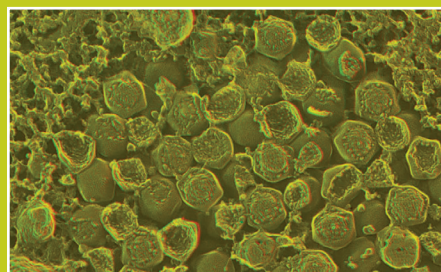




**Dr. V. Gregory Chinchar** received his B.S. from the University of Notre Dame in 1972 and a Ph.D. from Indiana University (Bloomington, IN) in 1978. As a graduate student, he worked on projects involving non-human picornaviruses and somatic cell hybridization. From 1978–1981, he was a post-doctoral fellow at St. Jude Children's Research Hospital (Memphis, TN) where he examined transcriptional events in paramyxovirus- and rhabdovirus-infected cells. From 1981–1984, he worked as a research associate/assistant member on two projects: the generation and characterization of temperature-sensitive and drug-resistant mutants, and the development and characterization of monoclonal antibodies targeted to FV3 proteins.

In August 1984, he joined the Department of Microbiology at the University of Mississippi Medical Center (UMMC) as an assistant professor, and is currently a professor within the department and the associate dean of the School of Graduate Studies. His laboratory is interested in FV3 replication and is attempting to identify FV3 genes involved in viral replication and immune evasion using antisense morpholino oligonucleotides and siRNAs to knock down viral gene expression and determine function by changes in phenotype. In addition, he collaborates with members of the UMMC comparative immunology group in studies related to anti-viral defense mechanisms in catfish.



J. Heuser

## 2011 JMIH Ranavirus Symposium Sponsors

### Gold Level

University of Tennessee Institute of Agriculture

### Silver Level

Association of Reptilian and Amphibian Veterinarians  
Environment Canada, National Wildlife Research Centre  
Morris Animal Foundation  
Tennessee Wildlife Resources Agency  
U.S. Forest Service, Pacific Northwest Research Station

### Bronze Level

American Society of Ichthyologists and Herpetologists  
Missouri Department of Conservation  
Partners in Amphibian and Reptile Conservation  
Tennessee Herpetological Society  
USGS Amphibian Research and Monitoring Initiative

Gold = \$5000, Silver = \$2500, Bronze = <\$2500

### SYMPOSIUM ORGANIZERS

**Matthew J. Gray, Ph.D.**

University of Tennessee, Center for Wildlife Health

**Jesse L. Brunner, Ph.D.**

Washington State University, School of Biological Sciences

**Debra L. Miller, D.V.M., Ph.D.**

University of Tennessee, Center for Wildlife Health  
College of Veterinary Medicine, Department of Pathobiology

**Jason T. Hoverman, Ph.D.**

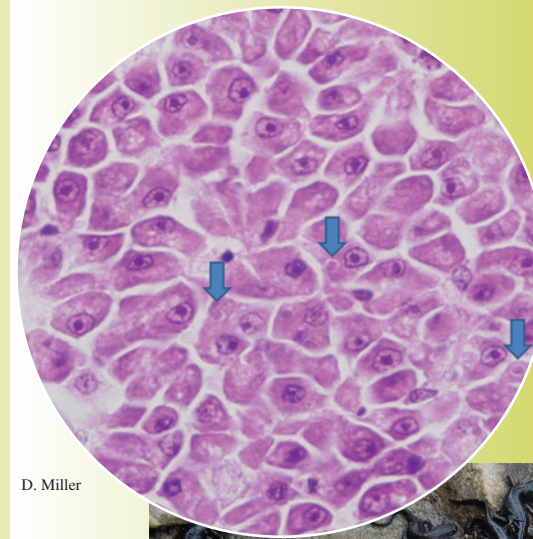
University of Colorado, Department of Ecology and Evolutionary Biology

**Andrew T. Storfer, Ph.D.**

Washington State University, School of Biological Sciences



N. Haislip



D. Miller



A. Balseiro



M. Niemiller

# Ranaviruses:

*an emerging threat  
to ectothermic vertebrates*



Artwork by: Dr. Jeanne Jones, Mississippi State University

**Friday, 8 July 2011  
Minneapolis, MN, USA**

THE UNIVERSITY of TENNESSEE   
INSTITUTE of AGRICULTURE



OVERVIEW

*Ranaviruses: An emerging threat to ectothermic vertebrates*

The scientific community is increasingly aware that emerging infectious diseases pose a significant threat to global biodiversity. A group of viruses in the genus *Ranavirus* (Family Iridoviridae) cause disease in amphibians, reptiles and fish, and appear to be emerging in some populations. Ranavirus-associated die-offs in larval and adult amphibians have been documented in the Americas, Europe and Asia, with death rates often exceeding 90 percent during an outbreak. Ranavirus infections also have been reported in wild and cultured fish populations worldwide. While research on reptiles has been slower to accumulate, recent evidence suggests that ranaviruses are capable of causing morbidity and mortality in free-ranging populations.

Together, these widespread die-offs have sparked a diversity of research programs addressing the ecology and evolution of ranavirus-host interactions, potential reservoirs and transmission dynamics, molecular techniques for identifying and characterizing ranaviruses, immunological and histopathological responses to infection, hypothesized causes for emergence, and potential conservation strategies to control emergence.

