

BIOGRAPHICAL SKETCH

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NAME Thomas R. Unnasch	POSITION TITLE Professor		
eRA COMMONS USER NAME UNNASCH			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Rutgers University, New Jersey	B.A.	1976	Microbiology
Massachusetts Institute of Technology, Massachusetts	Ph.D.	1981	Enzymology
Harvard University, Massachusetts	Post-Doc	1985	Mol. Parasitology

A. Positions and Honors.**Positions and Employment**

- 1976 - 1981 Graduate Student, Department of Biology, Massachusetts Institute of Technology.
1981 Instructor, Massachusetts Institute of Technology.
1981 - 1985 Post doctoral fellow, Department of Tropical Public Health, Harvard School of Public Health.
1985 - 1989 Assistant Professor, Division of Geographic Medicine, and Department of Molecular Biology and Microbiology, Case Western Reserve University.
1989 - 1997 Associate Professor, Division of Geographic Medicine, Department of Medicine, University of Alabama at Birmingham.
1997-2007 Professor, Division of Geographic Medicine, Department of Medicine, University of Alabama at Birmingham.
2007-present Professor, Global Health Infectious Disease Research Program, Department of Global Health, College of Public Health, University of South Florida

Other Experience and Professional Membership

- 2006-present: Member, Editorial Advisory Board, PLOS Neglected Diseases
2006: Member, NIH Roadmap Study Section
2006- Chair, Device and Detection Sciences Study Section, NIH
2006: Member, Genomics and Drug Discovery Steering Committee, Special Programme in Research and Training in Tropical Diseases, World Health Organization
2005-2006: Proposal reviewer, Bill and Melinda Gates Foundation
2004-2006: Chair, Assays and Methods Development Study Section, NIH
2003-present: Editorial Board, *Molecular and Biochemical Parasitology*
1989-2002: Editorial Board, *Experimental Parasitology*
1986-1992: Member, Young Investigator Award Committee, American Society of Tropical Medicine and Hygiene
1993-1996: Member, Program Committee, American Society of Tropical Medicine And Hygiene
1990-2001: Technical Advisor, Onchocerciasis Control Programme in West Africa
1993-2001: Ad Hoc Member, TMP/AHR study section
1995-1996: Chair, NIAID/AID Middle Eastern Research Cooperative Program Site Visit Committee

B. Selected peer-reviewed publications (in chronological order).

(All from last three years from 116 total)

1. Adjami, A.G., L., T., Bissan, Y., Bugri, S., Yaméogo, L., Kone, M., Katholi, C.R. and Unnasch, T.R. (2004) The Current Status of Onchocerciasis in the Forest/Savanna Transition Zone of Côte d' Ivoire. *Parasitology* **128**,407-414.

