# BIOCHEMISTRY SEMINAR SERIES

## “How does a heart grow? A cell biologist wants to know.”


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A developing heart grows by an increase in cell number (i.e., hyperplastic growth) and by an increase in the size of individual cells (i.e., hypertrophic growth). The Burnette lab is interested in the cellular mechanisms underlying hyperplastic and hypertrophic growth. As such, we started our studies focused on the major generator of contractile forces, the class of molecular motors, myosin II. Myosin II is best known for its role in the muscle sarcomere where it produces the force that drives the heartbeat. A cardiac muscle cell is full of sarcomeres and the physical enlargement of the cell during hypertrophic growth is concomitant with the assembly of new sarcomeres. Historically, sarcomere assembly has been difficult to study in live cells. To monitor sarcomere assembly, we utilized human iPSC-derived Cardiac Myocytes. Using this system, we are starting to define the molecular mechanisms underlying sarcomere assembly. For example, the incorporation of muscle myosin II into the sarcomere relies on specific interactions with multiple paralogs of so-called “non-muscle” myosin II—so named because they are ubiquitously expressed among cell types. Non-muscle myosin II has long been known for its role during cell division—which is vital for hyperplastic growth—where it localizes to the cell’s cortex and drives the physical separation of the two new daughter cells. We have found that several paralogs of non-muscle myosin II localize to the cortex of a dividing cell and their cooperation is vital for cytokinetic fidelity through multiple mechanisms.


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## via Zoom

## 3:30 pm

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