APRIL 6, 2022

9TH ANNUAL SYMPOSIUM
CARdiovascular Research Institute

VIRTUAL CONFERENCE
8:45 AM - 4:00 PM
CVRI MISSION
The Cardiovascular Research Institute was established in 2012 to enhance collaborative opportunities for research, promote the development of new cardiovascular technologies, and to expand training programs in cardiovascular sciences. The CVRI aims to provide administrative and research support to promote synergy for interdisciplinary basic, translational, and clinical research.

COMMITTEE CHAIR
LILEI ZHANG, MD, PHD
Assistant Professor
Molecular and Human Genetics
Baylor College of Medicine

SYMPOSIUM & SEMINAR COMMITTEE
Yuriana Aguilar, PhD
Lane Carpio
David Durgan, PhD
Amber Eakin
Xiaoming Jia, MD
Mirza Umair Khalid, MD
William Lagor, PhD
Scott LeMaire, MD
Na Li, PhD
Jing Liu, MD
A.J. Marian, MD
Jack Price, MD
Jeff Steimle, PhD
Xander Wehrens, MD, PhD

SESSION CHAIRS
Session 1  Jason Karch, PhD
Keynote  Xander Wehrens, MD, PhD
Session 2  Mirza Umair Khalid, MD & Ajith P. Nair, MD

WELCOME NOTE
FROM THE DIRECTOR
XANDER WEHRENS, MD, PHD

Dear Colleagues,

It is with great pleasure that I welcome you to the 9th Annual Symposium of the Cardiovascular Research Institute (CVRI) at Baylor College of Medicine.

The CVRI at Baylor College of Medicine was founded in 2012. One of its core missions is to promote innovative research by facilitating new collaborations across the various BCM departments and affiliated hospitals as well as throughout other institutions in the Texas Medical Center. The CVRI is also active in expanding training programs in cardiovascular sciences.

This year CVRI is honored to feature Nobel Laureate, Gregg L. Semenza, MD, PhD, Director of the Vascular Program at the Institute for Cell Engineering, and Professor of Genetic Medicine at Johns Hopkins University School of Medicine as the keynote lecturer. In addition, this year’s symposium features two sessions that focus on cardiovascular research being done in the Texas Medical Center, and a virtual poster session with over 70 abstract presentations.

On behalf of the organizing committee, I hope you enjoy the symposium and that it provides a great opportunity to virtually meet and network with colleagues and trainees interested in cardiovascular research.

Sincerely,

Xander Wehrens, MD, PhD
Director, Cardiovascular Research Institute
Baylor College of Medicine
POSTER SESSION JUDGES

Waleed Ageedi, PhD
Christie Ballantyne, MD
Biykem Bozkurt, MD, PhD
Changyi “Johnny” Chen, MD, PhD
Swati Choudhry, MD
Miguel Cruz, PhD
David Durgan, PhD
Mark L. Entman, MD
Brian Gibson, DVM
K. Jane Grande-Allen, PhD
Peter Jones, MD
Jason Karch, PhD
Mirza Umair Khalid, MD
Muge Kuyumcu-Martinez, PhD
Yichen Lai, MD
Tafheem Malik, PhD
Bharti Manwani, MD, PhD
Sirisha Mareddy, PhD
Lisa Mullany-McClendon, PhD
Ajith P. Nair, MD
Xinchun Pi, PhD
Anilkumar Reddy, PhD
Leila Rouhi, MD, PhD
Hassan Samee, PhD
Daryl Scott, MD, PhD
Zheng Sun, PhD
Lalita Wadhwa, PhD
Carl Walther, MD
Jun Wang, PhD
Xander Wehrens, MD, PhD
Liang Xie, PhD
Andrew Yee, PhD
Justin Zachariah, MD, MPH
Lilei Zhang, MD, PhD

CME INFORMATION

Accreditation
Baylor College of Medicine is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

Target Audience
Physicians, Fellows, Residents, Trainees, Physician Assistants, and Nurses/Nurse Practitioners specializing in cardiovascular research and care, and all other practitioners interested in cardiovascular sciences.

