T cells had markedly reduced T cell infiltration and tissue damage in liver and gut, and they produced significantly lower levels of IFN- $\gamma$ , TNF- $\alpha$ , and IL-2 but higher IL-10, IL-6 and IL-4 in serum. T-bet-/- CD4 T cells expressed significantly less IFN- $\gamma$ , CXCR3 and CD122, but more IL-17 and CCR6 compared with WT CD4 T cells, indicating that T-bet-/- T cells impaired in differentiating into Th1 but not Th17 cells. IFN- $\gamma$ -/- Th17 cells had a comparable ability to cause GVHD compared with WT Th17 cells, while T-bet-/- Th17 cells had reduced pathogenicity. Microarray analysis identified genes that are regulated by T-bet but independent of IFN- $\gamma$ , including Cxcr3, Ccr5, Ccl3, Ccl4, Klrc1, Klrk1, Nkg7 and Pdcd1, which may explain the compromised ability of T-bet-/- not IFN- $\gamma$ -/- T cells in the induction of GVHD.

**Conclusion:** T-bet is required for Th1 differentiation and migration, and contributes to optimal function of Th17 cells. Targeting T-bet or regulating its downstream effectors independent of IFN- $\gamma$  may be a promising strategy to control GVHD in clinic.

**Abstract #: 33**

**Presented by: Yvonne Girard, MS, Graduate Student**

***Development of a novel 3D in vitro multicellular tumor spheroid model to screen anti-cancer drugs***

Yvonne Davis<sup>1, 2</sup>, Jaya Mallela<sup>1, 2</sup>, Chunyan Wang<sup>1, 2</sup>, Mark Howell<sup>1</sup>, Sowndharya Ravi<sup>1</sup>, Shyam Mohapatra<sup>2</sup>, Subhra Mohapatra<sup>1, 2</sup> Department of Molecular Medicine<sup>1</sup>, USF Nanomedicine Research Center<sup>2</sup>, Morsani College of Medicine, University of South Florida, Tampa, FL

**Keywords:** cancer 3D EMT

**Objective:** The goal of this study is to develop a novel 3D scaffold that exhibits structural geometry and porosity similar to the native tumor ECM and allows the assembly of cancer cells into multicellular spheroids, which recapitulate the micrometastasis of in vivo tumors.

**Methods:** The electrospun scaffold, designated as 3P, was constructed from biocompatible, biodegradable polymers and characterized. LLC-1, MCF-7, MDA-MB and PC3 cancer cells were cultured on the scaffold and cell density and kinetics for tumor spheroid formation was established. Tumor spheroids were examined for epithelial mesenchymal transition (EMT) conversion and alterations in signal transduction pathways and gene expression analysis. Drug efficacy studies were performed by treatment of spheroids with known antitumor inhibitors.

**Results:** Tumor cells formed spheroids when cultured on the scaffolds that resemble the micrometastasis of avascular tumors. Spheroid formation induced EMT conversion demonstrated by upregulation of Vimentin and a loss in E-Cadherin expression. RT PCR array confirmed differential expression of genes. Treatment of spheroids with PI3-K or MPAK inhibitors abrogated EMT expression and prevented spheroid proliferation and growth.

**Conclusion:** The 3P scaffold induced multicellular tumor spheroids that showed evidence of EMT characteristic of tumors in vivo and can be used as 3D model of in vitro tumorigenesis to screen for anti-cancer drugs.

**Research supported by:** This work has been supported by the Office of Naval Research and Departmental funds.

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**Abstract #: 34**

**Presented by: Shannon Kesl, BS, Graduate Student**

***Dietary Ketone Supplementation Increases Blood Flow and Wound Closure in an Ischemic Model in Young and Aged Fisher Rats***

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**Keywords:** wound healing, metabolism, ROS, blood flow, ketones

**Objective:** Increasing evidence shows that elevated reactive oxygen species (ROS) and diminished blood flow are key features of aging that lead to impaired wound healing. Ketone bodies, including Beta-Hydroxybutyrate (BHB), are naturally occurring energy substrates shown to decrease ROS production and increase blood perfusion and thus may augment wound healing. Our preliminary data in young and aged primary human dermal fibroblasts showed that supplementation of 5mM BHB for 72 hours prior to an oxidant stress with 100uM tert-butyl-hydrogen peroxide significantly decreased cytosolic (young 40% (p=<0.0001); aged 41% (p=<0.0001)) and mitochondrial (young 29% (p<0.0001); aged by 51% (p<0.0001)) ROS production while significantly increasing migration. We hypothesized that dietary ketone supplementation would increase blood flow and improve wound closure in young adult and aged rats.

**Methods:** Sixteen Fisher 344 rats (8 months old, n=8 and 20 months old, n=8) were randomly assigned to one of two diet groups: standard rodent chow (N=4 young, 4 aged) or standard rodent chow containing 20% ketone supplement (N=4 young, 4 aged). On day zero of the diet, 6mm ischemic wounds were created within a dorsal bi-pedicle flap.

**Results:** Laser Doppler imaging of the ischemic peri-wound tissue every 7 days for 28 days demonstrated significantly increased blood flow in ketone supplemented young rats at 14 days (p=0.0367) and aged rats at 21 days (p=0.0050) compared to control. Ketones did not significantly change wound closure time in young rats; however, aged rats healed in 18 days compared to 21 of control.

**Conclusion:** We conclude that ketone supplementation may protect against redox stress, increase blood flow and augment wound healing, especially in the elderly.

**Research supported by:** ONR,VA Merit Review

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***Survival after Nephrectomy with Concomitant IVC Thrombectomy in the Context of Metastatic Renal Cell Carcinoma***

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**Keywords:** renal cell carcinoma

**Objective:** To identify predictors of survival in patients undergoing radical nephrectomy and IVC thrombectomy in the context of metastatic renal cell carcinoma (RCC).

**Methods:** A total of 125 patients underwent nephrectomy and IVC thrombectomy in the context of RCC at our respective center from 11/1989 to 5/2012. Patients with metastatic disease at the time of operation were included in the study and separated into 3 cohorts based on post-operative survival (<6 months, 6-24 months, and >24 months). Demographic, operative, and follow-up data were gathered and compared among groups. Survival was analyzed using the Kaplan-Meier method.

**Results:** Forty-one patients (33%) had metastatic RCC and 84 patients (67%) did not have metastatic RCC at time of operation. Median disease-specific survival (DSS) after surgery for patients with metastatic disease and patients without metastasis were 12 months and 86 months, respectively ( $P < 0.001$ ). Of the patients with metastatic disease, 14 (34%) died less than 6 months, 11 (27%) died 6-24 months, and 9 (22%) died later than 24 months after surgery. Seven (17%) patients are alive. Patients in these groups did not significantly differ in age, BMI, Charlson Comorbidity Index scores, ECOG performance status, or level of thrombus ( $P > 0.05$  for all). Patients dying within 6 months of surgery had a higher rate of peri-operative complications (64%) than those who died 6-24 months (9%) and later than 24 months (22%) after surgery ( $P = 0.01$ ).

**Conclusion:** Patients with metastatic RCC with concomitant IVC tumor thrombi must be carefully selected for surgical resection as their survival remains poor. At this time we are unable to determine which clinical/pathological characteristics best predict an adverse outcome within this patient cohort.

***An E2F Signature Predicts Benefit of Adjuvant Chemotherapy in Early-Stage Non-Small Cell Lung Cancer***

Courtney Kurtyka<sup>(1)</sup>, Dung-Tsa Chen<sup>(2)</sup>, Lu Chen<sup>(1)</sup>, William Brazelle<sup>(1)</sup>, Eric Welsh<sup>(3)</sup>, Anders Berglund<sup>(3)</sup>, Steven Eschrich<sup>(3)</sup>, Matthew Schabath<sup>(4)</sup>, Eric Haura<sup>(1)</sup> and Doug Cress<sup>(1)</sup>. (1) Department of Molecular Oncology, (2) Department of Biostatistics, (3) Department of Bioinformatics, (4) Department of Cancer Epidemiology, H. Lee Moffitt Cancer Center and Research Institute, Tampa, FL University of South Florida

**Keywords:** E2F signature, NSCLC, adjuvant chemotherapy

**Objective:** Early-stage non-small cell lung cancer (NSCLC) is primarily treated by surgical resection. Unfortunately, after resection one-third to one-half will die of metastatic recurrence. Adjuvant chemotherapy (ACT) improves the survival of early-stage patients and has become the standard treatment for patients with resected stage II–III NSCLC. However, the five-year survival advantage of ACT is only 4%–15%, suggesting that many patients do not benefit. Given the morbidity associated with ACT, it is imperative to develop new prognostic tools to identify patients with a high probability of relapse.

**Methods:** We have used siRNAs targeting multiple E2F pathway components to derive an E2F gene expression signature in vitro. This signature was refined by filtering for its components that were altered in NSCLC compared to normal tissue. Principal component analysis was then used to represent the signature which was tested for correlation to overall survival (OS) in two large cohorts. The first cohort was the Molecular Classification of Lung Adenocarcinoma (MCLA) from the Director's Challenge Consortium and the second was a novel database on 444 lung adenocarcinomas treated as a part of Moffitt's Total Cancer Care Network.

**Results:** The E2F signature is strongly prognostic in both cohorts with p-values  $< 0.0001$ . In addition, using data in the MCLA database, we determined that the patients having a high E2F signature benefit (have increased OS) from ACT, whereas patients with a low E2F signature do not.

**Conclusion:** This signature may be useful for determining those who would most benefit from receiving ACT as well as ensuring that those who would not benefit are not unnecessarily subjected to chemotherapy.

**Research supported by:** NIH Grants CA119997, CA129343, CA163068, and CA118809.

**Abstract #: 37**

**Presented by: Panida Lungchukiet, PhD, Postdoc**

***Role of Vitamin D and its Receptors in Suppressing Ovarian Cancer Invasion to Omentum***

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**Keywords:** ovarian cancer, invasion, omentum, vitamin D, vitamin D receptor

**Objective:** Ovarian cancer is the deadliest of all gynecologic cancers. Our published studies established a role for vitamin D (VD) and its receptors in suppressing ovarian cancer growth. These studies are to investigate the effect of the hormone and its receptors on ovarian tumor invasion. We conducted in vitro, ex vivo and in vivo experiments using wild type (WT) and vitamin D receptor (VDR) null mice.

**Methods:** Migration and invasion assays were performed in human ovarian cancer cells. WT and VDR null mouse omentum were used in the ex vivo assays. WT and VDR null mice were treated with EB1089 then challenged with ovarian cancer cells marked with the luciferase marker. The signals were quantified to follow the time of invasion using IVIS Systems.

**Results:** Vitamin D treatment decreased the ovarian cancer motility and invasion and VDR knockdown diminished the VD effects. The absence of VDR in either the tumor cells or omentum resulted in increased invasiveness of ovarian cancer cells into omental tissues. The in vivo studies showed that ovarian tumors invaded to omentum much more rapidly in VDR null mice than in wild type mice. The treatment of ovarian cancer cells with a VD analog decreased the invasion in both WT and VDR null mice.

**Conclusion:** This is the first demonstration for an important role of VD in suppressing ovarian tumor invasion using VDR null mouse model and suggests a role for both tumor and stromal VDR in the suppression. We define the VDR as a suppressor for ovarian tumor invasion and a novel molecular drug target for intervention of invasive ovarian cancers. We believe that this receptor-based therapy will allow the use of VD or its analogs either alone or in combination with conventional chemotherapy to improve outcomes in ovarian cancer patients.

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**Abstract #: 38**

**Presented by: Perna Malaney, BS, Graduate Student**

***Intrinsic Disorder in PTEN and its Interactome Provides Structural Plasticity and Functional Versatility***

Perna Malaney<sup>1</sup>, Ravi Ramesh Pathak<sup>1</sup>, Bin Xue<sup>2</sup>, Vladimir Uversky<sup>2</sup>, Vrushank Davé<sup>1</sup>. <sup>1</sup> Morsani College of Medicine, Pathology and Cell Biology, University of South Florida, Tampa, FL, <sup>2</sup> Morsani College of Medicine, Molecular Medicine, University of South Florida, Tampa, FL

**Keywords:** PTEN, IDP's, interactome, disorder, cancer

**Objective:** To analyze and assess the contribution of structural disorder to the functional versatility of tumor suppressor PTEN

**Methods:** Disorder analysis for PTEN, its primary interactome, secondary interactome and kinases that phosphorylate it were performed using the PONDR-FIT software. Compositional analysis of the PTEN protein was performed using the Compositional Profiler Tool. Network analysis and graphics of the primary and secondary interactomes was performed using the Metacore, IPA and Transcriptome Browser tools. Networks were visualized using Cytoscape.

**Results:** We identify PTEN to be an intrinsically disordered protein (IDP) with an intrinsically disordered region (IDR) at its carboxyl-terminus (C-tail), which modulates its activity, cellular localization, stability and function. The low mutability of PTEN C-tail IDR indicates its essential biological functions. Our derivation and analysis of PTEN primary and secondary interactome indicates that altered levels or interactions of IDPs perturb several cellular signaling pathways causing cancer. Further, evolutionarily conserved Eukaryotic Linear Motifs (ELMs) and Molecular Recognition Features (MoRFs) that we have identified within the C-tail IDR may play a critical role in orchestrating the formation and function of the PTEN interactome

**Conclusion:** The findings warrant the use of novel drug that target PTEN IDR and its interactome, particularly the hub proteins, for therapeutic activation of PTEN as a new paradigm to abrogate pathogenic PI3K signaling in cancer and several other pathologies

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**11NPRA Signaling Regulates Stem Cell Recruitment and Angiogenesis: A Model to Study Linkage Between Inflammation and Tumorigenesis**

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**Keywords:** NPRA signaling, Cell migration, Tumor angiogenesis, Stem cells

**Objective:** Natriuretic peptide receptor A (NPRA), the signaling receptor for the cardiac hormone, atrial natriuretic peptide (ANP), is expressed abundantly in inflamed/injured tissues and tumors. NPRA deficiency substantially decreases tissue inflammation and inhibits tumor growth. However, the precise mechanism of NPRA function and whether it links inflammation and tumorigenesis remains unknown. Our objective is to examine the role of NPRA signaling in tumor angiogenesis as a model of tissue injury repair in this study.

**Methods:** Aortic ring assay, Tube formation assay, In vivo tumor model, Immunohistochemistry

**Results:** In in vitro cultures aortas from NPRA-KO mice show significantly lower angiogenic response compared to wild type counterparts. The NPRA antagonist that decreases NPRA expression, inhibit lipopolysaccharide-induced angiogenesis. The reduction in angiogenesis correlates with decreased expression of vascular endothelial growth factor (VEGF) and CXCR4 implicating a cell recruitment defect. To test whether NPRA regulates migration of cells to tumors, mesenchymal stem cells (MSCs) were administered i.v. and the results showed that MSCs fail to migrate to the tumor microenvironment in NPRA-KO mice. However, co-implanting tumor cells with MSCs, increases angiogenesis and tumorigenesis in NPRA-KO mice, in part by promoting expression of CXCR4 and its ligand, stromal-derived factor 1 $\alpha$  (SDF-1 $\alpha$ ).

**Conclusion:** NPRA signaling regulates stem cell recruitment and angiogenesis leading to tumor growth. Thus, NPRA signaling provides a key linkage between inflammation and tumorigenesis, and NPRA may be a target for drug development against cancers and tissue injury repair.

**Research supported by:** 5R01CA152005 - NIH Florida Biomedical Research grants - to SM and SSM.

**Epigenetic Modulation of Co-inhibitory Molecules in Chronic Lymphocytic Leukemia (CLL)**

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**Keywords:** CLL, epigenetics, HDACi, HDAC

**Objective:** One mechanism contributing to the pathogenesis of CLL is the ability of tumor cells to evade immune recognition and eradication, which is partially mediated by immunosuppressive signals such as co-inhibitory molecules, including programmed death-1 (PD-1). The well-described interactions of PD-1 (CD279) with PD-L1 (CD274) lead to inhibition of proliferation, cytokine production, cytotoxic capabilities, and the emergence of "exhausted" T cells. Thus, we sought to characterize PD-1 and PD-L1 expression in CLL patient peripheral blood mononuclear cells (PBMCs) and understand how epigenetic modulation affects their expression.

**Methods:** CD19+ cells were positively isolated from PBMCs of CLL patients via magnetic separation (EasySep, StemCell Technologies) and following LPS-stimulation were treated with LBH589, a pan-HDAC inhibitor, and ACY1215, an iso-specific HDAC6 inhibitor. CD19+ cells were also positively isolated from splenocytes of E $\mu$ -TCL1 mice (CLL mouse model) treated with the systemic administration of LBH in vivo. Protein expression of PD-1 and PDL-1 were examined via flow cytometry analysis.

**Results:** PD-1 and PD-L1 expression were both increased in CLL patient samples in comparison to healthy volunteer donors. Dose-dependent reductions in PD-1 and PD-L1 expression were noted with LBH589 and ACY1215. We similarly observed increases in PD-L1 expression in E $\mu$ -TCL1 mice, which were attenuated with the systemic administration of LBH in vivo.

**Conclusion:** These results suggest PD-1 and PD-L1 as novel immunotherapeutic targets for epigenetic modulation using iso-selective HDACis, and therefore, can be used as an adjunct to current targeted cancer therapies.

**Research supported by:** Research Scholarly Concentration, Morsani College of Medicine & Moffitt Cancer Center Dept Immunology

**Abstract #: 41**

**Presented by: Allison Nelson, BS, Staff**

***NPRA signaling in myeloid cell differentiation and cancer progression***

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**Keywords:** MDSC, NPR-A, Reactive oxygen species.

**Objective:** It is now evident that inadequate function of the host immune system is due to suppressive factors such as myeloid derived suppressor cells (MDSC). In our study we found that MDSCs isolated from tumor bearing mice expressed high levels of natriuretic peptide receptor A (NPRA) a receptor for atrial natriuretic peptide (ANP).

**Methods:** Since Myeloid Derived Suppressor Cells (MDSC) plays a pivotal role in tumorigenesis, we addressed whether NPRA signaling may be linked with altered differentiation of myeloid cells and their suppressive function. We examined the wild type and NPRA deficient mice for MDSC differentiation, and the results showed that NPRA deficient mice exhibited restricted tumor growth and altered differentiation of MDSCs. Next we investigated the link between ANP levels and accumulation of MDSCs. Increase in ANP levels triggered expansion of MDSC. MDSCs suppressed T cells via reactive oxygen species (ROS), and increase in NPRA expression was associated with decreased miR150 as well as increased expression of Nox.

**Results:** NPRA KO mice showed increased expression of miR150 compared to WT mice. Our experiments suggested that activation of NPRA and was regulated by a key micro RNA, miR-150.

**Conclusion:** Taken together, these results suggest that a key role to NPRA signaling in myeloid cell differentiation and cancer progression.

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**Abstract #: 42**

**Presented by: Nadine Nelson, MS, Graduate Student**

***The Role of the Ikaros Transcription Factor in Regulatory T Cell (Treg) Development and Function in a Murine Pancreatic Adenocarcinoma Model***

Nadine Nelson<sup>1</sup>, Maya Jerald<sup>1</sup>, Laura Pendleton<sup>1</sup>, Karoly Szekeres<sup>1</sup>, Nasreen Vohra<sup>2</sup>, Shari Pilon-Thomas<sup>3</sup> and Tomar Ghansah<sup>1</sup>. <sup>1</sup>University of South Florida, Tampa, FL; <sup>2</sup>East Carolina University, Greenville, NC; <sup>3</sup>Moffitt Cancer Center, Tampa, FL. University of South Florida, Morsani College of Medicine, Department of Molecular Medicine

**Keywords:** Pancreatic Cancer, Tumor Immunology, Immune suppression, Tregs, Ikaros

**Objective:** Loss of regulatory T cell (Tregs) homeostasis leads to the suppression of anti-tumor immune responses in PC tumor-bearing (TB) hosts. Tregs express the Forkhead BoxP3 (FoxP3) gene that is critical for their suppressive function. The transcription factor Ikaros is crucial for normal T lymphocyte development and function. Our objective is to identify the role of Ikaros in regulating Treg homeostasis and function in a pancreatic tumor microenvironment.

**Methods:** We developed a murine model of pancreatic cancer, isolated splenocytes from TB and control mice and performed flow cytometry and magnetic activated cell sorting (MACS) to immunophenotype and enrich T cells for in vivo and in vitro analyses. We also used real-time PCR (qRT-PCR) and western blot analyses to evaluate Ikaros and FoxP3 mRNA and protein expression in enriched T cells and whole splenocytes from TB and control mice.

**Results:** Our flow cytometry results showed that CD4+ and CD8+ T cell percentages were significantly lower in splenocytes from TB mice compared to control. However, there was a significant expansion of Tregs in splenocytes from TB mice. In addition, enriched TB Tregs suppressed antigen-specific CD8+T cell responses in a dose-dependent manner, in vitro. Preliminary qRT-PCR results revealed no significant difference in Ikaros mRNA expression whereas Ikaros protein expression was reduced in TB whole splenocytes compared to control. In enriched TB CD3+ T cells, Ikaros protein expression was reduced while FoxP3 protein expression was increased, compared to controls.

**Conclusion:** Our results suggest that the PC microenvironment potentially downregulates Ikaros' expression, which may contribute to the expansion of Tregs and their suppression of CD8+T cell (anti-tumor) immune responses.

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**Systems Biology Analysis Predicts Alteration In Protein-Protein Interaction Networks Following Loss of PTEN in the Lung Epithelium**

Ravi Ramesh Pathak<sup>1</sup>, Bin Xue<sup>2</sup>, Arunachalam Vinyagam<sup>5</sup>, Vladimir N. Uversky<sup>2-4</sup>, Norbert Perrimon<sup>5</sup>, Vrushank Davé<sup>1,3\*</sup>. <sup>1</sup>Morsani College of Medicine, Department of Pathology and Cell Biology and <sup>2</sup>Department of Molecular Oncology, H. Lee Moffitt Cancer Center and Research Institute, <sup>3</sup>Department of Molecular Medicine, <sup>4</sup>USF Health Byrd Alzheimer's Research Institute, University of South Florida, Tampa, FL, 33612, <sup>5</sup>Institute for Biological Instrumentation, Russian Academy of Sciences, 142290 Pushchino, Moscow Region, Russia and <sup>5</sup>Howard Hughes Medical Institute, Department of Genetics Harvard Medical School, 77 Avenue Louis Pasteur, Boston MA 02115

**Keywords:** Systems Biology, PTEN, Protein-Protein interaction, Intrinsic Disorder

**Objective:** A novel method to reveal alterations in protein-protein interactions (PPIs) in PTEN deficient lung epithelium in vivo predicted from Phosphatase and tensin homolog (PTEN) regulome.

**Methods:** mRNA profiling identified altered gene expression following loss of PTEN in lungs harvested from triple transgenic mice SPC-rtTA/TetO-Cre/PTEN $\Delta/\Delta$ . Structural disorder of proteins derived from PTEN-regulome was classified by the CH-CDF plot method. Functional protein complexes coordinately regulated by PTEN were revealed using COMPLEAT, a novel protein complex-based enrichment analysis tool. Network analysis was carried out using the Mouse Integrated Network and visualized using Cytoscape.

**Results:** Network analysis indicates that disordered PTEN responsive proteins have the highest number of interactors as compared to their ordered counterparts. Disorder quadrant specific proteins participated in unique diseases, while highest disorder tends to predict cancer predisposition as seen with CDKN1A, an IDP that emerged as a network hub with 333 interacting proteins. Loss of PTEN down-regulates 7 protein complexes and up-regulates 14 protein complexes, many of which are novel and likely involved in pathogenesis.

**Conclusion:** By analyzing high throughput microarray data via structural informatics we reveal that loss of PTEN, which we identify as a disordered protein, perturbs multiple protein complexes, many of which are novel and possesses the property of hub proteins in various signaling networks. Thus, our novel systems biology approach provides a molecular understanding of pathogenesis following PTEN deficiency and identifies PPIs that may become potential drug targets.

**Chemotherapy with Adjuvant 2-deoxy-D-glucose (2-DG): Role of HIF1 $\alpha$  in p75 Neurotrophin Receptor (p75NTR) in Retinoblastoma and Glioblastoma Multiforme in Minority Populations.**

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**Keywords:** cancer retinoblastoma neuroblastoma transgenic minorities

**Objective:** Rb and GBM are highly aggressive tumors with chemoresistant hypoxic cells. HIF1 $\alpha$  mediates hypoxia and p75NTR is involved in invasive gliomas. The incidence and mortality rate in minorities in the US are higher than that of their white counterparts, and cancer research is lacking in these populations. The purpose is to: elucidate HIF1 $\alpha$  and p75NTR levels, the effect of combined 2-DG and chemotherapy, and explore these effects in minorities.

**Methods:** The expression of p75NTR and HIF1 $\alpha$  was evaluated by Western blot. A molecular genomics analysis was carried out on LHBETATAG mice (n=24) following treatment with 2-DG (500 mg/kg) at 16 weeks of age. Mice (n=25) were treated with periocular injections of carboplatin and 2-DG. Hypoxic cells were evaluated with pimonidazole. A clinical chart review of patients with GBM from different ethnic groups will be carried out (pending).

**Results:** There is increased expression of HIF1 $\alpha$  in GBM. More than 100 genes were dysregulated by  $\geq 2$ -fold difference in expression between treatment groups, and their dysregulation varied depending on the pathways for tumor cell growth identified. The difference in hypoxia and tumor burden between treatment groups was significant (P<0.015, P<0.001). Tumor burden was further reduced after combined treatment with carboplatin and 2-DG (P<0.001).

**Conclusion:** There is a need to target mechanisms responsible for the survival of chemoresistant cells to develop efficacious treatment modalities. This need becomes further important in minorities which have a high incidence and mortality rate.

**Research supported by:** Scholarly Concentration Grant by the Office of Education, USF RO1 EY013629 NIH Center Grant P30-EY014801 Research to Prevent Blindness IRB# Pro00006825

**Effects of the Ketogenic Diet, Supplemental Ketone Administration, and Hyperbaric Oxygen Therapy on the VM-M3 Mouse Model of Metastatic Cancer**

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**Keywords:** Cancer, Metastasis, Metabolism, Ketone, Hyperbaric Oxygen Therapy

**Objective:** Metastasis is responsible for 90% of cancer-related deaths in the U.S. Metastatic cancer cells are highly glycolytic, requiring a large supply of glucose for energy. Abnormal vasculature creates hypoxia within the tumor that promotes metastasis and further enhances the glycolytic dependency of the cancer. Healthy tissues have the metabolic flexibility to switch to utilizing ketone bodies for energy, but mitochondrial dysfunction prevents cancer cells from making this shift. The ketogenic diet (KD), ketone supplementation, and hyperbaric oxygen therapy (HBO2T) are non-toxic therapies that target the metabolic deficiencies of cancer cells.

**Methods:** We tested these metabolic therapies in the luciferase-tagged VM-M3 mouse model of metastatic cancer which spreads naturally in an immunocompetent host, mimicking the natural metastatic phenotype. Mice were fed ketogenic or standard diet with or without supplemental ketones (1,3-butanediol or ketone ester) or HBO2T (100% O<sub>2</sub>, 2.5 ATA, 90 min, 3x/wk). Tumor growth was monitored by in vivo bioluminescent imaging.

**Results:** The KD by itself significantly slowed tumor growth and increased mean survival time by 34% in mice with systemic metastatic cancer. While HBO2T alone was ineffective, combining the KD with HBO2T elicited a supra-additive, significant decrease in tumor growth rate and 80% increase in mean survival time. Ketone supplementation significantly slowed tumor growth and increased mean survival time by 34-51% when delivered in conjunction with both standard and ketogenic diets.

**Conclusion:** We propose that these non-toxic metabolic therapies could enhance the efficacy of standard care and improve the outcome of patients with advanced metastatic disease.

**Research supported by:** ONR N000140610105 and ONR-DURIP N000140210643

**The BCL2 Antagonist of Cell Death (BAD) Apoptotic Pathway and Cervical Cancer Cell Sensitivity to Cisplatin**

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**Keywords:** cervical cancer, chemoresistance, BAD pathway

**Objective:** The BCL2 antagonist of cell death (BAD) apoptosis pathway has been associated with cancer cell chemoresistance, via the phosphorylation status of the BAD protein. We sought to evaluate the BAD pathway and the sensitivity to cisplatin.

**Methods:** The cervical cancer cell line C33A was treated with the kinases and phosphatases known to influence the phosphorylation status of BAD protein, including the kinases, AKT and PKA, and the phosphatase, PP2C, using siRNA. A non-targeting siRNA duplex was used as a control. Depletion of the target protein was confirmed by Western blot analysis. Changes in the sensitivity of cells to cisplatin-induced cell growth arrest and cisplatin-induced apoptosis after depletion of AKT, PKA, and PP2C was then quantified by MTS cell viability and DNA fragmentation assays.

**Results:** Selective depletion of the BAD pathway kinases and phosphatases led to a decrease in cellular levels of phosphorylated BAD protein and increased cisplatin sensitivity when compared to cells transfected with non-targeting siRNA. In contrast, depletion of the BAD pathway phosphatase, PP2C, led to increased expression of phosphorylated BAD protein and a corresponding decrease in cisplatin-induced growth arrest and apoptosis.

**Conclusion:** Modulation of BAD pathway kinases and phosphatases influence the phosphorylation status of the BAD protein, and also cervical cancer cell line sensitivity to cisplatin. These data support the BAD pathway as an important determinant of cancer chemosensitivity and a potential future therapeutic target to enhance cisplatin activity for patients with cervical cancer.

Abstract #: 47

Presented by: Jiangchuan Tao, MD, Resident

***Combined Treatment of BTK and PI3K Inhibitors Synergistically Disrupts BCR-Signaling, Overcomes Microenvironment-Mediated Survival and Drug Resistance in Mantle Cell Lymphoma***

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**Keywords:** Microenvironment ; Lymphoma: non-Hodgkin's lymphoma ; Chemokine receptor ; Adhesion

**Objective:** Mantle cell lymphoma (MCL) is characterized with overexpression of cyclin D1. It carries poor prognosis due to the emergence of drug resistance and aggressive progression. Recently, B-cell receptor (BCR) provides essential growth and survival signals to B-cell lymphomas. Inhibitors of BCR signaling have become an area of substantial clinical interest.

**Methods:** We studied the role of BCR signaling in stroma-mediated cell survival and drug resistance in mantle cell lymphoma (MCL) by using Cell co-culture, western blot, cell proliferation assay and cell adhesion study.

**Results:** We demonstrated that adhesion of MCL cells to lymph node stroma enhanced activation of BCR signaling: PI3K $\delta$ , BTK and ERK pathways. Inhibition of BTK by PCI 32765 or PI3K $\delta$  by CAL101 significantly blocked intrinsic and stroma-conferred BCR signaling, lymphoma-stroma interaction and triggered lymphoma cell apoptosis. Combined treatment of BTK and PI3K $\delta$  inhibitors synergistically disrupt BCR-signaling, overcome microenvironment-mediated drug resistance, and suppress cyclin D1 expression and lymphoma cell growth in MCL cell lines and primary samples.

**Conclusion:** these data support that BCR activation controls intrinsic survival as well regulates stroma-mediated extrinsic lymphoma cell survival. Combined targeting of BCR pathway intermediates is a promising therapeutic strategy to MCL therapy.

**Research supported by:** This work was supported by grants from the National Cancer Institutes (R01 CA137123, to JT), Maher Fund (to JT), and Lymphoma Research Foundation (to JT).

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Abstract #: 48

Presented by: Chunyan Wang, PhD, Postdoc

***Multifunctional Chitosan Magnetic-Graphene Nanoparticles (CMGs): a Theranostic Platform for Tumor-targeted co-delivery of Drug, Gene and MRI contrast agent***

Chunyan Wang, Sowndharya Ravi, Ujjwala Sree Garapati, Jaya Mallela, Subhra Mohapatra, Molecular Medicine, Mahasweta Das, Internal Medicine, Molecular Medicine University of South Florida, Morsani College of Medicine

**Keywords:** chemically reduced graphene oxide, iron oxide, chitosan, theranostic, drug delivery, MR imaging

**Objective:** Combining chemotherapy with anticancer gene therapy is one of the most promising strategies for cancer treatment, but the addition of a magnetic resonance imaging (MRI) contrast agent would enhance its usefulness. However, to construct a single system that can efficiently deliver gene, drug and superparamagnetic iron oxide (SPIO) MRI contrast agent to the cancer site remains a challenge. Two-dimensional graphene nanosheets have great potential for passive tumor targeting and drug loading, but have not been tested as theranostic carriers. We constructed chitosan functionalized magnetic graphene (CMG) nanoparticles for simultaneous gene/drug delivery and MR imaging of tumor cells. CMGs consist of SPIO nanoparticles loaded onto chemically reduced graphene oxide that is covalently bound to chitosan.

**Methods:** CMGs were characterized by Fourier-transform infrared spectrometry, dynamic light scattering and phantom and ex vivo MRI. The tumor targeting and killing capability of doxorubicin (DOX)-loaded CMGs was tested on LLC tumor-bearing mice after optimizing DOX capacity and pH-sensitive release.

**Results:** The MRI results show CMGs are strong T2 contrast agent. They are biocompatible and accumulate in tumors as shown by MRI and Prussian blue staining. DOX-CMG showed faster release at pH 5.1 than 7.4 and more effective (IC<sub>50</sub> = 2  $\mu$ M) killing of A549 lung cancer cells than free DOX (IC<sub>50</sub> = 4  $\mu$ M). CMGs efficiently delivered plasmid DNA to A549 and C42b cancer cells. In mice, GFP and DOX accumulate at the tumor site 24 and 48 h after administration.

**Conclusion:** CMGs are a promising theranostic platform for anticancer drug/gene delivery and MRI of tumors.

**Research supported by:** This work is supported by 1R41CA139785 and 5R01CA152005 grants from National Institute of Health awarded to SM.

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***MK2206, a Selective AKT Inhibitor, Modulates Ovarian Cancer Cell Line Sensitivity to Carboplatin Plus Paclitaxel***

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**Keywords:** MK2206, ovarian cancer, carboplatin and paclitaxel

**Objective:** When phosphorylated, AKT promotes cell survival and influences human cancers response to chemotherapy. We sought to determine i) the influence of AKT on survival from ovarian cancer (OVCA), ii) assess activity of a novel AKT kinase inhibitor, MK2206, alone and in combination with carboplatin plus paclitaxel (C/T), and iii) explore the molecular determinants of MK2206-response.

**Methods:** Phospho-AKT expression values and Affymetrix U133a gene expression data were downloaded from The Cancer Genome Atlas (TCGA). Pearson correlation was used to determine associations between overall survival from OVCA and response to therapy. OVCA cells were treated with MK2206 and subjected to Affymetrix HuRSTA expression analysis. The genes associated with MK2206-sensitivity were subjected to pathway analysis using GeneGo Metacore software. Numeric values representing the expression of each pathway, as determined using the principal component analysis, were evaluated for associations with survival in a series of clinico-genomic datasets

**Results:** Phospho-AKT[serine473] expression correlated with both overall survival from OVCA and response to platinum-based therapy. In-vitro MK2206-sensitivity was associated with expression of 69 probesets with representation in 11 signaling pathways. Two of these pathways significantly associated with survival from OVCA in more than one survival dataset; i) Transcription\_receptor-mediated HIF regulation, ii) Transcription\_role of VDR in regulation of genes involved in osteoporosis

**Conclusion:** Our data provide insights into the molecular basis to MK2206 activity against OVCA cells, and identifies pathways associated with MK2206 sensitivity and clinical outcome.

***Perinephric Fat Density on Pre-Operative Imaging is Predictive of Perinephric Fat Adherence and Ease of Surgical Dissection During Partial Nephrectomy***

Yin Zheng (University of South Florida Morsani College of Medicine), Patrick Espiritu MD, Tariq Hakky MD (Department of Genitourinary Oncology, Moffitt Cancer Center, Tampa, FL), Kristin Jutras (University of South Florida), Philippe E Spiess MD (Department of Genitourinary Oncology, Moffitt Cancer Center, Tampa, FL), University of South Florida, Morsani College of Medicine, Urology

**Keywords:** density, perirenal fat, pre-operative imaging, nephron sparing surgery

**Objective:** The presence of thick and adherent perinephric fat (PF) in renal sparing surgery can complicate the procedure and impair the abilities to clearly delineate the surgical boundaries of an underlying renal lesion. In the present study, we sought to evaluate if preoperative PF radiographic characteristics based on CT density measurements is predictive of PF adherence and ease of surgical dissection.

**Methods:** 16 partial nephrectomy patients, with available preoperative imaging and perioperative dissection difficulty scores were identified from 2011-2012. A surgeon prospectively assessed the fat density at time of surgery and quantified the difficulty of the surgical dissection of PF on the surface of the renal capsule using a scale based on perioperative fat dissection (FD) times. On axial CT imaging centered on the renal hilum, we retrospectively measured the quantity and density of PF whose absorption coefficient is between -5 to -15 Hounsfield units. Comparisons between low difficulty and high difficulty of perirenal FD based on PF density were conducted using the Mann-Whitney test and ANCOVA.

**Results:** High difficulty FD had significantly higher mean fat density compared to low difficulty FD (P=0.006). An ANCOVA analysis that simultaneously controlled for age, sex, and side of operation, also demonstrated significantly higher average fat density for high difficulty FD (P=0.005).

**Conclusion:** Measurements of PF density are a strong indicator of perioperative ease of FD at time of surgery. PF density can be obtained from preoperative CT imaging based on our present methodology, which may help ultimately predict the expected ease of surgical dissection in a given case and potentially determine the best surgical modality for a given patient.

**Research supported by:** A stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine.

Abstract #: 51

Presented by: Richard Beard, PhD, Postdoc

***Interleukin-1 $\beta$ -induced BBB Dysfunction Involves Decreased Claudin-5 Protein Expression and is Dependent on Non-Muscle Myosin Light Chain Kinase***

Richard S. Beard Jr<sup>1</sup>, Kevin Wu<sup>1</sup>, Jason J. Reynolds<sup>1</sup>, Stephanie Davis<sup>1</sup>, Ricci Haines<sup>2</sup>, Mack H. Wu<sup>2</sup>, Sarah Y. Yuan<sup>1</sup>.  
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**Keywords:** Interleukin-1beta, EAE, BBB permeability, Multiple Sclerosis

**Objective:** Aberrant elevation in the pro-inflammatory cytokine interleukin-1 $\beta$  (IL-1 $\beta$ ) contributes to neuroinflammatory diseases. Blood-brain barrier (BBB) dysfunction is a hallmark phenotype of neuroinflammation, and it is known that IL-1 $\beta$  directly induces BBB hyperpermeability, but the mechanisms remain unclear. Claudin-5 (Cldn5) is a tight junction protein expressed at endothelial cell-to-cell contacts and is critical for maintaining BBB integrity. Non-muscle myosin light chain kinase (nmMLCK) is a key regulator involved in endothelial permeability, and IL-1 $\beta$  has been shown to modulate nmMLCK in intestinal epithelium. Considering these factors, we tested the hypothesis that IL-1 $\beta$  decreases Cldn5 expression to induce BBB hyperpermeability in an nmMLCK dependent manner.

**Methods:** Standard immunological techniques were used including western blotting and immunocytochemistry. Endothelial barrier function was assessed in vitro using ECIS and transwell permeability assays.

**Results:** Treating brain microvascular endothelial cells (BMVEC) with IL-1 $\beta$  decreased trans-endothelial electrical resistance (TER), increased monolayer permeability, and significantly decreased Cldn5 expression. However, BMVECs isolated from nmMLCK<sup>-/-</sup> mice showed attenuated TER response and unchanged Cldn5 expression upon IL-1 $\beta$  challenge.

**Conclusion:** Interleukin-1 $\beta$ -induced BBB dysfunction involves decreased claudin-5 protein expression and is dependent on non-muscle myosin light chain kinase

**Research supported by:** NIH RO1s: HL061507, GM097270, HL070752 and HL096640.

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Abstract #: 52

Presented by: Erika Donaldson, BS, Staff

***Interaction of Apolipoprotein E with ApoER2 and VLDLR modulates MAPK-ERK signaling transduction***

Erika Donaldson, Qingyou Li, Ning Chen, Kelly Psilos, Justin H Trotter, MaryJjo LaDu, G. William Rebeck and Edwin J. Weeber, University of South Florida, Morsani College of Medicine, Department of Molecular Pharmacology & Physiology

**Keywords:** Alzheimer's disease, Apolipoprotein E, ERK signaling,

**Objective:** We were interested in testing the effects of Apolipoprotein E (ApoE) and its receptors apoER2 and VLDLR modulate downstream extracellular signal-regulated kinases (ERK) signaling transduction which may contribute the functional difference of apoE isoform on learning and memory in normal brain and Alzheimer disease.

**Methods:** Brain slices from 9-month-old ApoEKO, ApoER2 KO, VLDLR KO and wild type mice were acutely exposed to 1  $\mu$ M of human recombinant ApoE. Immunohistochemistry and western blot analysis were used to determine ERK/JNK protein expression and phosphorylation in the hippocampus and cortex.

**Results:** Application of high dose recombinant human apoE (1 $\mu$ M) induced ERK phosphorylation in neurons regardless apoE isoform, however, the induction of phospho-ERK in astrocytes was apoE isoform specific with the highest effect by E4. Genetic lacking apoER2 dramatically enhanced ERK phosphorylation and absence of VLDLR was inferior to apoER2. The increased phospho-ERK induced by lacking VLDLR was ablated by apoE acute application. Unlike the effect of acute apoE exposure, chronic apoE expression down-regulated ERK activation in an isoform-dependent manner with the highest effect by E2 in neurons in both apoE TR and EFAD mice. However, apoE4 increased phospho-ERK expression in astrocytes in EFAD mice.

**Conclusion:** Interaction of ApoE with VLDLR and ApoER2 may influence the role of ApoE on normal brain function and AD pathology by modulating MAPK-ERK/JNK signaling transduction.

**Research supported by:** National Institutes of Health Grant Po1 AG030128

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**Abstract #: 53**

**Presented by: Lakshmi Galam, PhD, Faculty**

***Diindolylmethane Attenuates TGF  $\beta$  Mediated Human Lung Fibroblast Proliferation by Suppressing Matrix Metalloprotease-1 and Thrombospondin-2 Gene Expression***

Lakshmi Galam, Sayantani Bandyopadhyay, Osvaldo Martinez, Toaa Abuelenen, Annie Castillo, Prasanna Tamarapu Parthasarathy, Venu Lagishetty, Richard Lockey, and Narasaiah Kolliputi Division of Allergy and Immunology, Department of Internal Medicine, Morsani College of Medicine, University of South Florida, University of South Florida, Morsani College of Medicine, Internal Medicine

**Keywords:** Fibrosis, proliferation and Diindolylmethane

**Objective:** Idiopathic pulmonary fibrosis (IPF) is a progressive scarring disorder characterized by the deposition of extracellular matrix causing impaired gas exchange with excessive proliferation and apoptosis-resistant state of lung fibroblasts. Therefore, inhibitors of fibroblast proliferation offer considerable therapeutic promise. Diindolylmethane (DIM) is found in cruciferous vegetables and has been known for its anti-cancer and anti-proliferative properties. Surprisingly, DIM has never been studied in pulmonary fibrosis. In the current study, we tested the effect of DIM on human lung fibroblast proliferation and apoptosis.

**Methods:** Human lung fibroblasts were treated with TGF  $\beta$ , a fibroblast proliferation inducer, in the presence or absence of DIM. Proliferation and apoptosis were assessed by using commercially available kits. To further understand the mechanism of DIM, cell lysates were analyzed for gene expression analysis using RT PCR. Protein expressions were determined by western blot analysis.

**Results:** Our results showed that DIM suppressed TGF  $\beta$  induced proliferation in human lung fibroblasts but not apoptosis. In addition, DIM attenuated TGF  $\beta$  induced MMP-1 and thrombospondin-2 gene expression. Interestingly, DIM is not influencing ADAM-TS2 expression in human lung fibroblasts.

**Conclusion:** Our findings demonstrated that the natural dietary compound DIM attenuates TGF  $\beta$  mediated pro-fibrotic effects through suppression of MMP-1 and thrombospondin-2 in human lung fibroblasts. These findings suggest that DIM may be a potential therapeutic target for pulmonary fibrosis.

**Research supported by:** This work was supported by the AHA 09SDG2260957 and NIH R01 HL105932 to NK

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**Abstract #: 54**

**Presented by: Ricci Haines, PhD, Postdoc**

***Role of nmMLCK in VEGF Induced Intestinal Epithelial Monolayer Permeability***

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**Keywords:** nmMLCK, VEGF, permeability, iNOS, nitrosylation

**Objective:** Gut hyperpermeability significantly contributes to morbidity and mortality in several disease states, and is mediated, in part, by elevated serum VEGF levels. Previous reports have shown that VEGF induced permeability may involve the activity of non-muscle myosin light chain kinase (nmMLCK). In addition, excessive nitric oxide (NO) production, potentially by inducible nitric oxide synthase (iNOS), often promotes junction protein nitrosylation, thus may contribute to intestinal epithelial hyperpermeability. Specifically, it was recently demonstrated that beta catenin nitrosylation occluded its association with VE-cadherin and may contribute to gut barrier dysfunction. It is currently unknown whether nmMLCK phosphorylates iNOS in a manner that regulates nitrosylation in intestinal epithelial cells.

**Methods:** Here, we show that iNOS shares similar sequence identity with myosin light chain (MLC) at acetylation sites, EF-2 domains, and nmMLCK phosphorylation sites.

**Results:** Furthermore, via immunoprecipitation of S-nitrosocysteine, we show that VEGF treatment increased beta catenin nitrosylation in young adult colonic epithelial cells (YAMC). Finally, with immunofluorescent confocal microscopy, we show that localization of iNOS is altered in VEGF treated YAMCs in a fashion that suggests its association with nmMLCK signaling.

**Conclusion:** These results suggest that nmMLCK may play a critical role in VEGF induced loss of intestinal epithelial barrier function via its promotion of iNOS mediated beta catenin S-nitrosylation.

**Research supported by:** VA Merit Review 5101BX000799, HL-96640

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**Abstract #: 55**

**Presented by: Justin Hooper, MS, Graduate Student**

***Cardiac Arrhythmia Evoked by Inhalation of Capsaicin***

Justin Shane Hooper, Raffaele Pilla, Thomas Taylor-Clark University of South Florida, Morsani College of Medicine, Molecular Pharmacology & Physiology

**Keywords:** Capsaicin, cardiovascular, pulmonary, innervation, nebulize

**Objective:** It is thought that pollutants/irritants cause increased risk of cardiovascular mortality via reflex changes in autonomic control. We hypothesize that activation of airway sensory nerves will also cause dangerous changes in cardiac function. We will observe the effect of irritant inhalation on the cardiac cycle in normal and Spontaneously Hypertensive rats through selective activation of pulmonary C-fiber innervation. This will be accomplished through inhalation of the TRPV1 agonist capsaicin.

**Methods:** To assess the cardiac cycle in awake and freely moving rats, we employ the use of a radiotelemetric device (4ET, DSI) that is implanted during anesthetic-controlled surgery. A pair of electrodes are attached in the lead 2 position to record ECG. 7 to 10 days following surgery, the rat is placed inside a plexiglass chamber capable of administering a controlled exposure of nebulized irritant. The cardiac cycle (ECG recordings) is assessed for 10 minutes prior to vehicle, 10 minutes during vehicle exposure, and 10 minutes during irritant (Capsaicin 300uM) exposure. Analysis is then performed on the RR-Intervals and PR-Intervals in order to characterize any effects of irritant inhalation on the cardiac cycle.

**Results:** Analysis performed on RR-Intervals has shown a series of "dropped beats" and symptomatic bradycardia induced by capsaicin. Also, analysis performed on PR-Intervals has shown a prolongation of the PR-Intervals during capsaicin exposure leading to a second-degree Atrioventricular block (Mobitz Type I/2).

**Conclusion:** Our results show an increase in cardiac arrhythmias through selective activation of airway sensory nerves. It is likely that this mechanism contributes to inhaled pollution cardiovascular events.

**Research supported by:** USF Program Enhancement Grant

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**Abstract #: 56**

**Presented by: Kristen Marcet, BS, Graduate Student**

***Small for Gestational Age as a Marker for Postoperative Morbidity and Late Non-Surgical Mortality in Neonates Undergoing Patent Ductus Arteriosus Ligation.***

Kristen Marcet, USF COM, Alejandra Grana, USF COM, Anthony A. Sochet MD, USF Department of Pediatrics, Jennifer Leshko RN, BSN, All Children's Heart Institute, Katherine Braley MD, USF Department of Pediatrics, Rohit Aswani MD, All Children's Heart Institute, Jeffrey P. Jacobs MD, All Children's Heart Institute, Gul H. Dadlani MD, All Children's Heart Institute, and USF Department of Pediatrics

**Keywords:** This study is a retrospective chart review. Small for Gestational Age, Patent Ductus Arteriosus, Patent Ductus Arteriosus Ligation, Neonates

**Objective:** Small for gestational age (SGA) is a fetal marker of intrauterine growth restriction and has been associated with increased morbidity and mortality following neonatal cardiac surgery. SGA infants may have changes in the lungs, kidneys, pancreas, vasculature, and body composition that may lead to adult onset diseases such as: pulmonary hypertension, systemic hypertension, type 2 diabetes, coronary artery disease, and obesity. We sought to assess the affects of SGA on neonates undergoing patent ductus arteriosus (PDA) ligation.

**Methods:** A single institution retrospective review was performed on all neonates undergoing surgical ligation of PDA from 1/2007-12/2011 found in our CardioAccess Database. Patient demographics, anthropometric data, operative details, morbidities and mortality were recorded. All results compared SGA (birth weight [BW] <10th %) versus non-SGA (appropriate/large GA, BW >10th %). P-values were calculated using Fisher's Exact Test.

**Results:** 125 neonates had PDA ligation (21 SGA and 104 Non-SGA). Mean SGA BW was 0.734 kg, GA at 27 weeks, weight on day of surgery of 1.159 kg and age on date of surgery at 28.4 days. In comparison non-SGA had a mean BW of 0.901 kg, GA at 25.8 weeks, weight on day of surgery of 1.25 kg and age on date of surgery at 27.3 days. P-values were not less than 0.05. However, SGA neonates had increased risk of morbidities: CNS bleed (14.3% vs. 4.8%), chromosomal anomaly (14.3% vs. 2.9%), GERD (61.9% vs. 47.1%) and vocal cord paralysis (19% vs. 11.5%). SGA was associated with increased risk of late postoperative mortality (14.3% vs. 5.8%).

**Conclusion:** SGA may be an important risk factor in neonates undergoing PDA ligation. A larger sample size is needed to obtain significant P values at the .05 level

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Abstract #: 57

Presented by: Jason Reynolds, BS, Graduate Student

***Focal Adhesions Regulate Endothelial Junctions via Myosin Light Chain Kinase During Neutrophil-Induced Hyper Permeability***

Jason J. Reynolds<sup>1</sup>, Richard S. Beard Jr.<sup>1</sup>, Ricci Haines<sup>2</sup>, Nikolay L. Malinin<sup>1</sup>, Mack H. Wu<sup>2</sup>, Sarah Y. Yuan<sup>1</sup>.

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**Keywords:** Endothelial Permeability, Inflammation, Focal Adhesion, Adherens Junction

**Objective:** Inflammatory microvascular permeability is mediated largely by neutrophil activation, endothelial transmigration, and release of permeability inducing factors. The dysfunction resulting from the following fluid and protein leak can exacerbate inflammation under pathological conditions. Given the importance of the endothelial barrier in these processes, we investigated an alternative role of non-muscle myosin light chain kinase (nmMLCK) in neutrophil-stimulated endothelial permeability. We tested the hypothesis that nmMLCK has substrates other than myosin light chain, and that these targets play a role in the regulation of permeability by neutrophil stimulation.

**Methods:** Standard immunological techniques were used, including western blot and immunofluorescence. Phos-tag gel electrophoresis was used to study protein phosphorylation.

**Results:** We report that nmMLCK is involved in the phosphorylation of proteins from adherens junctions ( $\beta$ -catenin) as well as focal adhesions (Focal adhesion kinase [FAK], Kindlin 2), and that inhibition of either nmMLCK or FAK can rescue the junction disassembly observed with neutrophil stimulation.

**Conclusion:** This indicates a novel role of FAK in the disassembly of adherens junctions during neutrophil stimulation of endothelial cells. These findings help establish the intracellular molecular pathways underlying neutrophil stimulated endothelial permeability and may help identify therapeutic targets for inflammation-associated vascular leak and edema.

**Research supported by:** Supported by NIH R01 HL061507, GM097270, HL070752, HL096640.

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Abstract #: 58

Presented by: Jared Tur, BS, Graduate Student

***Role of Voltage Gated Potassium Channel Subunit Kvb1.1 in Cardiac Hypertrophy***

Jared Tur<sup>(1)</sup>, Kalyan C. Chapalamadugu<sup>(2)</sup>, Siva K. Panguluri<sup>(2)</sup>, Srinivas M. Tipparaju<sup>(2)</sup>. <sup>1</sup>. Department of Molecular Medicine, University of South Florida-Morsani College of Medicine

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**Keywords:** Potassium channel, cardiac hypertrophy, Kv Beta

**Objective:** Voltage gated potassium channels Kv1 and Kv4 are important for function of the heart. The Kv $\alpha$  subunits 1 and 4 channels bind the Kv $\beta$  subunits (Kv $\beta$ 1-3) via cytosolic domains. The precise role of the auxiliary subunits in cardiac physiology remains unknown. We hypothesized that the Kv $\beta$ 1.1 plays a significant role in regulating the ion channels and helps the heart sense hypertrophic stress.

**Methods:** Kv $\beta$ 1.1 KO mice were subjected to cardiac hypertrophy and evaluated by using physical, biochemical and physiological methods. The hypertrophy was induced by isoproterenol (ISO) osmotic pumps for 14 days by placement of an intraperitoneal infusion pump. The release of isoproterenol was equivalent to the physiological levels released in humans. Western blot analysis for key mediators and transcription factors was conducted.

**Results:** Echocardiographic and histochemistry data clearly indicate that ISO induced cardiac hypertrophy is present. Functional data for important echocardiographic parameters such as LVID(d) and LVID(s) was improved in the ISO-KO group compared with ISO-WT. Western analysis revealed modulation in key ion channels and transcription factors suggesting hypertrophy induced changes in Kv $\beta$ 1.1 KO mice. The baseline performance of the Kv $\beta$ 1.1KO mice showed functional changes at Day 0 without ISO infusion suggesting an important physiological role for Kv $\beta$ 1.1 subunits in the heart.

**Conclusion:** Together the study shows physiological changes due to ablation of the Kv $\beta$ 1.1 gene. The functional, pathological, and molecular evaluation suggests a significant and important role of Kv $\beta$ 1.1 in cardiac hypertrophy.

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**Abstract #: 59**

**Presented by: Mack Wu, MD, Faculty**

***Involvement of FAK and Src in Microvascular Hyperpermeability Caused by Fibrinogen-Gamma C-Terminal Fragments***

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**Keywords:** FAK, Src, fibrinogen, microvascular permeability

**Objective:** Fibrinogen degradation products have been associated with microvascular dysfunction during traumatic injury. We previously reported that fibrinogen-gamma C-terminal fragments (gC) was capable of causing microvascular leakage via integrin-mediated and RhoA-dependent pathway.

**Methods:** In this study, we further explored the potential roles of focal adhesion kinase (FAK) and Src in gC-induced microvascular hyperpermeability. Albumin permeability was measured using intravital microscopy in mouse mesenteric microvasculature. The fluid permeability was defined by the capillary filtration coefficient (K<sub>fc</sub>) in isolated and perfused mouse lungs. In addition, transcellular electric resistance (TER) was measured in cultured endothelial cell monolayers as an indicator of barrier function.

**Results:** The results showed that inhibition of FAK or Src attenuated gC-induced microvascular hyperpermeability in vivo. Correspondingly, Western blot analyses revealed that gC promoted phosphorylation of FAK (Y397) and Src (Y416) in time-dependent fashion comparable to that of gC-induced microvascular permeability. FAK or Src gene silencing and pharmacological inhibition greatly attenuated gC-elicited reduction in TER in endothelial monolayers. Furthermore, inhibition of FAK blocked gC-induced Src phosphorylation, indicating FAK activation was upstream of Src. Additionally, we found that gC was able to cause adherence junction responses characterized by dissociation between VE-cadherin and b-catenin. These responses were attenuated during inhibition of FAK or Src.

**Conclusion:** Taken together, the data suggest that the FAK-Src pathway plays an important role in mediating microvascular endothelial barrier dysfunction caused by gC stimulation.

**Research supported by:** NIH R01HL-096640, HL-070752

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**Abstract #: 60**

**Presented by: Rongqian Wu, MD, Faculty**

***CD44-mediated Src signaling in endothelial barrier dysfunction***

Rongqian Wu<sup>1</sup>, Richard S. Beard Jr.<sup>1</sup>, Xiaoxuan Cui<sup>1</sup>, John Elliott<sup>1</sup>, Mack H. Wu<sup>2</sup>, Sarah Y. Yuan<sup>1</sup>: <sup>1</sup> Department of Molecular Pharmacology & Physiology, <sup>2</sup> Department of Surgery, Morsani College of Medicine, University of South Florida, Tampa, FL 33612, University of South Florida, Morsani College of Medicine, Molecular Pharmacology & Physiology

**Keywords:** Endothelial permeability, CD44, hyaluronan, Src-Family Kinases, Signal transduction

**Objective:** CD44 is a cell-surface receptor for hyaluronan (HA), a major glycosaminoglycan component of extracellular matrix. The objective of this study was to define the role of CD44 in endothelial barrier function and its downstream signal.

**Methods:** Pulmonary microvascular endothelial cells isolated from wild type C57BL/6 mice and intravital microscopy in the rat mesentery were served as the primary models.

**Results:** Using cultured pulmonary microvascular endothelial cells, we found that blocking CD44 with high molecular weight HA (HMW-HA) increased electric resistance in hydrogen peroxide-stimulated endothelial monolayers, indicating a protective role of blocking endothelial CD44 signaling in the regulation of microvascular permeability. To confirm this finding in vivo, intravital microscopy was conducted in the rat mesentery. Our result showed that intravenous administration of HMW-HA prevented plasma leak caused by the inflammatory mediator PAF. Western blot analysis indicated that oxidative stress and CD44 activator (i.e., CD44 antibody IM-7) caused comparable Src activation (Y416 phosphorylation) in endothelial cells. The protective effect of HMW-HA on endothelial barrier function was associated with inhibition of Src phosphorylation at Y416. Inhibition of Src activity by PP2, a selective inhibitor for Src-family kinases, blocked CD44-induced barrier dysfunction.

**Conclusion:** Taken together, these results suggest that activation of endothelial CD44 increases microvascular permeability through Src phosphorylation.

**Research supported by:** Supported by NIH RO1 HL061507, HL070752, GM097270 and HL096640.

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**Abstract #: 61**

**Presented by: George Yang, BS, Med II Student**

***A Novel Approach to EVAR Simulation Using Patient Specific Modeling***

George Qiaosi Yang, Thu-Hoai Nguyen, Gavin R. Davis, MD, Vascular Surgery, Karl A. Illig, MD, Division of Vascular Surgery, USF Murray L. Shames, MD, Surgery & Radiology, USF, University of South Florida, Morsani College of Medicine, Surgery

**Keywords:** Simulation, Vascular Surgery, EVAR

**Objective:** The Symbionix Angiometer Procedure Rehearsal Studio (PRS) allows for accurate virtual anatomy for measurement, stent graft selection, and deployment of endovascular AAA repair (EVAR) devices.

**Methods:** Gore Excluder EVAR cases from a TGH/USF EVAR database were reviewed, and CT imaging data (DICOM) was loaded into the Symbionix Angiometer using PRS software. Centerline measurements were based on PRS neck diameter (D1), length from the lowest renal artery to each iliac bifurcation (LL and LR) and common iliac diameter (DL and DR). The measurements for graft device selection were created using the PRS simulator. The EVAR simulation was then performed by an experienced vascular surgeon. Changes in graft device selection based on intraoperative measurements and the use of PRS 3D anatomic overlay were documented. The actual devices used for surgery were considered the gold standard for comparison. The simulations were then evaluated on a 5 point scale for realism, imaging quality, and final product.

**Results:** 10 cases with complete operative data and CT scans were used. 5/10 had changes in device length via "in-vivo" 3D volume filled model and angiographic measurements. Changes that were implemented to the devices inserted resulted in correction of the limb length to that of actual inserted devices in 5/5 cases. Scoring showed ratings of decreased realism (average 2.3/5) due to unrealistic ease of wire passage and cannulation. Simulation imaging and final product were scored favorably (3.7 and 3.4 respectively).

**Conclusion:** PRS offers a new approach to simulation for EVAR with built-in case compatibility. Using the software predicts real life device selection and is an opportunity for high fidelity patient specific preoperative EVAR practice.

**Research supported by:** This research was supported by the Scholarly Concentrations Program at USF Health, Morsani College of Medicine and the American Heart Association Medical Student Summer Research Award

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**Abstract #: 62**

**Presented by: Adam Baumgarten, BS, Med III Student**

***Metallic Ureteral Stents: A Cost Effective Management of Chronic Ureteral Obstruction***

Adam S. Baumgarten, University of South Florida Morsani College of Medicine, Matthew C. Tufts University of South Florida Morsani College of Medicine, Tim J. Kim Moffitt Cancer Center Department of Urology, Tariq S. Hakky, Rafael E. Carrion, Jorge L. Lockhart, Philippe E. Spiess University of South Florida Department of Urology, University of South Florida, Morsani College of Medicine

**Keywords:** Stents, Ureteral, Obstruction, Cutaneous ureterostomy

**Objective:** The limitations of traditional ureteral stents in patients with chronic ureteral obstruction (CUO) have resulted in frequent stent exchanges, higher failure rates, and compromised quality of life. Metallic ureteral stents (MUS) were introduced to improve technical feasibility and patency rates for management of upper urinary tract obstruction, obviating the need for frequent stent exchanges.

**Methods:** 50 patients were retrospectively identified to have had MUS placement from 2009-2012. Stent failure was defined as unplanned stent exchange, nephrostomy tube requirement, increasing hydronephrosis, or increasing serum Cr. Stent life was analyzed using the Kaplan-Meier method. Predictors of clinical outcome were assessed using Cox regression. Cost analysis accounted for stent cost, OR and anesthesia fees, stent exchange rates, and patients' lost wages.

**Results:** A total of 97 MUS were placed in 50 patients from 2009-2012. The mean age was 63.0 years (22-88): 63 stents were placed due to malignant ureteral obstruction, 33 in the setting of cutaneous ureterostomies, and 1 stent into an ileal conduit. Stent failure occurred 12% of the time, and 27.4% of total stents were exchanged. Median stent life was 288.4 days (95% CI= 277.4-321.2). 19 patients died with stents in-situ. Analysis showed no predictive factors were significantly correlated with stent failure. The estimated annual cost for traditional plastic stents is \$9,781-\$13,309, while the estimated annual cost for MUS is \$4,917-\$6,218.

**Conclusion:** Our results indicate that MUS placement for management of CUO is a technically feasible procedure with minimal complications and is well tolerated by patients. MUS can be left in-situ for longer durations and provide a significant financial benefit.

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**Initial Results of Treatment of Advanced Glaucoma with Ahmed "Wing" Valve**

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**Keywords:** Glaucoma, Valve,

**Objective:** To compare the surgical and visual outcomes of the standard Ahmed valve with a new "Wing" Ahmed valve in the treatment of advanced glaucoma. The plate of the wing valve has a surface area of approximately 450mm<sup>2</sup> compared to a surface area of 180 mm<sup>2</sup> for the standard Ahmed valve.

**Methods:** This was a retrospective, non-randomized comparative trial of 30 consecutive patients who underwent implantation of the Ahmed valve with the wing valve compared to 30 consecutive patients who received the standard Ahmed valve. All procedures were performed by a single surgeon (WEL). Visual acuities, intraocular pressures (IOP) were compared preoperatively and at intervals of one day, one week, two weeks, four weeks, 7 months, and 10 to 14 months. Complication rates between the two groups were also compared.

**Results:** By Student's t-test, requiring  $p < 0.05$ , intraocular pressures were statistically similar at all intervals except on postoperative day one when average IOP was 15 with the "wing valve" and 10.5 with the standard Ahmed valve ( $p = 0.044$ ). At the 10 to 14 month time point, average IOP with the "wing" valve was 15 compared to 19 with the standard valve, although this was not statistically significant ( $p = 0.099$ ). The number of major complications (exposed valve with revision, explanted valve, or second valve implant) was 6 for the "wing" valve and 5 for the standard valve.

**Conclusion:** Despite larger surface area, the "wing" valve, in this study, did not produce a statistically significant difference in IOP at the one year time point. The rate of complications between the two valves was similar.

**Research supported by:** This research was supported by the Scholarly Concentrations Program at USF Health, Morsani College of Medicine.

**Extra-colonic Clostridium difficile Infection Associated with Methotrexate Use: A Case Report**

Allison C. DeRespino, BS, MS, Morsani College of Medicine, University of South Florida; Chike T. Chizea, MBBS, College of Public Health, University of South Florida; Dhanashree Kelkar, MD, Department of Infectious Diseases, Morsani College of Medicine, University of South Florida; John N. Greene, MD, FACP, Department of Infectious Diseases, H. Lee Moffitt Cancer Center University of South Florida, Morsani College of Medicine, Internal Medicine

**Keywords:** this is a Case Study. Key words could be: extracolonic, Clostridium difficile, osteomyelitis, methotrexate

**Objective:** Clostridium difficile, (C. difficile) is a gram positive, anaerobic spore-forming bacillus that is known to cause antibiotic-associated diarrhea and pseudomembranous colitis. It is found as a normal commensal of the gastrointestinal tract (GIT) but, in the setting of prolonged antibiotic use, other normal GIT flora can become suppressed and C. difficile can proliferate to pathogenic levels. Clinical manifestations are thus usually gastrointestinal secondary to local toxin production, but it can also present with extra-colonic infections, making the diagnosis complex. Here we present a rare case of C. difficile osteomyelitis of the knee not associated with antibiotic use and hospital admission, but with chronic use of the antineoplastic medication, Methotrexate.

**Methods:** (n/a - project is a case report, please use text in Objectives section as abstract)

**Results:** (n/a, see above)

**Conclusion:** (see above)

**Research supported by:** Research supported by: This research was supported by the Scholarly Concentrations Program at USF Health, Morsani College of Medicine and H. Lee Moffitt Cancer Center.

***Normal Variability in the Morphology of the Lumbar Disc Annuli and their Adjacent Endplates***

Chad W. Engel (USF Morsani College of Medicine), Carlos R. Martinez (USF Morsani College of Medicine, Department of Radiology, Neuroradiology Section), Jonathan M. Ford (USF Morsani College of Medicine, Department of Radiology, Division of Imaging Research and Applied Anatomy), Stephanie L. Davy-Jow (USF Morsani College of Medicine, Department of Radiology, Division of Imaging Research and Applied Anatomy), Summer J. Decker (USF Morsani College of Medicine, Department of Radiology, Division of Imaging Research and Applied Anatomy), University of South Florida Morsani College of Medicine Radiology

**Keywords:** Lumbar spine, disc, curvature, endplate

**Objective:** Variation in the morphology of the posterior margin of the lumbar annuli has not been well described. Our aim was to determine the normal shape of the posterior lumbar disc annuli and their adjacent endplates through CT evaluation of normal lumbar spines in a select population of young adults.

**Methods:** We retrospectively chose 60 CT scans of the abdomen/pelvis (mean age=27.25) from a large pool of young adults who presented to an outpatient diagnostic center for evaluation of possible abdominal and/or pelvic pathology. Exclusion criteria included congenital spinal variations/anomalies, scoliosis, prior trauma, degenerative disc/facet disease, disc protrusion, and spondylolisthesis. 3D models of the lumbar vertebrae and discs were rendered from original raw data, and the curvatures of the posterior margins of the discs and endplates were measured using 3D modeling software.

**Results:** With positive values reflecting anterior concavity and negative values reflecting posterior convexity, from L1L2 to L5S1, posterior disc curvature was  $0.53\pm 0.19, 0.38\pm 0.16, 0.30\pm 0.18, 0.07\pm 0.20$ , and  $-0.20\pm 0.22$  cm<sup>-1</sup> (mean $\pm$ 1SD), respectively. The superior endplate curvatures from L1L2 to L5S1 were  $0.56\pm 0.14, 0.42\pm 0.18, 0.26\pm 0.17, 0.02\pm 0.17$ , and  $-0.17\pm 0.16$  cm<sup>-1</sup>, respectively. The inferior endplate curvatures from L1L2 to L5S1 were  $0.64\pm 0.18, 0.50\pm 0.19, 0.40\pm 0.18, 0.17\pm 0.20$ , and  $-0.02\pm 0.28$  cm<sup>-1</sup>, respectively.

**Conclusion:** There is a normal variation in the shape of the posterior lumbar disc annuli and endplates. It is subtle, with decreasing anterior concavity from L1L2 to L5S1 that usually results in posterior convexity at L5S1 and often at L4L5. The grasp of this concept in lumbar disc shape is vital to avoid a false positive diagnosis of a disc bulge, particularly at L4L5 and L5S1.

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***Evaluation of Octreotide LAR Dose Optimization and Clinical Outcomes in Patients with Neuroendocrine Tumors: a Retrospective Chart Review Study***

Jamie Goldman, University of South Florida Morsani College of Medicine, Jonathan Strosberg, MD, Department of Gastrointestinal Oncology Neuroendocrine Division. University of South Florida, Morsani College of Medicine, Oncologic Sciences

**Keywords:** Neuroendocrine tumors, carcinoid, octreotide

**Objective:** Neuroendocrine tumors (NETs) are slow growing tumors that originate in the hormone-producing cells of the body's neuroendocrine system, commonly causing carcinoid syndrome. Octreotide is currently indicated for the symptomatic treatment of patients with NETs due to its inhibitory effect on carcinoid syndrome and is also used for its inhibitory effects on tumor growth. This is a retrospective, longitudinal medical chart review of octreotide LAR administration in NET patients at 3 tertiary institutions to evaluate the potential relationship between octreotide LAR dose optimization and resulting clinical outcomes.

**Methods:** A retrospective chart-review was performed using a database of patients with metastatic midgut and pancreatic neuroendocrine tumors treated at three tertiary cancer centers. Data included the duration, doses and frequency of octreotide LAR administered, additional treatments given, reasons for change in dose or frequency, and clinical outcomes associated with the dose change.

