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Mitoepigenetics in cardiac aging and metabolic diseases

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Mitochondrial dysfunction is proposed to be related with aging and various diseases. Epigenetic modifications in nuclear genome provide a substantial layer for the modulation of nuclear-encoded gene expression. However, whether mitochondria could also be subjected to such epigenetic alterations and the involved mechanisms remain largely obscure and controversial. Recently, accumulating evidence has suggested that mitochondrial epigenetics, also known as mitoepigenetics may serve as an intriguing regulatory layer in mitochondrial DNA (mtDNA)-encoded gene expression. Given the potential regulatory role of mitoepigenetics, mitochondrial dysfunction derived from mitoepigenetics-induced abnormal gene expression could also be closely associated with aging and disease development. In this presentation, I will summarize the recent advances in mitoepigenetics, with a special focus on our work on mtDNA methylation in cardiac aging and metabolic-related diseases. Uncovering the regulatory role of mitoepigenetics will help to understand the underlying mechanisms of mitochondrial dysfunction and provide novel strategies for delaying aging and preventing metabolic diseases.

Biography

Dr. Jiankang Liu received his BS from Xi'an Jiaotong University and PhD of Medical Science from Okayama University School of Medicine, Japan. He completed post-doc training in Dr. Bruce Ames laboratory at University of California, Berkeley and worked as a faculty at University of California at Berkeley, Children Hospital Oakland Research Institute, University of California at Irvine, University of Kentucky College of Medicine, and Shanghai Institute for Nutritional Science, Chinese Academy of Sciences. Currently, he is a Professor of the University of Health and Rehabilitation Sciences at Qingdao and Xi'an Jiaotong University at Xi'an, China. Dr. Liu's research interests include molecular and cellular mechanisms of aging, stress, and age-/stress-associated degenerative diseases with a focus on nutritional regulation of mitochondrial metabolism. He has published more 250 papers with more than 17,000 times citations (H-index 72) and was elected as one of the Most Cited Chinese Researchers in the area of Biochemistry, Genetics and Molecular Biology by Elsevier consecutively for 7 years (2015-2021) and the World Top 1.5% Scientist (2019-2021)..

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