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Dynamic adipose remodeling and metabolic improvement by intermittent fasting

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Abstract
White adipose tissue (WAT) undergoes dynamic remodeling in response to nutritional, environmental, and physical conditions. This process is essential for whole body energy homeostasis and metabolic adaptation of animals and human. Intermittent fasting (IF), a periodic energy restriction, has been shown to provide health benefits equivalent to prolonged fasting or caloric restriction. However, our understanding of the underlying mechanisms of IF-mediated metabolic benefits is limited. We previously showed that isocaloric IF improves metabolic homeostasis against diet-induced obesity and metabolic dysfunction primarily with adipose thermogenesis in mice. IF-induced metabolic benefits require fasting-mediated increases of vascular endothelial growth factor (VEGF) expression in white adipose tissue (WAT). Notably, periodic adipose-VEGF overexpression could recapitulate the metabolic improvements of IF in non-fasted animals. Mechanistically, IF and adipose-VEGF induce alternative activation of adipose macrophage, which is critical for thermogenic activity (brown fat-like change) of WAT. Human adipose gene analysis further revealed a positive correlation of adipose VEGF-M2 macrophage-WAT browning axis. Furthermore, we recently discover that IF is effective for preventing as well as reverting age-associated adipose fibrosis through activation of adipose progenitor cells (APCs). Uncovering the molecular mechanisms of IF-mediated metabolic benefit, our study suggests that isocaloric IF can be a preventive and therapeutic approach against obesity and metabolic disorders.

Biography
Dr. Sung received his M.D. and Ph.D. from University of Yeungnam in South Korea. Following his Ph.D., he did basic research training at the Korea Advanced Institute of Science and Technology (KAIST) in the laboratory of Dr. Gou Young Koh. He moved to Toronto in 2006 for his postdoctoral training in the laboratory of Dr. Andras Nagy in the Tanenbaum-Lunenfeld Research Institute at Mount Sinai Hospital. In 2014, he established his research group in the Translational Medicine Program at The Hospital for Sick Children Research Institute. He is also cross-appointed to The Department of Laboratory Medicine and Pathobiology, University of Toronto. His main research interest includes metabolism, adipose biology, angiogenesis and stem cell biology.

You can join by clicking the above link 10 minutes prior to the seminar. Please download ZOOM and complete the installation beforehand (https://zoom.us/download), and set up your camera and microphone if you wish to participate in the Q&A session after the presentation.

ALL ARE WELCOME

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