

Susan W.S. Leung

Key Research Programme

Susan W.S. Leung has conducted several studies in identifying differential signaling pathways involved in the regulation of the vascular tone of the arterial and venous circulations. Both arterial and venous resistances are influenced by the relaxing and contracting factors released from the endothelium. However, the extent to which different endothelium-derived vasoactive factors affect different vascular beds is different. While nitric oxide, an endothelium-derived relaxing factor, contributes significantly to systemic arterial tone, its effect on venous tone is much smaller in healthy anaesthetized rats. On the other hand, isolated human umbilical artery is relatively insensitive to relaxation to nitric oxide donor under physiological condition.

With aging or cardiovascular disorders such as hypertension and atherosclerosis, vascular responses to both mechanical (e.g. shear stress) and chemical (e.g. local mediators) stimuli are altered. This alteration is partially associated with endothelial dysfunction, and partially due to changes in responses to endothelial-derived vasoactive factors. Using porcine coronary artery in an isolated tissue bath setup, lysophosphatidylcholine (LPC), a major atherogenic phospholipid, caused inhibition of endothelium-dependent relaxation. Porcine coronary arterial response to sodium nitroprusside, a nitric oxide donor, was also reduced in the presence of LPC, albeit to a smaller extent. To the contrary, relaxation to levcromakalim, a potassium channel opener, was not affected by LPC.

Through identification of the alteration in the signaling cascade that underlies changes in vascular reactivity in pathophysiological conditions, pharmacological therapeutic strategies can be specifically designed for the prevention or early treatment of vascular complications associated with aging or cardiovascular disorders.

Representative Publications

Leung SWS, Quan A, Lao TT, Man RYK. Efficacy of different vasodilators on human umbilical arterial smooth muscle under normal and reduced oxygen conditions. *Early Hum Dev* 2006; in press.

Leung SWS, Cheng X, Lim SL and Pang CCY. Augmented pulmonary vascular and venous constrictions to N(G)-nitro-L-arginine methyl ester in rats with monocrotaline-induced pulmonary hypertension. *Pharmacology* 2003; 69: 167-170.

Leung SWS, Huang M, Man RYK. Detrimental vascular effects of lysophosphatidylcholine is limited by other phospholipid components of low-density lipoprotein. *Mol Cell biochem* 2003; 250: 159-166.