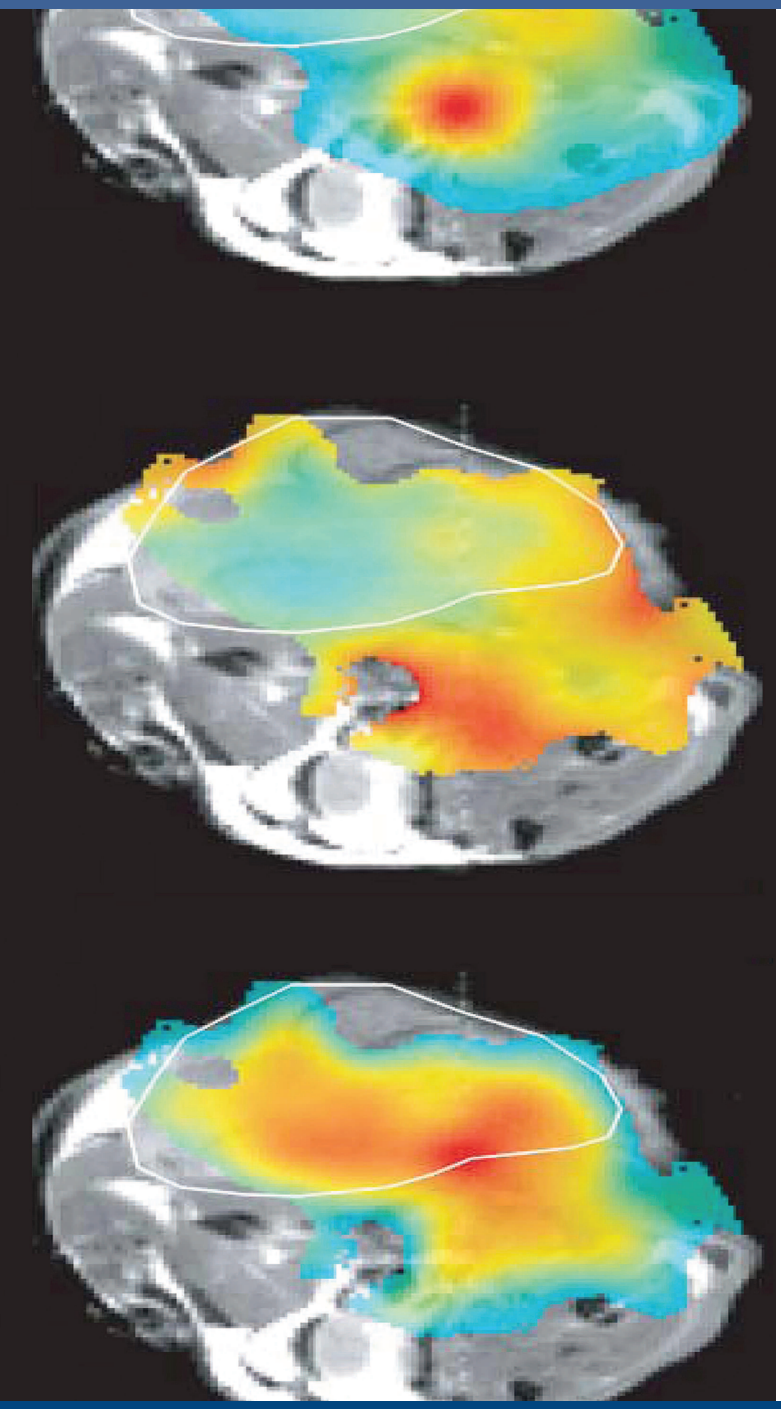
continuing education



Symposium and Training XVII:

Hyperpolarization in Biology

Wednesday-Thursday
May 20-21, 2009

UT Southwestern Medical Center
T. Boone Pickens Biomedical Building
Dallas, Texas

Sponsored by
The National Center for Research Resources,
UT Southwestern Advanced Imaging Research Center
and the Office of Continuing Medical Education

UT SOUTHWESTERN
MEDICAL CENTER

Symposium and Training XVII:
Hyperpolarization in Biology

Course Director
Craig Malloy, MD

Professor, Department of Radiology and Department of Internal Medicine;
Medical Director, Advanced Imaging Research Center,
UT Southwestern Medical Center, Dallas, Texas

Target Audience
Many diseases such as cancer, diabetes and ischemic heart disease change tissue biochemistry. The Symposium is designed for students, physicians and scientists with interests in this new method to probe the effects of disease on metabolic pathways.

Purpose and Content
Radiologists and physicists have long been aware of the superb anatomical resolution and valuable clinical information available by standard MR imaging. The power of NMR spectroscopy to obtain highly specific information about key molecules and metabolites is well-known to biochemists. Because of the low concentration of metabolites in the body and resulting low sensitivity, the development of MR as a tool for molecule-specific imaging has been challenging.

Recently a new technique to improve sensitivity by ~10,000–fold has been developed. Hyperpolarized ^{13}C MR provides a fundamentally new approach to molecular imaging. This technique brings numerous opportunities and challenges to physicists, chemists, biologists and clinicians. On Wednesday afternoon our speakers will review the basic features of important metabolic pathways that are frequently studied with ^{13}C. The use of ^{13}C as a tracer to probe these pathways will be presented and multiple examples will be worked through. On Thursday, the basic principles of hyperpolarization, production of hyperpolarized nuclei, and early biological and clinical applications will be presented.

The Symposium is supported by an NIH-funded Center for Research Resources (RR02584). Research opportunities at the Resource will also be described briefly.

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

- Summarize the fundamental advantages of ^{13}C NMR compared to standard radiotracer or radionuclide methods.
- Explain why the magnetic resonance signal is higher from a hyperpolarized samples compared to ordinary MRI.
- Identify the factors that currently limit hyperpolarized ^{13}C imaging.
- Discuss one example of a clinical condition, modeled in experimental animals, that can be evaluated by ^{13}C hyperpolarization and imaging.

Accreditation
The University of Texas Southwestern Medical Center is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

Credit Designation
The University of Texas Southwestern Medical Center designates this educational activity for a maximum of **7.25 *AMA PRA Category 1 Credits*™**. Physicians should only claim credit commensurate with the extent of their participation in the activity.

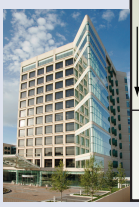
Conflict of Interest
It is UT Southwestern's policy that participants in CME activities should be made aware of any affiliation or financial interest that may affect the speaker's presentation(s). Each speaker has completed and signed a conflict of interest statement. The faculty members' relationships will be disclosed in the course syllabus.

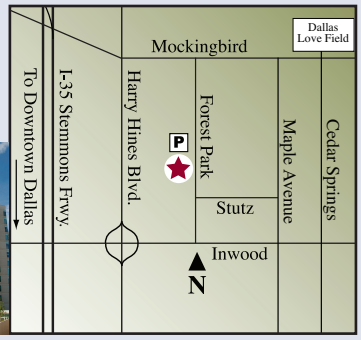
Discussion of Off-Label Use
Because this course is meant to educate physicians with what is currently in use and what may be available in the future, there may be "off-label" use discussed in the presentations. Speakers have been requested to inform the audience when off-label use is being discussed.

Registration
Registration is complimentary, but in order to guarantee your lunch and course materials, we do require a completed registration form prior to May 13, 2009.

Cancellation Policy
The Office of Continuing Medical Education reserves the right to limit registration and cancel courses, no less than one week prior to the course, should circumstances make this necessary.

Location
UT Southwestern Medical Center
T. Boone Pickens Biomedical Building Auditorium
6001 Forest Park Road
Dallas, Texas 75235



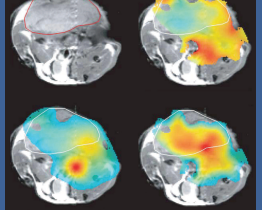


Parking
Complimentary parking is available in the Visitor Garage entered from 6001 Forest Park Road located adjacent to the T. Boone Pickens Biomedical Building. The garage elevators will take you to the third floor. Follow the directional signs to the conference room. Parking vouchers will be available at the registration desk.

ADA Statement
We accommodate people with disabilities. Please call 214-648-3138 for more information, or mark the space indicated on the registration form. To ensure accommodation, please register as soon as possible.

The University of Texas Southwestern Medical Center is committed to providing programs and activities to all persons regardless of race, color, national origin, religion, sex, age, veteran status, or disability.

UT Southwestern is an equal opportunity institution.



