DEPARTMENT OF BIOLOGY | UNIVERSITY of WASHINGTON

Biology Seminar

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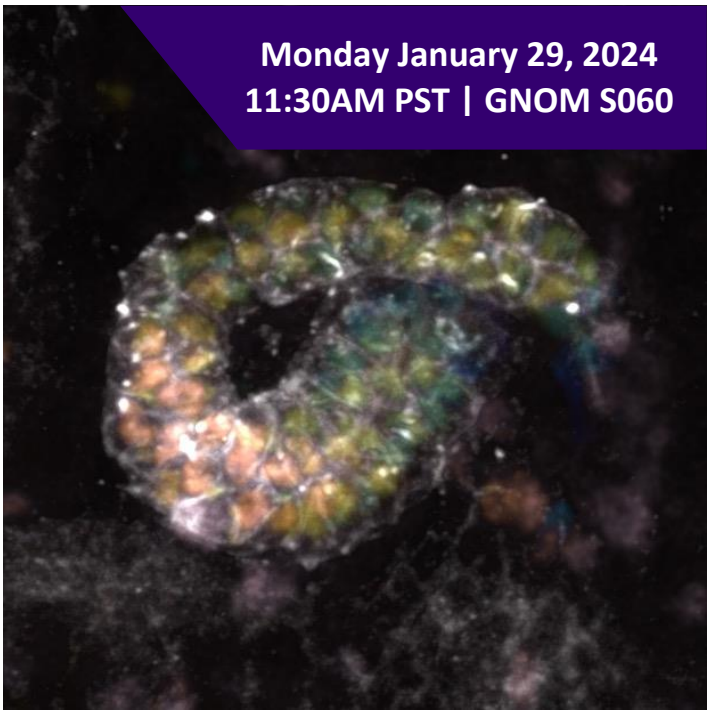
Can cells walk & chew gum at the same time? Understanding how cells build tubes that fold and still function.



The study of cell shape has taught us many lessons about cellular function; however, we are just beginning to understand how this basic attribute drives form and function at the level of multicellular tissues. The goal of my research program is to uncover the emergent properties that cells use to generate and maintain higher-order tissue structures. I will describe how my lab will apply these approaches to determine the architectural rules cells use to build more complex three-dimensional tissue structures, with an initial focus on the developing *Drosophila* renal system (Malpighian tubules). This system involves the generation and extension of four tubes that fold on themselves, allowing for inquiry on how cells generate and maintain differently shaped higher-order tissue structures. We will take interdisciplinary approaches to isolate the parameters that generate specific cell and tissue shapes while keeping the cells in an *in vivo* context. A major challenge in the field is to understand how cells use the same the same starting molecular components, generate and maintain organ structures and functions. How do these properties break down into molecular and physical rules? Which of these rules are broken in disease states? Work in my lab will leverage the known pathways and molecular mechanisms at work in this system to uncover how cells integrate these features into highly regulatable 3D tissue forms.

Seminar Speaker Host: Matt Akamatsu