

Imaging Metabolism in Brain Disease

Symposium and Training XXV

www.invivometabolism.org

Imaging
Metabolism
in
Brain Disease



Symposium
and
Training
XXV

 National Center
for In Vivo Metabolism

Wednesday-Thursday Jan 31- Feb 1, 2018
UTSW Medical Center North Campus NG3.112, Dallas, Texas

 **UTSouthwestern**
Peter O'Donnell Jr.
Brain Institute

January 31 -February 1, 2018

Each year the Advanced Imaging Research Center (AIRC) and The National Center for In Vivo Metabolism host a symposium on a topic relevant to work being carried out at the Center and also at UT Southwestern Medical Center. The purpose of the symposium is to provide information on research activities and training opportunities.

Faculty, research staff, undergraduate, graduate and post doctoral students are all encouraged to attend. Past participants have included those from academia and industry around the country. Each symposium is devoted to training in which the latest developments at the Center are discussed.

There will be a poster competition for Students and Postdocs. All basic and translational research topics as well as clinical studies related to imaging and metabolism are welcome. Attendees are also encouraged to submit a one page abstract on a primary research interest. Poster and Abstract instructions are available on the registration page. Attendee and Speaker abstracts will be distributed in a booklet during meeting registration. The intent of the booklet is to outline attendee research interests and expertise to augment Investigator interaction. There will be prizes for the top Graduate Student and Postdoc posters.

Target Audience

This Symposium is intended for physicians, scientists and students with an interest in metabolic imaging of brain disease.

Purpose and Content

Abnormalities in metabolism are associated with many brain diseases. Despite advances in clinical diagnostic tools, limitations on current methods to characterize and visualize changes in brain functions and metabolism remain a significant barrier to understanding common brain disorders.

The Symposium was designed to advance our understanding of the role of metabolism in brain diseases and to explore new methods to image metabolic pathways in human patients. Basic concepts in metabolism as well as MRI, MR spectroscopy and hyperpolarized ^{13}C MRI will be reviewed. Recent developments in imaging of brain diseases will be presented by internationally-recognized experts and by UT Southwestern faculty. Demonstrations of sample preparation and operation of hyperpolarized ^{13}C MRI set-up will be available. This Symposium is supported by the National Institute of Health - National Institute of Biomedical Imaging and Bioengineering (NIH-NIBIB: EB015908) and by the O'Donnell Brain Institute at the University of Texas Southwestern Medical Center.

Educational Objectives

Metabolic imaging plays important roles in the diagnosis and treatment of brain diseases. Upon completion of the Symposium, attendees should be able to:

- Describe basic principles of intermediary metabolism in the brain.
- Identify high-impact brain disorders that are caused by primary defects in metabolism.
- Describe fundamental principles and applications of CEST MRI.
- Describe the physiologic basis for functional MRI of the brain.
- Describe the potential role of hyperpolarized ^{13}C MR in imaging compared to current clinical tools.

Imaging Metabolism in Brain Disease

Wednesday, January 31, 2018

07:30 AM **Breakfast & Registration**

Morning Session 1

Moderator: Lloyd Lumata, PhD

University of Texas at Dallas

08:30 AM Replacing Radiation in Metabolic Research

Craig Malloy, MD

UT Southwestern Medical Center

09:00 AM Hyperpolarized ^{13}C : Basic Principles

Jae Mo Park, PhD

UT Southwestern Medical Center

09:30 AM Hyperpolarized ^{13}C MRI: Early Clinical Applications

John Kurhanewicz, PhD

UC San Francisco

10:00 AM **Break**

Morning Session 2

Moderator: Charlie Khemtong, PhD

UT Southwestern Medical Center

10:30 AM Water: The Best Biomarker of Metabolism!

Dean Sherry, PhD

UT Southwestern Medical Center

11:00 AM CEST: Pulse Sequences and Chemical Specificity

Elena Vinogradov, PhD

UT Southwestern Medical Center

11:30 AM Cancer Prognosis by CEST

Masaya Takahashi, PhD

UT Southwestern Medical Center

12:00 **Lunch**

01:00 PM Convene in NG, Tour Group Assignment

01:15 PM - **Facility Tour and Demos**
2:45 PM

In vivo HP ^{13}C MRI – *Jeannie Baxter, RN; Jeff Litiker, PharmD; Crystal Harrison, PhD; Jae Mo Park, PhD; Jian-xiong Wang, PhD*

Chemistry and Physics of Hyperpolarized MR – *Charlie Khemtong, PhD; Gaurav Sharma, PhD*

Afternoon Session

Moderator: Dean Sherry, PhD

UT Southwestern Medical Center

03:00 PM The Challenge of the Brain: Metabolism in Many Compartments

Doug Rothman, PhD

Yale University

03:45 PM Metabolic Basis of fMRI

Richard Buxton, PhD
UC San Diego

04:30 PM **Reception and Poster**

Thursday, February 1, 2018

07:30 AM **Breakfast & Registration**

Morning Session 1: Inborn Errors in Brain Metabolism

*Moderator: Juan Pascual, MD, PhD
UT Southwestern Medical Center*

08:30 AM Biochemical Basis of Neurodevelopmental Disorders

Andrea Gropman, MD
Children's National Health System

09:15 AM Integration of Clinical, Genetic and Imaging Data for Evaluation of Inborn Errors

Ralph Deberardinis, MD, PhD
UT Southwestern Medical Center

10:00 AM **Break**

Morning Session 2: Brain Cancer

*Moderator: Bruce Mickey, MD
UT Southwestern Medical Center*

10:30 AM MR Spectroscopy Studies of Brain Cancer

Sabrina Ronen, PhD
UC San Francisco

11:15 AM In Vivo Metabolomics of Brain Cancer

Changho Choi, PhD
UT Southwestern Medical Center

12:00 **Lunch**

Afternoon Session 1: Imaging after Concussion

*Moderator: Christopher Madden, MD
UT Southwestern Medical Center*

01:00 PM MEG and MRI in TBI

Joe Maldjian, MD
UT Southwestern Medical Center

01:45 PM Brain Metabolism after Concussion

Brenda Bartnik-Olson, PhD
Loma Linda University

02:30 PM **Break**

Afternoon Session 2: Neurodegeneration

*Moderator: Mark Goldberg, MD
UT Southwestern Medical Center*

03:00 PM MRI and PET for Evaluation of Age-Related Cognitive Decline

Prashanthi Vemuri, PhD
Mayo Clinic

03:45 PM MR Spectroscopy of Neuropsychiatric Disorders

Peter Barker, DPhil
Johns Hopkins University

04:30 PM **Poster Award, Discussion, and Adjourn**

Craig Malloy, MD

Discussion of Off-Label Use

Because this course is meant to educate the physicians with what is currently in use and what may be available in the future, there may be "off-label" use discussed in the presentations. Speakers have been requested to inform the audience when off-label use is being discussed.