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Differential response of lung and heart endothelial cells to hypoxia exposure

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Despite common lineage, endothelial cells of distinct vascular beds exhibit significant heterogeneity in structure, function and gene expression pattern. This heterogeneity is mainly observed in vivo;however some organ-specific attributesspecifically those that relate to endothelial-cells' response to external stimuli areexhibited in cultured endothelial cells. The molecular basis of endothelial cell heterogeneity and its response to external stimuli is not understood. We have extensively studied transcriptional regulation of a highly endothelial restricted gene, namely von Willebrand factor in vitro, in vivo, and in response to external stimuli such as hypoxia. We have demonstrated that distinct regions and specific transacting factors participate in regulation of VWF transcription in endothelial cells of distinct organs; and based on these results generated targeting vectors that can express desired genes specifically in endothelial cells of distinct organs. Additionally we have demonstrated that VWF transcription in response to hypoxia is differentially regulated in endothelial cells of lung compared to those in other organs in vivo. We have alsoevidence that VWF response to hypoxia is differentially regulated in endothelial cells of heart compared to lung when these cells are grown in culture. Determining the molecular basis of distined in endothelial cells of specific organs, will provide an opportunityfor development of effective therapeutic interventions based on specific and targeted manipulation of endothelial cells of desired organs.

Biography

Nadia Jahroudi completed her Ph.D. from University of Calgary and Postdoctoral studies from HarvardMedical School. She is currently an Associate Professor at the Department of Medicine, University of Alberta.

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