2. Apperson, C.S., Hassan, H.K., Harrison, B.A., Aspen, S.E., Savage, H.M., Farajollahi, A., Crans, W., Daniels, T.J., Falco, R.C., Benedict, M., Anderson, M., McMillen, L., and Unnasch, T.R. (2004) Host feeding patterns of probable vector mosquitoes of West Nile Virus in the Eastern United States. *Vect. Borne Zoonotic Dis.* **4**,71-82.
3. Beard, C.B., Roux, P., Nevez, G., Hauser, P.M., Kovacs, J.A., Unnasch, T.R. and Lundgren, B. (2004) Strain Typing Methods and Molecular Epidemiology of Pneumocystis Pneumonia. *Emerging Infectious Diseases* **10**,1729-1735.
4. Cupp, E.W., Tennessen, K.J., Oldland, W.K., Hassan, H.K., Hill, G.E., Katholi, C.R. and Unnasch, T.R. (2004) Mosquito and arbovirus activity during 1997-2002 in a wetland in northeastern Mississippi. *Journal of Medical Entomology* **41**,495-501.
5. Cupp, E.W., Zhang, D., Yue, X., M.S., C., Guyer, C., Korves, T. and Unnasch, T.R. (2004) Identification of Reptilian and Amphibian Bloodmeals from Mosquitoes in an Eastern Equine Encephalomyelitis Virus Focus in Central Alabama. *American Journal of Tropical Medicine and Hygiene* **71**,272-276.
6. Higazi, T.B., Klion, A.D., Boussinesq, M. and Unnasch, T.R. (2004) Genetic Heterogeneity in *Loa loa* parasites from Southern Cameroon: A Preliminary Study. *Fil. J.* **3**,4.
7. Higazi, T.B., Shu, L. and Unnasch, T.R. (2004) Development and transfection of short term primary cell cultures from *Brugia malayi*. *Mol. Biochem. Parasitol.* **137**,345-348.
8. Higazi, T.B. and Unnasch, T.R. (2004) Intron encoded sequences necessary for trans splicing in transiently transfected *Brugia malayi*. *Mol. Biochem. Parasitol.* **137**,181-184.
9. Rodríguez-Pérez, M.A., Lilley, B.G., Domínguez-Vázquez, A., Segura-Arenas, R., Lizarazo-Ortega, C., A., M.-H., Reyes-Villanueva, F. and Unnasch, T.R. (2004) Polymerase Chain Reaction monitoring of transmission of *Onchocerca volvulus* in two endemic states in Mexico. *American Journal of Tropical Medicine and Hygiene* **70**,38-45.
10. Higazi, T.B., DeOliveira, A., Katholi, C.R., Shu, L., Barchue, J., Lisanby, M. and Unnasch, T.R. (2005) Identification of elements essential for transcription in *Brugia malayi* promoters. *J. Mol. Biol.* **353**,1-13.
11. Higazi, T.B., Filiano, A., Katholi, C., Dadzie, K.Y., Remme, J.H. and Unnasch, T.R. (2005) *Wolbachia* endosymbiont levels in severe and mild strains of *Onchocerca volvulus*. *Mol. Biochem. Parasitol.* **141**,109-112.
12. Ramirez-Ramirez, A., Sanchez-Tejeda, G., Mendez-Galvan, J., Unnasch, T.R. and Monroy-Ostria, A. (2005) Molecular studies of *Onchocerca volvulus* isolates from Mexico. *Infect Genet Evol* **22**,22.
13. Unnasch, R.S., Cupp, E.W. and Unnasch, T.R. (2005) Host selection and its role in transmission of arboviral encephalitides. in *Disease Ecology: Community Structure and Pathogen Dynamics*, S.K. Collinge and C. Ray, Editors. Oxford University Press. Oxford, UK. pp. 73-89.
14. Unnasch, T.R. (2005) *Onchocerca volvulus*. in *Encyclopedia of Diagnostic Genomics and Proteomics*, J. Fuchs and M. Podda, Editors. Marcel Dekker, Inc. New York, NY. pp. 943-946.
15. Eng, J.K.L., Blackhall, W.J., Osei-Atweneboana, M., Bourguinat, C., Galazzo, D., Beech, R.N., Unnasch, T.R., Awadzi, K., Lubega, W.G. and Prichard, R.K. (2006) Ivermectin selection on α -tubulin: Evidence in *Onchocerca volvulus* and *Haemonchus contortus*. *Mol. Biochem. Parasitol.* **150**,229-235.
16. Katholi, C.R. and Unnasch, T.R. (2006) Important experimental parameters for determining infection rates in arthropod vectors using pool screening approaches. *American Journal of Tropical Medicine and Hygiene* **74**,779-785.
17. Richards, S.L., Ponnusammy, L., Unnasch, T.R., Hassan, H.K. and Apperson, C.A. (2006) Host-feeding Patterns of *Aedes albopictus* (Skuse) (Diptera: Culicidae) in relation to the availability of human and domestic animals in suburban landscapes of central North Carolina with notes on blood meal hosts of sympatric mosquito species. *Journal of Medical Entomology* **43**,543-551.
18. Rodríguez-Pérez, M.A., Katholi, C.R., Hassan, H.K. and Unnasch, T.R. (2006) A large-scale entomologic assessment of *Onchocerca volvulus* transmission by pool-screen PCR in Mexico. *American Journal of Tropical Medicine and Hygiene* **74**,1026-1033.
19. Rodríguez-Pérez, M.A., Núñez-González, C.A., Lizarazo-Ortega, C., Sánchez-Varela, A., Wooten, M.C. and Unnasch, T.R. (2006) Analysis of genetic variation in the ribosomal DNA internal transcribed spacer and the NADH dehydrogenase subunit 4 mitochondrial genes of the onchocerciasis vector *Simulium ochraceum* sensu lato. *Journal of Medical Entomology* **43**,701-706.
20. Unnasch, R.S., Sprenger, T., Katholi, C.R., Cupp, E.W., Hill, G.E. and Unnasch, T.R. (2006) A Dynamic Transmission Model of Eastern Equine Encephalomyelitis Virus. *Ecol. Model.* **192**,425-440.
21. Cupp, E.W., Hassan, H.K., Yue, X., Oldland, W.K., Lilley, B.M. and Unnasch, T.R. (2007) West Nile Virus

