DEPARTMENT OF ANESTHESIOLOGY AND PERIOPERATIVE MEDICINE

RESEARCH DAY

Monday, January 13, 2020

Agenda

3:30 p.m.  Welcome and Opening Remarks

3:40 p.m.  Visiting Professor Miles Berger, M.D., Ph.D.

4:40 p.m.  Outstanding Research – Clinical Science: Jack Crawford, M.D., Ph.D.

5:00 p.m.  Outstanding Research – Basic Science: Nithya Mariappan, Ph.D.

5:20 p.m.  Poster presentations

6:45 p.m.  Awards and Closing Remarks
Guest Speaker - Miles Berger, M.D., Ph.D.

Miles Berger completed his M.D. and Ph.D. at the University of California, San Francisco. He is a neuro-anesthesiologist and human translational neuroscientist at Duke University, where his group studies pathophysiologic mechanisms of perioperative neurocognitive disorders such as neuroinflammation, and their interaction with Alzheimer’s disease pathology. His team uses a variety of methods ranging from electroencephalogram and functional magnetic resonance imaging, to cognitive testing and delirium screening, to cerebrospinal fluid biomarker studies and flow cytometry. Dr. Berger’s research has been funded by the National Institute on Aging, Foundation for Anesthesia Education and Research, International Anesthesia Research Society, the Alzheimer’s Drug Discovery Foundation and the American Geriatrics Society.

Presentations

Jack Crawford, M.D., Ph.D.
Dr. Jack Crawford was the first trainee to participate in the Resident Academic Career Development (now STAR) Program during which time he investigated the changes that occur in red blood cells during storage prior to donation. These changes in red blood cells accelerate reactions with nitric oxide and thereby alter regulation of microvascular tone following transfusion. After completing the program, Dr. Crawford joined the faculty of the UAB Department of Anesthesiology and Perioperative Medicine in 2011 and went on to develop a new division that focuses on his primary interest, congenital heart disease and currently serves as the Vice Chair and Director of the Division of Congenital Cardiac Anesthesiology. Dr. Crawford’s research focuses on the inflammatory response and multi organ dysfunction in children after surgery involving cardiopulmonary bypass. He has ongoing clinical research projects aimed at improving perioperative care for these patients and was awarded a Young Investigator Award by the Society for Pediatric Anesthesiology in 2015.
Nithya Mariappan, Ph.D.

Dr. Nithya Mariappan is a Senior Postdoctoral Research Fellow in the Department of Anesthesiology and Perioperative Medicine at University of Alabama at Birmingham. Dr. Mariappan graduated with a doctoral degree from the University of Madras, Chennai, India. Thereafter, she was selected for the National Award by the Department of Biotechnology, Government of India, for her postdoctoral research at Central Leather Research Institute, Madras. She continued her training at Louisiana State University and studied the role of inflammation on mitochondrial function in the context of cardiovascular and metabolic disorders such as obesity and diabetes. Dr. Mariappan continued her research at the University of Arkansas for Medical Sciences as an NIH-funded T32 fellow. To pursue further research in inflammation, she joined UAB, focused on applying her knowledge and expertise in inflammation for the development of therapeutic strategies against warfare chemical agent-induced lung injury and toxicity. Dr. Mariappan has presented over 35 conference abstracts, published 30 peer-reviewed journal articles and received several awards from different associations (DBT-Govt of India, American Heart Association, Society of Toxicology and the American Thoracic Society.

