



**INSTITUTE FOR GENOME  
SCIENCES AND SOCIETY**  
TEXAS A&M UNIVERSITY

**Inaugural Symposium**



# Evolution of **STRESS:**

**From the Genome to Disease**

**October 8–9, 2015**

*tx.ag/stress*



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# **Evolution of STRESS:**

## **From the Genome to Disease**

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### **Keynote Address**

**(Open to the General Public)**

Thu., Oct. 8 • 6:30 pm • Rudder Theatre

## **Why Zebras Don't Get Ulcers: Stress and Health**

**Dr. Robert M. Sapolsky**

MacArthur Genius Fellow

John A. and Cynthia Fry Gunn Professor of Biology  
and Professor of Neurology & Neurosurgery  
at Stanford University

Author of *Why Zebras Don't Get Ulcers*

Featured in the National Geographic  
documentary *Stress: Portrait of a Killer*

Reception and book signing immediately following

# **Graduate Student Q&A with Dr. Sapolsky**

**(By Invitation Only)**

Fri., Oct. 9 • 8:30 to 9:30 am • Memorial Student Center (MSC) Room 2400

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## **Symposium Presentations**

Fri., Oct. 9 • 9:45 am to 4:45 pm • MSC Room 2400

- 9:45 am** Dr. David W. Threadgill, Texas A&M University  
Introduction
- 10:00 am** Dr. Moshe Szyf, McGill University  
Epigenetic Processes Embedding Early-life Stress in the Genome
- 10:30 am** Dr. Ronald D. Randel, Texas A&M AgriLife Research  
Temperament Is Linked with Stress Responsiveness  
and Is Controlled Genetically
- 11:00 am** Dr. Mary W. Meagher, Texas A&M University  
Adverse Life Experiences and Pain Sensitization
- 11:30 am** Dr. Jackie D. Wood, The Ohio State University  
Stress and the Gastrointestinal Tract
- 12:00 pm** Lunch and Trainee Poster Session (Box Lunches Provided)
- 1:30 pm** Dr. Martin B. Dickman, Texas A&M University  
Death Be Not Proud: Modulation of Programmed Cell Death  
for Disease Development/Stress Tolerance in Plants
- 2:00 pm** Dr. Jeffery A. Carroll, USDA ARS, Lubbock, Texas  
Linking Stress, Metabolism, and Immune Function in Cattle
- 2:30 pm** Dr. Stephen D. Hursting, University of North Carolina–Chapel Hill  
Genetic and Hormonal Mechanisms that Impair Metabolic Health
- 3:00 pm** Break (Beverages Provided)
- 3:15 pm** Dr. Mahua Choudhury, Texas A&M Health Science Center  
Plasticizers: Foe or Friend? An Epigenetic View
- 3:45 pm** Dr. Keith A. Young, Texas A&M Health Science Center  
Stress and the Pathophysiology of Post-traumatic Stress Disorder (PTSD)
- 4:15 pm** Recognition of Poster Presenters
- 4:30 pm** Dr. Thomas H. Welsh, Jr., Texas A&M University  
Summary

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## **Trainee Poster Session**

Fri., Oct. 9 • 12:00 pm to 1:30 pm • MSC Room 2400

# Keynote Speaker



**Robert M. Sapolsky, PhD**

MacArthur Genius Fellow

John A. & Cynthia Fry Gunn Professor of Biology

Professor of Neurology & Neurosurgery

School of Medicine, Stanford University

Stanford, California

## Why Zebras Don't Get Ulcers: Stress and Health

As a boy in New York City, Robert M. Sapolsky dreamed of living inside the African dioramas in the Museum of Natural History. By the age of twenty-one, he made it to Africa and joined a troop of baboons. Although the life of a naturalist appealed to him because it was a chance to “get the hell out of Brooklyn,” he never really left people behind.

In fact, he chose to live with the baboons because they are perfect for learning about stress and stress-related diseases in humans. Like their human counterparts, baboons live in large, complex social groups and have lots of time, Dr. Sapolsky writes, “to devote to being rotten to each other.” Just like stressed-out people, stressed-out baboons have high blood pressure, high cholesterol, and hardened arteries. And just like people, baboons are good material for stories. His gift for storytelling led *The New York Times* to suggest, “If you crossed Jane Goodall with a borscht-belt comedian, she might have written a book like *A Primate's Memoir*,” Dr. Sapolsky's account of his early years as a field biologist.