Global Learning Objectives
At the conclusion of the conference, participants should be able to:
• Summarize the molecular mechanisms of oxygen homeostasis.
• Explain the signaling role of lysosomal metabolism in regulating longevity.
• Discuss the role of DNA damage in the development of aortic aneurysm and dissection.
• Describe vascular heterogeneity and functional specialization across different organs.

Educational Methods
Lecture, Panel Discussion, Demonstration, Question and Answer Sessions.

Evaluation
An evaluation by questionnaire will address program content, presentation, and possible bias.

Credit Designation
Baylor College of Medicine designates this live activity for a maximum of 5.00 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.
The Dr. Mark L. Entman Award for Excellence in Cardiovascular Education was established in 2021 by the CVRI to recognize faculty for outstanding teaching and service in the graduate school curriculum.

In honor of Dr. Entman's extensive contributions to cardiovascular education and research at Baylor College of Medicine, the CVRI will present this prestigious award at the annual symposium.

Dr. Entman was recruited to Baylor as an assistant professor in 1970. He was a Howard Hughes Medical Investigator from 1971-1979. In 1977, Dr. Entman became the Chief of the Section of Cardiovascular Sciences and the Director of the Division of Research of the NHLBI National Research and Demonstration Center (now the DeBakey Heart Center) at Baylor College of Medicine and The Methodist Hospital from 1976-1985. Dr. Entman has been an inspirational leader whose research has spanned a range of topics, including the role of myocardial calcium and sarcoplasmic reticulum function, acute inflammation and myocardial injury, and the chronic inflammatory response in cardiac repair and remodeling.

Before joining Baylor faculty, Dr. Entman’s training at Duke University involved matriculation in the highly innovative Research Training Program designed to promote the proper background for cellular and molecular research for MD’s seeking a career in academic medicine. In 1974, his former mentor at Duke, Dr. Salih Wakil, joined the Baylor faculty as chairman of biochemistry and the two collaborated in writing the NIH training grant to establish the MD/PhD Program at Baylor, of which Dr. Entman was a co-director until 1980. In 1978, Dr. Entman became the director of the Section of Cardiovascular Sciences in the Department of Medicine and he was paramount in the new development of that program. The core curriculum for the DeBakey Heart Center Graduate Program arose from those efforts and was funded for many years by an NIH training grant which supported an independent graduate program directed by his colleague and close friend, Dr. Julius Allen. The resources of this program also provided the structure of a Basic Science Training program in Pediatric Cardiology at Texas Children’s Hospital which was financed by an independent NIH training program.

Dr. Entman has given countless lectures to trainees on the Cardiovascular Sciences PhD Track and has been dedicated to furthering the educational mission at Baylor College of Medicine. Dr. Entman has mentored over 50 physician-scientists and researchers, many of whom are now leading cardiology departments and research programs across the US and world. His enthusiasm and commitment to the educational programs at Baylor College of Medicine is revered among his trainees and peers.

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JOSEPH G. ROGERS, MD  
President and CEO  
Texas Heart Institute

YING H. SHEN, MD, PHD  
Professor of Surgery, Cardiothoracic Surgery  
Baylor College of Medicine

SALIM VIRANI, MD, PHD  
Professor of Medicine, Cardiology  
Baylor College of Medicine

MENG WANG, PHD  
Professor of Genetics, Huffington Center on Aging Investigator, Howard Hughes Medical Institute  
Baylor College of Medicine

JOSEPH D. WYTHE, PHD  
Associate Professor of Molecular Physiology & Biophysics  
Baylor College of Medicine

KEYNOTE SPEAKER  
GREGG L. SEMENZA, MD, PHD  
Director, Vascular Program, Institute for Cell Engineering  
Professor of Genetic Medicine  
Johns Hopkins University School of Medicine  
2019 Nobel Prize in Physiology or Medicine

KATARZYNA A. CIESLIK, PHD  
Associate Professor of Medicine, Cardiovascular Sciences  
Baylor College of Medicine

