



DEPARTMENT OF PHYSIOLOGY

DEPARTMENT OF PHYSIOLOGY FACULTY

Zhongjie Sun, MD, PhD, FAHA

Professor and Chair
Thomas A. Gerwin Chair of Excellence
in Physiology

Ade Adebisi, PhD

Associate Professor

Julio Cordero-Morales, PhD

Assistant Professor

Ioannis Dragatsis, PhD

Associate Professor

Zheng Fan, PhD

Professor

Polly Hofmann, PhD

Professor
Senior Executive Associate Dean
in the College of Medicine

Jonathan H. Jaggard, PhD

Maury W. Bronstein Professor

Salvatore Mancarella, PhD

Assistant Professor

Helena Parfenova, PhD

Professor

Kaushik Parthasarathi, PhD

Associate Professor

Gadiparthi N. Rao, PhD

George and Elizabeth Malloy
Professor of Physiology

Radhakrishna Rao, PhD

Professor

Donald B. Thomason, PhD

Professor
Dean, College of Graduate Health Sciences

Gabor J. Tigyi, MD, PhD

Van Vleet Professor

Valeria Vasquez, PhD

Assistant Professor

DEPARTMENT OF PHYSIOLOGY STAFF

Akiah Jones, MBA

Senior Administrative Assistant

Cicely Hicks, MBA

Operations Manager

Nathan Tipton, PhD

Administrative Coordinator/Executive
Assistant to the Chair



DR. HELENA PARFENOVA RECEIVES \$2.1 MILLION NIH GRANT TO STUDY NEWBORN SEIZURES

Dr. Helena Parfenova, Professor of Physiology, was recently awarded \$2.1 million to further study the functions and mechanisms behind neonatal seizures and to uncover potentially naturally-occurring defensive mechanisms to prevent cerebrovascular disease in newborns. The neonatal brain is vulnerable to compromises in its blood supply due to its rapid development of neurons, and seizures are the most frequent abnormal neurological event in newborns. Neonatal cerebrovascular disease caused by oxidative stress during seizures, hypoxia/asphyxia, and ischemia can lead to debilitating neurological complications. At present, there is no effective treatment to prevent neurovascular dysfunction triggered by neonatal seizures. Dr. Parfenova and her collaborators, Dr. Jonathan Jaggard, Maury W. Bronstein Endowed Professor of Physiology, and Dr. Massroor Pourcyrus, professor in the Departments of Pediatrics and Physiology, will use a combination of complementary techniques in a clinically-relevant study design. They will focus on the mechanisms that are responsible for stimulation of endothelial carbon monoxide (CO) production that, in small amounts, has proven to be a vital part of antioxidant defense mechanisms that promote endothelial cell survival in newborn brains. Dr. Parfenova's team will study how endothelial CO helps strengthen the antioxidant defense mechanism in the brain in response to head cooling. As Dr. Parfenova notes, "head or total body cooling is currently only approved for caring for babies with neonatal hypoxic-ischemic insult, a type of brain damage that occurs when an infant's brain does not receive enough oxygen and blood. We anticipate that head cooling may be used as an effective therapeutic approach to prevent neonatal cerebrovascular disease, protect blood-brain barrier integrity, and improve the neurodevelopmental outcome in babies with epileptic seizures." Dr. Parfenova's project, titled "Endothelial Vasoprotection by Hypothermia," is being funded for five years by the National Institutes of Health. To learn more, please contact Dr. Parfenova at hparfeno@uthsc.edu. For media coverage about Dr. Parfenova's exciting research, please visit dailymemphian.com/article/2099/Mild-hypothermia-could-reduce-harmful-effects-of-newborn-seizures.