Infection in Mosquitoes in the Mid-South USA, 2002-2005. *Journal of Medical Entomology* **44**,117-125.

22. de Oliveira, A., Unnasch, T.R., Crothers, K., Eiser, S., Zucchic, P., Moir, J., Beard, C.B., Lawrence, G.G. and Huang, L. (2007) Performance of a Molecular Viability Assay for the Diagnosis of Pneumocystis Pneumonia in HIV-Infected Patients. *Diagnostic Microbiology and Infectious Disease* **57**,169-176.

23. Lindblade, K.A., Arana, B., Zea-Flores, G., Rizzo, N., Porter, C.H., Dominguez, A., Cruz-Ortiz, N., Prosser, A., Unnasch, T.R., Punksody, G.A., Richards, J., Hengstermann, M., Barrios-Giron, M.E., Sauerbrey, M., Castro, J., Catú, E., Oliva, O., Klein, R.E., and Richards, F.O. (2007) Elimination of *Onchocercia volvulus* Transmission in the Santa Rosa focus of Guatemala. *American Journal of Tropical Medicine and Hygiene* **in press**.

24. Savage, H.M., Aggarwal, D., Apperson, C.S., Katholi, C.R., Gordon, E., Hassan, H.K., Anderson, M., Charnetzky, D., Mcmillen, L., Unnasch, E.A., and Unnasch, T.R. (2007) Host Choice and West Nile Virus Infection Rates in Blood Fed Mosquitoes, Including Members of the *Culex pipiens* complex, from Memphis and Shelby County, Tennessee 2002-2003. *Vect. Borne Zoonotic Dis.* **in press**.

C. Research Support **Ongoing Research Support**

R01 AI049724-05 T.R. Unnasch, (PI) 03/01/2006 – 02/28/2011
NIH/NIAID

Ecology of Encephalitis Virus in the Southeastern USA

The specific aims of the project are: 1. To test the hypothesis that mosquitoes feed preferentially upon nestlings, using a microsatellite based method capable of distinguishing avian blood meals to the individual level. 2. To test the hypothesis that mosquitoes that are residents of the TNF site endemic for EEE virus leave the site to forage for blood meals, and if so to estimate their mean foraging range. 3. To measure EEE virus exposure and reservoir competence of amphibians and reptiles endemic to the Tuskegee National Forest (TNF) research site. 4. To determine the vector competence of *Culex erraticus*, *Cx. peccator* and *Uranotaenia sapphirina* for EEE virus. 5. To test the hypothesis that certain over-wintering mosquitoes are responsible for maintaining the virus during the winter months.

Role: PI

R01 CI00226-01 T.R. Unnasch (PI) 09/30/04-03/31/08
NCID/CDC

Ecology of West Nile Virus in the Southeastern USA

The overall goal of this proposal will be to draw upon our studies of the ecology of EEE transmission to develop a comprehensive picture of WNV transmission in the Southeastern United States. To accomplish this, we will investigate the temporal and spatial characteristics of the vector mosquito and avian reservoir populations and the interaction of these populations at a site encompassing urban and peri-urban habitats.