**Results:** This project is currently ongoing, however we can predict the study outcomes based on a similar single-institution study performed at Moffitt Cancer Center in 2011-2012 showing improvement in symptoms with increased doses of octreotide.

**Conclusion:** The FDA-approved dose of octreotide LAR is 10mg to 30mg every 4 weeks. In clinical practice, higher doses and frequencies are commonly prescribed to patients for refractory carcinoid syndrome, and also for its inhibitory effects on tumor growth. The prior study showed that a majority of patients derived symptomatic relief from the above-label use of octreotide. This study will further assess and validate these findings.

**Research supported by:** Dr. Jonathan Strosberg (mentor) and the International Medicine Scholarly Concentration.

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**Abstract #: 67**

**Presented by: Lisa Hayman, BS, Med III Student**

***Oxygen Requirement as a Screening Test for Late Pulmonary Hypertension in Extremely Low Birth Weight Neonates***

Lisa Hayman, Rohit Aswani, MD, Gina Nichols, Rahul Mhaskar, MPH, PhD, Angel A Luciano, MD, FAAP and Gul H Dadlani, MD University of South Florida, Morsani College of Medicine, Pediatrics

**Keywords:** PH, BPD, ELBW, Chart Review

**Objective:** Pulmonary Hypertension (PH) in Extremely Low Birth Weight (ELBW) neonates causes significant morbidity and mortality. Doppler echocardiography is a noninvasive test commonly used to screen and manage PH. We assessed the use of supplemental oxygen requirement >30% at 30 days of life as a screening tool for the development of PH in the ELBW neonates.

**Methods:** Retrospective single center review of ELBW (birth weight (BW) <1000 g) who survived for more than 30 days from 1/2010-12/2010 was done. Demographic data were obtained and oxygen requirement at 30 days of life was assessed in all neonates, regardless of BPD status at 36 weeks corrected gestational age. Oxygen requirement of > 30% at day of life (DOL) 30 was tested as a screening tool for ELBW neonates at risk of developing PH. Diagnosis of PH was obtained from the discharge summary. The Fisher's exact test was used to test association between Oxygen requirements and PH.

**Results:** There were 55 ELBW neonates: The mean gestational age was  $25.8 \pm 1.5$  (SD) weeks, the mean BW was  $798.3 \pm 139.2$ (SD) grams. There were 61.8% requiring <30% oxygen and 38.2% requiring >30% oxygen at 30 days. The prevalence of PH was 16.3%. Requirement of oxygen more than 30% as a screening tool for PH was found to be 88.9% (95% CI: 51.8%-99.7%) sensitive and 71.7% (95% CI: 56.5%-84%) specific, with a positive predictive value of 38.1% (95% CI: 18.1%-61.6%) and negative predictive value of 97.1% (95% CI: 84.7%-99.9%). There was a significant association between Oxygen requirements and PH ( $p = 0.001$ )

**Conclusion:** Oxygen requirement > 30% at day of life 30, may be a good screening tool or adjunctive test for the diagnosis of PH in ELBW neonates. We are continuing the ongoing evaluation of this screening modality in a larger cohort.

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**Abstract #: 68**

**Presented by: Michelle Heck, BS, Graduate Student**

***Neurotoxoplasmosis: A Common Initial Presentation Among HIV-positive patients in the Dominican Republic in the HAART Era.***

Michelle Heck BS, Monica Thormann MD, Lynette Menezes PhD, Jose Montero MD, Ren Chen MD MPH, John Sinnott MD University of South Florida, Morsani College of Medicine, Department of Internal Medicine

**Keywords:** Chart Review, Neurotoxoplasmosis, AIDS, HIV

**Objective:** This retrospective study describes the most common clinical presentation and radiological manifestations of AIDS patients with neurotoxoplasmosis (NT) presenting to Hospital Gautier in Santo Domingo, Dominican Republic.

**Methods:** Data were extracted from medical records of 36 HIV-infected patients (18M, 18F) diagnosed with NT from September 2002 to June 2010 and treated at Hospital Gautier. NT diagnosis was based on clinical symptoms and/or radioimaging.

**Results:** Patients' mean age was 43 years (range 26 – 74). NT was the initial presentation in 80.6% (n=29) of patients. Seven patients had a prior diagnosis of HIV infection and had initiated HAART for a mean duration of 662 days prior to NT presentation (range 120 – 1967). Common clinical symptoms were headache, fever, motor/sensory deficit, seizure, altered mental status, dizziness, ataxia, and cranial nerve alterations. Concurrent infections were common: mucocutaneous candida infection (42%); herpes infection (19%); tuberculosis (19%); pneumocystis pneumonia (6%); and syphilis (6%). Patients' median CD4 cell count was 51 cells/ $\mu$ L and 83.9% had a count <200/ $\mu$ L. Only 58% of patients received imaging during inpatient evaluation. Lesions were located in the cerebral cortex (83%), basal ganglia (39%), cerebellum (17%), and internal capsule (6%).

**Conclusion:** Despite the increasing availability of HAART, our study indicates that NT can still be found as the initial presentation of HIV/AIDS within developing countries. Cerebral cortex lesions on imaging should suggest a prompt HIV evaluation, especially if concurrent opportunistic infections are present. Increasing the capacity of developing countries to provide imaging is essential for better patient outcomes.

**Research supported by:** USF College of Medicine

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**Abstract #: 69**

**Presented by: Sindhu Igala, MD, Resident**

***Semi-Comatose Man for Seven Years Wakes Up to Walk out of Hospital***

Sindhu Igala, M.D., Department of Medicine, University of South Florida, Morsani College of Medicine and James A. Haley VA Medical Center

**Keywords:** Partial hypopituitarism, semi-comatose, control hypothyroidism; euthyroid sick syndrome

**Objective:** To determine why a 61-year-old man with hydrocephalus had been semi-comatose for seven years.

**Methods:** Diagnostic evaluation was performed since he had a low thyroid stimulating hormone (TSH) value of 0.028 mIU/L (normal: 0.46-4.7 mIU/L).

**Results:** • Physical exam: Confused and only arousable by gentle shaking. • Lab: Free thyroxine (T4) was low at 0.69 ng/dl (normal: 0.89-1.76 ng/dl) with total triiodothyronine (T3) of 1.03 ng/dl (normal: 0.6-1.81 ng/dl). • Review of medical records revealed his TSH had been low for 7 years but the patient had never had his low TSH evaluated or treated. • Labs indicated pituitary-induced hypothyroidism. Evaluation of the rest of the pituitary revealed the following: o Luteinizing hormone (LH) was normal with a low total testosterone (T), indicating pituitary cause of low T as LH should have been high if dysfunction of testis was cause. o Insulin-like growth factor 1 (IGF-1) = 28.6 ng/ml (normal: 75-212 ng/ml). Low IGF-1 = growth hormone deficient. o Evaluation of the pituitary-adrenal axis with a 1mg dexamethasone suppression test and ACTH revealed that his adrenals stimulated normally, ruling out pituitary adrenal dysfunction.

**Conclusion:** In addition to central hypothyroidism, pituitary-induced hypogonadism, and growth hormone deficiency, it was also possible the patient had "euthyroid sick syndrome" where there is low T4 and/or T3. His normal reverse T3 ruled out euthyroid sick syndrome, which has an elevated reverse T3. He was given low-dose Synthroid (L-thyroxine/50 µg/day) orally and after 4 days he woke up and got out of bed the left the hospital, saying he was going to McDonald's for a Big Mac. He came back later with his Big Mac and is now at home, alert and functioning normally.

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**Abstract #: 70**

**Presented by: Robert Kent, BS, Resident**

***Peripheral Nerve Stimulation with Inter-lead Crosstalk Leading to Complete Pain Cessation in a Patient Suffering Post-Nephrectomy Syndrome.***

Rob Kent D.O. M.H.A. USF PM&R Benito Torres D.O. Moffitt Cancer Center, University of South Florida, Morsani College of Medicine, Department of Neurology

**Keywords:** Pain, interventional pain, neuropathic pain

**Objective:** -To demonstrate a novel approach to treating neuropathic, visceral pain

**Methods:** Patient is a 30 year old female that presented to our pain management clinic for refractory pain status post partial right nephrectomy two years prior. She underwent a diagnostic intercostal injection at seven months post partial nephrectomy that did relieve her pain for close to a full day. She later had a radiofrequency ablation of intercostal nerves from T10 to T12 with no improvement in pain. She also underwent multiple other interventional procedures with no relief. She underwent a trial and then permanent nerve stimulator placement along the area of neuropathic pain using crosstalk between the leads.

**Results:** At one week post-trial implant placement, patient returned to clinic with a zero out of ten pain on VAS and decided to move forward with permanent placement. Ten days later, Patient was seen for implantation of permanent peripheral nerve stimulator and her pain had returned to a ten out of ten on VAS after removal of the trial leads. At one and two week follow up after permanent peripheral nerve stimulator, this patients post-nephrectomy pain remained a zero out of ten on VAS and she had no complications from the procedure. The stimulator was programmed to use crosstalk both in the trial and permanent stimulator placements with stimulation from lead to lead crossing the nephrectomy incision area. She remains pain free at three months post peripheral implant.

**Conclusion:** Peripheral nerve stimulation crosstalk is an effective means of pain relief and possible cessation in specific patient populations. The development of a circuit between two stimulator leads offers improved coverage area and more effective pain control when used with peripheral nerve stimulation.

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**Uncommon Clinical Scenario and Diagnostic Challenge: Primary Gastrointestinal (GI) Plasmablastic Lymphoma**

Lynette Luria<sup>1</sup>, Domenico Coppola<sup>2</sup>, Jun Zhou<sup>3</sup>, Jane Messina<sup>1</sup>, Ling Zhang<sup>2</sup>, <sup>1</sup>.The University of South Florida Medical College, Department of Pathology and Cell Biology <sup>2</sup>. Department of Hematopathology, Moffitt Cancer Center and Research Institute and <sup>3</sup>. Department of Pathology, Wayne State University, Detroit, MI. University of South Florida Morsani College of Medicine

**Keywords:** Plasmablastic Lymphoma, GI Malignancy, Case Study

**Objective:** Plasmablastic Lymphoma (PBL) is a rare malignancy of the gastrointestinal (GI) tract. It is frequently seen in the oral cavity of HIV infected individuals. PBL is distinct from other B cell lymphomas in that it expresses plasma cell antigens but not common B cell antigens. In order to gain a broader understanding of PBL and distinguish it from other GI malignancies, we investigated cases that occurred in the GI tract.

**Methods:** We reviewed the clinical histories and pathology of three patients with primary GI PBL evaluated at Moffitt Cancer Center.

**Results:** In the first case, a 40 year-old HIV positive male presented with a hemorrhoid-like sensation and 3-month history of weight loss. He was diagnosed with PBL via a rectal mass biopsy. The second case involves a 65 year-old immunocompetent male with bloody diarrhea found to have PBL in a resected sigmoid mass. The third patient was a 4<sup>1</sup> year-old male with a history of Crohn's disease who presented with abdominal pain, diarrhea, and weight loss. A mass was found around the small intestine on CT, which was resected after it failed to respond to antibiotic and steroid therapies. The clinicopathologic characteristics of the three PBL cases are summarized in the table.

Age/ Sex	Stage	Phenotyping	Treatment	Outcome	Follow up (Mon)
1. 40M	III E	CD138(+), dim CD45(+), dim CD79a (+), EBER (+), CD20 (-)	EPOCH	Relapsed	12
2. 65M	II E	CD138 (+), dim CD45(+), EBER(+), CD20 (-)	CHOP-R, Auto-HSC	CR	44
3. 41M	III E	CD79a(+), MUM-1(+), EBER(+), CD45 (-/+), CD20(-)	Hyper-CVAD + Velcade	Discharged for hospice	6

**Conclusion:** While knowing the prototypical presentation of PBL can help direct clinical suspicion, discussing atypical presentations allows us to create a more comprehensive differential diagnosis for GI tumors.

**Treatment of Disseminated Melanoma with Metastasis to the Oropharynx**

Matthew Mifsud MD (USF COM), Demetri Arnaoutakis BA (University of Florida COM), Tapan Padhya MD (USF COM) University of South Florida, Morsani College of Medicine, Department of Otolaryngology-Head and Neck Surgery

**Keywords:** Melanoma, Oropharynx, palliative surgery

**Objective:** Metastatic melanoma involving the upper aerodigestive tract is a rare clinically entity, comprising only about 0.6% of all melanoma metastasis. Interestingly, these mucosal metastases have almost universally been described in the setting of disseminated melanoma, making them a harbinger of late stage disease. Despite an array of different approaches, systemic therapy in this setting, has generally proven disappointing with only modest disease response and improvement in long term survival. These metastases thus provide a unique clinical challenge, which allows consideration of the utility of palliative surgical technique.

**Methods:** This research involved a single case chart review from the Moffitt Cancer Center. All data was collected from patient chart with data de-identified.

**Results:** We present a case of a 72 year old male, with a known history of widely disseminated metastatic melanoma, who developed a new 1.5cm focus of melanoma within the vallecula, identified on PET-CT imaging. At the time in which this lesion was identified, he had already undergone multiple cycles of both conventional chemotherapy and temozolomide for systemic management of his disease, in addition to stereotactic radiation for metastatic foci within the CNS. Despite the above lesion, he remained asymptomatic normal speech and swallow function. To prevent sequelae of progressive oropharyngeal disease, a transoral laser approach was utilized for complete resection.

**Conclusion:** Transoral metastectomy, is a technique which can be applied in an outpatient surgical setting with minimal operative morbidity. It can thus be an effective tool for the palliative management of upper aerodigestive tract lesion, even in the setting of widely disseminated malignancy.

**Abstract #: 73**

**Presented by: Dat Nguyen, BS, Med II Student**

***Understanding Human Rhinovirus Severity in Immunocompromised Bone Marrow Transplant Patients***

Dat Nguyen, Medical Student II, USF Morsani College of Medicine, John N. Greene, M.D. Moffitt Cancer Center & USF Morsani College of Medicine, University of South Florida, Morsani College of Medicine, Internal Medicine

**Keywords:** Chart Review Rhinovirus BMT Heme Malignancy

**Objective:** New Rhinovirus research in immunocompromised patients has elevated rhinovirus's role as a significant contributor to respiratory complications in bone marrow transplant (BMT) patients. Although rhinovirus has been implicated in the mortality of BMT patients, the pathology of rhinovirus in these patients has been difficult to characterize due to limited conventional viral diagnostics. Recent developments in PCR techniques have enabled better detection of rhinovirus. The new data about rhinovirus will help elucidate its impact on BMT patients.

**Methods:** The study is a retrospective chart review of 87 BMT patients with hematological malignancy from Moffitt Cancer Center. The patients were identified based on heme malignancy and positive symptomatic rhinovirus infection from a nasopharyngeal swab. The chart review examined the impact of rhinovirus on the patients in various categories: viral infection duration, chest x-ray, lung damage, severity, mortality, co-infections, and lymphocyte counts.

**Results:** BMT patients with a rhinovirus infection had a mortality rate of 2.29% (2/87). The 2 patients that died were co-infected with other pathogens. 97.1% (85/87) of the patients had mild respiratory infection that cleared within 31 days of onset. 62.13% (64/103) of positive rhinovirus test on BMT patients showed a low lymphocyte count versus only 27.18% (28/103) that had a low neutrophil count.

**Conclusion:** In immunocompromised BMT patients, rhinovirus presented as a very mild infection with a very low mortality rate. BMT patients with rhinovirus infection were more likely to have lymphopenia than neutropenia. Fatal outcomes with Rhinovirus is rare; if severe illness develops, co-pathogens are usually found.

**Research supported by:** Research Scholarly Concentrations Program

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**Abstract #: 74**

**Presented by: Johnny Nguyen, MD, Resident**

***Colonic Medullary Carcinoma Mimicking a High Grade Lymphoma***

Johnny Nguyen, MD - USF Morsani College of Medicine, Department of Pathology and Cell Biology Yuan Shan, MD - Moffitt Cancer Center, Department of Anatomic Pathology Ling Zhang, MD - Moffitt Cancer Center, Department of Hematopathology, University of South Florida Morsani College of Medicine, Department of Pathology and Cell Biology

**Keywords:** Medullary carcinoma of the colon, high grade lymphoma, diagnostic pitfall

**Objective:** Medullary carcinoma (MC) of the colon and rectum is a rare entity (5-8/10,000 colon cancers diagnosed) that poses a diagnostic challenge for the practicing pathologist. Its unique histological appearance, heavy lymphoid infiltrate and unusual immunoprofile make it problematic when differentiating it from a high grade lymphoma or other undifferentiated neoplasms. In order to better understand this disease, we review the clinical and pathological findings from a case at the Moffitt Cancer Center.

**Methods:** We reviewed the patient's chart, radiological studies, and pathology from a patient at the Moffitt Cancer Center.

**Results:** 81 y/o female presented with a colon mass (7.0cm) detected by CT. A partial transverse resection, ileum resection and appendectomy were performed. Microscopic examination showed sheets of large, markedly-pleomorphic, mitotically-active cells with abundant eosinophilic cytoplasm and multiple prominent nucleoli, growing with a pushing border and poor gland formation in a heavy background of intratumoral lymphocytes by immunohistochemistry (IHC). The neoplastic cells were only focally positive for keratins; strongly positive for vimentin, CD10, Ki-67 (80-90%), microsatellite-instability markers (ie MSH2, MSH6), but negative for melanoma, lymphoma, neuroendocrine, and CDX-2, EBV, and RCC. Morphologic and phenotypic findings are compatible with colonic MC.

**Conclusion:** This case highlights the difficulty in distinguishing a high grade lymphoma and poorly differentiated carcinomas from MC, and, also explores the unusual expression of CD10 with significant loss of pankeratin, which could result in a diagnostic pitfall.

**Research supported by:** Moffitt Cancer Center

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**Abstract #: 75**

**Presented by: Hoka Nyanda, MD, Resident**

***Linear IgA Bullous Dermatitis***

Hoka Nyanda, M.D. PGY3, Phillip Shenefelt, MS, M.D. Morsani College of Medicine, Department of Dermatology & Cutaneous Surgery, University of South Florida

**Keywords:** Linear IgA bullous dermatosis, Bullous Disease, Childhood

**Objective:** To present a case of linear IgA bullous dermatosis. The diagnosis can commonly be missed and lead to inappropriate treatment. Therefore, reviewing the physical findings, causes, diagnosis and treatment should better equip clinicians to make the correct diagnosis.

**Methods:** A pubmed base literature search was conducted utilizing key words such as linear IgA bullous dermatosis and childhood. This search resulted in over 1500 articles. These articles were reviewed and key articles selected to included in the case report.

**Results:** The patient was started on Dapsone 25mg/day with close monitoring for hemolysis and methemoglobinemia. The patient after approximately 4 weeks of therapy began to exhibit clinical improvement and by 2 months of therapy has had almost complete remission.

**Conclusion:** Linear IgA is a blistering disorder of autoimmune origin. It can be misdiagnosed therefore it is imperative for clinicians to identify common physical exam findings and obtain a biopsy for correct diagnosis. The first line treatment for this disease is with dapsone. However, this disease is self-limiting and most patients should develop remission of symptoms in 3-6 years.

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**Abstract #: 76**

**Presented by: Panagiotis Pantazopoulos, MD, Resident**

***Molecular Studies In Early Detection Of Minimal Residual Disease (MRD) Of B Lymphoblastic Leukemia S/P Transplant Correlated With Risk Of Relapse***

Panagiotis Pantazopoulos<sup>1</sup>, Ling Zhang<sup>2</sup>, Kaaron Benson<sup>2</sup>, Dahui Qin<sup>2</sup>, Lynn Moscinski<sup>2</sup> and Pedro Horna<sup>2</sup>

<sup>1</sup>Morsani College of Medicine, Department of Pathology and Cell Biology, University of South Florida, Tampa, FL

<sup>2</sup>Department of Hematopathology and Laboratory Medicine, H. Lee Moffitt Cancer Center, Tampa, FL

**Keywords:** B Lymphoblastic Leukemia Stem Cell Transplantation BCR-ABL t(9:22) translocation

**Objective:** This study evaluates the molecular diagnosis in B Lymphoblastic Leukemia (BLL) in allogeneic hematopoietic stem cell transplant (allo-HSCT) bone marrow and their significance for MRD and risk of relapse.

**Methods:** Included in the study were 61 bone marrow biopsies from 30 patients diagnosed with BLL, post allo-HSCT and were followed up for a median time of 29 months. The laboratory evaluation included morphological assessment, flow cytometry, B cell gene rearrangement, chromosomal and engraftment analyses, FISH and RT-PCR for BCR-ABL1, where applicable.

**Results:** Results show 14/30 patients (47%) had BCR-ABL1+ disease at diagnosis; 6 of them (43%) relapsed at 3-36 months post-transplant by molecular testing. The most sensitive and largest diagnostic lead time interval was provided by qualitative p210/p190 RT-PCR (4/14), and quantitative RT-PCR (1/14) with a diagnostic lead time of 9.6 and 8.3 months. 5/6 patients diagnosed with molecular MRD progressed to morphological relapse. FISH (BCR-ABL1+) and B-cell gene rearrangement studies (IgH and IgL) were negative in all 14 patients, before morphological relapse. In patients with BCR-ABL1-neg BLL, gene rearrangement studies showed a clonal population in 4/7 studies from 3 patients, 2 of which later progressed to morphological relapse 0.9 and 1.8 months after the positive gene rearrangement results. Engraftment analysis of CD3+/CD33+ sorted donor cells showed no significant loss of donor cells before morphological relapse.

**Conclusion:** Qualitative RT PCR for BCR-ABL transcripts is the most reliable indicator of imminent relapse in patients with t(9;22) BLL. Indications of imminent relapse may be provided by B-cell gene rearrangement and FISH studies, but must be correlated with flow cytometry for adequacy.

**Research supported by:** MCC

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**Abstract #: 77**

**Presented by: Midhir Patel, MD, Resident**

***Primary Carcinosarcoma of the Liver: Radiologic and Pathologic Correlation***

Midhir J. Patel, M.D. - USF Health Department of Radiology, Tampa, FL Joseph R. Grajo, M.D. - USF Health Department of Radiology, Tampa, FL, University of South Florida, Morsani College of Medicine, Department of Radiology

**Keywords:** Carcinosarcoma Liver malignancy Case Report

**Objective:** - Review the radiologic features of carcinosarcoma, a rare primary malignancy of the liver - Demonstrate heterogenous histopathologic components of this malignancy

**Methods:** We will present a case of a patient from our institution that presented with known diagnosis of hepatocellular carcinoma and was later found to have carcinosarcoma of the liver. We will discuss specific imaging study findings and histopathologic features of carcinosarcoma. Gross and histopathologic images will be shown alongside their radiologic correlates.

**Results:** Primary hepatic carcinosarcoma shows early arterial enhancement with rapid washout on three-phase CT scan. In addition, areas of calcification may be identified in the setting of osteoid formation. This patient underwent liver transplant and the pathologic evaluation of the explanted liver showed poorly differentiated carcinosarcoma.

**Conclusion:** Primary carcinosarcoma of the liver is a rare aggressive malignancy with poor clinical prognosis. Approximately 20 cases have been reported in the literature. Primary hepatic carcinosarcoma consists of combination of epithelioid hepatocellular carcinoma with concomitant areas of osteoid formation and cartilaginous differentiation. Pathogenesis is not entirely known, but it may result from sarcomatous dedifferentiation of a pre-existing hepatocellular carcinoma. The imaging features of primary hepatic carcinosarcoma mirror the normal findings in hepatocellular carcinoma, including early arterial enhancement with rapid washout on three-phase CT scan. In addition, areas of calcification may be identified in the setting of osteoid formation. This case highlights correlating radiologic and histologic features of a rare liver malignancy.

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**Abstract #: 78**

**Presented by: Sandip Patel, MD, Resident**

***Multi-Radicular Syndrome Secondary to Air Introduced into the Cervical Epidural Space – A Case Presentation***

Sandip Patel MD Department of Neurology, Pain Program University of South Florida, Morsani College of Medicine, University of South Florida, Morsani College of Medicine

**Keywords:** Case Presentation Pain Epidural Injection Multi-radicular Syndrome

**Objective:** The epidural space is a tissue plane between the dura mater and periosteum and ligaments within the vertebral canal. We present a case of acute radicular pain caused by initial injection of air on accessing the cervical region.

**Methods:** 46y/o female patient presented with chronic neck pain radiating to her left hand. MRI C-spine confirmed a disk bulge at C5-C6, canal measuring approximately 7mm. She was subsequently scheduled for a C5-C6 epidural steroid injection to be done left of the midline under conscious sedation. Interspace was accessed using a gradual loss of resistance technique (LOR), and contrast injection revealed subdural needle placement accompanied by a left upper extremity paresthesia. On needle reposition, paresthesia was transient and disappeared. C6-C7 was then accessed with LOR without CSF, blood, or paresthesia. Space was then injected with 6mL solution of 0.3% lidocaine with 80mg of methylprednisolone acetate. Post procedure, patient continued to have left upper extremity pain and paresthesia. MRI C spine revealed epidural air along the left lateral recess and extending into the ipsilateral foramen causing foraminal stenosis.

**Results:** Rare occurrences of air trapping in the cervico-thoracic epidural space had been reported. With the cervical epidural space measuring only 3-4mm in the lower regions with the neck flexed, it is susceptible to causing radicular symptoms with even the smallest amount of air /saline or any type of space occupying lesion.

**Conclusion:** Any type of space occupying lesion in the epidural space can potentially cause radicular compression. This should be taken into consideration when performing the procedure and limiting volume of air injectate (no more than 1-2mL) in the LOR technique is recommended.

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***An Advantage to Submuscular Breast Augmentation: Implant-Sparing Mastectomy in Breast Cancer Patients with Previous Augmentation***

Michael Perrone MPH, Jessica Suber MD, Christine Laronga MD, Deniz Dayicioglu MD, Paul Smith MD University of South Florida, Morsani College of Medicine, Surgery

**Keywords:** Breast Augmentation Implant-Sparing Mastectomy Breast Cancer Chart Review

**Objective:** One emerging option for augmentation in breast cancer patients with previous augmentation is an implant-sparing mastectomy with delayed implant exchange. Foregoing the use of tissue expanders or immediate implant reconstruction, this technique utilizes the original implants to retain the breast pocket, which are later exchanged for larger, permanent implants.

**Methods:** Retrospective review of 22 patients who underwent implant-sparing mastectomies with delayed implant exchange at a single institution, by two surgeons, between 2006 and 2012. No patient had indications for implant removal at time of mastectomy.

**Results:** Average age at time of implant exchange was 37.5 years with an average of 7.6 years elapsing between initial augmentation and mastectomy. Average time between mastectomy and implant exchange was 6.8 months. Average size of implant at initial augmentation was 378.5cc. Size of the permanent implant was determined by adding the size of the original implant to the amount of breast tissue resected during the mastectomy. Two patients had cancer recurrence; both patients required implant removal. Four patients underwent an additional exchange: two for larger implants, one for smaller, and one exchanging silicone implants for saline. No other complications were reported.

**Conclusion:** Implant-sparing mastectomy with delayed exchange is a viable alternative to immediate implant reconstruction and/or tissue expander placement. The advantages of this alternative technique include less strenuous recovery, fewer office visits, no requirement for multiple expansions, and most importantly, sparing the patient the stigma associated with mastectomy defect.

***Prognostic Significance of VLA4 and CD44 Expression by Flow Cytometry in Multiple Myeloma.***

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**Keywords:** Multiple Myeloma, Prognostic Factors (Chart Review)

**Objective:** The purpose of this study is to evaluate the prognostic significance of VLA4 and CD44 expression in multiple myeloma (MM) patients.

**Methods:** We retrospectively reviewed 101 records of patients with MM who had a flow cytometry panel that included assessment for VLA4 and CD44 at Moffitt Cancer Center between 1/1/2004 and 12/31/2009. We collected demographic information, disease related characteristics (stage, cytogenetics, and baseline lab testing) and treatment and outcome related data (prior therapies, response to first line therapy, follow up and vital status). For the purpose of this study, a partial remission or better qualified as a response to therapy.

**Results:** Of the 101 patients, 45 expressed both VLA4 and CD44 markers, 28 expressed VLA4 but not CD44, 4 expressed CD44 and not VLA4, and 24 expressed neither. 76 patients responded to first line therapy, of which 66% expressed VLA4, while 25 patients did not respond to first line therapy, of which 92% expressed VLA4, suggesting VLA4 expression is a negative prognostic factor for response to therapy. Alternatively CD44 did not correlate with response to first line therapy. Median overall survival for patients who expressed VLA4 was 60.5 months versus 106.8 months for patients who did not express VLA4. For CD44 expressing patients, the median overall survival was 65.8 months versus 98.1 months for patients without CD44 expression.

**Conclusion:** Expression of VLA4 is associated with a decreased response to therapy and survival in MM patients, validating this marker as a therapeutic target in myeloma. Although total CD44 expression did not correlate with prognosis in this study, expression of specific CD44 splice variants could be prognostic and this does not dismiss CD44 as a target for novel therapy.

**RESEARCH SUPPORTED BY:** Scholarly Concentrations Program at USF Health, Morsani College of Medicine.

***The Concomitant Diagnosis of Acute Myelogenous Leukemia and Multiple Myeloma in a Patient Presenting with Hematuria***

Gopi K. Prithviraj (USF Health Hematology and Oncology), Matthew Whitehurst (USF Health Hematology and Oncology), University of South Florida, Morsani College of Medicine, Department of Internal Medicine

**Keywords:** AML, multiple myeloma, case study

**Objective:** 1. Review a rare case of the simultaneous diagnosis of acute myeloid leukemia and multiple myeloma. 2. Discuss possible pathophysiologic rationales and therapeutic options for this entity.

**Methods:** CB is a 70 year old male who presented with hematuria for one week. He was found to have anemia and thrombocytopenia with normal white blood cell count and was admitted for evaluation. Subsequent laboratories revealed an elevated INR, PT, and aPTT as well as a new leukocytosis of 23.7x10<sup>9</sup>/L and total protein 9.4 g/dL. Over the next four days, his white blood cell count progressively increased to 137 x10<sup>9</sup>/L and he developed numerous myeloid lineage blasts on peripheral smear.

**Results:** CB's bone marrow biopsy revealed acute myelomonocytic leukemia (AML), M4 subtype with 57% blasts and he was started on therapy with 7+3, cytarabine and daunorubicin. Due to his elevated total protein on admission, further evaluation was done and he was found to have an IgA lambda monoclonal gammopathy. Correlation with CB's bone marrow biopsy revealed the presence of 27% plasma cells. Thus, the patient was found to have a second diagnosis of plasma cell IgA lambda myeloma as well as AML, M4.

**Conclusion:** A thorough search of the current literature yielded only rare cases of simultaneous AML and multiple myeloma (MM) without prior chemotherapy. A coincidental appearance of dual malignancies is unlikely. Chronic antigenic stimulation may play a role in the development of plasmacytic dyscrasia followed by leukemia. Had the multiple myeloma been discovered prior to initiation of induction chemotherapy, the addition of bortezomib would have been considered. Also, allogeneic stem cell transplantation has been used successfully in the treatment of simultaneous AML and MM.

***Primary Stenting of Symptomatic Transplant Renal Artery and Ipsilateral Iliac Artery Stenosis.***

Kamal Massis, M.D.<sup>1</sup>, Andres Ramos, MSII<sup>2</sup>, Christopher Francis, M.D.<sup>1</sup>, Clifford Davis, M.D.<sup>1</sup>, Shawn Meader, M.D.<sup>1</sup>, Tambi Jarmi, M.D.<sup>1</sup>, Heidi Pearson, M.D.<sup>1</sup>, Tampa General Hospital<sup>2</sup> University of South Florida, Morsani College of Medicine, Radiology

**Keywords:** Transplant, Renal, Primary Stenting, Stenosis,

**Objective:** Assess the outcomes of stent placement as the primary treatment for stenosis in the transplant renal artery and Ipsilateral Iliac artery.

**Methods:** A retrospective review of primary stenting of renal transplant artery and ipsilateral iliac from November 2005 to February 2012 was performed. The technical results of the stenting and clinical outcomes were assessed at regular intervals up to one year post-procedure. Clinical outcomes were measured via the following values: serum creatinine, systolic blood pressure measurements, and number of antihypertensive medications. Surgical data was also reviewed to assess results based on transplant type, surgical procedure and possible complications.

**Results:** A total of 18 transplant renal arteries and 8 ipsilateral iliac arteries were stented. A technical success of 96% was achieved. A total of 15 males (60%) and 10 females (40%) were treated with one male treated for renal and iliac artery stenoses at separate occasions. The procedure-related morbidity was 4% with short term loss of only a single graft kidney. Clinical success was achieved in the majority of treated patients with significant improvement in creatinine, systolic blood pressure, and number of antihypertensives

**Conclusion:** Primary stenting of transplant renal arteries and ipsilateral iliac arteries results in good clinical outcomes with improvement in renal function and blood pressure.

**Research supported by:** This research was supported by the Scholarly Concentrations Program at USF Health, Morsani College of Medicine and The American Heart Association Medical Student Summer Research Award.

**Abstract #: 83**

**Presented by: Christopher Sosa, MS, Med IV Student**

***The First Case of Urinary Tract Infection and Pancreatitis Associated with Raoultella planticola in a Pediatric Patient***

Christopher Sosa, Carolyn Shammass, Lisa Rodriguez, MD, University of South Florida Morsani College of Medicine  
University of South Florida, Morsani College of Medicine, Pediatrics

**Keywords:** Case Study, Pediatrics, Infectious Disease

**Objective:** We report the first documented case of clinical infection by Raoultella planticola in a pediatric patient. We attempt to educate regarding Raoultella planticola's potential role as a colonizer and an opportunistic infection, especially in patients who are immunocompromised or have had recent instrumentation.

**Methods:** A Pubmed literature review of adult cases of infection with Raoultella planticola was performed. Our case was contrasted with other reported cases to identify the pathophysiology of our patient.

**Results:** Our patient was found to have a UTI culture positive for Raoultella planticola. By ruling out alternative diagnoses, the pancreatitis appears to be associated with Raoultella planticola.

**Conclusion:** Raoultella planticola appears to be a more common cause of disease than once believed. This should be considered in patients who are immunocompromised or who have had instrumentation or surgery. Antibiotic management depends on the accurate diagnosis of Raoultella planticola.

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**Abstract #: 84**

**Presented by: Maryam Tahmasbi, MD, Resident**

***Synchronous Neuroendocrine Tumor of Small Bowel and Diffuse Large B-Cell Lymphoma Arising from Follicular Lymphoma: A Rare Case Report***

Maryam Tahmasbi, MD; Loveleen Kang, MD; Leah B. Strickland-Marmol, MD, Department of Pathology and Cell Biology, University of South Florida, Department of Pathology and Laboratory Medicine, James A. Haley Veterans' Hospital, University of South Florida, Morsani College of Medicine

**Keywords:** Case report. Synchronous, Neuroendocrine Tumor, Diffuse Large B-Cell Lymphoma, Small Bowel

**Objective:** Carcinoid tumors of the gastrointestinal tract are on occasion associated with other tumors at various sites of which adenocarcinoma of the GI tract is the most common. However, only rare cases with concurrent lymphoma have been reported.

**Methods:** We report a case of a 62-year-old man who presented with abdominal discomfort and computed tomography demonstrated a large right lower quadrant infiltrative mesenteric mass and concurrent small mesenteric nodule in the same area. Octreotide scan showed increased uptake in the corresponding regions suggestive of somatostatin receptor-bearing neuroendocrine tumor. The patient underwent small bowel and right colon resection.

**Results:** Gross examination revealed two white-tan, solid masses (12.0 and 8.0 cm) in the small bowel mesentery, infiltrating the full thickness of the bowel wall and mucosa, and extending into the mesocolon. In the mesocolon adjacent to the larger mass and in the submucosa of distal ileum there were also two small (1.0 and 0.8 cm) well circumscribed, tan-gray nodules. Microscopic and immunohistochemical evaluations of the two small nodules showed typical morphology and immunohistochemistry of neuroendocrine tumors (chromogranin+, synaptophysin+, CD56+ and pankeratin+). However, the two larger masses were diffuse large B-cell lymphoma of follicular derivation. Diagnosis of the lymphoma was rendered based on the morphology and immunophenotype. Diffuse areas of the transformed phenotype consisted entirely of large cells, which expressed BCL-2, CD20, CD10 and BCL-6, and were negative for CD15 and CD30.

**Conclusion:** This is the first known case of synchronous NET and DLBCL of the small bowel, in which the overall clinical presentations and pre-operative octreotide scan were misleading.

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**Abstract #: 85**

**Presented by: Elyse Arnold, BA, Staff**

***Convergent and Discriminant Validity and Reliability of the Pediatric Anxiety Rating Scale in ASD***

Elyse B. Arnold\*, B.A., Jeffrey J. Wood, Ph.D.^, Jill Ehrenreich May, Ph.D.` , Anna M. Jones, B.S.\* , Jennifer M. Park, M.A.\* , Adam B. Lewin, Ph.D.\* , Tanya K. Murphy, M.D.\* , Eric A. Storch, Ph.D.\* \*Department of Pediatrics, University of South Florida, Morsani College of Medicine, St. Petersburg, FL ^Department of Educational Psychology, University of California, Los Angeles, CA, USA `Department of Psychology, University of Miami, Coral Gables, FL

**Keywords:** ASD, anxiety, psychometrics, Pediatric Anxiety Rating Scale

**Objective:** The current study examined the psychometric properties of the Pediatric Anxiety Rating Scale (PARS) in a well-characterized sample of youth with ASD. The research aims evaluated: 1) commonly endorsed symptoms 2) internal consistency 3) inter-rater reliability 4) test-retest reliability and 5) construct validity.

**Methods:** All youth (ages 7-17) were treatment seeking and met criteria for an Autism Spectrum diagnosis (ASD) while participating in the screening phase of two randomized-control treatment trials for youth with ASD and anxiety. All youth participated in the PARS administration at the screening and baseline assessments.

**Results:** The results revealed good psychometric properties including internal consistency ( $\alpha=.59$ ), test-retest reliability ( $ICC=.83$ ), inter-rater reliability ( $ICC=.86$ ) and convergent validity. However, the analyses for divergent validity produced mixed findings.

**Conclusion:** Overall, these findings support the utility of the Pediatric Anxiety Rating scale in youth with ASD.

**Research supported by:** This research was supported by: National Institute of Mental Health, All Children's Research Foundation, & USF Internal Awarded

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**Abstract #: 86**

**Presented by: Ty Bowman, BS, Graduate Student**

***Precise Measures of Visceral Fat Emphasize the Role of Visceral Fat in the Biology of Pancreatic Cancer***

Ty Bowman BS, USF Morsani College of Medicine, Whalen Clark MD, Sharona B Ross MD, Julia Francoeur BS, Kenneth Luberic BS, Charles Tkatch BS, Alexander S. Rosemurgy MD, Florida Hospital Tampa

**Keywords:** visceral fat, subcutaneous fat, sarcopenia, pancreatic cancer, Precise measures,

**Objective:** Survival with pancreatic adenocarcinoma is believed to be impaired by visceral obesity, and muscle wasting (i.e., sarcopenia); however, these studies involve crude measures of obesity (e.g. BMI). This study was undertaken to precisely measure and reexamine the impact of obesity and sarcopenia on pancreatic cancer.

**Methods:** CT scans of 100 patients undergoing pancreaticoduodenectomy for pancreatic adenocarcinoma were reviewed using specialized software to precisely determine the cross sectional area (CSA) of subcutaneous fat, visceral fat, and psoas muscles at L5. As well, the distances between the left kidney and psoas muscle at the level of the renal vein. CSA of the L5 vertebral body was used to standardize for body size. Median data are presented.

**Results:** Patients were 66 years old with BMI of 24 kg/m<sup>2</sup>. Cancers were T3 for 73%, N1 for 68%, and AJCC stage IIA for 18% and IIB for 60%. BMI, CSA of visceral or subcutaneous fat or psoas muscles, and measured distances of visceral or subcutaneous fat (e.g., distance between the kidney and the psoas muscle) were not significantly related to any measures of cancer progression (e.g., tumor size or T, N, or AJCC stage). Standardization to body size, utilizing the CSA of L5, did not improve any relationships.

**Conclusion:** Precise measures of visceral fat, subcutaneous fat, and muscle mass (e.g., sarcopenia), even when standardized to body size, do not predict cancer progression (i.e., T, N, or AJCC stage). With more precise analysis, fat mass, most notably visceral fat mass, and muscle mass do not predict measures of pancreatic cancer progression. Precise measures of visceral fat, subcutaneous fat and muscle mass question the role of each in the biology and progression of pancreatic adenocarcinoma.

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Abstract #: 87

Presented by: Jack Burns, MS, Med III Student

***The Impact of Deliberate Practice on Operative Times of Transverse Rectus Abdominis Myocutaneous (TRAM) Flaps***

Jack Burns <sup>(1)</sup>, Jeffrey Cone <sup>(2)</sup>, Jessica Ching <sup>(2)</sup>, and Paul Smith <sup>(2)</sup> <sup>(1)</sup>Morsani College of Medicine, University of South Florida, FL 33612 <sup>(2)</sup> Division of Plastic Surgery, University of South Florida, FL 33612 University of South Florida, Morsani College of Medicine

**Keywords:** Deliberate practice, breast reconstruction, Transverse Rectus Abdominis Myocutaneous (TRAM) flap, plastic surgery

**Objective:** Deliberate practice is defined as a highly structured activity in which the explicit goal of the activity is to improve performance. The purpose of this study was to assess the impact of K. Anders Ericsson's theory of deliberate practice on the operative times and procedure times of breast reconstruction via transverse rectus abdominis myocutaneous (TRAM) flaps.

**Methods:** A retrospective review of TRAM flap breast reconstruction was performed of resident-associated cases at the Moffitt Cancer Center from 2009-2011. Residents were trained according to the deliberate practice didactic model over their four-month rotations and trained along a continuum of increasing resident independence. Operative times were categorized into the 1st, 2nd, 3rd, and 4th months of the rotation.

**Results:** There were 75 cases (n=75) that met inclusion criteria. Mean duration of procedures for the 1st, 2nd, 3rd, and 4th months were 6.16 hours, 5.21 hours, 5.20 hours, and 5.24 hours, respectively. While the decline in procedure time during the rotation was not statistically significant (p=0.2440), the correlation coefficient for operative times for these cases over the four months was significant at -0.25 (r=-0.25, p=0.048).

**Conclusion:** This study marks the first application of the theory of deliberate practice to a complex skill set in the surgical literature. The data shows a decrease in operative times over each month interval of the residents' rotations. Further evaluation is warranted to determine whether this didactic model can be formalized and potentially accelerate the acquisition of the complex skill set required for breast reconstruction via TRAM flaps.

Abstract #: 88

Presented by: Marisa Couluris, DO, Faculty

***A Pilot Project Using Losartan to Treat Idiopathic Pulmonary Fibrosis***

Marisa Couluris(a), D.O., Brent W. Kinder(b), M.D., M.S., Ping XU(c), MPH, Margaret Cross King, B.N., M.S. (c), Jeffrey Krischer(c), PhD., Ralph J. Panos(b), M.D., Division of Pulmonology(a), Department of Pediatrics, University of South Florida College of medicine, Tampa, Florida, Division of Pulmonary and Critical Care(b), Department of Medicine, University of Cincinnati, and Division of Epidemiology(c), Department of Pediatrics, University of South Florida College of Medicine, Tampa, Florida, University of South Florida, N/A

**Keywords:** Idiopathic Pulmonary Fibrosis, losartan, lung function

**Objective:** We conducted a 12 months pilot project to provide preliminary data to evaluate the efficacy and feasibility of using losartan to stabilize lung function in patients with idiopathic Pulmonary Fibrosis.

**Methods:** We treated patients with non-smoking history and no other lung disease with losartan 50mg daily for 12 months. Lung function, including forced vital capacity, and 6-minute walk test distance were also stable or improved in 58%, 71% and 65% of patients, respectively.

**Results:** All participants enrolled were evaluable for response. There were no patients who discontinued the study due to side effects related to losartan. Blood Pressure was monitored closely on blood pressure logs since losartan is an antihypertensive medication. There were no patients with documented symptomatic or asymptomatic hypotension.

**Conclusion:** Losartan is a promising agent now with preliminary data to support further evaluation in a larger placebo-controlled Phase II study as a treatment for IPF. Although this is an uncontrolled pilot study, it is the first study to our knowledge that documents the use of losartan in patients living with IPF. This study provides support for the safety of this oral agent that is taken once daily. With over 50% of patients with stable or improved lung function after 12 months of losartan, it warrants further investigation in this patient population.

**Research supported by:** NCI

Abstract #: 89

Presented by: Erika Crawford, BA, Staff

***A Pilot Study of Computer-Assisted Cognitive-Behavioral Therapy for Childhood Anxiety in Community Mental Health Centers***

Alison Salloum, Ph.D., Adam B. Lewin, Ph.D., Ross Andel, Ph.D., Tanya K. Murphy, M.D., and Eric A. Storch, Ph.D., University of South Florida, Morsani College of Medicine, Department of Pediatrics

**Keywords:** anxiety, cognitive-behavioral therapy, children, dissemination, treatment outcome

**Objective:** Anxiety disorders among children are common, disabling, and run a chronic course without treatment. Cognitive behavioral therapy (CBT) has shown robust efficacy for childhood anxiety. However, dissemination of CBT into community mental health centers (CMHC) is limited. Computer-assisted CBT (CCBT) programs have been developed to improve dissemination by providing a structured treatment format that allows therapists to reliably deliver evidence-based treatments with fidelity. In this pilot study involving therapists with limited experience in CBT, the effectiveness, feasibility, and acceptability of a CCBT program.

**Methods:** Camp Cope-a-Lot, a CCBT program, was examined in three CMHC. Seventeen youth, ages 7-13 years, diagnosed with a primary anxiety disorder were enrolled. Assessments were conducted by a rater not involved in treatment at Baseline and Post-treatment. Study measures included those of anxiety severity, functional impairment, satisfaction with services, and barriers to participation in treatment.

**Results:** Significant reductions in anxiety severity and impairment were demonstrated at Post-treatment assessment. Non-responders to treatment were more likely to report encountering barriers in coming to treatment. Overall, high levels of family satisfaction with services were reported.

**Conclusion:** These results provide preliminary support for the successful implementation of an evidence-based computer-assisted treatment into CMHC. As seen through the reduction of anxiety severity and impairment, the CMHC therapists were able to effectively implement the treatment protocol. These findings require replication in a randomized control trial.

**Research supported by:** a grant to Dr. Storch from AHRQ.

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Abstract #: 90

Presented by: Camille Hanks, BA, Staff

***Comparison of Self-Concept and Tic Severity in Youth with Tic Disorders as Assessed by the Piers-Harris Children's Self-Concept Scale***

Camille Hanks B.A., Leah Jung B.A., Adam B. Lewin Ph.D., Eric Storch Ph.D., Joseph F. McGuire M.A., Tanya K. Murphy M.D. University of South Florida, Morsani College of Medicine, Department of Pediatrics and Psychiatry and Behavioral Neurosciences University of South Florida, Tampa, FL

**Keywords:** Tourette Syndrome; Tic Disorders; Self-Concept; Assessment

**Objective:** Many youth with tic disorders, particularly Tourette's Syndrome (TS), experience a wide range of behavioral and psychological difficulties. In many cases, these youth with tics become overly attuned to the concept of personal illness and focus many self attributes to the illness state, affecting their self-concept. Through data obtained from a CDC sponsored study evaluating the quality of life in youth with tic disorders, we aim to assess the self-concept in comparison to tic symptoms and severity through the use of the Piers-Harris Children's Self-Concept Scale (PHSCS).

**Methods:** 113 youth with a tic disorder (78% male, ages 6-17 years) were administered the Yale Global Tic Severity Scale (YGTSS), the PHSCS, and several self-report forms assessing the prevalence of behavioral and psychological difficulties, comorbid conditions, and quality of life.

**Results:** The PHSCS total scores of youth with tics were largely consistent with the normative population (Mean = 48.61, SD = 10.2). However, twenty percent of youth's PHSCS scores suggested an overall low self-concept (T-Score  $\leq 39$ ). Youth in the low PHSCS score range reported greater tic severity ( $r = -.274$ ,  $p = .01$ ) and greater tic-related impairment ( $r = -.313$ ,  $p = .01$ ) on the YGTSS.

**Conclusion:** Although most youth with tic disorders demonstrated a self-evaluation within the normal range, youth with higher ratings of tic severity and tic-related impairment tend to have a more negative self-evaluation than those with mild tic severity. These findings suggest that pharmacological and behavioral treatments should not only target the frequency and severity of tic symptoms, but also focus on improvements of self-esteem and quality of life in youth with tics.

**Research supported by:** Centers for Disease Control and Prevention

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**Abstract #: 91**

**Presented by: Nicole Howard, BS, Staff**

***MINT I: Multi-Institutional Neo-adjuvant Therapy, MammaPrint Project 1***

Nicole Howard (University of South Florida), Charles E. Cox (University of South Florida), Peter Blumencranz (Morton Plant Hospital), Douglas Reintgen (Florida Hospital North Pinellas), Ruben Saez (Plano Cancer Institute), Jessica Gibson (Agendia Inc), Lisette Stork-Sloots (Agendia Inc), Femke de Snoo (Agendia Inc), Stefan Glück (Miller School of Medicine), University of South Florida, Morsani College of Medicine, Department of Surgery

**Keywords:** Neoadjuvant- administration of therapeutic agents before a main treatment, LABC- locally advanced breast cancer, pCR- pathologic complete response, ER- estrogen receptor, PR- progesterone receptor

**Objective:** Objectives for this study are: 1. To determine the predictive power of MammaPrint and Blueprint for sensitivity to neo-adjuvant chemotherapy as measured by pCR. 2. To compare TargetPrint ER, PR and HER2 with local and centralized IHC and/or CISH/FISH assessment. 3. To identify correlations between TheraPrint and response to neo-adjuvant chemotherapy. 4. To identify and/or validate predictive gene expression profiles of clinical response or resistance to neo-adjuvant chemotherapy. 5. To compare Blueprint with IHC-based subtype classification.

**Methods:** Women  $\geq$  18 yrs with histologically-proven invasive breast cancer T2( $\geq$ 3.5cm)-T4,N0M0 or T2-T4N1M0, with measurable disease, adequate bone marrow reserves and normal renal and hepatic function who signed informed consent are enrolled. Axillary lymph nodes will be staged according to protocol. MammaPrint risk profile, Blueprint molecular subtyping profile, TargetPrint ER, PR and HER2 single gene readout, and the 56-gene TheraPrint Research Gene Panel will be analysed on a fresh tumor specimen using the whole genome array. Patients will receive neo-adjuvant chemotherapy treatment according to protocol. Response will be measured by centrally assessed Residual Cancer Burden (RCB).

**Results:** This study is still accruing patients. There has been no data analysis to date.

**Conclusion:** This study is still accruing patients. There has been no data analysis to date.

**Research supported by:** Charles E. Cox, MD is the Principle Investigator for the University of South Florida. Agendia Inc. is the sponsor for this research study.

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**Abstract #: 92**

**Presented by: Mark Howell, MS, Staff**

***Manganese-loaded Lipid-Micellar Nanoparticles (LMNs) for Lung Theranostics***

Mark Howell<sup>a,b\*</sup>, Jaya Mallela<sup>a,b</sup>, Chunyan Wang<sup>a,b</sup>, Sowndharya Ravi<sup>a</sup>, Suraj Dixit<sup>b</sup>, Ujjwala sree Garapati<sup>a</sup> and Subhra Mohapatra<sup>a,b</sup> <sup>a</sup> Molecular Medicine Department, <sup>b</sup> Nanomedicine Research Center, Morsani College of Medicine, University of South Florida, Tampa, FL

**Keywords:** theranostics, micelle, manganese, drug delivery, gene delivery

**Objective:** Gadolinium contrast agents are used for T1 MR imaging, but their high toxicity and serious side effects have led to the search for alternative T1 contrast agents. Since manganese (Mn) has paramagnetic properties, long electronic relaxation times, and labile water exchange, we evaluated Mn as a T1 magnetic resonance imaging (MRI) contrast agent for lung imaging.

**Methods:** . We designed and synthesized multifunctional lipid-micellar nanoparticles containing Mn oxide (M-LMN) for MRI that can also be used for DNA and drug delivery. Oleic acid-coated MnO particles were encapsulated in micelles composed of polyethylene glycol phosphatidyl-ethanolamine (PEG-2000 PE), DC-cholesterol, and dioleoyl-phosphatidyl-ethanolamine (DOPE). We tested these cationic lipid nanoparticles as a T1 contrast agent and DNA/drug delivery vehicle using in vitro and ex vivo MRI, DNA binding and protection assays, cellular uptake, transfection, cytotoxicity studies, and in vivo experiments in mice.

**Results:** Particles are taken up in vitro by human embryonic kidney (HEK293), Lewis lung carcinoma (LLC1), and human alveolar adenocarcinoma (A549) cells and are nontoxic. When administered to mice intranasally, they preferentially accumulate in the lungs. In vitro phantom and ex vivo lung MRI confirmed that M-LMNs enhance T1 MRI contrast. M-LMNs loaded with plasmid DNA and/or doxorubicin efficiently deliver their payload to cells in vitro and to target cells in mouse lungs.

**Conclusion:** M-LMNs are capable of simultaneously providing MRI contrast and DNA and/or drug delivery to target cells in the lung and therefore may prove useful as a lung theranostic, especially for lung cancers.

**Research supported by:** Research supported by grants 1R41CA139785 and 5R01CA152005 from the National Institutes of Health (SM).

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***Microbiology of Rhinosinusitis in the Immunocompromised Cancer Population***

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**Keywords:** Rhinosinusitis, oncology, immunocompromised

**Objective:** The microbiology of acute and chronic sinusitis in the general population is well documented, however, this is not well characterized in vulnerable subgroups. Our aim is to evaluate the paranasal sinus microbiology of immunocompromised patients at a tertiary cancer center.

**Methods:** Following institutional review board approval, records at Moffitt Cancer Center were retrospectively reviewed using ICD-9 codes for in-hospital treatment of sinusitis while undergoing concurrent oncologic therapy. All patients had nasal endoscopy with aerobic middle meatal culture. Demographics, type of malignancy, leukocyte count, glycemic status, and culture results were recorded.

**Results:** Eighty patients were identified from June 2000 to April 2009. Malignancies included leukemia (63%), lymphoma (22%), multiple myeloma (5%), carcinoma (5%), and sarcoma (4%). One patient (1%) had common variable immunodeficiency. A total of 102 sinus cultures were collected. Of those, 59 (58%) were interpreted as no growth (n=20) or usual respiratory flora (n=39). Of the 46 positive cultures, 58 organisms were isolated. There were 16 fungi (28%), 12 coagulase-negative Staphylococcus (20%), nine methicillin-sensitive Staphylococcus aureus (16%), eight methicillin-resistant Staphylococcus aureus (14%), six Pseudomonas species (10%), three Moraxella catarrhalis (5%), and four other gram-negative bacilli (7%) isolated.

**Conclusion:** Pathogens identified in this population differ from published data examining the general population. There is an increased percentage of negative cultures, fungi and coagulase negative staphylococcus. We found fewer streptococcus pneumonia species. We attribute this change in flora to frequent empiric treatment of this population with broad-spectrum antibiotics.

***Relationship Factors in Psychiatric Care***

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**Keywords:** Alliance, adherence, psychiatry, pediatrics

**Objective:** Recent research has found that over 50% of children with psychopathology discontinue prescribed pharmacotherapy before the period recommended for full therapeutic benefit (Richardson et al., 2006). Unfortunately, while many patient- and provider- level approaches to adherence have been evaluated, the patient-provider interaction has received little attention in this domain. However, such patient-provider interaction has been extensively evaluated in the scope of therapeutic alliance in the psychotherapy literature (Shirk & Karver, 2011). The objective of the present investigation was to evaluate the relative roles of alliance among children, parents, and clinicians in pediatric psychiatry.

**Methods:** 102 outpatient youths age 7-17 (along with their parents and treating clinicians) were administered alliance questionnaires immediately following their first appointment with a psychiatrist. Descriptive information regarding strength of alliance was evaluated, and agreement in alliance among reporting parties was evaluated via bivariate correlations. Differences based on psychiatrist diagnosis (e.g., externalizing psychopathology) were evaluated via independent t-tests.

**Results:** Parents and children reported good alliances with the clinician, but alliance with these parties was rated as modest by clinicians. We also found agreement on alliance between parents and youths was strong, but agreement with clinicians was mixed. Variability in alliance was observed among different patient diagnoses.

**Conclusion:** Differences in perception of alliance were observed based on the reporting party and child diagnosis. Findings will be discussed in the context of the substantial effects alliance can have on treatment adherence and outcome.

**Abstract #: 95**

**Presented by: Jennifer Libous, MS, Staff**

***Assessment of Barriers and Facilitators to Worksite Exercise in Firefighters***

Jennifer Libous, MS, Simon Dagenais, DC, PhD, William S. Quillen, PT, DPT, PhD, FACSM, John M. Mayer, DC, PhD, University of South Florida, Morsani College of Medicine, School of Physical Therapy & Rehabilitation Sciences, Center for Neuromusculoskeletal Research

**Keywords:** back injuries, exercise adherence, firefighters

**Objective:** The objective of this study was to assess the barriers and facilitators to worksite exercise adherence among firefighters.

**Methods:** Career firefighters (n = 27) from Tampa Fire Rescue FL, who were previously enrolled in a low back injury prevention clinical trial requiring worksite exercise training, 2X/week for 24 weeks, participated in moderated focus group discussions at the University of South Florida (USF). Each focus group was approximately 2 hours and consisted of 8 open-ended questions related to worksite physical fitness programs and exercise adherence. Responses were analyzed qualitatively using a social ecological framework to identify key intrapersonal, interpersonal, and institutional barriers and facilitators to exercise adherence.

**Results:** The key barriers to adherence to worksite exercise identified by the participants were lack of self-motivation (interpersonal), lack of peer support (interpersonal), and lack of time to exercise at work (institutional). The key facilitators were group cohesiveness, competitiveness, interest in exercise, financial incentives, and perceived health benefits.

**Conclusion:** This study suggests that exercise adherence could be improved through various strategies, such as education and reminders on exercise benefits, individual or group incentives for adherence and performance, monitoring adherence, varying exercises, and enhancing competition. Future exercise and physical fitness programs in research or implementation settings aimed at preventing low back pain and injuries in firefighters should address key barriers and facilitators to worksite exercise adherence in order to improve participation and outcomes.

**Research supported by:** Grant# EMW-2009-FP-00418; FEMA, US DHS; USF; JM Mayer: PI.

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**Abstract #: 96**

**Presented by: Ellen Linden, BS, Staff**

***Obesity Definition in Rhesus Monkeys: Anthropometric Measurements, BMI, and Human BMI Equivalents, and Comparative Risks***

Ellen H. Linden, Jennifer D. Newcomb, and Barbara C. Hansen, University of South Florida, Morsani College of Medicine

**Keywords:** BMI, obesity, anthropometric measurements, adiposity

**Objective:** This study aimed to provide a method to assess adiposity in rhesus (*Macaca mulatta*) that are currently being used as animal models for the study of obesity therapeutics and their potential for effective and safe mitigation of obesity in humans. To enable large scale screening of colonies of macaques for obesity, we have developed a revised BMI calculation proposed to better parallel the human BMI measurement and to better predict risk of diabetes in nonhuman primates.

**Methods:** This rhesus monkey colony consisted of 124 monkeys (age range 11.8 to 39.2 yrs). Body weights ranged 7 to 26.8 kg for males (N=86) and 5 to 13.7kg for females (N=38). We applied dual-energy-X-ray absorptiometry (DXA) and multiple anthropometric measures to determine absolute fat mass and fat mass as a percent of total mass, lean body mass and fat distribution. Because of the sexual dimorphism in nonhuman primates, we applied a multiplier (formula determined separately for males and females) to convert to human BMI units. The resulting approximate BMIs, were: 18 to 25 low risk/healthy; >25 for overweight/moderate risk; >30 for obese/high risk, and of >35 for severe obese/very high risk.

**Results:** We report new measurement standards for an obesity index in monkeys reflecting total (BMI) and abdominal adiposity using DXA as a standard. 100% of monkeys identified as PreDM had BMIs >30. In addition to an improved BMI estimate of obesity risk, we have also detailed approaches to minimize inter-observer variability in anthropometric measurements for old and obese animals.

**Conclusion:** The enhanced validity of these measurements allowed for consistent identification of abdominal obesity and risk of developing overt T2DM under various colony conditions.

**Research supported by:** NIA HHSN2532008002C

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**Abstract #: 97**

**Presented by: Joseph McGuire, MA, Graduate Student**

***Social Deficits in Children with Chronic Tic Disorders: Phenomenology, Clinical Correlates and Quality of Life***

Joseph F. McGuire, M.A.,<sup>1, 2</sup> Camille Hanks, B.A.,<sup>2</sup> Adam B. Lewin, Ph.D.,<sup>2,3</sup> Eric A. Storch, Ph.D.,<sup>1,2,3</sup> and Tanya K. Murphy, M.D., M.S.,<sup>2,3,1</sup> Department of Psychology, University of South Florida<sup>2</sup> Department of Pediatrics, University of South Florida<sup>3</sup> Departments of Psychiatry and Behavioral Neurosciences, University of South Florida, College of Arts and Sciences, Psychology

**Keywords:** Social Deficits, Social Impairment, Tourette Syndrome, Quality of Life

**Objective:** This report examined the presence and characteristics of social deficits in youth with CTD and explored the relationship between social deficits, social problems and quality of life

**Methods:** Ninety-nine youth (8-17 years) and their parents completed a battery of assessments to determine diagnoses, tic severity, severity of co-existing conditions, social responsiveness, and quality of life.

**Results:** Parents reported that youth with CTD had increased social deficits, with 19% meeting criteria for “severe” social deficits. The magnitude of social deficits was more strongly associated with inattention, hyperactivity, and oppositionality than with tic severity. Social deficits predicted internalizing and social problems, and quality of life above and beyond tic severity. Deficits in social abilities also mediated the relationships between tic severity and social problems, as well as tic severity and quality of life.

**Conclusion:** Findings suggest that youth with CTD have social deficits, which are greater in the presence of attention deficit hyperactivity disorder and obsessive compulsive disorder. These social deficits play an influential role in quality of life and global functioning. Future research is needed to develop interventions to address social performance deficits among youth with CTD.

**Research supported by:** This work was supported by funding from the Centers for Disease Control and Prevention, “Impact of Tic Disorders including Tourette Syndrome, in Youth, on Individuals, Families and Communities”.

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**Abstract #: 98**

**Presented by: Stephanie Melton, MPH, Graduate Student**

***We are in this together: Spouse Perspectives of Living with a Loved One with Diabetes***

Stephanie T. Melton, MA, MPH Nicole Johnson, MPH, MA University of South Florida, College of Arts and Sciences, Anthropology

**Keywords:** diabetes, spouses, caregiving, interpersonal dynamics

**Objective:** Type 1 diabetes management requires adherence to daily treatment regimes, which can result in challenges for individuals and families impacted by the disease. In these families increased stress and poor coping responses negatively affect diabetes outcomes and the quality of interpersonal relationships. For spouses and partners, the demands of caring for a loved one with diabetes are often not addressed or acknowledged in the medical community or professional literature. The purpose of this qualitative study is to assess spouses’ perceptions of how diabetes affects their personal relationship and the challenges they face in caring for their loved one, as well as to identify unmet needs for possible intervention.

**Methods:** In this study, individual interviews were conducted with 19 spouses and partners of individuals with Type 1 diabetes. The sample represents a diverse group of couples.

**Results:** The results indicate several key factors that impact not only the quality of the personal relationship, but also the spouses’ ability to care for and appropriately respond to low or high blood glucose episodes. The challenges spouses face revolve around the daily demands of diabetes care and the emotional weight from worrying about their loved one. Spouses face challenges in emotionally supporting their loved ones and helping with self-care of the loved one’s diabetes, as well as, experiencing chronic stress, fear and grief over the risk diabetes poses to their loved one.

**Conclusion:** This research highlights the unmet needs of spouses and the potential role of health care providers in providing critical diabetes education and support tools for couples affected by diabetes.

**Research supported by:** The Patterson Foundation

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***Difference in Outcome of Patients with Unresectable Hepatocellular Carcinoma (HCC) When Treated with Traditional Chemoembolization (TACE) Alone Vs. Combination Therapy with Sorafenib***

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**Keywords:** HCC, TACE, Survival

**Objective:** HCC is the cause of 250,000 deaths annually worldwide. Loco-regional treatment with TACE is offered to most of the patients awaiting LT or as a palliative therapy. Sorafenib (multikinase inhibitor of VEGF) showed improvement in median survival. Aim: To compare the outcome and mortality in patients with unresectable, non-transplantable HCC treated with TACE alone vs. in combination therapy with Sorafenib.

**Methods:** A retrospective chart review study was conducted at VA hospital after IRB approval. Data was collected on all patients with a diagnosis of unresectable HCC between 2007 and 2011 who had received TACE alone or with combination with Sorafenib. The overall mortality and LOS was compared in these 2 groups.

**Results:** 43 consecutive patients who presented to the VA hospital with HCC receiving TACE were studied. All patients underwent liver biopsy. All patients underwent TACE as primary palliative therapy. 30 (70%) patients had received TACE alone and 13 (30%) patients had combination therapy with Sorafenib. Overall HCC related mortality was 74% (32 out of 43 patients). Out of those 32 patients, 23 patients (72%) had received TACE alone vs. 9 patients (28%) received combination therapy with Sorafenib ( $p= 0.70$ ). The median survival time of the combined treatment group was 20.6 months (95% Confidence Interval 13.4-38.4) and that of TACE alone group was 18.3 months (95% Confidence Interval 11.8-32.9) ( $P = 0.72$ ).

**Conclusion:** There was difference in death rates and LOS between the two groups. The mortality rate was higher and median survival was lower in patients receiving TACE alone when compared to TACE plus Sorafenib, however they were not statistically significant. The limitation of this study is its retrospective nature and small number of patients.

***Factors influencing Prostate Specific Antigen (PSA) Bounce Phenomenon after High Dose Rate (HDR) Brachytherapy Treatment for Prostate Cancer (PCa)***

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**Keywords:** Prostate, Cancer, Brachytherapy, PSA, Bounce

**Objective:** Post-treatment PSA is the primary measure of treatment failure in PCa radiation therapy. The benign PSA bounce phenomenon presents a difficult clinical problem in appropriately determining patients who have failed treatment. HDR Brachytherapy is an emerging radiation treatment for PCa where in the PSA bounce has not been well described. This study's purpose was to evaluate the PSA bounce in patients undergoing HDR brachytherapy including quality of life metrics related to prostatitis.

**Methods:** We reviewed records on 908 patients treated with radiation for PCa at Moffitt Cancer Center between 2007-11. Multivariate and univariate analysis were performed to determine what factors may correlate with PSA bounce. Selected predictive variables included age at treatment, prostate volume, pretreatment PSA, Gleason score, HDR dose, AUA at base line, post treatment AUA, changes in AUA, TNM stage, and use of ADT. We defined bounce as a rise and fall in PSA of  $\geq 0.5$  ng without intervention.

**Results:** Of the 87 HDR brachytherapy patients, 17 received HDR monotherapy and 70 patients received HDR brachytherapy with external beam radiation therapy. 14 (16%) had a PSA bounce, 69 (80%) did not and 4 needed follow-up. Average time from treatment until bounce was 8.7 months. Age, Gleason score, and the use of androgen deprivation therapy were found to have statistically significant negative associations with risk of bounce. All other factors evaluated including quality of life metrics did not appear to correlate.

**Conclusion:** These findings suggest that the PSA bounce phenomenon is not the result of prostatitis. However, patient age, Gleason score, and use of ADT may be useful in identifying patients who are undergoing a bounce versus a treatment failure.

**Research supported by:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine.

**Abstract #: 101**

**Presented by: Keith O'Brien, MPH, Med II Student**

***Exploring New Methods to Capture Patient Satisfaction at the Point-of-Care***

Keith O'Brien, MPH (SELECT MD Program) Ian Mark, MSM (SELECT MD Program), University of South Florida, Morsani College of Medicine, Family Medicine

**Keywords:** iPad patient satisfaction

**Objective:** The shift from a volume-based evaluation of practitioners (RVUs) to incorporate quality metrics is the future of American health care. As one component, patient satisfaction has emerged as a key performance measure. However, issues with survey administration exist, including: low participation, delayed response, and cost. Our work explored a novel modality to enhance response rates in a timely, cost-effective format.

**Methods:** Patients visiting the Department of Family Medicine at the University of South Florida were asked to participate in a patient satisfaction survey based on the CG-CAHPS Visit Survey 2.0. The surveys were administered using iPad tablets over a one-month period. The timing of this process occurred after the provider encounter, while the patient was still in the examination room. Survey results were bench marked against national data from the AHRQ database.

**Results:** 99% of patients offered the survey completed it (100/101 patients). Respondents took between 3-14 minutes to complete the 37-question survey (28% of patients took between 3-5 minutes, 54% took 5-8 minutes, and 18% of patients took more 8 or more minutes). Provider specific data, as well as data regarding clinical operations, were shared with Department leadership.

**Conclusion:** Point-of-care patient satisfaction surveying provides the opportunity for immediate feedback and analysis. We believe on-site surveying is a viable option for organizations seeking to obtain data regarding provider performance, clinical operations, and potentially student evaluation. Modal adjustments to account for tablet survey bias are unknown at this time, and will be an area of future research.

**Research supported by:** USF Physicians Group

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**Abstract #: 102**

**Presented by: Julia Ogg, PhD, Faculty**

***Mental Health Needs in Medical Foster Care Children***

Julia Ogg PhD, School Psychology Program, USF, Jennifer Takagishi MD, Department of Pediatrics, Morsani College of Medicine University of South Florida, College of Education, Psychological & Social Foundations

**Keywords:** foster care, mental health, medical foster care

**Objective:** Children in foster care face disproportionate levels of behavioral and mental health risks compared to non-foster care peers. Children in medical foster care (MFC) face these same risks, but research examining their specific issues is limited. The purpose of the study was to use mixed methods to identify behavioral health needs among the MFC population.

**Methods:** Focus groups were held with MFC parents, MFC social workers/nurses, and foster care case managers to identify behavioral health needs common among MFC children. Data were analyzed qualitatively for themes. Decreased adaptive behavior and elevated levels of feeding concerns, externalizing and internalizing behavior, and MFC parent stress were commonly noted. A quantitative study was then conducted based on the identified concerns. MFC parents of 36 children enrolled in the MFC program completed rating scales regarding their child's feeding behaviors, externalizing and internalizing behavior, adaptive behavior, as well as parent stress.

