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YOU ARE INVITED TO ATTEND THE DEFENSE OF THE DOCTORAL DISSERTATION

"THE ROLE OF VENTROMEDIAL HYPOTHALAMIC (VMH) NEURONAL NITRIC OXIDE SYNTHASE (nNOS)-GLUCOSE INHIBITED (GI) NEURONS IN ENERGY BALANCE"

By

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Monday, February 12th, 2024
10:00 A.M.
H-Level Conference room, H609B (Medical Science Building)

Zoom link:
https://rutgers.zoom.us/j/92074248167?pwd=N1V6YlduZzM4alpjZGNmYTZTMmxRQT09

Meeting ID: 920 7424 8167
Password: 089262

ABSTRACT

Prevalence of diseases associated with imbalanced energy intake and expenditure, like obesity and type 2 diabetes mellitus, has continued to climb with the persistence of sedentary lifestyle and consistent access to calorie-dense foods. Investigating central nervous system control of energy balance is one way of discovering potential therapies to counter these diseases. Energy balance is mediated partially by the ventromedial hypothalamus (VMH) and lateral hypothalamus (LH). The VMH and LH have glucose sensing neurons, like the glucose-inhibited (GI) neuron. VMH GI neurons play an important role in the counterregulatory response (CRR) to hypoglycemia. However, the role of VMH GI neurons in the control of other aspects of energy balance has not been fully elucidated. GI neurons are dependent on AMP-activated protein kinase (AMPK) to activate in low glucose and initiate the counterregulatory response to hypoglycemia. AMPK-dependent activity in the VMH potentially links VMH GI neurons to LH orexin-dependent increases in brown adipose tissue (BAT) and white adipose (WAT) beiging, which decrease body weight. This project combines neuronal tracing methods with electrophysiological whole cell patch clamp recordings as well as viral protein knockdown in the brain to test the hypothesis that AMPK-dependent, VMH GI neurons play a role in energy homeostasis through BAT thermogenesis and WAT beiging. The results of this study are important for determining the neuronal mechanisms of whole-body energy balance, which can help the development of therapies to decrease incidence of obesity and type 2 diabetes mellitus.