The uniqueness of Dr. Sapolsky's perspective on the human condition comes from the ease with which he combines his insights from the field with his findings as a neuroscientist. For more than thirty years Dr. Sapolsky has divided his time between field work with baboons and highly technical neurological research in the laboratory. As a result, he can effortlessly move from a discussion of pecking orders in primate societies (human and baboon) to an explanation of how neurotransmitters work during stress—and get laughs doing it.

The problem for people, as Dr. Sapolsky explains in his book *Why Zebras Don't Get Ulcers*, is that our bodies' stress response evolved to help us get out of short-term physical emergencies—if a lion is chasing you, you run. But such reactions, he points out, compromise long-term physical health in favor of immediate self-preservation. Unfortunately, when confronted with purely psychological stressors, such as troubleshooting the fax machine, modern humans turn on the same stress response. “If you turn it on for too long,” notes Dr. Sapolsky, “you get sick.” Dr. Sapolsky regards this sobering news with characteristic good humor, finding hope in “our own capacity to prevent some of these problems...in the small steps with which we live our everyday lives.”

The humor and humanity he brings to sometimes-sobering subject matter make Dr. Sapolsky a fascinating speaker. He lectures widely on topics as diverse as stress and stress-related diseases, baboons, the biology of our individuality, the biology of religious belief, the biology of memory, schizophrenia, depression, aggression, and Alzheimer's disease.

Dr. Sapolsky is a MacArthur “Genius” Fellow, a professor of biology and neurology at Stanford University, and a research associate with the Institute of Primate Research at the National Museum of Kenya. In 2008, National Geographic & PBS aired an hour-long special on stress featuring Dr. Sapolsky and his research on the subject. In addition to *A Primate's Memoir*, which won the 2001 Bay Area Book Reviewers Award in nonfiction, Dr. Sapolsky has written three other books, including *The Trouble with Testosterone*, *Why Zebras Don't Get Ulcers*, and *Monkeyluv and Other Essays on our Lives as Animals*. Dr. Sapolsky was awarded Rockefeller University's Lewis Thomas Prize for Writing about Science for 2008. His articles have appeared in publications such as *Discover* and *The New Yorker*, and he writes a biweekly column for the *Wall Street Journal* entitled “Mind & Matter.” He is currently working on a book to be titled: *Human Aggression, Human Compassion and the Ambiguities of Biology*.

Dr. Sapolsky received his BA in biological anthropology from Harvard University and his PhD in Neuroendocrinology from Rockefeller University.

*Biography courtesy of the Steven Barclay Agency (barclayagency.com)*

# Symposium Organizers

## David W. Threadgill, PhD

University Distinguished Professor  
Tom & Jean McMullin Chair in Genetics  
Department of Molecular and Cellular Medicine  
College of Medicine, Texas A&M Health Science Center  
Department of Veterinary Pathobiology  
College of Veterinary Medicine & Biomedical Sciences  
Director, Institute for Genome Sciences & Society  
Texas A&M University, College Station, Texas



Dr. Threadgill's genetics research program uses the mouse as an experimental model to investigate factors that contribute to inter-individual differences in maintenance of health and incidence of disease in both animals and humans. Current research activities include the identification and functional characterization of alleles contributing to cancer susceptibility, the function of the Erbb gene family in development and disease, and the role of genetic variation in response to environmental stimuli, toxicants, or stressors. To facilitate these investigations, his team develops genetic tools to understand the complex genetic and environmental etiologies that result in disease phenotypes. Dr. Threadgill received his BS in Zoology (1983) and PhD in Genetics (1989), under the mentorship of Dr. James Womack, from Texas A&M University. Following an NIH-funded Postdoctoral Fellowship at Case Western Reserve University in Dr. Terry Magnuson's laboratory, he became an Assistant Professor in the Department of Cell Biology at Vanderbilt University in 1996. In 2000, he moved to the University of North Carolina at Chapel Hill where he was promoted to Professor in the Department of Genetics. In 2008, he moved to North Carolina State University as Professor and Head of the Department of Genetics. In 2011 Dr. Threadgill was named a Fellow in the American Association for the Advancement of Science in recognition of his distinguished contributions to the field of genetics, particularly for envisioning the Collaborative Cross model and establishing a new paradigm for pre-clinical drug safety testing. In 2013, Dr. Threadgill joined the faculty at Texas A&M University where he is the Director of the Texas A&M Institute for Genome Sciences & Society.

