

Over the last several years, USF Health and the College of Medicine have made a concerted effort to expand their laboratory and clinical research facilities. Significant resources have been allocated to achieve this goal for its faculty and students. The 130,000 sq. ft. Interdisciplinary Research Building houses state-of-the-art BSL-2 and BSL-3 biocontainment labs, with one BSL-3 lab outfitted to conduct animal and insect studies. The newly associated 108,000 sq. ft. Byrd Alzheimer Center and Research Institute has both basic sciences and clinical research facilities. The newly opened 194,400 sq. ft. Morsani Center for Advanced Health Care, and the 126,000 sq. ft. USF Health South Tampa Center for Advanced Health Care have plans for dedicated space for clinical research. Beyond the above, the College of Medicine also maintains another 200,000 sq. ft. of laboratory space for its departments of basic medical sciences. The newly opened Office of Clinical Research and the Clinical and Translational Science Institute provide further opportunities to support basic, translational and clinical research in the College of Medicine.

Additionally, an expansion of core research facilities has been a priority for the College. Currently, the College of Medicine has the following core resources and facilities:

*Mason Laboratory for Small Animal In Vivo Imaging* – The Small Animal *In Vivo* Imaging Laboratory located within the vivarium and is equipped with state-of-the-art equipment for high resolution *in vivo* imaging. Real-time noninvasive *in vivo* visualization of live tissue and blood flow from embryonic through to the adult rodent with an image resolution to 30 microns is possible. The system is equipped with software for 3D visualization and analysis. Noninvasive whole-animal imaging with a range of bioluminescent and fluorescent reporters across the blue to near infrared wavelength region is available. A Moor Instruments LDI2 high resolution laser Doppler is available for large area blood flow imaging.

*Murine Neurobehavioral Laboratory* – The Murine Neurobehavioral Laboratory (MNL) is equipped with automated, computer-controlled instrumentation for assessment of motor and cognitive behavior as well as drug responses. MNL personnel consult with investigators on experimental design and train core users in animal handling, data acquisition, and statistical analysis.

*Fred Wright Jr. Flow Cytometry Laboratory* – This facility offers state-of-the-art analytical and sorting flow cytometry. The core has three cytometers: A BD FACSAria sorter, BD LSR II, and a BD FACSCanto II, and a Miltenyi autoMACS magnetic sorter ideal for bulk separation.

*Bioanalytics Shared Resource* – The Bioanalytics Shared Resource houses state-of-the-art instrumentation for imaging and quantification of fluorescent, radioactive, luminescent, and chemiluminescent signals from gels, membranes, slides, or multiple well plates. Also available are a WPI LED-based, dual beam, photometric detection system, a GE Analytical Instruments nitric oxide analyzer and a Kodak M35 film processor.

*Lisa Muma Weitz Center for Advanced Microscopy and Cell Imaging* – This core provides users with access to a variety of state-of-the-art research microscopy resources. The technical staff also provides training in routine and advanced digital imaging techniques, assists with protocol development and trouble-shooting as well as expert technical assistance.

*Electron Microscopy:* A JEOL JEM1400 transmission electron microscope with a Gatan Orius side-mount widefield CCD camera and a Gatan Ultrascan 2K bottom-mounted CCD camera is available as well as a JEOL JSM6490 Scanning Electron Microscope with EDAX Genesis X-ray Analysis System. In addition to microscopes, the facility has the small equipment items necessary for specimen preparation.

*Confocal Microscopy:* An Olympus FV1000 MPE multiphoton microscope is available. The system is capable of exciting any fluorochrome above 457nm excitation for imaging of living, whole mounted specimen or thickly sliced specimens. An incubation chamber for live cell work is available with advanced notice. A Leica TCS SP II Laser Scanning Confocal Microscope which supports multicolor fluorescent studies allowing quadruple labeling using common fluorescent labels is also available.

*Light microscopy.* A Digital Leica upright microscope is equipped with fluorescent filter sets for DAPI, FITC, GFP and Rhodamine/Texas Red. In addition, it has a Prior motorized stage and focus drives for image analysis interfaced with the Stereologer System supporting computerized quantitative analysis of biological tissues including; cell counts, volume, surface area and length. An Oncor deconvolution microscope system permits digital image capture, optical sectioning, and computerized deconvolution of image stacks as well as rendering of image stacks to virtual 3-D images. The Oncor system is interfaced with a Nikon Diaphot inverted microscope with a Photometrics PXL CCD camera equipped with fluorescent filter sets for 3 color imaging.

*Laser Microdissection:* An Arcturus XT laser capture/microdissection system is available. In addition, a second high resolution digital camera is installed for publication quality image capture.

*Image Analysis and Processing:* A networked computer workstation is available for image processing, archiving and use of instrument –specific software. In addition, an Agfa Duoscan flatbed scanner as well as Fuji Pictography and Codonics photographic quality printers are available.Â

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*Mouse Models Core* – The Mouse Models Core facility provides regional scientists with proficient, affordable generation of genetically modified mice. Two doctoral-level senior scientists manage the core. They advise investigators on overall strategy and the design of transgenic and targeting vectors, perform pronuclear DNA microinjection services to generate transgenic founders; culture, transfects, selects, and screens embryonic stem (ES) cells; provide blastocyst microinjection and morula aggregation services to generate germline chimera from gene-targeted ES cells; and advise and assist investigators in the genotypic and phenotypic analysis of mice.

*Biostatistics Shared Resource* – The Biostatistics Shared Resource staffs two doctoral-level biostatisticians available for consultation on all statistical aspects of research studies including: study design, database design, sample-size analysis, data analysis and interpretation, statistical/software instruction and manuscript writing. Available software tools include: SAS, SPSS, S-Plus, R, and nQuery.

Animals – The USF Division of Comparative Medicine (DCM) serves as the advocate for animals involved in research at the University of South Florida, and provides a fully accredited, centralized service of pathogen-free animal procurement, husbandry, health surveillance, and quality control. DCM is fully accredited by the Association for the Assessment and Accreditation of Laboratory Animal Care, International (AAALAC #000434). Its program and facilities for animal care and use are managed in accordance with the National Research Council Guide for the Care and Use of Laboratory Animals, the PHS Policy on Humane Care and Use of Laboratory Animals, and the Animal Welfare Regulations. DCM has an assurance of compliance on file with OLAW and NIH, and is a registered research facility with the United States Department of Agriculture. Pre-clinical GLP Studies that support permit applications to the Food and Drug Administration are conducted in accordance with Good Laboratory Practice for Non-clinical Laboratory Studies.

The University of South Florida maintains a comprehensive Research Compliance and Integrity Program. Recently, the University became the first Florida University to be accredited by the Association for the Accreditation of Human Research Protection Programs, Inc (AAHRPP). The University provides four medical Institutional Review Boards (IRB) as well as one Social and Behavioral Sciences IRB. The Western IRB is also available for some clinical research studies and, currently, a couple of other external IRBs are also being explored as possible mechanisms for the approval of selected Human Subject's Research protocols. Such structure provides for rapid, yet thorough review, of all research that involves human subjects at USF.