



National Heart, Lung,
and Blood Institute



THE UNIVERSITY OF
ALABAMA AT BIRMINGHAM
Knowledge that will change your world

NIH Cardiovascular Bioengineering (CVBE) Symposium

March 1 – 2, 2018

UAB | The University of Alabama at Birmingham

UAB Hill Center, 1400 University Blvd, Birmingham, AL 35233

THURSDAY, MARCH 1st

Opening Remarks: 8:00 – 8:15 AM

MODERATOR: Jianyi 'Jay' Zhang, MD, PhD



Selwyn M. Vickers, MD, FACS
Senior Vice President, UAB Medicine
Dean, School of Medicine
Professor of Surgery
UAB | The University of Alabama at Birmingham



Jianyi 'Jay' Zhang, MD, PhD, FAHA
Chair, Department of Biomedical Engineering
T. Michael and Gillian Goodrich Endowed Chair of Engineering Leadership
Professor of Medicine, of Engineering
School of Medicine, School of Engineering
UAB | The University of Alabama at Birmingham



Denis Buxton, PhD
PCBC and PCTC
Director, Basic and Early Translational Research Program
Division of Cardiovascular Sciences
National Heart, Lung, and Blood Institute
NIH | National Institutes of Health

Session I: The State of Cardiovascular Regenerative Medicine 8:15 – 9:30 AM

MODERATORS: John P. Cooke, MD, PhD and Timothy J. Kamp, MD, PhD

8:15 – 8:30 AM

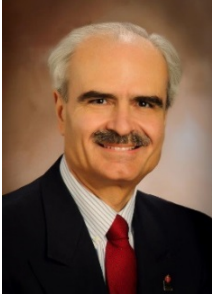


A Novel Epigenetic Process in Nuclear Reprogramming

John P. Cooke, MD, PhD

Joseph C. "Rusty" Walter and Carole Walter Looke Presidential Distinguished Chair in Cardiovascular Disease Research, Department of Cardiovascular Sciences, Institute for Academic Medicine, Director, Center for Cardiovascular Regeneration DeBakey Heart & Vascular Center Houston Methodist Hospital, Weill Cornell Medical College

8:30 – 8:45 AM



Repeated Cell Therapy

Roberto Bolli, MD, FAHA

Professor of Medicine, Physiology, and Biophysics
Jewish Hospital Heart and Lung Institute Distinguished Chair in Cardiology
Chief, Division of Cardiovascular Medicine
Executive Vice Chair, Department of Medicine
Scientific Director, Cardiovascular Innovation Institute
Distinguished University Scholar
University of Louisville – Kentucky
Editor-in-Chief, Circulation Research

8:45 – 9:00 AM



Transcriptional Mechanisms of Heart Development and Regeneration

William Pu, MD

Professor of Pediatrics, Harvard Medical School
Department of Cardiology, Boston Children's Hospital

9:00 – 9:15 AM



Regulatory Principles of Cardiac Proteins on a Global Scale

Peipei Ping, PhD

Professor of Physiology, Medicine/Cardiology, and Bioinformatics
Director, NIH BD2K Center of Excellence at UCLA
Director, NIH BD2K Centers-Coordination Center at UCLA
UCLA

9:15 – 9:30 AM



Remuscularization of Injured Ventricle has been achieved in Rodents– What is Next?

Jianyi 'Jay' Zhang, MD, PhD, FAHA

Chair, Department of Biomedical Engineering
T. Michael and Gillian Goodrich Endowed Chair of Engineering Leadership
Professor of Medicine, of Engineering
School of Medicine, School of Engineering
UAB | The University of Alabama at Birmingham

9:30 – 9:45 AM - Coffee Break

Session II: Frontiers in Pluripotent Stem Cell Biology 9:45 – 11:00 AM

MODERATORS: Daniel J. Garry, MD, PhD and Joel L. Berry, PhD

9:45 – 10:00 AM



Stem Cells & Genomics for Precision Medicine

Joseph C. Wu, MD, PhD

Simon H. Stertzer, MD, Professor and Professor of Radiology
Department of Medicine – Cardiovascular Medicine
Stanford University

