DEPARTMENT OF BIOLOGY | UNIVERSITY of WASHINGTON

Biology Seminar

By: Joy Sebe

University of Washington | Postdoctoral Fellow, Department of Biology

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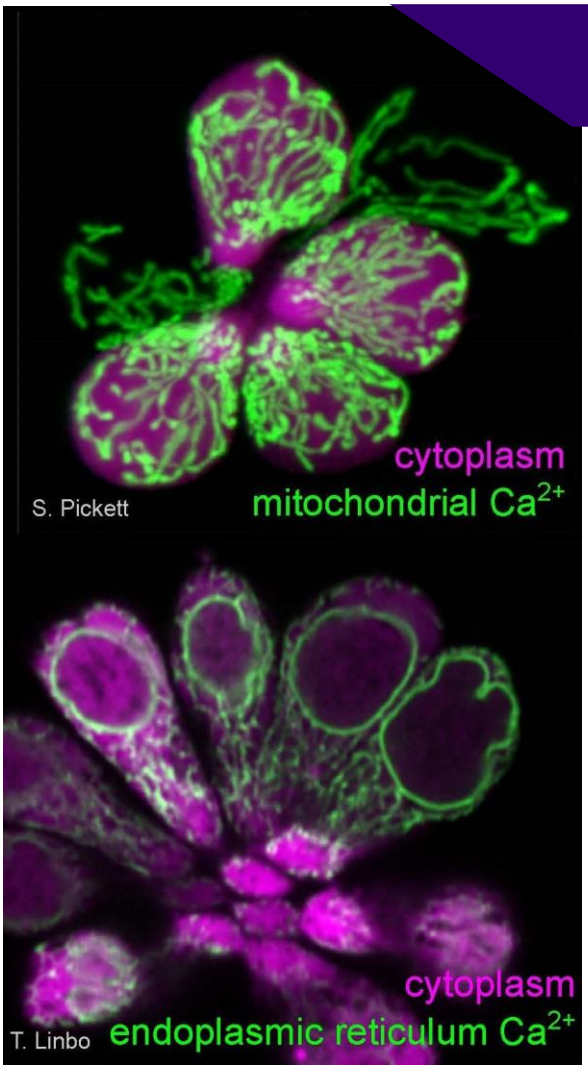
Staying alive: Cellular adaptations of mechanosensory hair cells



Wednesday, January 10, 2018 | 12:00pm
HCK 132 Refreshments at 11:45am

Organisms have developed remarkable specializations to sense and navigate their environments. Fish are able to detect predators and prey using a network of mechanosensory hair cells, called the lateral line, that are located on the surface of the skin. These cells detect disruptions in their surrounding fluid and convert mechanical information to electrical impulses that are relayed to the brain. The mechanosensory hair cells of the lateral line are both structurally and functionally similar to those of the inner ear that mediate hearing and balance. While hair cells of the inner ear are encased in the bony cochlea and therefore difficult to access, lateral line hair cells of the larval zebrafish can be easily visualized, mechanically stimulated and genetically manipulated providing an opportunity to learn general principles about hair cell function. Using the larval zebrafish lateral line, Joy applies *in vivo* functional imaging, electrophysiological and molecular biology approaches to visualize hair cell responses to mechanical input at the organelle and synaptic level. Joy will present work showing how hair cell mitochondria respond to both acute and long-term mechanical stimulation and will show that hair cells express excitatory neurotransmitter receptors, NMDA receptors, that can both protect against and promote cellular damage. The cellular adaptations that protect mechanosensory cells limit ionic, particularly Ca^{2+}, imbalances that lead to cell death. These studies of cytoplasmic and mitochondrial Ca^{2+} homeostasis may have implications for organisms living in osmotically imbalanced and metabolically demanding environments.

Seminar Speaker Host: Toby Bradshaw