**Results:** Data for internalizing, externalizing, and feeding behavior fell within typical limits when compared to norms from the general population. Also, MFC parents rated their stress within the normal range. However, parent ratings of children's adaptive behavior across conceptual, social, and practical tasks on average fell in the borderline range of functioning.

**Conclusion:** This study highlights that children in the MFC program have reduced adaptive behavior, which suggests the need for strategies to support the development of important daily living skills. A better understanding of these needs can provide insight into the treatment and system of care that best supports children and families in MFC.

**Research supported by:** American Academy of Pediatrics CATCH grant

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***Cutaneous Angiosarcoma: A Single Institution Review***

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**Keywords:** angiosarcoma

**Objective:** Cutaneous angiosarcoma (CAS) is a rare and aggressive vascular sarcoma. Our aim is to analyze patient and tumor characteristics, treatment algorithms and correlate these with outcomes.

**Methods:** A single institution retrospective review of patients (pts) treated at a tertiary referral center for CAS from 1999-2011. Demographics, primary tumor characteristics, treatment and outcomes were analyzed.

**Results:** 88 pts were identified; median age was 70 and 57% were female. Median tumor size was 3 cm. 5-year (yr) overall (OS) and recurrence free survival (RFS) were 35.2% and 32.3%, respectively. Three treatment groups were identified; surgery alone, XRT alone, and surgery with XRT. 50% pts experienced recurrence at a median of 7 months. Pts treated with surgery alone had the highest 5-yr OS (46.9%) and RFS (39.9%) although not significantly different from other groups. 4 presentation groups were identified; 1) Radiation (XRT) induced (median of 9 years between XRT and presentation) n=30 (34%), 26/30 occurred in the breast of females with a prior breast cancer; 2) sporadic CAS on head and neck (H/N) n=38; 3) sporadic CAS on trunk/extremities n=13; and 4) lymphedema-associated (Stewart-Treves) n=7. Pts with CAS of the trunk/extremity had the highest 5-yr OS (64.8%), whereas those with H/N CAS had the worst 5-yr survival (21.5%). On multivariate analysis, only tumor size < 5 cm was found to correlate with improved OS (p= 0.014).

**Conclusion:** CAS associated with Stewart Treves or the trunk and extremities had the best prognosis. Tumor size was a significant prognostic factor for OS. While surgery alone as treatment was associated with a better OS and RFS compared to XRT alone or surgery/XRT combined, this was not statistically significant.

**RESEARCH SUPPORTED BY:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine.

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***The Impact of Diabetic Peripheral Neuropathy: A Qualitative Inquiry***

Rose M. Pignataro, USF COM, SPTRS, University of South Florida, Morsani College of Medicine School of Physical Therapy and Rehabilitation Science

**Keywords:** Diabetes Peripheral Neuropathy Pain Management

**Objective:** There are 23.3 million Americans with type 2 diabetes. 50% are affected by diabetic peripheral neuropathy(DPN). Painful symptoms of DPN can interfere with the ability to perform daily tasks, as well as functioning within social and occupational roles. Neuropathic pain is also associated with decreased quality of life, and higher rates of anxiety and depression. Standardized assessments provide a limited view of the impact of DPN. In order to gain a broader perspective, this qualitative study explores the viewpoints of people with DPN in terms of symptoms, functional limitations, coping strategies, and experiences with the medical community in seeking appropriate care.

**Methods:** Data collection consisted of literature review, electronic medical records review, document review of online sources, and personal interviews.

**Results:** Sample 60% female, 40% male. Duration of diabetes = 2 to 17 years, mean of 6.72 (SD 4.81). Duration of DPN = 1 to 16 years, mean of 2.72 (SD 3.18). Average pain level was 6/10 (SD 1.5) Rate of disability (inability to perform occupational roles) = 46% Qualitative themes include neuropathic pain, pharmacologic management, impact of DPN on daily life, self-management and coping strategies, and dilemmas in receiving acceptable care.

**Conclusion:** People with DPN perceive deficits in obtaining acceptable medical care. Practitioners would benefit from an increased awareness of barriers to treatment, and the need for greater active listening, psychological support, and research regarding effective treatment interventions for DPN. Group support has a positive impact. Use of the internet may be a helpful outlet, particularly for people with DPN who are isolated and disabled by their condition.

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***The Use of the Bioflavonoid Luteolin as Glycogen Synthase-3 Inhibitor and Therapy for Fragile X Syndrome***

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**Keywords:** \*fragile X syndrome, autism, flavonoid, glycogen synthase kinase 3

**Objective:** Fragile X Syndrome (FXS) is the most common form of genetic intellectual disability and is an autism spectrum disorder (ASD). Glycogen-synthase kinase-3 (GSK-3) is a ubiquitous kinase that has been found to be over-active in murine models of FXS (fmr1 knockout mice). Recent studies have utilized lithium as a GSK-3 inhibitor in these animal models. at Tyr-216 and Tyr-279 in embryonic fibroblast cells (MEF) derived from fmr1 KO mice. In addition, luteolin treatment increased inhibitory serine-phosphorylation of both isoforms in MEF cells. Use of a bioflavonoid as a GSK3 inhibitor may prove a safer, more effective therapy for FXS. □ and GSK3-beta □ Though lithium is an effective GSK3 inhibitor, the drug is known to have a deleterious effect on hepatic function. Thus, long-term lithium administration could be highly toxic and risky therapeutic option, particularly for small children. The current study found that the bioflavonoid luteolin also decreases GSK3 activity by directly binding the active sites on GSK3-alpha

**Methods:** Mouse embryonic fibroblast cells derived from fmr1 knockout mice and wild-type mice and cultured with DMEM with 10% fetal bovine serum. Cells were plated on a coated 24-well plate and treated at various time points (0, 5, 15, 30 and 60 minutes) with 10uM luteolin. Cell lysate was collected and used for Western blot analysis. Three separate gels were used to analyze total GSK3-beta, active (Tyr-216) GSK3-beta, and inhibited (Ser-9) GSK3-beta.

**Results:** Results indicated no change in total GSK3-beta, but an increase in the Ser-9 form and decrease in Tyr-216. These changes peaked at 15 minutes.

**Conclusion:** The current study has found luteolin to be an effective GSK3-beta inhibitor.

**Research supported by:** the Silver Foundation, Silver Child Development Center

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***Initial Examination of the Feasibility of a Novel Approach in Tumor Therapy Using Magnetic Nanoparticles and a Spatially Selective Magnetic Field.***

Jessica Rainey, BA, USF MCOM, Gael Nicholis, USF CAS, Marzena Wiranowska PhD, USF MCOM, Kamran Aghayev MD Moffitt Cancer Center, Frank Vrionis MD Moffitt Cancer Center, University of South Florida, Morsani College of Medicine, Neurosurgery & Brain Repair

**Keywords:** nanoparticles, magnetic field, tumor therapy, animal model, fluorescence

**Objective:** This work aims to develop a novel therapy for treating brain tumors using intravenously injected magnetic nanoparticles (NPs). The NPs are localized to a region of interest (ROI), a tumor, using a magnetic field. Application of an alternating current will heat up NPs via their micromotion. This is anticipated to lead to coagulation of the microvasculature in the ROI and subsequent local ischemia. We have 1) confirmed the feasibility of concept, 2) determined the maximal tolerable dose of NPs, and 3) quantified the preferential localization of NPs in the ROI.

**Methods:** We serially injected varying doses (1.25-3.125mg) and dilutions (1:2-1:10) of iron core magnetic NPs conjugated to Chitosan with fluorescent excitation at 620 nm, emission at 570nm (Chemicell GmbH) into 20g nude mice to determine the maximal tolerable dose. Images were captured using Xenogen IVIS Spectrum (PerkinElmer). To localize the NPs in the ROI, we used both a simple refrigerator magnet and strong linear magnet. Using the ROI tool in the Living Image Software for Spectrum (PerkinElmer) we are analyzing the fluorescent signals.

**Results:** The maximal tolerable dose of NPs was observed at a 12.5mg/ml obtained at 1:2 dilution of 125ul of the NP stock sample (~2.2x10<sup>14</sup> particles/g) in 0.9% NaCl. No immediate or long-term negative effects on the mice survival were observed. On image evaluation we found increased areas of fluorescence in the ROI where the magnetic field was applied. Both magnets were visibly able to localize NPs. Further quantitative data and statistics and currently being calculated.

**Conclusion:** These preliminary studies confirm that a magnetic field can preferentially localize intravenously injected NPs into a ROI in a mouse model.

**Research supported by:** The Spine Fund SCP Summer Stipend

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**Abstract #: 109**

**Presented by: Amy Weiss, MD, Faculty**

***The Influence of Primary Care Provider Type on Adolescent Visits to the Emergency Department***

Amy L. Weiss, MD, MPH, USF Health College of Medicine; Alexandra C. Rucker, MD, Children's National Medical Center, University of South Florida, Morsani College of Medicine, Pediatrics

**Keywords:** adolescent medicine, emergency medicine, primary care

**Objective:** 1) To characterize a population of adolescents presenting to a large, urban children's hospital ED. 2) To examine if the type of PCP/primary clinic (academic, community, or private) they reported attending influenced triage level or reason for presenting to the ED rather than to the PCP.

**Methods:** Adolescents ages 12-21 in the ED with their parents/guardians were invited to participate. We used a 21-question online survey to assess key characteristics of the PCP practice and the main reason for presentation to the ED instead of to the PCP. Demographic data and triage information were collected from EMRs. PCPs were classified by study staff as academic, community, or private based on the provider/clinic name supplied by each participant.

**Results:** Of 203 participants, 93% (n=189) reported by name a PCP/primary clinic. 46% (n=94) had a private PCP, 23% (n=46) had an academic PCP, and 21% (n=42) had a community PCP. Those with an academic PCP were more likely (p=0.051) to be triaged as urgent compared to those with a community PCP. Those with private PCPs most commonly reported PCP direction to the ED (31%, n=29) compared to those with academic and community PCPs who most frequently presented to the ED due to perception of illness requiring immediate care (37%, n=17 and 40%, n=17 respectively).

**Conclusion:** Nearly all adolescents in this study identified a PCP/primary clinic during their ED visit, most frequently from a private office setting. However, those with private PCPs most commonly reported being sent to the ED by their PCPs. Further research is needed examining why private PCP offices divert adolescents to the ED—perhaps discomfort in caring for this age group, issues with time constraints in the outpatient setting, or inadequate reimbursement.

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**Abstract #: 110**

**Presented by: Joseph White, BS, Med IV Student**

***Patient Expectations and Recovery Following Major Head and Neck Surgery.***

Joseph White MSIV, Dr. Kristen Otto MD Moffitt Head and Neck Surgery, Dr. Ryan Jackson MD PGY4 University of South Florida, Morsani College of Medicine, Otolaryngology-Head and Neck Surgery

**Keywords:** Otolaryngology, Surgery, Prospective Case Study

**Objective:** Studies examining the early postoperative period after major head and neck surgery requiring reconstruction are lacking. The objectives are to determine patient expectations following major head and neck surgeries that require some form of reconstruction and compare those expectations to actual outcomes. This study will gauge the success of physician patient education for further optimization in the future in major head and neck surgeries.

**Methods:** This is a prospective study. A 10-item survey regarding recovery from anesthesia and head and neck surgery will be administered preoperatively followed by a postoperative survey that will be administered on the day of hospital discharge and again on the initial postoperative follow-up office visit. Expectations as far as pain, swallowing ability, voice, eating ability, breathing ability, prognosis, cosmetic outcomes, length of hospital stay, and postoperative discharge planning were included the survey. Preoperative surveys will establish base levels of expectations while postoperative surveys will establish actual outcomes for comparison.

**Results:** We are still awaiting IRB approval for the study. No results at this time.

**Conclusion:** We hypothesize that patient expectations of head and neck surgery with reconstruction will vary widely but predict that most patient's expectations will be optimistic to actual outcomes.

**Research supported by:** This is one of 2 projects I worked on with Dr. Otto over my research elective month.

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**Abstract #: 111**

**Presented by: Jennifer Bruno, BS, Med II Student**

***The Analytical Hierarchy Process as a Decision-Making Tool in Psychiatry***

Jennifer Bruno, University of South Florida, Morsani College of Medicine, Psychiatry and Behavioral Neurosciences

**Keywords:** Analytical Hierarchy Process, Treatment Resistant Depression, Psychiatry

**Objective:** The objective of this study was to use a structured analytical decision-making process to identify physician preferences when selecting treatments for patients with Treatment Resistant Depression, and to evaluate these preferences for consistency and standardization.

**Methods:** The data from this study were analyzed using the Analytical Hierarchy Process (AHP), a model that creates a multi-level hierarchical structure that utilizes pair-wise comparisons to evaluate alternatives in light of criteria that are deemed important (Saaty, 1990). Four psychiatrists were asked to rank 8 treatment criteria according to their level of importance in decision making. Next, they were provided with 11 different treatment options and asked to compare them to each other in a pairwise fashion. The AHP was applied to the results from their comparisons, generating a rank ordered list of each physician's preferred treatments as well as a consistency index.

**Results:** Applying the AHP to the physicians' selections resulted in a different rank-ordered list of preferred treatments for each doctor. Though none of the physicians' ordered lists was identical, there were obvious similarities. For example, repetitive Transcranial Magnetic Stimulation was the top treatment choice for all 4 doctors.

**Conclusion:** Every patient is different and has unique characteristics, which cannot be modeled in even the best AHP study, thus requiring expert judgment. Nevertheless, the AHP has the capacity to help physicians identify the most important information to consider when making multifactorial decisions and to compare treatment options based on chosen factors and their importance. When paired with clinical expertise it can enhance a physician's ability to make better-informed decisions.

**Research supported by:** Scholarly Concentration Program

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**Abstract #: 112**

**Presented by: Sally Coover, PhD, Faculty**

***Hey, Doc Is That Your Stethoscope? Increasing Engagement in Medical Education and Training with iPads***

Sally A. Coover, Ph.D., Adam Ducey, Mark Grichanik, Michael D. Coover, Ph.D., Robert M. Nelson, Jr., MD, MS  
University of South Florida, Morsani College of Medicine, Pediatrics

**Keywords:** Medical Education, Technology, Patient-Centered Education, Physician-Centered Training, Education-Centered Instructional Design

**Objective:** Evaluate the role of technology for enhancing medical education and training using tablet devices.

**Methods:** The entire incoming class of medical resident to be trained in pediatrics (N=56), at a large southeastern medical school, received iPads upon their arrival. Teaching faculty also received iPads for use in instruction, research and patient care. Several residents were shadowed and interviewed for this project and comments were recorded. Statements regarding iPad use were transcribed and analyzed using verbal reports as data (Ericsson & Simon, 1987).

**Results:** Content coding of all statements was conducted. Three areas emerged: education/training, professional/administrative, and patient centered. Within each area, the statements were reflective of: current iPad use, device limitations, and anticipation/desired future use.

**Conclusion:** The present research represents a first step in our ongoing research program to identify and deploy cutting edge technologies and instructional design to further increase the quality of medical education and training received by doctors in specialized training programs.

**Research supported by:** USF Morsani College of Medicine, Department of Pediatrics and USF College of Public Health, Lawton and Rhea Chiles Center for Healthy Mothers and Infants.

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**Abstract #: 113**

**Presented by: Mia Djulbegovic, BS, Med II Student**

***Medical Students: Visual and Verbal Insights***

Mia Djulbegovic, USF Morsani College of Medicine, MSII; Amanda A. Holup, MA, School of Aging Studies, University of South Florida, University of South Florida, Morsani College of Medicine, Psychiatry and Behavioral Neurosciences

**Keywords:** Humanities; Visual; Verbal; Insights; Medical Humanities

**Objective:** The purpose of this book study was to review medical student drawings and comments (collected over 20 plus years as assignments in Dr. Nixon's humanities classes), and to determine what subjective and, occasionally objective, insights were provided about them, their experiences, and their assignments.

**Methods:** The first step was to review and organize the visual pieces. We decided to put the drawings into chapters that reflected the medical student journey from year 1 to year 4 (topics include anatomy, studying for Step 1, Match Day and visual and verbal reflections to assigned readings and films that related to the basic science and clinical material covered in lecture).

**Results:** These insights reveal so much about the student much like a painting in a museum – their relationships, interests, fears. We know that patients are stories and that we are stories as well, but during periods of high stress, those human stories are suppressed or ignored. This stress message is clear in some of the visual expressions, but so many more point to idealism and pride in the profession.

**Conclusion:** This anthology is meant to illustrate the internal journey through the lifelong teachings of medicine. The prompts themselves force students to think about topics they might not normally discuss (e.g. death/dying), and usually gives us (the audience) an insight that they didn't even know they were drawing! In fact, inclusion of art, literature or film purposely challenges habitual frames of mind that are deeply rooted in textbook absolutes or facts, forcing us to discover connections and to re-vision ways of knowing what we know. In this respect, students learn to compare what they learn on a molecular level to the context of their future patients.

**Research supported by:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine.

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**Abstract #: 114**

**Presented by: Adam Ducey, BA, Graduate Student**

***Predicting Pediatrician Tablet Computer Use: An Extended Technology Acceptance Model***

Adam J. Ducey (Department of Psychology, USF), Michael D. Coovert, Ph.D. (Department of Psychology, USF), Sally A. Coovert Ph.D. (USF Health, Office of Children's Health), Robert M. Nelson Jr., M.D., M.S. (USF Health, Office of Children's Health) University of South Florida, College of Arts and Sciences, Psychology

**Keywords:** tablet computer, information technology adoption, Technology Acceptance Model, pediatricians

**Objective:** Mobile information technology (IT) has the potential to help physicians rapidly collect, store, retrieve, and transfer medical information to support clinical care and decision-making. Despite the promise of mobile devices, previous research has noted the high failure rate of large-scale IT adoption initiatives in the healthcare industry. Therefore, it is necessary to identify factors that predict adoption among physicians. The current study extends the Technology Acceptance Model to investigate how individual (perceived usefulness, perceived ease of use, attitude toward use), organizational (subjective norm), and device (compatibility, reliability) characteristics influence pediatricians' intention to use tablet computers.

**Methods:** 1,400 physicians practicing pediatrics or medical-pediatrics in the U.S. were invited to complete an online survey designed to assess perceptions of tablet computers. A sample of 261 physicians returned complete data. Three competing structural equation models were evaluated based on theoretical and empirical evidence to determine the most plausible model.

**Results:** The most parsimonious model fit the data well,  $\chi^2(338) = 925.01$ ,  $p < .01$ ; TLI = 0.98; CFI = .98; SRMR = .07; RMSEA = .08. Inspection of individual paths indicated that organizational and device characteristics positively related to perceived usefulness (PU) and device characteristics positively related to perceived ease of use (PEOU). PU and PEOU significantly related to one's attitude toward using a tablet computer, which ultimately influenced one's intention to use the device.

**Conclusion:** Individual, organizational, and device characteristics collectively influence pediatricians' intention to adopt tablet computers.

**Research supported by:** USF Health Office of Children's Health

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**Abstract #: 115**

**Presented by: Candace Haddox, BS, Med II Student**

***Nutrition Education: a curriculum to increase nutrition competency among medical students***

Candace L. Haddox, Morsani College of Medicine, Ellen Kent, College of Public Health, Frazier Stevenson, Morsani College of Medicine, University of South Florida, Morsani College of Medicine, Internal Medicine

**Keywords:** nutrition, medical education, community outreach

**Objective:** Despite the rise in obesity and diabetes, medical school curricula have fallen short of training students to become proficient in nutrition counseling. This project aims to increase the nutrition proficiency of USF medical students by adding online modules and nutrition counseling opportunities to the current curriculum.

**Methods:** The curriculum included an online 60 minute module, a 60 minute discussion session, and an opportunity to counsel patients at a community health fair. The online module was based on guidelines from the ADA and the diabetes literature. It presented an overview of major macronutrients and specific suggestions for diabetes patients. Throughout the module, an ongoing clinical scenario demonstrated counseling technique. The author-led discussion session focused on counseling approach. At the health fair, patients received their screening results for hyperglycemia, hyperlipidemia, and hypertension. Then, students interpreted the results, reviewed their diets, and set goals for diet modification. Students were surveyed to assess their nutrition knowledge and counseling ability before and after the curriculum.

**Results:** Ten students have completed the curriculum and participated in three community health fairs. Cumulatively, 75 patients have received counseling. 90% of students reported an increase in nutrition knowledge and counseling ability following the module. 90% of the students felt that they made a difference in the health of patients at the health fairs. Importantly, 100% of the students felt they were more likely to counsel patients in their future practices.

**Conclusion:** This three part active nutrition curriculum improved both student understanding and counseling ability on diabetes.

**Research supported by:** Scholarly Concentration Program

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**Abstract #: 116**

**Presented by: Gregory Horn, BA, Med III Student**

***Teaching Needle Thoracostomy to First Responders: Confidence Improvements with Manikins and Cadavers***

Gregory T. Horn MSIII, Nicholas M. Studer MSIII USF Morsani College of Medicine, Karl Muffly PhD USF Morsani College of Medicine, Department of Pathology and Cell Biology, University of South Florida Morsani College of Medicine, Surgery

**Keywords:** Emergency Medicine, Surgical Education, Needle Thoracostomy, Cadaver, First Responder

**Objective:** The U.S. military Combat LifeSaver course for non-medical personnel includes instruction on first responder skills and trauma management. This course for the lowest level of first responders but the instruction is routinely limited to a verbal block of instruction with a PowerPoint presentation. The curriculum includes instruction of needle thoracostomy to decompress tension pneumothorax, the second leading cause of preventable combat mortality. The purpose of this study was to assess the confidence of non-medical military personnel in their preparation to perform a needle thoracostomy before training, after verbal instruction on the procedure, after manikin training, and after practicing the procedure on a human cadaver.

**Methods:** Surveys were provided to students in a basic first responder course during their verbal education, manikin training, and cadaver course. Self-reported assessments of confidence on Likert scales and free response remarks were collected.

**Results:** Self-rated preparedness scores improved significantly with each level of training with maximal improvements following cadaver training, from a mean score of 2.31/5 before instruction to 4.75/5 following cadaver training (matched pairs t test:  $p < 0.005$ ).

**Conclusion:** Manikin training provided the largest single educational confidence boost to needle decompression skills with student reports indicating that cadaver training provided the most realism and cementing of knowledge. Cadaver training of needle decompression skills is an effective tool for improving first responder confidence on needle thoracostomy.

**Research supported by:** This research was made possible by U.S. military personnel who volunteered their time and the Pathology Department of the USF College of Medicine who volunteered the use of a cadaver.

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**Abstract #: 117**

**Presented by: Susan Kunihiro, BA, Med II Student**

***Evaluation of the Health Equity and Social Determinants of Health Course in USF Morsani PSEP Summer 2012***  
Susan Kunihiro, Shirley Smith (Office of Student Diversity and Enrichment), Kevin Casey (PSEP Program), William Johnson (Department of Molecular Pharmacology & Physiology), University of South Florida, Morsani College of Medicine, Family Medicine

**Keywords:** URM, pipeline, cultural competency, diversity

**Objective:** As part of the initiative to increase diversity among healthcare workers and recognize the social and behavioral components of health, the USF Morsani College of Medicine's Pre-Health Summer Enrichment Program (PSEP) for underrepresented minority (URM) undergraduate students added a health equity unit to the summer pipeline program.

**Methods:** Eight students were chosen and transcripts were reviewed for completion of social science courses. Half of the students had taken introductory psychology. Most students had not taken introductory biology or sociology. A medical student designed and implemented the curriculum, consisting of five four-hour sessions across the six-week program. Sessions included speakers, films, and case discussions, followed by reflective writing. A pre-program and a post-program survey were conducted. Questions scored confidence in ten areas of cultural competency using a Likert Scale. Results were analyzed using descriptive statistics.

**Results:** All of the students showed improved confidence in all ten areas of cultural competency by mean and median analyses.

**Conclusion:** URM pre-health students historically achieve lower scores on the Medical College Admissions Test (MCAT) than their majority counterparts. A new MCAT in 2015 will require scientific inquiry and reasoning skills to answer questions on natural, social and behavioral sciences. As a result, URM students need additional preparation. While the sample size is too small to be statistically significant, all of the students showed improved confidence in every area of cultural competency. Incorporation of this model into pipeline programs may be an effective approach to increase diversity in healthcare and improve knowledge of the social and behavioral components of health.

**Research supported by:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine and AHEC.

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**Abstract #: 118**

**Presented by: Asef Mahmud, BS, Med IV Student**

***An Innovative Look at Modern Education***

Asef Mahmud, Orhan Arslan, DVM, PhD. University of South Florida Morsani College of Medicine Pathology and Cell Biology

**Keywords:** Student Education Motivation Feedback Mastery

**Objective:** The goal of this project is to conduct a study on various theories of learning and subsequently develop a module that utilizes technology to advance and modernize medical education. Based on literature data, two main objectives are targeted in order to achieve this goal. 1. To design a specific step by step curricular and presentation model that promotes easy understanding and maintains longer retention of medical concepts. 2. To provide resources that promote student engagement and success in their academic careers. 3. Utilize student performance data to enhance learning through curricular redesign.

**Methods:** 1. Apply constructivism to a curricular design that naturally follows developmental learning processes 2. Consider the different informational processes in cognition to design teaching modules 3. Develop the mechanism through which cognitive loading is limited in presentations 4. Model problem solving techniques that follow social constructivist theories 5. Provide timely feedback to condition a stronger response to intrinsic and extrinsic forms of motivation 6. Use priming and spacing to promote long-term memorization

**Results:** 1. Two phase curricular design (Comprehension then long-term retention) 2. Curricular road-map (Constructing concepts using preexisting knowledge) 3. Presentations and written content outlines / summaries (Modeling, Learning Styles and Limiting Cognitive Loading) 4. Question bank (Feedback mechanism and Habituation) 5. Compiled performance data that can be used for curricular revitalization

**Conclusion:** Product produced: USF Health Medical Student Review website

**Research supported by:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine.

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**Abstract #: 119**

**Presented by: Daniella Schocken, BA, Staff**

***Patient Safety in Undergraduate Medical Education***

Daniella M Schocken, Aaron Block, Dawn M Schocken, Center for Advanced Clinical Learning and Simulation, USF Health; Kevin O'Brien, MD, Department of Internal Medicine, USF Health University of South Florida, Morsani College of Medicine, Tampa, FL

**Keywords:** patient safety, medical education, simulation, evaluation

**Objective:** Medical error is a significant, preventable source of patient morbidity and mortality. A review of the literature determined that medical students do not routinely acknowledge vulnerabilities that could contribute to adverse events. Faculty targeted MS IIIs on the Medicine Clerkship rotation, aiming to raise awareness of patient safety.

**Methods:** Students examined an adverse event involving common hospital processes with a high impact on patient safety and quality of care. In reviewing information collected from the adverse event, students identified vulnerabilities and safeguards for the process. The control group was asked to complete the simulation without prior knowledge of patient safety. Analysis of this data provided baseline information. In the second phase, students receive formal lectures focusing on patient safety, identifying vulnerabilities, and creating safeguards; they then complete the simulation activity and participate in debrief. Follow-up is ongoing to determine retention of knowledge and skills in identifying adverse events.

**Results:** We have collected two years of simulation data. A comparison with the baseline data is being reviewed to determine effectiveness of the teaching strategies. A significant improvement in student performance has been found following active participation in the curriculum.

**Conclusion:** Students report significantly higher attention to patient safety concerns when rounding in the inpatient setting. Teaching an aggressive patient safety curriculum is one method to begin reducing the number of patient safety violations seen daily.

**Research supported by:** The Center for Advanced Clinical Learning and Simulation at the USF Health Morsani College of Medicine

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**Abstract #: 120**

**Presented by: Eric Sellers, MD, Med II Student**

***The Advantages of Problem-Based Learning in Teaching High-Yield Medical Topics***

Eric Sellers, University of South Florida, Morsani College of Medicine, Internal Medicine

**Keywords:** problem-based learning, PSEP, education

**Objective:** A six week curriculum structured around problem-based learning was created for the USF Summer Enrichment Program. The program's goal was to facilitate and measure the students' understanding of target scientific concepts.

**Methods:** Eight undergraduate students were selected to participate, all of whom wish to pursue careers in the medical field and come from populations which are underrepresented in medical schools across the nation. The students were taught high yield science concepts through problem-based learning, which consists of learning through group work, problem solving and discussion. Participants were administered a survey before and after completion of the program in which they ranked their knowledge and grasp of various scientific concepts on a scale of one to ten.

**Results:** The results were averaged and analyzed through a statistical significance test. The null hypothesis ( $H_0 : \mu_1 - \mu_2 = 0$ ) stated that there was no improvement or change in the students' understanding of the topics. The alternative hypothesis ( $H_A : \mu_1 - \mu_2 < 0$ ) stated that the numerical data would reflect an increase in understanding of the topics after completion of the program. The significance test was conducted and a p-value of  $< 0.0001$  was obtained. With a p-value so close to zero, there is very strong statistical evidence to reject the null hypothesis in favor of the alternative hypothesis.

**Conclusion:** These results illustrate improved understanding of concepts, providing evidence for the efficacy of the program as well as of the concept of problem-based learning.

**RESEARCH SUPPORTED BY:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine.

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**Abstract #: 121**

**Presented by: Emily Shaffer-Hudkins, PhD, Staff**

***Social Media Use by Individuals with Diabetes***

Emily Shaffer-Hudkins, PhD, Nicole Johnson, DrPH candidate, MPH, MA Stephanie Melton, MA, MPH University of South Florida, Morsani College of Medicine

**Keywords:** Social media, diabetes, diabetes management

**Objective:** To better understand the perspectives of adults with diabetes and their caregivers in regards to frequency of diabetes-related social media use, motivating factors for reading or sharing about diabetes in online communities, and relationship between using diabetes-related social media and happiness and disease management.

**Methods:** Participants were adults 18 and older diagnosed with Type 1, Type 2, or gestational diabetes or parents/spouses of patients with diabetes. A 14-question survey was developed by the research team and administered via four of the most widespread diabetes social media websites.

**Results:** Results are currently being finalized.

**Conclusion:** Current findings demonstrate that information-seeking and emotional support are key motivating factors for social media use among patients with diabetes. Social media use is significantly related to better self-care and management of symptoms among patients with diabetes.

**Research supported by:** Bringing Science Home

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**Abstract #: 122**

**Presented by: Melissa Silva, BS, Med IV Student**

***Efficacy of Guest Lecturers in Middle and High School***

Melissa Silva BS, Shela Sridhar BS, Frazier Stevenson MD, Medical Education Scholarly Concentration University of South Florida, Morsani College of Medicine, Internal Medicine

**Keywords:** Education, teaching methods, learning styles

**Objective:** Commonly, middle and high school courses invite guest lecturers to educate students on important topics tangential to the course curriculum. It is difficult to gauge, however, the impact these lectures have on students. The following study is designed to determine the efficacy of guest lecturers in middle and high schools.

**Methods:** Four lectures were developed on health topics appropriate for middle and high school cohorts and presented twice at local schools in a 45 minute class. Three lecture techniques were used to compare teaching methods: basic powerpoint presentation, videos, or cases. Before and after each period, a survey was distributed with questions on the information presented in the various teaching methods. Interest level before and after the lecture was also scored.

**Results:** The average improvement on the surveys was 3.4 out of 10 questions. In individual classes, the improvement varied from 1.3 questions to 6.7. Greater improvement was seen in the high schoolers than middle schoolers. In the middle school cohorts, the teaching method with the greatest impact on scores was powerpoint (+4.8), but the high school cohort improved more with case based teaching (+6.1). In terms of generating interest, the video was ranked highest.

**Conclusion:** These lectures demonstrate varied impact on short term learning of the health topics. The data suggest that middle schoolers retain information better when presented in powerpoint format, whereas high schoolers gain more information from case based learning. This may reflect the teaching style most often used in these age groups or the different developmental stages. Long term memory could not be directly tested, but increased interest through videos may suggest a future impact on students' education.

**RESEARCH SUPPORTED BY:** This research was supported by the Scholarly Concentrations Program at USF Health, Morsani College of Medicine.

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**Abstract #: 123**

**Presented by: Gregg Sinner, MD, Med III Student**

***Group Testing: Group Dynamics and Effect on Student Performance***

Gregg J. Sinner, John Briggs, J. Charles Burns, John C. Briggs, Frazier T. Stevenson - Office of Educational Affairs, Stanley J. Nazian - Department of Molecular Pharmacology and Physiology University of South Florida, Morsani College of Medicine Molecular, Pharmacology & Physiology

**Keywords:** Group Testing Dynamics Test Exam

**Objective:** To demonstrate that greater familiarity within the group would help improve feelings among students during group tests.

**Methods:** First and second year medical students are administered an individual multiple choice exam. After the exam, students complete a group exam in a specified time in groups of 4-6 students. Groups were either randomized or preformed from a concurrent Doctoring course. Doctoring groups of 8-10 students are predetermined at the beginning of each academic year and meet once per week for 4 hours to discuss patient cases, learn interviewing techniques, and practice physical examination skills. Students alternated between Randomized and Doctoring groups during the year. Groups answered questions that were answered incorrectly >75% of the time by students on the individual exam. Students received 5% of their total grade from the group exam. At the end of the year, students completed an anonymous survey to gauge differences in group dynamics and overall opinion in the two group settings.

**Results:** Students in Doctoring groups reported decreased personal stress and conflict between members as opposed to students in random groups. Students' tendency to teach and seek clarification from colleagues occurred more often in Doctoring groups vs. Random groups

**Conclusion:** The group exam is a setting in which students can learn peer feedback and teaching skills under the stress of examination setting, a potential model for clinical teams. During group exams, pre-formed groups demonstrated less stress, conflict, and expression of hostility vs. randomized groups, improving the experience. Because students were more negative than positive on the continuing viability of the group exam, it should be reevaluated and improved as a learning experience.

**RESEARCH SUPPORTED BY:** This research was supported by the Scholarly Concentrations Program at USF Health, Morsani College of Medicine.

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**Abstract #: 124**

**Presented by: Joseph Standley, DO, Resident**

***"The Mannequin Project": An Innovative Approach to Teamwork and Core Competency Development During Residency***

Joseph Standley D.O.- USF PM&R, Rob Kent D.O., M.H.A. USF PM&R, Joe Shamp James A Haley VA, Emily Painter James A Haley VA, Gail Latlief D.O.-USF PMR, University of South Florida, Morsani College of Medicine, Department of Neurology

**Keywords:** ACGME Education Prosthetics

**Objective:** -Provide a novel approach to team building in residency and cross disciplinary situations that can focus on ACGME core competencies. -Provide a concrete teaching tool for both patients and residents.

**Methods:** Through a team effort we transformed an everyday mannequin into an indispensable teaching tool. The team created a quad "amputee" from a mannequin and, through the processes we use in everyday amputee care, we fitted the mannequin's residual limbs with several different prosthetic devices creating a showpiece that we are able to use in all facets of our patient's care. One of the most difficult things for a new amputee is to visualize the device that he/or she will be eventually utilizing as well as grasping the importance of comprehensive amputee care.

**Results:** We have found by having a concrete visual figure we are better able to address patient questions and alleviate fears and reservations that they have regarding their future as an amputee. To further delineate the process of amputee care we created a hub and spoke model showing the integrated team approach that will take place in the patient's ongoing care.

**Conclusion:** Through the involvement of both PMR and prosthetic residents in this project an innovative approach to core competency development was created and all competencies, as specified by the ACGME, were actively taught in a patient centered setting.

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**Abstract #: 125**

**Presented by: Kathy Lue, BS, Med II Student**

***A Single Institution's Journey with Heller Myotomy***

Kathy Lue BS, Alexander Rosemurgy MD FACS, Thara Salam BS, Carrie Ryan MS, Mercedes Cruz BS, Kenneth Luberice BS, Harold Paul MS, Sharona Ross, MD FACS University of South Florida, Morsani College of Medicine, Surgery

**Keywords:** Heller myotomy, Laparo-Endoscopic Single Site (LESS), achalasia, single access surgery

**Objective:** Surgical treatment of achalasia has evolved from conventional laparoscopic Heller myotomy to Laparo-Endoscopic Single Site (LESS) Heller myotomy with anterior fundoplication. This study illustrates the evolution in technology and instrumentation and details patient outcomes along our journey.

**Methods:** With IRB approval, patients were prospectively followed after Heller myotomy. Patients scored frequency and severity of their symptoms before and after myotomy using a Likert scale (0=never/not bothersome to 10=always/very bothersome). Symptom frequency and severity of the first 100 patients undergoing laparoscopic Heller myotomy with anterior fundoplication and the last 100 patients undergoing LESS Heller myotomy with anterior fundoplication were compared. Median data are reported.

**Results:** A total of 601 Heller myotomies were undertaken from 1992–2012. Of those, 470 (78%) were completed via conventional laparoscopy, 130 (21%) via LESS approach, and 1 (.1%) as an open procedure. The last 100 patients underwent the LESS approach. Frequency and severity of all preoperative symptoms significantly improved with either conventional laparoscopy or LESS approach; several postoperative symptoms had superior improvement with the LESS approach (e.g., vomiting, choking,  $p=0.01$  each). Those who underwent LESS Heller myotomy also had a decreased length of hospital stay (2 vs. 1 day,  $p<0.05$ ) and no apparent scar.

**Conclusion:** Laparoscopic Heller myotomy provides an efficacious and durable treatment for achalasia. The LESS technique offers a safe approach with equivalent or superior symptom relief and improved cosmesis. Overall patient satisfaction and symptom relief promotes laparoscopic Heller myotomy with anterior fundoplication, particularly with the LESS approach.

**Research supported by:**

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**Abstract #: 126**

**Presented by: Rahul Mhaskar, PhD, Faculty**

***Impact of Quality of Reporting of Treatment-related Harms On Overall Therapeutic Effects***

Mhaskar R\*, Reljic T\*, Wao H\*, Miladinovic B\*, Kumar A\*, Djulbegovic B\* \* Center and Division of Evidence based Medicine and Health Outcomes Research, Clinical and Translational Sciences Institute, University of South Florida, University of South Florida, Morsani College of Medicine, Internal Medicine

**Keywords:** Treatment related harms, Quality of reporting, treatment effects, National Cancer Institute's Co-operative Group, Randomized controlled trial

**Objective:** To assess the quality of reporting of treatment-related harms (TRH) and its impact on overall therapeutic effects.

**Methods:** We reviewed all consecutive phase III RCTs conducted by National Cancer Institute's co-operative groups from 1960 to 2007. The quality of TRH reporting was classified as good (both numerator and denominator for TRH are reported), intermediate (qualitative reporting or either numerator or denominator are missing for TRH) or poor (no TRH reporting). Association of overall therapeutic effects with quality of TRH reporting was evaluated using chi-square tests and meta-analytic techniques.

**Results:** We evaluated 672 RCTs (754 comparisons, 223,084 patients). The quality of reporting of treatment-related morbidity was "good" in 23% (175/754), "intermediate" in 63% (475/754), and "poor" in 14% (104/754) of studies. The quality of reporting of treatment-related mortality was "good" in 58% (435/754), "intermediate" in 8% (64/754), and "poor" in 34% (255/754) of studies. There was no association between treatment superiority as concluded by trial investigators and quality of reporting of treatment-related morbidity ( $p=0.95$ ) or treatment-related mortality ( $p=0.93$ ). Meta-analysis according to quality of reporting of TRH also did not show an association in terms of favoring experimental or standard treatments for the outcomes of overall survival, event-free survival or the primary outcome.

**Conclusion:** We found no evidence of systematic bias attributed to quality of reporting of treatment-related harms on overall therapeutic effects. Investigators judged both harms and benefits when they drew conclusions about treatment superiority in this cohort of studies.

**Research supported by:** This study was funded by NIH Grant # R01 CA133594-01 PI: Dr. B. Djulbegovic MD, PhD

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**Abstract #: 127**

**Presented by: Sean Spence, BS, Med II Student**

***Autologous Chondrocyte Implantation and High Tibial Osteotomy: Patient Reported Outcomes***

Sean Spence (Morsani College of Medicine), Michael E. Trice, MD (Johns Hopkins School of Medicine), University of South Florida, Morsani College of Medicine, Orthopaedics and Sports Medicine

**Keywords:** Autologous Chondrocyte Implantation Articular Cartilage

**Objective:** Autologous chondrocyte implantation (ACI) has been employed with considerable success in patients with full-thickness or near full thickness chondral lesions. Varus deformity is a relative contraindication to ACI in patients with chondral lesions of the medial femoral condyle (MFC). We studied clinical outcomes after ACI and corrective high tibial osteotomy (HTO) for medial femoral condylar lesions in varus knees.

**Methods:** Autologous chondrocyte implantation (ACI) has been employed with considerable success in patients with full-thickness or near full thickness chondral lesions. Varus deformity is a relative contraindication to ACI in patients with chondral lesions of the medial femoral condyle (MFC). We studied clinical outcomes after ACI and corrective high tibial osteotomy (HTO) for medial femoral condylar lesions in varus knees.

**Results:** 5 of 6 of patients (N=6) showed improvement across reported outcome measures. One patient reported an unsatisfactory outcome 8 months post surgery.

**Conclusion:** Patient reported outcome measures show strong evidence of benefit from ACI and HTO in patients with isolated MFC lesions. More long term objective and subjective outcome studies are needed to determine efficacy of this combined procedure.

**Research supported by:** Nth Dimensions, The American Academy of Orthopaedic Surgeons

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**Abstract #: 128**

**Presented by: Athanasios Tsalatsanis, PhD, Faculty**

***Dual System Model for Medical Decision-Making: An Extension to Include Diagnostic Testing***

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**Keywords:** Dual Processing Theory, Dual System Model

**Objective:** Dual Processing Theory (DPT) suggests that human cognition is governed by two distinct systems underlying reasoning: an affect-based system and an analytical system. Based on DPT we have previously derived a Dual System Model (DSM) to describe and explain medical decision-making. Here we extend our work to include a wider class of decision problems that involve diagnostic testing.

**Methods:** We analyzed a general decision schema that include 3 management strategy: 1. provide treatment 2. perform a diagnostic test and 3. withhold treatment. We derived the extensions to the Dual System Model to include the expected valuation of all strategies and developed the threshold probabilities for performing diagnostic testing. In our analysis, we considered harms and benefits of treatment as well as harms associated with the diagnostic test. Finally, we demonstrated the applicability of the proposed model in a typical clinical scenario considering the management of a patient evaluated for prostate cancer.

**Results:** The derived threshold probabilities of testing extend the corresponding threshold probabilities that are based on Expected Utility Theory (EUT) to include the influence of the affect-based system of human cognition. Based on the hypothetical scenario we showed that in most cases physicians prefer to order diagnostic tests before performing a radical prostatectomy. Compared to other models of decision making that rely on EUT, DSM demonstrated the ability to explain variations between the decisions physicians make and the decisions physicians should make.

**Conclusion:** We have extended the recently derived DSM for medical decision making to include decisions considering diagnostic testing. Our model provides understanding of how physicians make decisions.

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***Are Stress Management Interventions Effective in Improving Glycemic Control in Adults with Type 2 Diabetes? A Systematic Review and Meta-Analysis***

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**Keywords:** Type 2 diabetes Stress management interventions Meta-analysis glycemic control HbA1c

**Objective:** Diabetes is a metabolic disturbance associated with defects in insulin production, action, or both that result in high levels of blood glucose. Studies indicate that glycemic control is affected by stress. Stress management techniques can diminish the negative effects of stress. We aim to assess the efficacy of stress management interventions on long-term glycemic control as measured by glycosylated hemoglobin in adults with type 2 diabetes.

**Methods:** A comprehensive search of CINAHL, Cochrane CENTRAL, PsycInfo, PubMed, UMI Proquest Digital Dissertations, and Web of Science was performed. Studies published between January 1, 1976 and December 31, 2011 were retrieved. 'Stress management intervention' was defined as: any method, activity or program focused on assisting people with type 2 diabetes in coping/managing stress using some kind of physical relaxation, meditation, and/or cognitive-behavioral-change technique.

**Results:** Database and hand searches identified 1,768 citations from which 22 studies met inclusion criteria; 13 were randomized controlled trials (RCTs) and 9 were quasi-experimental. Pooled results from the 22 studies enrolling 1,932 patients showed a statistically significant beneficial effect of stress management interventions on glycemic control (standardized mean difference was -0.28; 95% CI: [-0.37, -0.19];  $p < 0.00001$ ). Among the pooled studies, heterogeneity was significant ( $I^2=62\%$ ). Heterogeneity disappeared when analysis was restricted to RCTs ( $I^2=0\%$ ). When data were analyzed separately for the RCTs and quasi-experimental trials, the overall effect was still significant.

**Conclusion:** Our meta-analysis showed that stress management interventions are helpful in improving long-term glycemic control in adult patients with type 2 diabetes.

***Overall Survival Analysis of Acute Erythroleukemia***

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**Keywords:** Acute leukemia, Erythroleukemia, Overall survival

**Objective:** The clinical and pathologic features of acute erythroleukemia (AEL) have not been clearly defined. This study is to analyze the overall survival rate of AEL patients, to compare the overall survival in high-grade MDS, de novo AEL, MDS-AEL and AML-MRC, and to analyze the impacts of multiple factors on the overall survival.

**Methods:** AEL cases from the MCC archive between 2001 and 2011 were retrieved, identifying 77 cases of AEL. De novo AEL, cases evolved from antecedent MDS (MDS-AEL), and cases of AML-MRC were reviewed. Patient survival was analyzed with Kaplan-Meier method and survival curves were compared by the logrank test.

**Results:** Patients with de novo AEL had better prognosis than those with AML-MRC. High-grade MDS with erythroid predominance (23 cases) had a median survival of 51 months, compared to 45 months for MDS-AEL. The survival rate was significantly better in the patients with blast counts consistently lower than 10% of all bone marrow cellularity even though an AEL was diagnosed. Patients with normal karyotype (29 cases) had significantly better overall survival than the patients with abnormal or complex karyotypes (48 cases) ( $p=0.0017$ ). The overall survival was not significantly different among the different groups that received azanucleosides chemotherapy or standard induction therapy, with or without a bone marrow transplant.

**Conclusion:** Our findings suggest that there are overlapping features among high-grade MDS, AEL and AML-MRC. Patients with cytogenetic changes have worse survival than the ones with normal karyotypes. Different therapies including azanucleosides chemotherapy, standard induction chemotherapy and bone marrow transplant have not significantly changed the overall survival.

***The Effect of Altered Ratios of Cysteine/Cystine (Cys/CySS) and Hypoxanthine/Xanthine Oxidase (HX/XO) on Human Dermal Fibroblasts (HDFs)***

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**Keywords:** wound healing, oxidative stress, fibroblasts

**Objective:** Determine how alterations in the Cys to CySS or HX to XO ratio, both models of extracellular oxidative stress intended to mimic the effect of leukocyte activity on wound healing, influence the production of reactive oxygen species (ROS) by HDFs and their proliferation. We hypothesize that an oxidized Cys/CySS will promote cell proliferation, while an increase in HX/XO will inhibit cell proliferation.

**Methods:** HDFs were derived from tissue obtained from 20-40 years old human patients under an IRB approved protocol. These were subcultured into 96 well plates (~10,000 cells/well). Different extracellular Cys/CySS redox potentials were established by varying the concentration of Cys and CySS added to cysteine free Dulbecco's modified Eagle's medium. The redox potentials tested were 0mV, -20mV, -40mV, -80mV, -100mV, and -120mV. ROS were measured in dihydroethidium and a platereader set for the dye's excitation/emission ratio. Similarly, cultured HDFs were exposed to varying ratios of HX/XO. After incubation, the ROS produced were measured. In both procedures, cell counts were performed after incubation to determine the number of viable cells after treatment with Cys/CySS or HX/XO.

**Results:** A consistent trend of ROS production or cell viability using Cys/CySS could not be obtained. However, a dose-response curve was generated using HX/XO indicating increased ROS production and decreased cell viability at increasing concentrations of HX/XO.

**Conclusion:** This experiment successfully identified cell culture conditions containing HX/XO that can generate varying amounts of ROS, while maintaining the viability of the cells involved. These conditions may be applied in the future to determine the difference in ROS production between young and aged HDFs.

**Research supported by:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine.

***Discovery in Melatonin Derivatives against Alzheimer's Disease***

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**Keywords:** Alzheimer's Disease, Melatonin Derivatives, N2a/APP cells, anti-aggregation

**Objective:** Melatonin has been long been used as a small molecule pharmacy to regulate circadian syndrome. Recently, its great potential of anti-Alzheimer's disease has been discovered and mechanism has been studied, such as anti oxidative stress, interaction with aggregation of beta-amyloid peptide. In our study, 10 candidate compounds were synthesized based on structure of melatonin. Their potential of anti- Alzheimer's diseases was also evaluated using in-vitro anti-aggregation assay. Their ex vivo assay was also performed on genetic engineered APP mutated Neuroblastoma cells. This research provided information on drug development for Alzheimer's diseases, especially on melatonin-like small molecule derivatives.

**Methods:** 1. Solid Phase Peptide synthesis was used to establish compound library. 2. HPLC and LC-MC was used to verify structure of compounds. 3. In-vitro anti-aggregation assay was performed using Abeta1-40 synthesized peptide. Thioflavin T assay was also performed. 4. Tissue culture technique on N2a/APP mutant mice neuroblastoma cells was used for ex vivo study. 5. ELISA assay on Abeta1-40 peptide was performed to screen Alzheimer's related protein.

**Results:** Efficiency of compounds was evaluated. 2 out of 10 compounds provided positive results in both anti-aggregation and ThT assay. Although with similar structure, derivatives of melatonin shows different effect of adjusting Abeta level in N2a APP cells.

**Conclusion:** Here in this research, we found 2 melatonin derivatives that contain great potential against Alzheimer's diseases. This discovery also provided information for further design of anti-Alzheimer's pharmacy.

**Research supported by:** Startup Founding, University of South Florida

**Abstract #: 133**

**Presented by: Jonathan Braue, BS, Med II Student**

***Identification of Modulators of Protein Acyltransferase from a Natural Product Library***

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**Keywords:** DHHC9 Modulators

**Objective:** Protein Acyltransferases (PATs) are a family of enzymes that posttranslationally modify proteins with the long chain acyl group, palmitate. Palmitoylation regulates membrane association, subcellular trafficking, and protein stability. Mutations in PAT genes are linked to many diseases such as X-linked Mental Retardation (XLMR) and cancer. However, there are currently no good chemical modulators or drug leads for PATs. The goal of this project is to identify lead compounds that inhibit the human PAT, DHHC9, from a chemical library Antarctic sea life.

**Methods:** A 96-well plate assay was developed to screen DHHC9. The assay is based on the production of CoA upon transfer of palmitate to the enzyme. The production of CoA was coupled to reduction of NAD<sup>+</sup> via  $\alpha$ -KDH, which in turn is measured in 96 well microtiter format using a fluorometer.

**Results:** Four compounds were 3 std below the mean activity in our experiments and thus antagonistic, and one compound was 3 std above the mean activity in the experiments and thus agonistic. Three of the compounds are in a family of macrolides known to be V-ATPase inhibitors, and cytotoxic against melanoma cells. The other hits have been implicated as antibiotics and antivirals. Secondary screens were set up to ensure that the inhibitors did not affect KDH and to further characterize the nature of inhibition against DHHC9.

**Conclusion:** Our data show compounds from this library do modulate DHHC9-GCP16. Due to growing evidence that PATs play a role in human diseases, further evaluation of our hits is warranted. Also, the viability of our assay renders it an excellent platform for analysis of other libraries.

**Research supported by:** USF College of Medicine Scholarly Concentration Program stipend.

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**Abstract #: 134**

**Presented by: Shelly DeForte, PhD, Graduate Student**

***A sequence based analysis of disorder in sirtuin proteins***

Shelly M DeForte, Vladimir N Uversky (Department of Molecular Medicine, University of South Florida, Morsani College of Medicine), University of South Florida

**Keywords:** enzyme mechanisms, disordered proteins, bioinformatics, Sirtuin

**Objective:** Sirtuins are a family of enzymes ubiquitous throughout all phyla of life. Collectively, they are important modulators of energy metabolism and stress resistance. Sirtuins are defined by a catalytic core which is highly conserved throughout all organisms. While much is known about the biochemistry of the conserved catalytic domain, less is understood about the function of the variable N and C terminals. Sirt1, the most well studied of the sirtuins, has extensive disorder in its N and C terminals and this flexibility has been shown to be critical to sirt1 function. Little is currently known about the prevalence of disorder throughout the sirtuin family, however preliminary results suggest that the catalytic domain tends towards structure, while the N and C terminals often contain flexible regions. Examining the pattern of disorder throughout a family of proteins can provide clues to conserved functional behavior. Therefore, the objective in this research is to perform a bioinformatics examination of the disordered regions throughout all sirtuins, and to look for correlations between sirtuin function and location, phylogenetic placement, and pattern of disorder.

**Methods:** Sequence based analysis of disorder will be performed by PONDR VLXT and ANCHOR. Sequence alignments will be obtained with the use of ClustalW, with phylogenetic construction through MEGA 5.

**Results:** A sequence based analysis suggests that sirtuins are enriched in disorder in the N and C terminal regions, while the catalytic domain tends to be structured.

**Conclusion:** Our findings show a conserved pattern of disorder in many proteins in the sirtuin family. Flexibility may provide a functional advantage in this important family of enzymes.

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**Abstract #: 135**

**Presented by: Erica J. Fratz, MS, Graduate Student**

***Protoporphyrin IX Accumulation and Light-Induced Cell Death Resulting from Overexpression of Murine Erythroid 5-Aminolevulinic Synthase Variants***

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Molecular Medicine

**Keywords:** Heme, 5-aminolevulinic synthase, protoporphyrin IX, photodynamic therapy

**Objective:** 5-Aminolevulinic synthase (ALAS) catalyzes the reaction of succinyl-CoA and glycine to produce 5-aminolevulinic (ALA), carbon dioxide, and CoA, the first and rate-limiting step of the heme biosynthetic pathway in animals. Erythroid ALAS (ALAS2) is negatively regulated by heme at the level of mitochondrial import and, in its mature form, certain mutations of the murine ALAS2 active site loop result in an increase in production of protoporphyrin IX (PPIX), the precursor for heme. Interestingly, generation of PPIX is a crucial component in the widely used cancer photodynamic therapy (PDT). ALAS2 variants that cause accumulation of PPIX provide a novel means of targeted photosensitization.

**Methods:** In order to assess the potential utility of ALAS2 variants in PPIX production for PDT, K562 cells and HeLa cells were transfected with plasmids encoding ALAS2 variants and the level of accumulated PPIX was analyzed using flow cytometry with fluorescence detection. Further, cells overexpressing ALAS2 variants were subjected to light treatments after which cell viability was measured.

**Results:** In HeLa cells, we found that transfection of murine ALAS2 hyperactive variants, specifically those with mutated mitochondrial presequences and with the R433K mutation, cause significant accumulation of PPIX. The addition of glycine increases PPIX accumulation in HeLa cells, and addition of glycine or desferrioxamine increases PPIX in K562 cells. Light treatments revealed that ALAS2 overexpression in HeLa cells results in photosensitization and cell death.

**Conclusion:** Thus, the delivery of very active and stable ALAS2 variants has the potential to considerably improve current ALA-PDT.

**Research supported by:** The American Heart Association Grant #10GRNT4300073.

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**Abstract #: 136**

**Presented by: Jutaro Fukumoto, PhD, Postdoc**

***ASC Plays a Role in Maintaining Epithelial Integrity under Oxidant Stress***

Jutaro Fukumoto<sup>1</sup>, Itsuko Fukumoto, Oluwakemi Phillips, Ruan Cox Jr, Prasanna Tamarapu Parthasarathy, Venu Lagishetty, Richard F. Lockey and Narasaiah Kolliputi, University of South Florida, Morsani College of Medicine, Department of Internal Medicine

**Keywords:** ASC, acute lung injury, hyperoxia, inflammasome, epithelial cell integrity

**Objective:** Acute lung injury (ALI) is a major clinical problem in the United States. Inspiration of high concentration of oxygen is a palliative therapy which counteracts hypoxemia caused by ALI-induced pulmonary edema. However, animal experiments so far have shown that hyperoxia itself could deteriorate ALI through reactive oxygen species (ROS). Our previous study revealed that NLRP3, a sensor component of inflammasome complex, plays a major role in hyperoxia-induced ALI (HALI) in mouse. Meanwhile, the role of Apoptosis-associated speck-like protein containing a carboxy-terminal CARD (ASC), an adaptor component of NLRP3 inflammasome, in HALI remains elusive. In this study, we investigated whether ASC deficiency in alveolar macrophages would lead to blunted inflammatory cytokine secretion and modified alveolar epithelial cell (A549) integrity.

**Methods:** We used bone marrow-derived macrophages (BMMs) harvested from wild type and ASC<sup>-/-</sup> mice. BMMs were subjected to hyperoxic conditions in the presence or absence of LPS. Supernatants from these cells were used to treat A549 cells and transepithelial resistance (TER) was measured. Further, protein expression of E-cadherin by A549 cells exposed to BMM-derived supernatants was used as a measure of epithelial integrity.

**Results:** Our results reveal that A549 cells treated with ASC<sup>-/-</sup> BMM supernatant under hyperoxic conditions showed decreased TER in comparison to WT BMM supernatant treatment. The expression of E-cadherin in these cells was also decreased in comparison to WT hyperoxic control.

**Conclusion:** These results suggest that ASC may play a role in aiding alveolar macrophages maintaining epithelial integrity under oxidant stress.

**Research supported by:** AHA Grant 09SDG2260957 and NIH R01 HL105932

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**Abstract #: 137**

**Presented by: Robert Lorch, BS, Graduate Student**

***Inhibition of Apoptosis Signal-Regulating Kinase 1 Prevents Progressive Diabetic Nephropathy in Mice***

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**Keywords:** ASK1, diabetic nephropathy, db/db eNOS<sup>-/-</sup>, p38, 8-isoprostane

**Objective:** Altered signaling and increased apoptosis of podocytes are important components of glomerular injury in diabetic nephropathy (DN). Apoptosis Signal-Regulating Kinase 1 (ASK1) is activated by oxidative stress and high glucose in mesangial cells and endothelial cells in vitro, and is implicated in apoptosis, differentiation, and inflammation. We aimed to investigate effects of a selective ASK1 inhibitor on progression of DN in db/db eNOS<sup>-/-</sup> mice. We hypothesized that treatment prevents the progression of diabetic kidney injury by protecting podocytes from ASK1-mediated apoptosis.

**Methods:** Ten week old db/db eNOS<sup>-/-</sup> mice were administered 0.3% (by weight) of ASK1 inhibitor in their chow for eight weeks (N=9) and sacrificed at age 18 weeks to assess histopathology on tissues acquired at autopsy. The experimental group was compared to a placebo control group (N=14) sacrificed at 18 weeks and a baseline group (N=8) sacrificed at age 10 weeks.

**Results:** ASK1 inhibitor treatment improved renal function (GFR) compared to the placebo-fed group, as well as improved progressive proteinuria. Treatment with ASK1 inhibitor also reduced glomerular injury, assessed by glomerular injury score. Deposition of collagen matrix was reduced by ASK1 inhibitor treatment, and immunostaining of WT-1 showed reduced loss of podocytes. Treatment resulted in reduced urine levels of the oxidative stress marker 8-isoprostane and decreased levels of activated p38 in renal cortex tissue.

**Conclusion:** Treatment with an ASK1 inhibitor markedly slows progression of DN in mice and halts progressive glomerulosclerosis and apoptosis in the kidney. These results suggest a protective effect of ASK1 inhibitor on podocytes and support the ASK1 pathway as a therapeutic target for the treatment of DN.

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**Abstract #: 138**

**Presented by: Yiru Qin, Graduate Student**

***One-step Fast and Facile Preparation of Graphene Quantum Dots from Graphite for Bioimaging Application***

Yiru Qin<sup>1,2</sup>, Shu-Feng Zhou<sup>1,2,\*</sup> <sup>1</sup>Department of Pharmaceutical Science, College of Pharmacy, University of South Florida, Tampa, FL; <sup>2</sup>Department of Molecular Medicine, College of Medicine, University of South Florida, Tampa, FL

**Keywords:** Graphene quantum dots, fluorescence, cytotoxicity, bioimaging

**Objective:** Graphene quantum dots (GQDs) are a promising alternative fluorescent probe of traditional fluorophore probes due to their excellent chemical and optical properties. In contrast to organic dyes and fluorescent proteins, GQDs have high resistance of photobleaching and exceptional resistance to chemical degradation. However, the difficulty to obtain GQDs limits their application. To address this problem, we developed a fast and facile preparation route of GQDs directly from graphite by a one-step hydrothermal reaction.

**Methods:** A graphene sheet was cut via a one-step hydrothermal oxidation process into graphene quantum dots. TEM, FTIR, and Raman Spectroscopy were used to characterize GQDs. MTT analysis was used to measure relative viabilities of Jar and A549 cancer cell lines. Cellular imaging was performed by laser-scanning confocal microscopy.

**Results:** Low cytotoxicity, highly green fluorescent GQDs with a size range of 10 nm to 20 nm were synthesized. Raman Spectroscopy and Fourier Transform infrared spectroscopy indicated the successful preparation. Furthermore, we also labeled live cells by GQDs to demonstrate their long-term stable capabilities of bioimaging application.

**Conclusion:** We successfully developed a one-step, fast, and facile preparation method of graphene quantum dots directly from graphite and those quantum dots can be used as a fluorescent probe for cancer cell imaging.

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**Abstract #: 139**

**Presented by: Krishna Reddy, BS, Graduate Student**

***Global Sequence-based Analysis of DHHC Palmitoyltransferases***

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**Keywords:** palmitoylation, DHHC, enzyme mechanisms, cysteine rich domain

**Objective:** Palmitoylation is a post-translational modification essential to normal cellular function, and defects in this process are associated with human disease. This reaction is catalyzed by the DHHC family of enzymes, which consists of 23 proteins in humans and 7 in yeast. DHHC enzymes are characterized by 4-6 transmembrane domains and a cysteine-rich domain (CRD), which contains a DHHC (Asp-His-His-Cys) motif that is essential to proper enzymatic function. However, there are other regions of the protein that have not been well characterized that are essential to function. The aim of this study is to characterize functionally conserved regions DHHC proteins.

**Methods:** A combination of computational sequence-based predictive tools and experimental techniques will be used in this study.

**Results:** We have identified new sequence motifs and protein domains, through co-divergence analysis of the CRD domain and C-terminus, that indicate previously uncharacterized substrate interaction domains and zinc binding motifs. Zinc binding stoichiometry and effect on enzyme function was experimentally confirmed.

**Conclusion:** DHHC proteins have several regions essential to proper enzymatic function, and the complexity of this family is only just beginning to be understood.

**Research supported by:** NIH Grants CA50211 and GM73976

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**Abstract #: 140**

**Presented by: Huquan Yin, PhD, Postdoc**

***MIR-217 Is a Major Inflammatory Regulator in Experimental Alcoholic Steatohepatitis***

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**Keywords:** microRNA, ethanol, liver, inflammation, macrophage

**Objective:** Dysregulation of pro-inflammatory cytokines such as tumor necrosis factor-alpha (TNF- $\alpha$ ) contributes to the development of alcoholic steatohepatitis. Our group recently identified miR-217 as a major novel and specific target of ethanol in liver. miR-217 promotes ethanol-induced lipid accumulation in hepatocytes.

**Methods:** In the present study, we investigated the role of miR-217 in regulating the inflammatory responses from lipopolysaccharide (LPS), ethanol, and the combination of ethanol and LPS (EL) in two cultured macrophage cell lines.

**Results:** In both rat Kupffer cell line 1 (RKC1) and murine RAW264.7 macrophages, treatment with LPS or ethanol caused substantial increases in miR-217 compared with controls. Ethanol drastically exacerbated LPS-mediated induction of miR-217 in both macrophage cell lines. Overexpression of miR-217 promoted generation of a panel of inflammatory cytokines in macrophages exposed to LPS, ethanol, or EL compared to the controls. Mechanistic studies demonstrated that miR-217 promoted EL-mediated impairments of sirtuin 1 (SIRT1), a known inhibitor of inflammation. The miR-217-mediated SIRT1 inhibition led to increased activities of nuclear transcription factor (NF- $\kappa$ B) and the nuclear factor of activated T cells c4 (NFATc4), which, caused excessive production of a panel of inflammatory cytokines in cultured macrophage cell lines.

**Conclusion:** Taken together, our findings suggest that miR-217 is a major inflammatory regulator involved in development of alcoholic steatohepatitis. Our novel findings shed light on the pathogenesis of alcoholic hepatitis. Our study also raises the possibility that manipulation of miR-217 may have therapeutic potential for treating human alcoholic steatohepatitis.

**Research supported by:** NIAAA R01AA013623 and R01AA015951

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***Intravenous Human Adipose Stem Cell Grafts Protect the Brain from Neurodegeneration, Motor and Cognitive Impairments: Biodistribution of hADSCs in Young and Aged Rats***

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**Keywords:** human adipose stem cells, transplantation, neurocognitive, motor, TBI

**Objective:** Traumatic brain injury (TBI) survivors exhibit neurological, motor and neurocognitive symptoms from the primary injury which can aggravate over time due to secondary cell death. In the present in vivo study, we examined the beneficial effects of human adipose stem cells (hADSCs) in a controlled cortical impact (CCI) model of mild TBI using young (6 months) and aged (20 months) F344 rats.

**Methods:** Young and aged rats were subjected to mild TBI and treated with 4x10<sup>6</sup> ADSCs (Tx), conditioned media (CM) or control media (M) at 3 hours post TBI. ADSC's labeled with DiR were imaged using the IVIS imager at 1hr to 3 days post injury. Motor and cognitive tests were performed.

**Results:** We observed amelioration of motor and cognitive behavior in young Tx and CM groups, but there was less improvement in aged rats. Fluorescent (FL) imaging revealed ADSC's moved to organs and brain within 1 to 12 hours following TBI. In aged rats decreased FL was seen in spleen, however higher FL was observed in brain at 12 – 72 hours post TBI. The impact volume in cortex was reduced in young rats with Tx and CM, however in aged rats this effect was decreased and only Tx reduced impact volume. Peri-impact area was reduced to a similar extent in both young and aged rats with both Tx and CM. In addition, there was a decrease in hippocampal CA3 neuron loss in young and old rats treated with Tx.

**Conclusion:** Results show that hADSCs is a promising therapeutic intervention to rescue against TBI-induced behavioral and histological impairments with better functional recovery in young animals, likely due to robust migration of the transplanted cells to peripheral organs quickly in young animals despite increased stem cell recruitment to the injured aged brain.

***Development of Manganese-containing Chitosan Nanoparticles for Intranasal Delivery of RNA Interference to the Brain***

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**Keywords:** RNA Interference, Nanomedicine, Huntington's Disease, Intranasal Delivery

**Objective:** The blood brain barrier limits drug therapy for central nervous system diseases. The olfactory nerve terminals in the olfactory epithelium can transport divalent metals including manganese (Mn) via the DMT1 transporter into the CNS, making intranasal delivery an alternate route. This project seeks to design chitosan (CS) nanoparticles (NPs) with incorporated Mn to deliver intranasally small interfering RNA (siRNA) against mHtt mRNA for the treatment of Huntington's disease. Here we compare two NP synthesis methods and evaluate the effects of CS to siRNA ratio (N:P) and molecular weight of CS on in vitro transfection efficiency of NPs.

**Methods:** The first method mixed CS and red-fluorescing siRNA with varying N:P ratios to form polyelectrolyte complexes that did not contain Mn. The second method used reverse microemulsions (RE) to covalently cross-link CS with various polycarboxylic acid linkers, some of which were functionalized to chelate Mn; resultant NPs were purified and mixed in varying N:P ratios with siRNA. Transfection efficiency was measured in SH5Y-HY neuroblastoma cultures using flow cytometry and fluorescence microscopy.

**Results:** Polyelectrolyte NPs, RE NPs, and RE Mn-containing NPs achieved peak transfection efficiencies of 10%, 75%, and 44.8%, respectively. Both higher N:P ratios and lower molecular weight CS produced higher efficiencies. Efficiencies varied with different linkers.

**Conclusion:** These results suggest that the RE NPs are preferable candidates for further study. The role of Mn inclusion is still unclear, though upcoming in vivo studies in mice of intranasally instilled NPs will show whether Mn can target the DMT1 transporter and enhance CNS delivery of siRNA.

**Research supported by:** HD Research Fund, USF Foundation; Scholarly Concentration Program

Abstract #: 143

Presented by: Laura Blair, BA, Graduate Student

***FKBP51/FKBP5 Accelerates Alzheimer's Disease Pathogenesis By Slowing Tau Turnover And Altering Tau Aggregate Structure***

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**Keywords:** FKBP5, FKBP51, Alzheimer's disease, tau, Hsp90

**Objective:** To explore the role of FKBP51 on modulating tau through Hsp90.

**Methods:** Biochemical analysis of recombinant protein was performed using circular dichroism (CD), dynamic light scattering (DLS), and atomic force microscopy (AFM). We used stereotaxic injections to deliver FKBP5 tagged AAV particles into the hippocampus of rTg4510 tau mice. Immunohistochemistry was performed on brain tissue to evaluate tau protein levels. Human mRNA and DNA were evaluated for gene expression and methylation.

**Results:** Recombinant tau assays reveal that FKBP51 together with Hsp90 acts to preserve tau in an intermediate state. We find that FKBP51 in conjunction with Hsp90 preserves tau and prevents tau from forming silver-positive tangles. FKBP51 overexpression in tau mice is neurotoxic. FKBP5 levels increase with age and correlate with BRAAK staging in Alzheimer's disease (AD). DNA methylation of FKBP5 decreases significantly with age along with non-significant trend with AD.

**Conclusion:** Overall this work suggests age-dependent FKBP51 expression could cause a homeostatic imbalance leading to the preservation of tau. Furthermore, tau toxicity could be heightened by FKBP51 dysregulation.

**Research supported by:** NIH R01 6144106100

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Abstract #: 144

Presented by: Leonid Breydo, PhD, Faculty

***Effects of Different Types of Crowding Agents on Protein Aggregation***

Leonid Breydo, Krishna Reddy, Alessandro Piai, Isabella C. Felli, Roberta Pierattelli, Vladimir N. Uversky University of South Florida, Morsani College of Medicine, Molecular Medicine

**Keywords:** protein biophysics, macromolecular crowding, protein aggregation

**Objective:** Protein aggregation has been associated with a variety of human diseases. The precise mechanism of protein aggregation is still poorly understood. The problem is further complicated by the fact that the in vivo environment is very crowded with macromolecules occupying up to 30% of the available volume. The goal of this study was to examine the effects of different types of crowding agents on protein aggregation.