## Thomas H. Welsh, Jr., PhD

Professor and Texas A&M AgriLife Research Faculty Fellow  
Physiology of Reproduction Section Leader  
Department of Animal Science  
College of Agriculture & Life Sciences  
Department of Veterinary Integrative Biosciences  
College of Veterinary Medicine & Biomedical Sciences  
Texas A&M University, College Station, Texas



Dr. Welsh's endocrine physiology program focuses on how stress affects metabolism, growth, reproduction, and immunity by working at the population, whole animal, cellular or molecular levels to improve both animal and human health. Through interdisciplinary teamwork, students with Dr. Welsh and his colleagues have studied: 1) the effect of social and early-life stress on virally mediated neurodegenerative disease; 2) endocrine and immune factors that affect survival of septic neonates; 3) the role of stress hormones and temperament in regulation of innate and adaptive immunity; and, 4) potential epigenetic and metabolomic effects of prenatal stressors upon postnatal neuroendocrine and immune functions. Dr. Welsh earned his BS in Animal Science (1974) and PhD in Physiology & Biochemistry (1980), under the mentorship of Dr. Bryan Johnson at North Carolina State University. Following service as an NIH and Giannini Medical Foundation funded Postdoctoral Scholar in the Department of Reproductive Medicine at the University of California-San Diego in Dr. Aaron Hsueh's laboratory, he became an Assistant Professor of Physiology of Reproduction in the Department of Animal Science at Texas A&M University in 1983. He was granted tenure in 1988, promoted to Professor in 1996 and Section Leader in 2009, and designated as a Texas A&M AgriLife Research Faculty Fellow in 2012. Dr. Welsh coordinates an interdisciplinary team of Texas A&M University System researchers as part of the TAMU One Health Grand Challenge Initiative. The team's research focus is to determine genetic and environmental factors, including stress, that disrupt metabolic health in humans and animals, which may lead to lost productivity or chronic disease conditions.

# Symposium Presenters



## **Moshe Szyf, PhD**

James McGill Professor & GlaxoSmithKline-CIHR Chair  
Department of Pharmacology and Therapeutics  
College of Medicine, McGill University  
Montreal, Quebec, Canada

### **Epigenetic Processes Embedding Early-life Stress in the Genome**

Dr. Szyf is an international pioneer and leader in understanding basic epigenetic mechanisms and their broad implications in human behavior, health, and disease. Epigenetics refers to the study of altered gene expression that occurred without a change in DNA sequences. Three decades ago, Dr. Szyf's lab proposed that DNA methylation is a prime therapeutic target in cancer and other diseases. The lab also postulated, and then provided, the first set of evidence that the "social environment" early in life can alter DNA methylation, launching the emerging field of "social epigenetics." Dr. Szyf received his PhD in Biochemistry from Hebrew University Medical School (1985) under the mentorship of Dr. Aharon Razin and completed a postdoctoral fellowship in Genetics at Harvard Medical School. In 1989 he became an Assistant Professor in the Department of Pharmacology and Therapeutics at McGill University in Montreal. Dr. Szyf currently holds a James McGill Professorship and is the GlaxoSmithKline-CIHR Chair in Pharmacology. He is a fellow of the Royal Society of Canada and the founding co-director of the Sackler Institute for Epigenetics and Psychobiology. Dr. Szyf was the founder of the first "pharma company" to develop epigenetic pharmacology, "Methylgene Inc.," and the first journal in epigenetics, "Epigenetics."



