

MiP
Mitochondrial
Physiology Society

14th MiP *SCHOOL*

May 18-23rd, 2025
Baton Rouge, LA, USA



pb Pennington Biomedical
Research Center
Louisiana State University

 **THE UNIVERSITY of
NEW ORLEANS**

MiPschool 2025

MiPschool 2025 is the 14th installment of the Mitochondrial Physiology Society's flagship training school focused on the history, fundamentals, and conceptual advances in the field of cellular bioenergetics. Participants will gain and improve working knowledge in key areas of study within the field of mitochondrial physiology including substrate coupling control, mechanisms of oxidative phosphorylation and electron transfer, redox regulation, and structural organization of the respiratory system, and more. Lecturers will provide detailed presentations on the principles of bioenergetics, and keynote speakers will deliver talks on cutting edge applications in biochemistry, cell biology, physiology, and biomedicine spanning multiple levels of biological organization.

The Mitochondrial Physiology Society

The Mitochondrial Physiology Society (MiP), founded in 2003, provides a multidisciplinary forum through high-level conferences, workshops and training courses. These forums bring together scientists working in divergent disciplines to discuss mitochondrial function and dysfunction, resolve differences, spread new knowledge and techniques, and to develop new research agendas and collaborations. Events of the MiP aim to provide the expertise necessary for successful application of techniques and concepts in mitochondrial physiology to the broader fields of molecular and cell biology, study of disease mechanisms, and comparative physiology.

Local Organizing Committee

Christopher L. Axelrod	Pennington Biomedical Research Center
Steven C. Hand	Louisiana State University
Ji Suk Chang	Pennington Biomedical Research Center
Brian A. Irving	Louisiana State University
Bernard B. Rees	University of New Orleans

MiP Executive Committee

Erich Gnaiger	Oroboros Instruments (Chair)
Christopher L. Axelrod	Pennington Biomedical Research Center (Co-chair)
Steven C. Hand	Louisiana State University (Treasurer)
Adam J. Chicco	Colorado State University
Pablo Garcia-Roves	University of Barcelona
Graham P. Holloway	University of Guelph
Verena Laner	Oroboros Instruments

Sponsors



Keynote Speakers

Erich Gnaiger
(Oroboros Instruments)



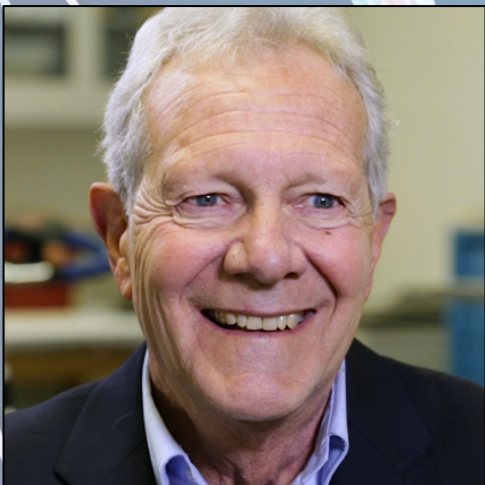
Dr. Gnaiger is the founder and CEO of Oroboros Instruments, co-chair of the Mitochondrial Physiology Society, and Editor-in-chief of Bioenergetic Communications. Dr. Gnaiger has dedicated more than 40 years to the study of thermodynamics of energy transfer and mitochondrial physiology. Since the early 1990's, Oroboros Instruments has manufactured and refined gold-standard instrumentation and support for high-resolution respirometry.

Charles L. Hoppel
(Case Western Reserve University)



Dr. Hoppel is Professor Emeritus in the department of pharmacology at Case Western Reserve University, and an adjunct Professor of Molecular Medicine at Pennington Biomedical Research Center. Over his 60+ year career, Dr. Hoppel has made countless discoveries advancing our understanding of mitochondrial bioenergetics and physiology. As a clinical-translational physician-scientist, Dr. Hoppel also numerous advancements in the diagnostics and screening of mitochondrial diseases.

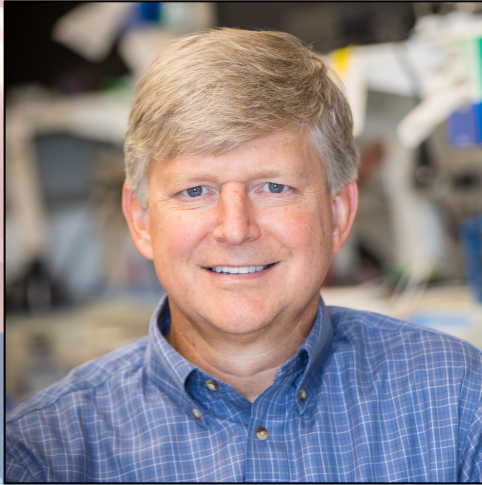
George A. Brooks
(UC Berkley)



Dr. Brooks is Professor of Integrative Biology at The University of California, Berkeley. Over his illustrious career, Dr. Brooks has published more than 300 papers elucidating mechanisms of cellular metabolism and exercise physiology. Most notably, Dr. Brooks has extensively illuminated the role and regulation of the lactate shuttle in the context of health and disease, with direct implications for the treatment of metabolic inflexibility in diseases such as obesity and type 2 diabetes.