SEAN P. MARRELLI, PHD  
Professor of Vascular Neurology, BRAINS Research Laboratory  
University of Texas Health Science Center at Houston

LISA MULLANY-MCLENDON, PHD  
Assistant Professor of Molecular & Cellular Biology  
Baylor College of Medicine
<table>
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<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>8:50 – 9:00</td>
<td>Welcome &amp; Opening Remarks</td>
<td>Biykem Bozkurt, MD, PhD</td>
<td>Associate Director, CVRI</td>
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<td>Professor of Medicine, Cardiology</td>
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<td>9:00 – 9:25</td>
<td>Cytosolic DNA signaling in smooth muscle cell dysfunction and aortic degeneration</td>
<td>Ying H. Shen, MD, PhD</td>
<td>Professor of Surgery, Cardiothoracic Surgery</td>
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<td>Baylor College of Medicine</td>
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<td>9:25 – 9:45</td>
<td>Identification of transcriptional networks governing organotypic specialization within the vasculature</td>
<td>Joshua D. Wythe, PhD</td>
<td>Associate Professor of Molecular Physiology &amp; Biophysics</td>
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<td>9:45 – 10:05</td>
<td>Role of endothelial Piezo1 in regulating cerebral blood flow and cerebrovascular function</td>
<td>Sean P. Marrelli, PhD</td>
<td>Professor of Vascular Neurology, BRAINS Research Laboratory</td>
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<td>University of Texas Health Science Center at Houston</td>
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<td>10:05 – 10:30</td>
<td>Metabolic Signals in Health and Longevity</td>
<td>Meng Wang, PhD</td>
<td>Professor of Genetics, Huffington Center on Aging Investigator, Howard Hughes Medical Institute</td>
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<td>10:30 – 11:30</td>
<td>Virtual Poster Competition</td>
<td>Breakout Rooms</td>
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<td>11:30 – 12:00</td>
<td>Break</td>
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### PROGRAM

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<tr>
<th>Time</th>
<th>Session 2</th>
<th>Keynote Speaker</th>
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| 12:00-1:30 | **KEYNOTE LECTURE** Hypoxia-Inducible Factors in Physiology and Medicine | Gregg L. Semenza, MD, PhD  
*Director, Vascular Program, Institute for Cell Engineering*  
*Professor of Genetic Medicine*  
*Johns Hopkins University School of Medicine*  
*2019 Nobel Prize in Physiology or Medicine*

#### Session 2

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<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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| 1:30– 1:50 | The aging heart and diastolic dysfunction                            | Katarzyna A. Cieslik, PhD  
*Associate Professor of Medicine, Cardiovascular Sciences*  
*Baylor College of Medicine* |
| 1:50– 2:15 | The Evolution of Mechanically Assisted Circulation in Advanced Heart Failure | Joseph G. Rogers, MD  
*President and CEO*  
*Texas Heart Institute* |
| 2:15 – 2:35 | Potential new treatment for heart failure                             | Lisa Mullany-McClendon, PhD  
*Assistant Professor of Molecular & Cellular Biology*  
*Baylor College of Medicine* |
| 2:35 – 3:00 | COVID-19 Pandemic and Non-Communicable Diseases-How Many Curves Will We Need to Flatten in the Next Decade? | Salim Virani, MD, PhD, FACC, FAHA, FASPC  
*Professor of Medicine, Cardiology*  
*Baylor College of Medicine* |
| 3:00 – 3:45 | Award Ceremony                                                        | Sandra Haudek, PhD  
*Associate Professor of Medicine*  
*Cardiovascular Sciences*  
*Baylor College of Medicine* |
| 3:45 – 4:00 | Closing Remarks                                                       | Lilei Zhang, MD, PhD  
*Assistant Professor of Molecular and Human Genetics*  
*Baylor College of Medicine* |
Gregg L. Semenza, MD, PhD