## **Ronald D. Randel, PhD**

Professor, Regents Fellow, and  
Senior Texas A&M AgriLife Research Faculty Fellow  
Texas A&M AgriLife Research  
Overton, Texas

### **Temperament Is Linked with Stress Responsiveness and Is Controlled Genetically**

Dr. Randel is an internationally recognized expert on bovine reproductive endocrinology and physiology. Due to his extensive basic and applied research with tropically adapted cattle breeds such as the Brahman, Dr. Randel has presented invited papers on reproductive and stress physiology topics on six continents. For over 2 decades, Dr. Randel and colleagues have studied the influence of prenatal stress and temperament on health and productivity of beef calves. Dr. Randel's team used objective and subjective methods to assess calf temperament at an early age and demonstrated the heritability of temperament traits. For these contributions, he was the recipient of major awards from the American Society of Animal Science (Research Fellow, Physiology and Endocrinology Award, Casida Award for Excellence in Graduate Education, Distinguished Service Award) and the Texas A&M AgriLife Program (Individual Research, Team Research, International Involvement, and TAMU System Partnerships). Dr. Randel received his BS in Animal Science (1965) from Washington State University and his PhD (1971) from Purdue University. After service as a Research Scientist with USDA ARS in Miles City, Montana, Dr. Randel became an Associate Professor of Physiology of Reproduction at the Texas A&M AgriLife Research Center in Overton, Texas. As a member of the Department of Animal Science he has mentored over 32 PhD and 47 MS students. Dr. Randel's recent research on physiological and genetic factors affecting beef cattle productivity emphasizes the influence of prenatal stress on postnatal performance and health.

# Symposium Presenters

## Mary W. Meagher, PhD

Professor and Cornerstone Faculty Fellow  
Licensed Clinical Psychologist  
Department of Psychology, College of Liberal Arts  
Texas A&M University, College Station, Texas



## Adverse Life Experiences and Pain Sensitization

Mary W. Meagher is Professor of Psychology and Neuroscience at Texas A&M University. She received her PhD in Psychology from the University of North Carolina at Chapel Hill in Behavioral Neuroscience with a minor in Neurobiology. She subsequently completed postdoctoral training in Clinical Psychology at Texas A&M University followed by a clinical internship at the Audie L. Murphy Memorial Veteran's Administration Hospital in San Antonio. Her research focuses on the role of stress and emotion in health, with an emphasis on pain and inflammatory conditions. Meagher uses both animal and human laboratory models to examine how stress modulates pain and sensitivity. Her recent human studies investigate the effects of adverse early life events on pain sensitization and the mitigating effects of exposure interventions. Other work examines the effects of persistent pain on motivation and decision-making using EEG to assess changes in prefrontal regulation. Her recent animal work examines how psychosocial stressors alter vulnerability to an animal model of multiple sclerosis, Theiler's murine encephalomyelitis virus infection. The long-term goal of this research program is to elucidate mechanisms by which early life stress alters susceptibility to later infectious, inflammatory, and autoimmune diseases. She is a Fellow of the American Psychological Association in Divisions 6 (Behavioral Neuroscience) and 12 (Clinical Psychology) and the recipient of several university awards for research and service. Meagher and her collaborative team have been funded by grants and fellowships from NIH, NSF, and the National Multiple Sclerosis Society.

## Jackie D. Wood, PhD, AGAF

Professor, Department of Physiology and Cell Biology  
and Department of Internal Medicine  
College of Medicine, The Ohio State University  
Columbus, Ohio



## Stress and the Gastrointestinal Tract

Dr. Wood is internationally recognized for his pioneering work on the neural control of gastrointestinal function. He studies the function of the enteric nervous system or the "little brain in the gut," which is a phrase he has popularized. He is the author or co-author of numerous journal articles, abstracts, books and book chapters focused on emerging concepts in neurogastroenterology and stress. Dr. Wood and colleagues conducted translational research by studying impacts of stressors on gut functions in rodent, non-human primate and human models. Dr. Wood received his BS (1964) in Biology and MS (1966) in Physiology from Kansas State University-Pittsburgh, and PhD (1969) in Physiology and Biophysics from the University of Illinois-Urbana. He was an Assistant Professor of Biology at Williams College in Massachusetts from 1969-1971 after which time he was appointed as Assistant Professor at the University of Kansas School of Medicine and Medical Center in 1971, and promoted to Professor in 1979. He served as Professor and Chairman in the Department of Physiology of the University of Nevada School of Medicine from 1979-85 and as Professor the Department of Physiology and Professor of Internal Medicine at The Ohio State University College of Medicine (served as Chair from 1985-97). Dr. Wood is an editorial board member for several leading medical and physiology journals and has been the principal investigator for research grants from the National Institutes of Health (NIH) continuously since 1971. In recognition of his pioneering research and distinguished leadership, Dr. Wood was inducted as a Fellow of the American Gastroenterological Association in 2006. He is a frequent lecturer on topics and concepts in neurogastroenterology. The subject of Dr. Wood's presentation at this Symposium is the effects of stress on functions of the gastrointestinal tract.

