ECEE Seminar Series
Fall 2014

Tuesday, November 11, 2014
3:30 pm – 4:45 pm
ECCR 265

Membrane Voltage: How Tissues Regain Their Shape During Regeneration

Dr. Wendy S. Beane
Department of Biological Sciences
Western Michigan University

Abstract:
You’ve heard about the exciting promise of stem cells and their ability to give rise to new tissues. But have you thought about how these new cells will know what shape they should take? Recent data highlights an important role for bioelectrical (ion flux-mediated) signaling in regulating tissue shape. Ion currents and endogenous electric fields are crucial to development, wound healing, tissue outgrowth, and even cancer. Using the awesome regenerative powers of the planarian flatworm, which is able to regrow any and all tissues, this talk will examine the role of voltage gradients and ion flux during regeneration. These in vivo studies reveal that membrane voltage acts as a master shape regulator—determining the position, size and shape of organs during regeneration. These data suggest that reagents regulating ion flux, many of which are already approved for human use, could be adapted to control tissue shape in stem cell-driven regenerative therapies.

Biography:
Wendy S. Beane is an Assistant Professor at Western Michigan University, where her lab studies the role of bioelectrical signaling during adult stem cell-mediated regeneration. She received both a B.A. and a B.S. from Averett University, followed by a Ph.D. in Biology from Duke University. Next, she was a Post-Doctoral Fellow at Harvard’s Forsyth Institute (later Tufts University) in the lab of Dr. Michael Levin. Her graduate work in understanding embryonic pattern formation, combined with her post-doctoral work on the regulation of bioelectrical signaling, has led to her current interest in how tissue shape is restored following injury.

Light refreshments will be served.