



Each year the Advanced Imaging Research Center and The National Center for Research Resources (recently dissolved and reorganized under the National Institute of Biomedical Imaging and Bioengineering) host a symposium on a topic relevant to work being carried out at the Center. The purpose of the symposium is to provide information on research activities and training opportunities.

Faculty, research staff, undergraduate, graduate, and postdoctoral 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 no poster presentations. Instead, all attendees are encouraged to submit a one page abstract on a primary research interest (instructions are available on the registration page). These abstracts, along with speaker abstracts, will be distributed in a booklet at the meeting registration desk. The intent of the booklet is to outline attendee research interests and expertise to augment Investigator interaction.

### **Target Audience**

This symposium is intended for students, scientists and physicians with an interest in translating new ideas in chemistry and physics to practical imaging methods for patients using PET and MRI.

### **Purpose and Content**

Molecular imaging may be defined as the detection, measurement and visualization of biologic processes at the molecular and cellular levels. The power of molecular imaging lies in the fact that it is essentially noninvasive and thus can be used to probe disease processes at the time of diagnosis and over time in response to therapy.

New techniques to image protons in water to reveal information about macromolecules have appeared, and new positron-emitting probes are continuously under development. Imaging nuclei using hyperpolarized carbon opens a new approach to clinical research in cancer metabolism. These are just a few examples of recent advances in this exciting field.

This Symposium is supported by the National Institute of Health – National Institute of Biomedical Imaging and Bioengineering (NIH-NIBIB: EB015908). The purpose is twofold: to present basic concepts in molecular imaging under development in the Center, and to provide an update from internationally recognized leaders in the field on recent exciting advances in molecular imaging.

## Educational Objectives

Upon completion of the course, the participant should be able to:

- Define molecular imaging.
- Describe the physical and physiological basis for one recent clinical translation of molecular imaging.
- Describe one example of the relevance of molecular imaging to genetics of disease.

### Wednesday, May 22, 2013

07:30 AM	<i>Breakfast and Registration</i>
08:25 AM	Welcome & Overview of CPRIT - <i>Craig Malloy, M.D.</i>
08:30 AM	Clinical Relevance of Metabolism in Cancer - <i>Elizabeth Maher, M.D., Ph.D.</i>
08:55 AM	Mass Spectrometry-based Oncometabolomics - <i>Dinesh Rakheja, M.D.</i>
09:20 AM	Animal Models of Malignancies - <i>Robert Bachoo, M.D., Ph.D.</i>
09:45 AM	The Biology of Prostate and Renal Cancers - <i>Kevin Courtney, M.D., Ph.D.</i>
10:10 AM	<i>Break</i>
10:30 AM	Imaging an Oncometabolite at 3T and 7T - <i>Changho Choi, Ph.D.</i>
10:55 AM	The Challenges of Imaging at 7T - <i>Mary Preston McDougall, Ph.D.</i>
11:20 AM	The Promise of Hyperpolarization - <i>Jim Bankson, Ph.D.</i>
11:45 AM	Discussion
12:00 Noon	<i>Lunch</i>
01:00 AM	Stable Isotopes in Clinical Research - <i>Craig Malloy, M.D.</i>
01:45 PM	Intermediary Metabolism by $^2\text{H}$ and $^{13}\text{C}$ NMR - <i>Shawn Burgess, Ph.D.</i>
02:30 PM	<i>Break</i>
02:45 PM	Hyperpolarized $^{13}\text{C}$ : Basic Physics and Examples - <i>Matthew Merritt, Ph.D.</i>
03:30 PM	Time-Resolved Imaging with Hyperpolarized $^{13}\text{C}$ - <i>Charles Cunningham, Ph.D.</i>
04:15PM	<i>Discussion and Reception</i>

### Thursday, May 23, 2013

07:30 AM	<i>Registration and Breakfast</i>
08:30 AM	Clinical Applications for Metabolic Imaging - <i>Ralph DeBerardinis, M.D., Ph.D.</i>
09:15 AM	Approaches for Clinical Hyperpolarized $^{13}\text{C}$ Imaging - <i>Peder Larson, Ph.D.</i>
10:00 AM	<i>Break</i>
10:15 AM	Clinical CEST - <i>Seth Smith, Ph.D.</i>

- 11:00 AM New Windows into Brain Physiology Using High-speed Functional and Spectroscopic MRI  
- *Stefan Posse, Ph.D.*
- 11:45 AM Discussion
- 12:00 Noon *Lunch*
- 01:00 PM Merging Therapeutic and Diagnostic Imaging  
- *Jamey Weichert, Ph.D.*
- 01:45 PM Radiogenomics: Integrating Clinical Imaging and Genomics  
- *Michael Kuo, M.D.*
- 02:30 PM *Break*
- 03:00 PM Molecular Imaging and Interventional Radiology  
- *Rajiv Chopra, M.D.*
- 03:45 PM Radiomics and Habitat Imaging  
- *Robert Gillies, Ph.D.*
- 04:30 PM *Discussion and Adjourn*

### **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.