# Symposium Presenters



## **Martin B. Dickman, PhD**

University Distinguished Professor  
Christine Richardson Professor of Agriculture  
Director, Institute for Plant Genomics & Biotechnology  
Department of Plant Pathology & Microbiology  
College of Agriculture & Life Sciences  
Texas A&M University, College Station, Texas

### **Death Be Not Proud: Modulation of Programmed Cell Death for Disease Development/Stress Tolerance in Plants**

Dr. Dickman, University Distinguished Professor, the Christine Richardson Professor of Agriculture, Director of the Institute for Plant Genomics and Biotechnology, and Professor of Plant Pathology, is an internationally recognized and distinguished scientist specializing in the genetics and molecular biology of fungi and fungal-plant interactions. His primary emphasis is on plant programmed cell death regulation (PCD). Dr. Dickman was the first to demonstrate that plant and animal systems, though lacking primary sequence conservation, are highly similar functionally and he further showed that plant and animal PCD components can complement each other. This disproved the paradigm that plants were incapable of apoptosis. He demonstrated that PCD is broadly conserved across phylogenetic kingdoms. He demonstrated that several important plant pathogens can manipulate the host's PCD pathways to assist in causing disease, and whether this occurred was dependent on cell context and pathogen lifestyle. Dr. Dickman received his BS (1979) in Horticulture and his MS (1982) and PhD (1986) degrees in Plant Pathology from the University of Hawaii. Dr. Dickman completed postdoctoral training at Washington State University and served as Charles Bessey Professor at the University of Nebraska before becoming Christine Richardson Professor of Agriculture and Director of the Institute for Plant Genomics & Biotechnology at Texas A&M University in 2006. Dr. Dickman is a Fellow of the American Phytopathological Society, American Society for Microbiology and the American Association for the Advancement of Science.



## **Jeffery A. Carroll, PhD**

Research Leader, Livestock Issues Research Unit  
USDA Agricultural Research Service (ARS)  
Lubbock, Texas

### **Linking Stress, Metabolism, and Immune Function in Cattle**

Dr. Carroll, a Research Physiologist with the USDA, is recognized for his fundamental research to determine how stress affects the physiological and behavioral responses of cattle and swine. Dr. Carroll's team is developing management practices and alternative production systems to enhance animal well-being. In addition, they study how stress induced alterations in immune responses relate to pre-harvest food safety. His research group has been the recipient of several industry and professional society awards in recognition of their leadership to discover linkages of cytokine and endocrine factors that regulate metabolism and health of weaned pigs and calves. Dr. Carroll's integrative research philosophy facilitates collaborations with both industry and university scientists. He holds Adjunct Professor and Graduate Faculty appointments at Texas A&M University in College Station and Kingsville, Mississippi State University, the University of Missouri, the University of Nebraska, Oregon State University, Texas Tech University, and West Texas A&M University. Dr. Carroll completed his BS (1991) in Animal Science and his MS (1993) and PhD (1996) in Physiology of Reproduction from Texas A&M University. In 1996, he joined the USDA ARS Animal Physiology Research Unit located in Columbia, Missouri, where he served as a Research Physiologist for eight years. In 2004, Dr. Carroll became the Research Leader for the USDA ARS Livestock Issues Research Unit in Lubbock, Texas. His team is actively addressing methods to mitigate adverse effects of stress and develop alternatives to antimicrobials to enhance health and wellbeing of growing pigs and calves. His presentation at this Symposium will focus on the relationships among stress, metabolism, and immune function.