**Methods:** Fluorescence and FTIR spectroscopy, electron microscopy, NMR, calorimetry.

**Results:** We have shown that effects of crowding agents on protein aggregation are complex and strongly depend on the structure of both proteins and polymers. Increased rigidity of polymers leads to increased inhibition of protein aggregation. Lower degree of intrinsic disorder in proteins makes them more sensitive to the effect of polymers.

**Conclusion:** Most previous studies of the effects of macromolecular crowding on protein aggregation have used neutral, flexible polymers (usually polysaccharides) as model crowding agents. These polymers promote protein aggregation and are believed to act primarily via excluded volume effect. We have shown that the situation is more complex and other factors such as non-specific chemical interactions of proteins with polymers are likely to be involved in the phenomenon of macromolecular crowding.

**Research supported by:** startup

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**Abstract #: 145**

**Presented by: Jessica Chang, PhD, Postdoc**

***Withania Somnifera Extract Protects Model Neurons From in Vitro Traumatic Injury***

Jessica N. Chang<sup>1,2</sup>, Haris Hatic<sup>1</sup>, Eisha Shaw<sup>3</sup>, Vijayalakshmi Ravindranath<sup>3</sup>, and Bruce A. Citron<sup>1,2</sup> <sup>1</sup>Laboratory of Molecular Biology, Research and Development, Bay Pines VA Healthcare System, <sup>2</sup>Department of Molecular Medicine, University of South Florida, Morsani College of Medicine, and <sup>3</sup>Centre for Neuroscience, Indian Institute of Science, Bangalore, India

**Keywords:** Traumatic Brain Injury, *Withania somnifera*, Ayurveda

**Objective:** Ayurvedic medicines have been used for millenia, but the efficacy and mechanisms are largely unknown. The root of the *Withania somnifera* plant has been used to treat several disorders including neurodegeneration and likely increases antioxidant capacities. We sought to determine whether this extract can protect cultured neurons from an in vitro injury that mimics a traumatic brain injury.

**Methods:** Neuronal cultures were plated on a silastic membranes and treated with 20 µg of *W. somnifera* root extract. A brief pressure pulse produced a momentary biaxial stretch injury of the neurons to mimic the rotational forces that occur following a traumatic brain injury. Neuronal health was evaluated by annexin and propidium iodide staining, monitoring lactose dehydrogenase activity, and measuring neuronal processes. Quantitative RT-PCR and Western blots were performed to examine potential mechanistic changes in selected mRNAs and proteins.

**Results:** Pretreatment with *W. somnifera* root extract produced a significant decrease in annexin and PI staining following traumatic injury as well as a decrease in released lactose dehydrogenase activity. Measurement of neuronal processes indicated that the treatment benefited both the number and length of processes extending from neurons following traumatic injury. Significant differences were not found in the expression of the antioxidant transcription factor Nrf2 or HSP70.

**Conclusion:** *W. somnifera* extract was able to protect neurons from model traumatic brain injury in vitro. We will next determine the underlying molecular processes responsible for the neuroprotection observed in this system.

**Research supported by:** The Department of Veterans Affairs, The Bay Pines Foundation, and the James & Esther King Postdoctoral Fellowship.

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**Abstract #: 146**

**Presented by: Ming Chen, PhD, Faculty**

***High-Energy Compounds Promote Physiological Processing of Alzheimer's Amyloid-B Precursor Protein and Boost Cell Survival In Culture***

Ming Chen, Darrell R. Sawmiller and Huey T. Nguyen University of South Florida, Morsani College of Medicine Molecular, Pharmacology & Physiology

**Keywords:** biogenetics, amyloid, aging, Alzheimer's

**Objective:** Mitochondria and energy dysfunction underlies brain aging and Alzheimer's disease (AD). Thus, agents promoting energy levels may be useful for prevention of AD. Here we tested a group of high-energy compounds (HECs), including ATP, phosphoenol pyruvate (PEP) phosphocreatine (PCr) and acetyl coenzyme A (ACoA) for their roles in  $\alpha$ -processing of amyloid precursor protein (APP) and also in promoting neurons survival in the culture.

**Methods:** Measurements of APP secretion by Western blot and cell survival assay in cultured SH-SY5Y neurons

**Results:** We found that ATP, PEP, PCr and ACoA all potently promote APP  $\alpha$ -processing, whereas their cognate counterparts, i.e. ADP, pyruvate, creatine or coenzyme A did not show the same effects. The effects were abolished by energy inhibitors rotenone or NaN<sub>3</sub>. The overall efficacy of the HECs ranged from 3 to 4-fold, significantly greater than other physiological stimulators, suggesting that the HECs were perhaps the most efficient physiological stimulators for APP  $\alpha$ -processing when tested in vitro. Moreover, the HECs largely offset the inefficient APP  $\alpha$ -processing in aged human fibroblasts or in cells impaired by rotenone or H<sub>2</sub>O<sub>2</sub>. Most importantly, some HECs markedly boosted the survival rate of SH-SY5Y cells in the death process induced by energy suppression or oxidative stress.

**Conclusion:** These findings suggest a new regulatory mechanism for the putative  $\alpha$ -secretase. They also raise the possibility that the HECs may be useful to energize and strengthen the aging brain cells to slowdown the progression of AD.

**Research supported by:** US Department of Veterans Affairs Merit Review program

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**Abstract #: 147**

**Presented by: Travis Dailey, MS, Med II Student**

***Trophic Factor-Mediated Stem Cell Neuroprotection Against Kainic Acid Models of Epilepsy***

Travis Dailey, Yuji Kaneko, Naoki Tajiri, Hiroto Ishikawa, Kazutaka Shinozuka, Teresita Malapira, Linella Gemma, Fernando Vale, Cesar V. Borlongan University of South Florida, Morsani College of Medicine, Neurosurgery & Brain Repair

**Keywords:** Epilepsy, Stem Cells, Kainic Acid, Neurotrophic factors, Trophic factors

**Objective:** Epilepsy, in the United States, imposes an economic burden of \$15.5 billion in associated costs. Our team explores both the therapeutic efficacy and mechanism of stem cell media promoting cell survival during kainic acid (KA) exposure, an established in vivo and in vitro epilepsy model.

**Methods:** Using a rat primary hippocampal neuron model in vitro, cells incubated in 100µL cell media with 1µM KA were treated with 100µL of stem cell media for 1-4 days. Afterwards, an MTT assay analyzed viability. To further reveal the therapeutic benefits of stem cells, Sprague-Dawley rats with KA-induced epilepsy received intrahippocampal transplants of stem cells derived from cortical tissues of epileptic patients. Graft fate and its effects on the epileptic brain were examined.

**Results:** In vitro, all groups exposed to the stem cell media had significantly greater survival than the controls. Furthermore, transplantation of stem cells derived from the neocortex of epileptic patients both survived in the amygdala and reduced KA-induced hippocampal cell loss in epileptic rats. Transplanted cells migrated from the amygdala to hippocampal lesions, specifically the CA1 and CA3. However, graft survival and migration was low despite the rescue of hippocampal cells, suggesting a trophic factor mechanism similar to cell culture experiments.

**Conclusion:** Stem cell media provided a significant reduction in KA-induced cell death while epileptic patient stem cells afforded rescue of the epileptic hippocampus, likely via trophic factors. On-going projects are exploring neurotrophic factors, such as BDNF and NGF, involved in these observed therapeutic benefits of stem cell transplantation for treatment of epilepsy.

**RESEARCH SUPPORTED BY:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine and the Center of Excellence for Aging and Brain Repair.

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**Abstract #: 148**

**Presented by: Lancia Darville-Bowleg, PhD, Postdoc**

***In-depth Proteomic Analysis of Mouse Cochlear Sensory Epithelium by Mass Spectrometry***

Lancia Darville, Bernd Sokolowski ;University of South Florida, Morsani College of Medicine, Otology Laboratory, Department of Otolaryngology-Head and Neck Surgery, Tampa FL, University of South Florida, Morsani College of Medicine

**Keywords:** cochlea, high-resolution mass spectrometry, proteomics, sensory epithelium

**Objective:** Identification of the complete proteome in sensory organs such as the cochlea is challenging due to small amounts of tissue and because membrane proteins, such as ion channels, are difficult to isolate and identify. Several proteomic techniques have been developed, including 2D-DIGE, antibody microarray and mass spectrometry (MS). However, MS in conjunction with separation methods can provide a more comprehensive proteome because of its ability to enrich protein samples, detect hydrophobic proteins, and identify low abundant proteins by reducing its dynamic range.

**Methods:** We tried several separation techniques to maximize protein ID and applied Filter Assisted Sample Preparation for detergent removal and protein digestion prior to nano LC-MS/MS, to obtain an in-depth proteome analysis of 30-day-old mouse cochlear sensory epithelium. First, we fractionated extracted proteins using gel-eluted liquid fraction entrapment electrophoresis. In another approach, proteins were digested and separated by SCX or WAX chromatography. We also compared single and double digestions.

**Results:** Double digestion with SCX fractionation identified 3390 proteins with a 1% FDR (MaxQuant). GELFrEE yielded 2173 proteins, of which 511 were absent when using SCX. Gene ontology annotation showed that 59% and 51% are binding proteins and 32% and 40% are catalytic when comparing SCX and GELFrEE, respectively. Combining the results from the different techniques resulted in 4620 total protein IDs, including proteins not previously characterized in the cochlear.

**Conclusion:** The results show that the application of multiple approaches is needed to provide an exhaustive proteome analysis of the cochlear sensory epithelium that includes many membrane proteins.

**Research supported by:** NIDCD grant R01 DC004295 to BS.

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***Translational regulation of Ube3a.***

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**Keywords:** angelman syndrome, fragile X mental retardation, Ube3a, FMRP, local translation

**Objective:** Fragile X Mental Retardation (FXS) and Angelman Syndrome (AS) are two devastating neurodevelopmental disorders. Despite having different genetic origins and severity of the symptoms they both share similar cognitive deficits and are part of autism spectrum disorder. At present time, there is no known connection between AS and FSX. Our work provides insight on potential interaction between Ube3a (genetic cause of AS) and FMRP (genetic cause of FXS) that help us better understand the pathology of both diseases.

**Methods:** In current study we utilized a variety of molecular biology methods (immunohistochemistry, immunoblotting, etc) to investigate translational regulation of Ube3a at synapses and its connection to FMRP. We used synaptoneurosomal stimulation to explore changes in Ube3a restricted to post- and pre- synaptic compartments of neurons. Moreover, we employed genetic manipulation (double knockout mice) and viral injections to explore Ube3a dosage effect in Fmr1 KO mice.

**Results:** Our work demonstrated that Ube3a is subjected to translational regulation at the synapses. We observed increases of Ube3a protein in the synaptoneurosomal fraction in response to GluR1/5 stimulation. However, Ube3a expression was not changed during GluR1/5 activation in Fmr1 KO mice implying that FMRP is involved in Ube3a translational control. Furthermore, we discovered that Ube3a protein is decreased in synapses of Fmr1 KO mice suggesting that it could be a potential FMRP target.

**Conclusion:** This study is crucial for childhood neurodevelopmental disorders research. We are the first to show an interaction between AS and FSX. The connection between Ube3a and FMRP offers a novel way to re-examine these disorders and provides more potential therapeutic targets for both syndromes.

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***Correlative studies examining APP proteolysis under apoptotic and mitotic conditions provide valuable insights into pathogenic processing of APP***

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**Keywords:** Alzheimer's, amyloid precursor protein, proteolysis, cell cycle, apoptosis

**Objective:** Alzheimer's disease (AD) results from abnormal production and accumulation of amyloid beta, a proteolytic fragment of the amyloid precursor protein (APP). Aberrant cell cycle activation and apoptosis are also observed in the AD brain. Here, we investigate the contribution of cell cycle activation and apoptosis to APP proteolysis.

**Methods:** Cells were treated with various agents to synchronize their passage through the cell cycle or induce apoptosis. Cellular status was assessed by flow cytometry using propidium iodide. APP fragments in cell lysates and culture media were identified by western blot using various antibodies against epitopes along the APP peptide. Immunocytochemical analysis was also performed to assess phosphorylation and localization of APP and proteases.

**Results:** APP phosphorylation was observed in cells in G2/M phase and was associated with elevated levels of APP and APP C-terminal fragments. Cells in S phase, however, had markedly decreased levels of APP and APP C-terminal fragments. Cells undergoing DNA damage induced apoptosis also showed decreased levels of C-terminal fragments and secreted forms of APP and an increase in a novel proteolytic fragment derived from cleavage within the ectodomain of APP.

**Conclusion:** APP levels and proteolysis are regulated in a cell-cycle dependent manner. Apoptosis is associated with altered processing of APP. Since cell-cycle dysregulation and neuronal apoptosis are apparent in the brains of patients with AD, a careful analysis of APP proteolysis under different conditions may provide us with important information regarding APP-related mechanisms in AD pathogenesis.

**Research supported by:** NIH, Alzheimer's Association, USF Byrd Inst, Dept of Molecular Medicine

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**Abstract #: 151**

**Presented by: Joseph Grieco, MS, Graduate Student**

***Children Administered Minocycline Show Improvement in EEG, Neuropsychological Assessment Scores and Parent Defined Visual Analog Scales***

Joseph Grieco and Edwin Weeber, University of South Florida, Morsani College of Medicine, Department of Molecular Pharmacology and Physiology

**Keywords:** Minocycline, Angelman, Syndrome, synaptic plasticity, tetracycline

**Objective:** The objective of this study is to determine the effects of administering minocycline to participants with Angelman Syndrome.

**Methods:** During this IRB-approved study, participants completed three study visits each consisting of EEG monitoring, neurology examination and neuropsychological testing. Parents of the participants were also asked to identify 3 areas of behavior in which they wished to see changes. During each study visit, they evaluated their child's level of ability using the visual analog scale. After baseline testing, minocycline was administered to the participants for 8 weeks. The first follow-up visit was completed 8 weeks after the treatment with minocycline began. The minocycline was then discontinued, and after an 8 week wash-out period, another follow-up visit was completed.

**Results:** The results of the study show an improvement in raw scores of several domains of the Bayley Scale of Infant and Toddler Development including: expressive language, fine motor control, community use, functional pre-academics and self-direction. Parents observed improvements in verbal and non-verbal communication as well as a change in the ability to care for one's self.

**Conclusion:** The administration of minocycline to children with Angelman Syndrome is beneficial and contributes to increased communication, motor control and the ability to care for one's self. Further investigation is warranted and should include a larger scale, placebo controlled study design.

**Research supported by:** The Foundation for Angelman Syndrome Therapeutics

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**Abstract #: 152**

**Presented by: Beth Grimmig, BA, Staff**

***Disrupted Fractalkine Signaling Accelerates Aging and Leads to Impaired Cognitive Function***

Grimmig, B.,<sup>1</sup> Morganti, J.,<sup>2</sup> Hudson, C.,<sup>3</sup> Zdrojewski, M.,<sup>1</sup> Gemma, C.,<sup>4</sup> Bickford, P.C.,<sup>1,3,1</sup> Department of Neurosurgery and Brain Repair, USF Morsani College of Medicine Tampa, FL <sup>2</sup> Brain and Spinal Cord Injury Center, University of California, San Francisco, CA <sup>3</sup> James A. Haley VA Hospital, Tampa, FL <sup>4</sup> Department of Anesthesiology and Pain Medicine, University of Washington, Seattle WA

**Keywords:** Aging, Neurogenesis, Inflammation, Cognitive Function

**Objective:** CX3CL1 is a chemokine involved in neuronal-glia communication. We have observed that fractalkine receptor deficient mice (CX3CR1<sup>-/-</sup>) show signs of premature aging due to the interruption of normal receptor-ligand signaling. CX3CR1<sup>-/-</sup> mice show decreased hippocampal neurogenesis as well as deficits in cerebellar and hippocampal-dependent behaviors by 6 months of age. The objective of the current study was to elucidate similar characteristics of accelerated aging in mice missing the fractalkine ligand.

**Methods:** CX3CL1<sup>-/-</sup> mice and age-matched controls were evaluated at 6 and 15 months of age. Motor coordination and learning were assessed on the accelerated rotarod. Cognitive function was explored using contextual fear conditioning.

**Results:** At 6 months of age CX3CL1<sup>-/-</sup> mice show reduced neurogenesis, however no behavioral deficits were observed. In contrast, 15 month old CX3CL1<sup>-/-</sup> mice have impaired motor function, as indicated by their shorter latency to fall on the rotarod. The CX3CL1<sup>-/-</sup> mice show increased baseline freezing in the contextual fear conditioning. At 24 hours post training, there is a decrease in contextual freezing in the first minute of testing, but this disparity is diminished over the next 2 minutes. When mice were re-exposed to the context 2 months after training, the CX3CL1<sup>-/-</sup> mice retained significantly less freezing compared to the wild-type controls.

**Conclusion:** CX3CL1<sup>-/-</sup> mice have impaired hippocampal neurogenesis and subsequent behavioral deficits. These findings corroborate the initial observations that compromising fractalkine signaling interferes with the normal aging process. The absence of this suppressive chemokine is detrimental to both cognitive function and motor coordination.

**Research supported by:** The National Institute on Aging

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***Inflammatory Role of CD36 in a Rat Model of Traumatic Brain Injury***

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**Keywords:** Fatty acid translocase (FAT/CD36), traumatic brain injury (TBI), modified low density lipoprotein (mLDL), soluble receptor of advanced glycation end products(sRAGE)

**Objective:** Traumatic brain injury has prevalent occurrence due to intense military combat worldwide. Urgent clinical treatment is needed for wounded soldiers whose brains suffer massive cell loss, neighboring cells succumb to progressive neurodegeneration, inflammatory and cell death events. Recently CD36/FAT, a class B scavenger receptor of modified low-density lipoproteins in macrophages, has been implicated in lipid metabolism, atherosclerosis, oxidative stress, inflammatory response, tissue injury in cerebral ischemia, TBI, and certain neurodegenerative diseases.

**Methods:** Based on preliminary data implicating splenic CD36 expression after TBI and data suggesting the inhibitory action of sRAGE blocking CD36-mediated uptake of modified hypochlorite low density lipoprotein (HOCl-LDL) in different cell types we characterized pathological alterations in acute and chronic TBI stages with emphasis on neuroinflammation. Sprague-Dawley rats (n= 5 per group) were subjected to TBI using the controlled cortical impact injury model (CCI). After 5 days following surgery animals were anesthetized and perfused intracardially with saline. The brain was removed and processed accordingly for future immunohistochemical (IHC) staining against CD36, monocyte chemo attractant protein 1 (MCP-1), and cd11b for microglia.

**Results:** On-going studies are analyzing CD36-expressing cells in the brains of TBI rats, particularly at the core of injury and surrounding areas, which are likely to be co-localized with other inflammatory markers like MCP1 and CD11b.

**Conclusion:** Based on ischemic and hyperlipidemic rodent models, infiltrating monocytes/macrophages from the periphery are the major source of CD36 in the post-ischemic brain and may contribute to stroke-induced brain injury.

***Active immunization with Wild-Type and P301L Tau Results in an Immune Response and Changes in Levels Of Tau in rTg 4510 Mouse Model***

Steven B. Housley, M.S.<sup>1,5</sup>, #, Laura Blair<sup>1,2</sup>, Hayk Davtyan, Ph.D.<sup>3,4</sup>, Awa Sanneh<sup>1,5</sup>, TJ Mouse<sup>1,5</sup>, Dave Morgan, Ph.D.<sup>1,5</sup>, Marcia N. Gordon, Ph.D.<sup>1,5</sup>, Michael Agadjanyan, Ph.D.<sup>3,4</sup>, Chad Dickey, Ph.D.<sup>1,2</sup>, Maj-Linda B. Selenica, Ph.D.<sup>1,6</sup>, Byrd Alzheimer's Institute, University of South Florida, Tampa, FL; <sup>2</sup>Department of Molecular Medicine, Morsani College of Medicine, University of South Florida, Tampa, FL; <sup>3</sup>Department of Immunology The Institute for Molecular Medicine, Huntington Beach, CA; <sup>4</sup>The Institute for Memory Impairments and Neurological Disorders, University of California, Irvine, CA; <sup>5</sup>Department of Molecular Pharmacology and Physiology, College of Pharmacy, University of South Florida, Tampa FL. <sup>6</sup>Department of Pharmaceutical Sciences, College of Pharmacy, University of South Florida Tampa, FL

**Keywords:** Neuroscience, Immunology, Active-Immunization, rTG4510

**Objective:** Tau hyperphosphorylation and formation of neurofibrillary tangles, are hallmarks of Alzheimer's disease and similar tauopathies. We examined changes in phosphorylated tau and neurofibrillary tangle levels as well as cognitive function following active immunization with either non-mutated (WT) (4R0N) or P301L tau.

**Methods:** Non-transgenic (ntg) and rTg4510 mice are immunized with each protein or PBS four times, biweekly, followed by three booster immunizations, three weeks apart. Mice were bled and sera were analyzed for immune reactivity via Elisa. IFN $\gamma$  ELISPOT and [3H]-Thymidine Incorporation assays were performed on the splenocytes, and immunohistochemistry and western blots were performed on the brain. Y-maze is used to assess behavioral changes.

**Results:** High antibody titers against WT and P301L tau are observed in the sera, and increased IFN $\gamma$  and T-Cell activation are seen in the splenocytes. Immunohistochemistry analysis of total tau (H150) showed a significant decrease (p<0.05) in the WT. and a slight decrease in the P301L injected group when compared to controls. Additionally, levels of pS199/202 tau were significantly decreased (p<0.001) after immunization with both tau variants. Western blot data on the anterior cortex, soluble fraction shows similar results. Significance is observed with H150, in WT (p<0.01) and P301L (p<0.05) tau, and with PHF1 (paired helical filament-1) in P301L (p<0.01) when compared to controls. The Y maze revealed a significant (p<0.001) transgene effect between ntg and transgenic groups.

**Conclusion:** Our data demonstrates that active tau immunization may be useful in reducing tau levels. Further analysis of insoluble tau levels and assessment of brain inflammation is ongoing.

**Research supported by:** NIH grants and Byrd Institute-USF

***Relative Influence of Spatial Reasoning vs. Processing Speed on Neurocognitive Performance in Women with Multiple Sclerosis***

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**Keywords:** Multiple Sclerosis, Neuropsychology, Cognitive Impairment

**Objective:** This study assesses the differential influence of spatial reasoning and processing speed on neuropsychological measures that assess both domains together in women with Multiple Sclerosis (MS).

**Methods:** Subjects with MS (n=42; all women) were administered a standardized neuropsychological battery that included measures of spatial reasoning (Matrix Reasoning (MR) subtest of the Wechsler Abbreviated Scales of Intelligence [WASI]) and processing speed (Stroop Color-Word Test), as well as tasks that combine both domains (Block Design [BD] subtest of the WASI). Linear regression analysis was run to determine the predictive association of each "pure" domain measure, with the combined domain measure. Control analysis was also made for level of education, general intelligence (FSIQ), depression, state and trait anxiety. Age was also corrected for through pre-standardization of all measures.

**Results:** Significant association was observed for MR with BD (Beta = .757,  $p < .005$ ), Stroop with BD (Beta = .546,  $p < .005$ ), with Stroop and MR being highly correlated (Beta = .546,  $p < .005$ ). Linear regression analysis with each control variable yielded a Beta of .530 for MR/BD, and a Beta of .126 for Stroop/BD. This shows a 4.2 times greater magnitude of influence of MR on BD over Stroop after education, FSIQ, depression and anxiety were controlled for.

**Conclusion:** Processing speed is a known major impairment in MS due to the pathophysiology of the disease. These data indicate that measures of visuospatial reasoning are a more predictive domain than processing speed in determining impairment on Block Design in MS. This indicates that BD is a more spatially demanding task than it is of processing speed.

**Research supported by:** Grant supporting the University of South Florida Neuropsychology Database

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***Sex and Laterality Differences in Parkinsonian Impairment and Transcranial Ultrasound in Never-Treated Schizophrenics and Their First Degree Relatives.***

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**Keywords:** Schizophrenia Parkinsonism Gender Differences Transcranial Ultrasound

**Objective:** We tested the hypothesis that loss of substantia nigra neurons in subjects at risk of schizophrenia (1), as reflected by midbrain hyperechogenicity (2) and parkinsonian motor impairment (3), is asymmetric and influenced by sex.

**Methods:** We evaluated 62 subjects with never-treated chronic schizophrenia, 80 of their adult, unaffected first degree relatives and 62 healthy controls (matched by sex and age to the cases), part of an Andean population of Northern Argentina. Diagnostic ascertainment was carried out with the Schedules of Clinical Assessment in Neuropsychiatry. Parkinsonism was scored blindly using UPDRS-3 on videotaped exams by 2 independent raters. Transcranial ultrasound was performed by an expert sonographer blind to subject condition. Quantification of echogenic area was carried out on saved images by a different evaluator.

**Results:** We found a significant difference in parkinsonian motor impairment between patients, their relatives as well controls. All three groups showed worse parkinsonism on the left side than the right, corresponding with increased echogenicity on the right substantia nigra compared with the left. Females had significantly more right echogenicity than males, and patients and unaffected relatives were significantly more echogenic than controls on that side. On the left, only female patients had significant echogenicity.

**Conclusion:** Our data supports the hypothesis that unaffected relatives of schizophrenic subjects have increased parkinsonism and concomitant brainstem abnormalities which may represent a vulnerability to the disease. Both motor and brainstem abnormalities are asymmetric and influenced by sex.

**Research supported by:** NIMH K08MH077220, NARSAD Young Investigator Award, Fundación FULTRA. Scholarly Concentration Program at USF.

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***Combination Treatment of Moderate Hypothermia and Mesenchymal Stem Cells Amplifies Neuroprotection in Experimental Hypoxic-Ischemic Injury: Involvement of the Opioid***

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**Keywords:** Hypoxic-ischemic encephalopathy (HIE), hypothermia, Primary rat neuronal cells, human mesenchymal stem cells (hMSCs), delta opioid peptide

**Objective:** Hypoxic-ischemic encephalopathy (HIE), a subset of neonatal encephalopathy, has caused infant mortality and severe long-term neurological disorders. Although treatment of neonatal encephalopathy in newborns 6 hours after birth with brain cooling (hypothermia) has significantly increased survival rate, approximately 40% of these babies sustain serious neurologic disability and continue to deteriorate. The current hypothermia treatment protocol may benefit from combination therapeutic strategies. To define the optimal regimen for hypothermia treatment in combination with stem cell therapy for ameliorating neonatal encephalopathy.

**Methods:** Primary rat neuronal cells (Day 18 of gestation) were exposed to oxygen-glucose deprivation (OGD) condition, a model of HIE, then incubated at 25°C (severe hypothermia), 34°C (moderate hypothermia), and 37°C (normothermia). Cells were subsequently co-cultured with human mesenchymal stem cells (hMSCs), and cell viability and mitochondrial activity of each condition were measured.

**Results:** Combination of moderate hypothermia and hMSCs treatment significantly improved cell survival and protected against mitochondrial dysfunction after OGD. Pharmacologic induction of hypothermia in HEK293 cells via treatment with delta opioid peptide resembled moderate hypothermia's attenuation of OGD-mediated cell alterations, which were much more pronounced in HEK293 cells overexpressing the delta opioid receptor.

**Conclusion:** These results support combination therapy of hypothermia and stem cells for hypoxic-ischemic injury, which may have direct impact on current trials using stand-alone hypothermia or stem cells for treating newborn encephalopathy.

**Research supported by:** USF Department of Neurosurgery and Brain Repair Funds

***Perceptual Magnitude Constriction in Parkinson's Disease***

Tigran Kesayan BS, USF Morsani College of Medicine, John Williamson PhD, Adam Falchook MD, Michael Okun MD, FAAN, Irene Malaty MD, Ramon Rodriguez MD, Keith White PhD, UF Medicine Dept. of Neurology, Robert Hauser MD, MBA, FAAN, USF Medicine Dept. of Neurology, and Kenneth Heilman MD, FAAN, UF Medicine Dept. of Neurology, University of South Florida, Morsani College of Medicine, Neurology

**Keywords:** Keyword 1: Touch Perception Keyword 2: Parkinson Disease Keyword 3: Executive Function

**Objective:** The purpose of this study was to test the hypothesis that patients with Parkinson disease (PD) are impaired at perceiving the relative magnitude of tactile stimuli. Patients with PD often demonstrate hypometria (e.g., micrographia). Hypometria may be related to defective motor programming or a perceptual disorder where stimulus magnitude is over estimated. Alternatively, people with PD often have frontal lobe dysfunction with an impaired ability to disengage attention which may produce a perceptual grasp such that the perception of stimuli with high or low intensity will be perceived with a reduced range of magnitudes.

**Methods:** Participants were 12 people with PD and 12 matched healthy controls. To assess tactile perception we used von Frey hairs made of nylon monofilaments. For each trial, a standard monofilament was applied to the skin on the palm and the participant was told its magnitude was 100. Then, a second monofilament was applied and the participant provided a numerical estimate of the magnitude of the second stimulus relative to the first. There were 6 experimental stimuli, 3 lower and 3 higher in magnitude than the reference stimulus.

**Results:** When compared to controls, participants with PD over-estimated the magnitudes of the tactile stimuli that were below the standard stimulus and underestimated the magnitudes of stimuli that were above the standard stimulus ( $p$  values  $<.05$  in 2-way ANOVA analysis for all stimuli except the one closest to the reference).

**Conclusion:** The results demonstrate that patients with PD have a perceptual grasp for the pressure exerted by tactile stimuli. This perceptual grasp may be a disorder of disengagement induced by frontal executive dysfunction that is often associated with PD.

**Research supported by:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine.

**Abstract #: 159**

**Presented by: Dae Won Kim, PhD, Postdoc**

***Stem Cells are Finally Starting to Jell***

Dae Won Kim MD.PhD., Naoki Tajiri PhD., Hiroto Ishikawa MD.PhD., Kazutaka Shinozuka PhD., Sandra A Acosta PhD., Mibel Pabon Saldana PhD, Cesar V Borlongan PhD. University of South Florida, Morsani College of Medicine, Department of Neurosurgery & Brain Repair

**Keywords:** Umbilical cord, Wharton's jelly, Mesenchymal stem cell, Therapeutic applications

**Objective:** Wharton's jelly is a gelatinous tissue within the umbilical cord that contains myofibroblast-like stromal cells. A unique cell population of Wharton's jelly that has been suggested as displaying the stemness phenotype is the mesenchymal stromal cells or MSCs. Because MSC' stemness and immune properties appear to be more robustly expressed and functional comparable with fetal than adult-derived MSCs, MSCs harvested from the Wharton's jelly are considered much more proliferative, immunosuppressive, and even therapeutically active stem cells than those isolated from older, adult tissue sources such as the bone marrow or adipose.

**Methods:** The present review discusses the phenotypic character, therapeutic applications, and optimization of experimental protocols for Wharton's jelly-derived stem cells.

**Results:** MSCs derived from Wharton's jelly display promising transplantable characteristics including ease of sourcing, in vitro expandability, differentiation abilities, immune-evasion and immune-regulation features. Thus, Wharton's jelly-derived stem cells posses many potential advantages as transplantable cells for treatment of various diseases.

**Conclusion:** We are witnesses to the many tissue sources of stem cells. Here, we are given the many appealing features of a unique set of stem cells that jell – Wharton's jelly.

**Research supported by:** USF Department of Neurosurgery and Brain Repair Funds.

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**Abstract #: 160**

**Presented by: Lisa Kirouac, BS, Graduate Student**

***Cell cycle mediated hyperphosphorylation of APP at Thr668***

Lisa Hornbeck, Tina Fiorelli, Jaya Padmanabhan Department of Molecular Medicine, Morsani College of Medicine, USF Health Byrd Alzheimer's Institute, University of South Florida

**Keywords:** Amyloid Precursor Protein (APP) Alzheimer's disease (AD) Amyloid Beta (A $\beta$ ) Phosphorylated APP (P-APP) C-terminal APP (C-APP)

**Objective:** Studies show that AD brain of human and transgenic mice have aberrant expression of cell cycle regulatory proteins. In addition, past research reveals A $\beta$  induces cell cycle activation and apoptosis in neurons. Our lab has shown that APP is phosphorylated at Thr668 in a cell cycle dependent manner. Here we examine if cell cycle activation is necessary for phosphorylation and processing of APP.

**Methods:** H4-APP cells were synchronized by serum starvation. Cells were maintained in serum free media or released in serum media and treated with cell cycle inhibitors. Western blot was used to detect APP, P-APP, A $\beta$ , and C-APP. Cellular distribution of phosphorylated APP under various treatments was visualized by immunostaining. Cultured hippocampal rat neurons were treated with increasing A $\beta$  concentrations and immunostaining performed.

**Results:** Thr668 phosphorylated APP was detected only after serum release. Cells arrested in G2/M had maximum phosphorylation with nocodazole treatment resulting in hyperphosphorylated APP. C-APP generation was only visible under serum stimulation with an increase in nocodazole and taxol treatment. The findings were supported by H4-APP immunostaining. Neuronal immunostaining reveals increased APP phosphorylation at Thr668 correlated with increased A $\beta$  concentration.

**Conclusion:** We show APP phosphorylation and processing are cell cycle dependent. Analysis of phosphorylation in cells arrested at different phases of cell cycle reveals maximum Thr668 phosphorylation occurs in G2/M. Immunostaining indicates APP phosphorylation occurs with A $\beta$  treatment and when cells enter cell cycle. This suggests neurons subjected to any cell cycle deregulation may show altered processing of APP and neurodegeneration.

**Research supported by:** NIH, Alzheimer's Association, USF/Byrd

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**Abstract #: 161**

**Presented by: Yaqiong Li, PhD, Graduate Student**

***Redefine the mechanism of THC against Alzheimer's Disease***

Yaqiong Li, Ge Bai, Xiaoyang Lin, Jonathan Mayl, Jianfeng Cai, Chuanhai Cao University of South Florida College of Arts and Sciences Chemistry

**Keywords:** THC, Alzheimer's Disease, Abeta amyloid peptide

**Objective:** To confirm the effect of THC against Alzheimer's Disease, and to elucidate its underlying working mechanism.

**Methods:** Grow the N2aAPP cells and treat them with different concentrations of THC. Test Abeta and its aggregation level, and some other downstream signals.

**Results:** THC shows a strong potential to inhibit Abeta production and aggregation. The possible mechanism may be direct binding or through GSK pathway.

**Conclusion:** THC may be a potential drug candidate to treat Alzheimer's Disease.

**Research supported by:** Dr. Cao College of Pharmacy Byrd Alzheimer's Institute University of South Florida

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**Abstract #: 162**

**Presented by: Sean Masi, BS, Staff**

***The effect of Natalizumab (Tysabri) on Sexual Dysfunction in Multiple Sclerosis.***

Sean M. Masi., Derrick Robertson MD, Megan Butler, Lise Casady ARNP, Angela Seevers MPH, University of South Florida, Morsani College of Medicine, Department of Neurology

**Keywords:** Multiple Sclerosis, Neurology, works in progress

**Objective:** Primary Outcome Measures Sexual Dysfunction: Decrease in level of dysfunction demonstrated by the comparison and analysis of MSISQ-19 responses at end of study to baseline Secondary Outcome Measure: Sexual Function: •Change in composite score in the sexual function subscale of the MSQOL-54 over 6 months of Natalizumab treatment •Improvement shown in at least one area designated in the MSISQ-19 Fatigue: Improved score on the FAMS questionnaire fatigue scale for MS Quality of Life •Improved score on the MSQOL-54 from end of study compared to baseline •Improvement shown in the sexual function component of the MSQOL-54

**Methods:** All participants will be followed for 6 months while receiving Natalizumab infusions once monthly. Participants will complete MSQOL-54, FAMS, MSISQ-19, and BDI questionnaires to determine baseline dysfunction as well as dysfunction level at months 3 and 6.

**Results:** in progress

**Conclusion:** in progress

**Research supported by:** Biogen, Idec

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**Abstract #: 163**

**Presented by: Christopher Metcalf, MS, Med I Student**

***Review of Melatonin and Neuroprotection in Stroke***

Christopher Metcalf M.S., Yuji Kaneko PhD, Naoki Tajiri PhD, Cesar Borlongan PhD, USF Morsani College of Medicine, Department of Neurosurgery and Brain Repair, University of South Florida

**Keywords:** Oxidative Stress, stroke, stem cells, neuroprotection, cerebral ischemia

**Objective:** In this present study, we review in vitro and in vivo stroke models investigating melatonin's role in stem cell differentiation, proliferation, and neuroprotection.

**Methods:** We conducted a meta-analysis of melatonin-based neuroprotective studies to present the evolution and latest strategies in stroke therapy. We discussed the concept of melatonin receptor technology in stem cell therapy, whereby stem cells can be switched on (melatonin treatment) or relatively switched off (lack of melatonin treatment), facilitating the regulation of stem cell growth and differentiation, as well as stimulating the cells' growth factor secretory capacity.

**Results:** Melatonin-based strategies for stroke therapy were identified, including 1) Intracerebral transplantation of melatonin-secreting pineal gland demonstrated improved behavioral deficits in experimentally stroke rats; 2) Exogenous melatonin treatment enhances glial cell survival in protecting against cerebral ischemia, and; 3) Stimulation of the melatonin receptor by its ligand melatonin exerted a neuroprotective effect.

**Conclusion:** Understanding these current techniques may give translational and/or clinical investigators the tools to explore melatonin receptor technology that can be used for efficient regulation of stem cell fate and function after transplantation, ensuring both safety and efficacy of stem cell therapy.

**Research supported by:** University of South Florida Department of Neurosurgery and Brain Repair Center of Excellence for Aging and Brain Repair Tampa, FL 33612

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**Abstract #: 164**

**Presented by: Huey Nguyen, BS, Staff**

***Dysfunctioned Ca<sup>2+</sup> Handling System and Decreased Calpain Activity in Aged Human Fibroblasts: New Paradigm for Alzheimer Prevention***

Huey T. Nguyen, Darrell R. Sawmiller and Ming Chen, Bay Pines VA Healthcare System and USF Dept. Molecular Pharmacology and Physiology, University of South Florida, Morsani College of Medicine

**Keywords:** calcium, calpain, aging, Alzheimer's disease

**Objective:** Intracellular Ca<sup>2+</sup> levels are elevated in aged cells and this is thought to activate Ca<sup>2+</sup> signaling and calpain, leading to cell death in Alzheimer's disease (AD). This hypothesis has deeply influenced the research reasoning and strategic design for AD intervention. Since questions have been raised, here we revisited the hypothesis by simultaneously measuring Ca<sup>2+</sup> transient and enzymatic activity of calpain in cultured human fibroblasts.

**Methods:** Confocal Ca<sup>2+</sup> imaging; Intracellular calpain activity assay; calpain protein level assay by Western blotting; cell culture

**Results:** We found that Ca<sup>2+</sup> transition elicited by bradykinin was indeed higher or overstayed in old cells compared to young cells, but this occurred with a concomitant decrease of calpain activity. Treating young cells with energy inhibitor rotenone or H<sub>2</sub>O<sub>2</sub> recaptured the Ca<sup>2+</sup> overstay and calpain inactivation. In contrast, treating old cells with several high-energy compounds such as phosphoenol pyruvate or phosphocreatine reduced the Ca<sup>2+</sup> overstay and meanwhile re-activated calpain. Moreover, both Ca<sup>2+</sup> levels and calpain activity were sharply raised in the cells killed by detergent. Furthermore, spiking Ca<sup>2+</sup> oscillations were induced by a low dose of bradykinin in fibroblasts, and the frequency of the oscillations in old cells was visibly lower but overall Ca<sup>2+</sup> levels were slightly higher than in young cells.

**Conclusion:** The data suggest that the excessive Ca<sup>2+</sup> levels in old cells arise from a dysfunctioned Ca<sup>2+</sup> handling system compromised by energy depletion and oxidative stress. Thus, tonic activation of bioenergetics and Ca<sup>2+</sup> signaling will benefit aging brains, thereby extending their lifespan to catch up with the extended life expectancy today.

**Research supported by:** VA Merit Review

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***Brain region-specific histopathological effects of varying the trajectories of controlled cortical impact (CCI) model of traumatic brain injury***

Mibel Pabón<sup>1,2</sup>, Naoki Tajiri<sup>1</sup>, Kazutaka Shinozuka<sup>1</sup>, Sandra Acosta<sup>1</sup>, Dae Won Kim<sup>1</sup>, Hiroto Ishikawa<sup>1</sup>, Diana Hernandez-Ontiveroz<sup>2</sup>, Julie Vasconcellos<sup>1</sup>, Travis Dailey<sup>1</sup>, Christopher Metcalf<sup>1</sup>, Meaghan Staples<sup>1</sup>, Cyrus Tamboli<sup>1</sup>, Yuji Kaneko<sup>1</sup>, Cesar V. Borlongan<sup>1,2</sup><sup>1</sup>Center for Excellence in Aging and Brain Repair, Dept. of Neurosurgery and Brain Repair, Univ. of South Florida, Tampa, FL. <sup>2</sup>Morsani College of Medicine, Univ. of South Florida, Tampa, FL

**Keywords:** Olfactory bulb (OB) Cerebellum (CB) farthest right angle targeting the frontal cortex (FRA) closest right angle targeting the frontal cortex (CRA) Controlled cortical impact (CCI)

**Objective:** 1.7 million people sustain TBI annually, which is a major cause of disability and death in the US. Most of the TBI animal models focus on a definite trajectory affecting specific areas of the brain; but traumatic injuries in patients not always impact the same brain regions. Consequently, we examine the histopathological effects of different angles of mechanical injury by manipulating the trajectory of CCI model in adult Sprague-Dawley rats. We hypothesized that different types of impact trajectories would produce different levels of brain damage.

**Methods:** Manipulations of the CCI model performed include: conventional rat model of TBI targeting frontal cortex, farthest right angle targeting frontal cortex, closest right angle targeting frontal cortex, olfactory bulb (OB) injury, and cerebellar (CB) injury.

**Results:** Preliminary data showed typical cell loss in the M1 region of cortex in conventional TBI group using H&E histological staining and Cavalieri method of stereology. No significant cell death was detected in M1 region of animals that received OB or CB injury. FRA and CRA types of injury displayed cortical damage comparable to conventional TBI group. H&E expression in hippocampus revealed cell loss in CA3 region for all impact trajectories without any detectable differences across TBI groups. Comparable hippocampal cell loss was noted across TBI groups for both ipsi and contra hemispheres. Increased expression of inflammatory marker OX-6 in M1 region of cortex accompanied conventional, FRA, and CRA TBI, suggesting a critical role for inflammation.

**Conclusion:** Varying the trajectory target of the CCI may result in different levels and extent of brain damage, at least for the short 3-day period following our experimental TBI.

**Research supported by:** Dept. of Defense

***Cefdinir for New Onset Pediatric Neuropsychiatric Disorders***

Laura Ramirez M.S., P. Jane Mutch Ph.D., Adam B. Lewin Ph.D., Eric Storch Ph.D., Tanya K. Murphy M.D. University of South Florida, Morsani College of Medicine, Department of Pediatrics and Psychiatry

**Keywords:** PANS, PANDAS, OCD, Tic Disorders, Cefdinir

**Objective:** Pediatric Acute onset Neuropsychiatric Syndrome (PANS) is a subtype of rapid childhood onset obsessive-compulsive disorder (OCD) and/or tic disorders that begin following an acute infection, with accompanying non-focal neurological signs and an episodic course. Anecdotal reports note symptom improvement in children with PANS after 2-4 weeks of antibiotic treatment. Our objective was to investigate the use of Cefdinir antibiotic therapy to reduce clinical severity of symptoms of OCD and/or tics in children with PANS.

**Methods:** Nineteen children ages 4 -13 were randomized to receive placebo (n=10) or antibiotic (n=9) treatment for new onset OCD and/or tics after preliminary testing. The antibiotic group received 14mg/kg (max 600mg) per day for a total of 30 days, while the placebo group received a similar non-active treatment matched for taste and consistency. The primary outcome measures for symptom severity were the Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS) for OCD, and the Yale Global Tic Severity Scale (YGTSS) for tics.

**Results:** There was a decrease in mean for both YGTSS (6.75) and CY-BOCS (8.83) scores in the Cefdinir group following the 30 day treatment. Significant group differences were observed for the CY-BOCS scores ( $F(1, 12) = 7.0, p = 0.02$ ), but not for the YGTSS ( $F(1, 13) = 0.88, p = 0.37$ ).

**Conclusion:** The Cefdinir group exhibited significant improvement in OCD and tic symptoms per CY-BOCS and YGTSS score means when compared to the placebo group. In this pilot study, these results suggest that antibiotic therapy may help to reduce the severity of both OCD and tic symptoms in children with PANS. The mechanism of action is presumed to be antimicrobial, immune modulatory or neurochemical. A larger study is warranted.

**Abstract #: 167**

**Presented by: Kazutaka Shinozuka, PhD, Postdoc**

***Social Modulation of Behavioral, Physiological, and Molecular Changes Following Experimental Stroke***

Kazutaka Shinozuka, Naoki Tajiri, Hiroto Ishikawa, Yuji Kaneko, Cesar V. Borlongan; Center of Excellence for Aging & Brain Repair, Department of Neurosurgery and Brain Repair, University of South Florida Morsani College of Medicine, Tampa FL

**Keywords:** stroke, stress, social, thymus, AGE

**Objective:** Stress is a major exacerbating factor for stroke, including hyperglycemia in response to secretion of stress hormones. The present study investigated social modulatory interactions between stroke, stress, and expressions of advanced glycation endproducts (AGE)-related proteins in thymus, an important organ for immune system.

**Methods:** Social conditions in the housing colony of paired rats were manipulated as follows: Stroke with Stroke (SS), Stroke with Naïve (SN), Naïve with Stroke (NS), or Naïve with Naïve (NN). Stroke rats received middle cerebral artery occlusion (MCAo). General activity and pain perception was analyzed using digital video. Concentrations of plasma corticosterone and methylglyoxal (MG) were analyzed with ELISA kits. Expressions of AGE-related proteins in the thymus were analyzed by Western blotting.

**Results:** Following MCAo, SS, SN, and NS subjects significantly showed lower activity. Higher pain scores were observed in SS and SN. Concentration of plasma corticosterone was higher only in SS. MG concentration was higher in SS and SN. Interestingly, changes in expressions of AGE-related proteins were observed in relation to the social conditions.

**Conclusion:** We demonstrated that some of MCAo-induced changes were affected by social conditions: social inhibition of general activity and social facilitation of plasma corticosterone. We also demonstrated that MCAo changed expressions of AGE-related proteins in the thymus. Those results suggest that stroke affects immune functions via activation of AGE-related cascades in the thymus, and such deterioration effects could be modulated by appropriate settings of social environments.

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**Abstract #: 168**

**Presented by: Shijie Song, MD, Faculty**

***Hippocampal Neurogenesis and the Brain Repair Response to Brief Stereotaxic Insertion of a Micro-needle***

Shijie Song<sup>1,2</sup>, Shuojing Song<sup>3</sup>, Cao Chuanhai<sup>4</sup>, Xiaoyang Lin<sup>4</sup>, Kunyu Li<sup>1</sup>, Vasyi Sava<sup>1,2</sup>, Juan Sanchez-Ramos<sup>1,2,4</sup>  
University of South Florida Morsani College of Medicine Neurology

**Keywords:** focal brain injury, brain repair, astrocytosis, microgliosis, neurogenesis, cytokines

**Objective:** Objectives: To understand the earliest reactions to implantation of a metal electrode, we studied the cellular and cytokine responses over time to transient insertion of a fine needle (maximum diameter of 200 µm) into the dorsal hippocampus of the mouse. We tested the hypothesis that creation of a focal micro-lesion in hippocampus elicits self-repair mechanisms mediated by cytokines which activate microglia, promote astrocytosis and stimulate stem/progenitor cells to proliferate and generate new neurons.

**Methods:** Brief stereotaxic insertion and removal of an a micro-needle into the right hippocampus

**Results:** a) significantly increased expression of granulocyte-colony stimulating factor (G-CSF), the chemokine MIP-1a and the pro-inflammatory cytokine IL12p40; b) pronounced activation of microglia and astrocytes, and c) increase in hippocampal neurogenesis.

**Conclusion:** This study describes immediate and early humoral and cellular mechanisms of the brain's response to micro-injury that will be useful for investigation of potential neuro-protective and deleterious effects of deep brain stimulation in various neuro-psychiatric disorders.

**Research supported by:** VA Merit Review Grant

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***Sound Location Processing in Schizophrenia Patients with Auditory Verbal Hallucinations***

Lee Stratton, MS II Morsani COM and International Medicine SC, Lucia Alba-Ferrara, Postdoctoral Scholar Department of Psychiatry and Neuroscience, Gabriel de Erausquin, Roskamp Chair in Biological Psychiatry, Associate Professor of Psychiatry and Neurosciences, Neurology and Neurosurgery, Director of Roskamp Laboratory of Brain Development, Modulation and Repair, Director of Center for Neuromodulation, University of South Florida, Morsani College of Medicine Psychiatry and Behavioral Neurosciences

**Keywords:** schizophrenia, sound localization, hallucinations, spatial recognition

**Objective:** To study the deficits in the spatial recognition of auditory stimuli in patients with schizophrenia.

**Methods:** 15 patients with history of AVH, 12 patients without history of hallucinations (NAVH) and 16 controls (C) participated in a combined paradigm of sound localization (task a) and internal/external perception of prosody (task b). Task a) consisted of tunes presented in either the right or the left ear in 2 conditions (located close to or far from the listener). Task b) consisted of numbers spoken in either angry or neutral tones in 2 conditions (IH/OH). Angry/neutral numbers, of which one was virtually inside and the other outside the head, were presented simultaneously and monaurally via headphones. Modification of acoustic stimuli using virtual acoustic space techniques creates the illusion that the sound is "inside the head" (IH) or "outside the head" (OH). Patients responded in both tasks by a keypress.

**Results:** Tasks a) and b) were analyzed in 2 separate 2X3 factorial ANOVAs. In task a) accuracy was above chance level ( $M=75\% \pm SE=2.7$ ), but without effects of Presentation side (left/right) or Group (AVH, NAVH, C). In task b) stimuli presented to the left ear were located more accurately than to the right ( $F(1,40)=14.19, p<.001$ ). Additionally, C located the source more accurately than patients regardless of AVH traits ( $F(1,40)=12.19, p<.001$ ). Both patients groups did not differ from each other and there was not interaction.

**Conclusion:** Schizophrenia patients have difficulties to distinguish between virtually located IH/OH auditory objects loaded with emotional prosody. Our data suggest that the deficit is associated with schizophrenia itself and not to hallucinations in particular.

**Research supported by:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine, International Medicine Concentration and Department of Psychiatry and Neuroscience.

***MicroRNA, RT-PCR and Immunocytochemical Profiling Of Human Temporal Lobe Epilepsy Brain Reveals An Upregulation of miR-34b/c and a Downregulation of miR-592 in the Hippocampus and Amygdala Compared to the Neocortex***

Naoki Tajiri, Hiroto Ishikawa, Yuji Kaneko, Teresita Malapira, Carmelina Gemma, Fernando Vale, Cesar V. Borlongan  
University of South Florida, Morsani College of Medicine, Department of Neurosurgery & Brain Repair

**Keywords:** Epilepsy, Stem cell, Transplantation, MicroRNA, RT-PCR

**Objective:** Over three million Americans suffer from some form of epilepsy, with mesial temporal lobe epilepsy (MTLE) being the most common, arising from the temporal lobe structures of amygdala, hippocampus and parahippocampal gyrus. At present, temporal lobectomy is considered the most definitive treatment for intractable TLE. This study sought to investigate the pathophysiology of epilepsy in an effort to seek more effective treatments for this disorder.

**Methods:** Tissues from multiple brain regions were obtained from TLE patients undergoing hippocampal resection. Specimens were processed for microRNA and RT-PCR analysis, while alternate tissues were grown in culture for immunohistochemical assays.

**Results:** Data revealed that miR-34b and miR-34c were significantly upregulated in hippocampus and amygdala compared to the neocortex, with miR-34b/c expression highest in the amygdala. In contrast, levels of miR-592 were significantly downregulated in the hippocampus and amygdala compared to the neocortex in epileptic brain tissues from individual epileptic patients. The bioactivity and functional effects of stem cells derived from epileptic and non-epileptic brain tissue were explored by xenotransplantation. Transplantation of stem cells derived from non-epileptic brain tissues, characterized by normal levels of the miR-34b/c and miR-592, abrogated brain cell loss in experimental epileptic rats.

**Conclusion:** The results show cell proliferation and differentiation are reduced in the hippocampus and amygdala compared to the neocortex of TLE patients. To date, no studies have analyzed the role of miR-592. Further investigation on microRNAs's role in the disease pathology of TLE may lead to novel biomarkers and new treatments.

**Research supported by:** USF Dept. of Neurosurgery & Brain Repair Funds

**Abstract #: 171**

**Presented by: Justin Trotter, BS, Graduate Student**

***Modulation of Hippocampal Synaptic Function by Reelin Autocrine Signaling***

Trotter, J.H., Lussier, A., Mahoney, H., Cohen, J., and Weeber E.J. USF Health Byrd Alzheimer's Institute, Tampa, FL, Morsani College of Medicine, Molecular Pharmacology & Physiology

**Keywords:** GABAergic interneurons, learning and memory, schizophrenia, synaptic plasticity

**Objective:** Dysfunction of GABAergic interneurons and haploinsufficiency of reelin have both been hypothesized to contribute to cognitive impairment in patients with schizophrenia. The specific mechanisms whereby reductions in reelin and GABAergic dysfunction contribute to the pathoetiology of schizophrenia haven't been thoroughly explored, although they may be interrelated. In this study, we determined if reelin directly influences the function of GABAergic interneurons

**Methods:** Using a combination of biochemical, electrophysiological, and behavioral approaches we determined how reelin signaling onto GABAergic interneurons influences hippocampal function.

**Results:** We found that increasing reelin in vivo up-regulated the levels of the GABA-synthesizing enzyme GAD67, while genetic deficiency of reelin reduced GAD67 levels. The downstream adaptor protein, dab1, was found to be expressed by a sparse subset of GABAergic interneurons throughout the forebrain, which suggested that reelin may directly modulate inhibitory neurotransmission through autocrine signaling. To test this hypothesis, we generated GABAergic interneuron-specific dab1 conditional knockout mice (dab1 cKO), in order to prevent reelin signaling exclusively in GABAergic interneurons. While forebrain development was normal in these mice, we observed that adult mice had impaired hippocampal synaptic plasticity and alterations in learning and memory.

**Conclusion:** These data are the first to describe a role for reelin as a regulatory of inhibitory interneuron function and strongly suggest that reduced reelin levels and GABAergic interneuron dysfunction in patients with schizophrenia are interrelated.

**Research supported by:** NIA 5P01AG030128-04

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**Abstract #: 172**

**Presented by: Xingyu Zhao, PhD, Postdoc**

***RanBP9 is also an important focal adhesion protein***

Xingyu Zhao, Richard Witas, Jong A. Woo, David E. Kang University of South Florida, Morsani College of Medicine, Department of Molecular Medicine

**Keywords:** RanBP9, Focal adhesion, tyrosine phosphorylation

**Objective:** RanBP9 is also an important focal adhesion protein

**Methods:** Western blot, Immunoprecipitation,

**Results:** RanBP9 phosphorylation level changed when cells were separated . Both EDTA and trypsin driven cell detachment can increase the tyrosine phosphorylation of RanBP9. Treat cells with 10 uM PP2(a Src family kinase inhibitor) also gives a different RanBP9 tyrosine phosphorylation pattern during cell detachment and readhesion.

**Conclusion:** RanBP9 is also an important focal adhesion protein, its scaffold structure and phosphorylated site make it a potential linkage between integrin and other signal pathway.

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**Abstract #: 173**

**Presented by: Pinky Budhrani, MS, Graduate Student**

***Subjective Sleep Quality, Physical and Psychological Symptoms in Breast Cancer Survivors***

Pinky H. Budhrani, RN, MSN University of South Florida College of Nursing; Cecile A. Lengacher, PhD, RN University of South Florida College of Nursing\_University of South Florida, College of Nursing

**Keywords:** sleep, symptoms, breast cancer

**Objective:** The symptom frequently reported by breast cancer survivors (BCS) is sleep disturbances. The purpose of this study is to examine the relationship between individual psychological and physical symptoms, and subjective sleep quality in BCS.

**Methods:** A secondary data analysis will be conducted on baseline data from Dr. Lengacher's R-01 Symptom Cluster Trial (1R01CA131080-01A2) among 79 BCS who enrolled in a supplement to examine sleep quality. Sleep quality is measured by the Pittsburgh Sleep Quality Index (PSQI) and the sleep diary. The CES-D Scale, State Trait Anxiety Inventory (State Scale Only), Perceived Stress Scale, Fatigue Symptom Inventory, and the Brief Pain Inventory were used to measure depression, anxiety, perceived stress, fatigue, and pain respectively. Correlation coefficients will be used to analyze the association between the independent variables (fatigue, pain, depression, anxiety, and stress) and the dependent variable, subjective sleep quality.

**Results:** The sleep diaries provide an acute measure of sleep quality, depression, fatigue, and anxiety. The instruments provide a more stable or a non-acute measure of sleep, physical, and psychological symptoms. Associated physical and psychological symptoms are common symptoms in breast cancer and often co-occur with insomnia in symptom clusters. Sleep disturbance may worsen concurrent cancer symptoms and/or treatment-related symptoms such as fatigue, pain, and depression. This leads to a reduced quality of life and overall health status of cancer patients.

**Conclusion:** These findings will lead to an understanding of the best treatment approaches and whether specific treatments for sleep should be integrated for cancer patients before, during, and after treatment.

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**Abstract #: 174**

**Presented by: Irina Carranza, BS, Graduate Student**

***State of the Science: Evaluating Cognitive Functioning and Genes in Breast Cancer***

Carranza, I.M., Lengacher, C.A., Park, J and Kip, K. University of South Florida College of Nursing, Tampa, Florida, USA H. Lee Moffitt Cancer Center and Research Institute, Tampa, Florida, USA University of South Florida, College of Nursing

**Keywords:** Cognitive function and genetics in Breast Cancer

**Objective:** To determine the State of the Science on Cognitive Functioning (CF) and Genes through a synthesis of published research and to evaluate underlying genetic variations that may be related to cognitive functioning in breast cancer.

**Methods:** A literature search was conducted from 1980 to September 2012 through PubMed, PsycInfo, and Web of Science databases. Search terms included: Cognitive Function and Genes in Breast Cancer. Inclusion criteria: 1.) Publications prior to September 2012; 2.) Examination of Cognitive Function and Genes in Breast Cancer; and 3.) Research published in English. Exclusion criteria: 1.) Anecdotal notes; 2.) Studies in other languages; and 3.) Dissertations.

**Results:** Results identified 66 studies meeting the search terms. After eliminating duplicates and articles of which did not meet inclusion or exclusion criteria, 7 was the final number of studies. Most of the 7 studies examined genetic markers associated with cognitive functioning and related effects. Genes that were identified to be related to cognitive functioning—Apolipoprotein E (APOE) gene, ESR1, ESR2, and cAMP.

**Conclusion:** Results from this review, indicate there are few studies meeting our inclusion criteria, thus showing the need for further research in this area to advance the science. The primary focus in breast cancer has been related to genetic markers and its association with cognitive function. Future research has the potential to broaden the understanding of the underlying mechanisms involved with cognitive deficits in breast cancer in order to design interventions to assist with this prevalent and disruptive symptom.

**Research supported by:** USF College of Nursing

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**Abstract #: 175**

**Presented by: Rasheeta Chandler, PhD, Faculty**

***HIV Prevention Needs of Black College Women***

Rasheeta Chandler, PhD, MS, ARNP, FNP-BC, College of Nursing Erica H. Anstey, MA, CLC, College of Public Health, University of South Florida, College of Nursing

**Keywords:** African Americans; women's health; HIV/AIDS prevention; college students

**Objective:** HIV prevention interventions are important to assist college students in engaging in safe sexual behaviors. Little is known about the culturally-specific HIV prevention needs of Black college women. The purpose of this study was to (a) appraise HIV prevention information, motivation, and behavioral skills needs among Black college women, and (b) identify potential determinants of HIV-preventive behavior in this population.

**Methods:** Focus group participants (n=32) were recruited from two Florida universities. Four 90-minute focus groups were conducted with participants who self-identified as black females aged 18-24, enrolled freshmen or sophomores, and sexually active with a male partner. Focus groups were digitally recorded, transcribed, and analyzed by constant-comparative method using NVivo. Two researchers independently coded and met regularly to ensure inter-rater reliability.

**Results:** Participants desire clear information about STDs/HIV. Their current motivators for practicing safe sex were related to cultural expectations, issues of respect, the desire to avoid pregnancy, and a conscious effort to defy racial stereotypes. We also found a general consensus among the women about the need to develop skill-building HIV prevention interventions focused on communication, condom negotiation, accessing services, and empowerment.

**Conclusion:** Our findings offer insight into culturally- and age-appropriate HIV prevention needs for Black college women and should guide the development of future interventions. Results will inform the development of an intervention for college-aged black females and will influence development of a media intervention aiming to instruct policy on media censorship.

**Research supported by:** USF College of Nursing Faculty Research Pilot Projects Program

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**Abstract #: 176**

**Presented by: Julie Daugherty, MS, Graduate Student**

***Evaluating the Effectiveness of a Mindfulness Based Stress Reduction Program in Patients with Chronic Tinnitus Disturbance***

Julie A. Daugherty MS NP-C, Cecile A. Lengacher, PhD RN FAAN University of South Florida, College of Nursing

**Keywords:** tinnitus, mindfulness, alternative therapy

**Objective:** Tinnitus is a significant health problem, affecting over 50 million adults. Many chronic tinnitus sufferers have a substantial perceived handicap, affecting their coping ability and daily functioning. The purpose of this dissertation research will be to evaluate the positive effect of mindfulness based stress reduction (MBSR), a standardized form of alternative therapy, on psychological outcomes (perceived stress, anxiety, depression, and quality of life) and physical outcomes (sleep and tinnitus) among individuals diagnosed with chronic tinnitus disturbance.

**Methods:** This feasibility study will utilize a one group, quasi-experimental, pre-post test design to assess the efficacy of a MBSR program in 30 adults with chronic tinnitus disturbance. The MBSR intervention consists of 6 weekly, 2-hour group sessions on mindfulness, yoga, body scan, and meditation. Instruments to be used include the Tinnitus Handicap Inventory (THI), Perceived Stress Scale (PSS), the State-Trait Anxiety Inventory (STAI) and the Center for Epidemiological Studies Depression Scale (CES-D). Quality of life and sleep disturbance will be assessed using the Medical Outcomes Studies 36-item Short-Form Health Survey (SF-36) and the Pittsburgh Sleep Quality Index (PSQI).

**Results:** This proposed study and logic model design postulates the MBSR program will reduce tinnitus disturbance, and improve the psychological and physical status and quality of life in individuals with chronic tinnitus. Data analysis of the instruments will be performed to assess the pre-post test changes in the variables identified.

**Conclusion:** The results will determine if MBSR is feasible among individuals with chronic tinnitus disturbance and provide evidence to support a future randomized clinical trial.

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Abstract #: 177

Presented by: Jessica Gordon, MS, Graduate Student

**Stabilization of Extra-uterine Life with Skin to Skin Contact**

Jessica M Gordon, ARNP, Former Lactation Community Affairs Coordinator at St Joseph's Women's Hospital, USF CON PhD Student, Victoria Drum, RN, St Joseph's Women's Hospital Labor and Delivery Charge Nurse, Winta Araya, RN, USF CON Research Intern, University of South Florida, College of Nursing

**Keywords:** hospital research, maternal-child health

**Objective:** Determine if standardization of skin to skin contact (SSC) within one hour of birth positively influences SSC practice, neonatal stabilization, and breastfeeding outcomes.

**Methods:** One month implementation of SSC learning module and skills validation, a retrospective chart review was conducted of 84 stabilized newborn babies within a neonatal intensive care unit (NICU) located in Tampa, Florida. Half of the newborn babies were stabilized using SSC (group 1) and the other half were stabilized using incubator care (group 2). Outcomes were analyzed for 1) respiratory rate at delivery, 24 hrs, and 48 hrs; 2) admission to intensive care nursery (NICU); and 3) feeding pattern (breast feeding, formula, & mixed) at the time of discharge using t-test and chi-square statistics.

**Results:** Comparison of the two groups showed that SSC was equally effective as that of incubator care in stabilizing temperature ( $t=-2.3$ ,  $p=0.21$ ;  $t=-6$ ,  $p=0.24$  &  $t=-2.8$ ,  $p=0.15$ ) and respiratory rate ( $t=-3.7$ ,  $p=0.03$ ;  $t=-0.17$ ,  $p=0.45$ ;  $t=0.29$ ,  $p=0.9$ ) at delivery, 24 hrs, and 48 hrs. There was no difference in feeding pattern at discharge ( $X^2=1.14$ ,  $P=0.57$ ). There was no admission to NICU in either group. SSC practice increased from 1 (2.4%) in group 2 to 33 (80.5%) in group 1.

**Conclusion:** The findings show that desirable outcomes were achieved with SSC intervention comparable to conventional incubator care. Implementation of a SSC protocol with proper in-servicing can effectively increase SSC practice. Breastfeeding outcomes on hospital discharge are influenced by more than SSC.

**Research supported by:** March of Dimes

Withdrawn

Oral Presentation Only

Abstract #: 178

Presented by: Pao-Chu Hsu, MS, Graduate Student

**Prenatal Stress, Depression and Herpes Viruses Reactivation**

Pao-Chu Hsu, MS, ARNP, PhD student, USF; Maureen W. Groer, PhD, FAAN, Professor, USF; Shun-Yung Wang, PhD, Assistant Professor, USF; Nicole Williams, MPH, USF; Bradley P. Kane, BS, USF University of South Florida, College of Nursing

**Keywords:** Cell-Mediated Immunity, IDO, Tryptophan, Phenylalanine, Tyrosine

**Objective:** Psychosocial stress during pregnancy is a strong predictor of prenatal depression. Prenatal depression may be associated with herpes viruses' reactivation. The purpose of this study is to analyze prenatal stress, depression, herpes viral titers, and metabolites of indoleamine-2, 3-dioxygenase (IDO) activation, which involves tryptophan and guanosine-triphosphate-cyclohydrolase-1 pathways. IFN- $\gamma$  and TNF- $\alpha$  induce IDO activation which decreases tryptophan production and increases phenylalanine/tyrosine metabolism, respectively. Prenatal depression may occur from tryptophan stealing through the IDO pathway which results in decreased serotonin and increased risk for latent viral reactivation.

**Methods:** A secondary data analysis was performed from a R01 study. Participants (N=382) were 18 to 45 years of age and between 16 to 25 gestational weeks. The data set included: demographic information, Perceived Stress Scale scores, Profile of Mood States scores and a number of plasma markers. Fifteen mLs of blood were collected during the time of enrollment. This plasma has been analyzed for HSV-1, HSV-2, CMV IgG and nitrite, neopterin, tryptophan, kynurenine, phenylalanine, and tyrosine. In addition EBV IgG titers will be measured.

**Results:** Perceived stress was correlated with depression. Depression was correlated with HSV-2 IgG titer ( $r=.215$ ,  $p<.001$ ). Tryptophan was lower in depressed women. Phenylalanine and phenylalanine to tyrosine ratios were all significantly lower in women with antibody above the threshold for positive HSV-1 & 2, and CMV.

**Conclusion:** Prenatal depression needs to be addressed as a specific health problem in a vulnerable time in women's lives. The results will be of importance in health promotion and disease prevention during pregnancy.

**Abstract #: 179**

**Presented by: Carly Paterson, MS RN, Graduate Student**

***Body Image in Younger Breast Cancer Survivors: A Review of the Literature***

Carly L. Paterson MS RN, Cecile A. Lengacher PhD RN FAAN University of South Florida, College of Nursing

**Keywords:** body image, breast cancer, survivorship

**Objective:** The objective of conducting this literature review was to determine what is known in the scientific literature related to body image in younger breast cancer survivors through a synthesis of published research. Body image has been identified as a distressing symptom for breast cancer survivors after treatment.

**Methods:** The PsycInfo, Medline, PubMed and Web of Science databases were reviewed from 2000-2012. Search terms included: "body image and younger breast cancer survivors" and "body image, young age, breast cancer." Inclusion criteria: 1.) Studies published after December 1999; 2.) Examination of body image in breast cancer patients; 3.) Original research studies; and 4.) Research published in English. Exclusion criteria: 1.) Anecdotal notes; 2.) Studies in other languages; 3) Reviews and 4.) Dissertations.

**Results:** Results from the searches identified 184 potential results following the search terms in the 4 databases. After eliminating duplications and identifying studies meeting the inclusion and exclusion criteria, there were a total of 48 studies reviewed ranging from the years 2000 to 2012. A number of studies found that type of surgery impacted body image after treatment, with mastectomy having a greater negative impact on body image than lumpectomy. In addition, younger women were found to be more affected by poor body image and impaired sexuality. This was also found to be true as many as 3 years post-treatment in some younger breast cancer survivors.

**Conclusion:** The strong evidence of poor body image in younger breast cancer survivors but the limited number of intervention studies to improve this symptom warrants future work related to designing and implementing therapeutic interventions to improve quality of life.

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**Abstract #: 180**

**Presented by: Chun-Yi Tai, MS, Graduate Student**

***Understanding How Taiwanese Registered Nurses Make Clinical Decisions Regarding Patient Care: A Grounded Theory Approach***

Chun-Yi Tai, MS, RN; Jason W. Beckstead, Ph.D.; Denise Passmore, Ph.D.; and Li-Ting Huang, BS, RN College of Nursing, University of South Florida, University of South Florida, College of Nursing

**Keywords:** registered nurses; clinical decision making; grounded theory

**Objective:** Develop a substantive theory portraying social processes influencing clinical decisions among Taiwanese RN's.

**Methods:** Participants were identified from medical center units in Taiwan using snowball recruitment. Semi-structured interviews were used to explore nurses' perspectives on clinical decision making until saturation of categories was obtained. Data analysis was conducted concurrently, consistent with grounded theory methods.

**Results:** Six participants were included in the study between February and May 2011. The analysis generated a theory, the Nursing Clinical Decision Making Model, which revealed the central social psychological problem, Cumulative Experiences as a Nurse, and the basic social psychological process, Stages of Understanding Clinical Decision Making, used by Taiwanese RN's in clinical decision making. The model describes the nurses' progression through phases of understanding of clinical decision making to accumulating experiences and skills as competent nurses. These phases are Focus on Patient Risks and Safety, Recognize Importance of Patient and Family Characteristics, Internalize Social/Organizational Structure of Health Care System, and Achieve Profession Identity. The model is in a pyramid shape, with a majority of coded quotations in the Focus on Patient Risks and Safety phase; the fewest were in the Achieve Profession Identity phase.

