

Department of Biological Sciences

JOB TALK (SKYPE)

Speaker: Dr. Sadhan Chandra Das, PhD

Beckman Research Institute, CA, USA

Date/Time: Monday, 28th May, 2018 at 11:00 am

Venue: L-2, LHC

Enhancers, super enhancers and long non-coding RNAs in diabetes and diabetes complications

Diabetes and metabolic disorders significantly advance the development of cardiovascular diseases such as atherosclerosis and hypertension. Recent evidences have demonstrated that epigenetic factors and non-coding RNAs triggered by changing lifestyles and environment, may be new players in these pathologies. Angiotensin II (AngII), a peptide hormone, promotes hypertension and atherosclerosis by activating growth-promoting and pro-inflammatory gene expression in vascular smooth muscle cells. However, the genome-wide changes in distal regulatory elements (enhancers) triggered by AngII were previously unknown. I have delineated the AngII-induced signals that integrate enhancers/super enhancers and long non-coding RNA (lncRNAs) to promote the expression of genes involved in vascular smooth muscle cell dysfunction. Moreover, I have demonstrated that inhibition of super enhancer binding protein BRD4 attenuates AngII-induced enhancers/super enhancers and inflammatory genes in vascular smooth muscle cells, and ameliorates AngII-induced hypertension, medial hypertrophy and inflammation in mice that could lead to development of novel therapeutics for cardiovascular diseases in diabetes. I will be elaborating about these findings in my talk. In addition, I will also be discussing how other epigenetic layers such as lncRNAs could co-operate with chromatin modifying complexes to regulate AngII-induced genes involved in inflammation, proliferation and oxidative stress in vascular smooth muscle cells. Finally, I will be discussing the role of diabetes-induced lncRNA *Dynammin3 opposite strand (Dnm3os)* in regulating inflammatory macrophages phenotypes through nuclear mechanisms.