# Symposium Presenters

## Stephen D. Hursting, MPH, PhD

Professor, Department of Nutrition  
The Nutrition Research Institute  
The Lineberger Comprehensive Cancer Center  
University of North Carolina–Chapel Hill, North Carolina



### Genetic and Hormonal Mechanisms that Impair Metabolic Health

Dr. Hursting earned a BA (1980) in Biology from Earlham College in Richmond, VA and an MPH in Nutritional Epidemiology (1984) and a PhD (1992) in Nutritional Biochemistry from the University of North Carolina at Chapel Hill. As a Cancer Prevention Fellow at the National Cancer Institute (NCI) Dr. Hursting completed postdoctoral training in molecular biology and cancer prevention. From 1995 to 1999, Dr. Hursting was an Assistant Professor in the Departments of Epidemiology and Carcinogenesis at the University of Texas MD Anderson Cancer, where he directed a multidisciplinary research program in nutrition and cancer prevention. He is now an Adjunct Professor of Epidemiology and Carcinogenesis at the MD Anderson Cancer Center. From 1999–2005, Dr. Hursting was Deputy Director of the NCI's Office of Preventive Oncology and Chief of the Nutrition and Molecular Carcinogenesis Section of the NCI's Laboratory of Biosystems and Cancer. In 2014 Dr. Hursting became Professor in the Department of Nutrition, the Nutrition Research Institute, and the Lineberger Comprehensive Cancer Center all at the University of North Carolina-Chapel Hill. His research program focuses on the nutritional modulation of the carcinogenesis process, with a particular focus on hormonal and genetic factors that affect metabolic health.

## Mahua Choudhury, PhD

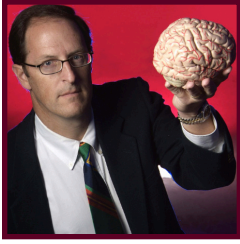
Morris L. Lichtenstein, Jr. Medical Research Foundation Scientist  
Assistant Professor  
Department of Pharmaceutical Sciences  
Rangel College of Pharmacy  
Texas A&M Health Science Center  
Kingsville, Texas



### Plasticizer: Foe or Friend? An Epigenetic View

Dr. Choudhury investigates epigenetic regulation using a variety of models using rodent, non-human primate, and human derived cells and tissues. Her lab's primary research interest is in maternal-fetal health and metabolic syndrome, with a focus on epigenetics and the biology of microRNAs. Dr. Choudhury's research team members investigate epigenetic regulation (DNA methylation, microRNA, and histone modifications) as an early step towards diminishing mortality in human populations who are at high risk with pregnancy disorders or metabolic complications. Dr. Choudhury earned her BS (1999) in Zoology, Botany, Chemistry and MS (2001) in Molecular Biology, Biophysics & Genetics from the University of Calcutta and her PhD (2008) in Medical Pharmacology from the University of Missouri-Columbia. From 2008 to 2011 Dr. Choudhury was an American Diabetes Association Postdoctoral Fellow and subsequently a Research Instructor in Pediatrics and Neonatology at the University of Colorado-Aurora. In 2012, Dr. Choudhury became an Assistant Professor of Pharmaceutical Sciences in the Texas A&M Health Science Center at Kingsville, Texas. Dr. Choudhury's research is funded by several organizations including the Bill and Melinda Gates Foundation, Mitsubishi, the American Diabetes Association, and the Morris L. Lichtenstein Foundation. With their support Dr. Choudhury's research team is working toward understanding and controlling interactions of diet and environmental chemicals on genetic control of metabolism, especially during gestation.