Keynote Speakers (continued)

P. Darrell Nuefer
(Wake Forest University)



Dr. Nuefer is Professor and Chief of Molecular Medicine and Associated Director of the Cardiometabolic Center of Excellence at Wake Forest University. Over the past 40 years, Dr. Nuefer has employed bioenergetic approaches to determine how altered mitochondrial function contributes or protects against the etiology and/or pathology of metabolic diseases such as obesity and type 2 diabetes, including key contributions to our understanding of homeostatic regulation of redox stress.

Alexander Galkin
(Weill Cornell)



Dr. Galkin is Associate Professor of Neuroscience in the Brain and Mind Research Institute at Weill Cornell Medicine. Dr. Galkin's work is focused on characterizing the role of mitochondria metabolism and redox regulations in the development of tissue injury during ischemia/reperfusion. Dr. Galkin has published over 250 papers on the structural and functional regulation of aspects of mitochondrial biochemistry, regulation of respiratory system enzymes, and mechanisms of reactive oxygen species regulation.

Martin Jastroch
(Stockholm University)



Dr. Jastroch is a Professor in the Department of Molecular Biosciences at Stockholm University. Dr. Jastroch's work has focused on the physiology and molecular mechanisms of energy metabolism from the organism to the molecular level. Dr. Jastroch has published ~150 papers to date focused on metabolic aspects during obesity, adipose tissue biology, mitochondrial mechanisms, and thermogenesis.

May 18th (ARRIVAL)

4:00 – 6:00 PM	Registration (Cook Conference Center)
6:00 – 7:00 PM	Welcome Reception
7:00 – 9:00 PM	Dinner

May 19th (CONFERENCE DAY 1)

6:00 – 8:45 AM	Complimentary Breakfast (Cook Hotel)
8:00 – 5:00 PM	Registration (continued)
9:00 – 9:15 AM	<i>Opening Remarks</i> Christopher Axelrod (Pennington Biomedical); Local Organizing Committee
9:15 – 10:00 AM	<i>Mitochondrial Respiratory Function in Living Cells</i> Erich Gnaiger (Oroboros Instruments)
10:00 – 10:30 AM	Coffee Break
10:30 – 11:15 PM	Coenzyme Q Junction and Respiratory Control Mateus Grings (Oroboros Instruments)
11:15 – 12:00 PM	<i>Convergence and Additivity of Oxidative Phosphorylation and Electron Transfer Pathways; Developing Substrate, Uncoupler, Inhibitor, Titration Protocols</i> Adam Chicco (Colorado State University)
12:00 – 1:00 PM	Lunch (Cook Conference Center)
1:00 – 2:30 PM	Walk and Talk (LSU Lakes)
2:30 – 3:15 PM	Coffee Break
3:15 – 4:00 PM	<i>Mitochondrial Respiratory Control Efficiencies</i> Erich Gnaiger (Oroboros Instruments)
4:00 – 5:00 PM	<i>Role and Regulation of the Lactate Shuttle</i> George Brooks (University of California, Berkeley)
5:00 – 6:00 PM	<i>Mitochondrial Physiology: 125 Years From the “Bioblast”</i> Charles Hoppel (Case Western Reserve University)
6:00 – 8:00 PM	Dinner (Cook Conference Center)

May 20th (CONFERENCE DAY 2)

6:00 – 8:45 AM	Complimentary Breakfast (Cook Hotel)
8:00 – 9:00 AM	Registration (continued)