Dr. Semenza is professor of genetic medicine, pediatrics, radiation oncology, biological chemistry, medicine and oncology at the Johns Hopkins University School of Medicine. Dr. Semenza is the C. Michael Armstrong Professor of Genetic Medicine and serves as the director of the Armstrong Oxygen Biology Research Center and the Vascular Program at the Johns Hopkins Institute for Cell Engineering. Dr. Semenza has pioneered the field in uncovering how cells adapt to changing oxygen levels through his groundbreaking discovery of hypoxia-inducible factor 1 (HIF-1), which controls the expression of thousands of genes in response to changes in oxygen availability. The finding, for which he was awarded the 2019 Nobel Prize in Physiology or Medicine, has far-reaching implications in understanding and treating low-oxygen health conditions, such as coronary artery disease and cancer.

Dr. Semenza received his bachelor’s degree in Biology magna cum laude from Harvard University. He earned his M.D. and Ph.D. degrees in genetics from the University of Pennsylvania, completed residency training in pediatrics at Duke University Medical Center, and performed postdoctoral research in medical genetics at Johns Hopkins. Dr. Semenza joined the Johns Hopkins faculty in 1990.

Dr. Semenza’s current research interests include the molecular mechanisms of oxygen homeostasis, the role of HIF-1 in cancer progression, and the development of novel HIF inhibitors for the treatment of cancer and blinding eye diseases. He has authored more than 400 research articles and book chapters, and his work has been cited in research papers of other scientists more than 150,000 times.

Dr. Semenza is a founding fellow of the American College of Medical Genetics and Genomics, and was elected to the Association of American Physicians and the National Academy of Sciences in 2008, and the National Academy of Medicine in 2012. He serves as deputy editor of The Journal of Clinical Investigation.

Dr. Semenza has been recognized with numerous other awards, including the Albert Lasker Basic Medical Research Award in 2016, the Wiley Prize in Biomedical Sciences in 2014, the Lefoulon-Delalande Grand Prize from the Institut de France in 2012, and the Canada Gairdner International Award in 2010.
Katarzyna A. Cieslik, PhD

Dr. Cieslik is an associate professor in the Department of Medicine at Baylor College of Medicine. She is a basic research scientist, and her primary interest lies in molecular and cellular mechanisms of cardiac aging. Recently Dr. Cieslik’s laboratory discovered how sex differences in the aging heart dictate responses to drug treatments. These differences are related to extracellular matrix composition and the phenotype of inflammatory cells. Dr. Cieslik is one of the few researchers pursuing the study of such sex differences in the context of normal aging. Her studies bridge the responses of various cell types in the heart with aging changes in the extracellular matrix, resulting in chronic inflammation. Dr. Cieslik collaborates with various experts in the field of aging and proteomics and is also involved in teaching and mentoring at Baylor College of Medicine and Texas A & M University.

Lisa Mullany-McClendon, PhD

Dr. McClendon has a broad academic and research background in immunology, pathobiology, pharmacology, tumor biology, hormone signaling and metabolism. Her most significant early career contribution was the development of the first assay to measure the affinity of an allergen-specific immune response. Later studies were focused on interactions between steroid signaling and cell cycle control in liver, breast, prostate and ovarian cancers.

After joining Baylor College of Medicine, Dr. McClendon developed and characterized animal models of ovarian cancer that lead to important and novel findings that the tumor suppressor gene p53 promotes the ovarian cancer phenotype and steroid hormones estradiol and progesterone mediate metastasis of ovarian cancer cells. Follow-up studies identified that specific p53 mutations are associated with unique and common pathways that can be targeted for novel ovarian cancer therapies.