# Symposium Presenters



**Keith A. Young, PhD**

Professor

Department of Psychiatry & Behavioral Science

Texas A&M Health Science Center

Central Texas Veterans Health Care System

Temple, Texas

## **Stress and the Pathophysiology of Post-traumatic Stress Disorder (PTSD)**

Dr. Young leads research efforts to understand susceptibility to post traumatic stress disorder (PTSD). The Neuropsychiatry Research Program of the Texas A&M HSC Department of Psychiatry and Behavioral Science has been performing research into serious mental conditions for over 15 years, recently focusing on stress-related disorders in military veterans. The lab specializes in human brain molecular, anatomical, and genetic studies using stereological techniques and focusing on the thalamus. The lab is currently pursuing investigations of the role of subcortical circuits in stress responses and PTSD. Dr. Young's team studies the genetic factors associated with neurological disorders such as autism, depression, schizophrenia and PTSD. For example, Dr. Young helps lead a national consortium to collect PTSD brains and is a member of the steering committee of the newly formed Veterans Administration (VA) National PTSD Brain Bank. He is a PI in the Consortium to Alleviate PTSD (CAP), which is performing genetic and epigenetic research on pre and post deployment samples from over 4,500 active-duty troops at Fort Hood and on post-mortem PTSD brain samples. Dr. Young is also a co-investigator on genetic studies of 500 veterans enrolled in VA longitudinal studies. "In one of the first studies of PTSD brain, we have found anatomical and molecular evidence for loss of synaptic and neuronal elements in the orbitofrontal cortex that is consistent with animal models of severe stress. Cortical pathophysiology may be the end result of a serotonergic genetic predisposition to PTSD, related to a developmental enlargement of the pulvinar nucleus of the thalamus. Since this nucleus is a major node in an ancient circuit controlling defensive and escape behaviors, our working hypothesis is that this anatomical enhancement alters responses to environmental signals, contributing to poor recovery from post-traumatic stress."

## **Evolution of Stress: From the Genome to Disease About the Symposium**

The "fight-or-flight" response—the reaction to real or perceived threats—no doubt saved many of our ancestors from harm. This instinct, seen in humans and animals, evolved to deal with the stress arising from dangerous situations, such as that lion chasing them. However, when this increased level of stress continues for an extended period of time—as it often does in modern culture where we are chronically stressed—it can lead to disease and chronic disorders. Current research unravels the biological and genetic origins of stress response with the goal of reducing its negative impact while still maintaining its evolutionary benefits. This symposium will explore current knowledge of stress research and how it can be used to improve human, animal, and plant health.

# Members of the Stress and Metabolic Health Team

The TAMU One Health Grand Challenge Initiative consists of 4 projects. This symposium is co-sponsored by The One Health project entitled, "Genetic and Environmental Regulation of Metabolic Health," which aims to improve one's health by reduction of stress and obesity. The team's long-term goal is to enhance health and well-being by alleviation of the adverse physical, societal and economic effects of stressful, chronic diseases and conditions in humans and animals, especially metabolic dysregulation and obesity.

Member	College/Agency
Dr. Robert Alaniz	Medicine (College Station)
Dr. Gordon Carstens	Agriculture & Life Sciences
Dr. Mahua Choudhury	Pharmacy (Kingsville)
Dr. Noah Cohen	Veterinary Medicine & Biomedical Sciences
Dr. Kevin Curley	Veterinary Medicine & Biomedical Sciences
Dr. Sherecce Fields	Liberal Arts
Dr. Idethia Shevon Harvey	Education & Human Development
Dr. Kianfar Kiavash	Engineering
Dr. Narendra Kumar	Pharmacy (Kingsville)
Dr. Sara Lawhon	Veterinary Medicine & Biomedical Sciences
Dr. John Lawler	Education & Human Development
Dr. Jeffrey Liew	Education & Human Development
Dr. Dai Lu	Pharmacy (Kingsville)
Dr. Lisako McKyer	Education & Human Development
Dr. Mary Meagher	Liberal Arts
Dr. Cynthia Meininger	Medicine (Temple)
Dr. Peter Murano	Agriculture & Life Sciences
Dr. David Potter	Pharmacy (Kingsville)
Dr. Ron Randel	Texas A&M AgriLife Research (Overton)
Dr. Penny Riggs	Agriculture & Life Sciences
Dr. Loren Skow	Veterinary Medicine & Biomedical Sciences
Dr. Jan Suchodolski	Veterinary Medicine & Biomedical Sciences
Dr. Jane Welsh	Veterinary Medicine & Biomedical Sciences
Dr. Tom Welsh	Agriculture & Life Sciences
Dr. Steven Woltering	Education & Human Development
Dr. Keith Young	Medicine (Temple)
Dr. Beiyang Zhou	Veterinary Medicine & Biomedical Sciences



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