

Symposium and Training VI: ¹³C in Metabolic Research

Thursday, May 7, 1998

Presented by

**The Mary Nell and Ralph B. Rogers
Magnetic Resonance Center**

and

The National Center for Research Resources in association with



Program Objective

This symposium brings together research from laboratories at UT Southwestern and our outstanding guest speakers. The morning session is devoted to training for physicians, biomedical scientists and students who are interested in ¹³C NMR isotopomer analysis for metabolic studies. In this session, Dr. Dean Sherry will present an overview of basic concepts for ¹³C NMR isotopomer analysis, Dr. John Jones will discuss recent studies in human volunteers, and Dr. Craig Malloy will present a systematic examination of the ¹³C NMR spectrum of glutamate, a popular target for analysis in metabolic studies.

The afternoon session focuses on ¹³C NMR and ¹³C Mass Spectrometry in metabolic research with an emphasis on analysis of kinetics. Dr. Robert London will summarize the principles behind calculating metabolic fluxes from ¹³C NMR data. Following this presentation, Dr. Doug Lewandowski, Dr. John Chatham, and Dr. Mark Jeffrey will present their methods for kinetic analysis. Dr. Sherry will then lead a panel discussion of these methods.

Later in the afternoon, the emphasis will shift to issues which complement NMR studies in small animal models under high resolution conditions. Dr. Christine Des Rosiers will remind the audience of the importance and experimental sensitivity of ¹³C isotopomer analysis by mass spectrometry, and Dr. Rolf Gruetter will examine the potential for *in vivo* studies in humans at very high fields.

The reception and dinner is designed to provide an opportunity for interaction between attendees and speakers. After dinner, Dr. Robert Shulman from Yale University will discuss his lab's recent metabolic studies in the human brain.

Guest Speakers

Robert London, PhD Director of NMR Laboratories, National Institutes of Environmental Health Sciences, Research Triangle Park, NC

John C. Chatham, D.Phil., Assistant Professor of Radiology, Johns Hopkins University School of Medicine, Baltimore, MD

Douglas Lewandowski, PhD Associate Professor of Radiology, Massachusetts General Hospital, Charleston, MA, Harvard Medical School, Boston, MA

Christine Des Rosiers, PhD Associate Professor of Nutrition and Biochemistry, University of Montreal, Quebec, Canada

Rolf Gruetter, PhD Assistant Professor of Radiology, University of Minnesota Medical School, Minneapolis, MN

Robert Shulman, PhD Professor of Molecular Biophysics and Biochemistry, Yale University, New Haven, CT

UT Southwestern Speakers

A. Dean Sherry, PhD Professor of Radiology at the University of Texas Southwestern Medical Center and Professor of Chemistry at the University of Texas at Dallas

John G. Jones, DSc, Instructor of Radiology, University of Texas Southwestern Medical Center, Dallas, TX

Craig R. Malloy, MD, Professor of Radiology and Internal Medicine, and Director of the Southwestern Biomedical Magnetic Resonance Facility at the Mary Nell and Ralph B. Rogers Magnetic Resonance Center, University of Texas Southwestern Medical Center, Dallas, Texas

F. Mark Jeffrey, D.Phil., Assistant Professor of Radiology, University of Texas Southwestern Medical Center, Dallas, Texas

Program Schedule

8:00 a.m.	On Site Registration
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TRAINING: INTRODUCTION TO ^{13}C NMR ISOTOPOMER ANALYSIS

8:30 a.m.	Introduction to ^{13}C Isotopomers A. Dean Sherry, PhD
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9:00 a.m.	Analysis of Hepatic Metabolism in Humans John G. Jones, DSc
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9:30 a.m.	Systematic Analysis of the Glutamate Spectrum Craig R. Malloy, MD
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10:00 a.m.	Break
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10:15 a.m.	Participants' Presentations and Discussion
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12:00 a.m.	Lunch on your own
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SYMPOSIUM: ^{13}C AND CITRIC ACID CYCLE KINETICS

1:00 p.m.	Isotope Inertia
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Robert London, PhD

1:30 p.m. **Where Have All the Carbons Gone? Modeling TCA Cycle Fluxes - the Good, the Bad and the Unknown**
John C. Chatham, D.Phil.

2:00 p.m. **Analysis of ^{13}C Kinetics and Subcellular Compartments**
Douglas Lewandowski, PhD

2:30 p.m. **Multiplet Momentum**
F. Mark Jeffrey, D.Phil.

3:00 p.m. **Break**

3:15 p.m. **Round Table Discussion of Flux Measurements**
Moderator: A. Dean Sherry, PhD

4:00 p.m. **^{13}C Isotopomer Analysis by GCMS, a Look at the TCA Cycle From the Inside**
Christine Des Rosiers, PhD

4:45 p.m. **^{13}C NMR Methods for Human Metabolism Studies**
Rolf Gruetter, PhD

5:30 p.m. **Wine and cheese reception**

6:30 p.m. **Buffet dinner**

7:15 p.m. **Mind and Brain by ^{13}C NMR**
Robert Shulman, PhD

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