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**Date** Friday, November 8, 2024

**Time** 12:00 to 1:00 PM

**Location** SEC 201

Flow-Induced Reprogramming of Endothelial Cells (FIRE) in Atherosclerosis: From Mechanobiology to Mechanomedicine.

Atherosclerosis is the major underlying cause of myocardial infarction and stroke. It occurs preferentially in arterial regions exposed to disturbed flow (d-flow) by mechanisms involving broad changes in the expression of genes. Using the partial carotid ligation model of atherosclerosis in mice and single-cell OMICs studies, we revealed the roles of flow-sensitive genes in endothelial dysfunction and atherosclerosis. The single-cell OMICs and validation studies revealed that d-flow reprograms endothelial cells to proatherogenic phenotypes, including inflammation, endothelial-to-mesenchymal transition (End-MT), and endothelial-to-immune cell-like transition (EndIT). The scRNAseq study revealed several novel flow-sensitive genes, such as HEG1, and how they regulate endothelial function and atherosclerosis. I will also discuss how we target those flow-sensitive genes to develop novel anti-atherogenic therapeutics and pursue endothelial-targeted delivery of therapeutics.

**Dr. Hanjoong Jo** is Coulter Distinguished Chair Professor and Associate Chair in the Department of Biomedical Engineering (BME) and the Department of Medicine at Emory University and Georgia Tech, where he directs the Cardiovascular Mechanobiology, Therapeutics, and Nanomedicine Lab. He is the Director of the Cardiovascular Biomechanics T32 Graduate Training Program at Emory/GT. He studies how blood flow regulates vascular endothelial function, leading to atherosclerosis and aortic valve disease. He has trained >60 trainees, including PhDs and postdocs, many of whom have become successful members of universities, industries, and government. He has published >240 peer-reviewed papers and written three books. He is an elected fellow of the AAAS, BME Society, Am Institute of Medical and Biomedical Engineers, Am Heart Association, and Am Physiological Society. He received a Marshall Distinguished Investigator Award from the British Society of Cardiovascular Research. He has served as an Editorial Board Member and Associate Editor of many high-impact journals. He was the Chair of the 2012 Annual BME Society Meeting, the 2023 Gordon Research Conference in Biomechanics of Vascular Biology and Disease, and the International Symposium in Biomechanics in Cardiovascular Diseases. He was the Vice President of the Korean-Am Scientists and Engineers Association.