10:00 – 10:15 AM



iPSC-derived Fibroblasts

Timothy J. Kamp MD, PhD

Professor of Medicine
Co-Director, Stem Cell and Regenerative Medicine Center
Cellular and Molecular Arrhythmia Research Program
University of Wisconsin-Madison School of Medicine and Public Health

10:15 – 10:30 AM



3D Scaffolds for Endothelial Cell Regeneration from hiPSCs

Lei Ye, PhD

Principal Investigator
National Heart Research Institute Singapore
National Heart Centre Singapore

10:30 – 10:45 AM



CCND2 Overexpression Enhances Regenerative Potency of Human iPSC-Derived Cardiomyocytes: A Model to Study Remuscularization of Injured Ventricle

Wuqiang Zhu, MD, PhD

Assistant Professor, Department of Biomedical Engineering
School of Medicine & School of Engineering
UAB | The University of Alabama at Birmingham

10:45 – 11:00 AM



Generating Pigs with Humanized Vasculature:

Using iPSCs to Model Human Disease in Large Animals

Daniel J. Garry, MD, PhD, FAHA

Professor of Medicine
St. Jude Medical Endowed Chair in Cardiology
Director, Lillehei Heart Institute
University of Minnesota Medical School

11:00 – 11:15 AM - Coffee Break

Session III: Novel Mechanisms of Stem Cell Actions 11:15 AM – 12:30 PM

MODERATORS: Michael E. Davis, PhD and Prasanna Krishnamurthy, DVM, PhD

11:15 – 11:30 AM



Exosomes and Materials for Assistance of Stem Cell Mediated Cardiac Repair

Michael E. Davis, PhD

Associate Professor of Medicine

Director, Children's Heart Research and Outcomes (HeRO) Center

Wallace H. Coulter Department of Biomedical Engineering

Georgia Tech College of Engineering and Emory University School of Medicine

11:30 – 11:45 AM



MiR322~351 Cluster Engages in Complex Feedback Interaction between Notch and HIF-1 Signaling Controlling Fate of Cardiac Progenitors

Yaoliang Tang, MD, PhD, FAHA

Professor of Medicine, Cardiology

Vascular Biology Center

Medical College of Georgia

11:45 AM – 12:00 PM



Cellular Cross-talk in Cardiac Remodeling and Repair

Prasanna Krishnamurthy, DVM, PhD, FAHA

Associate Professor of Medicine

Department of Biomedical Engineering

UAB | The University of Alabama at Birmingham

12:00 – 12:15 PM



Proteotoxic Cardiac Aging and Disease

Rajasekaran Namakkal Soorappan, MPhil, PhD, MSci, BSc

Assistant Professor, Molecular & Cellular Pathology

and Cell, Developmental, & Integrative Biology

Department of Pathology

School of Medicine

UAB | The University of Alabama at Birmingham

12:15 – 12:30 PM



Paracrine Effects of hESC-derived Cardiac Cell Therapy

Huangtian Yang, MD, PhD

Professor and Principal Investigator

Laboratory of Molecular Cardiology

Key Laboratory of Stem Cell Biology

Shanghai Institutes for Biological Sciences

China Academy of Sciences

Shanghai, China

12:30 – 2:00 PM – Lunch

Session IV: New Paradigms in Cardiovascular Science (1) 2:30 – 3:45 PM

MODERATORS: William Pu, MD and Yabing Chen, PhD

2:30 – 2:45 PM



Novel Role for GRK2 in Ischemic Cardiac Injury

Walter J. Koch, PhD

William Wikoff Smith Endowed Chair in Cardiovascular Medicine
Chair, Pharmacology
Director, Center for Translational Medicine
Temple University School of Medicine

2:45 – 3:00 PM



Mechanistic Insights into Cardiac Regeneration and Degeneration

Ronglih Liao, PhD

Professor
Stanford Cardiovascular Institute
Stanford University School of Medicine

3:00 – 3:15 PM



Immune Cells and Cardiac Repair

Sumanth D. Prabhu, MD

Professor of Medicine and Cell, Developmental and Integrative Biology
Mary Gertrude Waters Chair of Cardiovascular Medicine
Director of the Division of Cardiovascular Disease
UAB | The University of Alabama at Birmingham