**Conclusion:** The cumulative characteristics of the process of developing clinical decision making competence in the model are consistent with Maslow's Hierarchy of Needs, and is consistent with traditional Chinese culture and hierarchy of progress in nursing professional development. This model might be a useful framework in the enhancement of RNs' clinical decision making competence.

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**Abstract #: 181**

**Presented by: Kaitlyn Braswell, BS, Staff**

***Screening of Drugs for the Treatment of Synucleinopathies***

Kaitlyn Braswell, Juan Zhang, Devki Patel, Twisha Jani, Maxx Ramirez, Diego Peralta, Daniel Lee, Umesh K. Jinwal  
University of South Florida, College of Pharmacy, Department of Pharmaceutical Science

**Keywords:** Synuclein, drugs, Parkinson's disease

**Objective:**  $\alpha$ -Synuclein is a key protein in the pathogenesis of Parkinson's disease, Alzheimer's disease and other synuclein related disorders collectively termed as Synucleinopathies. The aggregations of  $\alpha$ -Synuclein protein form Lewy bodies that led to neuronal dysfunction and death. Our aim is to find novel drugs for the treatment of Synucleinopathies.

**Methods:** To target  $\alpha$ -Synuclein we have used an in vitro cell culture model expressing  $\alpha$ -Synuclein. Cells were treated with various drugs from the NIH drug library or vehicle DMSO control for 24 hours. Samples were analyzed by Western blots by using anti- $\alpha$ -Synuclein and anti-GAPDH antibodies. Band intensities in the control and drug treated samples were compared to identify drugs that reduce synuclein.

**Results:** So far we have screened around 50 drugs, and our preliminary data showed several novel drugs that reduced  $\alpha$ -Synuclein protein in the cells.

**Conclusion:** Newly identified drugs from cell based screening will be taken for various in vivo studies by using *C. elegans* worm model for Synucleinopathies. These new drugs eventually could lead to the development of more stable, nontoxic drugs to slow progression of aggregations  $\alpha$ -Synuclein proteins and prevent the production of Lewy bodies.

**Research supported by:** This work was supported by the USF College of Pharmacy Dean's Clinical and pilot award for the Start-up.

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**Abstract #: 182**

**Presented by: Glenda Castellanos, BS, Staff**

***Cigarette Smoke Extract Exposure Blunts Adenosine A2A-mediated Activation of cAMP, and its cAMP-dependent protein kinase, (PKA) and Stimulates Protein Kinase C (PKC) Activation Mediated Impairment of Adenosine A2A-stimulated Wound Repair in Bronchial Epithelial Cells***

Glenda Castellanos<sup>1</sup>, Hui Zhang<sup>2</sup>, Todd A. Wyatt<sup>2,3,4</sup> and Diane Allen-Gipson<sup>1</sup>. <sup>1</sup>Department of Pharmaceutical Sciences, College of Pharmacy, University of South Florida Health, University of South Florida, Tampa FL; <sup>2</sup>Division of Pulmonary, Critical Care, Sleep & Allergy, Department of Internal Medicine, University of Nebraska Medical Center, Omaha, NE; <sup>3</sup>Department of Environmental, Agricultural, & Occupational Health, College of Public Health, University of Nebraska Medical Center, Omaha, NE; and <sup>4</sup>Research Service, Omaha-Western Iowa Veterans Affairs Medical Center, Omaha, NE.

**Keywords:** Cigarette smoke extract, adenosine, wound closure, kinase, oxidant

**Objective:** The present study explores the signaling mechanism(s) by which cigarette smoke exposure alters A2A-stimulated wound repair. We hypothesize cigarette smoke extract attenuates adenosine-mediated wound repair by altering PKA activation.

**Methods:** Human bronchial epithelial Nuli-1 cells were exposed to 5% cigarette smoke extract (CSE), wounded via electric cell-substrate impedance sensing (ECIS) and stimulated with CGS21680 or CPCA (selective A2A agonist; 10  $\mu$ M) for 24 hours. Some cells were pretreated for 1 hour with specific A2A antagonist, ZM241385 (100 nM). Cyclic AMP levels were measured and enzyme activity of PKA and PKC was assayed.

**Results:** We observed a significant increase (~ 3 fold) in PKA activation when cells were stimulated with CPCA as compared to media-treated cells ( $P < 0.01$ ). However, in the presence of smoke extract there was a significant reduction in PKA activity when compared to CPCA-treatment ( $P < 0.01$ ). Interestingly, we observed a robust PKC activation when cells were stimulated with smoke extract alone ( $P < 0.001$ ) or in combination with CPCA ( $P < 0.001$ ) as compared to media-treated cells. Cells stimulated with CGS21680 and exposed to CSE showed decreased cAMP whereas pretreatment with N-acetyl cysteine (NAC; antioxidant) reversed this affect ( $P < 0.001$ ) as compared to smoke extract + CGS2160-treated cells.

**Conclusion:** Collectively, these data suggest that smoke extract blocks A2A-mediated activation of cAMP, subsequently inhibiting PKA activity. Furthermore, the data suggest smoke extract mediated inhibition of A2A-stimulated PKA activation may involve oxidants.

**Research supported by:** NIH-NHLBI (K01HL084684) to D.A.G, and (AA017993 and BX000728) to T.A.W.

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**Abstract #: 183**

**Presented by: Kalyan Chapalamadugu, PhD, Postdoc**

***Redox Regulation in Diabetic Heart***

Kalyan C. Chapalamadugu, Siva K. Panguluri, Jared Tur, and Srinivas M. Tipparaju. College of Pharmacy, Department of Pharmaceutical Sciences, University of South Florida, Tampa, FL

**Keywords:** Diabetes, Pyridine nucleotides, Cardiomyopathy, electrical remodeling.

**Objective:** Diabetes is among the top five most prevalent pathophysiological conditions worldwide, and the American Heart Association classifies diabetes as a cardiovascular disease. Cardiomyopathy represents a leading co-morbidity of diabetes. Because pyridine nucleotides are important mediators of oxidative stress and ion channel function, we hypothesized that bulk changes in pyridine nucleotide levels in diabetes leads to electrical remodeling and thereby cardiomyopathy.

**Methods:** We determined the concentrations of all four pyridine nucleotides in db/db and Wt mouse hearts using NAD(P)/NAD(P)H assay system. The quantitative real-time PCR (qRT-PCR) was used to analyze mRNA expression of various genes encoding cardiac ion channels, auxiliary subunits and metabolic mediators in both ventricles. The qRT-PCR data was further validated using western blotting.

**Results:** We found significant up-regulation (>2-fold) of reduced pyridine nucleotides in db/db hearts compared to Wt, suggesting elevated oxidative stress in diabetes. Gene expression data using qRT-PCR revealed significant alteration of several genes involved in redox regulation and electrical remodeling in ventricles, which was confirmed by Western blotting.

**Conclusion:** The results of this study show that pyridine nucleotide concentrations change significantly in diabetic mouse hearts, and that these changes are parallel to altered expression of cardiac electrical and metabolic gene machinery. We speculate that chronic dysregulation of pyridine nucleotide homeostasis in diabetic hearts may, at least in part, contribute to altered electrical phenotype and higher incidence of cardiomyopathy.

**Research supported by:** NIH/NHLBI

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**Abstract #: 184**

**Presented by: Feng Cheng, PhD, Faculty**

***Gene Networks Implicated in Acetaminophen-Induced Hepatotoxicity***

Feng Cheng and Shu-Feng Zhou Department of Pharmaceutical Science, College of Pharmacy, University of South Florida, Tampa, FL

**Keywords:** Acetaminophen, heptatotoxicity, Microarray, Transcriptome, Gene pathway

**Objective:** Acetaminophen (APAP) is widely used as a pain reliever and a fever reducer. APAP is generally considered safe at therapeutic doses. However, high dose APAP will cause heptatotoxicity that can be fatal. The biochemical mechanisms for APAP-induced liver injury are complex and not fully understood, although multiple targets and pathways have been implicated. Here, we evaluated the changes of gene expression associated with APAP treatment of rat hepatocytes and provided a systematically studies on gene networks implicated in APAP heptatotoxicity.

**Methods:** We analyzed expression microarray data from primary rat hepatocytes treated for 24 and 48 hours with DMSO (as control) and two doses (0.5 mM and 5 mM) of APAP. Each treatment group has 5 biological replicates.

**Results:** Differentially expressed (DEX) genes between high doses APAP treatment and control group at different time periods (24 and 48 hours) were identified. Using a conservative threshold (false-discovery-rate Q value of 0.01 and 2-fold signal intensity difference), we found 157 and 130 genes were significantly differentially expressed after 24 and 48 hour APAP treatment, respectively. Gene ontology enrichment analysis of these DEX genes showed that several important metabolism-related pathways were significantly regulated by high doses of APAP. These pathways included metabolism of xenobiotics by cytochrome P450, nitrogen metabolism, fatty acid metabolism, glycine/serine/threonine metabolism, retinol metabolism, steroid hormone biosynthesis, and PPAR signaling pathways.

**Conclusion:** Our analysis reveals gene pathways implicated in acetaminophen-induced hepatotoxicity and provides further insights into the toxicological mechanism of this drug.

**Research supported by:** the start-up grant from the USF College of Pharmacy

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**Abstract #: 185**

**Presented by: Helen Chew, High School Student -Intern**

***Interactome of the Anticancer Herbal Drug Plumbagin***

Helen Chew, Jun Liang, Department of Pharmaceutical Sciences, College of Pharmacy, USF, Tampa, FL, Lun Yang, Bio-X Institutes, Key Laboratory for the Genetics of Development and Neuropsychiatric Disorders (Ministry of Education), Shanghai Jiao Tong University, Shanghai, China; Zhi-Xin Wang, Feng Cheng, Shu-Feng Zhou, Department of Pharmaceutical Sciences, College of Pharmacy, USF, Tampa, FL

**Keywords:** Plumbagin, human tongue carcinoma, proliferation, cell cycle arrest, apoptosis; targets.

**Objective:** Plumbagin, a quinonoid constituent isolated from the root of *Plumbago zeylanica* L., has been proven to possess anti-tumor activity. This study aimed to investigate the molecular targets using a bioinformatic approach and verified by literature data and data from benchtop experiments.

**Methods:** The molecular targets of plumbagin were predicted using the CPI program. Molecular pathways were analyzed using DAVID database and docking assays were run by Discovery Studio 3.2. The results were verified by literature data and cell-based assays.

**Results:** Plumbagin was predicted to interact with a number of proteins that are involved in cell proliferation and apoptosis, nucleic acid biosynthesis and metabolism, immune and inflammatory response, gene expression, carbohydrate, lipid, amino acid and protein metabolism, and signal transduction. Some of the predicted targets have been verified by published studies. Ten functional clusters were identified to be significantly enriched (score > 3) in the target lists derived from molecular docking calculations. Cluster 2 is for NADP(H) oxidation and reduction. It has been proved that plumbagin could bind Nox-4, a renal NADPH oxidase, and inhibit its activity. Cluster 6 points to the regulation of apoptosis. Ten KEGG pathways significantly enriched (FDR<0.1) in the target list were discovered. The first significant pathway reported by DAVID database is "Metabolism of xenobiotics by cytochrome P450" (the enrichment fold is 7.48 and FDR=0.012). Six proteins, AKR1C1, AKR1C2, AKR1C3, ADH5, ADH7 and GSTM4 were included in this pathway.

**Conclusion:** Plumbagin elicits its pharmacological activities through a network that control important cellular processes and fate.

**Research supported by:** USF Health College of Pharmacy Startup Fund

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**Abstract #: 186**

**Presented by: MINGHUA LI, PhD, Postdoc**

***MicroR-561 Exaggerates Acetaminophen-Induced Hepatotoxicity Through Down-Regulation of DAX-1***

Ming-Hua Li, Shu-Feng Zhou; Department of Pharmaceutical Science, College of Pharmacy, University of South Florida, Tampa, FL

**Keywords:** miRNA-561; acetaminophen; DAX-1; hepatotoxicity; HepG2 cells

**Objective:** One of the major mechanisms involved in acetaminophen (APAP)-induced hepatotoxicity is the hepatocyte nuclear factor 4 (HNF4)-mediated activation of PXR- and CAR and subsequently transcriptional activation of the cytochrome P450 3A enzymes. A panel of miRNAs has been shown to be involved in APAP-induced hepatotoxicity in humans, however, it is unclear how these miRNAs regulate the occurrence of toxicity. In the present study, we have investigated the role of microRNA-561 and its target gene DAX-1 encoding a co-repressor of HNF4 in the process of APAP-induced hepatotoxicity.

**Methods:** The human hepatoma HepG2 cells were used in this study. RT-PCR and Western blot assays were used to determine the expression levels of DAX-1, PXR and CAR. The levels of reactive oxygen species (ROS), LDH, and glutathione (GSH) were monitored.

**Results:** Treatment of HepG2 cells with APAP caused reduced expression of DAX-1 in a dose-dependent manner. Subsequent microRNA expression analysis showed the miRNA-561 was specifically induced by APAP treatment in HepG2 cells. Treatment of HepG2 cells with a miRNA-561 mimic resulted in enhanced APAP-induced hepatotoxicity. Decreased protein level of DAX-1 by APAP was also enhanced by miRNA-561 mimic treatment. Increased protein levels of PXR and CAR by APAP were also enhanced by miRNA-561 mimic treatment. On the contrary, treatment of HepG2 cells with miRNA-561 inhibitors nearly completely blocked the APAP-induced cytotoxicity.

**Conclusion:** These results indicate that miRNA-561 worsens APAP-induced hepatotoxicity probably by inhibition of DAX-1 and consequent increased activation of nuclear receptors.

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**Abstract #: 187**

**Presented by: Qi Li, MA, Faculty**

***Novel Polymeric Nanoparticles Containing Tanshinone-IIA from Chinese Herbal Medicine: Preparation, Characterization, and Antitumor Activity***

1.) Qi Li, Department of Oncology, Longhua Hospital, Shanghai University of Traditional Chinese Medicine, Shanghai, P. R. China 2.) Shu-Feng Zhou, Department of Pharmaceutics Science, College of Pharmacy, University of South Florida, Tampa, FL

**Keywords:** Nanoparticles, tanshinone IIA, PLA, hepatoma.

**Objective:** We have synthesized novel polylactic acid nanoparticles containing tanshinone IIA (TS-PLA-NPs) using a single oil-in-water emulsion/solvent evaporation method. In this study, we aimed to characterize the properties of these particles.

**Methods:** The optimized nanoparticles were characterized for morphology, mean particle size, zeta potential, entrapment efficiency, drug-loading content, X-ray diffractometer measurement, and in vitro release kinetics. The effect of TS-PLA-NPs on hepatoma in mice was also performed.

**Results:** The obtained nanoparticles were spherical and intact. The mean particle size was 192.5 nm with polydispersity index being 0.029 and zeta potential of 226.27 mV. The mean entrapment efficiency and loading of TSIIA in TS-PLA-NPs were 86.35 and 1.61%, respectively. The mean in vitro cumulative release percentage of TSIIA from TS-PLA-NPs vs. time curve fitted well with the Higuchi Equation. In pharmacokinetics and tissue distribution studies, the concentrations of TSIIA were higher in hepatoma and lower in blood, heart, kidney, spleen, and lung at 2 hr after TS-PLA-NPs was administered via caudal vein. TS-PLA-NPs were effective in destroying the human liver cancer cells in a concentration- and time-dependent manner. Mice studies showed TS-PLA-NPs were markedly more effective than both of TSIIA and blank PLA nanoparticles in preventing tumor growth and increasing survival time of mice with hepatoma.

**Conclusion:** This study provided support for the new paradigm, the application of TSIIA for the treatment of hepatoma.

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**Abstract #: 188**

**Presented by: Yancong Li, MD, Staff**

***Effects of a Novel nano-particle on Human Non-Small-Cell Lung Cancer Cells***

Yan-Cong Li, Juan-Juan Yin, and Shu-Feng Zhou University of South Florida, College of Pharmacy Department of Pharmaceutical Science

**Keywords:** nanoparticle;Foliate acid receptor; Doxorubicin; Non-Small-Cell Lung Cancer

**Objective:** The ideal drug delivery system combines targeted delivery with controlled release such that the drug is delivered and released in a selective and discriminatory fashion. Such a system not only improves the efficacy of the drug, but minimizes the systemic toxicity to improve the quality of the patients' life. In recent years a wide range of different nonsocial drug delivery vectors have been evaluated. This study is focused on the effect of a novel nano-particle complex of cytotoxic adamantine (Ada) and doxorubicin (Dox) with folic acid (FA)-conjugated  $\beta$ -cyclodextrin on non-small cell lung cancer cells.

**Methods:** MTT-based in vitro cytotoxicity assay is performed to compare anti-cancer effects of Ada-DOX-FA nanoparticles on H23 and A549 cell lines which are employed as FOL receptor (+) cancer cells and FOL receptor (-) cancer cells, respectively. In order to investigate selective cellular uptake of Ada-DOX-FA nanoparticles via folic-receptor-mediated endocytosis, H23 cells and A549 cells are incubated with Ada-DOX-FA nanoparticles in the presence or absence of folic acid in the culture medium and see the intracellular drug uptake using confocal microscope. In order to investigate selective targeting ability of Ada-DOX-FA nanoparticles against FOL receptors on the cell, H23 cells and A549 cells are both cultured in medium with and without folic acid.

**Results:** MTT assay showed that the IC50 of H23 cells treated with Ada-DOX-FA nanoparticles is lower than that treated with doxorubicin alone.

**Conclusion:** Ada-DOX-FA nanoparticles may represent a novel, more effective and less toxicnormal cell toxicity anti-cancer drug.

**Research supported by:** Shu-Feng Zhou

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**Abstract #: 189**

**Presented by: Jun Liang, BS, Staff**

***Beclin 1 and Nuclear Factor- $\kappa$ Bp65 as Potential Biomarkers For Hepatocellular Carcinoma***

Jun Liang<sup>(1)</sup>, Kai-Fu Kang<sup>(2)</sup>, Feng Cheng<sup>(1)</sup>, and Shu-Feng Zhou<sup>(1)</sup> <sup>(1)</sup> Department of Pharmaceutical Sciences, College of Pharmacy, University of South Florida, Tampa, FL

<sup>(2)</sup> Department of Pathology, the First People's Hospital of Shunde, Foshan, Guangdong 528300, China

**Keywords:** B; immunohistochemistry; in situ hybridization, hepatocellular carcinoma. □BECN1; nuclear factor-

**Objective:** B (NF- $\kappa$ Bp65) in patients with HCC. □There are no sensitive and specific biomarkers for the diagnosis and prognosis prediction of hepatocellular carcinoma (HCC). This study was to determine the expression pattern of beclin 1 (BECN1) and nuclear factor-

**Methods:** We used immunohistochemistry and in situ hybridization to detect the expression of hepatic BECN1 and NF- $\kappa$ Bp65. The expression patterns were compared to those of liver cirrhosis, hepatitis, and normal liver tissues. An online search for the pathways related to BECN1 and NF- $\kappa$ Bp65 was performed based on the GeneGo database.

**Results:** The expression of BECN1 in cancer tissues was significantly higher than that of cirrhosis tissue, hepatitis tissue, and normal tissue. The expression of BECN1 protein in hepatitis tissues was significantly higher than that of cirrhosis tissue and normal tissues. The expression of BECN1 mRNA in cancer tissue was significantly higher than that of cirrhosis tissues and normal tissues, and the expression of BECN1 mRNA in hepatitis tissues was significantly higher than that of cirrhosis tissues and normal tissues. The expression of NF- $\kappa$ Bp65 protein in cancer tissue was significantly higher than that of cirrhosis tissue, hepatitis tissue and normal tissue. BECN1 expression was positively correlated with the NF- $\kappa$ Bp65 expression in HCC. The abnormal expression of BECN1 and NF- $\kappa$ Bp65 was closely associated with the development of HCC. It appeared that MyD88 played an important role in the pathway, which linked both proteins through multiple proteins such as IRAK1/2, TRAF6, TAK1, c-Jun, TLR2 and TLR4.

**Conclusion:** These results suggest that BECN1 together with NF- $\kappa$ Bp65 may serve as useful biomarkers for HCC but other interacting proteins are also implicated.

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**Abstract #: 190**

**Presented by: Dong Lin, MD, Postdoc**

***Crizotinib Induces Autophagy and p21Waf1 and Arrests Cell Cycle in G2/M by Alternative Targeting Non-TK target Akt/mTOR Pathway Cascade***

Dong Lin<sup>1</sup>, Jia-Zhi Sun<sup>1,2</sup>, Lun Yang<sup>3</sup>, Ming-Hua Li<sup>1</sup>, Qian Wang<sup>1</sup>, Isaac Raplee<sup>1</sup>, Yan-Cong Li<sup>1</sup> and Shu-Feng Zhou<sup>1</sup>

<sup>1</sup>Department of Pharmaceutical Sciences, College of Pharmacy, University of South Florida, Tampa, FL; <sup>2</sup>Department of Molecular Medicine, College of Medicine, University of South Florida, Tampa, FL; <sup>3</sup>Bio-X Center, Key Laboratory for the Genetics of Developmental and Neuropsychiatric Disorders, Shanghai Jiao Tong University, Shanghai, China

**Keywords:** Crizotinib, Drug repositioning, Cancer, Autophagy, CPI

**Objective:** Crizotinib, a first ever ALK/MET multi-targeted receptor tyrosine kinase inhibitor developed by Pfizer and fast approved by FDA in 2011 for NSCLC patients. We hypothesize that crizotinib acts on other molecular targets in addition to tyrosine kinases ALK/MET and may play a critical role given that there is a complex network of kinases that work together to regulate a number of important cellular processes.

**Methods:** Employing a comprehensive docking method with our established chemical-protein interactome (CPI) and crizotinib, we have discovered 301 PDB-deposited proteins corresponding to 353 ligand binding pockets among a total of 1,780 PDB-deposited human protein entries. Systemic pharmacology approach also applied including validation the molecular target of crizotinib.

**Results:** Crizotinib had a high CPI binding score (ZZ\_score) of -2.2778 against tyrosine kinase Lck, also had -1.4672, -1.1242, -0.7033 against MAPK3, S6K, and GSK-3 $\beta$ , respectively, which indicated crizotinib had potential broad range interaction with both TK and ser/thr kinases. In addition, those crizotinib achieved high ZZ scores against PPAR- $\gamma$  (-1.6145) and VitD3R (0.9479), suggesting a high binding affinity of crizotinib with these nuclear proteins. Our preliminary studies have showed that the crizotinib induced autophagy by activated LC3 in vitro and inhibited oncogenic Akt signaling in melanoma cells resulting in G2/M cell cycle arrest. Furthermore, crizotinib increased p21Waf1 and VDRE luciferase reporter activity in the human NSCLC A-549 cells.

**Conclusion:** Taken together, crizotinib may be potentially treat other type of human cancer by concurrently targeting tyrosine kinase, HDAC, PPAR, VDR and Akt/mTOR, shedding a light for future both anti-cancer drug development.

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**Abstract #: 191**

**Presented by: Ruijuan Luo, PhD, Postdoc**

***Metabonomics Study on Human Hepatocarcinoma Cells Treated with Tyrosine Kinase Inhibitors***

1.) Rui-Juan Luo, PhD, Shu-Feng Zhou, MD, PhD, Department of Pharmaceutical Sciences, College of Pharmacy, University of South Florida, Tampa, FL

**Keywords:** TKI, HCC, Metabonomics

**Objective:** The molecular pathogenesis of hepatocellular carcinoma (HCC) is complicated, involving multiple signaling pathways and altered cellular behavior. However, early and timely diagnosis of HCC is difficult due to lack of selective biomarkers and specific clinical symptoms. In HCC, there is often increased expression of angiogenic factors including VEGFs, EGFs, and PDGF, which represent useful therapeutic targets that can be hit by tyrosine kinase inhibitors (TKIs). Metabolite profiles represent sensitive biomarkers of both genomic and phenotypic changes. We looked to metabonomic methods to find novel biomarkers and aid in TKI based drug development for HCC.

**Methods:** An HPLC-MS based metabonomics method was applied to monitor the endogenous metabolite profiling in HCC cell lines, HepG2, Hep3B and SK-HEP-1 upon treatment with commonly used TKIs.

**Results:** TKI drugs and their metabolites were quantified to establish pharmacokinetic concentration at cellular levels to clarify the effect of drug metabolism on therapeutic outcome and establish concentration-response relationships.

**Conclusion:** Concentration-response relationships were determined for each TKI tested. Our research shows metabonomics as a powerful methods to determine pharmacokinetic and therapeutic properties of TKI's for HCC.

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**Abstract #: 192**

**Presented by: Athar Naif, MS, Graduate Student**

***Thymoglobulin Induction Improves Cardiac Transplant Patient Outcomes***

Athar Naif, MS, USF College of Pharmacy; Tambi Jarmi, MD, FASN, USF College of Medicine, Tampa General Hospital (Nephrology), LifeLink Healthcare Institute

**Keywords:** Chart Review, Immunosuppression, Induction, Rejection, Transplant

**Objective:** Induction immunosuppression can incomparably improve the outcomes of patients undergoing transplants. These therapies reduce the risk of rejection and can lead to substantially longer survival times of both the graft and the patient. Antithymocyte globulin (ATG) induction has shown great promise with mediating early acute allograft rejection in cardiac transplant patients, a patient group which normally sees 7% graft failure within three months. Its exact method of action is unknown, however T-cell depletion is indicated following intense opsonization and complement-dependent cytotoxicity. We hypothesize that ATG induction will improve the outcomes of cardiac transplant patients. Outcome improvement would come in the form of increased graft survival, patient survival, and lower frequency of rejection, at least.

**Methods:** Our study compares rejection and survival in induced and uninduced cardiac transplant patients over a four-year period.

**Results:** We found not only that ATG induction is safe for therapy, but it also reduces the risk of rejection. Furthermore, all induced patients survived over the four-year follow-up period, which was not the case for uninduced patients. Moreover, rejections which occurred in ATG-induced patients tended to be of a lower grade than those in uninduced patients, and first rejections occurred much later in induced patients than in uninduced. Donor specific antibody and panel reactive anti-HLA antibody levels, common markers for graft rejection risk, were all lower in the induction group.

**Conclusion:** We conclude that the protective effect of ATG immunosuppression substantially improves prognosis in cardiac transplantation patients, and health centers should consider making the therapy standard for cardiac transplant patients.

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***Alcohol in Combination with Cigarette Smoke Exposure Induces Lung Injury via Upregulated Dual Oxidase (Duox 1) and Cytochrome P450 Isoform, CYP2E1 in the Airways of Adenosine A2B Knockout Mice***

Ashish Pandit<sup>1</sup>, Hui Zhang<sup>2</sup>, Kusum Kharbanda<sup>4</sup>, Todd A. Wyatt<sup>2,3,4</sup> and Diane Allen-Gipson<sup>1</sup>. <sup>1</sup>Department of Pharmaceutical Sciences, College of Pharmacy, University of South Florida Health, University of South Florida, Tampa FL; <sup>2</sup>Division of Pulmonary, Critical Care, Sleep & Allergy, Department of Internal Medicine, University of Nebraska Medical Center, Omaha, NE; <sup>3</sup>Department of Environmental, Agricultural, & Occupational Health, College of Public Health, University of Nebraska Medical Center, Omaha, NE; and <sup>4</sup>Research Service, Omaha-Western Iowa Veterans Affairs Medical Center, Omaha, NE.

**Keywords:** Airway Injury, alcohol, oxidative stress, metabolism and adenosine

**Objective:** We reported ethanol blocks adenosine uptake by inhibiting the nucleoside transport system in bronchial epithelium (Alcohol Clin Exp Res, 2009) and most recently, demonstrated cigarette-smoke generated hydrogen peroxide impaired adenosine-mediated airway wound repair (USF Research Day 2012 abstract #199). Taken together, we hypothesize alcohol in combination with cigarette smoke upregulates NADPH oxidase, Duox 1, an enzyme that generates hydrogen peroxide and a key alcohol-metabolizing enzyme, CYP2E1 to further impairs adenosine reparative process.

**Methods:** C57BL/6 (wildtype; WT) and adenosine A2B knockout mice (A2BKO) were allowed to drink ad libitum 20% alcohol (wt/vol) in water and were exposed to air or whole body cigarette smoke for six weeks. The control groups (WT or A2BKO) did not received alcohol or cigarette smoke exposure. After the target treatment time, mice were sacrificed; lung tissue, serum and lung lavage fluids were collected and analyzed.

**Results:** Lung pathology in alcohol ± cigarette smoke exposed mice revealed increased inflammatory cells and hypertrophy of the bronchial airway epithelium in the lungs of WT as compared to A2BKO mice and to their respective air-exposed control group mice. Increased protein expression in Duox 1 and CYP2E1 from WT lung exposed to alcohol or in combination with cigarette smoke as compared to A2BKO mice was observed in Western blot analysis.

**Conclusion:** These results suggest that alcohol in combination with cigarette smoke aggravates systemic and local oxidative stress leading to the dysfunction of adenosine reparative properties.

**Research supported by:** NIH-NHLBI (K01HL084684) to D.A.G, and (AA017993 and BX000728) to T.A.W.

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***Characterization of Particle Size and Chemical Profiling of Electronic Cigarette Refill Cartridge Fluid***

Vishwani Persaud-Sharma, Juan-Juan Yin, Shu-Feng Zhou, Department of Pharmaceutical Sciences, College of Pharmacy, University of South Florida, Tampa, FL

**Keywords:** Electronic Cigarette, Refill Fluid, Cytotoxicity, HPLC, LC/MS, TEM

**Objective:** As the frequency of detrimental health risk due to cigarette smoke continues to rise & cause medical concern around the world, the search for safe alternatives permeate the global consumption industry. One such alternative is the electronic cigarette (EC) that claims a healthful substitute for smoking consumers. The purpose of this study is to experimentally examine the purity of the EC fluid in terms of chemical profiling & particle size characterization to establish safety profile parameters via HPLC, LC/MS, & TEM analysis.

**Methods:** Base EC fluid sans additives was primarily analyzed by HPLC in its unaltered state, however, no rational data was observed. As a result, EC fluid was dissolved & re-analyzed as a 1% EC solution via the use of 1:1 acetonitrile & methanol. Similar conditions were used for LC/MS analysis with a binary gradient of 1mM ammonium acetate & pure acetonitrile observed at 230nm. Both HPLC & LC/MS data were obtained through the use of a C18 column whereas particle size & zeta potential characterizations were obtained through TEM analysis.

**Results:** Sample analysis via LC/MS & HPLC methods yielded similar results with a large amount of identified coenzyme Q10. Further analysis is needed to re-evaluate the samples at a lower molecular size range within the 1-100 Da range. As observed by TEM analysis, the particle size of the flavored EC samples ranged from 0.90-1.70nm in size & the zeta potential was obtained at a range of -46.89 to 27.69.

**Conclusion:** Results obtained serve as the preliminary step in data accumulation leading towards the critical parameters that govern EC purity & ultimately safety profiling. Re-evaluation of EC samples at a lower molecular range is needed to identify smaller, more common substances for comprehensive analysis

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**Indication switching of the FDA-approved anti-cancer tyrosine kinase inhibitors to treat metabolic diseases**

Jia-Zhi Sun<sup>1,2</sup>, Lun Yang<sup>3</sup>, Ming-Hua Li<sup>1</sup>, Zhixin Wang<sup>1</sup>, Amy Haynes<sup>1</sup>, Qian Wang<sup>1</sup>, Isaac Raplee<sup>1</sup>, Jean Melchisedek<sup>1</sup>, Anand Prasad<sup>1</sup>, Kevin B. Sneed<sup>4</sup>, Lin He<sup>3</sup> and Shu-Feng Zhou<sup>1</sup> <sup>1</sup>Department of Pharmaceutical Sciences, College of Pharmacy, University of South Florida, Tampa, Florida 33612; <sup>2</sup>Department of Molecular Medicine, College of Medicine, University of South Florida, Tampa, Florida 33612; <sup>3</sup>Bio-X Center, Key Laboratory for the Genetics of Developmental and Neuropsychiatric Disorders, Shanghai Jiao Tong University, Shanghai, China; and <sup>4</sup>Department of Pharmacotherapeutics and Clinical Research, College of Pharmacy, University of South Florida, Tampa, FL

**Keywords:** TKI, Drug repositioning, Cancer, Metabolic disorder, CPI

**Objective:** Drug switching is a unique way to identify and extend new indications for approved drugs in drug discovery & development. We hypothesize that these TKIs act on other molecular targets in addition to tyrosine kinases and may manage metabolic diseases given that there is a complex network of kinases that work together to regulate a number of important cellular processes.

**Methods:** Employing a comprehensive docking method with our established chemical-protein interactome (CPI) and 11 FDA-approved TKIs, we have discovered 301 PDB-deposited proteins corresponding to 353 ligand binding pockets among a total of 1,780 PDB-deposited human protein entries. Systemic pharmacology approach also applied including validation the molecular target(s) of TKIs in vitro and efficacy study in vivo.

**Results:** Notably, those TKIs achieved high ZZ scores against B-Raf, PPAR and VDR, suggesting a high binding affinity of sorafenib, dasatinib and crizotinib with these proteins. Our preliminary studies have showed that oncogenic Akt and Raf-signaling was inhibited significantly in human multiple melanoma cells by these TKIs. Interestingly, dasatinib increased VDRE and HDLR luciferase reporter activity in the human lung adenocarcinoma A-549 cells, and erlotinib and sorafenib decreased glucose levels in Wistar STZ-D rats. These TKIs are predicted to act on a series of therapeutics targets associated with metabolic diseases (such as PPAR and Sirt1).

**Conclusion:** Collectively, FDA-approved TKIs may be switched to become a “magic bullet” concurrently targeting tyrosine kinase, HDAC, PPAR, VDR and B-Raf, shedding a light for future anti-metabolic disorder and anticancer drug discovery & development.

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**'Preparation and In-Vitro Characterization of Zosteric Acid Incorporated Thermoreversible Gel'**

Anastasia Groshev<sup>1</sup>, Schellsie Beaubrun<sup>1</sup>, Vrinda VEDI<sup>1</sup>, Newby Zhang<sup>2</sup>, Vijakumar Sutariya<sup>1</sup>. <sup>1</sup>Department of Pharmaceutical Sciences, College of Pharmacy, University of South Florida, Tampa, FL 33647. <sup>2</sup>Department of Chemical and Biomolecular Engineering, The University of Akron, OH 44325

**Keywords:** Nanoparticles, Zosteric Acid, PLGA-PEG, Thermoreversible Gels, Surgical Adhesions

**Objective:** Design and preparation of Zosteric Acid (ZA) Nanoparticles (NPs) incorporated thermoreversible gels for prevention of surgical adhesions (post operation complication in peritoneum).

**Methods:** ZA NPs were prepared using nanoprecipitation method with PLGA-PEG and PVA, properties -particle size, zeta potential, structure, and polydispersity index (PDI)- of which were assessed using appropriate methods (particle size and zeta potential by degree of light scattering using Microtrac FLEX, PDI using DynamiPro plate reader, structure by transmission electron microscopy (TEM) using JEOL100S TEM). These NPs were then incorporated within a thermoreversible gel prepared via cold method using Pluronic-127® and hydroxypropylmethylcellulose (HPMC). The gel was screened for optimal density and gelation temperature.

**Results:** ZA NP was round and had uniform shape with the drug loaded inside the particle. NP size was close to desired 200nm and polydispersity index <1. Zeta potential was slightly positive (8.5±4.06mV) making it a stable formulation. The most optimal gel composition was identified to be 18% PF-127 and 0.5% HPMC with gelation temperature below the physiological temperature: 32-34°C.

**Conclusion:** The drug delivery system consisting of ZA-NP incorporated thermoreversible gel was successfully prepared and was found suitable for sustained release within the abdominal cavity to prevent surgical adhesions.

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**Abstract #: 197**

**Presented by: Qian Wang, MS, Staff**

***A New Nanoscaled Targeted Therapy for Osseous Tuberculosis***

Qian Wang, Shu-Feng Zhou, Department of Pharmaceutical Sciences, College of Pharmacy University of South Florida College of Pharmacy Pharmaceutical Science

**Keywords:** Osseous tuberculosis, nanoscaled

**Objective:** Osseous tuberculosis (OTB) still exists in developing countries and represents a severe health problem since the penetration of anti-TB drugs to the diseased site and drug resistance are still a major challenge. This project aims to develop and characterize new nanoscaled targeted treatments for OTB. In the designed treatment, antibody against TB (such as anti-MPB64-McAb) will be conjugated with effective anti-TB drugs.

**Methods:** Using particular nano particles to combine approved anti-TB drugs with anti- MPB64-McAb to form a nano-antibody product, which is intended to deliver anti-TB drugs to the diseased tissues. The chemical features and targeting potential will be assessed and the pharmacokinetics, pharmacodynamics and safety profiles will be evaluated.

**Results:** Literature search has been performed and the design of the targeted nanoparticles will be optimized. In vitro assays will be started shortly.

**Conclusion:** The new nanoparticles targeting OTB is expected to manage OTB with higher efficacy and less toxicity.

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**Abstract #: 198**

**Presented by: Zhi-Xin Wang, MA, Staff**

***Bioinformatic Prediction of the microRNAs That Regulate ABC Transporter Genes***

Zhi-Xin Wang, Jun Liang, Shu-Feng Zhou, Department of Pharmaceutical Sciences, College of Pharmacy, University of South Florida

**Keywords:** Bioinformatic, microRNA,

**Objective:** MicroRNAs (miRNAs) are a class of minute RNA molecules (approx. 22 nucleotides long) which act as post-transcriptional regulators. By targeting specific mRNA sequences, miRNAs regulate gene expression through RNA interference. Multiple studies have shown that miRNAs are responsible for the regulation of 30% of the human genome. The genes being regulated by miRNAs involve cell development, carcinogenesis, and apoptosis. Recently, there has been a limited amount of data regarding miRNA's role in the regulation of ATP-binding cassette transporters (ABC family). ABC transporters can carry many types of sterols, lipids, and drugs across membranes. This study has predicted the miRNAs which are responsible for regulating the ABC transporter genes using a bioinformatic approach.

**Methods:** The computer program TargetScan was used in this study.

**Results:** Among the 48 predicted ABC transporter genes, a total of 5,428 matching sites were found, which means there were around 113 candidate miRNAs for each gene. From the TargetScan data, ABCA4, ABCB2, ABCB9, ABCC3, ABCE2, and ABCG4 were regulated by 38, 132, 89, 181, 124 and 219 miRNAs, respectively. Conserved miRNAs included miR-124, miR-1271, miR-96, miR-182, and miR-495, while examples of poorly conserved ones are miR-17, miR-155, miR-23, miR-205 and miR-186. Also, it was shown that a single miRNA might regulate different ABC transporter genes. For example, miR-383 could regulate ABCA9, ABCC10, ABCC11, ABCG1, and ABCG5, as well as miR-1227 might regulate ABCA9, ABCA10, ABCB10, ABCC5, ABCG4, and ABCG8. Totally 682 miRNAs were involved in the regulation of these 48 ABC transporters genes.

**Conclusion:** Benchmarking studies are undergoing to validate our computational data.

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Abstract #: 199

Presented by: Juanjuan Yin, PhD, Postdoc

***Estrogen Anchored Multifunctional Micelles Designed for Site-Specific Delivery of Doxorubicin Prodrug in Breast Cancer Therapy***

Juanjuan Yin, Shu-Feng Zhou\* Department of Pharmaceutical Sciences, College of Pharmacy, University of South Florida, Tampa, FL

**Keywords:** Tumor Targeting, Estrogen receptor, Antioxidant, Doxorubicin, Cyclodextrin, Copolymer

**Objective:** The efficacy and applicability of anticancer drugs are greatly restricted by severe systemic toxicities and drug resistance. Targeting drug delivery strategies is an active area of research and it has been developed to prevent the shortcomings of chemotherapy. In this study, multifunctional estrogen anchored polymer micelles have been designed and prepared, and it is aimed to deliver therapeutics as well as accessorial agents such as antioxidants to estrogen positive cancer cells. The multifunctional micelles are expected to enhance the drug uptake by cancer cells and spare normal tissues compared to conventional chemotherapy.

**Methods:** The PEG-PLA di-block co-polymer was functionalized with gossypol in the PEG terminal through reductive amination. Adamantane were also conjugated to the PEG terminal to serve as a guest molecule moiety for the estrogen targeting cyclodextrin which were synthesized and characterized through multi-step reactions and spectral methods. Adamantane doxorubicin prodrug was prepared and encapsulated the polymer micelles. In vitro competition experiment of ER positive and negative for the targeting and non-targeting micelles were assessed. The in vitro drug release profile was determined and targeted drug binding in vitro was quantitated. The cytotoxicity was measured and the biomarkers related to free Dox-induced cardiotoxicity were also examined.

**Results:** Estrogen anchored multifunctional micelles were successfully synthesized. Cellular uptake experiments demonstrated a preferentially targeted delivery of drugs into ER-positive carcinomatous cells.

**Conclusion:** The targeted polymer micelles possess sustained drug release properties with good biocompatibility. It targeted specific to ER positive cancer cells.

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Abstract #: 200

Presented by: Damian Gilling, PhD, Postdoc

***Pyrosequencing Assay for Rapid Detection of Burkholderia mallei and Discrimination from Burkholderia pseudomallei***

Damian H. Gilling, Aparna Tatavarthy, Vicki Luna University of South Florida, Public Health Practice

**Keywords:** Burkholderia mallei Burkholderia pseudomallei Pyrosequencing Rapid Detection

**Objective:** Burkholderia mallei's evolutionary split from Burkholderia pseudomallei has created a significant challenge for rapid detection methods. The genomic similarities between B.mallei and B.pseudomallei create a unique challenge to design rapid assays to discriminate between the two organisms. The assay developed in this study was designed to identify B.mallei only, through sequence analysis, in a time effective manner on the PyroMark Q96 ID instrument.

**Methods:** We applied pyrosequencing to analyze our collection of four B.mallei isolates, seven B.pseudomallei isolates, and twenty-one additional organisms. The flagellin P (fliP) genomic sequence of B.pseudomallei is present in B.mallei; however, it is interrupted by various insertion sequences in B.pseudomallei. This difference was used to design primers to the selected target sequence used during pyrosequencing. The PCR reaction was optimized for primer and MgCl concentration.

**Results:** Gel electrophoresis revealed the presence of a PCR product of the estimated size only in the four B.mallei isolates. The seven B.pseudomallei and twenty-one additional organisms were PCR negative and generated failed pyrosequencing reactions. However, all B.mallei generated pyrograms matching the target sequence, indicating the presence of the insertion.

**Conclusion:** In conclusion, this assay is able to discriminate between the closely related B.mallei and B.pseudomallei. Use of this pyrosequencing method provides a means to rapidly identify B.mallei. This assay can be further optimized to extend the length of the target accurately sequenced; and through a collaborative effort additional isolates of both species will be analyzed.

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**Abstract #: 201**

**Presented by: Ngozichukwuka Agu, , Graduate Student**

***Age and Gender differences in Self-Reported Quality of Life Among Older Adults Living in The Villages***

Ngozichukwuka Agu, Department of Community and Family Health; Erika Thompson, Department of Epidemiology and Biostatistics; Ellen Daley, Department of Community and Family Health; Rita Debate, Department of Community and Family Health; Carla Vandeweerd, Department of Community and Family Health; Jaime Corvin, Department of Global Health; and Donna Petersen, Dean of College of Public Health, University of South Florida

**Keywords:** Quality of life, Older adults, Gender disparity, Age disparity

**Objective:** With the exponential growth in the population of older adults in the United States, it is becoming increasingly important to explore determinants of the quality of life (QOL) in this population. This study aims to examine age and gender differences in self-reported quality of life among older adults.

**Methods:** This analysis focuses on data collected as part of the USF Health and The Villages Study conducted between October 2011 and December 2012. Data was collected in 2 phases. Phase one involved the collection of formative health data through qualitative focus groups and led to the development of quantitative health surveys administered to all village residents (N=88,527) in phase two. A split ballot design was used to collect general health information in the domains of health behaviors, quality of life, mental health, and health care access, yielding an overall participation rate of 37% (N=33,119).

**Results:** Overall, participants were approximately 44.8% male (N=14,838) and 52.6% female (N=17,408). The majority of participants (77.4%) were classed as 'young old' (age < 75 years; N=25,643) and 21.2% (N=7,028) were classed as 'older old' adults. In general, residents reported good quality of life (N=27,724), though younger adults were significantly more likely to report good QOL than older adults ( $p=.000$ ) and females were more likely to report good QOL than males ( $p=.000$ ).

**Conclusion:** While the cross sectional nature of this study limits causal inference, results highlight differences in the QOL experienced by men and women across the life span. More research is needed to promote an understanding of factors that contribute to disparities in self-reported QOL within this population.

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**Abstract #: 202**

**Presented by: Blake Barrett, , Graduate Student**

***Do Drug Court Participants Reduce Their Levels of Substance Use Over Time, and Does This Differ by Younger and Older Adults? Application of a Mixed-Effect, Mixed-Distribution Model***

Blake Barrett<sup>(1,2)</sup>, Laura Merrell<sup>(1)</sup> <sup>1</sup>. Department of Community and Family Health, College of Public Health, University of South Florida <sup>2</sup> Department of Mental Health Law & Policy, Florida Mental Health Institute, University of South Florida

**Keywords:** drug courts, substance abuse, hierarchical modeling, mixed-effects mixed-distribution modeling

**Objective:** This study examined two research questions. First, is participation in a gender-specific drug court program for prescription drug abuse associated with reductions in substance use? Second, are there differences between levels of initial use and rate of change of substance use for younger and older adults participating in this program?

**Methods:** Drug court participants (N =210) completed a face-to-face baseline, three-, six-, and twelve-month follow-up assessment. Participants reported the number of days they used specific substances in the past 90 days at each assessment point. A mixed-effects, mixed-distribution model was used to examine change in participants level of self-reported substance use across assessment points to account for the zero-inflated, overdispersed nature of study data.

**Results:** At baseline, younger adults were found to have a higher likelihood of any self-reported substance use, as well as a higher intensity of use. Across the entire sample, there was a significant reduction over time in both the likelihood of any self-reported substance use as well as intensity of use. Younger and older adults did not differ in their rate of change of substance use over time.

**Conclusion:** Prescription drug abuse represents a significant public health concern. Results from this study document the ability of one, gender-specific drug court program for offenders with prescription drug abuse issues to reduce participant substance use. Compared to older adults, younger adults were significantly more likely to report any level of substance use, as well as a higher intensity of use at baseline, suggesting a higher level of treatment need. However, younger and older adults did not differ in their rate of reduction in levels of substance use reduction.

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Abstract #: 203

Presented by: Nicole Brasseur, BPh, Graduate Student

***Sexuality Education Changes in Florida: Challenges and Lessons Learned from a Community-Based Research Project***

Nicole Brasseur, B.Ph., Saba Rahman, B.S., Chris Wheldon, M.S.P.H, M.Ed, Elizabeth Baker, M.P.H., Natalie Hernandez, M.P.H., Krystal J. Hill, B.A., Linsey Grove, B.S., Ellen Daley, Ph.D., and Eric Buhi, Ph.D. University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** Sexuality education, Policy analysis, Florida

**Objective:** Florida youth engage in first sex at a younger age, fail to use reliable contraception and are at risk for unintended pregnancy. Sex education policies in Florida schools can negatively impact these and other sexual health outcomes by limiting access to medically-accurate information that youth need in order to make informed decisions.

**Methods:** Sexuality education policies from all 67 Florida counties were reviewed to determine if a change from abstinence-only to more comprehensive sexuality education occurred within the previous 7 years. Of those counties identified, content analyses of local newspaper articles and other media sources were conducted and key informants from each county were interviewed.

**Results:** Overall official county-level policies regarding sexuality education were not clearly or consistently defined; six counties were initially identified through the policy review, but only four counties met inclusion criteria (Brevard, Collier, St. Lucie and Volusia). Differences across the four counties were found in the roles of the key players in policy change (i.e. community activists, parents, school officials and board members). Similar findings across all counties had to do with confusion related to sex-ed curriculum terminology (e.g. terms such as abstinence-based and abstinence-only were often used interchangeably), and in what elements comprise comprehensive sexuality education.

**Conclusion:** These inconsistencies have created confusion within counties that recently adopted changes to sex education policies and/or curriculum, and weaken the ability of public health officials to accurately assess the effects of county-level policy change on sexual health outcomes across the state.

**Research supported by:** Ford Foundation

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Abstract #: 204

Presented by: Kaylynn Brown, BS, Graduate Student

***Developing a Community Research Review Committee as an Expansion of a Community Research Council to Promote Participation in Research Trials Among Medically Underserved Populations***

Kaylynn Brown BS (College of Public Health), Kevin B. Sneed PharmD, Maisha Standifer MPH (College of Pharmacy), & B. Lee Green PhD MPH (Moffitt Cancer Center), University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** 1) Talking Circles 2) Patient-provider communication 3) Health Education

**Objective:** To increase minority participation in research trials conducted in the Tampa Bay area.

**Methods:** The Community Research Council was established to advocate for and oversee clinical and translational research activities in the Tampa Bay region. To accomplish this, community representatives with diverse backgrounds and roles within target populations were identified and invited to the Community Research Review Committee. The Committee will guide and oversee the direction of the Council. All members will be required to read and approve the committee protocol and procedures. The Committee will determine the cultural sensitivity of research proposals based on guidelines set by the Council and provide feedback to participating researchers. The Council will disseminate information about approved research trials to community stakeholders and evaluate applications to ensure standards are being maintained.

**Results:** An increase in minority participation in research trials conducted in the Tampa Bay area is expected to occur. Improvement in the cultural awareness of reviewed research trials is expected as a result from feedback provided to researchers from the Committee.

**Conclusion:** Creating a Committee of individuals who are actively involved within minority communities will reduce barriers related to low participation in research trials by facilitating awareness of approved ongoing trials within the community and providing a sense of trust in the source of the information.

**Research supported by:** The Center for Equal Health-USF College of Pharmacy. Funded by the National Institute on Minority Health and Health Disparities, National Institutes of Health, Department of Health and Human Services (Dr. Richard Roetzheim, PI & Dr. B. Lee Green, PI; 1P20MD003375)

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**Participatory Processes to Develop Innovative Tailored Health Education Material for Ngabe-Buglé Indigenous Communities in Panama**

Arturo Rebolon MD MPH CPH <sup>(1)</sup>, Arlene Calvo PhD MPH <sup>(2)</sup>, Lourdes Alguero RN MPH <sup>(3)</sup>, Silvio Vega MD MSC <sup>(3, 4)</sup>. <sup>(1)</sup>. USF Health International Foundation, University of South Florida, Clayton, City of Knowledge, Building 118-B, Panama, Panama. <sup>(2)</sup>. Community and Family Health, Global Health, University of South Florida, Clayton, City of Knowledge, Building 118-B, Panama, Panama. <sup>(3)</sup>. School of Medicine, University of Panama, La Cresta, Panama, Panama. <sup>(4)</sup>Microbiology, Social Security System, La Cresta, Panama, Panama.

**Keywords:** Community-Based Health Promotion, International Public Health, USF Health Panama

**Objective:** (1) Demonstrate the application of community participation and social marketing processes in the development of tailored educational material. (2) Describe the development of health education material with structured iterations and pretesting with guidance from key community members that resulted in empowerment and community inclusion for capacity building. (3). Formulate results of a health education intervention that includes KABB and intention measures during process, outcome, and impact evaluation.

**Methods:** Development of tailored educational material for training of Promotores, following community-based participatory processes and social marketing techniques. Community members guided the processes including topics selected (hygiene, domestic violence, midwives in the community, prenatal care, nutrition, environment). Process, outcome, and impact evaluation of health education, outreach, and tailored material were conducted.

**Results:** Community participation resulted in development of tailored material in the form of colorful laminated flipcharts with interchangeable slides. Fifty Promotores, lay midwives, and traditional doctors were trained and themselves reached over 4,600 community members in distant communities in five months. Increase in KABB and intention measures were determined.

**Conclusion:** Community member and partner participation in developing educational materials and health prevention interventions supports efforts to improve health status among underserved rural indigenous communities in low- and middle-income countries. Reaching distant populations in rural areas require the inclusion of community members acting as Promotores and enables their empowerment.

**Research supported by:** National Secretariat of Science, Technology and Innovation of Panama

**“Correlation Between Sexting and Other Sexual Behaviors in Undergraduate Students.”**

Jesica Candanedo, MD, Community and Family Health Jaime Corvin, PhD, MSPH, Global Health, Morgan Hess-Holtz, BA, Epidemiology and Biostatistics, Jennifer Burges, BA, Global Health Practice, Kimberly Fleek, BS, MMSc, PA-C, Global Health, Joanna Reid, BA, University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** sexting, undergraduates, sexual behavior

**Objective:** To assess whether or not sexting activity correlates with increased sexual activity and/or risky sexual behavior.

**Methods:** An online survey was sent to 37,372 undergraduate students; 2,960 responded. It included questions regarding demographic information, engagement in sexting, age of onset of sexual intercourse, sexual behavior risk exposure, and other forms of sexual activity and expression.

**Results:** Of respondents, 69% have engaged in sexual intercourse at the age of 18 or younger. From students who have not had any sexual partners, 72.8%, 88.3%, 63.8% & 76.3% have never sent sexually explicit messages or photos, or received sexually explicit messages or photos, and 95.8% have never forwarded sexually explicit messages or photos. Alternatively, participants at the higher sexual behavior risk exposure showed 5.8%, 21.7%, 3.3%, 10.5% and 65.1%, respectively. From individuals who have used pornographic materials 82% have sent sexually explicit texts, 61% nude photos, and 28% have forwarded both sexually explicit texts and photos; versus 46%, 30%, and 3% respectively, for those who have not used. Pornography users also agreed more frequently with sending “sexts” to acquaintances and those they are casually dating than did those who do not use pornography (40% versus 5%). It was found that 82% strip club or novelty store visitors have sent sext messages and 62% have sent nude photos, versus 58% & 38% correspondingly, for not visitors. There were no significant correlations noted between levels of sexting prevalence and those indicating they had cheated in relationships or had been sexually abused.

**Conclusion:** Undergraduates engaging in “sexting,” may be a segment of this population also expressing higher sexual activity and/or sexual risky behaviors.

**Abstract #: 207**

**Presented by: Jeannese Castro, BA, Graduate Student**

***Evaluating a Community-Based Approach to Reducing Neighborhood Conflict through Positive Youth Development***

Jeannese Castro, USF Department of Community and Family Health, Susan Greenbaum, USF Department of Anthropology, Shannon Richardson, Moses House, Lance Arney, USF Office of Community Engagement and Partnerships, Paola Gonzalez, Crisis Center of Tampa Bay, Wendy Hathaway, USF Department of Anthropology, University of South Florida College of Public Health

**Keywords:** positive youth development, community, violence, self awareness

**Objective:** This research evaluates the outcomes of Girls Together, a community-based youth program designed to build health awareness, self-confidence, and leadership skills for a group of 12 adolescent girls.

**Methods:** Qualitative and quantitative data were collected before, during, and at the conclusion of the program. At the start of the program a survey using positive youth development indicators was given to measure the girls' self-awareness of their development. The same survey was given at the conclusion of the program in order to assess possible changes in the girls' sense of development. Two focus group interviews were conducted in the final stages of the program in order to understand, in the girls' own words, what they learned through the program and what they wanted to do to make improvements in their lives and community.

**Results:** The surveys did measure changes in the girls' perceptions of their development, but it is difficult to know whether the changes were a result of the program or other factors. The focus groups resulted in an understanding that interpersonal conflict and neighborhood violence are prominent in the girls' everyday lives and negatively affect their development. The girls also expressed that they learned ways to resolve conflict and reduce this behavior in their neighborhood.

**Conclusion:** We conclude that this community-based youth program had positive results and that youth are able to understand the factors that affect their development and propose ways to make positive changes in their neighborhood. The participants in Girls Together decided to design a social awareness project to reduce violence against girls and women in their neighborhood.

**Research supported by:** Blue Foundation of Florida; Moses House; Department of Anthropology

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**Abstract #: 208**

**Presented by: Margeaux Chavez, BA, Graduate Student**

***Evaluating the Impact of Urban Agriculture on Food Accessibility through GIS Modeling: An Assets-based Approach to Food Desert Research***

Margeaux Chavez, Susan Tyler (Department of Anthropology and College of Public Health); Lorraine Monteagut (Department of Geography); David Godfrey (Department of Anthropology); University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** food access, food desert, GIS, urban agriculture

**Objective:** "Food desert" commonly describes food insecure areas with few fresh food outlets and numerous fast food outlets. This definition is largely undeveloped and research is often deficit oriented. One asset that has yet to be considered in food desert research is land used or available for use in urban agriculture. Objectives: 1. Identify the common factors that characterize "food desert" in scholarly research, public policy, and mass media. 2. Modify the current food desert map by incorporating additional factors into the GIS spatial analysis of Sulphur Springs. 3. Assess how planned modifications of food desert research meet the needs of a local nutritional health intervention.

**Methods:** Our project combines GIS methodology and ethnographic research to assess the potential positive effect of urban agriculture on food accessibility

**Results:** GIS results suggest that a local community garden/ farmers market would decrease residents' distance to and from fresh food outlets. Qualitative data suggest that residents are largely concerned about the quality of the fresh produce available in their local super markets and are deterred by low quality produce (i.e. spoiled or rotting) which may be a barrier to healthy eating habits. Rather than using a traditional community garden model to address issues of access, participant residents thought Community Supported Agriculture model would best serve the Sulphur Springs community. Participants also identified locations where they believed a CSA would be most impactful.

**Conclusion:** Based on this study, we believe that community-supported agriculture will improve the availability of quality, acceptable produce in Sulphur Springs.

**Research supported by:** USF Graduate School 2012-2013 Challenge Grant

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**Abstract #: 209**

**Presented by: Candace Clayborne-Harris , MPH, Graduate Student**

***Family-Centered Management of Birth Defects Diagnosis and Referral in Hospital Settings***

Candace Clayborne-Harris, University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** birth defects, services, families

**Objective:** The objective of this study was to identify best practices for the management of family support, provision of information, and referral to services following the diagnosis of a birth defect in birth hospitals. Despite considerable advances in birth defects diagnosis and clinical care, provision of services and supports to families has been inconsistent; families often report negative experiences in receiving limited information, if any, from professionals in the birth hospital setting about the diagnosis, prognosis, or available services and supports. Gaps in the referral process leave parents anxious and with unanswered questions.

**Methods:** Preliminary research utilizing focus groups and surveys with parents of children with Down syndrome identified needs and gaps within the hospital system from parents' perspectives. This review of multiple databases enriched those findings with a comprehensive examination of research conducted between 1995-2013 on postnatal diagnosis, provision of information and referral services for 12 selected birth defects.

**Results:** In spite of limitations in published studies, including a focus on specific conditions, small sample sizes, and the variability of hospital practices, important recommendations were identified and synthesized. The study presents a number of core recommendations in the provision of family-centered management of birth defects diagnosis and referral.

**Conclusion:** Best practices must be determined, operationalized, disseminated, and evaluated so that parents consistently receive sensitive, individualized, and timely information and referrals relative to their child's condition.

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**Abstract #: 210**

**Presented by: Emily Dunn, BA, Graduate Student**

***The Association Between Poverty and Formula Introduction in the Breastfed Infant***

Emily A. Dunn, USF Department of Community and Family Health and Department of Anthropology, University of South Florida, College of Public Health

**Keywords:** breastfeeding, poverty, socioeconomic factors, infant formula

**Objective:** To determine whether household poverty level is associated with the age at which infant formula is first introduced to the breastfed baby, and to assess the extent to which variables measuring socioeconomic status are associated with the age in months when an infant is first fed formula.

**Methods:** Data were obtained from the 2007 National Survey of Children's Health. Multivariable linear regression was used to estimate association between predictor variables and age at which formula was introduced. A multivariable logistic regression analysis was also performed, dichotomizing the outcome as less than one month and greater than or equal to one month but less than six months. Analyses were limited to children aged 6 months to 3 years who had ever breastfed.

**Results:** The linear regression analysis found that age at formula introduction was significantly associated with the child's age at the time of the survey ( $p=.0004$ ), child's race as other non-Hispanic ( $p=.02$ ) and mother's education level as a high school graduate ( $p=.02$ ). Adjusted logistic regression showed that Hispanic children were more likely to have received infant formula at less than one month of age (adjusted OR: 1.5, 95% CI: 1.058-2.245).

**Conclusion:** In the United States, household poverty level is not significantly associated with the age of formula introduction. Breastfeeding promotion interventions should incorporate a focus on other factors that influence the introduction of formula in the breastfed baby in low-income populations. Factors associated with the age of formula introduction should be further investigated.

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Abstract #: 211

Presented by: Pamela Guevara, MPH, Graduate Student

***Binge Drinking and Risky Sex among Adolescents: An Application of Structural Equation Modeling***

Pamela C. Guevara, MPH and Sarah B. Maness, MPH, Department of Community and Family Health, College of Public Health, University of South Florida

**Keywords:** structural equation modeling, adolescents, risky sexual behaviors, binge drinking

**Objective:** To test a path model of the relation of binge drinking to high-risk sexual behaviors among adolescents using structural equation modeling (SEM). Risky sexual behaviors include early age of sexual initiation, multiple sex partners, and lack of condom use during last time of sexual intercourse.

**Methods:** Data was analyzed from the 2011 National Youth Risk Behavior Survey (YRBS). Specific questions from the YRBS used in this SEM analysis include four questions related to binge drinking, condom use, age of sexual initiation, and number of sexual partners. Maximum likelihood estimation was used to fit the data matrix to the model using SAS 9.3 PROC CALIS function.

**Results:** Participants in the 2011 YRBS sample were predominantly ages 15 and older (n = 13,734) and approximately equally distributed between males and females as well as between 9th, 10th, 11th, and 12th grades. Of the national sample, 13,797 surveys were used. The model's convergence criterion was satisfied. Fit indices are the following: chi-square value ( $X^2 = 82.89$ ,  $df = 2$ ,  $p < 0.0001$ ), standardized root mean-square residual (SRMR) was 0.01, root mean square error of approximation was 0.05, and comparative fit index (CFI) was 0.99.

**Conclusion:** Through the use of SEM, the results indicated that even though the statistically significant chi-square suggests this is not the exact model, the other fit indices point to it being a reasonable model. The SRMS being very low indicates a good absolute fit of the model, and conversely the CFI being very high indicates a good incremental fit. The model indicated a positive relationship between binge drinking and risky sexual behaviors. Risky sexual behavior was most strongly associated with age of first sexual intercourse and total number of sexual partners.

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Abstract #: 212

Presented by: Marcda Hilaire, BA, Graduate Student

***Examining Medical Homes and Depression in Adolescents ages 10-17: A Secondary Analysis of the National Survey of Children's Health 2007***

Marcda E. Hilaire University of South Florida College of Public Health, Department of Community & Family Health

**Keywords:** Medical Home, Children, Depression, Mental Health, Disparities

**Objective:** To examine the association between participation in a medical home and depression status and severity in adolescents aged 10-17.

**Methods:** The study used secondary data from the 2007 National Survey of Children's Health. A total of 43,775 cases among children ages 12-17 had non-missing data on all variables of interest. The dependent variable was medical home status, while primary independent variable was depression, as measured by status and severity. Analyses were done in SAS 9.3, using the SURVEY procedures to account for the complex sample survey design. Analyses included Chi-square tests, simple and multiple logistic regression.

**Results:** Depressed children were less likely to participate in a medical home, compared to those who have never been told they are depressed (OR 0.378 [(95% CI 0.295-0.484)] and those who had been told previously, but not depressed at the time of the survey (OR 0.465 [0.344-0.629]). By depression severity, comparing those never depressed those with mild depression were less likely to have a medical home (OR 0.471 [(95% CI 0.356-0.623)] and with moderate/severe depression even less likely (OR [(95% CI 0.212-0.484)]. Those least likely to meet medical home criteria were Hispanics and Blacks, 0-99% FPL, uninsured or Medicaid/SCHIP, and those living in "other" family types. Neither age of child or gender were associated with likelihood of medical home in the multivariable analyses.

**Conclusion:** These findings warrant recommendations to decrease disparities in race/ethnicity, type of insurance and family structure for medical home participation. This is achievable through actions such as inclusion in healthcare reform and education in the preconception health models. Such steps would contribute to better mental health outcomes in children.

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**Abstract #: 213**

**Presented by: Mary Ivory, BA, Graduate Student**

***“About Me”: A Content Analysis of Older Women’s Online Vulnerability***

Mary Ivory, BA, Carla VandeWeerd, PhD, Martha Coulter, DrPH, and Jaime Corvin, PhD College of Public Health, Elizabeth Perkins, PhD College of Behavioral and Community Sciences, Ali Yalcin, PhD College of Engineering, Bonnie Yegidis, PhD School of Social Work, Jaime Myers, MPH College of Public Health, University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** online, social networking, vulnerability, older adults, women

**Objective:** Older women are increasingly using online social networking sites (SNS) to meet new people, including romantic partners. This study examines the vulnerability of older women who seek relationships online through a content analysis of information displayed on public SNS profiles. Differences between traditional SNS and online dating profiles are explored with respect to risk implications.

**Methods:** An interdisciplinary team of investigators developed an instrument to systematically abstract information from publicly available SNS profiles of women 50+, living within 50 miles of zip code 33602, who self-identified as looking for a “relationship” or “dating” on MySpace or hosted a profile on the dating site Plenty of Fish. Women were stratified by age and race (White, Hispanic, and Black), and data were abstracted for a minimum of 50 women in each racial category per website (N=365) across various domains associated with vulnerability.

**Results:** Women using Myspace posted a greater variety of information; this often included their full name, family members’ names, place of employment, and schools attended, which could be used to locate individuals off-line. Myspace profiles were also used to keep in touch with family and friends and had security settings available to make profile content inaccessible to unknown individuals. Plenty of Fish profiles focused on types of individuals the participant wanted to meet and content often suggested previous negative experiences meeting people online.

**Conclusion:** Data revealed that women share a variety of life experiences and information publicly; some of which may place them at increased risk for abuse and exploitation.

**Research supported by:** COPH Interdisciplinary Grant

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**Abstract #: 214**

**Presented by: Nicole Johnson, MPH, Graduate Student**

***Students With Diabetes: Education and Support for Living Well with Diabetes***

Nicole Johnson, MPH, MA Paige Wagner, BA Stephanie T. Melton, MA, MPH University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** diabetes education, young adults, social support

**Objective:** Young adults with diabetes face enormous challenges adapting to independent life due to the demands of diabetes management. Diabetes requires daily management for optimal glycemic control and decreased risk of diabetic complications, though maintaining diabetes management behaviors can be challenging for college students. Students With Diabetes is a campus-based education. The objectives of the program are to empower young adults living with diabetes, to socially connect young adults with diabetes, to create a social safety net for young adults with diabetes and to provide appropriate and relevant diabetes education targeted to the young adult life stage. In this study, the effectiveness of the Students With Diabetes education program for young adults with diabetes is assessed.

**Methods:** Evaluation was conducted at two time points with participants from three college chapters who completed surveys and standardized HbA1c blood glucose measures. The assessment measures perceived social support, benefit from SWD membership and diabetes management outcomes.

**Results:** The results indicate that improved perceived support of young adults with diabetes can positively impact the individual's ability to manage lifestyle and diabetes needs. Blood glucose measures improved with participation in the program. The results provide subjective and objective measures of the effectiveness of this format for diabetes education and the positive impact of social support on disease management.

**Conclusion:** This model for health communication is useful for health and chronic disease education on college campuses during the young adult transition phase.

**Research supported by:** The Patterson Foundation

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**Abstract #: 215**

**Presented by: Sabrina Luke, MPH, Graduate Student**

***Maternal Smoking by Trimester of Pregnancy and Severity of Fetal Growth Restriction in Small-for-Gestational-Age Infants***

Sabrina Luke, Department of Community and Family Health, University of South Florida, Russell Kirby, Department of Community and Family Health, University of South Florida, Cande V. Ananth, Department of Obstetrics and Gynecology, Columbia University University of South Florida, College of Public Health

**Keywords:** Tobacco, Small-for-gestational-age, trimester

**Objective:** Infants born small-for-gestational-age (SGA) are at increased risk for severe disabilities and chronic health problems. One of the most significant risk factors for fetal growth restriction is smoking during pregnancy. In this study we seek to 1) compare outcomes by trimester of maternal tobacco use in order to identify whether this effect is modified by the timing of tobacco exposure and 2) identify whether there are differences in association by percentile of SGA (<5th and 5th-10th).

**Methods:** Data were obtained from the 2009 Natality public use file available through National Center for Health Statistics. MANOVA and multivariable logistic regression models were developed to determine the association between percentile of SGA outcome (<5th and 5th-10th) and trimester of tobacco exposure.

**Results:** Women who smoked had a 116% increased risk of giving birth to an infant in the <5th percentile SGA and a 78% increased risk of giving birth to an infant in the 5th to 10th percentile SGA compared to non-smokers. The risks increased by trimester of smoking and were highest among women who smoked for all three trimesters consecutively. Infants in the <5th percentile SGA also experienced the highest mean tobacco exposure during pregnancy.

**Conclusion:** The risks of delivering an infant that is SGA due to maternal smoking varies by trimester of tobacco use, duration of exposure and quantity of cigarettes smoked. Women can significantly reduce their risks of giving birth to a SGA infant by quitting smoking as early as possible in their pregnancy.

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**Abstract #: 216**

**Presented by: Sarah Maness, MPH, Graduate Student**

***A Systematic Review of Pregnancy Prevention Programs for Minority Youth in the U.S.: A Critical Analysis and Recommendations for Improvement***

Sarah Maness, MPH, Eric Buhi, MPH, PhD University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** Systematic Review, Pregnancy Prevention, Minority Health

**Objective:** In the United States, African American and Latino youth suffer from disproportionate rates of adolescent pregnancy. A public health priority to ameliorate the high rates among this population has been the creation and proposed expansion of pregnancy prevention programs designed specifically for minority youth. To better understand the components and outcomes of existing programs for this population, this systematic review of the literature analyzed published outcome evaluations of adolescent pregnancy prevention programs for minority youth.

**Methods:** This review of scholarly databases abstracted results from 10 published outcome evaluations meeting all inclusion criteria. Publications were assessed for intervention characteristics, including use of theory, implementation setting, and cultural tailoring. In addition, characteristics of the evaluation, including study design, outcome variables, and measures were assessed.

