Zheng Sun, J Clin Exp Cardiolog 2019, Volume 10
DOI: 10.4172/2155-9880-C4-133

Zheng Sun
Baylor College of Medicine, USA

Epigenome regulation of myocardial metabolism in heart failure

Heart failure is a common cause of death in patients with obesity or diabetes. However, heart failure patients with higher BMI have better prognosis than patients with lower BMI. The relationship between myocardial glucose or lipid metabolism and cardiac contractile function is not clearly understood. We find that an epigenomic modifier, histone deacetylase 3 (HDAC3), is essential to protect the heart from obesity-induced heart failure. Mice with HDAC3 postnatally depleted in cardiac muscles (MCH3-KO) have normal cardiac functions on the normal chow diet, but display complete lethality due to severe hypertrophic cardiomyopathy and heart failure within four months on high-fat diet. Hyperglycemia, but not hyperlipidemia, precipitated heart failure in MCH3-KO mice. HDAC3 ChIP-seq analysis showed that the top DNA sequence motifs in HDAC3 binding site near down-regulated genes was binding sites of Estrogen Receptor (ER) and FOX family transcription factors known as pioneer cofactors for ER. Transcriptomics, metabolomics and isotope metabolic tracing revealed profound metabolic remodeling of glucose and lipid metabolism in cardiomyocytes depleted of HDAC3 or its related transcriptional factors. These findings shed light on the intricate epigenomic regulatory mechanisms connecting myocardial intermediary metabolism and cardiac contractile functions.

Biography

Zheng Sun has completed his PhD at University of Arizona and Postdoctoral training at University of Pennsylvania. He is the Assistant Professor at Baylor College of Medicine. He has published many seminal work and won several prestigious awards.

zheng.sun@bcm.edu

Notes: