

4th ICP Network Symposium
Physiological and Functional MRI of the Brain:
Emerging Techniques and Clinical Applications

September 13-15, 2019

Chevy Chase Bank Conference Center
The Sheikh Zayed Tower
The Johns Hopkins Hospital
Baltimore, Maryland

This activity has been approved for *AMA PRA Category 1 Credits™*.

DESCRIPTION

This symposium will discuss recent advances in physiological and functional MRI techniques, challenges and limitations, and their applications in basic and clinical neuroscience.

WHO SHOULD ATTEND

This activity is intended for scientists and clinicians interested in MRI imaging techniques for brain function, physiology and diseases.

OBJECTIVES

After attending this activity, the participant will demonstrate the ability to:

- List typical brain physiological and functional parameters that can be obtained with advanced MRI.
- Describe available approaches to measure brain blood supply using MRI and their potential strengths and limitations.
- Explain techniques to probe brain function, both under resting-state and under a task.
- Outline MRI techniques to probe molecular properties of the brain.
- Illustrate clinical applications of physiological and functional MRI techniques.

ACCREDITATION STATEMENT

The Johns Hopkins University School of Medicine is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.



CREDIT DESIGNATION STATEMENT

The Johns Hopkins University School of Medicine designates this live activity for a maximum of 9.5 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

OTHER CREDITS

The Johns Hopkins University has approved this activity for 9.5 **contact hours for non-physicians**.

POLICY ON SPEAKER AND PROVIDER DISCLOSURE

It is the policy of the Johns Hopkins University School of Medicine that the speaker and provider globally disclose conflicts of interest. The Johns Hopkins University School of Medicine OCME has established policies in place that will identify and resolve conflicts of interest prior to this educational activity. Detailed disclosure will be made prior to presentation of the education.

GENERAL INFORMATION**REGISTRATION**

September 13, 2019 • 8:00 a.m. – 8:30 a.m.

LOCATION

Chevy Chase Bank Conference Center
The Sheikh Zayed Tower
The Johns Hopkins Hospital
1800 Orleans Street, Main Level
Baltimore, Maryland 21287

The Sheikh Zayed Tower is located on Orleans Street between Broadway and Wolfe Streets. Directions and campus parking information are available on our website under the Contact Us tab at <https://HopkinsCME.cloud-cme.com>. The closest garage is the Orleans Street Garage, which is located on Orleans Street (Route 40) between Wolfe Street and Broadway. Handicapped parking is also available in the McElderry Street Garage. Johns Hopkins is smoke free.

FEES

Register Online: <https://hopkinscme.cloud-cme.com/aph.aspx?P=5&EID=18027>

Methods of Payment: We require full payment prior to the start of the activity. On-site payments by credit card only. The registration fee includes continental breakfasts, refreshment breaks, lunches, and one dinner.

Faculty/Physicians/Scientists/Staff.....\$300

Residents/Fellows/Students/Postdocs/Other Trainees.....\$100

You will receive a confirmation by e-mail. If you have not received it by September 7, 2019, call (410) 502-9636 to confirm that you are registered. A transcript of attendance will be available upon attestation of your credit hours and submission of the post activity online evaluation. The Johns Hopkins University reserves the right to cancel or postpone any activity due to unforeseen circumstances. In this event, the University will refund the registration fee but is not responsible for travel expenses. Additionally, we reserve the right to change the venue to a comparable venue. Under such circumstances registrants will be notified as soon as possible.

LATE FEE AND REFUND POLICY

A \$50 late fee applies to registrations received after 5:00 p.m. ET on September 7, 2019. A handling fee of \$50 will be deducted for cancellation. Refund requests must be received by fax or mail by September 7, 2019. No refunds will be made thereafter. Transfer of registration to another Johns Hopkins activity in lieu of cancellation is not possible.

HOTEL AND TRAVEL INFORMATION

Residence Inn Baltimore at the Johns Hopkins Medical Campus
Phone: (443) 524-8400
800 North Wolfe Street
Baltimore, Maryland 21205

HOTEL RESERVATION CUT-OFF DATE: August 13, 2019

The Residence Inn Baltimore is located on the Johns Hopkins Medical Campus. Make your reservation by clicking [here](#) or call the hotel directly and specify that you are attending the **Johns Hopkins ICP Network Symposium** to receive the special group rate of \$149.00 for one bedroom king suite, plus tax. On-site parking is available at the hotel at an additional charge. Check-in time is 4:00 p.m. Check-out time is 12:00 p.m.

SOCIAL EVENT

A dinner for registrants and faculty will be held at the Residence Inn Baltimore at the Johns Hopkins Medical Campus on Friday, September 13, 2019 from 6:00 p.m. – 8:00 p.m. Please indicate your attendance on the registration form.

HOW TO OBTAIN CREDIT

Post activity, an online evaluation will be available to attendees to evaluate the activity and individual presentations and to identify future educational needs. Upon completion of the evaluation, the learner must attest to the number of hours in attendance. Credits earned will be added to the learner's transcript and immediately available for print. The last day to access the evaluation and attest to your credits is **October 30, 2019**.