### Posters on Display

<table>
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<th>Poster Number</th>
<th>Title and Participants</th>
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| 1             | Nucleic acid scavenging rescues rats from chemical-induced ARDS  
Nithya Mariappan, Maroof Husain, Iram Zafar, Vinodkumar Singh, Kenneth G. Smithson, Jean-Francois Pittet, Shama Ahmad and Aftab Ahmad |
| 2             | Post-exposure treatment with esomeprazole protects pregnant mice from mortality and from compromised fetal growth after exposure to chlorine gas  
Molyvdas A., Ren C., Dunigan K., Tipple T.E., Matalon S. and Jilling T. |
| 3             | Novel Biomarkers of Preeclampsia: Aquaporins and Fatty Acids, and S100B  
Dina Ford, Brittany Hatter, Adam Sturdivant, Sadis Matalon, Tamas Jilling and Tekuila Carter |
| 4             | Primary Air-Liquid Interface (ALI) cultures of human, ferret and mouse tracheal/bronchial cells (HBEC, FTEC and MTEC) are effective models for the study of airway pathogens, host responses and therapeutic interventions  
Jennifer L. Tipper, Bethany B. Brock, Courtney F. Moon and Kevin S. Harrod |
| 5             | α1G T-type Calcium Channel Determines the Angiogenic Potential of Pulmonary Microvascular Endothelial Cells  
Zhen Zheng, Hairu Chen, Peilin Xie, Carol A. Dickerson, Judy A. C. King, Mikhail F. Alexeyev and Songwei Wu |
| 6             | Cardiac specific SERCA knock out mice replicate adverse cardiac effects of bromine and demonstrate enhanced myocardial injury |
Juan Xavier Masjoan Juncos, Shazia Shakil, Wayne E. Bradley, Iram Zafar, Nithya Mariappan, William E. Louch, Louis J. Dell'Italia, Ganesh Halade, Aftab Ahmad and Shama Ahmad

7 A role of voltage-gated potassium channel Kv4.3 in controlling orofacial nociception of cooling temperatures
Ya-Ting Chang, Hirosato Kanda and Jianguo G Gu

8 Influenza conferred susceptibility to pneumococcal virulence is mediated through oxidative stress
Kevin S. Harrod, Norberto Gonzales, Jennifer Tipper, Alexander Jureka, John Trombley, Jeffrey Brand, Ashleigh Riegler, Ninecia Scott and Carlos Orihuela

9 Acute Pulmonary and Serologic Changes in the Proteomes of Bromine Exposed Mice
James A. Mobley, Stephen Doran, Saurabh Aggarwal, Dylan Addis, Kyoko Kojima and Sadis Matalon

10 T1 Erector Spinae Plane Block Catheter as a Novel Treatment Modality for Pancoast Tumor Pain
Hari Kalagara, Paige Deichmann, Brandon Brooks, Peter Nagi, Promil Kukreja

11 Chauncey D. Leake, Ph.D. Scientist, Historian, Humanitarian
Mark G. Mandabach

12 Emerging role of extracellular nucleic acids in a gastric aspiration model of ARDS
Nithya Mariappan, Iram Zafar, Chih-Chang Wei, Wayne Bradley, Shama Ahmad and Aftab Ahmad

13 S-nitrosothiols as Nitric Oxide Donors to Protect against Cardiovascular Disease risk factors of Endothelial Dysfunction, Arterial Stiffness and Hypertension
Nagababu Enika and Dan E. Berkowitz

14 Doppler indices of diastolic function in pregnant mice after bromine gas exposure
Dylan R. Addis, Tamas Jilling and Sadis Matalon

15 Characterizing electrophysiological properties of the nodes of Ranvier at motor never fibers using the in situ pressure-patch-clamp recording technique
16 Solvent/detergent-treated plasma vs. fresh frozen plasma for cardiopulmonary bypass surgery in children: single center, case control comparison
Jack H. Crawford, Krissie Hock and Santiago Borasino

17 Effects of spinal contusion injury on lower urinary tract function in a female mouse model
Salvador Lopez, Cary DeWitte, Chan-Ho Lee and Jennifer J. DeBerry

18 Estrogens Alleviate Parasympathetic-induced, α7nAChR-mediated Mortality from secondary P. aeruginosa lung infection after Traumatic Brain Injury in Mice
Jean-Francois Pittet, Angela P. Brandon, Cilina A. Evans, Rebekah J. Muthalaly and Brant M. Wagener

19 Reserved bed pilot program increases transfer volume and improves capacity strain in a large neurosciences intensive care unit
Christopher D. Shank, Nicholas J. Erickson, David W. Miller, Brittnay F. Lindsey and Beverly C. Walters

20 Comparing Traditional, Immersive Simulation with Rapid Cycle Deliberate Practice in Postgraduate Year 2 Anesthesiology Residents
Tekuila Carter, Erin Blanchard, Lee Ann Riesenberg, Lisa Bergman and Emma O’Hagan

