NCGG SEMINAR

"Adipose Tissue NAD+ Biology in Inter-organ Metabolic Communication"

Dr. Jun Yoshino

Assistant Professor
Center for Human Nutrition, Division of Geriatrics and Nutritional Science, Department of Medicine, Washington University School of Medicine, St. Louis, USA

September 5, 2017 (Tuesday) 16:00 ~ 17:00

Room: The 2nd floor Conference Hall Main in the 1st Research building, NCGG

Nicotinamide adenine dinucleotide (NAD^+) plays a pivotal role in controlling many biological processes, such as metabolism, aging, and circadian rhythm. Our group has been studying the pathophysiological importance of adipose tissue NAD^+ biology in obesity and its metabolic complications. We found that adipose tissue NAD^+ biosynthesis, mediated by nicotinamide phosphoribosyltransferase (NAMPT), is impaired by obesity and aging. Strikingly, adipocyte-specific inactivation of NAMPT causes systemic metabolic complications, such as multi-organ insulin resistance, glucose intolerance, and dyslipidemia. These findings have revealed that NAD^+ biosynthesis in white adipose tissue (WAT) is a key physiological regulator of whole-body glucose and lipid metabolism. More recently, we generated and analyzed brown-adipocyte specific Nampt knockout (BANKO) mice. Intriguingly, BANKO mice have impaired mitochondrial function and thermogenesis in brown adipose tissue (BAT) at both cellular and organismal level. Unexpectedly, despite such BAT dysfunction, BANKO mice increase whole-body energy expenditure and decrease body weight gain following high-fat diet feeding, compared to their control mice. Based on these results, we now hypothesize that BAT-derived molecules are released in response to mitochondrial stress induced by NAD+ depletion, leading to increasing energy metabolism in remote organs. We will discuss potential novel inter-organ metabolic communications mediated by WAT and BAT NAD^+ biology.

Contact: Akiko Satoh, SARR (TEL: 0562-44-5651 ext.7855)