**Results:** Results of this review indicated that 9 of the 10 evaluations found statistically significant results for a main pregnancy prevention variable (delay of sexual initiation, birth, avoidance of sexual activity, or intent to engage in sexual activity). The review also indicated areas for improvement in methodological quality, and consistency in cultural components, variables and measures.

**Conclusion:** Implications of this research indicate a positive impact from adolescent pregnancy programs for minority youth, and a need to expand standardized measures and program components as well as increase rigor in research methodology.

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**Abstract #: 217**

**Presented by: Lauren Meltzer, BA, Graduate Student**

***Development of a Smoking Relapse-Prevention Intervention for Cancer Patients***

Meltzer, L.R.<sup>1,2\*</sup>, Diaz, D.B.<sup>1,2</sup>, Carrington, M.S.<sup>1,2</sup>, Meade, C.D.<sup>1,2</sup>, Brandon, T.H.<sup>1,2</sup>, Jacobsen, P.B.<sup>1,2</sup>, McCaffrey, J.C.<sup>1,2</sup>, Haura, E.B.<sup>1,2</sup>, Sutton, S.K.<sup>1</sup>, & Simmons, V.N.<sup>1,2,1</sup> - Moffitt Cancer Center<sup>2</sup> - University of South Florida  
University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** Smoking relapse-prevention intervention

**Objective:** Many smokers spontaneously quit smoking after receiving a cancer diagnosis; however, there is a lack of resources available to assist cancer patients in maintaining their smoking abstinence.

**Methods:** As part of a randomized clinical trial testing the first ever smoking-relapse intervention specifically for cancer patients, we developed a DVD titled Surviving SmokeFree. Building on our previous formative work (Simmons et al., 2009) and the smoking relapse literature, this educational tool provides information about the benefits of staying smoke free and offers coping strategies to deal with smoking urges. The DVD draws upon the concept of role-modeling through featured testimonials from cancer survivors who reflect on their experiences in remaining smoke free. The DVD is accompanied by the Forever Free series which consists of 8 self-help booklets that have previously been found to be effective in reducing smoking relapse in the general smoking population.

**Results:** This poster: 1) illustrates how we incorporated findings from formative research into the development of a novel smoking relapse intervention for cancer patients; 2) outlines the series of systematic and iterative steps in the DVD development process; and 3) presents results from the learner verification interviews that were conducted with cancer patients to ensure suitability of the messages.

**Conclusion:** Cancer educators and researchers may use this systematic framework to guide their efforts in the development of future educational interventions.

**Research supported by:** Funded by NCI Grant R01CA154596

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**Abstract #: 218**

**Presented by: Jaime Myers, MPH, Graduate Student**

***Just Part of the Game: Normalization of Adverse Online Dating Experiences Among Older Women***

Jaime Myers, MPH, Carla VandeWeerd, Martha Coulter, DrPH, Jaime Corvin, PhD College of Public Health, Elizabeth Perkins, PhD College of Behavioral and Community Sciences, Ali Yalcin, PhD College of Engineering, Bonnie Yegidis, PhD School of Social Work, Maria Rodriguez, BA College of Public Health, University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** online, interpersonal violence, elderly, technology, social networking

**Objective:** Little is known about the experiences of older women using the internet to seek new relationships. An exploratory study of women who seek relationships online found that women reported experiencing adverse events including financial exploitation (40%), threats (55%), and physical harm (38%). This study seeks to build on these findings to understand the adverse experiences of women who date online using a "lived experience" perspective.

**Methods:** Semi-structured telephone interviews were conducted with women ages 50+ living within 50 miles of zip code 33602 using PlentyofFish.com or Craigslist.com to seek relationships (N=44). Interviews were audio-recorded, transcribed verbatim, team coded using a combination of a priori and emergent codes, and entered into ATLAS TI for analysis.

**Results:** Women reported a variety of negative experiences dating online. Attempted financial exploitation through the experience of meeting "scammers" online was normative. Many women reported numerous interactions with scammers, indicating that false identities on online dating sites were commonplace. Deception and lying was typical of online dating even among legitimate profiles. Often lies became apparent during the first in person meeting with someone they spoke with online. Women also reported sexual assault through explicit online messages and unwanted in person advances. Adverse events were typically minimized and were viewed as "just part of online dating."

**Conclusion:** Findings reveal attempted financial exploitation through online scams and unwanted sexual advances are common aspects of the online dating experience for older women. Thus, strategies to decrease online vulnerability of older women are discussed.

**Research supported by:** COPH Interdisciplinary Grant

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Abstract #: 219

Presented by: Robert Nelson, MD, Faculty

***USF-UCE iPad Project-Bringing the Classroom to the Field: A tool to Improve Children's Quality of Life in the Eastern Region of the Dominican Republic.***

Robert M. Nelson, Jr., MD, MS, Ana J Santos, BS, Goldny A. Mills Bradshaw, MD, MPH, University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** International Medical Education, Technology

**Objective:** The Universidad Central del Este (UCE) epidemiology students used iPads in the field during their eight months theoretical practical exercise to define the most important health problems affecting each batey (sugar worker town in DR), educate on history and risk factors of contacting the diseases affecting each batey, determine strategy for prevention and control, and applying the strategy and predict disease trends to promote healthier communities.

**Methods:** The planning phase included lifestyle and community health assessment on issues affecting each batey and brainstorming on best use of iPad apps to educate. During implementation, the students focused on each batey needs and power of social media to educate and bring national and international awareness. Finally, in the dissemination phase they explored local, national and international media and publications to promote the use of social media for health communication strategies.

**Results:** iPad applications were used as an educational tool; for example, apps such as "PepiBath" to show children how to take bath and maintain personal hygiene in a fun way. The students started developing a video library (including iUSFChildHealthTv) to demonstrate control and prevention of transmission of diseases such as flu, malaria, tuberculosis, and dengue. iPads were used to broadcast prevention activities via radio and television stations through social media in real time. International health activities included using the internet to disseminate photo collages and multiple short videos.

**Conclusion:** Student leaders found the use of iPads as an innovative tool that truly brings classrooms to the field. Partnerships such as this one also stimulates innovation in medical education.

**Research supported by:** USF Health- Children's Health

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Abstract #: 220

Presented by: Anthony Panzera, MPH, Graduate Student

***What Users Want in an App: Design Suggestions after Use of Currently Available Asthma Self-Management Applications by Teens and Their Healthcare Providers.***

Anthony Panzera, Tali Schneider, Cassandra Tardiff, COPH, James Lindenberger, Social Marketing Group, COPH, Marisa Couluris, Morsani College of Medicine, University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** Asthma, adolescents, Social Media, Design Thinking, Mobile Technology

**Objective:** Social media technologies, including applications ("apps," provide a unique opportunity for self-management of chronic disease and health education. We describe asthmatic teens' perceptions and suggestions for development of asthma-related apps to help their parents and themselves with asthma management.

**Methods:** Sixteen teens were assigned to use either an over-the-counter (OTC) AsthmaPlus app or a prescription app. They used the apps frequently throughout a 4-week period. Following use, semi-structured interviews were used to identify perceived benefits and barriers encountered. Teens were also asked to provide feedback on their perception of the app's utility for their pediatric pulmonologist participating in the study. The pulmonologist agreed to receive app entries sent by teens and share her experience reviewing self-reported patient information from the app.

**Results:** Teen participants describe apps as useful tools to assist them with asthma control and connect with their healthcare providers. Suggested features to increase utilization include tailored reminders, tracking asthma measures, and medication monitoring. Appearance and graphic design were mentioned as factors that would stimulate use. Physicians recommended basic measures that would trigger alerts appropriately and would require the provider to consult the patient on necessary actions to be taken.

**Conclusion:** Future app development can be guided by participants' recommendations. Physician suggestions include utilizing specific questions in the app to help triage the teen based on their noted asthma condition. Framing app use as fun and providing real or symbolic incentives for continued use are needed.

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**Abstract #: 221**

**Presented by: Mahmooda Khaliq Pasha, MPH, Graduate Student**

***Factors Impacting Modern Contraceptive Use: An Analysis of the 2011 Uganda Demographic and Health Survey***

Mahmooda Khaliq, MHS, CPH, Russell Kirby, PhD, MS, FACE, University of South Florida, College of Public Health, Department of Community and Family Health

**Keywords:** Demographic Health Survey, Fertility, Contraception

**Objective:** This study aims to understand modern contraceptive use in Uganda with a focus on differentials due to proximate and socioeconomic variables that directly or indirectly impact fertility. Specifically, the questions being investigated include:  
•How do women who use modern contraception compare to women who do not use modern contraception. •What individual level (age, education, wealth or fertility), cultural level (marriage, ethnicity, religion), and program level characteristics are associated with modern contraceptive use?

**Methods:** This study analyzed a nationally representative sample of 8,674 women of reproductive age(15-49 years) from the 2011 Uganda Demographic and Health Survey (UDHS). The UDHS collects data on fertility, family planning, maternal and child health and demographics. Manipulation of the UDHS using study inclusion and exclusion criteria, created a total sample of 6,401 women. Multivariable logistics regression with crude and adjusted odds ratios and Multivariate Analysis of Variance(MANOVA) followed by discriminant function analysis(DFA) was performed.

**Results:** Age (OR=2.11, CI 95% 1.70, 2.62), education level (OR=2.28, CI 95% 1.79, 2.92), wealth (OR=2.45 CI 95% 1.86, 3.21), total number of children (OR=2.62, CI 95% 1.96, 3.52) and program exposure (OR=1.50, CI 95% 1.28, 1.74) are all strong and significant predictors of modern contraceptive use. A statistically significant Wilks Lambda indicates that contraceptive type differ on age, education and total number of children ( $\lambda=.916$ ,  $F(27,8765)=9.85$ ,  $P<.0001$ ).

**Conclusion:** These results showcase the need for interventions that are designed at the individual and household level and highlight the need for additional research on community contextual factors that impact contraceptive use.

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**Abstract #: 222**

**Presented by: Saba Rahman, BS, Graduate Student**

***Sex on the beach: An In-depth Situational Analysis of School-Based Sexuality Education Changes in Florida***

Saba Rahman, BS, Nicole Brasseur, BPh, Elizabeth Baker, MPH, Natalie Hernandez MPH, Chris Wheldon, MSPH, MEd, Linsey Grove, BS, Krystal J. Hill, BA, Ellen Daley, PhD, Eric Buhi, MPH, PhD University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** Sex Education, Schools, Policy, Youth, Florida

**Objective:** Sexual and reproductive health outcomes of Florida youth are among the poorest in the nation. Although school-based sexuality education (sex ed) is one strategy to alleviate these outcomes, such education is inconsistent across the state and determined at the local level. Over the past few years, some Florida districts have changed from an abstinence-only approach to a more progressive form of sex ed. The purpose of this study was to better understand the process of sex ed curricular/policy change at local levels.

**Methods:** We employed a series of case studies involving multiple phases/data collection methods. First, sex ed policies from all 67 Florida counties were reviewed to determine if a change occurred in the previous 7 years. For each county identified, we conducted a media analysis of local newspaper articles to identify key informants, involved in the change discussion, who we later interviewed.

**Results:** Four counties were identified as having recently changed their curriculum/policy: Brevard, Collier, St. Lucie, and Volusia. Interviews revealed that Brevard County's change was driven by parental involvement and a national advocacy organization local chapter. Change in Collier County was driven by a behind-the-scenes community activist, who capitalized on a post-election change in school board makeup. In St. Lucie County, change was achieved through a community participatory process prompted by a local HIV/AIDS epidemic. In Volusia County, the change process was supported by school officials but spearheaded and driven by a fervent, well-educated parent.

**Conclusion:** We had initially anticipated identifying common threads across these counties but each county had a unique set of circumstances and individuals facilitating change.

**Research supported by:** Ford Foundation

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***Informal Caregiving Burden and Quality of Life Within The Villages community***

M Rodriguez, BA, C Vandeweerd, PhD, Department of Community and Family Health; J Corvin, PhD, Department of Global Health; AR Williams, PhD, Department of Health Policy and Management; and D Petersen, ScD, Dean of College of Public Health, University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** Informal caregiving, quality of life, caregiver burden

**Objective:** The CDC predicts the number of older adults aged 65 and over in the U.S. will increase from 35 million in 2000 to 71 million in 2030. While skilled professionals including doctors, nurses and other health professionals are trained to provide formal care to older adults, more than 43.5 million individuals in the U.S. will be responsible for informal care to older adults. These caregivers are primarily family, typically female spouses and they face a number of challenges as a result of their caretaking. Informal caregivers tend to have lower quality of life compared to non-caregivers and are more likely to suffer from depression, poor physical health, and financial stress

**Methods:** A multi-phased study that utilized a mixed-methods approach was designed to assess the health status of residents. Phase one included a formative qualitative stage in which 59 focus groups (FG) (n=451), stratified by age, gender, and health status were conducted. FGs were recorded, transcribed, coded, and analyzed using Nvivo9 software. Salient themes including definitions of health, importance of good health, and service availability informed the development of health assessment survey (Phase two) distributed to all the residents via online and paper form. To better understand caregiver's needs and assess their quality of life, responses from residents of The Villages who indicated being a caretaker (n=449) were analyzed and compared to national data

**Results:** Informal caregivers residing within The Villages report better quality of life than informal caregivers across the nation

**Conclusion:** An active and engaged lifestyle are suggestions for policy and practice changes to guide future research and reduce caregiver burden for informal caregivers

***Family Physical Activity Practices and Adolescents Obesity***

Tali Schneider, MPH, Department of Community and Family Health, College of Public Health

**Keywords:** Adolescent Obesity Physical Activity Family Dynamic

**Objective:** Over the past 3 decades, childhood obesity rates in the United States have tripled. Childhood obesity increases the likelihood for obesity in adulthood, including the risk for related health complications. Among the various factors associated with adolescents' weight, family dynamics and the family environment play a key role. This study examines the association of physical activity (PA) performed by adolescents and caregivers and the probability of obesity among these adolescents.

**Methods:** This study utilized secondary data from the 2007 National Survey of Children Health. Statistical analysis included bivariate and multivariate logistic regression to evaluate association of overweight and PA practices of adolescents and their caregivers, using survey weights to account for the complex survey design.

**Results:** Mother's exercise habits were protective for child obesity (OR=0.772, 95% C.I. 0.649-0.917). Level of adolescent PA also reduced their risk of obesity. Compared with non-active adolescents, the odds of obesity among adolescents exercising 4-6 days/week measured 0.805 (95% C.I. 0.652-0.995). Adolescents who spent 1-4 hours/day viewing TV showed higher odds for obesity (1.389, 95% C.I. 1.024-1.884) compared to those viewing TV 1 hour or less a day.

**Conclusion:** Parents' lifestyle is linked to their adolescent child weight. Preventive interventions should consider family-based programs, focusing on behavioral change to promote active lifestyle within the family. Given the disproportionate prevalence of obesity among certain demographic segments, population specific intervention should be considered as well.

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Abstract #: 225

Presented by: Monica Solomon, MPH, Graduate Student

***Impact of Religion and Spirituality on Depressive Symptoms in Older Adults***

Solomon, Monica, <sup>1,4</sup> Sharkey, S., <sup>4</sup> VandeWeerd, C., <sup>1,4</sup> Corvin, J., <sup>3,4</sup> Levin, B., <sup>1,2,4,5</sup> Gum, A., <sup>5,6</sup> Petersen, D., <sup>1,4</sup>  
Department of Community and Family Health<sup>1</sup>, Department of Child & Family Studies<sup>2</sup>, Department of Global Health<sup>3</sup>,  
College of Public Health<sup>4</sup>, College of Behavioral & Community Sciences<sup>5</sup>, Department of Mental Health Law & Policy<sup>6</sup>

**Keywords:** religion, mental health, spirituality

**Objective:** The US is experiencing growth of older adults, with numbers up 15% between 2000 and 2010. Research has shown that participation in religious communities can impact mental health outcomes, but specific impacts remains unclear. The study will build upon current research by examining spiritual, religious, and depression indicators in older adults.

**Methods:** The study focuses on data obtained via the USF Health and The Villages study, which examined health in this active living population through qualitative and quantitative data collection. In the formative stage, 451 Villagers provided health care information over 59 focus groups between October and December 2011 which informed development of a quantitative survey. In Phase 2, the quantitative health survey was administered to all residents (N= 88,529) yielding a response rate of 37.4% (N=33, 119). Among other data collected, surveys included measures of religiosity, depression (PHQ-2, and participant demographics which are the focus of this analysis.

**Results:** PHQ-2 findings report over 91% (n= 28,655) of Villages resident were negative for depression. In regards to religiosity, 69.5 % (n=7309) of Villages residents considered themselves religious and 30.5% (n=3210) did not. Furthermore, 81.2% (n=8527) of Villages residents consider themselves spiritual whereas 18.8% (n=1968) did not. Bivariate analysis of PHQ-2 scores and church attendance was statistically significant  $\chi^2 (3) = 8.216$ ,  $p = < .05$ . Bivariate analysis of the SF36 MHI-6 (76 cutoff score) and church attendance was statistically significant  $\chi^2 (3) = 23.476$ ,  $p = < .05$ .

**Conclusion:** Implications will be discussed in terms of public health practice and policy for meeting mental health needs for an aging population.

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Abstract #: 226

Presented by: Susan Tyler, BA, Graduate Student

***Social Foodways and Nutritional Risk: Complex Food Issues in The Villages, Fl., an Active Adult Retirement Community***

Tyler, S., BA, Department of Community and Family Health, Department of Anthropology; McNab, P., MA, MPH; VandeWeerd, C., PhD, Department of Community and Family Health; Corvin, J., PhD, Department of Global Health; Petersen, D., ScD, MHS, College of Public Health, University of South Florida

**Keywords:** Older Adults, Nutritional Risk, Food Environment

**Objective:** Many older adults do not consume the recommended amounts of fruits and vegetables and, as a result, experience nutritional deficiencies. While these problems persist in all demographic groups, aging populations encounter unique barriers and facilitators to food access. The aims of this research were to (1) assess levels of nutritional risk among residents of The Villages and (2) identify food-related environmental supports and hindrances.

**Methods:** Data was collected in two interrelated phases: (1) Fifty-nine focus groups (n = 451) that focused on the collection of formative health data and (2) a quantitative health survey that was completed by 33,119 residents (37.4% response rate). The survey included the Nutrition Screening Initiative (NSI) checklist, a screening tool that categorizes individuals by level of risk. Questions about quality of life (WHOQOL-BREF) and social support were included.

**Results:** Focus groups revealed both benefits and barriers of living in a socially active and supportive community. Neighbors and organizations often cooked and delivered meals for individuals needing assistance. However, social eating was the norm and reportedly resulted in overconsumption and weight gain. The NSI checklist indicated that well over half of residents were either at moderate (55.3%) or high (12.2%) nutritional risk.

**Conclusion:** The Villages is an exceptional community in terms of resident satisfaction, health, and social cohesion. Still, problems related to food access and nutrition exist. Additional research is needed to pinpoint age-specific factors that contribute to food insecurity and over- and undernutrition among older adults. Further implications for policy and practice will be discussed.

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**Abstract #: 227**

**Presented by: Heather Williamson, MBA, Graduate Student**

***Home and Community Based Services Waiver: Family Quality of Life as an Outcome Measure***

Heather J. Williamson, OTR/L, MBA, Mary Armstrong, PhD University of South Florida, College of Public Health, Department of Community & Family Health

**Keywords:** Disability, caregiver, family support

**Objective:** Individuals with intellectual and developmental disabilities (I/DD) are experiencing longer life expectancies and families continue to be the primary providers of care for the majority of adults with I/DD. Given the growth of the aging adult population with I/DD and the reliance on families to provide a majority of caregiving, it is imperative that support services for families be not only accessible but also effective in supporting the family caregiver. Disability service systems should work to support families, resulting in the improvement of family quality of life (FQOL). Therefore, it will allow families to continue caregiving to avoid individuals with I/DD needing institutional care.

**Methods:** The primary funding source for family support services is the Home and Community-Based Services (HCBS) waiver. Therefore, an evaluation of existing HCBS waiver evaluations' outcomes was completed for evidence of measuring family caregiver outcomes. 1) Family support is defined, 2) HCBS waiver family support services identified, 3) unified FQOL theory and FQOL domains reviewed, and 4) existing HCBS waiver evaluations reviewed for FQOL domains reflected in outcomes.

**Results:** Only one evaluation of the HCBS waiver, which is voluntary for states, included partial FQOL domains in their outcomes.

**Conclusion:** Since disability service systems are placing more reliance on the family to provide care, more HCBS waiver evaluations should work to include FQOL measures.

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**Abstract #: 228**

**Presented by: Ushang Desai, MPH, Graduate Student**

***Managing Public Health Risks Using Air Monitoring at a Former Manufactured Gas Plant (MGP) Site***

Ushang Desai<sup>(1)</sup>, Robin DeHate<sup>(2)</sup>, Brian Skelly<sup>(2)</sup>, Giffe Johnson<sup>(1)</sup> and Raymond Harbison<sup>(1)</sup> Department of Environmental and Occupational Health, College of Public Health, University of South Florida, Tampa, FL. <sup>(2)</sup>GEI Consultants, Inc. Valrico, FL University of South Florida

**Keywords:** Manufacturing Gas Plants, Public Health Risk, Volatile Organic Chemicals, Polycyclic Aromatic Hydrocarbons, Particulate Matters (PM10)

**Objective:** Monitoring emissions from a former Manufactured Gas Plant (MGP) site during remediation was used to manage risks associated with inhalation of VOCs such as benzene, toluene, ethylbenzene, and xylenes; and contaminated particulates acting as an exposure conduit for PAHs and heavy metals at a former MGP site located in the southeast U.S.

**Methods:** A total 535 twenty-four hour time weighted samples (269 VOC samples and 266 PAH samples) were collected over a 12-months period; risk values were based on USEPA's Regional Screening Levels. Risk-based Acceptable Air Concentrations (AACs) were developed and a sampling regime established to monitor potential emissions to maintain contaminant concentrations below the AACs. The AAC for benzene was based on carcinogenic effects using the current IUR from the USEPA's IRIS database. Risks for toluene, ethyl benzene, and xylenes were based on non-carcinogenic effects using the current RfC from the IRIS database Risks for the carcinogenic PAHs were based on carcinogenic effects using the current IUR from California EPA. Risks for respirable particulate matter (PM10) was based on the National Ambient Air Quality Standard (NAAQS) for PM10 and was used as a surrogate for both the PAHs and heavy metals. Site-specific AACs were calculated using a target cancer risk (TR) value of  $1 \times 10^{-4}$  for carcinogens and a target hazard quotient (THQ) of 1 for non-carcinogens.

**Results:** Only minor levels of VOCs and PAHs were detected and no results were above the AACs.

**Conclusion:** These measured air levels demonstrate that the real-time air monitoring and control measures implemented at the site effectively maintained concentrations below the AACs and were protective of public health.

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**Abstract #: 229**

**Presented by: Shabnam Mehra, MSPH, Graduate Student**

***SAS and Excel Go Hand in Hand for Automation: Data Management to Policy Reports***

Shabnam Mehra (COPH), Mittal Nagda (COB) Durga Morpati (COB) University of South Florida, College of Public Health, Department of Environmental & Occupational Health

**Keywords:** SAS Excel Policy Report Automation

**Objective:** To automate policy reports using administrative data with multiple dates and overlapping date spans.

**Methods:** Managing and cleaning administrative data can be challenging, but by using SAS® to manage and analyze the data, it can help overcome some of the challenges. The process can be a simple four step process: 1. Use SAS® 'Data \_NULL\_' to create headers for report; 2. Combine multiple records to single records using RETAIN with IF-THEN-ELSE-DO loops in SAS®; 3. Create Data Summaries using SAS® SQL or Proc Summary; 4. Export SAS® data to pre-formatted Microsoft Excel workbook or templates. The process of generating policy reports can be automated using various methods currently available in SAS®, i.e. DDE, ODS, X-command or Add-In.

**Results:** In SAS, using the \_NULL\_ and RETAIN with IF... Then...Else...Do loops can alleviate some problems which arise during data management. Often dates in administrative dataset are not in date format, \_NULL\_ can be used to manage dates and put headers log and output reports. RETAIN statement with if-then-else-do loop can be used to combine different overlapping date spans to one unique record. DDE, X-command and Add-In in Excel can be used to export SAS® data to pre-formatted Microsoft Excel workbook or templates.

**Conclusion:** The methods employed here are simple and can be combined to clean administrative data to desirable format for answering research and policy questions. With the examples and information provided in this presentation/poster, the audience is expected to be able to (1) Combine multiple records to single records efficiently using SAS® ; (2) Automate regulatory reports from data analyzed in SAS® to pre-formatted templates.

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**Abstract #: 230**

**Presented by: Daniel Mendoza, PhD, Postdoc**

***High-resolution Emissions and Concentrations of Carbon Monoxide and Fine Particulate Black Carbon in Fort Collins, Colorado: Toward Estimation of Exposures by Commute Route and Mode***

Daniel Mendoza, Amy L. Stuart, Environmental & Occupational Health, Getachew Dagne, Epidemiology and Biostatistics, University of South Florida, College of Public Health

**Keywords:** Commuter pollutant exposure, Urban pollution, Bayesian updating, Carbon Monoxide, PM2.5 Black Carbon

**Objective:** Characterization of emissions is necessary for understanding exposures and effects of urban air pollution. The goals of this work are 1) to estimate emissions of carbon monoxide (CO) and fine particle black carbon (PM2.5 BC) for Fort Collins, CO, 2) to estimate concentrations at high spatiotemporal resolution, and 3) to quantify the uncertainty in these estimates.

**Methods:** Annual county emissions were obtained from the National Emissions Inventory. We allocated onroad emissions to hourly resolution and to area roadway links using the MOVES model and vehicle count information from measurement site and travel demand model data. Emissions for other sectors were spatiotemporally allocated using established surrogates. Uncertainty in the emissions processing were also tabulated. Pollutant concentrations at 500m resolution for a 10x10 km area were estimated using Gaussian dispersion modeling.

**Results:** Concentration fields show variability at hourly scales that are consistent with measured diurnal cycles. High variability is observed in residential areas on weekdays as nearby roads host a large fraction of the traffic volume during peak hours. Onroad emissions contribute three orders of magnitude more to local CO concentrations than do point sources on average.

**Conclusion:** Estimated emissions and concentrations at high resolution will allow for exposure estimation by commute route and mode in ongoing work. Uncertainty estimates will be used to improve estimation by assimilation of measured concentration data in a Bayesian framework. Onroad sources are the dominant emitters of CO; their mitigation may yield the greatest reduction in commuter exposure.

**Research supported by:** NIEHS R01ES020017. The content does not necessarily represent the views of NIH.

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**Abstract #: 231**

**Presented by: Jill Sears, BS, Graduate Student**

***Impacts of Urban Forestry on Transportation Pollutant Reductions***

Jill Sears, Environmental & Occupational Health, Amy L. Stuart, Environmental & Occupational Health, Civil & Environmental Engineering, University of South Florida College of Public Health

**Keywords:** urban air pollution, urban form, urban forests

**Objective:** Transportation-related air pollutants account for the majority of harmful air pollution in urban areas. Forests are expected to reduce air pollution by facilitating dry deposition and atmospheric gas exchange. This work investigates interactions between transportation air pollutants and urban forests in Hillsborough County, Florida.

**Methods:** Pathways of pollutant removal by local forests were identified through literature review and mapping. A passive air sampling campaign was designed to characterize concentrations of aldehydes, nitrogen oxides, benzene, toluene, ethylbenzene, and xylene (BTEX) in Hillsborough County at high spatial resolution. Fifty Census block groups were randomly assigned for sampling in forested or nonforested areas. Pollutants of interests will be chemically extracted then analyzed for concentration using analytical instrumentation.

**Results:** The literature review suggests a slight reduction in nitrogen oxides and BTEX concentrations based on their accelerated reaction to form ozone, which is absorbed by trees. Conversely, aldehyde concentrations are expected to be greater in forested areas because of tree production of biogenic hydrocarbons that react to produce formaldehyde. Trial sampling has been performed to test experimental methods and identify the expected range of concentrations.

**Conclusion:** Recommended approaches for use of urban forests as an effective air pollution mitigation technique in Hillsborough County will be generated based on results. This work will be used to determine if urban forests can be usefully incorporated into a sustainable urban design in order to reduce exposure to harmful air pollutant levels.

**Research supported by:** National Science Foundation Grant No. 0846342. The content does not necessarily reflect the views of NSF.

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**Abstract #: 232**

**Presented by: Kristy Siegel, MPH, Graduate Student**

***Exploring Physical Activity Levels and Health-Status of Older Adults in The Villages, FL***

KA Siegel, MPH, CPH, Department of Environmental & Occupational Health; L Bach, MPH; C Radwan, MA, Department of Anthropology; C Vandeweerd, PhD, Department of Community and Family Health; J Corvin, PhD, Department of Global Health; and D Petersen, ScD, Dean of College of Public Health, University of South Florida

**Keywords:** Older adults; physical activity; health-status

**Objective:** The health benefits of physical activity (PA) in the older population have been well established. However, few older adults are meeting the minimum recommendations for PA. The purpose of this study is to explore PA levels of residents of The Villages, FL, as well as their reported health status, quality of life, and satisfaction with options for PA, across the gender and age-groups represented.

**Methods:** A comprehensive cross-sectional survey was disseminated to all Villages residents, an active adult retirement community, examining a series of health related domains via well-established, short, high salience instruments. Of the 88,527 surveys that were mailed, 33,119 (37.4%) were completed and returned for analysis.

**Results:** Based on US DHHS recommendations for PA, 16.2% of residents walk 5 or more times per week for at least 30 minutes; 14.4% engage in 30 minutes or more of moderate-intensity PA 5 or more times per week; and 40.5% engage in 20 minutes or more of vigorous-intensity PA 3 or more times per week. When comparing genders, men and women have similar patterns of PA: 15.4% men and 16.9% women met the guidelines for walking; 15.6% men and 13.5% women met the guidelines for moderate-intensity PA; and 42.4% men and 33.5% women met the guidelines for vigorous-intensity PA. As the population ages, residents meeting the PA guidelines decreases. PA satisfaction, health status, and quality of life as related to PA will also be discussed.

**Conclusion:** The Villages community has been successful in implementing numerous PA opportunities for residents. Residents are utilizing these opportunities to improve their health and well-being. Findings are discussed to include policy and practice implications at The Villages and in other senior communities.

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**Abstract #: 233**

**Presented by: Korede Adegoke, MPH, Graduate Student**

***Spousal Violence and Unwanted Pregnancy among Married Nigerian women***

Korede Adegoke: Dept. of Epidemiology and Biostatistics. Ngozichukwuka Agu: Dept. of Community and Family Health. Evelyn Anegebe: Dept. of Epidemiology and Biostatistics. Oluyemi Falope: Dept. of Global health. Martha Coulter: Dept. of Community and Family Health. University of South Florida, College of Public Health

**Keywords:** Spousal violence, Unwanted pregnancy, Adverse pregnancy outcome

**Objective:** Violence against women has been recognized as a serious public health problem worldwide. The World Health Organization reports that between 10 to 69% of women experience intimate partner violence in their lifetime. Intimate partner violence (IPV) can result in adverse effects on women's physical, mental, sexual and reproductive health. This study aims to examine the impact of spousal violence on unwanted pregnancy in Nigeria.

**Methods:** The Nigeria Demographic and Health Survey 2008 was analyzed in this study. The study population included 18,010 married women between the ages of 15 and 49 years. The exposure variable, spousal violence was defined as exposure to physical, emotional and sexual abuse by partner. The outcome variable of interest was pregnancy termination. Data were analyzed using descriptive, chi-square test, and multiple logistic regression analysis.

**Results:** Preliminary results show that about a quarter of the women sampled 4,614 (25.6 %) reported a history of spousal abuse. Emotional abuse, physical abuse and sexual abuse was reported among 3,482 (19.3%), 2,576 (14.3%) and 551 (3.1%) of respondents respectively.

**Conclusion:** This study found a significant relationship between spousal violence and unwanted pregnancy among married Nigerian women. It is important to identify women at risk of spousal abuse and implement targeted health programs aimed at improving reproductive health outcomes.

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**Abstract #: 234**

**Presented by: Evelyn Anegebe, MPH, Graduate Student**

***Prostate Cancer Treatment and Outcomes: 20-Year Experience at a Single Cancer Center***

Evelyn Anegebe University of South Florida, College of Public Health, Department of Epidemiology & Biostatistics

**Keywords:** Prostate cancer, Radical prostatectomy, Radiation therapy, Retrospective cohort study

**Objective:** Radical prostatectomy(RP) and radiation therapy(RT) are the two major treatment recommendations for men diagnosed with clinically localized prostate cancer. The objective of this report is to provide descriptive information on patient outcomes for a study population with prostate carcinoma who underwent standard treatment options including radical prostatectomy and radiation therapy, and other treatment options over a 20-year period at the Moffitt Cancer Center.

**Methods:** Electronic data on demographics, clinical information and outcomes were abstracted retrospectively from the cancer registry and medical records of patients with primary prostate cancer at Moffitt Cancer Center from January 1989 to December 2009. Data were analyzed using multivariate logistic regression, Kaplan-Meier survival analysis, and multivariable Cox proportional hazards regression analysis.

**Results:** During a median follow-up of 8.2 years, a total of 5513 patients received treatment for prostate cancer. The 20-year prostate cancer specific survival rate was 91.2% and 88.7% among patients who received RP and RT respectively. On multivariate analysis, age at diagnosis (hazard ratio[HR]2.76;  $P<0.0001$ ), tobacco use(HR 1.64;  $P=0.005$ ), and disease recurrence(HR 2.56;  $P<0.0001$ ) were associated with a significant risk of prostate cancer death.

**Conclusion:** The review of the 20-year experience at this institution indicates treatment outcomes for patients are comparable to national trends of increase in survival. Treatment with RP and RT offer a real chance of long-term survival to patients diagnosed and treated for prostate cancer. Also, radical prostatectomy was associated with a reduction in mortality rate from prostate cancer.

**Research supported by:** H.Lee Moffitt Cancer Center & Research Institute

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**Chronic Disease, Depression, and the Buffering Effects of Social Cohesion: Healthy Healing in *The Villages***  
 Corvin, J. (COPH: Global Health); Fishleder, S. (COPH: Epidemiology); VandeWeerd, C. (COPH: Community and Family Health); Schonfeld, L. (Mental Health Law and Policy); Petersen, D. (COPH: Dean's Office)

**Objective:** Depression, the 4th leading cause of disability worldwide, causes significant, long-lasting impairments in functioning and can exacerbate other illness and health outcomes. While advances in health care have prolonged the life expectancy of persons with chronic disease (CD), less attention has been paid to the increased prevalence of depression among this group, or to the dual burden of these often co-morbid conditions.

**Methods:** This paper describes co-occurrence of depression and chronic illness among residents living in *The Villages*, an active living 55+. Basic descriptive and bivariate analyses were conducted on the relationship between self-reported CD, health behaviors such as alcohol consumption (MAST) and depressive symptoms (PHQ-2). Factor and regression analysis was performed to examine relationships between CD and depression.

**Results:** In total, surveys were distributed to 88,529 residents in 2012, with 37.4% returned (N=33,119). Chi square analysis indicated a significant relationship between alcohol consumption and depressive symptoms ( $\chi^2=23.68$ ;  $p=.0001$ ) with 14.38% of persons reporting drinking problems having depressive symptoms. Additionally, significant relationships were found between the presence of dementia ( $\chi^2=267.55$ ;  $p=.0001$ ), joint problems ( $\chi^2=12.68$ ;  $p=.0001$ ), and diabetes ( $\chi^2=7.85$ ;  $p=.0005$ ) and the presence of depressive symptoms; with approximately 29.67% of persons with dementia, 9.99% of persons with diabetes, and 9.68% of persons with joint problems reporting depressive symptoms as measured by the PHQ-2.

**Conclusions:** Findings suggest differences exist among individuals living with CD and co-occurring depression. Recommendations addressing depressive symptoms in older adults living with chronic illness will be presented.

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***A Study of the Effect of Distance from Transplant Center on Survival Post Liver Transplantation***

Alexia Makris MS University of South Florida, College of Public Health, Department of Epidemiology & Biostatistics

**Keywords:** survival analysis, liver transplant, distance, AIC

**Objective:** We hypothesize that distance from the transplant center has a detrimental effect on post-transplant survival. From the current literature it is not clear if patients' distance from a transplant center affects outcomes after liver transplantation. Our study aims to examine outcomes of liver transplant recipients based on distance from a transplant center.

**Methods:** This is a retrospective single center study of liver transplant recipients transplanted between 1996 and 2012 (N=813). Survival analysis was performed using the Kaplan Meier (KM), Cox Proportional Hazards (Cox PH), and Accelerated Failure Time (AFT) methods. Logistic regression (LR) analysis was used to predict outcome (failed vs. not) as well as some newer methodology: Akaike Information Criterion (AIC) and Monte Carlo (MC) for change point detection. While the KM and Cox PH are the most commonly used methods, the AFT, AIC and MC approaches will provide a novel approach to this topic.

**Results:** Five year survival was 0.734 with a standard error of 0.018. Using the AIC approach to Cox PH, patients living within 180 miles had a hazard ratio (HR) of 0.4 ( $p\text{-value}<0.0073$ ) compared to those beyond 180 miles from the transplant center. Patients with both Hepatitis C (HCV) and Hepatocellular Carcinoma (HCC) had the worst survival compared to those that had neither (HR=2.6 with  $p<0.0001$ ). LR confirmed the distance effect at 180 mi ( $p=0.0292$ ), 1 year post LTx.

**Conclusion:** Distance had a detrimental effect and this effect was observed at 180 mi from the transplant center. Recipients with both Hepatitis C and Hepatocellular Carcinoma fared the worst. Patients living within 180 miles from the transplant center had 0.4 times the death rate compared to those living within the 180 mile radius.

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***Prognostic Impact of Lymph Node Retrieval and Ratio in Gastric Cancer: A Single Center U.S. experience.***

Shams Rahman\*, Joyce Wong, Nadia Saeed, Hui-Yi Lin, Khaldoun Almhanna, Ravi Shridhar, Sarah Hoffe, & Kenneth Meredith \*Department of Epidemiology and Biostatistics College of Public Health University of South Florida, Tampa, Florida. H. Lee Moffitt Cancer Center & Research Institute, Tampa, FL

**Keywords:** Gastric Cancer Survival Lymphnode Ratio

**Objective:** To assess the ratio of lymphadenectomy to Lymph-node-positivity as a prognostic indicator for gastric cancer survival.

**Methods:** Prospectively-maintained database of patients with gastric cancer was reviewed. Patients were stratified by number of lymphnodes (LN) examined, number of LN positive and Lymph node ratio (LNe/LN+). Disease-free-survival (DFS) and OS were the primary endpoints, determined by Kaplan-Meier analyses.

**Results:** From 1997-2012, 222 patients were included; most were male (N=122, 55%) with median age 67 (range 17-92) years. Of 220 (99%) patients surgically explored, 164 (74%) ultimately underwent resection. Median OS of the entire cohort was 22 months. Factors such as perineural, lymphovascular invasion and poor differentiation adversely affected OS,  $P < 0.05$ . A median 14 lymph nodes (LN) were retrieved (range 0-45), with a median of one LN+ (range 0-31). No OS or DFS difference was observed when comparing  $< 5$ , 6-10, 11-15, and  $> 15$  eLN,  $P = 0.30$ . LN+ affected both OS and DFS: median OS was 52 months for 0 LN+ and decreased to 21 with 1-2 LN+, 34 months 3-6 LN+, 25 months 7-15 LN+, and 11.5 with  $> 15$  LN+. Median DFS decreased from 35 months with 0 LN+ to 19 with 1-2 LN+, 9 with 3-6 LN+, 13.5 with 7-15 LN+, and 7.5 months with  $> 15$  LN+. Lymphnode ratio demonstrated worse median OS with increasing ratio: 49 months for ratio of 0, 37 months for 0.01-0.2, 27 months for 0.21-0.5, and 12 months for  $> 0.5$ ,  $P < 0.0001$ . DFS was similar: 35 months for ratio of 0, 22 months for 0.01-0.2, 13 months for 0.21-0.5, and 7 months for  $> 0.5$ ,  $P < 0.001$ .

**Conclusion:** Extent of lymphadenectomy does not impact OS or DFS. Presence of LN+ adversely impacts OS and DFS. Lymph node ratio may be a better prognostic indicator than number of eLN or LN+ in gastric cancer.

***The Diagnostic Yield of Repeat Head Computed Tomography after Blunt Head Trauma: Systematic Review and Meta-Analysis***

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**Keywords:** Traumatic brain injury Computed tomography Systematic review

**Objective:** Timely diagnosis and management following traumatic brain injury (TBI) are crucial to improve patient outcomes. Consensus exists regarding utility of initial head CT in TBI patients; however, guidelines regarding repeat CT differ among institutions. Two systematic reviews on this topic exist, but neither has performed a comprehensive meta-analysis of all studies.

**Methods:** Broad electronic search of Medline, Cochrane, Clinicaltrials.gov and a hand search of conference abstracts and references for all completed studies reporting data on change in management following repeat CT was conducted. Two reviewers selected all studies and extracted data using a standardized form. A proportional meta-analysis was performed using random-effects model for outcomes related to change in management following repeat CT.

**Results:** Initial search yielded 6,982 references of which 41 studies enrolling 10,501 patients met all inclusion criteria. Change in management following repeat CT was reported in 13 prospective (1,713 patients) and 28 retrospective (6,112 patients) studies and yielded a pooled proportion of 11.4% (95% confidence interval [CI] 5.9-18.4) and 9.6% (95% CI 6.5-13.2) respectively. For mild TBI patients, 5 prospective (570 patients) and 9 retrospective (1,828 patients) studies reported on change in management following repeat CT. Change in management for mild TBI patients across prospective studies was 2.3% (95% CI 0.3-6.3) and across retrospective studies was 3.9% (95% CI 2.3-5.7).

**Conclusion:** Available evidence suggests repeat CT in patients with TBI results in any change in management for only a minority of patients. However, trials with optimal study designs are needed to conclusively assess the value of repeat CT in the analysis and management of TBI.

***Cross-sectional Correlates of Long Sleep: A Longitudinal Investigation of the Alameda County Cohort***

**AUTHORS:** Yuri V. Sebastião <sup>(1)</sup>, Kambria K. Haire <sup>(2)</sup>, Skai W. Schwartz <sup>(1)</sup> <sup>1</sup>. Epidemiology/Biostatistics, University of South Florida, Tampa, FL, United States. <sup>2</sup>. Toxicology/Risk Assessment, University of South Florida, Tampa, FL

**Keywords:** long sleep, exercise, Alameda, mortality

**Objective:** Long sleep has been associated with increased mortality since initial reports in the 1960's. Investigators have not been able determine whether this is due to confounding. We examined consistency of covariates for self-reported long sleep taken three times over a period 25 years using the Alameda Cohort study.

**Methods:** We used data collected during the 1974, 1994 and 1999 Alameda county survey panels. For each panel year, we used multiple logistic regression analysis to identify correlates of self-reported long sleep. Potential correlates were obtained from survey questions on the demographic characteristics, medical conditions, health behaviors and psychosocial factors of the respondents.

**Results:** The number of self-reported long sleepers was 323 (6.6% of all participants) in 1974, 191 (7.0%) in 1994 and 140 (6.6%) in 1999. Self-reported long sleep was consistently inversely associated with trouble getting to sleep at night and lack of physical activity (all three panel years), and with older age and depression (two panel years). The odds of being a long sleeper were 43% and 44% lower among respondents who reported doing physical exercise "sometimes" in 1974, and 1994, and 54% lower in among those who reported doing physical exercise "often" in 1999—compared to those who reported "never" doing physical exercise. Self-reported arthritis (1994) and diabetes (1999) were significantly associated with long sleep in only one panel year.

**Conclusion:** In addition to confirming aging and depression as two correlates of long sleep, our results reveal a notable relationship between long sleep and lack of physical exercise. These factors likely explain some of the previously reported association between long sleep and mortality.

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***Addressing Transdisciplinary Women's Oral Health Research and Practice through Systems Thinking***

**Erika L. Thompson** <sup>(1)</sup>, **Erin O'Connell** <sup>(2)</sup>, **Cheryl A. Vamos** <sup>(2)</sup>, **Ellen M. Daley** <sup>(2)</sup>, **Rita D. DeBate** <sup>(2)</sup> <sup>(1)</sup> Department of Epidemiology and Biostatistics, College of Public Health, USF <sup>(2)</sup> Department of Community and Family Health, College of Public Health, USF University of South Florida

**Keywords:** women's health; systems-thinking, oral-systemic health

**Objective:** Research has demonstrated oral-systemic health connections that only or disproportionately impact women's health, some of which can cause, or be the result of, poor oral health. Several psychosocial conditions associated with poor oral health also disproportionately affect women. Furthermore, the intersection of poverty, psychosocial and behavioral factors within oral-systemic health has received little attention and necessitates the integration of disciplines, theories and methods to critically examine how diverse factors influence one another within the context of a system. The purpose is to develop a conceptual framework through a transdisciplinary, systems thinking approach regarding women's oral-systemic health.

**Methods:** Although barriers to transdisciplinary research must be addressed, we have utilized evidence-based research to develop a conceptual framework for transdisciplinary research and practice that uniquely addresses how complex systems influence women's oral-systemic health issues.

**Results:** The conceptual framework, resulting from systems thinking and analysis, is comprised of biological, behavioral, and structural factors and reveals dynamic relationships, multiple levels of influence, and synergistic mechanisms. Through employing systems thinking, effective and holistic primary, secondary and tertiary prevention interventions across stakeholders and settings have the potential to improve women's oral-systemic health and decrease disparities.

**Conclusion:** Reducing morbidity and mortality requires a transdisciplinary, systems thinking approach that can discern where disparities exist and how distinctive disciplines can interact collaboratively to modify health behaviors/practices.

**Research supported by:** Center for Transdisciplinary Research on Women's Health

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**Abstract #: 241**

**Presented by: Christine Ancheta, MPH, Staff**

***Evaluating a Novel Antiviral Peptide That Inhibits Influenza Virus Infection***

Christine Ancheta, Susan Pauer, Maria Theresa Trindade, Alberto van Olphen, Center for Biological Defense, Global Health Infectious Disease Research Program, College of Public Health

**Keywords:** Influenza, Phage Display, Peptide Inhibitor

**Objective:** The purpose of this study was to evaluate the antiviral properties of two peptides obtained from phage display experiments.

**Methods:** An M13 phage library expressing random peptide sequences as fusions to coat proteins on the surface of the virion was used to pan against the hemagglutinin (HA) protein from A/California/04/2009 (H1N1). After three rounds of panning to enrich for high affinity binding phage, individual clones were analyzed using a pyrosequencer to identify consensus binding sequences. A phage ELISA was conducted to determine binding specificity to the target HA protein. A plaque reduction assay assessed the inhibition of replication of the influenza virus by the isolated phage clones. Peptides were synthesized with the sequences the phage clones displayed and were used in a cell based neutralization assay. The assay was analyzed by immunohistochemical staining. Supernatants from the neutralization assay were also titered to determine progeny virus concentration.

**Results:** Two phages, 3C and 3F, expressing the peptide sequences SPVIWWNSQGL and ERWFTQDDVANF, respectively, were isolated from the third round of panning and showed specific binding activity to the HA protein through phage ELISA. These phage clones also inhibited viral replication through a plaque reduction assay. At 20 $\mu$ M the 3C peptide showed significant protection against A/California/04/2009 when compared to the 3F peptide and an irrelevant peptide control. Furthermore, supernatant from cells infected with 3C peptide treated virus collected two days post infection showed a decrease in progeny virus concentration when compared to control.

**Conclusion:** These data indicate that the 3C peptide is an effective inhibitor of influenza virus infection.

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**Abstract #: 242**

**Presented by: Magda Baksh, BS, Graduate Student**

***Antagonistic Activities of Extremophile Kazakhstan Extracts Against Drug-Resistant Hospital-Associated Pathogens***

Magda Baksh<sup>1</sup>, Lyudmila Trenochnikova<sup>2</sup>, Stefanie Albert<sup>1</sup>, Lylah Seaton<sup>1</sup>, Ami Patel<sup>1</sup>, Colton Faza<sup>1</sup>, Jackie Whitaker<sup>3</sup>, Christen Mayer<sup>3</sup>, Jill Roberts<sup>1</sup>, Yashwant Pathak<sup>4</sup>, Shufeng Zhou<sup>4</sup>, Laurent Calcul<sup>5</sup> and AzliyatiAzizan<sup>1</sup> University of South Florida College of Public Health<sup>1</sup>, Institute of Microbiology and Virology in Kazakhstan<sup>2</sup>, Florida Hospital Tampa<sup>3</sup>, University of South Florida College of Pharmacy<sup>4</sup>, Center for Drug Discovery and Innovation<sup>5</sup>

**Keywords:** Extremophile Kazakhstan Extracts Hospital-Associated Pathogens

**Objective:** The aim of this study was to characterize the antagonistic activities and identify the active components of extremophile actinomycetes extracts screened from the unusual (extreme) ecosystems of Kazakhstan, against the isolates of Hospital-Associated MRSA (HA-MRSA) from the United States (U.S.)

**Methods:** Our collaborators collected 5,936 strains from Kazakhstan soil extreme environments exhibiting high salinity and/or alkalinity. A total of 424 (out of 2,019) of extremophiles exhibited inhibition against several Kazakhstan HA-MRSAs. We chose fourteen of the purified extracts from this total for disk diffusion susceptibility testing of U.S. HA-MRSA. Through collaboration with the Center for Drug Discovery and Innovation (CDDI) at USF, we aimed to detect and chemically characterize potential active molecules using LC/DAD/MS instrumentation.

**Results:** While the fourteen antagonists tested displayed inhibition against Kazakhstan HA-MRSA, less than half (5 of 14) inhibited US HA-MRSA. De-replication search (using mass (MS) data observed and source taxonomic information) identified many potential active components with two major candidate molecules exhibiting molecular weight of around 515 and 529.

**Conclusion:** The disc diffusion data are consistent with the known geographical differences in antibiotic resistance profiles in that the U.S. HA-MRSA strains are resistant to more antibiotics than the HA-MRSA from Kazakhstan. The methodology for characterization of active components through collaboration with the CDDI identified active components, and will be used for our future expanded study. Extracts with promising antagonistic activities will be investigated further for their properties against other HA drug resistant pathogens.

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**Abstract #: 243**

**Presented by: Andrea Bingham, PhD, Graduate Student**

***Development of a Mosquito Trap that Uses Sugar Feeding to Detect Eastern Equine Encephalitis Virus***

Andrea M. Bingham, Nathan D. Burkett-Cadena, and Thomas R. Unnasch, University of South Florida, College of Public Health, Department of Global Health

**Keywords:** mosquito, sugar feeding, virus secretion, eastern equine encephalitis virus

**Objective:** Eastern equine encephalomyelitis virus (EEEV) is the most pathogenic arbovirus endemic to the USA. Prevention of infection relies upon transmission surveillance and community-wide prevention measures to prevent the spread of the virus to humans. Many counties in Florida cannot afford the costs associated with thorough active surveillance, including testing of wild birds, sentinel chickens, and mosquito pools. For mosquito surveillance, sample size is extremely important due to low infection rates in mosquito populations. Current methods rely on mosquito pools with no greater than 50 mosquitoes and can be costly and time consuming.

**Methods:** We designed a surveillance system that exploits virus secretion in saliva during sugar feeding by mosquitoes. Modified collection chambers of CO<sub>2</sub>-baited traps are supplied with honey-coated nucleic acid preservation cards. Mosquitoes that feed upon honey expectorate viral particles onto the card which are then inactivated and preserved by the card. RNA extracted from the cards can then be screened via RT-PCR for arboviruses.

**Results:** In field trials, we found that 1) the modified traps captured as many females with a similar species distribution as did standard CO<sub>2</sub>-baited CDC light traps; 2) nearly all females (91.4%) in traps fed on honey; and 3) traps could run unattended for 3 consecutive days on a single battery and CO<sub>2</sub> tank. Experimental inoculations of EEEV onto honey coated preservation cards demonstrated that viral levels down to 1 PFU were detectable for up to seven days. Additional field trials are currently in progress.

**Conclusion:** This method will allow us to screen more mosquitoes at a time, decreasing the amount of labor and cost.

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**Abstract #: 244**

**Presented by: Cynthia Bucher, BS, Staff**

***Utilization of Fluorescent Microsphere Immunoassay for Detection And Serotyping Antibodies against Influenza Virus***

Cynthia J. Bucher, Theresa Trindade, Alberto van Olphen Center for Biological Defense and Global Health Infectious Disease Research Program, University of South Florida

**Keywords:** Influenza Fluorescent microsphere immunoassay (FMIA) Rapid detection Surveillance Antibodies

**Objective:** Rapid detection of specific strains of influenza can be a valuable tool in medical diagnosis and epidemiology. Reliable serological evidence of the circulating strains of influenza by determining the presence of protective anti-influenza antibodies could help develop, or improve targeted therapeutics

**Methods:** A fluorescent microsphere immunoassay (FMIA) has been developed to screen patient serum samples for antibodies against multiple strains of influenza at one time with minimally prepared serum in a few hours

**Results:** Blood serum samples from two hundred and two individuals were collected in April and May of 2011. All of the samples were taken by Florida Blood Services, tested for blood born human pathogens, and stripped of all personal identifiers. The serum samples were tested for the presence of antibodies to influenza A and B using FMIA. The results were determined to be positive or negative for the presence of protective antibodies against several strains of influenza and compared to the positive/negative results obtained from the optical interference assay done on the same samples.

**Conclusion:** The data presented shows that FMIA is a reliable method for detecting antibodies to influenza viruses in human serum. FMIA has the potential for being an alternative method for screening serum samples and surveillance programs. This multi target assay is rapid, sensitive, and user-friendly. Using this method, targeted therapeutics and prevention strategies could be developed and implemented in a timely manner in the face of a possible epidemic. With the FMIA's ability to detect several different antibodies in the same patient serum sample, the cost of per patient per probe is significantly less than other conventional methods.

**Research supported by:** Department of Defense

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**Abstract #: 245**

**Presented by: Christopher Campbell, MS, Graduate Student**

***Evaluation of a Putative Plasmodium MAPK-like Phosphatase for Antimalarial Drug Discovery***

Christopher O. Campbell, USF College of Public Health, Department of Global Health Bharath Balu, Tropical Disease Research Program, SRI International Steven P. Maher, USF College of Public Health, Department of Global Health Roman Manetsch, USF College of Arts and Sciences Department of Chemistry Daniel Santiago, USF College of Arts and Sciences Department of Chemistry Wayne Guida, USF College of Arts and Sciences Department of Chemistry John H. Adams, USF College of Public Health, Department of Global Health, University of South Florida, College of Public Health

**Keywords:** Malaria, Drug Discovery

**Objective:** Plasmodium falciparum is a major threat to global health. Despite the numerous opportunities for drug discovery present in the genome, functional annotation remains incomplete. In a forward genetics study, a knockout of PF13\_0027 produced (clone C9) had attenuated asexual development. Analysis of the KO revealed delayed pre-S phase exit contributing to prolonged cell cycle length.

**Methods:** The structure and function of PF13\_0027 was assessed through bioinformatics, functional assays with recombinant protein, complementation of C9 parasites, and in vitro inhibitory drug assays. Inhibitory compounds were identified by in silico screening using a homology model of the dual-specificity phosphatase (DUSP) domain and evaluated for in vitro inhibitory activity and effect on the cell cycle.

**Results:** Genetic complementation rescued normal parasite development validating the KO phenotype while recombinant protein products of the phosphatase domain failed to demonstrate catalytic activity. In vitro drug assays detected at least one compound that changed the asexual development cycle similar to C9.

**Conclusion:** Considering phenotypic assessment, bioinformatics and structural analysis, PF13\_0027 is a MAPK-like phosphatase important for asexual development. A native R398I substitution in the signature motif suggests it may not be a highly active phosphatase and may have a substrate-trapping function similar to a pseudophosphatase. Inhibitory effects of DUSP-interacting compounds validated the role of the PF13\_0027 in regulating asexual-stage development. This research may pave the way to understand the growth cycle and asexual development of P. falciparum, enhancing drug discovery efforts.

**Research supported by:** NIAID R01AI09497302

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**Abstract #: 246**

**Presented by: Isabella Chan, BA, Graduate Student**

***Engaging the Local Community: Using Participatory Action Research to Understand the Maternal Experience in Carhuaz, Peru***

Isabella Chan (Department of Anthropology and Department of Global Health), University of South Florida, College of Public Health

**Keywords:** Participatory Action Research, Maternal Health, Peru

**Objective:** Through the use of participatory action research (PAR) workshops, this investigation sought to understand the maternal experience in the Peruvian Andes where both biomedical and traditional health practices exist. This paper focuses on the use of PAR methods, the types of data elicited, and the resulting community engagement.

**Methods:** The data analyzed in this paper were collected through three sets of PAR workshops in three communities within Carhuaz province. A total of 69 women participated in the workshops, which were composed of open-ended, interactive group activities in which participants were engaged as collaborators in a shared, democratic learning experience. These activities focused on perspectives, practices, and attitudes regarding prenatal care and childbirth. All workshops were audio-recorded and transcribed, and analysis was conducted through coding for salient themes and patterns.

**Results:** Analysis identified constrained agency regarding decision-making during the prenatal period and childbirth, particularly as a result of a lack of communication and ethnic and gender discrimination. This information was used to develop an informational booklet composed of women's experiences and perspectives that facilitated conversation between care providers and women in an effort to improve provider-patient relations.

**Conclusion:** The use of PAR methods resulted in a holistic, community-guided illustration of the complex nature of the maternal experience in Carhuaz. Moreover, the use of PAR methods allowed for the generation of community ownership of and engagement with the research, as demonstrated by the formation of a local women's group, ultimately resulting in the continued pursuance of the research issues after the departure of the researcher.

**Research supported by:** International Field Experience Scholarship Genshaft/Greenbaum Passport Scholarship Fathauer Graduate Fieldwork Travel Grant Student Research Scholarship

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**Abstract #: 247**

**Presented by: Oluyemis Falope, Graduate Student**

***Spousal Violence and Modern Contraceptive Use among Nigerian women***

Oluyemisi Falope, Dept of Global Health, Ngozichukwuka Agu, Dept of Community and Family Health, Evelyn Anegebe, Dept of Epidemiology and Biostats, Korede Adegoke, Dept of Epidemiology and Biostats, Martha Coulter, Dept of Community and Family Health, University of South Florida, College of Public Health

**Keywords:** Spousal Violence Contraceptive use Nigerian Women

**Objective:** Objectives: Violence against women has been recognized as a serious public health problem worldwide. The World Health Organization reports that between 10 to 69% of women experience intimate partner violence in their lifetime. Intimate partner violence (IPV) can result in adverse effects on women's physical, mental, sexual and reproductive health. This study aims to examine the impact of spousal violence on modern contraceptive use among married women in Nigeria

**Methods:** Methods: Data on studied variables were retrospectively obtained from the Demographic and Health Surveys conducted on Nigeria in 2008. The study population included 18,010 married women between the ages of 15 and 49. Spousal violence was defined as exposure to physical, emotional and sexual abuse. The outcome variable was use of modern contraceptive method. Data were analyzed using descriptive, chi-square test, and multiple logistic regression analysis.

**Results:** Preliminary Results: The results show that 4,614 (25.6 %) of married women sampled reported a history of spousal abuse. Also, 2,576 (14.3%) reported physical abuse, 3,482 (19.3%) emotional abuse, and 551 (3.1%) sexual abuse. Compared to married women who were not exposed to IPV, those who were exposed to IPV have higher odds of modern contraceptive use.

**Conclusion:** Conclusion: This study findings show evidence that spousal violence may affect women's subsequent use of modern contraceptive in Nigeria.

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**Abstract #: 248**

**Presented by: Caitlin Gordon, MPH, Graduate Student**

***Consistency and Adequacy of Health Insurance for Immigrant Children***

Caitlin E. Gordon University of South Florida, College of Public Health, Department of Global Health

**Keywords:** children, immigrants, health insurance

**Objective:** Previous research has examined the cost of providing health insurance to immigrant children and their families. The objective of this study is to determine the consistency and adequacy of health insurance for immigrant children living in the northeast United States.

**Methods:** Using the 2007 National Survey of Children's Health (NSCH) we formed a multivariable logistic regression analysis of the independent variable, which was immigrant status, vs. the dependent variables, which were the consistency and adequacy of health insurance coverage, while controlling for socio-demographic factors.

**Results:** Approximately 10% of respondents reported inconsistent health care coverage and ~20% reported inadequate health care coverage. This study found that 68% of participants not born in the U.S. reported inconsistent health insurance coverage for children vs. 87% of those with children who had been born in the U.S. Data on nativity were more complete for mothers than fathers.

**Conclusion:** Contrary to the initial hypothesis, a larger percentage of inconsistent health insurance coverage was reported for those children who were born in the U.S. than outside of the U.S. Future research will include a cost analysis to determine effects of costs for providing health insurance to immigrant children and their families. We will also further examine factors associated with the high rate of inadequacy of health insurance coverage.

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***Epidemiological and Spatial Analysis of Dengue Cases in the Kuching District of Sarawak, Malaysia***

Amelia Johnson<sup>1</sup>, Mohamad Taha Arif<sup>2</sup>, Nor Aliza Abdul Rahim<sup>2</sup>, Haironi Yusoff<sup>2</sup>, Narcissus Sundin<sup>3</sup>, Aurora Sanchez-Anguiano<sup>1</sup>, Boo Kwa<sup>1</sup> and Azliyati Azizan<sup>1</sup> College of Public Health, University of South Florida<sup>1</sup>; Faculty of Medicine and Health Sciences, University Malaysia Sarawak<sup>2</sup>; Kuching District Health Office<sup>3</sup>, University of South Florida, College of Public Health, Department of Global Health

**Keywords:** Dengue, Spatial-Temporal, GIS

**Objective:** The aim of this study was to examine the dynamics of dengue transmission and to characteristics of the disease specific to the Kuching District of Sarawak, Malaysia.

**Methods:** General descriptive statistics were used to determine the gender, age, and temporal distribution of cases. Temporal distribution of cases was compared with climactic and rainfall patterns for the year to observe patterns in mosquito density. Specific clusters were pin-pointed spatially using the Collect Events tool in ArcGIS. Distance analysis of the dengue cases was performed using the Average Nearest Neighbor (ANN) method, to detect clusters of cases. Multi-distance spatial cluster analysis, based on Ripley's K function, was also utilized in order to observe the spatial distribution of the dengue cases over a series of distances.

**Results:** Using the Multi-distance spatial cluster analysis, the null hypothesis of no observed clustering over a range of 10 tested distances was rejected. The observed L(d) was greater than the Expected L(d) at all tested distances. For the overall spatial analysis, using ANN, the cases were determined to be significantly clustered. In the spatial-temporal analysis, only the second time period (weeks 14-27) of the study was found to be significantly clustered.

**Conclusion:** The multi-distance spatial cluster analysis showed that the overall data set displayed a clearly clustered pattern throughout the study area of the Kuching District. The ANN ratio was able to identify not just the presence of spatial clustering in the study data set, but it was able to pin-point a more specific time period where cases were clustered, and thus the time of the year where there was likely the occurrence of local transmission.

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***Identification of Biomarkers in P. vivax Infected Human Samples***

Siddharth G. Kamath\*, Samantha J. Barnes\*, Wanlapa Roobsoong\*\*, Narathathai Yimamnuaychok\*\*, Chalermpon Kumpitak\*\*, Nattapat Rochanarutaiprida\*\*, Jetsumon Prachumsri\*\*, John H. Adams\* (\*University of South Florida College of Public Health, Department of Global Health \*\*Mahidol University, Malaria Vivax Research Center, Bangkok, Thailand)

**Keywords:** Malaria, P. vivax, gametocytes, copy numbers

**Objective:** Malaria is a mosquito-borne infectious disease that ranks globally among the top causes of morbidity and mortality. Infectious gametocytes (sexual stage) are involved in the transmission of P. vivax from human to mosquitoes. The quality of infectivity of gametocytes is regulated by various unknown genes and environmental factors. Therefore, discovering genetic biomarkers predictive of transmission is an important first step in eradicating malaria.

**Methods:** Genes were selected using the PlasmoDB (version 8.1) database with following criteria: genes with > 2-fold in days 2 -13 in P. falciparum gametocytes, minimum exon counts of 4, P. berghei mass spectroscopic evidence, and presence of P. vivax ortholog. Total RNA was isolated from frozen samples of P. vivax infected human blood packed cells. CDNA and qPCR were done using standard methods. Copy number was analyzed using Graphpad® and SPSS® softwares.

**Results:** We identified 15 mRNAs in patient blood infected with P. vivax. Twelve mRNAs were used to screen patient samples for copy number study. Of these, one potential biomarker heat shock protein 101 (PVX\_091470) copy numbers, appeared to be statistically significant by Pearson correlation for male (r=0.563, P< 0.0001) and female (r=0.8493, P< 0.0001) gametocyte counts.

**Conclusion:** Heat shock protein 101 may be involved in regulating gametocytogenesis in P. vivax. If confirmed, this would be the first known genetic biomarker of any Plasmodium species to be predictive of infection to a mosquito vector. This result is important for developmental of new therapies to block transmission as well as understand epidemiology of the malaria in endemic countries.

**Research supported by:** Bill and Melinda Gates Foundation (Grant # OPP1023643).

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**Abstract #: 251**

**Presented by: Samuel Matos, MPH, Graduate Student**

***Su Corazon, Su Vida: Willingness to Participate in a Community-Based Heart Disease Prevention Program***

Samuel Matos, Wayne Westhoff, Jaime Corvin, Jesica Candanedo-Perez, Lissette Chang, and Lorna Jenkins,  
University of South Florida, College of Public Health, Department of Global Health

**Keywords:** Health education, chronic disease prevention, community-based programs, Latino health, promotora model.

**Objective:** Rates of cardiovascular disease (CVD) are increasing dramatically in the Latino population. While numerous programs have been developed to address CVD among this population, evaluation of these programs for transcreation in a local population is imperative. Thus, this study attempts to: 1) identify motivating and deterring factors for participation in Su Corazon, Su Vida, a heart health program; 2) describe awareness of heart disease risk factors; 3) gather recommendations for future implementation.

**Methods:** Latino participants from Hillsborough County who graduated from the program were purposely recruited to participate in a focus group. An individual interview was done to a lay health worker or promotora responsible for delivering the program. Sessions were conducted in Spanish using an open-end interview guide. Sessions were recorded, transcribed verbatim, and coded using a combination of a priori and emergent codes, and then analyzed with Nvivo® qualitative software.

**Results:** Participants considered acquiring knowledge, with an emphasis on nutrition, as the main drive for entering the program. Organizational and personal barriers were noted and recommendations for improved program components for physical activity and stress management suggested.

**Conclusion:** Su Corazon, Su Vida is both practical and easy to learn, but could be improved to better meet participants' needs. Motivators to participate included group support, desire to live a healthy life, and dynamism of the promotora. Barriers included scheduling, conducting assessments prior to class, and incentivizing attendance.

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**Abstract #: 252**

**Presented by: Amruta Mhashilkar, PhD, Graduate Student**

***Ecdysone signalling pathway as a target for discovery of new drugs for lymphatic filariasis***

Amruta Mhashilkar, Dr. Tom Unnasch University of South Florida, College of Public Health, Department of Global Health

**Keywords:** ecdysone, drug discovery, brugia, Ponasterone-A, 20-hydroxyecdysone

**Objective:** *Brugia malayi*, *Brugia timori* and *Wuchereria bancrofti* cause lymphatic filariasis. The prevention and treatment of this debilitating disease depends on drug therapy. The drugs currently in use have drug resistance and newer drugs are urgently required. Recent pharmacological evidence suggests that the ecdysone signaling pathway in *Brugia* is an exciting new target for drug discovery. It regulates molting and embryogenesis in insects. The ecdysone receptor binds with the ultraspiracle to form a heterodimer, activating the ecdysone signaling cascade.

**Methods:** The *B. malayi* ecdysone receptor (BmEcR) and *Brugia* retinoid X receptor (Bm-RXR) have recently been cloned and expressed. The study is proposed to establish a high throughput screen with mammalian cells transfected with the ecdysone receptor with *Brugia* retinoid X receptor (Bm-RXR) and a Luciferase promoter. In adjunct, embryogram was conducted to verify effect of ecdysone agonist on live adult female worms. The adult females were treated with 20-hydroxyecdysone and microfilariae release was observed.

**Results:** An upregulation of the reporter gene is observed through ligand-dependent transactivation when induced with Ponasterone-A, a synthetic agonist. A five-fold amplification of the signal was observed on induction. The embryogram showed that there was significant increase in the microfilariae and pre-microfilariae release on inducing with 20-hydroxyecdysone.

**Conclusion:** The results confirm that the ecdysone signaling system is capable of responding to the synthetic agonists in mammalian cell system and in live adult female worms. It can be used as a drug discovery model to screen drugs for their activity against *Brugia malayi*. Pharmacological interventions can proceed with our drug discovery model.

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**Abstract #: 253**

**Presented by: Malinee Neelamegam, Graduate Student**

***Prevalence of Attention Deficit Hyperactivity Disorder (ADHD) in Primary School Children in Penang, Malaysia***

Malinee Neelamegam (College of Public Health USF), Looi Irene (Clinical Research Centre, Seberang Jaya Hospital, Malaysia), Rema Ramakrishnan (College of Public Health, USF), University of South Florida, College of Public Health, Department of Global Health

**Keywords:** Prevalence, ADHD, Attention Deficit, Hyperactivity

**Objective:** The prevalence of ADHD is poorly described in Malaysia and very few studies have been done in the Southeast Asia region. We aim to determine the prevalence of ADHD and its subtypes in children in Penang, Malaysia.

**Methods:** In this cross-sectional study, children aged between 6 to 12 years old were assessed using the National Innovative for Children's Healthcare Quality (NICHQ) Vanderbilt Parent and Teacher Assessment Scale. Cluster random sampling was used to identify 850 students from 17 schools in the state of Penang, Malaysia. Informed consent was obtained for 438 children and complete parent and teacher assessments were done for 395 children. Frequencies were generated for prevalence rates. Chi-square and Fisher's exact test were used to compare teacher and parent evaluations.

**Results:** Overall prevalence rates for predominantly inattentive subtype, predominantly hyperactive-impulsive subtype and combined ADHD were 1.52%, 0.25% and 0.25% respectively. Prevalence of symptoms of the respective subtypes were slightly higher at 3.06%, 0.76% and 0.50%. When compared, teachers were significantly more likely to assess a child as predominantly inattentive compared to parents ( $X^2 = 17.64$ ,  $df=1$ ,  $p<0.001$ ). No significant difference is noted in the assessment for predominantly hyperactive-impulsive and combined ADHD among teachers and parents.

