

**A205**

**A microarray screen identifies Dll4 target genes in endothelial cells**

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The Notch pathway is a highly conserved inter-cellular signalling pathway. The endothelial-specific Notch ligand, Dll4, is essential for angiogenesis during development. In adults expression of Dll4 is reduced and restricted. However Dll4 is induced by hypoxia and is highly expressed in tumour vasculature making it an attractive anti-angiogenic target. In order to understand the role of Dll4 in angiogenesis we investigated its function in endothelial cell biology. Retroviral-mediated introduction of Dll4 into human umbilical vein endothelial cells (HUVECs) results in Dll4 expression, activates Notch signalling and reduces the sprout length and lumen formation of HUVECs in a *in vitro* 3D tubulogenesis assay. A microarray screen identified over 260 genes regulated by Dll4 by more than 1.5 fold which may contribute to this phenotype. The analysis suggests that Dll4 signalling modulates VEGF signalling by regulating the expression of multiple VEGF pathway components (VEGFR2, PlGF, NRP1 and NRP2, all downregulated). In addition Dll4 regulates genes involved in biological processes central to endothelial cell function such as adhesion (VCAM-1, CDH11 both upregulated and PCDH12 downregulated) and arterial-venous differentiation (elastin and ephrinB2 both upregulated). We confirmed the mRNA expression changes of a subset of candidate genes by Q-PCR. Future work includes confirmation of these changes at the protein level and investigation of the effect of modulating Dll4-target gene expression in *in vitro* angiogenesis assays. These results implicate Dll4 as a key modulator of endothelial cell biology and provide novel insights into the genes and biological responses that Dll4 regulates.