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Adult stem cells offer significant therapeutic potential but in order to harness their medically relevant properties more basic science must be performed. Cell state and differentiation of stem cells is determined by the interaction of signaling pathways, chromatin modifiers, and transcription factors working together to regulate cell-type specific gene expression profiles. I am currently investigating the role of Notch signaling and transcriptional cofactor, MED12, to better understand the relationship between various regulatory mechanisms that determine cell fate. The MED12 subunit of the Mediator complex and the Notch signaling pathway are both known to influence hASC self-renewal and adipogenesis. We will investigate the physical relationship between MED12 and Notch1 and Notch3 intracellular domains as well as use siRNA mediated knockdown, to determine the effect that decreased MED12 expression has on Notch1 and Notch3 intracellular domain activity. Understanding the interaction of MED12, Notch1, and Notch3 and their influence on self-renewal and adipogenesis will increase understanding of hASC cell fate for applications in regenerative medicine. To continue support for stem cell research, public education of the basic science and medical relevance of stem cells should be addressed. I am currently creating a book to communicate fact-based stem cell content, address common misconceptions, and promote positive student-science relationships for increased science engagement in elementary audiences. Together, these studies aim to elucidate regulatory mechanisms in the interaction of the Notch signaling pathway and MED12 cofactor in hASC self-renewal and adipogenesis while providing fact-based public educational material for continued support of stem cell research and clinical applications.