Insulin acts on the central nervous system to modulate behavior and systemic metabolism. Disturbance in brain insulin action is a potential link between metabolic and cognitive health. Our current findings suggest that central insulin action in the brain is linked to weight loss during lifestyle intervention and associates with favorable body fat distribution. Moreover, central insulin action curbs food intake by reducing the salience of highly palatable food cues and increasing cognitive control. To pinpoint specific regions of brain insulin action, we employ intranasal insulin with functional magnetic resonance imaging. These studies show that regions within the mesocorticolimbic circuitry are particularly sensitive to central insulin. Based on recent findings, I will show that exercise can potentially restore brain insulin responsivity with beneficial effects on whole-body metabolism and behavior. We observed enhanced insulin action in the brain resulting in increased hippocampal functional connectivity and striatal blood flow to central insulin from before to after the exercise intervention. The exercise-induced restored brain insulin action significantly correlated with cognitive and metabolic functions. Overall, our current findings highlight the role of insulin action in the brain and its consequences on peripheral metabolism and cognition. Hence, improving central insulin action could represent a therapeutic option for persons at increased risk for metabolic and cognitive diseases.

Trainee Oral Presentations
Alexandra Yunker, BA
(University of Southern California)
Mike Hendrickson, BS
(University of Southern California)
Paige Berger, PhD
(Children’s Hospital Los Angeles)
Clarissa Liu, BS
(University of Southern California)

Zoom Registration Link
https://usc.zoom.us/webinar/register/WN_Cz2E-pgNTD-RoHCEeX0SxQ

I CME will be offered for those who register and watch the session live. After the session, please contact Roxanne Odom at rod@med.usc.edu.

This session will be recorded.
USC DORI’S 8TH ANNUAL MINI RESEARCH SYMPOSIA ON DIABETES & OBESITY
April 13, 2021 (10:00 AM – 12:00 PM PST)

Schedule

10:00 AM – Introduction & Moderator by Katie Page, MD (USC Associate Professor of Medicine)

10:05 AM – Alexandra Yunker, BA (USC Project Coordinator; mentor: Katie Page, MD)
*Effects of Obesity on Neuroendocrine Response to Food Cues Following Non-Nutritive and Nutritive Sweetener Ingestion*
Authors: Alexander Yunker, Shan Luo, Jasmin Alves, Sabrina Jones, Brendan Angelo, Alexis DeFendis, John Monterosso, Katie Page

10:17 AM – Mike Hendricks, BS (USC Project Assistant; mentor: Meredith Braskie, PhD)
*Associations of Glucose Levels with Brain Default Mode Network Connectivity After Glucose Ingestion*
Authors: Mike Hendricks, Jianhang Zhou, Natalie Navarette, Carla Canas, Richard Watanabe, Helena Chui, Hussein Yassine, Meredith Braskie

10:29 AM – Paige Berger, PhD (CHLA Postdoctoral Research Fellow; mentor: Michael Goran, PhD)
*Association of Prenatal Sugar Consumption with Newborn Brain Tissue Organization*
Authors: Paige Berger, Catherine Monk, Ravi Bansal, Siddhant Sawarekar, Michael I. Goran, Bradley S. Peterson

10:41 AM – Clarissa Liu, BS (USC Neuroscience PhD Student; mentor: Scott Kanoski, PhD)
*Central Oxytocin Signaling Inhibits Food Reward-Motivated Behaviors and Mesolimbic Dopamine Responses to Food-Predictive Cues*
Authors: Clarissa Liu, Ted M. Hsu, Keshav S. Subramanian, Andrea N. Suarez, Ryan A. Fatemi, Alyssa M. Cortella, Emily E. Noble, Mitchell F. Roitman, Scott Kanoski

10:53 AM – Introduction by Katie Page, MD

11:00 AM – Keynote speaker: Stephanie Kullmann, PhD

12:00 PM – Adjourn

Next session: Tuesday, May 18 (12 – 2 PM) with Christopher Wright, D. Phil. (Vanderbilt School of Medicine)
Theme: Diabetes