

## **Investigating the Role of Sonic Hedgehog Signaling in Adult Neurogenesis**

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Since I started in the UMass MCB program and Karlstrom lab four years ago I've become fascinated with understanding the molecular and cellular mechanisms that underlie the formation, growth, and function of the vertebrate brain. My Ph.D. research focuses on understanding how highly regulated cell division (proliferation) affects the growth, maintenance, and possibly function of the zebrafish hypothalamus, an evolutionarily conserved region of the vertebrate brain that regulates a wide range of metabolic functions. In particular, I am investigating the role of the cell-cell signaling molecule Sonic Hedgehog (Shh) in regulating proliferation of adult hypothalamic neural stem cells (NSCs). Utilizing a number of transgenic zebrafish lines, conditional gene manipulating tools, and confocal microscopy I am characterizing a newly discovered population of NSCs and examining the cellular and molecular mechanisms by which this well-studied embryonic signaling system affects the NSC cell cycle. My long-term goals are to contribute to our understanding of how hypothalamic NSCs cells are regulated throughout life, and to shed light on the role Shh signaling plays in hypothalamic function, dysfunction, and the aging of the vertebrate brain.