In Search of Mitochondrial Clock for Aging-Related Metabolic Diseases

Ageing significantly increases the risk for the development obesity, type 2 diabetes, cardiovascular diseases, and other aging-related metabolic diseases through poorly defined mechanisms. It was proposed more than 60 years ago by Dr. Denham Harman, the father of "the mitochondrial free radical ageing theory," that the deleterious effect of reactive oxygen species (ROS) generated from the mitochondria is the driving force for ageing and ageing-related diseases. However, this theory remains controversial, since ROS have both the "good" and "evil" effect on our health. Dr. Shi's lab has recently identified a novel metabolic pathway that mediates the "evil effect" of ROS, linking mitochondrial dysfunction associated with aging to the onset of aging-related metabolic diseases. Ablation of this pathway in mice ameliorates obesity, type 2 diabetes, and diabetic complications, paving the way for the development of novel treatment for aging and aging-related diseases.