

Membrane dynamics and remodelling by endothelial cells

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Introduction

Endothelial cells line all blood vessels and regulate vasculogenesis, angiogenesis and many aspects of vascular physiology. Angiogenesis is the sprouting of new blood vessels from pre-existing blood vessels. This phenomenon is regulated by the interaction of soluble growth factors (VEGFs) with cell surface receptors on the endothelium which can trigger protein secretion, gene expression and cellular proliferation. An overall aim is to understand how different biochemical interactions are linked to membrane remodelling by human endothelial cells during angiogenesis.

Other model systems include receptors that bind lipoproteins, lipid-modifying enzymes and factors that regulate blood clotting and blood pressure. Endothelial cell dysfunction is implicated in diseases such as atherosclerosis, cancer and diabetes. We are also studying atypical protein kinase C enzymes in regulating membrane dynamics at diverse intracellular locations such as the plasma membrane, Golgi apparatus and nucleus. These hormone-activated enzymes may function as molecular switches at different cellular locations.

Publications

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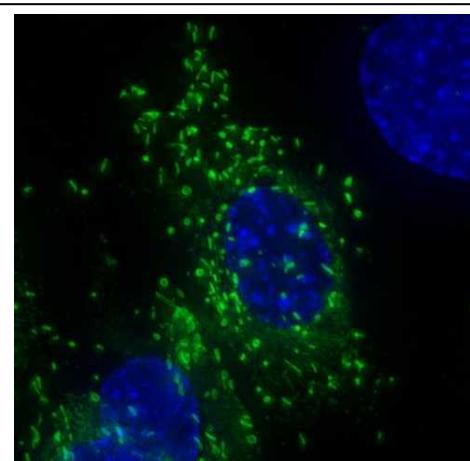
Cobbold, C., Coventry, J., Ponnambalam, S. and Monaco, A.P. (2004) Actin and microtubule regulation of *trans*-Golgi network architecture, and copper-dependent protein transport to the cell surface. *Mol Membr Biol* **21**, 59-66.

Collaborations

We collaborate with Dr. John Walker (BMB, Leeds), and Dr. Ian Zachary (Centre for Cardiovascular Biology and Medicine, University College London) on this project.

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The figure shows localisation of the pro-atherogenic hormone, Von Willebrand Factor, to cylindrical granules called Weibel-Palade bodies (Howell *et al.*, 2004)