DEPARTMENT OF PHYSIOLOGY YEAR END REVIEW EVENT

Physiology Faculty, postdocs, graduate students, support staff, and family and friends gathered on Saturday, December 8, at the Fogelman Executive Center Holiday Inn University of Memphis to celebrate a wonderful year for the Physiology department. Dr. Zhongjie Sun, Thomas A. Gerwin Chair of Excellence in Physiology, delivered a wonderful PowerPoint presentation outlining the department's many outstanding accomplishments in 2018, and then presented three awards. Dr. Don Thomason, Professor and Dean in the College of Graduate Health Sciences, was given the Outstanding Service by a Faculty Member award. Dr. Rachel Helms, Graduate Research Assistant for Dr. Kaushik Parthasarathi, was presented with the Outstanding Student Award. Akiyah Jones, MBA, Senior Administrative Assistant in Physiology, was conferred with the Outstanding Service by a Support Staff Member award. Attendees praised the event as a resounding success, and the evening culminated with dinner and dancing. We look forward to commemorating even more departmental successes in 2019!



Dr. Rachel Helms and Dr. Adebawale Adebisi



UTHSC Physiology Faculty



Akiyah Jones and Dr. Gabor Tigyi



Alicia Stires and Patricia Fayne



Dr. Zhongjie Sun



Dr. Rachel Helms and
Dr. Kaushik Parthasarathi



Briar and Kaitlyn Bell



Dr. Zhongjie Sun



Drs. Gabor Tigyi, Rusty Johnson
and Aziz Hassid



Dr. Ioannis Dragatsis, Dr. Ade Adebisi,
and Dr. Kaushik Parthasarathi



Barbara Patton, Cicely Hicks,
Nathan Tipton and Akiyah Jones



Alex Fedinec, Susan Fedinec,
Helena Parfenova,
Dianna Liu, and Giri Chandaka

DR. HELENA PARFENOVA INVITED TO PRESENT AT CENTER FOR PERINATAL BIOLOGY SEMINARS

In December 2018, Dr. Helena Parfenova, Professor of Physiology, was invited to present at the Lawrence D. Longo, MD, Center for Perinatal Biology at Loma Linda University in California. She presented two seminars: “Dual faces of oxidative stress: lessons from animal models of neonatal brain disease” as part of the Integrated Biomedical Sciences Graduate Seminar series, and “Hydrogen sulfide: a novel gasotransmitter and cerebrovascular protector during neonatal asphyxia” for the Perinatal Biology Seminar. Founded over three decades ago, the Center for Perinatal Biology functions as a mini-institute within Loma Linda University. It consists of a group of biomedical scientists devoted to investigation of the biology of the developing fetus and newborn infant. Without exception, the faculty of the Center for Perinatal Biology are national and international leaders in fetal and neonatal physiology and/or biochemistry and are experts in their individual discipline. To learn more, please contact Dr. Parfenova at hparfeno@uthsc.edu. For more information about the Lawrence D. Longo, MD, Center for Perinatal Biology, please visit: medicine.llu.edu/research/centers/lawrence-longo-center-perinatal-biology

DR. JONATHAN JAGGAR'S LAB PUBLISHES ARTICLE IN ELIFE

Dr. Jonathan Jaggar, Maury W. Bronstein Endowed Professor of Physiology, along with members of his lab, recently published a paper in eLife in December 2018. The paper, “Arterial smooth muscle cell PKD2 (TRPP1) channels regulate systemic blood pressure,” dovetails with Dr. Jaggar’s research interest of investigating the physiological regulation of arterial contractility and systemic blood pressure by ion channels expressed in smooth muscle and endothelial cells. The article can be found at elifesciences.org/articles/42628, and was covered by PNAS (blog.pnas.org/2018/12/journal-club-ion-channel-puts-the-squeeze-on-blood-vessels-affecting-blood-pressure/), AAAS (eurekalert.org/pub_releases/2018-12/e-ndt120518.php), and Science Daily (sciencedaily.com/releases/2018/12/181205134042.htm). Dr. Jaggar received his PhD in Potassium Channels from the University of Sheffield (UK), and he did postdoc work in vascular physiology at the University of Vermont at Burlington before joining the Physiology Department at UTHSC. Dr. Jaggar’s lab also examines pathological alterations in ion channels that are associated with cardiovascular diseases, including hypertension and stroke. His lab currently studies ion channels including TRP, KV, ANO1, and CaV1.2 proteins. To learn more, please contact Dr. Jaggar at jjaggar@uthsc.edu, or visit his website at uthsc.edu/physiology/faculty/jjaggar.php