An outcome survey will be sent to all physician attendees within two months post activity to assist us in determining what impact this activity had on the learner's practice.

EMERGENCY CALLS

On September 13-15, 2019, direct emergency calls to the Hopkins registration desk, (443) 287-5426. Messages will be posted for participants.

AMERICANS WITH DISABILITIES ACT

The Johns Hopkins University School of Medicine fully complies with the legal requirements of the ADA and the rules and regulations thereof. *Please notify us if you have any special needs.*

SYLLABUS

The syllabus will be accessible online and via your mobile device in the CloudCME App prior to the activity. All registrants will receive a program and paper for note-taking.

TO REGISTER OR FOR FURTHER INFORMATION

Register Online..... <https://hopkinscme.cloud-cme.com/aph.aspx?P=5&EID=18027>
Register by Phone.....(410) 502-9636
Register by Fax.....(866) 510-7088
Confirmation/Certificates/Transcripts.....(410) 502-9636
General Information.....(410) 955-2959
E-mail the Office of CME.....cmenet@jhmi.edu

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Check out our mobile app CloudCME.

Organization Code: HopkinsCME



For website and CloudCME mobile app technical difficulties, email:

cmetechnsupport@jhmi.edu

For general information, please visit the activity webpage at

<https://hopkinscme.cloud-cme.com/aph.aspx?P=5&EID=18027>

SPEAKERS**ACTIVITY DIRECTOR****Hanzhang Lu, PhD**

Professor of Radiology and Radiological Science
Johns Hopkins University School of Medicine

JOHNS HOPKINS SPEAKERS**Jun Hua, PhD**

Associate Professor of Radiology
Kennedy Krieger Institute

Peiyong Liu, PhD

Assistant Professor of Radiology and Radiological Science
Johns Hopkins University School of Medicine

Jiadi Xu, PhD

Assistant Professor of Radiology
Kennedy Krieger Institute

Peter Van Zijl, PhD

Professor of Radiology and Radiological Science
Director, F.M. Kirby Research Center
Johns Hopkins University School of Medicine

GUEST SPEAKERS**John Detre, MD**

Professor of Neurology and Radiology
Director of the Center for Functional Neuroimaging in the Department of Radiology, Vice
Chair for Research in Neurology
University of Pennsylvania Perelman School of Medicine

Bruce Pike, PhD

Professor of Radiology and Clinical Neuroscience
CAIP Chair in Healthy Brain Aging
Head of Image Science
Hotchkiss Brain Institute
University of Calgary

Nicholas Blockley, PhD

Assistant Professor of Physiology
School of Life Sciences
University of Nottingham

Manus Donahue, PhD

Associate Professor of Radiology, Neurology, Psychiatry, and Physics
Vanderbilt University

Peter Bandettini, PhD

Principal Investigator
Chief of Section on Functional Imaging Methods
Director of FMRI Core Facility
NIMH, NIH

Molly Bright, PhD

Assistant Professor of Physical Therapy, Human Movement Sciences and Biomedical
Engineering
Feinberg School of Medicine
Northwestern University

Kevin Murphy, PhD

Wellcome Trust Senior Research Fellow
Head of Brain Imaging Group
School of Physics and Astronomy
Cardiff University

Dan Bulte, PhD

Associate Professor of Engineering Science
The Institute of Biomedical Engineering
University of Oxford

Jean Chen, PhD

Senior Scientist, Associate Professor of Medical Biophysics
Rotman Research Institute
Baycrest Health Sciences

Richard Hoge, PhD

Associate Professor of Neurology and Neurosurgery
Director of the Human Magnetic Resonance (MRI) Program
Montreal Neurological Institute and Hospital

Yulin Ge, MD

Professor of Radiology
New York University School of Medicine

Larry Ward, PhD

Professor of Radiology
Director, MGH NMR Core, Martinos Center
Harvard Medical School

David Feinberg, PhD

Adjunct Professor of Neuroscience
President of Advanced MRI Technologies
University of California Berkeley

Jack Wells, PhD

Principle Investigator
Sir Henry Dale Wellcome Trust/ Royal Society Research Fellow
Centre for Advanced Biomedical Imaging
University College London

Danny Wang, PhD

Professor of Neurology and Radiology
Director of Imaging Technology Innovation
Keck School of Medicine
University of Southern California

Felix Wehrli, PhD

Professor of Radiologic Science, Biochemistry and Biophysics
University of Pennsylvania Perelman School of Medicine

John Wood, MD, PhD

Professor of Pediatrics and Radiology,
Divisions of Pediatric Cardiology and Radiology, Keck School of Medicine, University of
Southern California

Ze Wang, PhD

Associate Professor of Radiology
Director of the MRI Lab
Lewis Katz School of Medicine
Temple University