Dr. McClendon's current research interests are to identify molecular and cellular signaling pathways involved in cardiac cellular reprogramming. This exciting new area of research is being explored as a promising approach to repair damaged heart tissue to improve the lives of patients with congestive heart failure. Dr. McClendon’s recent paper demonstrates a potent small molecule stimulator of steroid receptor coactivators improves cardiac function following myocardial infarction thus serving as an innovative agent for cardiac protection after ischemic injury.
Sean P. Marrelli, PhD

Dr. Marrelli is a tenured professor in the Department of Neurology at the McGovern Medical School (MMS) at UTHealth. He received a BA in Chemistry from the University of Houston as a member of the Honors Program (1992). As an undergraduate, he performed research on the fabrication and characterization of high temperature superconductors within the Texas Center for Superconductivity Research at UH (TcSUH). In addition, he worked in the NMR spectroscopy facility, providing 1D and 2D sample analyses. Upon graduation, he applied his skills in NMR spectroscopy first at the UTHSC Research Imaging Center in San Antonio and then in the Department of Radiology at the Johns Hopkins School of Medicine. He then entered graduate school at Baylor College of Medicine (BCM) and received a PhD in Cardiovascular Sciences in 1998. He later joined the faculty at BCM in 2002, where he developed a research program focused on endothelial regulation of vascular function in the brain.

In 2017, Dr. Marrelli moved his laboratory to the MMS at UTHealth in the Department of Neurology. He is currently a senior member of the Brain-Rejuvenation-Aging-Inflammation-Neurodegeneration-Stroke (BRAINS) research group, a highly collaborative consortium of 12 principal investigators with combined annual research funding in excess of $8M. His laboratory is currently funded through multiple NIH grants covering a range of neurovascular-related projects, such as endothelial Piezo1 channel regulation of cerebrovascular function and mechanisms of neuroinflammation in stroke and Alzheimer’s disease. He has served on multiple grant review study sections from both NIH and AHA, including as co-chair of the AHA Brain 4 Study Group. Since joining MMS, he has continued his involvement in graduate education as a member of the Neuroscience graduate program.

Joseph G. Rogers, MD

Dr. Rogers is the President and CEO of the Texas Heart Institute. He obtained his Bachelor’s degree from the University of Kansas and attended medical school at the University of Nebraska. He performed his Internal Medicine residency at Nebraska prior to research and clinical cardiology training at Washington University in St. Louis. Following his fellowship he remained on faculty at Washington University for 10 years prior to moving to Duke. Dr. Rogers’ clinical practice and research initiatives are focused on advanced heart failure. He served as the medical director of the cardiac transplant and mechanical circulatory support programs at Washington University and Duke. His research interests are focused on the clinical application of mechanical circulatory support devices, heart transplantation, and palliative care in advanced heart failure.

He has authored more than 250 articles in peer-reviewed journals including Journal of the American College of Cardiology, Journal of the American College of Cardiology Heart Failure, New England Journal of Medicine, Circulation and the Journal of Heart and Lung Transplantation.

Dr. Rogers has served in several institutional leadership roles and is the immediate past-president of the International Society for Heart and Lung Transplantation. He also was Chair of the UNOS Thoracic Committee during the 2018 modification to US heart allocation policy.
Ying H. Shen, MD, PhD

Dr. Shen is professor of surgery and director of the Aortic Disease Research Laboratory at Baylor College of Medicine. Her research focuses on understanding the development of vascular diseases. She received a MD from Beijing Medical College, Beijing, China and PhD from the University of New South Wales, Sydney, Australia.

Dr. Shen began her career with a strong interest in diabetic vascular diseases. She became the director of the Aortic Disease Research Laboratory in 2008, and has since focused on aortic aneurysms and dissections, highly lethal but poorly understood diseases. Throughout her tenure, she has worked closely with collaborator Dr. Scott LeMaire and together, they have built a translational research program and developed several research directions to investigate the mechanisms of aortic injury, repair, and remodeling. The ultimate goal of her research is to develop pharmacological treatments to prevent progressive aortic destruction, maladaptive remodeling, and disease deterioration. In the laboratory, the team has developed a mouse model of sporadic aortic aneurysms and dissections. Additionally, they have established various techniques to evaluate aortic structure and function.

