

Recap for Seventh Annual CVRI Symposium – 2019

Since it was founded in 2012, the [Cardiovascular Research Institute](#) at [Baylor College of Medicine](#) has been hosting an annual symposium that offers an exceptional opportunity to learn about the latest, most innovative research work related to cardiovascular diseases. Led by CVRI Director Dr. Xander Wehrens and Associate Director Dr. Biykem Bozkurt, the event encourages participants from BCM departments, affiliated hospitals and other institutions across the Texas Medical Center to meet and facilitates scientific collaborations.

[Dr. Adam Kuspa](#), professor and Salih J. Wakil, Ph.D. Endowed Chair in the Verna & Marrs McLean Department of Biochemistry & Molecular Biology and Senior Vice President and Dean of Research, opened the event this year, welcoming the audience to an exciting day of discovery and opportunities for networking.

Keynote Speakers

During the symposium, participants enjoyed two keynote lectures by renowned scientists [Dr. Mariell Jessup](#), chief science and medical officer of the [American Heart Association](#), and [Dr. Mark Sussman](#), director of the [Integrated Regenerative Research Institute](#) at San Diego State University.

During her talk, Jessup raised her concerns about the persistence and devastating consequences of heart disease and stroke in the American population, the challenges of interpreting ‘big data’ to improve this situation and the need to foster more productive collaborations. She also highlighted the importance of studies focusing on women’s cardiovascular disease as it continues to be a woman’s greatest health threat, claiming the lives of 1 in 3. Jessup encouraged the audience to visit the AHA portal “[Research Goes Red for Women,](#)” an initiative calling on women across the United States to contribute to health research. She concluded with AHA’s mission statement: “To be a relentless force for a world of longer, healthier lives.”



Dr. Mariell Jessup, Chief Science and Medical Officer of the American Heart Association, speaking at the Seventh Annual Cardiovascular Research Institute Symposium.

Sussman spoke about the latest research on polyploidy in myocardial homeostasis, repair and ageing. Polyploidy refers to the state of a cell having more than two paired sets of chromosomes. He explained that polyploidy is a normal state in human bodies and that it can play both positive and negative roles. For instance, polyploidy is of physiological significance during platelet development, but it also may play a role in diseases such as cancer. He showed that the human heart is tremendously polyploid and prompted the audience to think about the role polyploidy may play on cardiomyocyte and interstitial cell functions in health and disease. In addition, Sussman highlighted the significant differences in polyploidy between human and murine (mouse) hearts and the implications of these differences when using mice as models of human disease. Postdoctoral researcher Ann Quick discusses Dr. Sussman's provocative lecture from a basic science perspective.



Dr. Mark Sussman of San Diego State University speaking on the role of polyploidy in the heart.

Poster Sessions and Awards

The Symposium featured 81 poster presentations by graduate students, postdocs, junior faculty members and clinical fellows.

Top abstracts and poster presenters were recognized with a plaque and monetary award during the symposium's afternoon session. [View a listing and photos of the 2019 CVRI Symposium best abstract and best poster winners.](#)

Award Winners for Seventh Annual CVRI Symposium – 2019

The seventh annual symposium hosted by Baylor College of Medicine's Cardiovascular Research Institute (CVRI) highlighted the innovative research being done in the field of cardiovascular research by faculty and trainees from across the Texas Medical Center. Winners from each category are listed below.



Best Abstract Winners 2019

From left: CVRI Director Xander Wehrens, Larry Scott Jr., Qilin Gu, Lisa Mullany, Ishita Jindal, National Keynote Speaker Mariell Jessup, and CVRI Co-Director Biykem Bozkurt.

Student Category – Best Abstract

Larry Scott Jr, BS, Molecular Physiology and Biophysics, Baylor College of Medicine, Houston, Texas

NLRP3 Inflammasome Mediates the Obesity-Induced Pathogenesis of Atrial Fibrillation

Authors: Larry Scott Jr.¹, Changqun Yao², Luge Li², Thomas Colunga², Na Li³

¹Molecular Physiology & Biophysics, Baylor College of Medicine, Houston, TX; ²Department of Medicine/ CVRI, Baylor College of Medicine; ³Department of Molecular Physiology and Biophysics/ Department of Medicine/ CVRI, Baylor College of Medicine