3:15 – 3:30 PM



Molecular Regulation of Vascular Stiffness and Aging

Yabing Chen, PhD

Professor and Vice Chair for Faculty Development and Education
Department of Pathology
UAB | The University of Alabama at Birmingham

3:30– 3:45 PM



Metabolic Regulation of Cardiac Remodeling

E. Dale Abel, MD, PhD

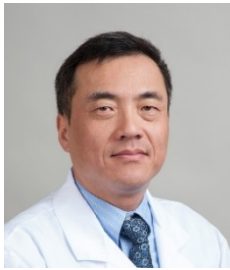
Chair & Department Executive Officer, Department of Internal Medicine
Director, Division of Endocrinology and Metabolism, Department of Internal Medicine
Director, Fraternal Order of Eagles Diabetes Research Center
Professor of Internal Medicine, Biochemistry, and Biomedical Engineering
University of Iowa - Carver College of Medicine

3:45 – 4:00 PM - Coffee Break

Session V: New Paradigms in Cardiovascular Science (2) 4:00 – 5:15 PM

MODERATORS: Yibing Wang, PhD and Ying Ge, PhD

4:00 – 4:15 PM



Cardiomyocyte Maturation in Development and Stem-Cell Biology

Yibin Wang, PhD

Professor of Anesthesiology and Medicine
Vice Chair of Research, Department of Anesthesiology
UCLA David Geffen School of Medicine

4:15 – 4:30 PM



Top-down Proteomics in Stem Cell and Cardiac Regeneration

Ying Ge, PhD

Associate Professor, Department of Cell and Regenerative Biology
Associate Professor, Department of Chemistry
Director of Mass Spectrometry Human Proteomics Program
School of Medicine and Public Health
University of Wisconsin-Madison

4:30 – 4:45 PM



Bioengineering Approaches for Enhancing Stem Cell Therapies

Ke Cheng, PhD

Associate Professor
Department of Molecular Biomedical Sciences, NC State University
Department of Biomedical Engineering, UNC-Chapel Hill & NC State University
Division of Molecular Pharmaceutics, UNC-Chapel Hill

4:45 – 5:00 PM

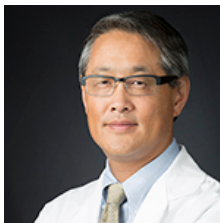


3D Aggregates of Human Mesenchymal Stem Cells in Cardiovascular Diseases

Teng Ma, PhD

Professor and Chair
Department of Chemical and Biomedical Engineering
Florida A & M University
Florida State University College of Engineering

5:00 – 5:15 PM



Notch Signaling in Cell Biology and Disease

Herbert Chen, MD

Chair, Department of Surgery
Professor of Surgery, Professor of Biomedical Engineering
Fay Fletcher Kerner Endowed Chair
Surgeon-in-Chief, UAB Hospital and Health System
UAB | The University of Alabama at Birmingham

FRIDAY, MARCH 2nd

Session VI: Engineering Cardiac Tissues 8:00 – 9:00 AM

MODERATORS: Nenad Bursac, PhD and Jack M. Rogers, PhD

8:00 – 8:15 AM



Engineering Human Tissues for Regenerative Medicine and Study of Disease

Gordana Vunjak-Novakovic, PhD

University Professor

The Mikati Foundation Professor of Biomedical Engineering and Medicine

Director, Laboratory for Stem Cells and Tissue Engineering

Columbia University

8:15 – 8:30 AM



Human Myocardial Patch for Heart Repair

Nenad Bursac, PhD

Professor of Biomedical Engineering

Co-Director of the Regenerative Next Initiative

Duke University School of Medicine

8:30 – 8:45 AM



Extracellular Matrix-Guided Endothelial Differentiation to Support Thick, Engineered Tissues