**Conclusion:** Prevalence of ADHD in the study population is lower than the worldwide pooled prevalence of 5.29%. Variations in screening tools remain a challenge in the determination and comparison of ADHD prevalence rates.

**Research supported by:** This study was supported by a Major Research Grant (MRG), Ministry of Health Malaysia.

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**Abstract #: 254**

**Presented by: Alison Roth, MPH, Staff**

***Solution-phase Panning with anti-Influenza IgM Bead Capture***

Alison Roth, Susan Pauer, Christine Ancheta, Theresa Trindade, Alberto van Olphen Center for Biological Defense and Global Health Infectious Disease Research Program, University of South Florida University of South Florida College of Public Health Global Health

**Keywords:** Phage Display, Solution-phase Panning, H9N2, H1N1

**Objective:** The utilization of phage display technology to identify peptides that are either identical or mimic the proteins produced by the target pathogen can be a platform for a rapid diagnostic test. One approach is solution-phase panning where a phage library can react with a virus target in solution followed by affinity bead capture.

**Methods:** A solution-phase panning protocol was developed with anti-rabbit IgM capture beads and purified, post-exposure rabbit IgM. Two rabbits were individually inoculated with influenza viruses A/California/04/2009 (H1N1) and A/Chicken/Hong Kong/69/97 (H9N2). Production bleeds were collected routinely from the infected animals and conventional ELISA assays were used to determine peak IgM production. Several rounds of biopanning were implemented until the phage pool was enriched in specific IgM binding phage. Phage clones were then isolated and characterized through PCR and pyrosequencing. Once a consensus peptide sequence was established, the identified phage clones were amplified on a large scale and subjected to further characterization by ELISA.

**Results:** The consensus peptide sequence "ALWPPNLHAWVP" was discovered among fourteen individual H9N2 phage clones, indicating a specific IgM binding protein. Furthermore, biopanning with anti-IgM H1N1 serum has produced the following two conserved sequences: "TLDPNGKPTLKA" and "VLHKSLDVHPNL."

**Conclusion:** This phage display method has been successful in the identification of peptide sequences that are potentially specific for IgM antibody to influenza virus A/Chicken/Hong Kong/69/97 and A/Chicken/Hong Kong/69/97. Solution-phase panning can be used for rapidly characterizing other emerging pathogens.

**Research supported by:** The U.S. Department of Defense

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**Abstract #: 255**

**Presented by: Amanda Rutter, BS, Graduate Student**

***Molecular Markers for in Vitro artemisinin Resistance in Patient Isolates from Southeast Asia***

Amanda Rutter (Department of Global Health, College of Public Health, University of South Florida, Tampa, FL), Amanda Hott (Signature Program in Allergy, Immunology, and Infectious Diseases, College of Medicine, University of South Florida, Tampa, FL), Debra Casandra, Kansas Sparks, Lindsay Morton, Matthew S. Tucker, (Department of Global Health, College of Public Health) and Dennis E. Kyle (Department of Global Health, College of Public Health and Signature Program in Allergy, Immunology, and Infectious Diseases, College of Medicine, University of South Florida, Tampa, FL)

**Keywords:** malaria, artemisinin resistance, single nucleotide polymorphisms

**Objective:** Successful treatment of uncomplicated and severe Plasmodium falciparum malaria may soon be impeded by clinical artemisinin resistance, which is characterized by delayed parasite clearance time (PCT). The World Health Organization currently recommends five different types of artemisinin combination therapy (ACT) for the treatment of uncomplicated malaria, as well as intravenous artesunate for the treatment of severe P. falciparum malaria in adults and children. However, resistance to artemisinin has become an increasing threat to the current supply of antimalarials. The mechanism of action of artemisinin, and therefore the mechanism of action of artemisinin resistance, has yet to be defined conclusively. In the present study, we attempt to correlate the in vitro artemisinin resistance phenotype with a genetic marker.

**Methods:** The first potential molecular marker examined was P. falciparum multidrug resistance transporter 1 (pfmdr1), located on chromosome 5.

**Results:** Real-time QPCR has demonstrated that an increased copy number of this gene is present in resistant patient isolates from Thailand and Cambodia that have been adapted to culture.

**Conclusion:** However, the parasites did not maintain the gene amplification over 16 weeks in culture in the absence of drug pressure. Therefore, single nucleotide polymorphisms (SNPs) on chromosomes 10, 13, and 14 were also analyzed in order to identify additional markers of resistance.

**Research supported by:** This work was funded in part by NIAID (R01 AI058973). The Kyle Lab was part of the ARC3 consortium funded by a Bill & Melinda Gates Foundation grant (#48821) to the World Health Organization.

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**Abstract #: 256**

**Presented by: Emily Schwartz, MS, Graduate Student**

***Livestock and Environmental Variables to Identify Possible Vulnerabilities for Rift Valley Fever along the Tanya River, Kenya***

Emily Schwartz USF, Semiha Caliskan, MSC, USF University of South Florida, College of Public Health, Department of Global Health

**Keywords:** Rift Valley Fever, Geographical Informational Systems, GIS

**Objective:** Rift Valley Fever, a zoonotic virus from the genus Phlebovirus transmitted by floodwater Aedes mosquitoes, costs Africa substantial annual economic loss due to livestock death and human illness. A resurgence of epidemics in once endemic areas as well as incident cases in new regions warrants investigation into possible vulnerable regions. The chosen study site was along the Tana River in Kenya to exemplify the use of Geographical Informational System (GIS) and data of risk factors to map possible areas of susceptibility.

**Methods:** Using Google Earth, oxbows, oviposition site for Aedes floodwater mosquito, were located and digitalized in Esri ArcMap. GIS was used to create buffers around oxbows to examine their relation to the following risk factors: human population, flood plains, and livestock density.

**Results:** GIS determined certain areas where surveillance systems should be implemented to prevent further epidemics in these susceptible areas and analyzed the limitations and gaps in data that need to be addressed to provide adequate prediction modeling.

**Conclusion:** Further development of Rift Valley Fever mapping can be achieved through comprehensive data collection and risk map assessment so outbreaks can be accurately detected.

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**Abstract #: 257**

**Presented by: Jennifer Sedillo, MS, Graduate Student**

***Identification of a Novel MAPK Phosphatase in Plasmodium falciparum***

Jennifer L. Sedillo, Shulin Xu, Christopher O. Campbell, Negin Taghizadhasl, and John H. Adams Department of Global Health, College of Public Health, University of South Florida

**Keywords:** malaria, MAPK, kinase, phosphatase, recombinant protein

**Objective:** Plasmodium falciparum is the major cause of malaria in sub-Saharan Africa and worldwide is the primary species responsible for deaths due to malaria. Much about P. falciparum biology is unknown as many proteins are annotated as hypothetical without experimental validation. The MAPK pathway is well characterized in humans and other eukaryotes but much less is known about the MAPK or other signaling pathways in P. falciparum and other parasitic protozoa. My research is focused on a newly identified PF13\_0027 MAPK phosphatase (PfMKP). The goal of my project is experimentally characterize interacting partners of MKP and its putative functional motifs that would be important in mediating phosphatase-kinase interactions (e.g., "kinase interaction motif").

**Methods:** Recombinant protein products of the putative functional regions of P. falciparum kinases (PfMAP1, PfMAP2) and phosphatases (PfMKP and PfYVH1) were expressed in Escherichia coli and affinity purified. In vitro binding assays were conducted between recombinant kinases and phosphatases. A phosphatase assay was conducted using a generic protein tyrosine phosphatase substrate.

**Results:** The results indicate that putative MAPKs interact with MKP. This MKP and a previously identified phosphatase PfYVH1 both show phosphatase activity in vitro.

**Conclusion:** Based on literature research and the interactions found here, we propose there is a functional MAPK pathway critical for regulating asexual-stage development of P. falciparum. We are proposing a hypothetical MAPK pathway and its involvement in cell cycle and cell growth.

**Research supported by:** USF Presidential Doctoral Fellowship and NIH RO1AI33656

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**Abstract #: 258**

**Presented by: Alexandra Talsma, , Graduate Student**

***Development of a Confirmatory PCR Assay to Detect Onchocerca volvulus in Pools of Vector Black Flies***

Alexandra J. Talsma University of South Florida ,College of Public Health, Department of Global Health

**Keywords:** DNA Purification, Black Flies, Onchocerciasis, Streptavidin, and Capture Assay

**Objective:** To use an alternative DNA purification method to accurately detect Onchocerciasis volvulus larvae in pools of 200 American black flies. Onchocerciasis, or river blindness, has historically represented one of the most significant neglected tropical diseases on the planet in terms of socio-economic impact. The discovery that ivermectin was a safe and effective treatment for onchocerciasis, together with the decision of the manufacturer to donate the drug for the treatment of this disease became the basis for several large international programs to control and eventually eliminate the infection. These programs have managed to virtually eliminate transmission of the parasite causing onchocerciasis Onchocerca volvulus from many foci in Africa and the Americas.

**Methods:** Verifying that transmission has been halted requires sensitive and specific assays to detect the presence of the parasite. The gold standard to accomplish this has been to employ a PCR assay targeting a specific repeated sequence family encoded in the genome of O. volvulus to screen for the presence of the parasite in pools of vector black flies.

**Results:** While this assay is highly sensitive, obtaining the high specificity required to document an absence of transmission requires an independent confirmatory assay. To meet his need, an independent PCR assay targeting the X gene of the O. volvulus mitochondrion was developed. This assay could detect O. volvulus mitochondrial DNA purified sequentially from DNA samples that had been depleted of the target repeated sequence DNA targeted in the primary assay.

**Conclusion:** These preliminary data suggest that the mitochondrial PCR assay may be employed as a confirmatory assay to detect O. volvulus in pools of vector flies.

**Research supported by:** Thomas Unnasch, Ph.D

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**Abstract #: 259**

**Presented by: Theresa Trindade, PhD, Postdoc**

***In Vitro Inhibition of Dengue Virus by Palmerolide Natural Products***

Maria Trindade, Alberto van Olphen (Dept of Global Health), Laurent Calcul, Bill J. Baker (Department of Chemistry and Center for Drug Discovery and Innovation), University of South Florida College of Public Health

**Keywords:** dengue, screening assay, palmerolides, drug

**Objective:** Current anti-dengue drug screening assays are based on indirect measurement of the virus induced cell toxicity (e.i. MTT). The purpose of this study was to develop a screening assay which works regardless of the virus ability to induce cytophatic effect and to evaluate its capacity to screen a library of natural compounds for activity against dengue virus serotypes 1 and 4.

**Methods:** A dilution series was made of the natural compound library and tested in a cell-based assay for in vitro activity against dengue virus serotypes 1 and 4. Vero E6 cells were infected with dengue virus at a concentration of 100TCID<sub>50</sub>. After a seven day incubation period, the cells were fixed and permeabilized. Immunohistochemical staining was performed using a monoclonal antibody specific to all serotypes of dengue virus to assess the degree of virus infection. Mycophenolic acid was used as a control compound for the assay. Following staining, a 592 nm absorbance reading was taken of the infected wells for data analysis.

**Results:** Following preliminary screening, 2 palmerolide compounds were found to have activity against both serotypes of dengue virus. Palmerolide A was active against dengue virus 1 and 4 with an IC<sub>50</sub> value of 8.85  $\mu$ M and 6.81  $\mu$ M respectively. Palmerolide G was active against 8.51  $\mu$ M and 10.31  $\mu$ M.

**Conclusion:** A dengue-specific screening assay was developed that allowed the identification of palmerolide compounds with in vitro antiviral activity independently from the virus ability to produce cytophatic effect. This assay can be used for evaluating synthetic and natural compound libraries. The palmerolides should be investigated further as potential therapeutic agents.

**Research supported by:** Department of Defense and Florida Consortium for Vector Borne Diseases

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**Abstract #: 260**

**Presented by: Kenneth Udenze, MS, Graduate Student**

***Progeny Cloning from a Plasmodium falciparum Genetic Cross: a Collaborative Project to Identify Genetic Basis of artesunate Resistance***

Kenneth O. Udenze<sup>3</sup>, Suzanne Li<sup>3</sup>, Min Zhang<sup>3</sup>, John Adams<sup>3</sup>, Juliana M. Sa<sup>1</sup>, Sarah R. Kaslow<sup>1</sup>, Rebecca Salzman<sup>1</sup>, Viviana Melendez-Muniz<sup>1</sup>, Justine S. Cummins-Oman<sup>1</sup>, Michael A. Krause<sup>1</sup>, Chanaki Amaratunga<sup>1</sup>, Jiangbing Mu<sup>1</sup>, Bingbing Deng<sup>1</sup>, Greg Tullo<sup>1</sup>, Kazutoyo Miura<sup>1</sup>, Soundarapandian Velmurugan<sup>2</sup>, Adam Richman<sup>2</sup>, Sumana Chakravarty<sup>2</sup>, Yonas F. Abebe<sup>2</sup>, Eric R. James<sup>2</sup>, Peter F. Billingsley<sup>2</sup>, Carole A. Long<sup>1</sup>, Robert W. Gwadz<sup>1</sup>, B. Kim Lee Sim<sup>2</sup>, Stephen L. Hoffman<sup>2</sup>, Rick M. Fairhurst<sup>1</sup>, Thomas E. Wellems<sup>1</sup>. (<sup>1</sup>Laboratory of Malaria and Vector Research-LMVR, National Institute of Allergy and Infectious Disease, National Institutes of Health, Rockville, MD; <sup>2</sup>Sanaria Inc. Rockville, MD; <sup>3</sup>Department of Global Health, College of Public Health, University of South Florida)

**Keywords:** Malaria, Plasmodium, Genetic cross, Progeny cloning

**Objective:** Slow clearance of Plasmodium falciparum infections after artesunate treatment suggest emergence of artemisinin resistance. To investigate genetic determinants of resistance, a genetic cross was created between artesunate resistant isolate 803 from Cambodia and lab clone GB4. Progeny will be cloned and analyzed as collaboration between Dr. Wellems's group at NIAID and Dr. Adams' group at USF to identify genes associated with phenotypes.

**Methods:** Progeny clones were isolated by robotic, high-throughput cloning with limiting dilution into 96-well plates. Expansion of clones was followed by cryopreservation and genotyping of isolated clones by  $\geq 12$  microsatellite markers. Cloning required 105 days using 52 96-well cloning plates, 11,520 PCR reactions, and 32,000 Giemsa-stained thin smears.)

**Results:** Large-scale blood collections of progeny (7 pools) were made in June 2012 at NIH. Round 1 of parasite cloning experiments analyzed two progeny pools resulting in isolation of 340 lines containing a minimum of 39 independent clones. Most clones were cryopreserved <30 days, while slow growing clones continued to be isolated until day 105.

**Conclusion:** A new P. falciparum genetic cross was generated and hundreds of recombinant progeny were isolated and verified by genotyping. This study is establishing an in vivo model to study artesunate P. falciparum resistance and may allow identification of parasite genetic determinants of response to artemisinin.

**Research supported by:** NIAID Division of Intramural Research (TEW) & NIH grant 5R01AI094973-02 (JHA).

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**Abstract #: 261**

**Presented by: Shulin Xu, MS, Faculty**

***Development of A Luciferase and mCherry Expressing piggyBac Transgenic Plasmodium falciparum***

Shulin Xu<sup>1</sup>, Steven P. Maher<sup>1</sup>, Hitoshi Otsuki<sup>2</sup>, John H. Adams<sup>1\*</sup> <sup>1</sup> Department of Global Health, College of Public Health, University of South Florida, Tampa, Florida; <sup>2</sup> Division of Medical Zoology, Department of Microbiology and Immunology, Faculty of Medicine, Tottori University, Japan

**Keywords:** Luciferase, mCherry, piggyBac, Plasmodium falciparum

**Objective:** Generate a stable *P. falciparum* line with high levels of luciferase and mCherry expression for drug discovery in liver stage or other life cycle stages.

**Methods:** Luciferase and PbDHFR3' UTR gene was amplified from existing expression cassette and inserted it into a mCherry-hDHFR piggyBac vector pL-BacII-bEDMH to obtain pL-BACII-bEDMH-Luc plasmid vector. The vector is designed to express both mCherry and luciferase driven by *P. berghei* EF1 $\alpha$ , which is a constitutive promoter active in all developmental stages. The vector was used to transfect *P. falciparum* KF7 parasite by using the erythrocyte loading method. Integrated into the *P. falciparum* genome clones were confirmed after transfection, drug selection, limiting dilution cloning, tail PCR and sequencing. Promega Luciferase Reporter System was performed for parasite luciferase activity and mCherry signals were checked by DeltaVision live cell imaging.

**Results:** We completed two transfections. Seven clones carrying integrated transposon reporter cassettes were confirmed. These integrated clones express high level of luciferase and mCherry signals through all stage of parasite blood cycle. The clone PfKF7G4 was confirmed to infect mosquito, form sporozoites and express both luciferase and mCherry in mosquito stage.

**Conclusion:** The luciferase-mCherry expressing cassette was successfully integrated in the genome of *P. falciparum* KF7 by piggyBac transposon system. In blood cycle and mosquito stage, a stable high level expressing luciferase and mCherry reporter gene *P. falciparum* parasite line-PfKF7G4 has been developed. PfKFG4 can be used for parasite visualization and quantitative analysis. It may offer drug screen assay for HTS and potential for liver stage infection investigation.

**Research supported by:** DARPA:N66001.11.1-4174

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**Abstract #: 262**

**Presented by: Connor DeVore, High School Student**

***Does the Amount of Propeller Pitch Affect the Forward Force and Speed of an Aircraft***

Connor DeVore University of South Florida

**Keywords:** Propellers, Pitch, Aircraft

**Objective:** The purpose of this project was to find out if the amount of pitch of a propeller affects the forward force and speed of an aircraft. This scientist predicted that the bigger the pitch of the propeller, the more forward force and speed the aircraft would have.

**Methods:** In order to conduct this experiment, this scientist had to build a model to represent an aircraft. This scientist constructed a model to run on the ground with wheels while placing the propeller on the front of the vehicle to move it forward. This scientist found a straight three meter run on a bocce court and measured the time it took each propeller to make the model travel this distance. After that, this scientist recorded and analyzed the data found.

**Results:** The results of this project were this. The first propeller had a pitch of 6X4 and had test times of 1.6, 1.8 and 1.8 seconds. The average time was 1.733 seconds. The second propeller had a pitch of 6X5 and had test times of 1.6, 1.4, and 1.5 seconds. The average time was 1.5 seconds. The final propeller had a pitch of 6X5.5 and had test times of 1.5, 1.3 and 1.3 seconds. The average time was 1.366 seconds.

**Conclusion:** In conclusion, the greater the pitch results in a faster vehicle with more forward force and speed.

**Research supported by:** The Villages Charter School

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**Abstract #: 263**

**Presented by: Kathryn Dougherty, High School Student**

***Use Solar and Heliospheric Observatory to Measure Coronal Mass Ejection***

Kathryn Dougherty University of South Florida

**Keywords:** Coronal Mass Ejection

**Objective:** The purpose of this project is to use the three axis-stabilized axis satellite "Solar and Heliospheric Observatory" to measure coronal mass ejections. They will be measured in year, month, date, time, degree, width, speed (km/s), height (km/s), accel (m/s<sup>2</sup>), mass (gram), kinetic energy (erg), and occurrence This researcher will find patterns in the data to determine if there is a specific annual time in which coronal mass ejections are more likely to occur. Coronal flares and holes occur because of disruptions in the magnetic field due to random fluctuations cause by temperature change, plasma movement, and gravitational pulls that are not affected by seasonal or periodic occurrences.

**Methods:** In order to conduct this experiment this scientist gained access into the Solar and Heliospheric Observatory data achieve. This scientist also needed Microsoft Excel in order to put the data into an easily accessible format. Then, data graphs were formed in order to find patterns and make conclusions.

**Results:** The results of this project show that May had the most amounts of CMEs during the 15 year time span and the year 2011 has the most total CMEs. However, in the lack in a pattern over angular width, central PA, linear speed, quadratic speed, speed at final height, and MPA along with data gaps and technological advancement suggest no supportive data . Also, there were many data gaps and as technology advances there is more data collected so there are factors affecting the results

**Conclusion:** This scientist accepts her hypothesis that there was no conclusive data to support that coronal mass ejections occur during a specific annual time period based on Earth time.

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**Abstract #: 264**

**Presented by: Fairchild, Kathryn, Student**

***Is There a Statistical Correlation Between Cancer, Alcohol, and Tobacco Use Among Military Men and Women?***

Fairchild, Kathryn,USF Health and The Villages

**Keywords:** Military, cancer, cancer rates, alcohol consumption, tobacco usage, retired military

**Objective:** The purpose of this project is to determine if there is a statistical correlation between alcohol use, smoking habits and cancer rates among military men and women.

**Methods:**1. Complete IRB training. 2. Research cancer rates vs. alcohol and tobacco consumption. 3. Research cancer vs. lifestyle. 4. Research military duty and cancer rates. 5. Analyze the three different surveys offered by USF to Village Residents. 6. Determine what data is relevant. 7. Create data sets to capture relevant data. 8. Analyze data. 9. Look for correlations. 10. Find mean and precedence of each dataset. 11. Figure out mathematical equations. 12. Determine results.

**Results:**The results show that of the 33,119 survey respondents, there was a total incidence of cancer in 4,982 people. 1,909 were retired military personnel. Of the retired military personnel 17.5% consumed three or more alcoholic drinks daily and 78% used a tobacco product in their lifetime. When compared to civilian retirees the results are .8% consumed three or more alcoholic drinks daily, and 59% used a tobacco product in their lifetime.

**Conclusion:**There is a statistical correlation between alcohol consumption, tobacco usage and incidence of cancer in military personnel. The results showed that the rates of cancer incidence and tobacco use and alcohol consumption were actually increased in retired military personnel than in retired civilians. Retired military personnel had a 16.7% higher alcohol consumption rate and a 19% higher tobacco usage rate and a reported cancer rate of 20%.

**Research supported by:** The Villages – USF Health Survey of 2012 data results.

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**Abstract #: 265**

**Presented by: Adriana Gonzalez, High School Student**

***Effect of Two Different Types of Fish Food on the Development of Lettuce in an Aquaponic System.***

Adriana Gonzalez, Skyler Case University of South Florida

**Keywords:** Aquaponics, lettuce, growth

**Objective:** The purpose of this project was to determine if different types of fish food affect the growth of the lettuce in an aquaponics system. These students' procedures are that the vegetable based fish food tank will prevail the animal based fish food tank's lettuce.

**Methods:** In order to conduct this experiment the scientists paced two fish tanks on either side of a table. They then proceeded to set up the fish tanks. Afterwards, the scientists fed and monitored the fish and plants daily. At the end of the forty five day marking period, the scientists weighed the lettuce and measured its amount of vitamin C.

**Results:** The results of this project show that there is a one gram difference between lettuces weight.

**Conclusion:** In conclusion, the vegetable based fish food tank showed more growth in lettuce than the animal based tank. It was found that there was more vitamin C in the vegetable based lettuce tank then the opposing tank. The scientist's hypothesis was proven correct.

**Research supported by:** The Villages Charter School

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**Abstract #: 266**

**Presented by: Asia Marion, High School Student**

***Which Wood Preservative Protects Best Against Deterioration in Soil***

Asia Marion, Logan Chavous University of South Florida

**Keywords:** wood, environmental, preservatives

**Objective:** The purpose of this project was to determine which wood preservative would protect best against deterioration in soil.

**Methods:** This was tested using Rust-Oleum Ultimate Spar Varnish, Minwax Helmsman Spar Urethane, Minwax Polycrylic Protective Finish, and Thompsons Water Sealant. We hypothesized that the wood coated in the Thompsons Water Sealant would protect best against deterioration because it should protect against any moisture from the soil. The Minwax Polycrylic Protective Finish will be the easiest to break because, being water-based, it will allow moisture into the wood. To conduct this experiment we obtained three 10 foot boards and cut 25 wood planks to the same size. Four buckets were filled with soil and labeled A, B, C, and D. After coating the boards with the preservatives, we placed five each in the buckets. The wood planks were left in the buckets for two weeks and then taken out and left to dry for three days. After drying, the strength of the wood was tested using a crush tester.

**Results:** The results of this project were that, after testing the wood's strength, the wood planks coated in the Minwax Polycrylic Protective Finish broke the easiest. Also, the wood planks coated in the Thompsons Water Sealant were the hardest to break.

**Conclusion:** In conclusion, the results of this experiment supported our hypothesis in that the Thompsons Water Sealant protected the board the best. This can be accredited to the fact that the water sealant did the best job in keeping moisture out of the wood.

**Research supported by:** The Villages Charter High School

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**Abstract #: 267**

**Presented by: Cassandra Mead, High School Student**

***Now or Later?***

Cassandra Mead University of South Florida

**Keywords:** Instant, Delayed Gratification; Case Study

**Objective:** The purpose of this project was to determine if more preschoolers would perform instant gratification or delayed gratification. This scientist predicted that preschoolers would not have the patience needed to wait because they are so young. Henceforth, this scientist believed that more preschoolers would take one marshmallow right away.

**Methods:** In order to conduct this experiment, this scientist needed to find a handful of preschool volunteers for two different test groups. The first test group, group A, had marshmallows on the table while the children were waiting, while the second test group, group B, did not have marshmallows on the table while the children were waiting. This scientist will take each child into the hallway by themselves and explain that they could either have one marshmallow now or five marshmallows in five minutes. If the child decided to wait, this scientist would then start the timer and make observations of how the child waited.

**Results:** The results are that 20 out of 38 preschoolers succeeded in waiting. In group A, 11 out of 18 preschoolers were able to wait, but in group B, only 9 out of 20 preschoolers were able to wait.

**Conclusion:** In conclusion, more preschoolers who had marshmallows on the table were able to wait than preschoolers who did not have marshmallows on the table. This scientist believes that the marshmallows on the table showed the children their reward and motivated them to wait for it. To conclude, over half of the preschoolers succeeded in waiting the five minutes.

**Research supported by:** The Villages Charter School

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**Abstract #: 268**

**Presented by: Ugwumsinachi Nwaubani, High School Student**

***White Coat Syndrome***

Ugwumsinachi Nwaubani University of South Florida

**Keywords:** White Coats, Bacteria, Medical Doctors

**Objective:** The scientist's purpose for this experiment was to find out if "the caregiver's legendary and historical white coat is a potential source of harm, infection and cross-infection to their patients, ancillary staff and possibly family members." The scientist hypothesized that there will be some possibly harmful bacterial agents found on the physicians' white coat, in addition to some harmless bacteria.

**Methods:** The scientist conducted this experiment with the following procedure; the experiment will be by random approach. First, you must select fourteen medical doctors. Then, swab their white coats at the hems of the sleeve and the bottom. Once all doctors are swabbed, culture the bacteria at the lab and identify what they are. Finally, ID the bacteria you find that might possibly be MRSA (Methicillin Resistant Staphylococcus Aureus).

**Results:** The results of this experiment showed that there were no conceivably hazardous superbugs such as MRSA. Nonetheless, there were some common bacteria found such as Staph Epidermidis, Bacillus Species, Pseudomonas –Luteola and Rhizobium-Radiobacter.

**Conclusion:** In conclusion, from the above study, the subjects' lab coats did not grow any superbugs. Nonetheless, potentially harmful though common bacteria were identified. Nevertheless; the scientist did discover that there were some bacteria located on the doctors' lab coat but they were harmless. Therefore, this led the scientist to partially reject her hypothesis of the fact that superbugs would be present on the medical doctors lab coat; however she did accept the section of her hypothesis where she mention the presence of minor/harmless bacteria.

**Research supported by:** The Villages Charter School

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**Abstract #: 269**

**Presented by: Isabel Torres, High School Student**

***Is there Gliosis in the Autistic Brain?***

Isabel Torres University of South Florida

**Keywords:** Gliosis, Autism, Brain

**Objective:** Autism, a brain development disorder, was first recognized as a distinct condition separate from schizophrenia or mental retardation in the 1960's. Patients with autism struggle with social interactions, verbal and non verbal communication and show restricted and repetitive behaviors. Today, autism affects every 1 in 88 children. In this study gliosis in the autistic brain is examined as a possible pathophysiological pathway in this condition. Based on findings from previous studies, it was hypothesized that a higher amount of astrocytes will be found in autistic samples when compared to controls.

**Methods:** In order to identify and count the number of astrocytes, an immunohistochemistry protocol was followed using 5% horse serum blocking solution, rat GFAP primary antibody, anti-rat GFAP secondary antibody, ABC reagent as an enzyme, and DAB as a catalyst. This protocol enabled the staining of Glial Fibrillary Acidic Protein (GFAP), a reliable bio-marker for astrocytes in the brain tissue of two autistic subjects and two controls. After staining, the slides were viewed through a microscope and pictures were taken. From the pictures, the astrocytes were identified, marked and tallied.

**Results:** The average astrocyte count for controls number 1284 and 3835 was 128.5. The average count for autistic brain samples number 4021 and 4334 was 106.5.

**Conclusion:** On average, astrocytes of autistic samples was less than that for control samples, therefore the hypothesis was not supported. A larger sample of autistic and control tissue must be tested to corroborate this conclusion.

**Research supported by:** The Villages Charter School

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**Abstract #: 270**

**Presented by: Byrell Bautista, High School Student**

***Do Sediments From Various Locations Contain Substances That Pose a Threat to Water-based Organisms?***

Byrell Bautista - The Villages Charter School University of South Florida

**Keywords:** Earth, Water, Soil, Sediments, Daphnia

**Objective:** The purpose of this project is to determine if sediments collected during surface runoff from various locations contain harmful substances that impact water-based organisms, in this case the Daphnia magna. The student hypothesized that there would be harmful substances, with the parking lot containing the sediments with the highest level of toxicity.

**Methods:** In order to conduct the experiment, the student first needed to establish a stable Daphnia culture. After doing so, the student then collected sediments from various locations; the parking lot, playground, and sidewalk. Then the student diluted the sediments and separated them in three labeled containers. He then took three different containers and placed 60-70 Daphnia magna on each and then applied the different sediments and labeled each. He recorded the number of viable Daphnia every 8 hours for two days. Finally he analyzed and drew a conclusion.

**Results:** The data showed that the diluted sediments collected from the sidewalk rendered the most Daphnia nonviable, followed by the diluted sediments from the playground, and finally the ones from the parking lot.

**Conclusion:** In conclusion, sediments from various locations do pose a threat to water-based organisms, but the sediments from the parking lot did not have the most harmful substances, but instead, the sediments from the sidewalk.

**Research supported by:** The Villages Charter School

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Abstract #: 271

Presented by: Madison Coffey , High School Student

***What is Required to Increase the Distance of Wireless Illumination of Fluorescent Lamps from a Tesla Coil's Electromagnetic Field?***

Madison Coffey-The Villages Charter School University of South Florida

**Keywords:** Tesla Coil, Fluorescent Lamps, Electromagnetic Field, Wireless Illumination, Illumination

**Objective:** The purpose of this experiment is to continue this scientist's previous science fair project where successful wireless illumination of fluorescent lamps was achieved through safe operation of a home-made Tesla Coil. These lamps were illuminated by the electromagnetic field produced by the Tesla Coil at three feet. This scientist predicted that the distance of wirelessly illuminated fluorescent bulbs could be increased by optimizing the Tesla Coil's function.

**Methods:** In order to conduct this experiment, the original Tesla Coil was used. The resonant frequency of the secondary coil was measured using an oscilloscope with a signal generator. The primary coil was measured using the oscilloscope with signal generator. The point of connection of the primary coil was adjusted to change the resonant frequency to match the frequency of the secondary coil

**Results:** By matching the frequencies of the primary and secondary coils, the Tesla Coil's electromagnetic field was increased. This process essentially "fine-tuned" the home-made Tesla Coil. The frequency adjustments of the primary and secondary coil allowed illumination of the fluorescent lamps to be increased from three to eight feet.

**Conclusion:** By matching the frequencies of the primary and secondary coils, the Tesla Coil's electromagnetic field was increased.

**Research supported by:** The Villages Charter School

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Abstract #: 272

Presented by: Elizabeth Fairchild, High School Student

***Utilization of a Red Worm Windrow to Reduce Volume and Density of Horse Manure to Minimize Ground Water Contamination in a Horse Stable or Farm Environment.***

N/A University of South Florida

**Keywords:** Vermicompost, Horse Manure, Windrow, Red Worms, Water

**Objective:** The purpose of this project is to determine if creating a windrow for a standard horse owner would reduce the volume and density of raw the horse manure and decrease the ability of any ground water contamination by runoff from the horse manure.

**Methods:** In order to conduct this experiment the scientist had to build a small scale windrow and partner with a horse owner, to receive horse manure. Then, after 45 days, tests were conducted in order to test if the redworms change the volume and density.

**Results:** The results of the red worm windrow experiment shows a beginning raw manure pile of 92 lbs. or 41.730 kg. was reduced to a 3.5688lb or 1.6188kg vermicompost pile. There was a 29.16% reduction in moisture content after the vermicomposted manure was dried out in the sun for 24hrs. The red worms migrated to the fresh or newly added manure within 24 hours of placing the new material in the box. Including a pathway from the old manure to the new manure, the red worms were able to move easily. Allowing the older pile of manure to dry out facilitated the worm's movement to the new pile of horse manure thus allowing the vermicomposted horse manure to be harvested.

**Conclusion:** A red worm windrow can be used successfully to reduce volume and density of horse manure also minimizing the opportunity for ground water contamination. Utilizing the windrow system with red worms is a simple and easy way for stable owners to create a beneficial fertilizer for end use while creating a green alternative to stock piling manure in a hole in the ground or spreading it over rotating fields each week. The worm castings or vermicompost can be harvested for fertilizer in 45 to 60 days at a 90% reduction of volume and density of the raw horse manure.

**Research supported by:** The Villages Charter School

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**Abstract #: 273**

**Presented by: Max Infinger, High School Student**

***What Materials Would Better Improve a Salt Water Desalination Generator***

Max Ininger- The Villages Charter School University of South Florida

**Keywords:** salt water, purify, evaporation, solar power

**Objective:** The purpose of this project is to determine which type of material is best to generate fresh water. This scientist will be using hard and soft plastics and large and small generators. This scientist predicted that the small soft plastic generator would do the best. Its compact structure would allow it to heat faster and the thin plastic would allow for better magnification.

**Methods:** In order to conduct this experiment, this scientist had to construct four different types of generators. These types of generators were: one large soft, one small soft, one large hard and one small hard. After the construction the experiment had to be tested five days in a row. In order to be accurate each experiment had to start and end at the same time of day.

**Results:** The results of this project showed that sometimes bigger is not better because the smaller generators seemed to heat up faster. The hard covers made bigger fresh water droplets, which could lead to more fresh water collection. In conclusion, the small hard generator did the best. Its compact size and metallic outside allowed it to heat up faster. The hard plastic dome created bigger fresh water droplets for easier collection.

**Conclusion:** In conclusion the small hard plastic generator did the best because of its compact size and type of plastic

**Research supported by:** The Villages Charter School

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**Abstract #: 274**

**Presented by: Tiffany Liu, High School Student**

***What plays the major roles in Myopia Development: Acquired Factors versus Genetic Factors***

Tiffany Liu- The Villages Charter School University of South Florida

**Keywords:** Eyes, Myopia, Genetic Factors, Acquired Factors

**Objective:** The purpose of this project was to determine whether genetic or acquired factors play a larger role in myopia development.

**Methods:** To conduct this experiment, this student had to design a survey, print out copies of the survey and the consent forms, distribute the survey, and collect the surveys.

**Results:** Student results will be reported on research day.

**Conclusion:** In conclusion, genetic factors played the major roles in myopia development and acquired factors played the minor roles.

**Research supported by:** The Villages Charter School

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**Abstract #: 275**

**Presented by: Hayden Siverson, , High School Student**

***How Safe is Raw Milk?***

Hayden Siverson University of South Florida

**Keywords:** milk,bacteria,raw,safe

**Objective:** The purpose of this experiment is to determine whether or not drinking raw milk is safe for human consumption and to compare raw milk that is grass-fed, organic, and non-organic. This will be measured using standard plate bacteria (SPC) count and somatic cell count. Both of these tests are used to measure milk quality and bacteria growth. The hypothesis is that the grass-fed raw milk will have the lowest somatic cell count and SPC. Grass-fed cows are only fed grass and free of artificial hormones or antibiotics.

**Methods:** To begin this experiment, all samples are tested at Southeast Milk Inc. Quality Control Lab. To conduct somatic cell testing, milk samples from each type are placed into sterilized sample bottles and heated to a temperature of 40°C. Results are generated using the Bentley Somacount 500. To test bacteria, samples are accurately drawn from each type of milk, at different periods of time, and diluted with water. Samples are placed on Petrifilm and then placed in an incubator. SPC bacteria are measured after 48 hours.

**Results:** After completing this experiment, it was found that the raw non-organic milk had the lowest somatic cell count and SPC count, followed by grass-fed milk, and then organic milk.

**Conclusion:** Bacteria was present in all samples, but since a total bacteria count was tested, and not a specific bacteria type, it is unknown whether the bacteria present is good or bad bacteria. Further testing would need to be done to isolate the types of bacteria that were present and decide whether raw milk is safe to consume.

**Research supported by:** The Villages Charter School

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**Abstract #: 276**

**Presented by: Kunal Upadya, High School Student**

***Steer Assist-steering the World to a Better Driving Experience***

Kunal Upadya University of South Florida N/A

**Keywords:** Computer programming, Cars, Steering

**Objective:** The purpose of this project was to keep people from crashing by keeping them in their lane.

**Methods:** 1. Build "The Jeep" as specified in the Unofficial LEGO Mindstorms NXT 2.0 Inventors Guide. 2. Program the robot to sense in the blind spot, drive forward, and check for lane markers. 3. Paint the black mat to model a road. 4. Test the program. 5. Revise based on tests.

**Results:** The robot traveled almost 10 times its length per trial. It also traveled approximately 197 cm per trial on average. It also went 3.37 turns per trial on average.

**Conclusion:** The conclusion of this project was that this system worked well in the controlled area, but it would perform even better in an uncontrolled area. Grass on the side of the road and a human at the wheel would make the car go even farther.

**Research supported by:** The Villages Charter School

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**Abstract #: 277**

**Presented by: Brock Wiley, High School Student**

***Earth Power - Behavior vs. Weather & Moon Phases***

Brock Wiley - The Villages Charter School University of South Florida

**Keywords:** Behavior, Weather, Moon Phases, Adolescent, Discipline

**Objective:** The purpose of this project was to find out if the weather affected the amount of referrals and the change in adolescent behavior. This scientist predicted that there would be more referrals and worst adolescent behavior on a day were it's raining or storming. The scientist also predicts there will be more referrals on full moons.

**Methods:** In order to conduct this experiment the scientist had to have permission from the front office to gather the information on the referrals, access to a computer, and a logbook to record all the information. This data was analyzed by weather conditions and moon phases to the number of referrals daily.

**Results:** The results of this project show that on non-raining/clear day's there are 47 referrals over a total of 54 days. On rainy days there are a total of 45 of referrals over 54 days. Waning Crescent moon phases have a total of 23 referrals out of 14 days. Waxing Crescent moon phases have a total of 16 referrals out of 10 days. Waxing Gibbous moon phases have a total of 22 referrals out of 13 days. Waning Gibbous moon phases have a total of 27 referrals out of 13 days. Full moon phases have a total of 1 referral out of 2 days. New moon phases have a total of 1 referral out of 1 day. Lastly, the First Quarter moon phases have a total of 0 referrals out of one day. Therefore there are more referrals on sunny days than on rainy days and there are more referrals on a waning gibbous than any other moon phase.

**Conclusion:** In conclusion, there are more referrals on day's it is not raining than the day's it is raining.

**Research supported by:** The Villages Charter School

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**Abstract #: 278**

**Presented by: Josh Allen, BA, Graduate Student**

***The Impact of Dispositional Mindfulness on Work-Related Stress and Employee Burnout: A Meta-analytic Review***

Josh Allen, Florida International University, Jessica Mesmer-Magnus, University of North Carolina Wilmington, Chockalingam Viswesvaran, Florida International University, SERC Invitee

**Keywords:** Mindfulness, Burnout, Work-related stress, meta-analysis

**Objective:** Mindfulness has long been believed to be a construct of importance (Conze, 1956). However, until recently mindfulness was generally overlooked by organizational researchers (Dane, 2011). The objective of this paper is to use meta-analytical techniques to determine the impact of mindfulness on work-related stress and burnout. Hypothesis 1: Higher mindfulness will decrease employees perceptions of work-related stress. Hypothesis 2: Higher mindfulness will decrease employee burnout.

**Methods:** A literature search was performed using Psycinfo, Proquest Dissertations and Abstracts, Google Scholar and Business Source Premier using the search terms: "mindfulness", "burnout" and "stress". The study was included if (a) an overall measure of mindfulness provided (b) the burnout or stress outcomes were work-related (c) correlations or statistics that could be converted into correlations were provided. The meta-analytical methods outlined by Rosenthal (1991) were used.

**Results:** Mindfulness and work-related stress resulted in a  $k=9$ ,  $n=1280$ . Mindfulness and burnout resulted in a  $k=5$ ,  $n=596$ . Our analysis resulted in an effect size of  $rWM=-0.27$  when assessing the relationship with mindfulness and work-related stress, providing support for hypothesis one. When assessing the relationship with mindfulness and burnout the analysis resulted in an effect size of  $rWM=-0.42$ , providing support for hypothesis two.

**Conclusion:** Given the support of both hypotheses, the results of the meta-analysis suggest that dispositional mindfulness is related to employees perceiving less job-related stressors and being less susceptible to job-related burnout. The significant findings offer evidence that mindfulness could be an important variable of interest for organizational researchers.

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**Abstract #: 279**

**Presented by: Pamela Bambaren, MS, Graduate Student**

***A Review of Healthy Workplace Practices***

Pamela Bambaren, Hernandez, Miryam, Levesque, Angie, Provost, Nicolle, FIU,  
SERC Invitee University of South Florida, College of Arts and Sciences, Department of Psychology

**Keywords:** Healthy workplace practices

**Objective:** This paper provides an extensive overview of a variety of healthy workplace practices. The review is based on the American Psychological Association's classification of five major healthy workplace practice categories. The categories consist of work-life balance, health and safety, employee growth and development, employee involvement, and employee recognition. Specific programs within each are defined and evaluated in terms of benefits to the employee and the organization with emphasis on how these practices contribute to a healthy workplace.

**Methods:** The comprehensive literature review was based on the five major healthy workplace practices, and led to a qualitative review of each. Research was gathered by using multiple search engines and using each category as key terms. The sources considered were from multidisciplinary fields. The information gathered primarily focused on the benefits of these practices for both the organization and employees. These findings were compiled and reviewed.

**Results:** Healthy workplace practices require continuous active participation and there is no "one-size-fits-all" approach (Kinnie, Hutchinson, Purcell, Rayton, & Swart, 2005). In order to respond to these needs, human resource investments should be made in healthy workplace practices (Huselid, 1995). This investment can enhance work attitudes and positive work behaviors (Schneider, Hanges, Smith, & Salvaggio, 2003).

**Conclusion:** Some corporations have taken care of their employee's needs not just by focusing on workplace productivity, but also by creating a solid, supportive, and vibrant organizational culture. The nature of this paper is exploratory and, therefore, provides a foundation and basic overview of the healthy workplace practices for future research.

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**Abstract #: 280**

**Presented by: Jeremy Bauer, MA, Graduate Student**

***The Role of Citizenship Pressure within the Organization***

Jeremy Bauer, Kevin Loo, University of South Florida, Supported by USF Sunshine ERC University of South Florida,  
College of Arts and Sciences, Department of Psychology

**Keywords:** Counterproductive Work Behaviors, Organizational Citizenship Behaviors, deviance, Citizenship Pressure

**Objective:** The goals of this study are threefold. The first goal of the study is to determine how CP is associated with different motives for OCB. The second goal of this study is to investigate how CP relates to measures of job effort, OCB, and counterproductive work behaviors (CWB). CWBs are behaviors that can harm the organization and organizational members. The final goal of this study is to investigate the role of CP in regards to organizational attitudes (i.e., job satisfaction).

**Methods:** The sample consists of 136 employed participants who were recruited from classes at a large public university in the southeastern U.S. Additionally, coworker reports of OCB and CWB were obtained from 88 participants. Students were recruited to complete an electronic self-report survey (target survey) that contained all study variables. Participants were given a unique code and a survey link to enter online. They then entered the code once they completed the survey. Participants then wrote the unique code on the coworker instruction sheet that contained the link to the coworker survey. Participants were then instructed to give the sheet to a coworker. Coworkers then completed the online survey after they received the instruction sheet. The code was used to link the two surveys together.

**Results:** CP was significantly related to three different motives. In regards to OCB, Citizenship Pressure was negatively related to self-report OCB and coworker reported OCB. Citizenship Pressure was also positively related self-reported CWB but not coworker reported CWB. Citizenship Pressure was negatively related to job satisfaction.

**Conclusion:** Citizenship Pressure may not be helpful in promoting OCBs and may result in negative behavioral outcomes.

**Research supported by:** USF Sunshine ERC

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**Abstract #: 281**

**Presented by: Adrienne Berarducci, PhD, Faculty**

***Increasing Osteoporosis Awareness in the Workplace***

Adrienne Berarducci, PhD, ARNP, BC, FAANP, USF College of Nursing & College of Medicine, Candace M. Burns, PhD, ARNP, College of Nursing & College of Public Health, Director OHN Program, Deputy Director Sunshine Education & Research Center USF SERC Invitee

**Keywords:** Osteoporosis, Intervention, Midlife, Workplace

**Objective:** An experimental study was conducted to determine if workplace participation in an evidence-based osteoporosis preventive intervention increased knowledge, self-efficacy, and intention to engage in osteoporosis preventive behaviors in mid-life women and if osteoporosis-related knowledge and self-efficacy predict intention to participate in preventive behaviors.

**Methods:** Instruments used included the Osteoporosis Knowledge Questionnaire (Berarducci, Lengacher & Keller, 2002), the General Self-Efficacy Scale (Sherer et al., 1982) and the Osteoporosis Preventive Intention Scale. The sample consisted of 165 working, midlife women (mean age = 46.25 years) randomized to an experimental (n = 88) or control group (n = 77). Multifactorial analysis of variance was used to assess changes in knowledge, self-efficacy and intention. Standardized regression analysis assessed predictive value of knowledge and self-efficacy on intention to engage in osteoporosis-preventive behaviors.

**Results:** Results indicated a significant increase ( $p < .001$ ) in osteoporosis-related knowledge in the experimental group as compared to the control group two-weeks following the intervention. Despite not reaching significance, experimental participants did increase self-efficacy ( $p = .056$ ) and intention ( $p = .056$ ). Predictor variables of knowledge and self-efficacy did not significantly predict ( $p = .345$ ) intention to engage in osteoporosis preventive.

**Conclusion:** Future increases in the number of older women in the workforce will have a significant impact on the practice of occupational health nursing. These data suggest that development of workplace osteoporosis-preventive interventions are warranted to assist women adopt skeletal health behaviors and prevent future fractures.

**Research supported by:**

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**Abstract #: 282**

**Presented by: Burgos-Martínez, Melanie, Graduate Student**

***The Relationship Between Breast Cancer and Shift Work***

Melanie Burgos-Martínez, Lida Orta: Faculty of Biosocial Sciences and Graduate School of Public Health, University of Puerto Rico, Medical Sciences Campus

**Keywords:** Breast cancer, shift work, light at night

**Objective:** It has been proposed that workers with night shifts are at greater risk of developing breast cancer than workers with day shifts.

**Methods:** A literature review of publications studying the relationship of workers with night shifts and risk of breast cancer was conducted. These publications were chosen through PubMed and Science Direct databases and references found in the literature.

**Results:** Studies selected reported a relationship between decreased melatonin with breast cancer, the ratio of night work with breast cancer, and disruption of the circadian cycle with breast cancer.

**Conclusion:** More clinical studies are needed evaluating the relationship between night work and breast cancer.

**Research supported by:** UPR Industrial Hygiene Program and USF Sunshine ERC

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**Abstract #: 283**

**Presented by: Karen Campbell, MS, Graduate Student**

***Workplace Exercise Programs***

Karen Campbell, University of South Florida, College of Nursing

**Keywords:** Workplace, exercise, musculoskeletal disorders, injury, strain

**Objective:** As healthcare professionals in the workplace environment, occupational health nurses (OHN's) are uniquely poised to present and model healthy lifestyle choices, including sound exercise programs. Cancer, diabetes and cardiovascular disease are responsible for over 1.6 million deaths per year in the U.S., and are often preventable. (NIOSH, 2010). Working adults spend nearly half of their waking hours in their occupational settings, offering consistent backdrops for education and training.

**Methods:** Literature Review

**Results:** Individual's intrinsic motivation is the chief determining factor in the long term lifestyle change, however, supportive work environment and encouragement in exercise programs at work assisted and supported individuals in making that choice.

**Conclusion:** Workplace exercise programs are effective in assisting some employees in making lifestyle changes.

**Research supported by:** Literature review SERC

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**Abstract #: 284**

**Presented by: Helena Chapman, MD,  
Graduate Student**

***Novel Anti-smoking Health Communication Strategies in Eighteen Communities in the Dominican Republic***

Helena Chapman MD MPH (University of Florida; Universidad Iberoamericana), Ignacio Pellin Arino (Universidad Nacional Pedro Henriquez Urena), Marcos Nunez Cuervo MD FICS (Universidad Iberoamericana), Goldny Mills Bradshaw MD MPH (Universidad Central del Este)

**Keywords:** anti-tobacco, prevention, communication strategies

**Objective:** Tobacco use increases morbidity and mortality in multiple organ systems, causing six million annual deaths. Since World No Tobacco Day is celebrated on May 31st, the purpose of this intervention was to implement novel communication strategies for anti-tobacco messages to educate citizens to reduce smoking utilization in the Dominican Republic (DR).

**Methods:** Fifty medical students from six DR medical schools developed the first two-week national anti-smoking health project in support of World No Tobacco Day activities. Team focused on collaborations among universities, local community, national and international settings. They explored media and publications to promote the use of social media for health communication strategies.

**Results:** Fifty medical students organized a national anti-smoking campaign to educate more than 7,500 citizens of all ages of the hazards of smoking tobacco and exposure to secondhand smoking in seven cities and eleven rural DR communities. Cost-effective communication strategies were used in local universities (poster displays, university seminars) and multiple local (health counseling, educational pamphlets), national (radio, television) and global (social media) communities to reduce smoking utilization in the DR. Student leaders evaluated this cost-effective program as enhancing excellent teamwork, developing high-quality, low-cost health educational materials, and disseminating the anti-tobacco message through social media.

**Conclusion:** This anti-smoking campaign enhanced interdisciplinary teamwork through the development of innovative health communication strategies for the DR population. Health professionals may use this model to develop future health communication campaigns in developing countries.

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**Abstract #: 285**

**Presented by: Crespo González, Janet, Graduate Student**

***Relationship Between Occupational Hazardous Noise Exposure and Increased Risk of Cardiovascular Disease***

Crespo González, Janet; Orta Anés, Lida. University of Puerto Rico, Medical Sciences Campus, Graduate School of Public Health, Industrial Hygiene Program

**Keywords:** Occupational hazardous noise exposure, Cardiovascular disease

**Objective:** Evaluate if hazardous noise exposure can increase the risk of cardiovascular disease.

**Methods:** For this investigation was conducted a literature review from papers published on scientific journals from 2004 to 2012. Papers were identified by systematic search on the online data bases: Pub Med, Scopus, Ovid, and Science Direct.

**Results:** The results presented by different authors cited show a statistical significance level that demonstrated the increased risk of hypertension and cardiovascular disease.

**Conclusion:** The analysis leads to the conclusion that exposure to occupational noise is associated with higher risks of cardiovascular disease.

**Research supported by:** UPR Industrial Hygiene Program and USF Sunshine ERC

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**Abstract #: 286**

**Presented by: Cruz, Odalys, Graduate Student**

***Workplace Violence in Puerto Rico: Recommended Engineering and Administrative Controls***

Odalys Cruz Berríos- University of Puerto Rico Medical Sciences Campus, Lida Orta Anés- University of Puerto Rico Medical Sciences Campus

**Keywords:** Workplace violence (WV); Workplace violence prevention; Engineering and administrative controls

**Objective:** This research aims to identify the recommended controls to prevent workplace violence related to the highest WV fatal injuries occupations in Puerto Rico.

**Methods:** This study reports a critical review of the published literature on engineering and administrative/work practices controls recommended address workplace violence.

**Results:** It was observed that the most recommended controls were: WV preventing trainings and WV written policies and procedures. Two studies recommended engineering controls to prevent workplace violence.

**Conclusion:** We expect to find that the use of administrative or engineering controls can positively help to reduce the risk of exposure to workplace violence. Also, it is expected that additional research needed to demonstrate the effectiveness of the implementation of controls to further reduce workplace violence

**Research supported by:** UPR Industrial Hygiene Program and USF Sunshine ERC

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**Abstract #: 287**

**Presented by: Maha Elbadry, PhD, Graduate Student**

***Evaluation of Plasmodium falciparum Multi-Drug Resistance -1 Genotypes in Haiti***

Maha ElBadry<sup>1</sup>, Alexander Existe<sup>2</sup>, Yves Victor<sup>3</sup>, Gladys Memnon<sup>4</sup>, Mark Fukuda<sup>5</sup>, Bernard Okech<sup>1, 6§</sup> <sup>1</sup>Department of Environmental and Global Health, University of Florida, Gainesville, FL 32610, <sup>2</sup>National Public Health Laboratory, Ministry of Public Health and Population, Port au Prince, Haiti, <sup>3</sup>Blanchard Clinic - Family Health Ministries Haiti, Terre Noire, Port au Prince, Haiti; <sup>4</sup>Hospital Saint Croix, Leogane, Haiti, <sup>5</sup>Armed Forces Health Sciences Surveillance Center, Silver Spring, MD, <sup>6</sup>Emerging Pathogens Institute, University of Florida, Gainesville, FL 32610 "SERC Invitee".

**Keywords:** Pfmdr-1, CQ resistance, multidrug resistance

**Objective:** Resistance to anti-malarial drugs is a major threat to the management and elimination of malaria in endemic countries. In Haiti Chloroquine (CQ) is widely used for malaria treatment, reports of clinical resistance to CQ are absent despite a long history of its use. In this study, we examined mutations in the Pfmdr1 gene that have been shown to correlate with CQ resistance in other parts of the world.

**Methods:** We amplified the pfmdr-1 gene at five codons namely 86, 184, 1034, 1042 and 1246 using a nested PCR protocol. Products of amplification were then subjected to site-specific restriction enzyme digest to detect polymorphic codons known to confer resistance to CQ. The amplification products were also sequenced by a nested sequencing protocol to confirm the restriction enzyme digest result.

**Results:** Of the 356 samples obtained and confirmed positive for *P. falciparum* by microscopy, only 160 samples were able to amplify for the presence of *P. falciparum* small ribosomal subunit RNA gene. All the codons tested but 184 were wild type with no mutations. However, at codon 184, all the samples had the Tyr to Phe mutation (Y→F) as confirmed by both restriction enzyme digestion and nested sequencing. Thirty eight matched samples amplified at 4 codons (86, 184, 1034 and 1042) indicated the widespread presence of the NFSN haplotype in Haiti.

**Conclusion:** The study has found the widespread presence of Y184F mutation in *P. falciparum* parasites in Haiti. This mutation is thought to confer resistance to other antimalarial medications. Therefore, surveillance of changes in prevalence of SNPs in the Pfmdr-1 gene is important and may serve as an early warning for the emergence of *P. falciparum* resistance to CQ and other antimalarial in Haiti.

**Research supported by:** University of Florida

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**Abstract #: 288**

**Presented by: Nadia Etienne, MS, Graduate Student**

***Nutritional Education***

Nadia Etienne, SERC Invitee- OHN Student\_University of South Florida, College of Nursing

**Keywords:** Occupational Health Nursing, Nutrition, Education

**Objective:** While most people know it is important to eat a healthy diet, it isn't always easy to sort through all of the information available about nutrition. Understanding nutrition is a fundamental step to good health and a productive lifestyle. A poor understanding of nutrition and a lack of exercise has lead millions of Americans to co-morbidities including heart disease, diabetes and cancer.

**Methods:** Review of Literature

**Results:** By implementation a workplace nutrition education program the Occupational Health Nurse can enable increase productivity, decrease absenteeism, dispel fallacies about nutrition and prevent chronic diseases among his/her workforce.

**Conclusion:** Occupational Health Nurses (OHN) are often the sole healthcare provided in many work facilities and therefore play a vital role in intersecting and/or impeding the incidence of nutrition illiteracy of the workforce.

**Research supported by:** Benavidea, A. D., David, H. (2010) Local Government Wellness Program: A vital option to decrease healthcare cost and improve production. *Public Personnel Management*, 39(4), 17-25. Cooper, K., Hancock, C. (2011) Collaborating for workplace health. *Occupational Health* 63(10). Lemone, P, Burke, K. (2008) *Medical-surgical nursing: Critical thinking in client care* (4th ed.). Upper Saddle River, NJ: Pearson. National Institute for Occupational Safety and Health. Obesity. <http://www.cdc.gov/niosh/update/upd-04-11-07.html>. Shaw, M. (2011) Helping Hand for Better Health. *Occupational Health*, 63.(11) 25-28. Spillmann, M.D & Siegrist, M. (2011): Consumers' knowledge of healthy diets and its correlation with dietary behavior. *Journal of Human Nutrition and Dietetics*, 24. 54-60.

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**Abstract #: 289**

**Presented by: Angel Ferrer, MS, Graduate Student**

***Comparison of WBGT and PHS Heat Exposure Assessment Methods***

Angel Ferrer, Thomas E. Bernard College of Public Health, USF University of South Florida, College of Public Health, Department of Environmental & Occupational Health

**Keywords:** heat stress, exposure assessment, WBGT, PHS

**Objective:** Two methods for assessing heat stress in occupational settings are an empirical model based on the wet bulb globe temperature (WBGT) and the Predicted Heat Strain (PHS), which is a rational model based on biophysical models of heat exchange. Their purpose is to predict limiting thermal stress in order to be able to protect the exposed worker. The purpose of this effort was to compare decision outcomes based on PHS for a range of limiting WBGT conditions. That is, are they congruent exposure assessments.

**Methods:** Exposure scenarios were developed using all the combinations of metabolic rate, relative humidity and air speed at three levels each; two levels of radiant heat and four levels of clothing. The temperatures for all scenarios were calculated using an Excel macro that adjusted the temperatures until the WBGT<sub>eff</sub> reached the TLV. Once all data was computed, there were 216 distinct scenarios that predicted a sustainable exposure to heat stress based on WBGT. These data were used to calculate the PHS.

**Results:** Of the 216 scenarios, there were a total of 23 incongruent scenarios. These tended to occur with high metabolic rates and low air speeds. High evaporative resistance also contributed to the incongruent scenarios. In general, the agreement was excellent.

**Conclusion:** Although both methods are useful in assessing industrial heat stress, the added parameters of the PHS model may be a better predictor of sustainable heat stress in certain occupational settings. In these scenarios the rational PHS model yielded duration limitations even in cases where, according to the WBGT model, work would still be sustainable.

**Research supported by:** Sunshine ERC

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**Abstract #: 290**

**Presented by: Evelisse Flores Alvarez, Graduate Student**

***Musculo-Skeletal Problems among Public Transportation Drivers.***

Evelisse M. Flores Alvarez, University of Puerto Rico, Medical Sciences Campus, Dr. Lida Orta, University of Puerto Rico, Medical Sciences Campus

**Keywords:** Ergonomics problems, musculo-skeletal problems, back injury

**Objective:** This descriptive study aims to understand the main issues and musculo-skeletal injuries presented by the Metropolitan Bus Authority (AMA) workers. The ultimate purpose of this study is to make recommendations that benefit the health of bus drivers. The information was collected through a survey conducted to a convenience sample of 38 AMA drivers inquiring about symptoms that may be related to these problems and those work related.

**Methods:** This survey is a questionnaire tool where workers answered if at present time they had any discomfort in any joint in their body, the frequency of the discomfort, how long they have had it, and if they received any medical care because of this problem.

**Results:** The results showed that almost 95% of the subjects surveyed reported having at least some discomfort, which may be related to musculoskeletal injuries. The discomforts that most drivers report are on the back and neck, just about with 75% and 70% respectively. Of the total complaints reported 90% received private medical treatment, while only 31.7% received medical treatment in the State Workers Insurance Fund.

**Conclusion:** There are some engineering and administrative recommendations that can help reduce the occurrence of musculoskeletal injuries. Some of these recommendations are: ergonomic seat, ongoing maintenance of the suspension of the bus, implement guidance and exercise programs, reasonable rest periods.

**Research supported by:** UPR Industrial Hygiene Department and USF-Sunshine ERC.

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**Abstract #: 291**

**Presented by: Shari Frye, BS, Graduate Student**

***Commercial Truck Drivers and Diabetes***

Shari Frye, RN, BSN, Occupational Health Nurse Practitioner Student SERC Invitee-OHN Student University of South Florida, College of Nursing

**Keywords:** Commercial truck drivers and diabetes

**Objective:** As the economical state of the country fuels the increasing demands for qualified commercial truck drivers, the complications from poor nutrition, lack of exercise can lead to obesity and ultimately diabetes which could increase hazards and put the public at risk on our nation's highways.

**Methods:** reviewed literature

**Results:** Approximately 8.3% of the population in the United States is affected by diabetes, in 2010 there were 1.9 million cases of new onset diabetes. There are 3.5 million commercial truck drivers and the need will increase by 21% in 2020. Truck drivers are exposed to long working hours, irregular sleep patterns, poor nutritional and eating habits, and a lack of exercise that leads to obesity with this increasing the risk of commercial truck drivers becoming diabetic and unable to drive if placed on insulin. Drivers consume high caloric meals of fast processed foods, candies, and stimulant beverages during times of driving. Drivers need a complete medical history and physical examination to obtain or renew their commercial license. Maintaining a good diet, controlling blood sugar levels, and keeping the A1c below 7% are major keys to reduce driving hazards and cardiovascular disease for these individuals.

**Conclusion:** The OHN can promote education on blood glucose monitoring prior to driving and during driving to maintain safe highways. Counseling on healthy lifestyles, exercise, and nutritional snacks that could help maintain glycemic control while driving and decrease risk of obesity. The OHN be a advocate for truck stops to have exercise areas, foods that are compliant with diabetic individuals, and signage to indicate these areas.

**Research supported by:** Review of literature

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**Abstract #: 292**

**Presented by: Michele Gazica, JD, Graduate Student**

***The Distinctiveness of Safety Climate and Violence Prevention Climate***

Michele Gazica, Paul Spector, University of South Florida, College of Arts and Sciences, Department of Psychology, Sunshine ERC

**Keywords:** violence prevention climate safety climate

**Objective:** The purpose of this study was twofold: (1) to confirm the distinctiveness of safety climate and violence prevention climate, and (2) to explore the relationships between and among the two climate constructs, domain-specific motivation and compliance, and related safety and well-being outcomes.

**Methods:** Participants consisted of 423 college students employed for at least 20 hours a week, all of whom were recruited from the USF Department of Psychology human subjects pool. Each participant completed a host of survey measures, including violence prevention and safety climate, exposure to workplace accidents, aggression, and interpersonal conflict, and job satisfaction. This study employed a variety of statistical analyses to test study-related hypotheses, including correlation, multiple regression, and exploratory factor analyses.

**Results:** The data support that the two climate constructs are distinct, albeit related, constructs. The data further revealed that each of safety climate and violence prevention climate had differential relationships with the study's outcome variables.

**Conclusion:** Overall, the results of this study suggest that while safety climate variables might be the most influential predictors of various workplace health and safety outcomes, violence prevention variables do add some predictive validity in certain circumstances, but perhaps not necessarily in the way that theory suggests. The results of this study might further suggest these two climate constructs share a common factor that may predict relevant safety outcomes better than either construct alone.

**Research supported by:** USF Sunshine ERC

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***Encouraging Personal Protective Equipment and Social Acceptance***

Amie Gimon, Dr. Helen Conlon, Dr. Candace Burns University of South Florida, College of Nursing

**Keywords:** personal protective equipment, compliance, social pressures review of literature

**Objective:** Encouraging employees to comply with the safety professional's recommendations for PPE use may be difficult due to social pressures, perceived risk of exposure, reduction in efficiency, lack of enforcement and equipment discomfort. Both in nursing practice and industry, PPE may be the only method to prevent injury or disease. Research has indicated that most employees feel that training in PPE is appropriate. Job performance, PPE comfort level and examples of PPE compliance by more experienced workers affected PPE compliance use. For the purposes of this poster, emptying surgical drains in the hospital setting and mask, goggle and glove use in the agricultural setting will be used as examples. Research and/or modifications to equipment is needed to address alternatives to increase compliance with PPE use.

**Methods:** Literature review

**Results:** In both the agricultural and healthcare settings, research indicates that PPE may not be utilized at all times based on perceived level of risk. If workers are omitting PPE due to social pressures or perceived low risk of harm, encouraging new hires and re-educating the established workers as examples to the new hires may change the safety social setting of the industries.

**Conclusion:** Research and practice needs to: Identify areas where workers perceive low risk of exposure. Identify issues that limit reporting of body fluid exposure such as surgical drain splash when emptying drain. Develop engineering modifications to surgical drains to eliminate potential exposure. Educate workers on the importance of reporting perceived low risk exposure and reduce social pressures. Re-evaluate productivity requirements in agriculture so that workers will accomplish job duties efficiently while using PPE.

**Research supported by:** Literature review SERC

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***Characterization of Airborne Nanoparticles Using Four Different Methods***

Michael Henderson, Environmental and Occupational Health, College of Public Health, University of South Florida, Tampa, FL

**Keywords:** Nanoparticle, aerosol, real time monitoring

**Objective:** The purpose of this research was to assess the effectiveness of current nanoparticle aerosol measurement methods including Condensation Particle Counter (CPC), Optical Particle Counter (OPC), and Scanning Mobility Particle Sizer (SMPS), that is, real-time instruments used in evaluating properties of nanoparticle aerosol clouds; and compare the resulting concentrations and size distributions to these obtained by electron microscopy (EM).

**Methods:** Sodium chloride nanoaerosols were generated using a Collison Nebulizer. The aerosol cloud was passed through a radioactive neutralizer and a diffusion dryer prior to entry into the test chamber. The chamber was evaluated for air leakage, relative humidity, air flow patterns, and dispersion patterns. Real-time measurements were obtained with the OPC, CPC, and SMPS. Air samples were also collected on membrane filters for EM analysis.

**Results:** The research is ongoing and generated data is limited. The CPC was stable and consistent but the results were limited to nanoparticle concentration. The SMPS was effective in measuring the concentration and size distribution of the nanoparticle cloud. Comparable concentrations of nanoparticles within the size range of 20nm to 200nm, with a median diameter range of 80nm to 100nm were observed as determined by the SMPS and EM. The SMPS and EM sample results were comparable. OPC provided particle concentrations in selected nanoparticle size ranges but did not perform well at elevated nanoparticle aerosol concentrations.

**Conclusion:** The direct reading instruments examined in this study should be used with caution for characterization of size and concentrations of a nanoparticle cloud. EM should be used to verify size and concentration reported by the instruments.

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**Abstract #: 295**

**Presented by: Michael Hiles, MS, Graduate Student**

***Heat Stress and Incident Rates for Heat-Related Disorders and Acute Injury during Deepwater Horizon Clean-up Operations***

Michael Hiles, Thomas E. Bernard, University of South Florida, College of Public Health, Department of Environmental & Occupational Health

**Keywords:** heat stress, heat disorders, acute injury

**Objective:** The objective of this study is to examine the relationship between outdoor thermal conditions and (1) heat-related disorders and (2) acute injuries using injury and illness data collected during the BP Deepwater Horizon cleanup operations.

**Methods:** There were 5,485 heat-related or an acute injury cases over 11 months. Daily weather data were used to estimate the wet bulb globe temperature (WBGT) based on the time of day. Heat Stress Levels were baseline (HSL0: < 24 °C-WBGT), HSL1 (24 - 27 °C-WBGT), HSL2 (27 - 30 °C-WBGT), HSL3 (30 - 33 °C-WBGT) and HSL4 (> 33 °C-WBGT). Labor-hours by month were estimated by the prevailing shift length in the month and the number of workers. The incidents were assigned a Heat Stress Level and the number of labor-hours by heat stress level were determined. The next step was to calculate the incident rate ratios (RRs) by Heat Stress Level.

**Results:** For heat-related disorders, the RR increased from 6.2 at HSL1, to about 10 at HSL2 and HSL3 to 19 at HSL4. For acute injury, there was an increase from baseline to HSL1 (RR = 1.5) and then to HSL2 (2.3) and was similar for HSL3/4 (1.9).

**Conclusion:** As a frame of reference, the occupational exposure limit was about 30 °C-WBGT, the transition from HSL2 and HSL3. The rate of heat-related disorders increased above thermal comfort (HSL0) and below the exposure limit (HSL1 and HSL2). Some of this increase was likely due to aggressive recognition and treatment. Interestingly, there was a substantial increase at HSL4 (more than 3 °C-WBGT above the exposure limit) that likely represents the effects of the heat. The major increases in acute injury occurred between thermal comfort and the exposure limit, meaning that the exposure level is not protective for acute injury.

**Research supported by:** Sunshine ERC

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**Abstract #: 296**

**Presented by: Cristina Hudson, MA, Graduate Student**

***Understaffing: An Under-researched Phenomenon***

USF Sunshine ERC University of South Florida, College of Arts and Sciences, Department of Psychology

**Keywords:** understaffing, staffing, occupational constraint, occupational stressor

**Objective:** Our current economic crisis and subsequent workforce downsizing has led to “lack of qualified staff” being a primary concern for today’s workers (e.g., Edwards & Burnard, 2003). This qualitative review of previous understaffing literature outlines our current understanding of the construct, its links with workplace outcomes (including worker well-being), and proposes directions for future research.

**Methods:** Potential articles were identified using PsycInfo and GoogleScholar. Reference lists from relevant articles were also examined for related studies. The initial pool of 92 articles resulted in only a dozen that directly measured or focused primarily on understaffing.

**Results:** Our review identified six understaffing forms—three exposures (acute, fluctuating, chronic) by two types (manpower, expertise). Most research examines only manpower and fails to include the exposure dimension. This lack of scrutiny may have contributed to existing contradictory evidence regarding understaffing—outcome relationships. Furthermore, recent research tends to study understaffing as only one of many organizational constraints or stressors, confuse it with similar constructs (e.g., workload), or simply seek staffing-related solutions regardless of the lack of conceptual clarity.

