ABOUT THE COURSE

Welcome! This course provides basic introductory and comprehensive information on performing metabolic studies using tracers labeled with radioactive or stable isotopes in both humans and animals. The course is designed for beginners as well as for those with experience who wish to expand their capabilities to more sophisticated problems. The faculty has expertise in a wide variety of applications and methodologies.

Techniques are taught for the investigation of whole body metabolism, for metabolite balance across organs, intracellular flux rates and pathway regulation in humans, animals and cells. 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 are discussed, including examples of calculations involved in determining isotopic enrichment and basic kinetic parameters. Attendees can discuss their research projects in one-on-one mentoring sessions with faculty.

COURSE CO-DIRECTORS

Owen P. McGuinness
Vanderbilt University

Elizabeth Parks
University of Missouri

FACULTY / SPEAKERS

Julio AYALA, PhD

Henri BRUNENGRABER, MD, PhD

Stephanie CHUNG, MBBS

Melanie CREE-GREEN, MD, PhD

Joanne KELLEHER, PhD

Maren LAUGHLIN, PhD

Owen P. McGUINNESS, PhD

Matthew MERRITT, PhD

Elizabeth PARKS, PhD

Stephen PREVIS, PhD

Michelle PUCHOWICZ, PhD

David H. WASSERMAN, PhD

Robert R. WOLFE, PhD

Jamey YOUNG, PhD

Supported by
The National Institute of Diabetes and Digestive and Kidney Diseases

12th ANNUAL COURSE

ISOTOPE TRACERS IN METABOLIC RESEARCH

Principles and Practice of Kinetic Analysis

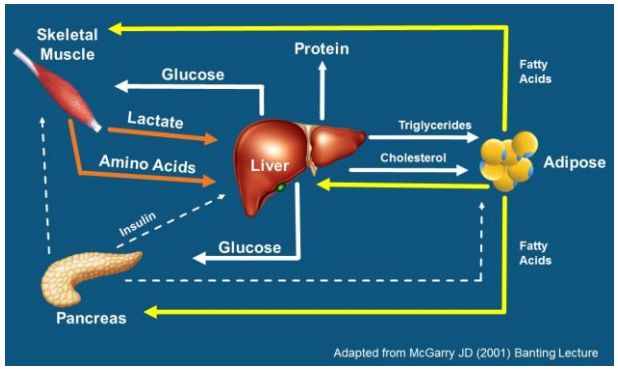
Oct. 21 – Oct. 25, 2019

Nashville, TN

A week-long course on the theory and practice of stable and radioactive isotopic tracers for the study of metabolism in human and animal models.

COURSE HIGHLIGHTS

- Intended for both novice and experienced individuals in isotopic tracer research
- One-on-one mentoring sessions with course faculty
- Opportunities for participants to present their work
- Unlimited access to online training beyond the week-long course
- Exceptional opportunity to network



"I consider the course essential for those that are going to work in this field. I wish I had been able to take the course when I was a student; it would [have] probably saved me a lot of time and trial and error."

2019 PROGRAM

MONDAY, OCTOBER 21, 2019

- Basic tracer theory
- Basic characteristics of radioactive isotopes
- General principles of mass spectrometry
- Specific activity and isotopic enrichment (GC-MS)
- Methods of mass spectrometry analysis MS, LC-MS
- Problem solving sessions

TUESDAY, OCTOBER 22, 2019

- Tracer kinetics (single pool models)
- Oxidation and synthesis rates
- Glucose metabolism (clamp studies)
- Lipid metabolism (basic kinetics)
- Introduction to the NIH grant process
- Practical application of the insulin clamp (breakout session)
  - Human
  - Animals

WEDNESDAY, OCTOBER 23, 2019

- Using positional isotopomer analysis to assess pathway fluxes using NMR
- Protein metabolism

THURSDAY, OCTOBER 24, 2019

- Energy expenditure measured with doubly labeled water
- Synthesis rates using deuterated water: proteins, fatty acids sterols, glucose, nucleic acids
- Mass isotopomer distribution analysis: polymer synthesis, multiple flux pathways, TCA cycle, anaplerosis
- Metabolic flux analysis workshop using MFA software suite

FRIDAY, OCTOBER 25, 2019

- Small Group sessions
  - Working with Mass Spec data
    - Lipid flux
  - Carbohydrate flux
    - Protein flux
- Pathway discovery via association of isotopomer analysis and metabolomics
- Discussion of inherently difficult problems

REGISTRATION & LOGISTICS

COURSE ENROLLMENT

Registration opens June 1, 2019
(deadline: October 1, 2019)

http://www.mmpc.org/shared/tracers

REGISTRATION FEE

(includes breakfast, lunch, snacks)

- Student/Post-Doc ($400)
- Academic/Govt. Scientist ($800)
- International or Industry Scientist ($1,300)

ACCOMMODATIONS

(ALSO SITE OF COURSE)
Homewood Suites by Hilton®
Nashville Vanderbilt
(615)340-8000

Mention group code "VT9" or group name "VU Tracer Course 2019" to receive discounted rates. Direct booking link available on registration form. Course rate will be available until **October 4th** or until the group block is sold-out.

COURSE ADMINISTRATION

Eann Malabanan, Program Coordinator
isotope.tracer@vanderbilt.edu
(615)343-1065