Brenda Ogle, PhD

Associate Professor of Biomedical Engineering

Department of Biomedical Engineering

University of Minnesota

8:45 – 9:00 AM



Optical Mapping of Cardiac Propagation and Deformation

Jack M. Rogers, PhD

Professor of Biomedical Engineering

Department of Biomedical Engineering

School of Medicine, School of Engineering

UAB | The University of Alabama at Birmingham

9:00 – 9:15 AM - Coffee Break

Session VII: Engineering Vascular Tissue 9:15 – 10:15 AM

MODERATORS: Milica Radisic, PhD and Ho-Wook Jun, PhD

9:15 – 9:30 AM

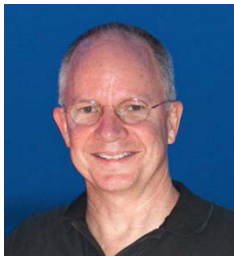


Engineering Microenvironment for Cardiovascular Regeneration

Milica Radisic, PhD

Professor and Canada Research Chair,
Functional Cardiovascular Tissue Engineering
Institute of Biomaterials & Biomedical Engineering
University of Toronto, Canada

9:30 – 9:45 AM

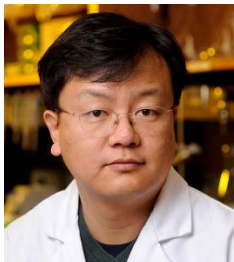


In vitro 3D Bioreactor for Drug Development

Joel L. Berry, PhD

Associate Professor of Biomedical Engineering
Department of Biomedical Engineering
School of Medicine, School of Engineering
UAB | The University of Alabama at Birmingham

9:45 – 10:00 AM



Pro-healing Endothelium Mimicking Nanomatrix

Ho-Wook Jun, PhD

Professor of Biomedical Engineering
Department of Biomedical Engineering
School of Medicine, School of Engineering
UAB | The University of Alabama at Birmingham

10:00 – 10:15 AM



Stem Cells for Vascular Regeneration and Remodeling

Song Li, PhD

Chancellor Professor and Department Chair
Department of Biomedical Engineering
Department of Medicine
UCLA

10:15 – 10:30 AM - Coffee Break

Session VIII: Mechanisms and Translation 10:30 – 11:45 AM

MODERATORS: X. Edward Guo, PhD and Philippe Menasche, MD, PhD

10:30 – 10:45 AM



3D Imaging Analysis of Bone Microstructure in Disease and Beyond

X. Edward Guo, PhD

Professor of Biomedical Engineering
Chair, Department of Biomedical Engineering
The Fu Foundation School of Engineering and Applied Science
Columbia University

10:45 – 11:00 AM



Biofabrication of Human Pancreatic Islets from Pluripotent Stem Cells

Kaiming Ye, PhD

Professor and Chair
Department of Biomedical Engineering
Director, Center of Biomufacturing for Regenerative Medicine
Binghamton University
State University of New York (SUNY)

11:00 - 11:15 AM



G-protein Receptor Kinases 2, 5, and 6 Modulate

Smoothed-GATA Transcriptional Crosstalk in Fetal Mouse Hearts

Gerald W. Dorn II, MD

Philip and Sima K. Needleman Professor of Medicine
Associate Chair for Translational Research
Director, Center for Pharmacogenomics
Washington University School of Medicine

11:15 – 11:30 AM



*Enhancing the Therapeutic Effect of Cardiac Regeneration
with Stem Cell-sheet Technique*

Keitaro Domae, MD, PhD

Assistant Professor
Department of Cardiovascular Surgery
Graduate School of Medicine
Osaka University, Japan

11:30 – 11:45 AM



Pluripotent Stem Cells in the Clinics: The ESCORT Trial and Beyond

Philippe Menasche, MD, PhD

Professor, Department of Cardiovascular Surgery
Hôpital Européen Georges Pompidou, Paris, France
Professor, Department of Biomedical Engineering
UAB | The University of Alabama at Birmingham

11:45 AM – 12:00 PM - Coffee Break

Session IX: Meet the Editor 12:00 – 12:30 PM

Moderator: Gangjian 'GQ' Qin, MD



Caitlin A. Czajka, PhD
Associate Editor
Science Translational Medicine

Concluding Remarks – 12:30 PM



J. Iwan D. Alexander, PhD
Dean, School of Engineering
Professor of Engineering, of Biomedical Engineering
UAB | The University of Alabama at Birmingham