PROGRAM
Friday, September 13, 2019

8:00-8:30 a.m.	Registration and Breakfast	
Opening Session		
8:30-8:45 a.m.	Hanzhang Lu, PhD Karen Horton, MD	Welcome and Conference Goals
Session 1: Perfusion and Permeability		
8:45-9:05 a.m.	John Detre, MD	Recent Progress in Arterial Spin Labeling (ASL) MRI
9:05-9:25 a.m.	Danny Wang, PhD	Contrast Agent and Non-Contrast Agent Imaging of Blood-Brain Barrier (BBB) Permeability
9:25-9:45 a.m.	Jun Hua, PhD	MRI Techniques for Cerebral Blood Volume (CBV) Mapping
9:45-10:30 a.m.	Proffered Talks*	
10:30-10:45 a.m.	Refreshment Break	
Session 2: Oxygenation and Metabolism		
10:45-11:05 a.m.	Felix Wehrli, PhD	Quantification of Cerebral Oxygen Consumption
11:05-11:25 a.m.	John Wood, MD, PhD	Oxygenation and Metabolism in Sickle Cell Disease (SCD)
11:25-11:45 a.m.	Bruce Pike, PhD	BOLD Response to Hyperoxia Challenge
11:45-12:30 p.m.	Proffered Talks*	
12:30-1:00 p.m.	Lunch	
1:00-3:00 p.m.	Poster Session*	
3:00-4:00 p.m.	Peter Van Zijl, PhD	Keynote Lecture
4:00-5:00 p.m.	Guided Tour of the MRI Facilities (Hanzhang Lu, Peter van Zijl)	
6:00-8:00 p.m.	Dinner at Residence Inn Baltimore	

* This session is not eligible for *AMA PRA Category 1 Credit™*.

PROGRAM
Saturday, September 14, 2019

8:00-8:30 a.m.	Breakfast	
Session 3: Cerebrovascular Reactivity		
8:30-8:50 a.m.	Nicholas Blockley, PhD	Cerebrovascular Reactivity (CVR) Mapping with Gas Challenges
8:50-9:10 a.m.	Peiying Liu, PhD	Cerebrovascular Reactivity (CVR) Mapping Without Gas Challenges
9:10-9:30 a.m.	Manus Donahue, PhD	Applications of Cerebrovascular Reactivity (CVR) in Aging and Brain Diseases
9:30-10:15 a.m.	Proffered Talks*	
10:15-10:30 a.m.	Refreshment Break	
Session 4: Neurovascular Coupling		
10:30-10:50 a.m.	Peter Bandettini, PhD	Neurovascular Coupling at Lamina Level
10:50-11:10 a.m.	Molly Bright, PhD	Noise Versus Signal in fMRI Data
11:10-11:30 a.m.	Kevin Murphy, PhD	Neurovascular Coupling in Advanced Physiology Maneuvers
11:30-12:15 p.m.	Proffered Talks*	
12:15-1:00 p.m.	Lunch	
1:00-3:00 p.m.	Poster session*	
Session 5: Calibrated fMRI		
3:00-3:20 p.m.	Dan Bulte, PhD	Recent Progress in Calibrated fMRI
3:20-3:40 p.m.	Jean Chen, PhD	Physiological Considerations and Normalization of Resting-State fMRI
3:40-4:00 p.m.	Richard Hoge, PhD	Application of Calibrated fMRI in Alzheimer's Disease
4:00-4:45 p.m.	Proffered Talks*	
4:45-5:00 p.m.	Award Ceremony	Best poster award Best presentation award

* This session is not eligible for *AMA PRA Category 1 Credit™*.

PROGRAM
Sunday, September 15, 2019

8:00-8:30 a.m.	Breakfast	
Session 6: New Contrast Agents		
8:30-8:50 a.m.	Jiadi Xu, PhD	Glucose-CEST: potentials and challenges
8:50-9:10 a.m.	Yulin Ge, PhD	Quantitative Susceptibility Mapping of the Cerebral Vasculature Using Ferumoxytol
9:10-9:30 a.m.	Larry Ward, PhD	Magnetic Particle Imaging (MPI): Potentials for Functional Brain Imaging
9:30-10:00 a.m.	Refreshment Break	
Session 7: Frontier Techniques		
10:00-10:20 a.m.	David Feinberg, PhD	Next-generation MRI Brain Scanner for High Resolution Imaging of Brain Function
10:20-10:40 a.m.	Jack Wells, PhD	Novel and Non-Invasive MRI Techniques to Assess Brain Clearance Pathways: Aquaporin-4 Dependent Water Flux Across the Blood Brain Barrier and CSF-ISF Exchange via Perivascular Fluid Movement
10:40-11:00 a.m.	Ze Wang, PhD	Machine Learning in Physiological MRI
Closing session		
11:00-11:55 a.m.	Panel Discussion	
11:55-12:10 p.m.	Hanzhang Lu, PhD	Closing Remarks
12:10 p.m.	Adjourn	