School of Natural Sciences
MCB Seminar

UCMERCED

Applied electric fields and their effects on stem cell behavior during tissue regeneration and cellular turnover

By: Devon Davidian

Abstract:

The human body has mastered the expansive power of bioelectricity, however the scientific community at large has yet to fully comprehend the complexity and potential of this innate capability. Naturally occurring electric fields have captivated the focus of researchers with its ability to control and influence tissue regeneration. Endogenous direct current electric fields (EFs) are generated instantaneously upon wounding and have been shown to play significant roles in the wound healing process, including the guidance regenerative cells to the site of injury (galvanotaxis) and stimulation of proliferation [1, 2]. External application of EFs can be used to enhance the regeneration of damaged epithelia [2, 3, 4, 5, 6]. Our lab has shown evidence that applied EFs can not only control regenerative events in the planarian flatworm Schmidtea mediterranea, but also influence cellular transcriptomic activity. The planarian model system allows us to study the effects of whole body applied EFs under homeostatic and/or regenerative environments while gaining insight into the cellular mechanisms governing EF sensitivity. Deciphering the complexity and nature of applied EFs in the adult body and their impact on cellular behavior will play a tremendous role in the advancement of regenerative therapies and medicine.

Biography:

Devon Davidian studied bioengineering at the University of California Merced from 2007 – 2012. He then joined UC Merced's graduate program in quantitative systems biology in fall 2012. His studies focus on the behavior of stem cells subjected to applied electric fields and bioelectrical effects on the regenerative capacity in the planarian flatworm Schmidtea mediterranea.

Date:

Tuesday, February 28, 2017

Time:

12:00pm

Location:

SE1 270K

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