Postdoctoral Researcher Category – Best Abstract

Qilin Gu, PhD, Department of Cardiovascular Sciences, Houston Methodist Research Institute, Houston, Texas

AIBP Instructs Hematopoietic Stem and Progenitor Cell Fate Through SREBP2-Regulated Notch Signaling

Authors: Qilin Gu¹, Xiaojie Yang¹, Jie Lv², Jiaoxiong Zhang³, Bo Xia², Jun-dae Kim¹, Ruoyu Wang⁴, Feng Xiong⁴, Shu Meng¹, Thomas P Clments⁵, Bhavna Tandon⁵, Daniel S Wagner⁵, Miguel F Diaz⁶, Pamela L Wenzel⁶, Yury I Miller⁷, David Traver⁸, John P Cooke¹, Wenbo Li⁴, Leonard I Zon⁹, Kaifu Chen², Yongping Bai³, Longhou Fang¹

¹Cardiovascular Sciences, Houston Methodist; ²Bioinformatics and Computational Biology, Houston Methodist; ³Geriatric Medicine, Central South University; ⁴Biochemistry and Molecular Biology, UTHealth McGovern Medical School; ⁵BioSciences, Rice University; ⁶Pediatric Surgery, The Brown Foundation Institute of Molecular Medicine; ⁷Medicine, University Of California, San Diego; ⁸Cellular and Molecular Medicine, University Of California, San Diego; ⁹Stem Cell Program and Division and Hematology/Oncology, Harvard Medical School

Clinical Fellow/Medical Resident Category – Best Abstract

Ishita Jindal, MD, Department of Pediatric Endocrinology, Baylor College of Medicine, Houston, Texas

Determinants of Cardiovascular Disease Risk in Obese Youth With Non-Alcoholic Fatty Liver Disease (NAFLD)

Authors: Ishita Jindal¹, Maurice Puyau², Anne Adolph², Fida Bacha³

¹Pediatric Endocrinology, Baylor College of Medicine, Houston, TX; ²Pediatric Nutrition, Children's Nutrition Research Center, Baylor College of Medicine; ³Pediatric Endocrinology, Children's Nutrition Research Center, Baylor College of Medicine

Junior Faculty Category – Best Abstract

Lisa Mullany, PhD, Department of Molecular and Cellular Biology, Baylor College of Medicine, Houston, Texas

A Steroid Receptor Coactivator Stimulator (MCB-613) Promotes Cardiac Protection and Repair After Myocardial Infarction

Authors: Lisa K Mullany¹, Aarti D Rohira¹, John P Leach², Tanner O Monroe³, Ravi R Pathak⁴, Andrew G Sikora⁴, M W Gaber⁵, Poonam Sarkar⁵, Kimal Rajapakshe¹, Cristian Coarfa¹, Todd K Rosengart⁶, Clifford C Dacso¹, Yongcheng Song⁷, David Lonard¹, James F Martin³, Bert W O'Malley¹

¹Molecular and Cellular Biology, Baylor College of Medicine, Houston, TX; ²Institute for Regenerative Medicine, University of Pennsylvania; ³Molecular Physiology and Biophysics, Baylor College of Medicine; ⁴Department of Otolaryngology-Head & Neck Surgery, Baylor College of Medicine; ⁵Pediatrics, Baylor College of Medicine; ⁶Surgery, Baylor College of Medicine; ⁷Pharmacology and Chemical Biology, Baylor College of Medicine



Best Poster Winners 2019

From left: CVRI Director Xander Wehrens, Manuel Cantu-Gutierrez, Waleed Ageedi, Ketan Ghaghada. Not pictured: Joseph Knadler, Parag Jain.

Student Category – Best Poster Award

Manuel Cantu Gutierrez, BS, Developmental Biology Graduate Program, Baylor College of Medicine, Houston, Texas

Defining the Transcriptional and Epigenetic Basis of Endothelial Heterogeneity

Authors: Manuel E Cantu Gutierrez¹, Matthew C Hill¹, Jason E Fish², James F Martin¹, Joshua D Wythe¹

¹Molecular Physiology and Biophysics, Baylor College of Medicine, Houston, TX; ²Vascular Cell and Molecular Biology, Toronto General Research Institute

Postdoctoral Researcher Category – Best Poster Award

Waleed Ageedi, MD, Department of Surgery, Baylor College of Medicine, Houston, Texas