9:00 – 10:00 AM	<i>Protonmotive Force – from Motive Protons to Membrane Potential</i> Erich Gnaiger (Oroboros Instruments)
10:00 – 10:30 AM	Coffee Break
10:30 – 11:15 PM	<i>Structural Regulation of Bioenergetic Function</i> Nelli Mnatsakanyan (Penn State University)
11:15 – 12:00 PM	<i>Quality Control and Comparison of Mitochondrial Respiration Media</i> Eleonora Baglivo (Oroboros Instruments)
12:00 – 1:00 PM	Lunch (Cook Conference Center)
1:00 – 2:30 PM	Walk and Talk (LSU Campus)
2:30 – 3:00 PM	Coffee Break
3:00 – 4:00 PM	<i>Redox Homeostasis</i> Alexander Galkin (Weil Cornell)
4:00 – 4:45 PM	<i>Bioenergetic Efficiency and Regulation</i> Christopher L. Axelrod (Pennington Biomedical Research Center)
4:45 – 6:15 PM	Selected Oral Presentations
4:45 – 4:55 PM	<i>MIRO1 Regulates Skeletal Muscle Insulin Action, Mitochondrial Dynamics, and Bioenergetic Function</i> Analisa Taylor (Pennington Biomedical Research Center)
4:55 – 5:05 PM	<i>Mitochondrial Remodeling and Energetics During FoxO1-Mediated Adipose Transdifferentiation</i> Zhiyong Cheng (University of Florida, Gainesville)
5:05 – 5:15 PM	<i>Exploring the Impact of Novel Cardiolipin Disease Genes on Mitochondrial Function and Bioenergetics</i> Jana Aref (UCL Queen Square Institute of Technology)
5:15 – 5:25 PM	<i>Exercise Training Reverses Skeletal Muscle Mitochondrial Fragmentation and Improves OXPHOS Conductance in Patients with Obesity and Type 2 Diabetes</i> Elizabeth Heintz (Pennington Biomedical Research Center)
5:25 – 5:35 PM	<i>The Effects of Age and Acclimation Temperature on Mitochondrial ROS Production, Respiration, and Structure in Western Painted Turtles (Chrysemys picta bellii)</i>

5:35 – 5:45 PM	Sam Hogue (Saint Louis University) <i>Lipin-1 Promotes Macrophage Mitochondrial Fission for Improved Inflammation Resolution</i>
5:45 – 5:55 PM	Oluwakemi Igiehon (LSU Health, Shreveport) <i>Hepatic Ketogenic Insufficiency Exacerbates Cognitive Impairment and Mitochondrial Dysfunction in the 5xFamilial Alzheimer's Disease Mouse Model</i>
5:55 – 6:05 PM	Taylor Kelty (University of Missouri, Columbia) <i>The contribution of tissue-specific mitochondrial respiration to individual variation in oxygen uptake during rest and exercise by the Gulf killifish, <i>Fundulus grandis</i></i>
6:05 – 6:15 PM	Samantha Bowden (University of New Orleans) <i>The Role of Mitochondrial Coupling Efficiency in MASH-Hepatocellular Carcinoma</i>
6:15 – 6:30 PM	Elizabeth Zunica (Pennington Biomedical Research Center) Session Wrap Up
6:30 – 8:30 PM	Dinner (Cook Conference Center)

May 21st (CONFERENCE DAY 3)

6:00 – 7:45 AM	Complimentary Breakfast (Cook Hotel)
8:00 – 12:00 PM	MiPSchool Excursion (<i>Optional Registration Item</i>)
	Atchafalaya Basin Swamp Tour
12:00 – 1:00 PM	Lunch (Cook Conference Center)
1:00 – 2:00 PM	<i>Reductive Stress in Health and Disease</i>
	P. Darrell Neuffer (Wake Forest University) <i>Bioenergetic Adaptation in Mitochondrial Diseases</i>
2:00 – 2:45 PM	Shilpa Iyer (University of Arkansas) <i>Immunoenergetics and Exercise</i>
2:45 – 3:30 PM	Brian Irving (LSU) Coffee Break
3:30 – 4:00 PM	<i>Mitochondrial Function during Extreme Metabolic Transitions: From Bioenergetic Control to Oxidative Stress</i>
4:00 – 4:45 PM	Steven Hand (Louisiana State University) <i>Mitochondrial Bioenergetics and Healthy Aging</i>
4:45 – 5:30 PM	Anthony Molina (UCSD)

5:30 – 6:15 PM

Hepatocyte ATP Homeostasis Modulates Peripheral Control of Food Intake Inhibition

E. Matthew Morris (University of Kansas)

6:30 – 8:30 PM

Dinner (Cook Conference Center)

May 22nd (CONFERENCE DAY 4)

6:00 – 8:45 AM

Complimentary Breakfast (Cook Hotel)

9:00 – 10 AM

Adipose Tissue Thermogenesis and Uncoupling Proteins

Martin Jastroch (Stockholm University)

10:00 – 10:30 AM

Coffee Break

10:30 – 11:15 AM

Regulation of Brown Adipose Tissue Thermogenesis by PGC-1alpha

Ji Suk Chang (Pennington Biomedical Research Center)

11:15 – 12:00 PM

Adaptation of Energy Metabolism to Low Oxygen Availability

Bernard Rees (University of New Orleans)

12:00 – 1:00 PM

Lunch (Cook Conference Center)

1:00 – 2:30 PM

Walk and Talk (Mississippi River Walk)

2:30 – 3:00 PM

Coffee Break

3:00 – 3:45 PM

Impact of exercise training, caloric restriction, and inactivity on mitochondrial function and energy metabolism.

