

# 8<sup>TH</sup> Annual MMPC Course

## ISOTOPE TRACERS IN METABOLIC RESEARCH

■ November 16-20, 2015

Welcome to the eighth annual course which provides basic introductory and comprehensive information on performing metabolic studies using tracers labeled with radioactive or stable isotopes, in humans and in animals. The course is designed for beginners as well as those with experience who wish to expand their capabilities to more sophisticated problems. The faculty is well-versed in a variety of applications and methodologies.

Techniques will be presented for investigating whole body metabolism, for metabolite balance across organs, intracellular flux rates and pathway regulation. The basic aspects of modeling will be considered, as well as specific applications to the study of carbohydrate, fat, protein metabolism and energy balance. Theoretical and practical matters related to sample analysis by mass spectrometry and NMR will be discussed, including detailed numerical examples of calculations involved in determining isotopic enrichment and basic kinetic parameters. Advanced lectures will discuss in more detail the use of positional and mass isotopomer analysis for intracellular flux rates and various aspects of protein and amino acid metabolism. Applications in humans and animal models (particularly mouse) will be considered.

Course material will be available for download from [www.mmpc.org/shared/tracers.aspx](http://www.mmpc.org/shared/tracers.aspx)

Problems and discussion questions will highlight key concepts. In addition to organized sessions, individual attendees will have ample opportunities for personal interaction with faculty members in the form of one-on-one mentoring sessions to discuss their research projects in more depth.

## COURSE CO-DIRECTORS



**Henri BRUNENGRABER**

Case Western Reserve University



**Owen MCGUINNESS**

Vanderbilt University - Medical Center



**Robert R. WOLFE**

University of Arkansas for Medical Sciences

## FACULTY/SPEAKERS

Douglas E. BEFROY, DPhil New Haven, CT

Henri BRUNENGRABER, MD, PhD Cleveland, OH

Gary CLINE, PhD New Haven, CT

Melanie CREE GREEN, MD, PhD Denver, CO

Joanne KELLEHER, PhD Boston, MA

Maren LAUGHLIN, PhD Bethesda, MD

Owen MCGUINNESS, PhD Nashville, TN

Matthew MERRITT, PhD Dallas, TX

Elizabeth PARKS, PhD Columbia, MD

Stephen PREVIS, PhD Rahway, NJ

Michelle PUCHOWICZ, PhD Cleveland, OH

Robert R. WOLFE Little Rock, AR

## SPONSORS

This course is supported by the Mouse Metabolic Phenotyping Centers.



Presented by:

**The Mouse Metabolic  
Phenotyping Consortium**

8<sup>TH</sup> Annual MMPC Course

**Isotope Tracers  
in Metabolic Research:**

Principles and Practice of Kinetic Analysis

[www.mmpc.org/shared/tracers.aspx](http://www.mmpc.org/shared/tracers.aspx)

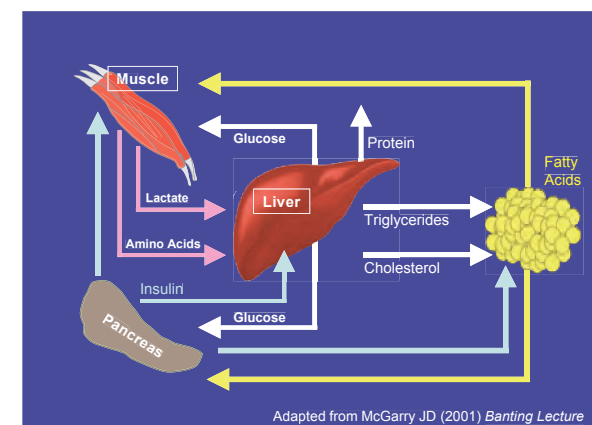
November 16-20, 2015  
Cleveland OH



**WYNDHAM®**  
Cleveland at PlayhouseSquare

1260 Euclid Avenue  
Cleveland, OHIO 441 15 USA

A week-long course (with one-on-one mentoring sessions) in the theory and practice of stable and radioactive isotopic tracers for the study of metabolism in human and animal models.