DR. REBECA CAIRES MUGARRA AWARDED A 2019 NEUROSCIENCE POSTDOCTORAL/RESEARCH ASSOCIATE AWARD

Dr. Rebeca Caires Mugarra, a postdoc in Dr. Julio Cordero-Morales’s lab, has been awarded a Neuroscience Postdoctoral/Research Associate Award from the UTHSC Neuroscience Institute for calendar year 2019. This award provides a total of \$15,000 toward salary and fringe. Dr. Mugarra is also eligible for a \$500 travel award supplement in 2019, which is awarded contingent on being the first author of a submitted abstract and/or invited speaker at any scientific meeting. Dr. Mugarra received her PhD from the Instituto de Neurociencias de Alicante (UMH-CSIC) in Spain and has been a postdoc at UTHSC since 2016. She has been the first author on journal articles that appeared in Cell Reports (2017) and Nature Communications (2015).



Dr. Mugarra’s work is focused on trying to elucidate how bioactive lipids can modulate the biophysical properties of ion channels, such as TRP channels. Her long term research goal is to help understanding the physiological and biophysical basis of membrane proteins involved in pain, somatosensation, proprioception, and inflammation. To learn more about the Neuroscience Institute at UTHSC, please visit uthsc.edu/neuroscience. For more information about Dr. Mugarra’s work with Dr. Cordero’s lab, please visit corderovasquezlab.com.



DR. PAULA DIETRICH INTERVIEWED FOR SCIENCE MAGAZINE ARTICLE

Dr. Paula Dietrich, neurobiologist and Assistant Professor of Physiology, was interviewed for an article on a promising new drug that will be used to combat Huntington disease. The article, “Daring to Hope,” appeared in the August 24, 2018, issue of *Science*, and the interview portion with Dr. Dietrich refers to the work being done in Dr. Ioannis Dragatsis’s lab, of which Dr. Dietrich is a member. The article also mentions the huntingtin paper (“Elimination of huntingtin in the adult mouse leads to progressive behavioral deficits, bilateral thalamic calcification, and altered brain ion homeostasis”) published by Drs. Dietrich and Dragatsis, along with lab members Drs. Irudayam Maria Johnson and Shanta Alli, that appeared in *PLOS Genetics* in 2017. The *Science* article is available at sciencemag.org/news/2018/08/i-feel-so-much-hope-new-drug-keeping-woman-s-deadly-huntington-disease-bay, while the *PLOS Genetics* paper can be found at journals.plos.org/plosgenetics/article?id=10.1371/journal.pgen.1006846. Dr. Dietrich received

her PhD in Genetics and Development from Columbia University and did postdoctoral work in the Division of Neurology at Columbia before coming to UTHSC. To learn more, contact Dr. Dietrich at pdietric@uthsc.edu.

DR. IOANNIS DRAGATSI INVITED TO SPEAK AT ANNUAL HUNTINGTON STUDY GROUP (HSG) GATHERING

Dr. Ioannis Dragatsis, Associate Professor of Physiology, was invited to be an educational course speaker at the HSG 2018: Unlocking HD annual gathering in November 2018 in Houston, Texas. Dr. Dragatsis presented as part of the Effect of Htt Lowering—Mutant Htt and Normal Htt session. The HSG has been holding annual gatherings since 1993 in support of their mission to seek treatments that make a difference to those impacted by Huntington disease. Dr. Dragatsis is a renowned expert in the field of Huntington disease and has

published numerous articles on the subject including a recent paper that appeared in *PLOS Genetics* and was featured in the journal *Science*. Dr. Dragatsis is also Director of UTHSC’s Transgenic Facility which generates transgenic and knockout mice for a large number of faculty both on campus and across the world. To learn more, please contact Dr. Dragatsis at dragats@uthsc.edu. For more information about the Huntington Study Group, please visit: huntingtonstudygroup.org

For more information, please contact:

Department of Physiology | 956 Court Ave. | Memphis, TN 38163
t 901.448.2675 | t 901.448.7111 | f 901.448.7126

uthsc.edu/physiology