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Human adipose-derived stem cells (hADSCs) are multipotent cells with great potential in regenerative medicine. Notch is a conserved contact-dependent signaling pathway that determines cell proliferation and differentiation. The pathway includes four membrane receptors, Notch1-4, and our goal is to explore the role of Notch1 and Notch3 in hADSC adipogenesis to understand how they work together to regulate cell state. We found that the loss of Notch3 promoted adipogenesis as demonstrated by increased lipid droplets and enhanced expression of adipose-related genes. In addition, we observed increased expression of Notch3 during adipogenesis. Expression of Notch1 also increased during adipogenesis but, unlike Notch3, appears to promote lipid accumulation. Immunofluorescence showed that Notch1 was enriched in adipocyte differentiated hADSCs while Notch3 was highly expressed in and only in adjacent hADSCs not undergoing adipogenesis to maintain cells at stem cells state. Our research provides new targets for directed differentiation in tissue regeneration.
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