21 Preoperative low-dose PO Baclofen administration as an analgesic adjuvant
Cathy Q. Zhang, Mark Mandabach, Robert Sorge, Timothy Ness, Dean Assimos and Kyle Wood

22 Impairment of slowly adapting type 1 mechanoreceptors in mice following vincristine treatment
Mayumi Sonekatsu, Akihiro Yamada and Jianguo G. Gu

23 Mechanisms of delayed cardiac hypertrophy, ultrastructural damage and systolic dysfunction after a single bromine exposure
Juan Xavier Masjoan Juncos, Shazia Shakil, Wayne E. Bradley, Wei Chih-Chang, Iram Zafar, Pamela Powell, Nithya Mariappan, William E. Louch, Aftab Ahmad, Louis J. Dell’Italia and Shama Ahmad
The alveolar epithelium produces cytotoxic amyloids that disrupt naïve alveolar-capillary integrity via the Receptor for Advanced Glycation End-products

Jean-Francois Pittet, Angela P. Brandon, Ryan D. Berry, Steven Gu, Ron Balczon, Troy Stevens and Brant M. Wagener

Precision Medicine in Anesthesia: Genetic Component in Opioid-induced Respiratory Depression

Alethia Sellers

Codeployment of a percutaneous edge-to-edge mitral valve repair device and a ventriculoseptal defect occluder device to address complex mitral regurgitation with leaflet perforation

Dylan R. Addis

Chemical-based portable inhaled nitric gas generating drug-device for the treatment of pulmonary hypertension

Nagababu Enika and Dan E. Berkowitz

Characterization of lung injury in mice exposed to inhaled arsenic trioxide

Nithya Mariappan, Iram Zafar, Chi-Chang Wei, Shama Ahmad, Hannah M. Goymer, Mohammad Athar, Veena B. Antony and Aftab Ahmad

Heme induces aberrant pulmonary remodeling and alveolar damage following inhalation lung injury

Israr Ahmad, Adam Lam, Matthew A. Carlisle, Changzhao Li, J. Michael Wells, S. Vamsee Raju, Mohammad Athar, Steven M. Rowe, Mark T. Dransfield, Saurabh Aggarwal and Sadis Matalon

Anterior quadratus lumborum block analgesia for total hip arthroplasty: a randomized, controlled study

Promil Kukreja, Lisa MacBeth, Adam Sturdivant, Charity J. Morgan, Elie Ghanem, Hari Kalagara, Daniel Johns, Benjamin Wilson and Vincent W. S. Chan

Neuronal Wiskott–Aldrich syndrome protein regulates Pseudomonas aeruginosa-induced lung vascular permeability through modulation of actin cytoskeletal dynamics

Pulin Che, Brant M. Wagener, Xueke Zhao, Angela P. Brandon, Cilina A. Evans, Guo-Qiang Cai, Rui Zhao, Zhi-Xiang Xu, Xiaosi Han, Scott Snapper, Jean-Francois Pittet and Qiang Ding

AMPK activation increases survival in animal models of acute lung injury
33 Intraoperative hemodynamic changes under general anesthesia in patients receiving preoperative neuraxial interventions
G.J. Gallegos, C.J. Morgan, G. Scott, D. Cochran, D. Benz and T.J. Ness

34 Improving Adherence to Intraoperative Lung Protective Ventilation Strategies Using Near Real-Time Feedback and Individualized Electronic Reporting
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35 Calcium-Sensing Receptor expression and function regulation by hyaluronan
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36 Characterization of lung injury in mice exposed to cutaneous Lewisite
Shajer Manzoor, Nithya Mariappan, Iram Zafar, Chih-Chang Wei, Shama Ahmad, Mohammad Athar, Jeremy Foote, Veena Antony and Aftab Ahmad

37 Circulating biomarkers to assess cardiopulmonary toxicity due to inhaled chemicals
Juan Xavier Masjoan Juncos, Shazia Shakeel, Louis J Dell’Italia, David A Ford, Aftab Ahmad and Shama Ahmad

38 Chronic Widespread Pain in HIV: Novel Mechanisms and Therapeutics
Saurabh Aggarwal, Jennifer DeBerry, Israr Ahmad, Sonya Heath and Sadis Matalon