SYMPOSIUM #2: New Method and Models to Study Human Metabolism with Stable Isotope Tracers

Session Description: Stable Isotopes have long been used to understand multiple aspects of physiology, including protein, fat and glucose metabolism. Advances in study designs, methods and modeling are allowing for further understanding of human metabolism while reducing participant burden. Advances in measuring whole body protein metabolism are required to determine dietary protein needs, the effects of supplements and disease. In association with the obesity epidemic, non-alcoholic fatty liver disease and type 2 diabetes are affecting millions world-wide, yet the underlying pathology is still not fully understood and new therapies are needed. A new model utilizing just an oral glycerol tracer combined with isotopomer analysis of collected blood helps elucidate intrahepatic flux through the TCA cycle vs direct gluconeogenesis or through the pentose phosphate pathway. Whereas tissue specific glucose metabolism is typically studied in the setting of an insulin clamp, this is a non-physiologic model that cannot assess the integrated gut response to a meal not the counter balance of the pancreatic response. Newer models are more robust and can be applied in patients with more varied insulin sensitivity. The use of these newer applications in varied participant and patient populations may continue the advancement in understanding human macronutrient physiology.

Learning Objectives:

- Discuss advances in isotope models for understanding protein metabolism
- Outline the neuropathologic processes in Alzheimer’s disease
- Apply the use of an oral glycerol drink combined with isotopomer analysis to understand hepatic metabolism
- Adapt oral glucose tolerance tests with tracers to different patient populations

Primary Chair/Organizer: Melanie Cree-Green, MD, PhD, Melanie.green@childrenscolorado.org
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Speaker 1: Robert R. Wolfe, PhD, RWolfe2@uams.edu
REYNOLDS INSTITUTE ON AGING, 675 Jack Stephens Drive, Little Rock, AR 72205
Career Status: Established Investigator
Presentation Title: Advances in isotope models for understanding protein metabolism (25 mins)

Speaker 2: Craig Malloy, MD, craig.malloy@utsouthwestern.edu
UT Southwestern Medical Center, 5323 Harry Hines Blvd., Dallas, Texas 75390-8568
Career Status: Established Investigator
Presentation Title: Use of an oral glycerol drink combined with isotopomer analysis to understand hepatic metabolism (25 mins)

Speaker 3: Cecelia Diniz-Behn, PhD, cdinizbe@mines.edu
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Career Status: Established Investigator
Presentation Title: Adapting oral glucose tolerance tests with tracers to different patient populations (20 mins)

Q&A – 20 mins