

# 5<sup>th</sup> World Congress on **Cell & Stem Cell Research**

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## **Endothelial Cells-Derived-iPS: A Tool For Studying Endothelial Cell Specific Gene Regulation.**

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**D**amage to endothelial cells (EC) is the core of various vascular diseases, however it is not yet clear how endothelial cells acquire their phenotype, and how the healthy phenotype is altered in various vascular diseases. Exploring the molecular mechanism(s) that are involved in regulation of endothelial specific gene expression will provide insight into the mechanisms that contribute to establishment of endothelial cell phenotype. We are studying the mechanism of transcriptional regulation of von Willebrand factor (VWF), a highly endothelial specific gene, in a system that is amenable to exploring sequential repression and activation of VWF transcription. Towards our goal, we generated induced pluripotent stem cells (iPS) from human umbilical vein endothelial cells (HUVEC) and then differentiated the iPS back to endothelial cells. This model provides a system with a homogenous genetic background to explore how VWF expression is repressed when EC phenotype is revoked (HUVEC to iPS), and how VWF expression is reactivated when endothelial cell phenotype is reestablished (iPS to EC). We determined the expression levels of transcription factors that function as regulators of VWF transcription in this system. Expression levels of most transacting factors that participate as repressors of the VWF promoter were not significantly altered, while transacting factors that function as activators of the VWF were undetectable in iPS, but expressed to similar levels in HUVEC and EC differentiated from iPS. Temporal expressions of activators were observed during various stages of differentiation, suggesting that this system provides an opportunity for exploring the mechanism of EC phenotype establishment.

### **Biography**

Nadia Jahroudi has completed her Ph.D. from University of Calgary and postdoctoral studies from Dana-Farber Cancer Institute at Harvard Medical School. She is an Associate Professor at University of Alberta. Her studies are focused on regulation of endothelial specific gene expression and have been supported by Grants from National Institute of Health, Canadian Institute of Health Research, and Heart and Stroke Foundation of Canada.

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