Symposium and Training XVII:
Hyperpolarization in Biology

Agenda

Teaching Session –
Probing Metabolic Pathways by ^{13}C NMR: The Basics
Wednesday, May 20, 2009

12:00 pm	***Registration***
1:00 pm	How NMR Illuminates Physiology and Medicine – *Robert Shulman, Ph.D.*
2:00 pm	Carbon Tracers and Enzyme Kinetics – *A. Dean Sherry, Ph.D*
2:30 pm	Substrate Oxidation in Heart and Skeletal Muscle – *Craig Malloy, M.D.*
3:00 pm	Discussion and Break
3:30 pm	Glucose Production and Complex Networks in Pancreas and Liver – *Shawn Burgess, Ph.D.*
4:00 pm	Neurotransmitter Synthesis in the Mouse Brain – *Juan Pascual, M.D., Ph.D.*
4:15 pm	Data Analysis and Computer Models: Examples– *F. Mark Jeffrey, D. Phil.*
4:30 pm	Problem Set – Sample Spectra and Discussion
5:00 pm	***Adjourn***

Symposium and Training XVII:
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Thursday, May 21, 2009

8:00 am	***Registration***
9:00 am	Introduction to Dynamic Nuclear Polarization – *Matthew Merritt, Ph.D.*
9:45 am	The Journey of DNP-Enhanced Nuclear Spins: From the Polarizer to the Rat Brain – *Arnaud Comment, Ph.D.*
10:30 am	***Discussion and Break***
11:00 am	Hyperpolarization and Long-Lived States: Circumventing T1 Barriers – *Aaron Grant, Ph.D.*
11:45 am	Discussion
12:00 pm	***Lunch***
1:00 pm	^{13}C Hyperpolarization: History, Results and Applications! – *Klaes Golman, Ph.D.*
2:00 pm	How to Image Hyperpolarized ^{13}C – *Charles Cunningham, Ph.D.*
2:45 pm	Discussion and Break
3:00 pm	Imaging Tumour Responses to Treatment with Hyperpolarized ^{13}C Magnetic Resonance Spectroscopic Imaging – *Kevin Brindle, Ph.D.*
3:45 pm	Early Clinical Perspectives on Hyperpolarized ^{13}C – *John Kurhanewicz, Ph.D.*
4:30 pm	Discussion
5:00 pm	***Adjourn/Reception***

Registration Form
Symposium and Training XVII:
Hyperpolarization in Biology
Wednesday-Thursday, May 20-21, 2009 **RP0905D**

Although there is no registration fee, in order to guarantee your lunch and course materials, we do require a completed registration form faxed to #214-648-4804 prior to May 13, 2009

Name_____ Degree_____ Last Four Digits of SS#_____

Address_____ Specialty_____

City_____ State_____ Zip Code_____

Business Phone_____ Fax_____

Email_____

Please indicate preferred method to receive confirmation: ❑ Email ❑ Fax ❑ Mail

Type of Credit Requested: (please check) ❑ AMA ❑ General

Complete and mail directly or fax registration to:

UT Southwestern / Continuing Medical Education
5323 Harry Hines Boulevard
Dallas, Texas 75390-9059
Phone (214) 648-3138, 1-800-688-8678 Fax (214) 648-4804

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SYMPOSIUM AND TRAINING XVII:
HYPERPOLARIZATION IN BIOLOGY

May 2009

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COURSE DIRECTOR

CRAIG MALLOY, MD
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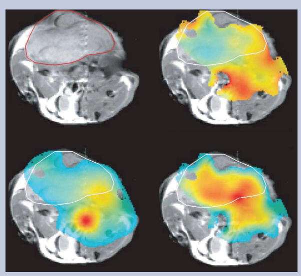

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SPEAKERS

KEVIN BRINDLE, PHD
University of Cambridge

SHAWN BURGESS, PHD
University of Texas

ARNAUD COMMENT, PHD
Ecole Polytechnique Fédérale de Lausanne

CHARLES CUNNINGHAM, PHD
University of Toronto

KLAES GOLMAN, PHD
Imagnia AB

AARON GRANT, PHD
Harvard University

F. MARK JEFFREY, DPHIL
University of Texas

JOHN KURHANEWICZ, PHD
University of California

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MATTHEW MERRITT, PHD
University of Texas

JUAN PASCUAL, MD, PHD
University of Texas

A. DEAN SHERRY, PHD
University of Texas

ROBERT SHULMAN, PHD
Yale University

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