In an attempt to bring scientists together from across the globe to learn and share information about ranaviruses, the organizers began planning in 2009 for the ***First International Symposium on Ranaviruses***. In total, 24 scientists from nine countries are participating, with expertise in herpetology, ichthyology, ecology, veterinary medicine, immunology, genetics and molecular biology. We thank these individuals for their contributions. We also thank our 11 sponsors who provided >\$22,000 to help offset travel costs for our presenters. We hope you enjoy the symposium and that today's events generate new research directions and collaborations!

2011 JOINT MEETING OF ICHTHYOLOGISTS AND HERPETOLOGISTS			
International Symposium on Ranaviruses			
Hilton, Minneapolis Ballroom F			
Minneapolis, MN, USA			
8:00 a.m.	Welcome – Matt Gray	10:45 a.m.	<b>Weakness of Innate Immunity Also Contributes to Susceptibility of Xenopus Tadpoles to FV3 infection</b> Jacques Robert (University of Rochester, USA)
<b>Moderator:</b> Jason Hoverman		11:00 a.m.	<b>Complex Role of Macrophages in <i>Xenopus</i> Immune Defenses and Persistence of the Ranavirus FV3</b> Jacques Robert (University of Rochester, USA)
8:15 a.m.	<b>Ranaviruses: Past, Present and Future</b> Greg Chinchar (University of Mississippi, USA)	11:15 a.m.	<b>Comparative Pathology of Ranavirus Infections in Wild Amphibians</b> D. Earl Green (U. S. Geological Survey, USA)**
8:45 a.m.	<b>Are Ranaviruses Capable of Contributing to Species Declines?</b> Matt Gray (University of Tennessee, USA)	11:30 a.m.	<b>Pathological Changes Observed in European Amphibians with Ranaviral Diseases</b> Ana Balseiro (SERIDA, Spain)**
9:00 a.m.	<b>Amphibian Ranavirus Transmission and Persistence</b> Jesse Brunner (Washington State University, USA)	11:45 a.m.	<b>Comparative Pathology of Ranaviral Disease among Amphibians, Reptiles and Fish</b> Debra Miller (University of Tennessee, USA)**
9:15 a.m.	<b>Amphibian Susceptibilities to the Emerging Amphibian Pathogen Ranavirus</b> Jason Hoverman (University of Colorado, USA)	Noon	LUNCH
9:30 a.m.	<b>Ranaviruses and Amphibians: Outside the Box of Host-Parasite Relationships</b> David Lesbarrères (Laurentian University, Canada)	<b>Moderator:</b> Jesse Brunner	
9:45 a.m.	<b>Effects of Pesticide Exposure on Susceptibility to Ranavirus in Tiger Salamanders, <i>Ambystoma tigrinum</i></b> Jacob Kerby (University of South Dakota, USA)	1:30 p.m.	<b>Amphibian Ranaviruses in Canada – Historical, Current and Future Research Directions</b> Danna Schock (Keyano College, Canada)
10:00 a.m.	BREAK	1:45 p.m.	<b>Ranaviruses in European Amphibians</b> Amanda Duffus (Gordon College, USA)
<b>Moderator:</b> Andrew Storfer		2:00 p.m.	<b>Current Understanding of Ranaviruses in South America</b> Rolando Mazzoni (Universidade Federal de Goiás, Brazil)**
10:15 a.m.	<b>Evidence for Multiple Recent Host Species Shifts among the Ranaviruses (Family Iridoviridae)</b> James Jancovich (Cal State San Marcos, USA)	2:15 p.m.	<b>Emergence of Ranaviruses in Japan</b> Yumi Une (Azabu University, Japan)**
10:30 a.m.	<b>Host-Pathogen Coevolution: From Genes to Landscapes</b> Andrew Storfer (Washington State University, USA)	2:30 p.m.	<b>Ranaviruses in Frogs and Fish in Southeast Asia</b> Somkiat Kanchanakhan (Aquatic Animal Health Research Institute, Thailand)
		2:45 p.m.	<b>Isolation of Frog Virus 3 from Pallid Sturgeon Suggests an Interclass Host Shift</b> Tom Waltzek (University of Florida, USA)**
		3:00 p.m.	BREAK
		<b>Moderator:</b> Debra Miller	
		3:15 p.m.	<b>Ranaviruses in European Reptiles</b> Rachel Marschang (University of Hohenheim, Germany)**
		3:30 p.m.	<b>Ranaviral Disease in Chelonians of North America</b> Matt Allender (University of Illinois, USA)**
		3:45 p.m.	<b>Challenge Studies of Australian Native Reptiles with a Ranavirus Isolated from a Native Amphibian</b> Ellen Ariel (James Cook University, Australia) ( <i>Matt Allender presenting</i> )
		4:00 p.m.	<b>Assessing the Risk of Introducing Exotic Ranaviruses into Europe via Imports of Infected Ornamental Fish from Asia</b> Britt Bang Jensen (Norwegian Veterinary Institute, Norway)**
		4:15 p.m.	<b>Amphibian Commerce and the Threat of Pathogen Pollution</b> Angela Picco (U.S. Fish and Wildlife Service, USA)
		4:30 p.m.	FUTURE DIRECTIONS (Matt Gray, Summation and Additional Suggestions)
		4:45-5:30 p.m.	FUTURE DIRECTIONS (Working Groups) <i>Director's Row 2, 3 and 4</i> (A) Ecology (host-pathogen interactions)
			(B) Conservation (stressors and pathogen pollution)
			(C) Pathology
			(D) Molecular Advancements (phylogeny, gene function, vaccines)
** Denotes Doctor of Veterinary Medicine			