Critical Role of AIM2 Inflammasome in the Development of Sporadic Aortic Dissection

Authors: Waleed Ageedi¹, Pingping Ren¹, Yidan Wang¹, Jao Guo¹, Joseph Coselli¹, Ying Hu Shen¹, Scott Anthony LeMaire¹

¹Division Of Cardiothoracic Surgery, Michael E. DeBakey Department Of Surgery, Baylor College of Medicine, Houston, TX

Clinical Fellow/Medical Resident Category – Best Poster Award

Joseph Knadler MD, Pediatric Cardiology, Texas Children's Hospital, Houston, Texas

Sex-Related Differences in Aortic Dimensions in Children and Young Adults with Marfan Syndrome

Authors: Joseph J Knadler¹, Yunfei Wang², Shaine A Morris²

¹Pediatric Cardiology, Texas Children's Hospital; ²Pediatric Cardiology, Texas Children's Hospital

Junior Faculty Category – Best Poster Award

Ketan Ghaghada, PhD, Radiology, Texas Children's Hospital, Houston, Texas

Computed Tomography Imaging of Aortic Wall Injury in a Mouse Model of Sporadic Aortic Aneurysm and Dissection

Ketan B Ghaghada¹, Pingping Ren², Laxman Devkota³, Zbigniew Starosolski⁴, Igor Stupin⁴, Eric Tanifum⁴, Ananth Annapragada⁴, Ying H Shen², Scott A LeMaire²

¹Radiology, Texas Children's Hospital, Houston, TX; ²Surgery/Cardiothoracic Sugery, BCM;

³Radiology, BCM/TCH; ⁴Radiology, TCH

Clinical Outcomes Research – Best Poster Award

Parag Jain, MD, Pediatric Critical Care Medicine, Baylor College of Medicine, Houston, Texas

A Novel Real-Time Patient Monitoring System For Detection of Junctional Ectopic Tachycardiac in Patients With Congenital Heart Disease

Parag Jain¹, Craig Rusin², Kriti Puri³, Raajen Patel⁴, Vincent Gagne⁴, Santiago Valdes², Daniel Penny²

¹Critical Care, Texas Children's Hospital, Houston, TX; ²Pediatric Cardiology, Baylor College of Medicine; ³Pediatric Critical Care, Baylor College of Medicine; ⁴Pediatrics, Baylor College of Medicine

Reflections on Dr. Mark Sussman's Keynote Lecture at the Seventh Annual CVRI Symposium

Ann Quick, PhD

Dr. Mark Sussman is a stem cell and cardiac regeneration biologist at San Diego State University who has set out to “take a fresh look at bold ideas” in the face of an ever-changing and controversial field.

Sussman's work focuses on polyploidy—multiple copies of DNA contained in one cell—in the mammalian heart. During his keynote lecture at this year's CVRI Symposium, he noted that polyploidy is the normal state for some organs including the liver, bone marrow, and placenta, but not many people consider polyploidy in the heart. However, as Dr. Sussman put it, it may be evolutionarily important for cells to have a “backup” copy of their DNA in the event that environmental stressors cause DNA damage.

That's why his lab studies the ploidy of heart cells (cardiomyocytes and interstitial cells) in response to ischemia. Using a new tool called FUCCI that images stages of the cell cycle, his lab can visualize the process of mitosis as cells change from red to yellow to green and complete the cycle. Video recordings of these cells can then be used to determine whether or not they ultimately divide in order to proliferate, or whether they just become enlarged polyploid cells.

Sussman's work has demonstrated that the adult heart initially contains a relatively balanced mix of diploid cells (containing 2 sets of chromosomes) and tetraploid cells (containing 4 sets of chromosomes). Environmental stressors like ischemia tip the balance towards diploidy favoring fibroblasts—which can scar the heart—over endothelial cells—which form vessels that bring oxygen and nutrients to the heart.

In order to determine whether tipping the balance back to tetraploidy can improve cell survival after environmental stress, Sussman's lab developed a tool that he calls an “unnatural solution” to a natural phenomenon: his group made a completely tetraploid human cardiac cell line called “CardioEvolvers.” These cells are resistant to environmental stressors like oxidative stress, and represent a promising new direction for the field of cardiac regeneration.