The specific aims of this proposal are: 1. To identify the most significant vectors for WNV at a site encompassing peri-urban and urban areas in South Central Alabama and to determine if the vector is involved in over-wintering of WNV in the Southeast, and if so, how this occurs. 2. To monitor WNV activity in the avifauna present at the study site, and to relate this activity to the interaction of the avifauna and vector mosquitoes at the site. As part of this study, we shall also monitor a well characterized songbird population to determine if there are subtle detrimental effects of WNV infection on the native avifauna. 3. To test the hypothesis that changes in the host-vector relationship are essential in triggering and maintaining an outbreak of WNV in the avian population.

Role: PI

5R01 AI48562-05 T.R. Unnasch (PI) 02/01/05-01/31/10
NIH/NIAID

Transfection and Analysis of Transcription *B. malayi*:

The specific aims of this project are: 1. To identify elements interacting with conserved transcriptional factors in the HSP70 core promoter of *B. malayi*. 2. To determine which portions of the core promoter of the HSP70 gene are conserved in other *B. malayi* promoters. 3. To dissect the role of downstream cis acting factors

necessary for trans splicing of transgenic pre-mRNAs. 4. To develop a stable transfection system for *B. malayi*.

Role: PI

05/01/05-4/30/08

Onchocerciasis Elimination Program for the Americas/Carter Center

Monitoring the effect of Mectizan distribution on *O. volvulus* transmission by pool screen PCR

The overall goal of this project is to assist the Onchocerciasis Elimination Program of the Americas (OEPA) to monitor the effect of mass distribution of Mectizan on the transmission of *O. volvulus* in the six American countries endemic for onchocerciasis. This is accomplished by screening wild caught vector black flies for the presence of *O. volvulus* infective larvae using techniques developed and perfected by our laboratory.

Role: PI

Recently Completed Research Support

R01 AI49724

09/29/00-06/30/05

NIH/NIAID

Ecology of Encephalitis Virus in the Southeastern USA

The overall goal of this project was to elucidate ecological factors necessary for promoting viral enzootics, and to identify the ecological factors necessary to allow the viruses to escape the zoonotic cycle and infect humans and other mammals. The specific aims of this project will be: 1. To study the temporal and spatial pattern of enzootic encephalitis infection at several sites in Alabama and neighboring states using GIS, serological and PCR detection methods; 2. To utilize a newly developed method capable of identifying avian blood meals to the species level to study temporal and spatial changes in the feeding pattern of the enzootic and bridge encephalitis mosquito vectors; and 3. To correlate the feeding behavior of populations of the enzootic and bridge vectors in each study with changes in abundance, behavior, reproductive stage, age classes present, or general physiological state of the endemic avian fauna.

Role: PI

R01 AI48562-

01/15/01-01/31/05

NIH/NIAID

Retroviral Transduction and Immortalization of Filaria

The main goals of this project were: 1. To employ the biolistic transient transfection system to identify cis acting factors important in controlling gene expression in *B. malayi*. Parameters to be explored will include identification of a minimal promoter for transient expression in *B. malayi*, the effect of 5' and 3' sequences important for message processing, and the effect of the addition of synthetic introns; 2. To develop pantropic retroviral vectors as a system for stable foreign gene expression in *B. malayi* embryos; 3. To employ pantropic retroviral vectors expressing oncogenes to create an immortalized cell line from *B. malayi*; and 4. To determine if heterologous DNA present in transfected *B. malayi* embryos is stably inherited.

Role: PI

R01 AI 48737

02/01/01-01/31/05

NIH/NIAID

Targeting of Nuclear Encoded Proteins to the Plastid of *Toxoplasma gondii*

The overall goal of this project is to understand the pathway by which nuclear encoded proteins are delivered to the apicoplast. The specific aims of the project are: 1. To determine the pathway through which nuclear encoded proteins are targeted to the apicoplast. 2. To determine the essential features of the signals necessary for plastid targeting by in vitro mutagenesis of the putative targeting sequences. 3. To identify parasite proteins associated with the apicoplast targeting pathway.

Role: Co-investigator (N.Lang-Unnasch, PI)