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CBME
Centre for Biomedical Engineering
University of Adelaide

Seminar Title: Mechanical Characterization of Vascular Endothelial Cells Focusing on Intracellular Structures

Presenter: Prof Toshiro Ohashi

Graduate School of Engineering

Hokkaido University, Japan

Date and Time: Tuesday, the 23rd of Feb 2010 at 11.10 AM

Venue: Lecture Theatre N132, Engineering North Building

Site Map: http://www.adelaide.edu.au/campuses/mapscurrent/north_terrace.pdf

Abstract

Vascular endothelial cells *in vivo* are exposed to complex mechanical forces including fluid shear stress, cyclic stretch and hydrostatic pressure. These mechanical forces are important factors in endothelial cell remodeling, possibly altering endothelial cell physiological functions. After applying fluid shear stress, cultured endothelial cells show marked elongation and orientation in the direction of flow. In addition, thick stress fibers of actin filaments develop and align along the cell long axis. It is believed that cell deformations and associated mechanotransduction responses to mechanical forces are critical for cell-involved tissue homeostasis in health and disease. So far, a lot of efforts have been done to study the effects of mechanical stimuli on the cell remodeling focusing on morphological and cytoskeletal changes or intracellular signaling events. However, little is still known of how mechanical forces are transmitted through cells to activate intracellular signalling cascades leading to alterations in cell functions. To further address this issue, it would be required to know intracellular mechanical environment including mechanical properties of subcellular structural components such as actin filaments, nucleus and so forth. The objective of this talk is to present recent findings related to cell biomechanics, introducing measurement methods including fluorescence imaging and mechanical tests of intracellular.

Biography

Prof Toshiro Ohashi received BSci. and Master of Science both from Tsukuba University, 1991 and 1994, respectively. Also PhD in Engineering from Tohoku University in 2000. He won a number of awards for outstanding papers and best papers in Japan in 2000-2001, also the Young Investigators Award from Japan Society of Medical Electronics and Biological Engineering, Finalist for a Calgary award the IV Word congress of Biomechanics, outstanding paper award at the International Congress of Biological and Medical Engineering – Signapore, the Seguchi Prize in Bioengineering in 2003, Young Investigators Award from the Japan Society of Medical Electronics and Biological Engineering, Medal for Outstanding Paper in Japan Society of Mechanical Engineers in 2008 and 2009. His research interest include Cell Biomechanics, Vascular Wall Biomechanics, Matrix Devices and Microfluidics. In addition to being referee for a number of high impact factor journals, Prof Ohashi has published over 50 peer reviewed scientific journals and was the Guest editor for the Journal of Biomechanical Science and Engineering on special issues on “Micro and Nanobiotechnology for Cells,” in 2010.

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