Salim Virani, MD, PhD

Dr. Virani is a tenured professor in the Sections of Cardiology and Cardiovascular Research at Baylor College of Medicine. His clinical practice includes being a preventative cardiologist with a special emphasis on management of complex dyslipidemias. He serves as the director for the Cardiovascular Disease Fellowship Training Program at Baylor and co-director for the VA Advanced Fellowship Program in Health Services Research and Development at the Michael E. DeBakey VA Medical Center.

Dr. Virani’s research portfolio aims to understand the pathophysiology and epidemiology of atherosclerosis and how “big data”, and point-of-care informatics driven interventions can improve guideline-concordant care delivery. He has authored or co-authored ~550 publications on various aspects of cardiovascular disease prevention with several in high-impact journals. This work has received >98,000 citations. He has been recognized as a “World Expert” in cholesterol by Expertscape (top 0.01% of scholars writing about cholesterol from 2011-2021, among 181,887 authors). Dr. Virani has also served as a faculty for >50 online educational programs and has participated in >100 online or in person interviews. He has made >250 presentations at various conferences and academic institutions with >60 of those at institutions and conferences outside of the U.S. He has been inducted several times in the Best Doctors® Database (peerreviewed) group that includes the top 5% of U.S. physicians). He has served as a panel member for the 2018 AHA/ACC Multisociety Guideline on Cholesterol Management, the 2019 ACC/AHA Guideline for the Prevention of Cardiovascular Disease, and the 2019 World Heart Federation and International Diabetes Federation’s Road Map on the Prevention of Cardiovascular Disease among People Living with Diabetes.
Meng Wang, PhD

Dr. Wang is an HHMI Investigator, professor and Robert C. Fyfe Endowed Chair on Aging at Baylor College of Medicine, and a co-director of the Genetics and Genomics Graduate Program. Wang's research focuses on the molecular mechanisms governing organism longevity, reproductive fitness and lipid metabolism through harnessing the power of functional genomics, metablomics, and chemical engineering and optical biophysics. Her group is working to discover novel pro-longevity signaling pathways, deliver nutraceutical targets for healthy aging, and drive technological developments to investigate lipid dynamics as a function of time and space in living organisms. Dr. Wang is the recipient of the NIH Director's Pioneer Award, Peter O'Donnell Award, Gibco Emerging Leader Prize, Early Career Life Scientist Award from the America Society for Cell Biology, Glenn Award for Research in Biological Mechanisms of Aging, and Kenneth Fong Young Investigator Award from the Society of Chinese Bioscientists in America. She was elected as a fellow of the American Association for the Advancement of Science. Wang received a B.S. from Peking University in 2001 and a Ph.D. from the University of Rochester in 2005. After being a postdoctoral fellow at Harvard Medical School/Massachusetts General Hospital, Wang joined the faculty at Baylor College of Medicine in 2010.

Joshua D. Wythe, PhD

Dr. Wythe is a tenured associate professor in the Department of Molecular Physiology and Biophysics, as well as a member of the Cardiovascular Research Institute and the Dan L. Duncan Comprehensive Cancer Center, at Baylor College of Medicine (BCM). Prior to moving to BCM in late 2014, he was a non-tenure track staff scientist at the Gladstone Institute of Cardiovascular Disease at the University of California, San Francisco (2012-2014), where he also completed his postdoctoral fellowship (2008-2012) in Dr. Benoit Bruneau's lab, where he studied the role of TBX5 in cardiac patterning and development. Dr. Wythe performed his graduate studies at the University of Utah with Dean Y. Li (2001-2007), studying angiogenesis, smooth muscle development, and cardiac morphogenesis in both zebrafish and mice.

His laboratory is currently focused on identifying the molecular regulators of endothelial specialization in the developing vertebrate embryo, and how this process is altered in disease settings, with a focus on the cerebrovasculature. Through next generation sequencing and informatics, and the use of both murine and zebrafish models combined with 3D imaging technologies (such as light sheet fluorescent microscopy and micro-CT), they are determining if these developmental mechanisms can be exploited for therapeutic advances in treating diseases featuring abnormal vascular behavior or function in the brain, such as in the setting of brain arteriovenous malformations, glioma, or CADASIL.