Dominik Pesta (German Aerospace Center)

3:45 – 4:30 PM

Cancer Bioenergetics

Kelsey Fisher-Wellman (Wake Forest University)

4:30 – 6:30 PM

Poster Session (Think and Drink)

6:30 – 8:30 PM

Dinner (Cook Conference Center)

Zydeco Band Performance

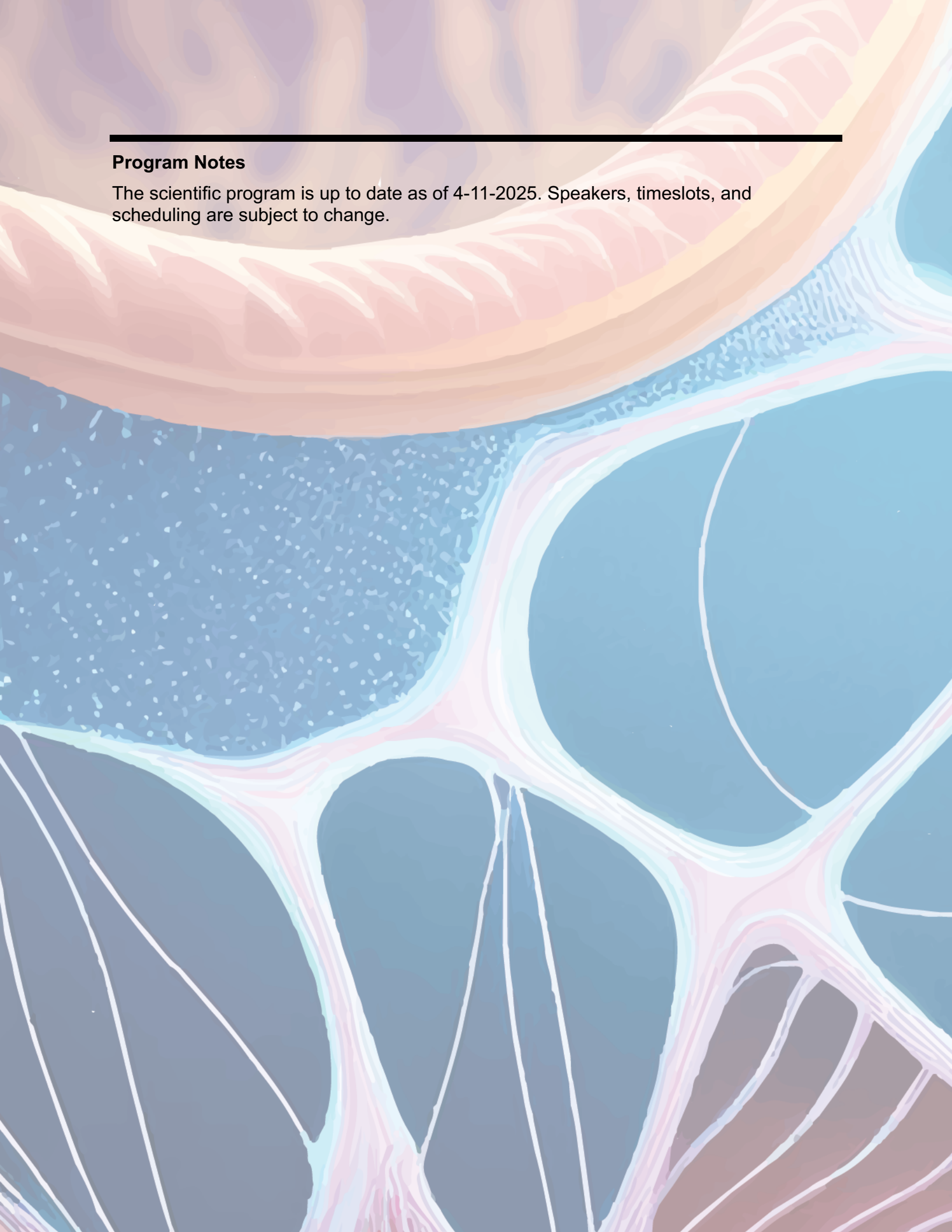
May 23rd (Departure)

6:00 – 9:30 AM

Complimentary Breakfast (Cook Hotel)

11:00 AM

Check Out from Cook Hotel



Program Notes

The scientific program is up to date as of 4-11-2025. Speakers, timeslots, and scheduling are subject to change.