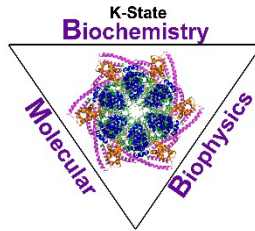


Ackert Hall, Room 120  
Wednesday, September 11, 2024  
4:00 P.M.



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

**Biochemistry**  
&  
**Molecular**  
**Biophysics**

**Seminar**

## Getting into shape: phosphoinositide roles in muscle cell remodeling

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Muscle contraction is essential for animal life. Muscle function depends on specialized cellular compartments, including plasma membrane domains that support ongoing myofiber signaling and integrity. Transverse (T)-tubules, invaginations of the muscle plasma membrane, form an extensive tubulated membrane network critical for excitation-to-contraction relays in both skeletal and heart muscles. Little is known about how the elaborate T-tubule network forms nor how it remodels with muscle growth, damage, aging and disease.

We developed the use of intact *Drosophila* body wall muscles as an ideal system to study the T-tubule membrane network. Using muscle-targeted genetic screens, we discovered functions that act within distinct programs for either T-tubule membrane formation versus regulated remodeling. Importantly, the identification of conserved genes involved in T-tubule regulation established fly models for several different human myopathy diseases. We found that factors involved in endocytic and autophagic membrane trafficking control T-tubule stability versus disassembly, and that targeting this regulation can revert myopathy-related defects. An emerging theme is that specific phosphoinositide lipids, as well as the lipid regulators and effectors, play key roles in T-tubule formation, remodeling and human disease.