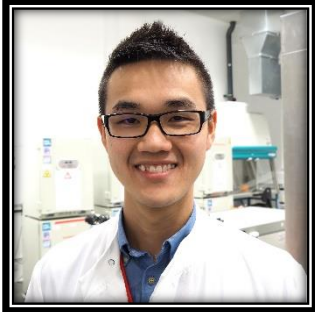


Multidirectional flow and LRG1 in endothelial cells: potential atheroprotective role



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Zoom

Hosted by Dr Deepak Choudhury

Seminar Abstract

Haemodynamic wall shear stress affects the function of arterial endothelial cells (ECs). Low magnitude, oscillatory and multidirectional shear have all been postulated to stimulate endothelial activation, whereas high magnitude and uniaxial shear are thought to promote endothelial homeostasis. The effects of shear interact with the effects of pro-inflammatory cytokines; they are mediated by complex signal transduction pathways and together may account for the patchy nature of atherosclerosis.

A commonly used in-vitro model - the swirling-well system- in the investigation of shear-induced endothelial activation will be introduced. Computational fluid dynamic (CFD) characterisation of the flow and an improvement of the method will be discussed. The swirling-well system was used to investigate the role of leucine-rich α -2-glycoprotein 1 (LRG1), a pro-angiogenic protein, in cytokine- and shear-induced endothelial activation. LRG1 expression was found to be highly expressed in activated EC, and its expression suppressed EC adhesion molecules expression and monocyte recruitment. Mechanistically, LRG1 caused TNFR1 shedding via the ALK5-SMAD2 pathway and the activation of ADAM10.

About the Speaker

Dr Zach Pang developed his research interest in bioengineering when he was pursuing his Bachelor of Technology in Mechanical Engineering at National University of Singapore, where he did his undergraduate research on cancer cell mechanics. He subsequently obtained his PhD from the Department of Bioengineering, Imperial College London under the A*STAR Graduate Scholarship. His PhD study focused on role of haemodynamic wall shear stress and LRG1 in cardiovascular diseases.