College of Science
Neuroscience Faculty Candidate

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Tuesday, January 19, 2016
Kelly Hall 310
3:00pm – 4:00pm

"Thyroid hormone regulates molecular and cellular processes that underlie *Xenopus laevis* tadpole visual system development"

Thyroid hormone is a critical regulator of brain development, but where and when thyroid hormone acts on developing neural circuits is not well understood. This is an important issue because dysregulation of thyroid hormone signaling during pregnancy can lead to brain damage and permanent behavioral deficits that will vary in severity depending upon the timing and type of dysregulation. African clawed frog (*Xenopus laevis*) tadpoles are useful animal models for better understanding this phenomenon because they are acutely sensitive to changes in thyroid hormone signaling, and their external development allows for manipulation and observation of early stages of brain development which are relatively inaccessible for study in mammalian systems. I will present results from experiments in which I used *in vivo* imaging, whole-mount immunohistochemistry, and 3D reconstruction, to show that visual system development in tadpoles is dramatically affected by changes in thyroid hormone signaling. My data show that thyroid hormone acts directly on the brain to significantly affect neural progenitor cell proliferation, neuronal differentiation, dendritic arborization, cell death, gene expression, and brain morphology. I will also present data that show that triclosan, an antimicrobial agent used in a variety of consumer household products, blocks thyroid hormone-mediated changes in the tadpole visual system. Last, I will discuss my plans to characterize how thyroid hormone regulates the transcriptome of neural progenitor cells, affects synaptogenesis, and to evaluate the effects of other manmade endocrine disrupting compounds on the molecular and cellular processes that are necessary for proper brain development.

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