Ackert Hall, Room 120
Wednesday, March 6, 2024
4:00 P.M.

Coffee and Cookies
Chalmers Hall, Room 168
3:45 P.M.

Biochemistry & Molecular Biophysics Seminar

Understanding tunicate development with single-cell resolution

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The invertebrate *Ciona* has a chordate body plan in the context of a very small, simple embryo with invariant cell lineages. My lab uses *Ciona* embryos to study chordate development with subcellular detail and an embryo-wide field of view. We use microscopy and transcriptomics as our major experimental modalities, with the *Ciona* embryo enabling some explicitly quantitative approaches that would be more difficult in other model organisms. Most of our work at KSU has been on the notochord as a tractable model organ, but a tangential observation from a single cell RNAseq experiment has led us into a new interest in a poorly understood branch of the *Ciona* embryonic cell lineages that gives rise to posterior neural tube and tail tip muscle cells. I will present our latest findings on this posterior neuromesodermal lineage and discuss the potential relationships with neuromesodermal progenitors in vertebrate embryos. Different cell types in this lineage exhibit major differences in the abundance and morphology of mitochondria and I will present evidence indicating that both asymmetric partitioning in cell division and differential mitochondrial dynamics in interphase are involved. I will also show results from a side project where we are working to quantify transcriptional cis-regulatory input/output relationships on a genome-wide scale.