**Conclusion:** Systematic research on the conceptual underpinnings of understaffing is lacking. Future studies must begin with the basics, first outlining the concept, then determining the appropriate measurement strategies of all forms of understaffing. These studies should examine relationships with outcomes (e.g., employee well-being and performance), uncover moderators and mediators of the understaffing-outcomes relationship, and determine means for primary and secondary interventions.

**Research supported by:** USF SERC

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**Abstract #: 297**

**Presented by: Joseph Johnson, MS, Graduate Student**

***Evaluation of Four Portable Cooling Vests for Workers Wearing Gas Extraction Coveralls in Hot Environments***

Joseph K. Johnson University of South Florida, College of Public Health, Department of Environmental & Occupational Health/Sunshine ERC

**Keywords:** heat stress, microclimate, cooling device

**Objective:** This study evaluated the performance of four personal cooling systems for use with insulated protective clothing in warm-humid (35°C, 50% relative humidity) and hot-dry (40°C, 30% relative humidity) conditions.

**Methods:** On 10 separate occasions, 5 male volunteers walked on a treadmill to elicit a target metabolic rate of 300 watts, for 120 minutes, while wearing either a (a) liquid-cooled vest, (b) air-cooled vest, (c) frozen polymer vest (d) novel liquid CO<sub>2</sub> cooling vest, or (e) no cooling (control). A three-way mixed effects ANOVA was used to assess the results. Multiple t-tests were used to determine where the main differences occur. The level of significance was  $p < 0.05$ .

**Results:** There was no difference between no-cooling and liquid CO<sub>2</sub> for storage rate ( $28.24 \pm 3.8$  W;  $24.64 \pm 4.29$  W) as well as the other physiological metrics. The same was true for the frozen polymer, air, and liquid systems, which were not statistically different for heat storage rate ( $14.76 \pm 3.90$  W;  $12.58 \pm 3.98$  W;  $9.89 \pm 3.90$  W) or the physiological metrics. The frozen polymer system was not clearly differentiated from the liquid CO<sub>2</sub> system for storage rate or rate of rise of skin temperature.

**Conclusion:** To the extent that the gas extraction coverall is worn in environment between 30 and 45 °C and the rate of work is moderate, the air vest and water vest were shown to manage heat storage well, reducing storage rate by 55% in comparison to no-cooling. Although if being free of a tether is important, the frozen polymer is acceptable as it reduced heat storage rate to about 50% compared to no-cooling.

**Research supported by:** Gas Technology Institute

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**Abstract #: 298**

**Presented by: Humberto Olivero Lara, MD, Resident**

***Quantifying the Ergonomic Impact of Needleless Jet Injectors on Healthcare Workers***

Humberto Olivero Lara, MD, University of South Florida, College of Public Health, Department of Environmental and Occupational Health; Padmaja Ramaiah, MSBME, University of South Florida, College of Public Health, Department of Global Health and Tampa Veterans Administration Research Center of Excellence; Michael Kerrigan, MSBME, Tampa Veterans Administration Research Center of Excellence; and Donna Haiduven, PhD, University of South Florida, College of Public Health, Department of Global Health and Tampa Veterans Administration Research Center of Excellence

**Keywords:** occupational safety research; laboratory-based research; evaluation of needleless injection system

**Objective:** Jet injectors are advantageous over needle injectors by eliminating sharps hazards. This laboratory experiment measured forces exerted by healthcare workers (HCWs) using a particular jet injector, a topic not previously explored.

**Methods:** In this lab experiment, 136 total trials were conducted using the PharmaJet™ Injector. A force gauge and load cell were integrated into the triggering setup and reset station, respectively, enabling force measurements to be obtained directly from the human-machine interfaces. These force data allowed for observations of force profiles in time by the HCW as researcher while preparing and administering injections. Data collection used three software applications for force conversions and data manipulation. Data were analyzed using descriptive statistics and ANOVA.

**Results:** The average force for triggering the injector in the 116 trials was 15.92 lbs (70.8 N) with a range of 9.77-26.46 lbs (43.46-117.69 N). The measured forces for the reset station ranged from 5.35 to 82.78 lbs (5.35-368.22 N) with an average of 25.32 lbs (112.62 N) (SD 12.36). When comparing triggering in the regular vs. the soft tissue trials, the latter required a statistically significantly greater force ( $p < 0.0001$ ).

**Conclusion:** Comparing the jet injector triggering efforts to those for activating 4 retractable syringes with needles from our previous studies, the range of mean forces was 3.63 to 17.42 lbs (16.19-77.53 N) for these syringes. The jet injector required more force per effort than 2 (4.4x per effort) and similar to the other 2 syringes (0.9x per effort). The effort described does not include displacement and gripping forces required to inject or to close the reset station. Suggestions to the device manufacturer are warranted.

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**Abstract #: 299**

**Presented by: Justin Lawandales, MS, Graduate Student**

***Identification and Prevention of Lift Injuries***

Justin Lawandales (USF SERC), University of South Florida, College of Nursing

**Keywords:** Occupational Safety Lift Injuries

**Objective:** Lift injuries are the most common nonfatal injuries in the workplace. These types of injuries occur due to lack of proper mechanics, lack of assistance, and lack of assistive devices in the workplace. As an Occupational Health Nurse (OHN), one can advocate for the implementation of lift programs to prevent disease, promote health, improve productivity, and decrease compensation claim costs.

**Methods:** Review of Literature

**Results:** Review of Literature

**Conclusion:** Review of Literature

**Research supported by:** Review of Literature

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**Abstract #: 300**

**Presented by: Archana Manapragada, BS,  
Graduate Student**

***Beyond Safety: Safety Climate's Influence on Organizational Outcomes***

Archana Manapragada, Julie Lamer, Valentina Bruk-Lee, and Ashley Nixon (SERC Invitees), University of South Florida

**Keywords:** safety climate, job satisfaction, turnover intentions, counterproductive work behaviors, organizational citizenship behaviors

**Objective:** An organization's safety climate can be defined as its employees' collective perception of safety in the workplace. A stronger safety climate has been shown to increase safety-related behaviors, such as compliance with safety guidelines. However, little research involving safety climate has looked beyond safety outcomes. The purpose of this study is to examine the mediating effect of job satisfaction on the relationships between safety climate and turnover intentions (TIs), counterproductive work behaviors (CWBs), and organizational citizenship behaviors (OCBs).

**Methods:** Three hundred and sixty nurses in the U.S., mostly female (93%) and Caucasian (79%), participated in this study. Safety climate was measured using the NIOSH Safety Climate scale. Job satisfaction and TIs were measured by two subscales of the Michigan Organizational Assessment Questionnaire. Behavioral outcomes were measured using a CWB and OCB scale. Questionnaires were completed through a web-based survey.

**Results:** Safety climate was significantly correlated with job satisfaction, TIs, and CWBs. However, it did not correlate with OCBs. Using a bootstrapping method for deriving indirect effects and standard errors (MacKinnon, Lockwood, & Williams, 2004), we found that job satisfaction mediates the relationship between safety climate and TIs, but not the relationship between safety climate and CWBs or OCBs.

**Conclusion:** Our results suggest that the impact of an organization's safety climate may be limited, but it reaches beyond the scope of safety-related outcomes. Our study furthers the research on safety climate by attempting to understand the multitude of its influence in the workplace.

**Research supported by:** National Institute for Occupational Safety and Health

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**Abstract #: 301**

**Presented by: Adam Marty, PhD, Graduate Student**

***Nanoparticle Generation and Size Characterization***

Adam Marty, Dr. Yehia Hammad, USF Sunshine ERC, University of South Florida, College of Public Health, Department of Environmental & Occupational Health

**Keywords:** nanoparticle, aerosol, generation, agglomeration

**Objective:** The generation of nanoparticles is a necessary component for determining health outcomes as they relate to exposure in animal models. Unfortunately, a bulk nanopowder cannot simply be aerosolized into nano-sized particles due to the agglomeration that nanoparticles undergo. The objectives of this research are to generate and characterize two kinds of nanoparticles.

**Methods:** This research attempts to generate nanoparticles using two different methods, nebulization of sodium chloride and aerosolization of aluminum oxide. Test aerosols are collected for visual inspection using electron microscopy. Samples are concurrently characterized using particle counters. Comparative data analysis of the particle counters relative to visual inspection is performed.

**Results:** Results indicate that nebulized particles can be generated and characterized at a predetermined size. Characterization of the aerosolized aluminum oxide has been less conclusive since the output of the generator was less than predicated. Preliminary results from the visual inspection of the aerosol indicate that the aluminum oxide consists of agglomerates ranging from 130 nm to 6  $\mu$ m.

**Conclusion:** The generation of particles from salt solutions is not new or novel. For the purpose of this research, it is a necessary aspect as a demonstration of our ability to characterize an aerosol. However, the generation of a nano-aerosol from a bulk nano-powder would be significant. If this method proves successful, it could offer a means to do research on the exposure, dose, and effect of nanoparticles in an animal model.

**Research supported by:** USF Sunshine ERC

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**Abstract #: 302**

**Presented by: Maysonet Rementeria, Joanet D., Graduate Student**

***Occupational Heat Stress: One Step Closer to Chronic Kidney Disease in Outdoor Working Tasks.***

Maysonet Rementeria, Joanet D.\*; Orta Anes, Lida; Graduate School of Public Health, University of Puerto Rico, Medical Sciences Campus.

**Keywords:** occupational heat stress, Chronic Kidney Disease (CKD), dehydration, outdoor working tasks

**Objective:** This research aims to answer if: *Heat stress in the work place, is a variable directly related to the development of chronic kidney disease?*

**Methods:** For this analysis of association between exposure to occupational heat stress and development of chronic kidney disease, an exhaustive search of scientific literature was conducted, which met the subject of interest in several online databases, such as PubMed and Science Direct.

**Results:** In overall, the different investigators found out that men were more disadvantaged than women when facing kidney problems, because they are the ones who predominate, usually in tasks of planting and harvesting coffee, cotton, sugar cane, among other activities in Central America countries.

**Conclusion:** It is an immediate situation that needs attention in many other places where the weather is extremely hot and many workers are exposed to high metabolic demands, which also may ignore the risk of kidney disease to which they are exposed every day.

**Research supported by:** UPR Industrial Hygiene Program and USF Sunshine ERC

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**Abstract #: 303**

**Presented by: Daniel Medina, MS, Graduate Student**

***Nanoparticle Leakage Through Staple Punctures in N95 Single Use Filtering Facepiece Respirators***

Daniel Medina, Yehia Hammad, University of South Florida, College of Public Health, Department of Environmental & Occupational Health

**Keywords:** nanoparticles, respirator, protection

**Objective:** N95 filtering facepiece respirators (FFPR) are widely used where personnel are exposed to aerosolized particles that can produce adverse health effects. Some N95 FFPR attach the head straps by stapling them directly onto to the respirator filter, which creates an open space where leakage of particles can occur. This study evaluates the effect of stapled head straps on respirator efficiency using 5 different N95 FFPR models challenged with 30 to 500 nm polystyrene latex spheres when the stapled head straps are left intact, stretched, and the staple punctures sealed with silicone rubber.

**Methods:** A polystyrene latex sphere suspension is atomized to form an aerosol cloud. The aerosol is introduced and mixed in the top part of the testing chamber above the respirator test assembly. A Scanning Mobility Particle Sizer is used to measure particle concentration inside and outside the respirator test assembly and this ratio is used to determine respirator efficiency.

**Results:** N95 FFPR efficiencies differed by model, particle size, and staple condition. There is significant difference between different models of FFPR and among the efficiencies of a single model when the head straps are left intact, stretched, and when the staple puncture is sealed. The lowest efficiencies were observed when head straps were stretched and at the 50 – 60 nm particle sizes. For some FFPRs, efficiencies were below 95%.

**Conclusion:** The study suggests that nanoparticle concentrations inside N95 FFPRs with stapled head straps (attached to the filter media) are expected to be higher than models with head straps attached using a method that does not puncture the filter.

**Research supported by:** Sunshine ERC

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**Abstract #: 304**

**Presented by: Casey Molumby, MS, Graduate Student**

***Noise Induced Hearing loss in the Workplace***

Casey Molumby RN USF Sunshine ERC University of South Florida, College of Nursing

**Keywords:** Hearing Loss, Workplace, NIHL

**Objective:** Noise-Induced Hearing Loss is a permanent hearing impairment resulting in prolonged exposure to high levels of noise. The Hearing Conservation Amendment of 1983 through Occupational Health and Safety Administration requires hearing conservation programs in noisy work places, and the use of personal hearing protection for each worker exposed. From all research concluded there is still a lack in workers using the preventive measures of hearing protection devices.

**Methods:** Review of Literature

**Results:** Summary of Literature

**Conclusion:** Summary of Review of Literature

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**Abstract #: 305**

**Presented by: Hanna Moore, MS, Graduate Student**

***Falls Injuries in Construction Industry: A High Risk Industry***

SERC Invitee - OHN Student University of South Florida, College of Nursing

**Keywords:** Fall Injuries in Construction

**Objective:** The occurrence of falls within the construction industry is the highest of all occupational work-sites. Serious injuries commonly result from these falls which effect this worker population's productivity, quality of life and their families. It is essential that standards are implemented to reduce hazards and decrease injuries related to falls in the construction industry.

**Methods:** Literature Review

**Results:** Literature Review

**Conclusion:** Literature Review

**Research supported by:** Literature Review

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**Abstract #: 306**

**Presented by: Prieto, Paola, Graduate Student**

***Software Tools on Ergonomics Practices: A Users Perception***

Paola Prieto, Dr. Lida Orta. UPR Industrial Hygiene Department and USF-Sunshine ERC

**Keywords:** 3D SSPP, WorkPace, Win-OWAS

**Objective:** This research aims to analyze three software tools available to aid in the process of evaluation and control of occupational hazards.

**Methods:** The development of this study consists of an explicit review of ergonomic literature with a primary focus on examining three software technological tools that currently exist on the market. this study groups the information in two categories:, product characteristics and product research (paper and customer reviews). A search of Science Direct database was conducted using the keywords 3DSSPP, WORKPACE and WINOWAS. On the other hand, a Google search was performed to obtain information about the products, like customer reviews and software characteristics. The analysis of available information is present in a matrix, comparing 3 relevant characteristics for each software: improves the process, User Friendly and cost.

**Results:** 3D SSPP (University of Michigan) rapidly and easily evaluate workers postures improving cost effectiveness and time consuming. WorkPace (Wellnomics) helps to reduce pain in workers in contrast when no micropauses are used. Win-OWAS helps perform postural assessment effectively using an automated process.

**Conclusion:** 3D SSPP integrate a series of features that helps hygienist to rapidly and easily evaluate workers postures in a three-dimensional human model using algorithms. This improves cost effectiveness and time consuming. In this way can predict accurately static strength capabilities. WorkPace helps to reduce pain in workers in contrast when no micropauses are used. In addition, customer review reflect wide acceptance of this program. Although Win-OWAS requires a large number of input variables, helps perform postural assessment effectively using an automated process.

**Research supported by:** UPR Industrial Hygiene Program and USF Sunshine ERC

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**Abstract #: 307**

**Presented by: Eric Reuther, MS, Graduate Student**

***Affects of Age and Experience On Injury Rates in Three Light Manufacturing Facilities***

Eric Reuther, Thomas E. Bernard College of Public Health, University of South Florida/ College of Public Health, Department of Environmental & Occupational Health

**Keywords:** accidents, acute injury, age, manufacturing

**Objective:** The relationship between the personal injury rates among industries in the United States has been a major focus point for many years. The prime objective of this study was to review and analyze personal injury rates by age and experience at light manufacturing facilities to determine how these factors affect the rates and severity of injuries. The working hypothesis was that age and experience most influence personal injury rates and the severity of injuries, among workers in the selected manufacturing setting.

**Methods:** Data from three facilities between January 2009 and December 2011 were selected. All data was pulled from a company database for injuries and illnesses, and staffing records. Age was considered as <30, 30 to 50 and >50. Experience groups were <3, 3-7 and >7 years. Incident rates were computed and the rate ratios computed based on the younger group and the least experience group.

**Results:** The results of the data showed that workers >50 experienced more injuries for all severity types (RR = 4.9), and workers with 3-7 years of experience (RR = 2.1) had significantly higher rates of injuries than those with less experience.

**Conclusion:** Older age was the dominant effect, showing the older workers experienced the greatest risk. This finding was in contrast to other studies that showed the middle age group to be at greatest risk. The other studies may have been biased by a survivor effect due to higher demands than light manufacturing.

**Research supported by:** Sunshine ERC

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**Abstract #: 308**

**Presented by: Iraidalys Rivera Flores, BS, Graduate Student**

***Relationship Between Effective Educational Programs in Safety for Young Workers and Injuries at Work***

Iraidalys Rivera Flores- University of Puerto Rico, Medical Science Campus, Co-Autor – Lida Orta Anès- University of Puerto Rico Medical Science Campus

**Keywords:** Young Worker, educational programs, injuries at work

**Objective:** After reviewing all the literature, we found that young workers are a population that is at risk and needs attention. For this, the aim of this study is to identify what type of information young workers are receiving about safety at work, as they enter the workforce. Also to determine how this information affect safety education programs to promote healthy work environments.

**Methods:** The aim of this pilot study is to identify what type of information young workers are receiving about safety at work. Also to determine what type of technology will be the preferred one by young workers in order to promote healthy work environments. A self-response survey was distributed to a group of young workers from urban and rural areas in Puerto Rico.

**Results:** From a convenience sample size of 50 young workers participants, the highest percentage of tasks or jobs reported were in the area of office work with 22.4%. Eighty eight percent (87.8%) of respondents agree with use the technology to educate young workers. Approximately, half of the respondents (50%) have not seen information about safety in their work place. The results show that jobs in the construction, research and cleaning are the type of jobs that mostly use security equipment in work. Fifty six percent (56%) of young worker in the sample, received information about safety before starting work. Among the young workers reporting that they never received information about safety before starting work, 44% also reports that at least once time their health and safety was at risk for not having the proper safety equipment.

**Conclusion:** The creation of effective safety education should be a priority in workplaces where young people are. Modern technology such as the internet, mobile phones applications and electronic modules are easily accessible resources for them, and should be considered as an effective approach.

**Research supported by:** UPR Industrial Hygiene Program

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Abstract #: 309

Presented by: Serrano Sheila M., Msc. Industrial Hygiene Graduate Student

***Ergonomic Instruments and Techniques Used by Health Care Workers to Reduce Musculoskeletal Disorders in Humacao, Puerto Rico***

**Authors and affiliations list:** Sheila M. Serrano-Serrano, UPR-RCM Msc.Industrial Hygiene Graduate Student; Lida Orta-Anes, UPR-RCM Professor

**Keywords:** occupational health, homecare workers, musculoskeletal disorders

**Objective:** Our sample of interest is the homecare workers hired by agencies and hospices. It is known that patient's houses are insecure because they don't have the facilities that a hospital or a caring center has. For the Occupational Safety and Health Agency is difficult to reach these environments and to make them follow the ergonomic guidelines. In In Puerto Rico as in the US it is difficult to reach health care workers that are live-ins. Our objective is to study health care workers from different agencies, (live-ins, health care visits and hospices) in order to determine their injury profile.

**Methods:** We will administer a survey to a convenience sample of 18 healthcare workers to study their incidence of musculoskeletal disorders in Puerto Rico. We are going to use open and closed questions to make a descriptive analysis of the situation in Puerto Rico.

**Results:** Many of the health care workers interviewed recognize the necessity of education, instruments and tools to assist and minimize musculoskeletal disorders. Seventeen of 18 have pains or injuries in their body after work. The back is the most affected part of the body. Few employees report using ergonomic instruments to make lifts or transfers of patients, such as the gait belt and the transfer board. The majority of them want extra help from somebody else in lifting and handling patients to and from the bed.

**Conclusion:** In Puerto Rico we had seen that the situation is very similar to the one exhibited by these workers in the US. Musculoskeletal disorders are one of the biggest problems of home healthcare workers, nurses, assistants and caregivers. Organizations need to take action to implement equipment, instruments, and workshops to show techniques and educate health care workers regarding safe lifting and patients handling.

**Research supported by:** UPR Industrial Hygiene Program and USF Sunshine ERC.

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Abstract #: 310

Presented by: Kimelia Titone, BS, Graduate Student

***Obesity in Firefighters: Prevalence and Prevention***

Kimelia Titone, BSN, University of South Florida, College of Nursing

**Keywords:** Firefighter Obesity Health Safety Cost

**Objective:** Firefighter obesity can adversely affect personal health and public safety, as well as contribute to increased costs directly, by treatment of comorbid conditions, or indirectly by loss of productivity.

**Methods:** Review of Literature

**Results:** Obesity is related to higher worker limitations, lower performance and increased disability. For every one-unit increase in BMI, there is a 5% increased risk of job disability. Firefighters are involved in shift work, which has been linked to an increased risk of health problems. Obese male shift workers have a higher rate of absenteeism, and lower work-related performance. Approximately \$73.1 billion per year is attributed to obesity, which includes medical costs, absenteeism, and presenteeism. Obese firefighters are at risk for hypertension and cardiovascular disease associated with frequent fatal cardiac events. Firefighter obesity may be associated with the poor nutrition, including fast food and processed food. Firefighters who want to eat healthy may fear that they will be an outcast, and perceived as not being a team player. However, the setting of the fire station makes firefighters ideal candidates for a team approach to controlling obesity with a healthy diet and exercise.

**Conclusion:** Previous studies and statistics for obesity related to firefighters regarding personal health, public health, and associated costs clearly identify the need for further research and plans of practice. Studies could also be developed for other emergency response personnel.

**Research supported by:** Review of Literature SERC

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***Exposure to Hazardous Chemicals in Health Care Workers and Safety Culture***

Stefanie Uriarte, Lida Orta (co-author) / College of Public Health, Medical Science Campus, University of Puerto Rico

**Keywords:** hazardous chemicals, health care workers, chemical exposure

**Objective:** The aims of this study is to conduct a systematic review in order to describe, summarize, and discuss the current research available; to assess safety practice and chemical hazards exposure in the health care sector; and to highlight gaps and research needs

**Methods:** A review of hospital studies conducted between 2008 and 2011 was performed using PubMed, ScienceDirect and Google Scholar, to identify safety management and the associated chemical hazards in the healthcare work environment

**Results:** Among studies reviewed, the job categories at higher risk of hazardous exposures were pharmacists, nurses and housekeeping personnel. Studies also revealed poor safety culture among hospitals and lack of worker monitoring for either acute or chronic exposure.

**Conclusion:** This review shows that health care workers are exposed to a variety of hazardous substance that they are not necessarily aware of, which could lead to serious illness and injuries. The lack of information could lead to non-compliance with OSHA's Hazard Communication Standard. This literature review demonstrates the need for greater attention to hazardous chemical handling, training and exposure monitoring. Efforts should be made to obtain quantity data of exposure levels to hazardous chemicals, track use of chemicals and measure workers' perception of safety culture.

**Research supported by:** UPR Industrial Hygiene Program and USF Sunshine ERC

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***Workplace Bullying and Occupational Health***

Margaret Vaccaro RN, BSN (SERC Invitee- OHN student) and Dr. Helen Conlon (Occupational Health Nursing Instructor) University of South Florida. College of Nursing

**Keywords:** workplace bullying, absenteeism, decreased productivity

**Objective:** •Educate the employer and employee regarding the negative consequences of workplace bullying. •Provide corporations options to address workplace bullying.

**Methods:** Review of literature.

**Results:** Review of literature.

**Conclusion:** Corporations cannot afford to dismiss the financial consequences of bullying in the workplace. Bullied employees suffer physical and emotional consequences, while corporations are negatively affected by decreased productivity, quality of work, employee absenteeism, and staff turnover. Occupational Health Nurses (OHNs) are in a unique position to assess, educate, implement, and evaluate the effectiveness of an anti-bullying campaign, so that a more healthy working culture is established.

**Research supported by:** Review of literature.

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**Title: Relationship between insomnia and work stress**

Josué Vera Aquino – University of Puerto Rico Medical Sciences Campus, Lida Orta Anés – University of Puerto Rico Medical Sciences Campus

**Keywords:** Work stress, insomnia, literature review, psychosocial characteristics

**Objective:** Insomnia and work stress are aspects that need to be managed with care to provide a healthy work environment. This study tries to prove the relationship between both aspects. Statistics of work stress reported in Puerto Rico provided by *Puerto Rico State Insurance Fund Corporation* were analyzed in order to confirm the relation that could be establish between these two components.

**Methods:** This literature review was possible with the use of different databases like Science Direct, ESCO Host and PubMed. In addition, data on work stress cases registered by the *Puerto Rico State Insurance Fund Corporation* were collected.

**Results:** Results show a relationship between work stress and insomnia. Also show it appear that employees in Puerto Rico reported to the *Puerto Rico State Insurance Fund Corporation* show a high incidence of cases with emotional symptoms were one of the most common causes is work stress.

**Conclusion:** These studies linking symptoms of work stress with insomnia differ between persistence and future appearance. Psychosocial characteristics like low social support and effort reward imbalance are associated with persistent insomnia. While the psychosocial characteristics like high job strain and over commitment to work causing also contribute to the prevalence of insomnia. Further studies are needed to validate the finding that employees who suffer from work stress in Puerto Rico show symptoms of insomnia.

**Research supported by:** UPR Industrial Hygiene Program and USF Sunshine ERC

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**Lack of Plasmodium vivax Infections and High Frequency of the Erythroid Silent Duffy Antigen Genotype in Haiti**

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**Keywords:** Plasmodium vivax, malaria, Hispaniola, Haiti, Duffy antigen receptor for chemokines (DARC), Duffy negative, genetic susceptibility

**Objective:** Malaria is a significant public health concern in Haiti where approximately 30,000 cases are reported annually with CDC estimates as high as 200,000. This study investigated the frequency of the FYES allele and P. vivax infections in malaria patients with the goal of uncovering factors for the lack of P. vivax infections reported in Haiti.

**Methods:** DNA was extracted from dried blood spots collected from malaria patients at four locations in Haiti. The samples were analysed by polymerase chain reaction (PCR) for the presence of the P. vivax small ribosomal subunit gene. PCR, sequencing, and restriction enzyme digestion were used to detect the presence of the FYES allele. Matched samples were examined for both presence of P. vivax and the FYES allele.

**Results:** No cases of P. vivax were detected in any of the samples (0/136). Of all samples tested for the FYES allele, 99.4% had the FYES allele (163/164). Of the matched samples, 99% had the FYES allele (98/99).

**Conclusion:** In this preliminary study, no cases of P. vivax were confirmed by PCR and 99% of the malaria patients tested carried the FYES allele. The high frequency of the FYES allele that silences erythroid expression of the Duffy antigen offers a biologically plausible explanation for the lack of P. vivax infections observed. These results provide sound insight on the host susceptibility of malaria patients for P. vivax infections that has never before been investigated in Haiti.

**Research supported by:** DoD-GEIS grant number #C0607\_12\_UN to BAO. The authors would like to thank Megan C. Warner for her contributions that ensured the success of this work.

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**Abstract #: 315**

**Presented by: John Wittgenstein, BS, Graduate Student**

***The Moderating Role of Personality on Workplace Conflict and Outcomes***

John P. Wittgenstein, Florida International University, SERC Invitee, Valentina Bruk-Lee, Florida International University

**Keywords:** Workplace aggression, Individual differences, health outcomes

**Objective:** This paper seeks to demonstrate the conceptual support for how individual difference such as extraversion, neuroticism, agreeableness, conscientiousness, trait anger, and locus of control moderate the established stressor-strain model as demonstrated through the job stress model. Specifically, the aim of this paper is to establish the conceptual links of that individual personality differences can have on health related strains through the job stress model.

**Methods:** The emotion-centered model of job stress proposes that an individual's personal characteristics will moderate their responses to their perceived stressors and shape how those responses are evaluated and experienced.

**Results:** Although the role of personality as a moderator of individual behavior has been a topic of interest for years only a handful of studies have examined their effects in the context of the social stressor-strain relationship or through the job stress model. Data to test these results is currently being collected

**Conclusion:** Research has focused on conflict as either a broad non-domain specific construct, as a non-work interpersonal form of conflict, or used stand in constructs representing personality variables. Future research should highlight the potential moderating factors of personality in the stressor-strain relationship and assist in addressing current research gaps. Furthermore, this study also begins to conceptually bridge the gap between interpersonal conflict and incivility, answering the 2011 call by Hershcovis, which challenged occupational health researchers to gain a better understanding of how the various forms of workplace aggression interact and influence one another.

**Research supported by:** Sunshine ERC Pilot Research Project Grant

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**Abstract #: 316**

**Presented by: Yadira Ortiz Reyes, Graduate Student**

***Title: Prevention of Respiratory Diseases among Autobody Shops Workers***

Yadira Ortiz Reyes- University of Puerto Rico Medical Sciences Campus, Lida Orta - University of Puerto Rico Medical Sciences Campus

**Keywords: Autobody Shops, Respiratory Diseases**

Abstract: Autobody shops represent a problem for the public health since these shops emits several pollutants to the environment. It has been demonstrated that people that are continuously exposed to volatile toxics coming from autobody shops have increased risk of respiratory diseases (Environmental Protection Agency, 2005). Autobody shop workers have direct exposition to these toxics and therefore they can accumulate highest toxic in their bodies. This exploratory study aims to search technologies that had been created for the protection of respiratory diseases and the analysis of respiratory utilization among autobody shops workers. The method consists of review using the EBSCO database and an analysis of violations to autobody shops documented for the Occupational Safety and Health Administration.

**Research supported by:** UPR Industrial Hygiene Program and USF Sunshine ERC.

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**Abstract #: 317**

**Presented by: Ricci Allen, Undergraduate**

***Psychoeducational Implications of Neurodevelopmental Disorders in Early Childhood: A Case Study of OMS***  
Ricci Allen, Heather Agazzi, Ph.D University of South Florida, Honors College

**Keywords:** opsoclonus-myoclonus syndrome (OMS), neurodevelopmental disorders, neuropsychological assessment, pediatric intervention

**Objective:** The purpose of this poster is to provide healthcare providers who work with children with neurodevelopmental disorders an overview of the psychoeducational implications associated with this population and offer information on neuropsychological assessment and intervention planning.

**Methods:** We will use the International Classification of Functioning, Disability and Health for Children and Youth as a framework for understanding outcomes for young people with developmental disabilities. Specifically, a description of childhood opsoclonus-myoclonus syndrome (OMS) will be presented, with an emphasis on known psychoeducational implications and assessment and intervention planning. A case study of a preschool-aged child with OMS will serve as a practical illustration of psychosocial and behavioral effects of neurodevelopmental disabilities.

**Results:** Childhood OMS was selected because it is a rare disease that is often misdiagnosed, resulting in a delay in medical treatment as well as stunted neurodevelopmental growth and motor function.

**Conclusion:** Neuropsychological assessment and early intervention is critical to improving long-term outcomes for children with neurodevelopmental disorders. Because of the rarity of OMS, children are often misdiagnosed at the onset of disease resulting in lost time for treatment and planning. The long-term neurological and behavioral sequelae of OMS affects a child's functioning in society. Use of the ICF-CY framework may facilitate communication between healthcare providers, family caregivers and educators in their efforts to create plans for children with neurodevelopmental disorders. This information is useful in the fields of medicine, psychology, nursing, speech & language pathology and physical/occupational therapy.

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**Abstract #: 318**

**Presented by: Beatrice Attilus, Undergraduate**

***HDAC Inhibitors Effect on tau, a-syn and TDP43- Implication in Neurodegenerative Diseases***

Beatrice Attilus<sup>1,2</sup>, Clement Yang<sup>1,2</sup>, Steven B. Housely, M.S., Daniel C. Lee<sup>1,2</sup>, PhD, Umesh Jinwal<sup>1,2</sup>, PhD, Marcia N. Gordon<sup>1,3</sup>, PhD, Dave Morgan<sup>1,3</sup>, Maj-Linda B. Selenica<sup>1,2</sup>, PhD University of South Florida College of Arts and Sciences Chemistry

**Keywords:** Neurosciences, TDP43, Tau

**Objective:** Histone deacetylases (HDACs) are a family of proteins which function in gene expression and chromatin condensation. HDAC inhibitors are under investigation for potential use as pharmacological reagents for treatment of neurodegenerative diseases. In this study we investigate the effect of HDAC inhibitors on tau, alpha synuclein (a-syn), acetylated tubulin and TDP43, proteins implicated in the pathology of neurodegenerative disorders.

**Methods:** We treated a human cancer cell line (Hela) that expresses wild type tau (C3) and murine neuroblastoma cell line (M17), expressing mutated A53T a-syn (M2.15) with various concentration of HDAC inhibitors Tubastatin (3µM, 30µM), Droxinostat (1µM, 10µM), SAHA (1µM, 10µM), and the proteasome inhibitor, MG132 (3 µM). The cells were treated for 24 hr and cell lysates were analyzed by Western blot.

**Results:** Our data indicated that treatment of C3 cells with Tubastatin, Droxinostat and SAHA significantly increased the levels of total tau, pS199/202 tau, pS396, and acetylated tubulin. Levels of TDP43 were significantly decreased by Tubastatin but significantly increased by the latter two inhibitors. Further, treatment with 30 µM Tubastatin increased the number of autophagosomes within the cell, similar to the levels of the cells treated with 3 µM MG132 and 1 µM Rapamycin. Analysis of M2.15 cell lysate demonstrated significant decrease in total a-syn levels following Tubastatin and MG132 treatment. This correlates with significant decrease in mTOR levels.

**Conclusion:** Our data suggest that HDAC inhibition affects tau, a-syn and TDP43 differently and autophagy is one possible pathway affected. Further analyses are ongoing to map the mechanism of action of HDACs inhibitors in these cell models.

**Research supported by:** Funded by Byrd Institute.

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**Abstract #: 319**

**Presented by: Rachel Baumsteiger, Undergraduate**

***The Phenomenology of Distress in the Absence of Electronic Devices and Its Relationship with Other Types of Distress***

Rachel Baumsteiger and Eric Storch, Ph.D. University of South Florida, College of Arts and Sciences, Department of Psychology

**Keywords:** Electronics, technology, distress, anxiety, dependence

**Objective:** The objective of this study was to investigate the phenomenology of distress that people experience when they cannot access electronic devices within a non-clinical sample, as well as its association with other types of distress.

**Methods:** A sample of 236 students completed a survey including the Sheehan Disability Scale modified to address distress without electronics, Generalized Anxiety Disorder 7, Body Sensations Questionnaire, Agoraphobic Cognitions Questionnaire, Obsessive-Compulsive Inventory-Revised, Anxiety Sensitivity Inventory, UCLA Loneliness Scale, and the Distress without Electronics Questionnaire, which was developed for this study.

**Results:** The majority of participants reported experiencing some symptoms of distress without electronics, especially when unable to use phones and computers. Distress without electronics was positively correlated with generalized anxiety, agoraphobic, and obsessive-compulsive symptoms, anxiety sensitivity, and loneliness. The Distress Without Electronics Questionnaire showed high consistency.

**Conclusion:** The findings suggest that most people experience physical, mental, emotional, and other symptoms when they are unable to use particular electronic devices. Most symptoms are mild and do not impair people's school/work, social, and family lives. However, symptoms were severe and distressful for some participants. Distress without electronics may share similar features with other types of distress, but it appears to be a distinct phenomenon.

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**Abstract #: 320**

**Presented by: Leif Benner, Undergraduate**

***Selective HDAC6 Inhibition Significantly Reduces Total Tau Levels With Mild Memory Improvement in rTg4510 Mouse Model***

Leif Benner<sup>1</sup>, Steven B. Housley<sup>1</sup>, Barbara Manchec<sup>1</sup>, Gabriela Pena<sup>1</sup>, Daniel C. Lee<sup>1,3</sup>, Jay Hans Kalin<sup>2</sup> PhD, Alan Kozikowski<sup>2</sup> PhD, Marcia N Gordon<sup>1</sup> PhD, Dave Morgan<sup>1</sup> PhD, Maj-Linda B Selenica<sup>1,3</sup> PhD Byrd Alzheimer's Institute and Department of Molecular Pharmacology and Physiology, University of South Florida, Tampa FL, USA. <sup>2</sup>College of Pharmacy, Dept of Medicinal Chemistry and Pharmacognosy (MC 781), 833 South Wood Street Chicago, Illinois <sup>3</sup>College of Pharmacy, Dept of Pharmaceutical Sciences, University of South Florida, Tampa FL

**Keywords:** HDAC6, Tau, Alzheimer's Disease

**Objective:** Histone deacetylases (HDACs) are a class of enzymes that regulate the removal of acetyl groups from histone and non-histone proteins. HDAC6 plays a key role in deacetylation of cytoplasmic proteins, including, but not limited to, tubulin and heat shock protein 90. Deacetylation of both may be implicated in de-stabilization of microtubules and inhibiting HSP90 degradation pathway, respectively. The inhibition of HDAC6 has been pursued as a novel treatment for tauopathies, since inhibiting HDAC6 has been shown to have neuroprotective effects and increase mutant protein degradation.

**Methods:** Tubastatin A, an HDAC6 inhibitor, or .9% saline was administered through i.p. injection every day over a two month period to nontransgenic and rTg4510 mice. A battery of behavior tests were performed during the last two weeks of treatment.

**Results:** We found that rTg4510 mice, treated with Tubastatin A, showed a trend for improved performance in a spatial memory test (Two Day Radial Arm Water Maze, RAWM) compared to rTg4510 Saline treated mice. There was also a reduction in motor activity of Tubastatin A treated mice, hence reversing the phenotype of the "hyperactive" rTg4510 mice. Immunohistochemical and western analysis, showed a significant reduction of total tau protein (H150) in Tubastatin A treated mice, compared to saline treated mice. However, mRNA level of total tau were unchanged in this model following Tubastatin treatment. We found no differences in p-tau levels utilizing different measures of p-tau epitopes and aggregated tau levels.

**Conclusion:** Our data so far suggests that HDAC6 inhibition ameliorates memory deficits, as well as reduces tau levels in the rTg4510 mouse model, positioning HDAC6 as a therapeutic target for AD and tauopathies.

**Research supported by:** Byrd Center

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**Abstract #: 321**

**Presented by: Annie Castillo, Undergraduate**

***Necrotic Cells Trigger ENaC Suppression in Human Alveolar Epithelial Cells***

Annie Castillo, Toaa Abuelenen, Prasanna Tamarapu Parthasarathy, Ruan Cox, Oluwakemi Phillips, Richard Lockey, and Narasaiah Kolliputi University of South, Florida Honors College

**Keywords:** Necrosis, ALI, ENaC, epithelial cells, monocytes

**Objective:** Acute Lung Injury (ALI) is a syndrome caused by trauma to the lungs that results in widespread damage to the structures and cells of the alveolar capillary membrane. ALI is characterized by rapid breathing, insufficient blood oxygenation, and a buildup of fluid in the lungs. Epithelial sodium channels (ENaC) are associated with clearing the accumulation of fluid from air spaces in the lungs, thus making them the main avenues for resolution of pulmonary edema. Studies have identified necrosis, a type of localized cell death, as a pathway contributing to ALI. However, the effects of necrosis on epithelial sodium channels in the lungs are unknown.

**Methods:** Necrosis was induced in A549 (Human alveolar epithelial cells) and THP-1 (monocytes) cells through repeated two-minute cycles of freezing and thawing. Whole cell lysates or supernatants obtained from necrotic A549 or THP-1 cells were added to a lawn of A549 cells and incubated at 37°C for 20 hours. Levels of ENaC protein expression were analyzed using Western Blotting.

**Results:** There was a substantial decrease in ENaC protein expression in A549 cells treated with both necrotic A549 and THP-1 whole cell lysates. This marked reduction was evident in both ENaC  $\alpha$  and  $\beta$  subunits. Increasing suppression of ENaC was apparent with increasing cycles of freeze and thaw, compared to the controls (Non-necrotic).

**Conclusion:** Our findings indicate that necrosis triggers a suppression of ENaC channels, therefore contributing to the alveolar fluid build-up, a characteristic feature of ALI. The exact mechanism of necrosis remains unknown, however, elucidation of this pathway could provide future opportunities for development of new therapies for treatment of ALI.

**Research supported by:** Grants to N.K.: AHA 09SDG2260957 and NIH R01 HL105932

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**Abstract #: 322**

**Presented by: Mariam Chowdhari, Undergraduate**

***Generation of a Novel Regulated Model of Parkinson's Disease***

Mariam Chowdhari, Peter Moran, Paula Bickford Ph.D, and Kevin Nash Ph.D. University of South Florida, Morsani College of Medicine, Department of Molecular Pharmacology & Physiology

**Keywords:** Parkinson's disease, alpha synuclein, animal model, AAV

**Objective:** Parkinson's disease is a chronic, neurodegenerative disorder with disruption of the dopaminergic system. Parkinson's is a disease that can be characterized by loss of movement control due to dopaminergic cell loss. Tissue samples from patients with Parkinson's disease show the presence of alpha synuclein positive Lewy bodies. Currently, we can model Parkinson's disease by over expression of alpha synuclein in the substantia nigra of rats using recombinant virus infection. This can result in a rapid, with in one month, loss of neurons with in this region. One major problem with this model is that the aggressive nature of neuron loss does not mimic the slow progression observed in patients. Further, because this model is so rapid, it may be difficult to examine therapeutic molecules that could reduce a more progressive neuron loss. Doxycycline is an antibiotic used to treat bacterial infections. Doxycycline can be used to regulate the activity of a of a Tet responsive element and therefore regulate gene expression. We employed this unique system to allow for regulation of alpha synuclein over expression.

**Methods:** We constructed a bicistronic Tet regulated expression vector. This vector has adeno-associated virus terminal repeats for packaging into a viral vector.

**Results:** We have successfully used this viral vector system with the reporter gene, GFP (green florescent protein). Further we have tested our vector for expression of the alpha-synuclein gene. We are currently examining the expression of alpha-synuclein in the presence and absence of doxycyclin.

**Conclusion:** We believe that this viral vector will be very useful as a new model of Parkinson's disease.

**Research supported by:** Michael J. Fox Foundation

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**Abstract #: 323**

**Presented by: Aditya Grover, BS, Undergraduate**

***Exploiting NFAT and CEBP $\delta$  Mediated COX-2 Expression for Potential Lung Fibrosis Therapies***

Aditya Grover, Ravi Pathak, Prerna Malaney and Vrushank Dave, Morsani College of Medicine, Department of Pathology and Cell Biology, University of South Florida

**Keywords:** Lung Fibrosis, COX-2, NFAT, CEBP

**Objective:** To identify molecular mechanisms regulating cyclooxygenase-2 (COX-2) and concomitant prostaglandin E2 (PGE2) expression in lung epithelial cells.

**Methods:** We identified transcriptional regulatory elements in the human COX-2 promoter (-2Kb upstream regulatory region) using "TRANSFAC", a Genomatix Software Suite tool. Promoter-deletion analysis, site-directed mutagenesis and gain- and loss-of-function studies with various transcription factors using reporter-assays in A549 lung epithelial cells identified transcription factors regulating COX-2 transcription.

**Results:** COX-2 gene transcription was regulated by an enhancer element comprising of the canonical NFATc3 and CEBP $\delta$  transcription factor binding sites in the proximal promoter. Co-transfection of COX-2 promoter-reporter construct with NFATc3 and CEBP $\delta$  expression plasmids increased COX-2 promoter activity. Over expression of VIVIT, a peptide inhibitor of NFAT, inhibited nuclear translocation of NFATc3 and reduced COX-2 promoter activity. Expression of dominant-negative pan-C/EBP inhibited COX-2 promoter activity. Mutations to NFAT and C/EBP sites abrogated COX-2 promoter activity.

**Conclusion:** During lung inflammation PGE2 is produced from arachidonic acid via COX-2. PGE2 as is cytoprotective and immunomodulatory agent plays a major role in lung injury/repair and lung fibrosis. Idiopathic Pulmonary Fibrosis (IPF), patients have reduced PGE2 due to dysregulation in COX-2 expression. PGE2 shows little promise as a therapeutic agent because of its short half-life. Thus, our mechanistic studies on COX-2 upregulation in lung epithelial cells provide a novel entrée to increase PGE2 at the cellular level for a sustained period of time that is required for the healing process in patients with lung diseases.

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**Abstract #: 324**

**Presented by: Jerry Hunt, Undergraduate**

***AAV-mediated tTA Induces Tau Overexpression and Activation of mTOR in TetO tau P301L Transgenic Mice***

Jerry Hunt, Kevin Nash, Devon Placides, Maj-Linda B Selenica, Marcia Gordon, Dave Morgan, Daniel C. Lee.  
University of South Florida, College of Arts and Sciences, Department of Integrative Biology

**Keywords:** transgenic mice, tau, gene regulation, autophagy, mTOR

**Objective:** Alzheimer's disease research has yielded several mouse models. An increasing number of transgenic mouse models have been generated using the tetracycline regulatable system. In this study, we create a versatile and regionally specific tau overexpression using a mouse line that expresses the human mutant tau (P301L) transgene controlled by the tet promoter and drive expression of tTA using adeno-associated virus (AAV).

**Methods:** Our AAV construct utilizes a bi-cistronic plasmid that expresses tTA controlled by the CBA promoter and another gene (GFP) under a separate promoter controlled by a doxycycline (Dox) regulatable tet promoter (tTA-AAV-GFP). Our model uses the tetOff system, where tau expresses in the presence of tTA but suppressed in the presence of Dox. Tau mice were injected intracranially with tTA-AAV-GFP into the hippocampus.

**Results:** GFP expression was significantly increased compared to mice that received tTA-AAV-GFP and administered Dox. Tau expression was also significantly increased compared to mice that didn't receive the virus and non-transgenic littermates. Tau was significantly decreased in mice that received both tTA-AAV-GFP and Dox, with a similar profile was observed for phospho-tau species. Additionally, significant increases in the mTOR pathway were observed compared to mice that didn't receive the virus and non-transgenic littermates.

**Conclusion:** This model permits us to overexpress a mouse transgene (P301L tau) in select brain regions and time frames while activating the mTOR pathway.

**Research supported by:** USF New Researcher Grant

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**Abstract #: 325**

**Presented by: Twisha Jani, BS, Undergraduate**

***Screening of Tau Targeting Drugs for the Treatment of Alzheimer's Disease***

Twisha Jani, Danielle Demers, Devki Patel, Kaitlyn Braswell, Juan Zhang, Umesh K. Jinwal, Chad A. Dickey, and Bill J. Baker. University of South Florida, College of Pharmacy, Department of Pharmaceutical Science

**Keywords:** Reduction of Tau

**Objective:** Accumulation of tau protein is one of the causative factors for the Alzheimer's disease (AD) and several other tau related neurodegenerative diseases. As tau begins to detach from the stabilizing microtubules, it aggregates, that results into neuronal death and memory loss. Our goal is to identify novel tau reducing drugs by using an in-vitro cell based AD model.

**Methods:** We have used stably tau transfected HeLa cells for the drug screen. The cells were treated with various DHD crude extracts or control DMSO vehicle. Cells were harvested 24 hours after treatment and samples were taken for western blot. Anti-Tau and Anti-GAPDH antibodies were used to determine changes in tau protein level upon drug treatments.

**Results:** Tau reducing drugs were identified by comparing control and drug treated samples band intensities. The preliminary data from the drug screen suggests crude extracts B3P1-D3 and B4P1-D4 showed reduction in tau level.

**Conclusion:** So far from drug screening 2 crude drug extracts have shown effects on tau protein. These crude extracts will be taken for purification and identification of specific drug compounds for tau regulation.

**Research supported by:** This work was supported by the USF College of Pharmacy Dean's Clinical and pilot award for the Start-up.

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**Abstract #: 326**

**Presented by: Iman Khalil, Undergraduate**

***Alterations in Cortical Dendritic Thickness in Mild Cognitive Impairment and Alzheimer's Disease***

Iman Khalil, Stephanie Foley, The Honors College, USF; Stephen Scheff, Sanders-Brown Center on Aging, The University of Kentucky, Lexington, KY, Elliott Mufson, Dept of Neurological Sciences, Rush University Medical Center, Chicago, IL.; Ronald Mervis, Center of Excellence for Aging and Brain Repair, Dept of Neurosurgery and Brain Repair, USF Morsani College of Medicine, Tampa, FL & Neurostructural Research Labs, Tampa, FL

**Keywords:** Alzheimer's Disease, Mild Cognitive Impairment, Neocortex, Neuropathology

**Objective:** Alzheimer's Disease (AD) is associated with a breakdown of brain circuitry. Cognitively intact individuals (NCI = non-cognitively impaired) normally progress through an intermediate state of Mild Cognitive Impairment (MCI) before onset of full-blown AD. Previously, we evaluated dendritic branching and spines of layer II-III neurons in three cortical regions (frontal, parietal, and temporal cortices). The purpose of this study was to ascertain how the thickness of the cerebral cortices of these same regions were affected by MCI and AD.

**Methods:** Autopsied brain tissue from NCI, MCI, and AD brains was provided by Drs. Scheff and Mufson. Tissue blocks were stained using the Rapid Golgi method. Coded slides were prepared. The thickness of the cortical regions was measured using a camera lucida drawing tube and a digitizing tablet.

**Results:** The thickness of the parietal cortex showed essentially no difference between NCI and MCI. In AD, however, there was 13% thinning of the cortex compared to the MCI brains. In Temporal Cortex, there was small but stepwise thinning of the cortex from NCI, to MCI, to AD. The AD cortex was 6% thinner than the NCI cortex. In contrast, in the Frontal Cortex there was a 23% increase in thickness in the MCI subjects, followed by a significant 30% thinning of the cortex in the AD brains.

**Conclusion:** Previously, we found that dendritic branching and spines of layer II-III neurons also showed a corresponding neuroplastic increase in branching in MCI followed by an atrophic contraction in AD. While the mechanism is currently obscure, it is relevant that both branching and spine changes in the progression of AD are positively correlated with cortical thickness.

**Research supported by:** The USF Honors College and PO1 AG09466 PO1 AG 14449, P30 AG10161

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**Abstract #: 327**

**Presented by: Peter Moran, Undergraduate**

***Soluble Fractalkine Suppresses Neuron Loss and Tau Pathology in a Mouse Model of Tauopathy***

Peter Moran, Daniel C. Lee, Jerry B. Hunt Jr., Clement Guang-Yu Yang, Paula C. Bickford, Marcia N. Gordon, David Morgan, Kevin R. Nash. University of South Florida, Morsani College of Medicine Department of Molecular Pharmacology & Physiology

**Keywords:** Tauopathy, Fractalkine, Gene therapy

**Objective:** Tauopathies such as frontal temporal dementia are characterized by neurofibrillary tangles, glial activation and neurodegeneration. In mouse models, inflammatory activation of microglia accelerates tau pathology. The chemokine fractalkine serves as an endogenous neuronal modulator to quell microglial activation. Experiments with fractalkine receptor (CX3CR1) null mice suggest that fractalkine signaling may diminishes tau pathology.

**Methods:** We generated an adeno-associated virus expression vector expressing soluble fractalkine. This virus and a control GFP virus were injected into the hippocampus of three month old Tg4510 mice (Tau Mouse model).

**Results:** We report here that soluble fractalkine overexpression using adeno-associated viral vectors significantly reduced tau pathology in the rTg4510 mouse model of tau deposition. More importantly, we observed significant reductions in neuron loss and hippocampal volume loss. As expected we also observed significant reductions in microglial activation.

**Conclusion:** These data argue that agonism at fractalkine receptors may be an excellent target for therapeutic intervention in tauopathies.

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**Abstract #: 328**

**Presented by: Devki Patel, BS, Undergraduate**

***Screening of Novel Drugs to Decrease Tau Protein in Alzheimer's Disease***

Devki Patel, Dan Utic, Twisha Jani, Kaitlyn Braswell, Juan Zhang, Chad A. Dickey, Bill J. Baker and Umesh K. Jinwal University of South Florida, College of Pharmacy, Department of Pharmaceutical Science

**Keywords:** Tau, Alzheimer's disease, Drug

**Objective:** Alzheimer's disease (AD) is a progressive and irreversible neurodegenerative disorder that slowly destroys memory, thinking and reasoning skills in the brain. AD is one of the most common causes of Dementia. According to Alzheimer's Association 2012 AD report, an estimated 5.4 million Americans currently have this disease. Tau accumulation in neurons is one of the causative agents for AD. Normal function of tau protein is to stabilize microtubules. Abnormal overabundance of tau proteins leads to accumulation and eventually to neuronal cell death. Our main aim is to find novel drugs that can reduce tau protein in AD.

**Methods:** To perform drug screening we have used a Tau expressing cell based AD model. The cells were treated with 30 µg crude extracts/ml or the DMSO vehicle control media for 24 hours. The samples were analyzed by western blot technique by using anti-Tau and anti-GAPDH antibodies. The effects of drugs on tau protein were determined by comparing tau bands with the DMSO control band.

**Results:** So far we have screened around 50 microbial crude extracts for tau. Our data revealed several novel tau regulating crude extracts. In particular, extracts B2, B3, D8, E3, and E4 showed reduction in tau.

**Conclusion:** Among the microbial crude extracts screened, more than one showed a noticeable change in the Tau protein levels. These newly identified microbial crude extracts will be taken for further purification to identify tau reducing compounds/drugs in the extract. The new tau regulating drugs could provide researchers with a greater insight of Alzheimer's disease and the role of Tau protein in the progression of this disease.

**Research supported by:** This work was supported by the USF College of Pharmacy Dean's Clinical and pilot award for the Start-up.

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**Abstract #: 329**

**Presented by: Tam-Anh Phan, BS, Undergraduate**

***The Effects of Caloric Restriction on Isolated Brain Mitochondrial Function in a Transgenic P301L Tau Mouse Model of Alzheimer's Disease***

Tam-Anh Phan USF Dept. of CMM Biology, Milene Brownlow USF College of Medicine, Aurelie Amado USF College of Medicine Vedad Delic USF Dept. of CMM Biology Sandra Zivkovic USF Dept. of CMM Biology, Kenyarria Noble USF Dept of CMM Biology, David Morgan USF College of Medicine, Patrick Bradshaw USF Dept. of CMM Biology, University of South Florida, College of Arts and Sciences, Department of Cell Biology, Microbiology & Molecular Biology

**Keywords:** Alzheimer's disease, caloric restriction, tau, mitochondria, mice

**Objective:** In Alzheimer's disease (AD), hyperphosphorylated tau protein has been implicated in mitochondrial dysfunction. Caloric restriction (CR) has been shown to delay aging and many aging-related diseases in animal models. Therefore, we placed Tg4510 transgenic P301L tau Alzheimer's mice on a CR diet, sacrificed the mice at 8 months of age, and measured many facets of cerebral cortical mitochondrial function to determine if mutant tau causes mitochondrial dysfunction in this model and if CR mutes any of the effects of tau expression on mitochondrial function.

**Methods:** Respiration was measured using a Clark oxygen electrode. Mitochondrial membrane potential was measured using the dye JC-1. ROS production was measured using 2',7'-dichlorofluorescein diacetate. ATP production was measured using luciferase luminescence.

**Results:** Wild-type mice on a CR diet trended toward an increased mitochondrial respiratory control ratio (RCR), but Tg4510 mice on a CR diet trended toward a decreased RCR. Tg4510 mice also showed strong trends for increased reactive oxygen species (ROS) production and increased mitochondrial membrane potential that was dampened by the CR diet. We also found strong trends for decreased ADP stimulated respiration in tau transgenic mice compared to controls, most likely indicating either a defect in ADP transport or ATP synthesis that was not restored by the CR diet.

**Conclusion:** Tg4510 mice showed slight indications of mitochondrial dysfunction including strong trends for increased ROS production and mitochondrial membrane potential, and decreased ADP-stimulated respiration and RCR. The only measured benefit of the CR diet on mitochondrial function in Tg4510 mice was decreased mitochondrial ROS production.

**Research supported by:**

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**Abstract #: 330**

**Presented by: Devon Placides, Undergraduate**

***Development and Characterization of Alpha-Synuclein Stable Cells For Therapeutic Targeting of the Polyamine Pathway***

Devon S Placides, College of Pharmacy, Byrd Alzheimer's Institute, Clement Yang, College of Pharmacy, Byrd Alzheimer's Institute, Daniel H. Lee, Byrd Alzheimer's Institute, Daniel C. Lee Ph.D, College of Pharmacy, Byrd Alzheimer's Institute, University of South Florida, College of Pharmacy

**Keywords:** Alpha-Synuclein, Parkinson's, Neuroblastoma, Polyamines, Neuroscience

**Objective:** In this study, we aim to develop neuroblastoma cells (BE (2) M17) stably transfected with either wild-type (WT) syn or the mutant syn A30P form in order to test therapeutic drugs, pathways, or proteins that modify its biology and aggregation.

**Methods:** Cells were characterized by western blotting analysis and immunofluorescence. Several total syn antibodies and several phospho specific epitopes were used to verify expression of positive clones.

**Results:** Our results show stable expression of both WT and the A30P mutant in neuroblastoma cells. Furthermore, stably transfected cells show expression of several phospho-epitopes including Tyr125, Tyr133, and Tyr136 in both soluble and insoluble fractions. Interestingly alpha syn Ser129, a biomarker for lewy body inclusion primarily deposited in the insoluble fraction. Stable cells were treated with several drugs that target various pathways including polyamines and autophagy to identify the impact on syn biology.

**Conclusion:** These studies will provide a method for determining drug screening, pathways, and therapeutics that target syn biology.

**Research supported by:** USF New Researcher Grant

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**Abstract #: 331**

**Presented by: Kevin Ratnasamy, BS, Undergraduate**

***Integration of Recombinant Adeno-associated Virus Using the piggyBac Transposable Element***

Kevin Ratnasamy, Mariam Chowdhari, Peter Moran, Kevin Nash University of South Florida, Morsani College of Medicine, Department of Molecular Pharmacology & Physiology

**Keywords:** transposon, Adeno-associated virus, integration

**Objective:** Adeno-associate virus (AAV) has become increasingly popular for gene transfer into mammalian cells for in vivo animal studies as well as gene therapy in human trials. This virus has a number of advantages such as transduction of dividing and non-dividing cells, low immunogenicity, is non-pathogenic and achieves long-term expression. However, the DNA remains episomal which potentially reduces the effectiveness in dividing cells where continuous cell divisions can lead to dilution of cells containing the DNA. Transposons are small sequences of DNA that can move from one location on a genome to another. They can achieve this by using a protein they encode, termed transposase. This protein uses inverted repeat DNA sequences that flank either end of the transposable element. We wish to take advantage of this system in order to generate an AAV system that would allow for integration of a recombinant AAV genome into cells or animal models.

**Methods:** We have established a two vector system, one that contains the transposase which would not integrate and a second virus that would contain the transposon terminal repeats and allow for its integration into the genome when co-infected with the transposase virus. We are using the transposase PiggyBac.

**Results:** We have constructed viral vectors expressing both PiggyBac and our reporter gene GFP (green fluorescent protein). We are currently examining these vectors in vitro cell culture.

**Conclusion:** The combination of PiggyBac and AAV could allow for the generation of permanent tissue-specific alterations using a simple viral injection. In this poster we discuss the development of this new system.

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**Abstract #: 332**

**Presented by: Santiago Rodriguez-Ospina, Undergraduate**

***Arginase1 Overexpression Activates Autophagy and Reduces Tau Pathology in rTg4310 Tau Transgenic Mice***

Santiago Rodriguez-Ospina, Kevin Nash, Patrick Reid, Devon Placides, Clement Yang, Jerry Hunt, Peter Moran, Maj-Linda Selenica, Marcia Gordon, Dave Morgan, Daniel C. Lee University of South Florida, College of Arts and Sciences, Department of Cell Biology, Microbiology & Molecular Biology

**Keywords:** Arginase, tau, transgenic mice, Gene therapy

**Objective:** Alzheimer's disease (AD) remains the number one neurodegenerative disease (NDs) in the US. Several hallmarks in AD including amyloid beta peptide and tau protein continue to be therapeutic targets in halting disease progression. The role of inflammation and polyamines in NDs remains controversial yet provides opportunity for therapeutic intervention. By-products of certain activation profiles reduce disease pathology whereas others promote it.

**Methods:** Inhibiting one pathway may promote an alternative cascade. Arginase 1 (Arg1) and nitric oxide synthases (NOS) increase during certain disease states and both compete for L-arginine to produce either polyamines or nitric oxide, respectively. We hypothesize that overexpression of Arg1 in the CNS impacts tau pathology. Previous data from our lab showed that overexpression of Arg1 in the CNS of rTg4510 tau transgenic mice using recombinant adeno associated virus (rAAV) decreased tau pathology.

**Results:** Our results showed that Arg1 reduced several phospho tau species and tangle pathology indicated by Gallyas silver positive staining compared to the control vector (rAAV-GFP). In addition, Arg1 decreased mammalian target of rapamycin (mTOR) and p62, suggesting increased autophagy. Cells overexpressing tau also showed changes in tau levels and autophagy-related proteins following Arg1 overexpression in vitro suggesting that Arg1 and polyamines impact tau biology.

**Conclusion:** These data suggests Arg1 and polyamine pathway as potential targets for tauopathies.

**Research supported by:** New Researchers Grant

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**Abstract #: 333**

**Presented by: Awa Sanneh, Undergraduate**

***Overexpression of CCL2 Induces Tau Aggregation Through the mTOR Dependent Autophagy Pathway***

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**Keywords:** CCL2, Alzheimer's disease, tau, mTOR, autophagy.

**Objective:** Expression of CCL2, which is associated with the CCR2 receptor, induces the activity of mTOR, a negative regulator of autophagic activity. In Alzheimer's disease (AD), intraneuronal accumulation of hyperphosphorylated tau leads to increased neuronal death, possibly due to impairments in the macroautophagy machinery. Hence, the role of CCL2 in the autophagy pathway poses a possible link to the progression of tau pathology in AD.

**Methods:** In this study, through experiments conducted both in vitro (C3 cell-line, which overexpresses human tau) and in vivo (rTg4510 mice, P301L tau overexpressing models), we demonstrate that CCL2 expression elicits an increase in levels of phosphorylated tau.

**Results:** Data from the in vitro experiment indicate that total and p-tau (phosphorylated tau), at S199/202 and S396, levels increase with CCL2 treatment of C3 cells. Furthermore, our in vivo data demonstrated an increase in oligomeric soluble tau and insoluble levels of total and phosphorylated tau following CCL2 overexpression in the brain of rTg4510 mice. Subsequent analysis on the levels of autophagy markers revealed increases in the activity of proteins such as mTOR, phosphorylated mTOR2481 and raptor, all of which are negative regulators of autophagy, and also in the p62 marker. The immunohistochemical analysis of cortical tissue shows a trend toward increase in total tau and p-tau at S396; however pS199/202 levels were slightly decreased.

**Conclusion:** The results propose that CCL2 induces tau aggregation through the activation of the mTOR pathway. This marks the CCL2-CCR2 pathway as a potential target for the inhibition of tau aggregation in AD patients.

**Research supported by:** Funding provided by Byrd Alzheimer's institute, University of South Florida, Tampa, FL.

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**Abstract #: 334**

**Presented by: Naomi Swanta, BS,  
Undergraduate**

***Prevention of Surgical Adhesion Using Narcistatin Delivered In Hydro Reversible Gel to Peritoneal Cavity Following Gynecological Surgery***

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**Keywords:** Narcistatin, Thermoreversible gels, nanoparticles, drug delivery systems

**Objective:** One of the most prevalent abdominal and pelvic post-surgery complications is the formation of adhesions in the peritoneum. Sodium Narcistatin(SNS) as a TNF- $\alpha$  and IL-1 inhibitor has been shown to decrease pro-inflammatory cytokine production in a dose dependent manner; however SNS is quickly cleared from peritoneum after direct administration. The purpose of this study is develop sustainable and controlled SNS drug delivery method into the peritoneum.

**Methods:** Thermoreversible gels using Pluronic F-127 (PF-127) with addition of hydroxypropymethylcellulose (HPMC) formulations have been screened using visual observation and rheological method for optimal viscosity and gelation temperature suitable for sustained release in peritoneum. To attain prolonged release of SNS, nanoparticles (NPs) have been synthesized using nanoprecipitation method. Following the characterization by laser scattering to determine size, polydispersity index, and zeta potential, SNS-containing NPs were incorporated into the gel. SNS release was assessed in vitro model.

**Results:** In the screening process, 15% and 18% PF-127 has shown similar response to varying concentration of HPMC. 18% PF-127/0.5% HPMC composition gel has shown the highest viscosity with gelation temperature range below the physiological temperature of 32-34°C, which would be suitable for easy delivery to the peritoneum. SNS-loaded NPs were successfully incorporated into a gel. In vitro release of the formulation was up to 140 hours.

**Conclusion:** Using a combination of nanoparticles and thermo reversible gel provides an easy and efficient method of sustained slow release system for peritoneal delivery and may be applied in pharmaceutical drug delivery.

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**Abstract #: 335**

**Presented by: Julianne Vasconcellos, Undergraduate**

***Stroke: Taking Direct Aim at the Heart of the Problem***

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**Keywords:** heart, stroke, in vitro, in vivo

**Objective:** Cardiac myocyte vulnerability may be associated with ischemic stroke. However, it remains uncertain how an ischemic brain condition links to cardiac alterations. Here, we employed experimental stroke models in order to reveal the pathological effects of the ischemic brain on the heart.

**Methods:** For the in vitro study, primary rat neuronal cells (PRNCs) and rat cardiac myocytes (RCMs) were grown in culture for 5 days. PRNCs were subjected to 90 min OGD condition and two hours after, the supernatant was collected and cryopreserved. Primary RCMs were cultured with the PRNC-derived supernatant for 2, 6, 24, and 48 hours. The RCM was processed for MTT, cAMP and calcein assays to reveal mitochondrial activity and cell viability. For the in vivo study, focal cerebral ischemia was induced by MCAO in rats. Animals were euthanized 3 months post stroke and processed immunohistochemically for cell death markers including necrosis, apoptosis, and autophagy.

**Results:** In vitro results demonstrated that the supernatant from PRNCs under OGD condition caused significant reduction of both mitochondrial activity and cell viability in RCM, when combined at least 24 hours after culture. In vivo results showed cardiac cells immunopositive for all cell death markers in chronic stroke animals. In tandem, brains of chronic stroke animals displayed immunohistochemical positive neuronal cells against all cell death markers involving necrosis in the ipsilateral side and autophagy-positive neuronal cells in the contralateral side.

**Conclusion:** Both in vitro and in vivo models of chronic stroke were accompanied by cardiac cell death, indicating a close pathologic link between brain and heart.

**Research supported by:** USF Department of Neurosurgery and Brain Repair Funds.

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**Abstract #: 336**

**Presented by: Sandra Zivkovic, BS, Undergraduate**

***Mitochondrial DNA Mutations Alter the Effects of 5-aminimidazole-4-carboxamide Riboside (AICAR) and Rapamycin (sirolimus) on Electron Transport Chain Activity***

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**Keywords:** AICAR, rapamycin, mitochondrial dysfunction, electron transport chain

**Objective:** Aging and aging related diseases, such as Alzheimer's and Parkinson's disease, have been associated with mitochondrial dysfunction. Mitochondrial dysfunction is characterized by increased reactive oxygen species (ROS), decreased mitochondrial membrane potential, and decreased ATP production.

**Methods:** E1A-transformed mouse embryonic fibroblasts (MEFs) were utilized. MEFs were isolated from homozygous knock-in mice containing a D257A mutation in the mitochondrial DNA (mtDNA) polymerase gamma (POLG) gene, which results in the lack of proofreading activity and accumulation of missense and deletion mutations in mtDNA. The mice were constructed in attempt to discern the role of mtDNA mutations in the aging process, since these mutations also accumulate with age. AMP kinase activation by AICAR and mTor inhibition by rapamycin are known to modulate mitochondrial function. Therefore, we administered AICAR and rapamycin to WT and POLG-D257A MEFs in growth media with varied glucose and pyruvate levels and monitored mitochondrial function.

**Results:** AICAR and rapamycin treatments of WT and POLG-D257A MEFs in low glucose with pyruvate increased ATP levels. These treatments decreased oxygen consumption in POLG-D257A MEFs and increased oxygen consumption in WT MEFs.

**Conclusion:** The results indicate that mtDNA mutations causing mitochondrial dysfunction alter the effects of the mTor and AMPK signaling cascades on electron transport chain activity. Future experiments will determine the phosphorylation status of mTor and AMPK and their targets to determine how decreased mitochondrial function alters kinase signaling.

**Research supported by:** USF College of Arts & Sciences, CMM Biology Department principal investigator startup funds awarded to Dr. Patrick Bradshaw.

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Ian Mark and Chris Pothering, ***Clinic Flow in a Multidisciplinary Setting: The USF Diabetes Center***, Preceptor: Dr. Henry Rodriguez, USF Diabetes Center at the Morsani Center

Ian Osburn and Jennifer Chevinsky, ***There is No "I" in Team: A Quality Improvement Survey***, Preceptor: Dr. June Leland, James A. Haley VA

Rachel Appelbaum and Alexandra Printz, ***Improving the Bone Health Screening of Premature Infants***, Preceptor: Dr. Antoinette Spoto – Cannons, Complex Chronic Peds Center - St. Joseph's Children's Hospital

Justin R. Abbatemarco and Sasha Yakhkind, ***USF Healthy Weight Clinic Intake Form***, Preceptor: Dr. Denise Edwards, USF Healthy Weight Clinic

Kirk Chassey and Shawn Palmeri, ***Proactively Preparing Interns for their NICU Rotation***, Preceptor: Dr. Terri Ashmeade, NICU – Tampa General Hospital

Sven Oman and Yasir Abunamous, ***Multidisciplinary Care & Parkinson's: Miracle or Mess?*** Preceptor: Dr. Robert Hauser, USF Parkinson's Disease & Movement Disorders Center – Byrd Institute

Keith O'Brien and Kyle Ingram, ***A Multi-Disciplinary Definition of an Episode of Care for Patients in a Urogynecology and Pelvic Reconstructive Surgery Practice***, Preceptor: Dr. Lennox Hoyte & Dr. Renee Basally, USF Urogyn & Female Pelvic Reconstructive Surgery, USF Health South

Emma Qureshey and Aresh Ramin, ***Finding the Meaning in "Meaningful Use" of Electronic Health Records***, Preceptor: Dr. Elizabeth Lawrence & Dr. George Rankin, Turley Family Health Center (Baycare)

Kanchi Batra and Norman McKoy, ***Explorations of Team-Based Communication***, Preceptor: Dr. Sally Zachariah, VA Medical Center of Bay Pines – Division of Strokes

Kyle Correll, ***End of Visit Care and its Effect on Patient Compliance***, Preceptor: Dr. Pamela Grover, Dunedin Primary Care (BayCare)

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