DETAILED COURSE AGENDA IS AVAILABLE AT:

[www.mmpc.org/shared/tracers.aspx](http://www.mmpc.org/shared/tracers.aspx)

### Monday, November 16, 2015

Basic characteristics of radioactive, stable isotope tracers.

General principles of mass spectrometry.

Isotopic enrichment using GC-MS, LC-MS.

Methods of mass spectrometry analysis.

Measurement of specific activity.

### Tuesday, November 17, 2015

Tracer kinetics (single pool models).

Oxidation and synthesis rates.

Glucose metabolism (clamp studies).

Lipid metabolism (basic kinetics).

### Wednesday, November 18, 2015

Pathway fluxes using NMR isotopomer analysis.

Methods in protein metabolism.

### Thursday, November 19, 2015

Energy expenditure with doubly labeled water.

Synthesis rates with deuterated water: proteins, fatty acids sterols, glucose, nucleic acids.

Mass isotopomer distribution analysis: polymer synthesis, multiple flux pathways, TCA cycle, anaplerosis.

### Friday, November 20, 2015

Pathway discovery via association of isotopomer analysis and metabolomics.

Inherently difficult problems.

#### FOR COURSE DETAILS OR SUGGESTIONS

Please contact Dr. Henri Brunengraber

Email: [hxb8@case.edu](mailto:hxb8@case.edu) • Tel.: (216) 368-6548

#### LOGISTICS



# WYNDHAM®

Cleveland at PlayhouseSquare

Wyndham Hotel (also where the course takes place)

1260 Euclid Avenue

Cleveland, OHIO 44115

1 (216) 615-7500

[www.wyndham.com/hotels/ohio/cleveland/wyndham-cleveland-at-playhousesquare/hotel-overview](http://www.wyndham.com/hotels/ohio/cleveland/wyndham-cleveland-at-playhousesquare/hotel-overview)

The Cleveland Hopkins Int'l Airport is only within 20 minutes from the Wyndham Hotel by public transit.

[www.clevelandairport.com/Transportation/Public-Transit.aspx](http://www.clevelandairport.com/Transportation/Public-Transit.aspx)

#### COURSE REGISTRATION & MATERIAL

- Registration opens on June 1, 2015
- **Registration is available online or via the attached form. Registration is limited to 100 participants**
- To register online please go to <https://www.mmpc.org/shared/tracers>
- **Course registration deadline: Mon Oct 26, 2015**
- Please refer to 'Registration Form' for list of fees.
- Registration fee includes:
  - ~ breakfast, lunch and snacks (Nov 16 - 20)
- Please bring a Wi-Fi enable device to download and view all course material.

**NOTE:** The following book is also very useful

"Isotope Tracers in Metabolic Research: Principles and Practice of Kinetic Analysis" by Robert R. Wolfe and David L. Chinkes, 2nd Edition (2005 Wiley-Liss).

#### ACCOMMODATIONS & INFORMATION

To book a room at the discount rate, please call 1 (866) 270-6768 and **mention the identifier:**

**8<sup>th</sup> Annual MMPC Course + Dates of course**

**Reservations must be made on or before 10/26/2015**

☐ By registering, I certify that I have been trained in the Responsible Conduct of Research at my Institution.

#### REGISTRATION FORM

The course is **limited to 100 participants**

Name: \_\_\_\_\_  
Last First Degree

Institution: \_\_\_\_\_

Position: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City | State | ZIP: \_\_\_\_\_

Email: \_\_\_\_\_ Tel #: \_\_\_\_\_

The personal information above may be shared with other course attendees: ☐ YES ☐ NO

Experience with Isotopic Tracers: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Topic(s) I wish to learn about: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Special Dietary or Accessibility needs: \_\_\_\_\_

\_\_\_\_\_

#### REGISTRATION FEES

- ☐ Student / Post-Doc (\$450)
- ☐ Academic / Gov. Scientist (\$800)
- ☐ Industry Scientist (\$1,300)

Payable by personal, company or institutional check  
**ONLY by Monday October 26, 2015**

Please Make Check Payable To:

Case Western Reserve University

Ref.: **8<sup>th</sup> Annual MMPC Course**

Mail To: Case Western Reserve University

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Cleveland, OH 44106-4954 (USA)