Advances in Analytical Real-Time Microscopy & Imaging

July 9, 2015
New Mexico State University

RISE STARTUP SUMMER 2015 SYMPOSIUM SERIES

8:30 a.m. Coffee & breakfast with the speakers

9:00 a.m. Introduction **Dr. Jessica Houston, Assistant Professor, NMSU Chemical Engineering**

9:10 a.m. Kinetic Image Cytometry of Stem Cell-Derived Cardiomyocytes and Neurons

Dr. Jeffrey Price, Professor, Scintillon Institute and CEO, Vala Sciences

Kinetic image cytometry (KIC) creates single cell measurements of dynamics of events such as action potentials and calcium transients in fast-acting cells such as cardiomyocytes and neurons. Kinetic image cytometry (KIC), developed via collaboration between Vala Sciences and Jeff Price's and Mark Mercola's academic labs at Sanford-Burnham Medical Research Institute, detects changes in kinetics due to drugs or toxins. Examples shown are changes in the kinetics of the calcium transients in human induced pluripotent stem cell-derived cardiomyocytes (hiPSC-CMs) for predicting the risk of arrhythmias in humans. Dr. Mercola's lab also used KIC to discover a new drug target for heart failure. Thus KIC can help create safer and more effective drugs.

10:10 a.m. A Miniature Confocal Microscope for 3-D Imaging in the Brain

Dr. Emily Gibson, Assistant Professor, Bioengineering, University of Colorado Denver, Anschutz Medical Campus

Microscopy has greatly expanded the capabilities for cellular-level biological imaging. In the field of neuroscience, high resolution imaging of action potentials in individual neurons can be viewed in real-time using fluorescent genetically encoded calcium indicators (GECI) or voltage indicators (GEVI). These genetically encoded fluorescent proteins combined with new developments in deep brain optical imaging in awake behaving animals will have great potential for understanding neural circuitry down to the cellular level.

11:10 a.m. Coffee with the speakers

11:30 a.m. Multidimensional Cellular Imaging from In Vitro 3D to Intravital Animal Models **Dr. Kevin Eliceiri, Director, Laboratory for Optical & Computational Instrumentation (LOCI), University of Wisconsin Madison**

A fertile area of imaging research and development is in the area of optical instrumentation where collaborative efforts are needed to develop the next generation of optical instrumentation and computational approaches for visualizing and assaying key biological and biomedical phenomena. A key area of emphasis has been in cellular imaging research. Noninvasive optical methods such as multiphoton microscopy, second harmonic generation (SHG), light sheet microscopy and fluorescent lifetime microscopy (FLIM) hold great promise for investigations in human cell and animal models of normal and diseased processes. Data from developmental models and cancer models such as pancreatic, prostate and breast cancer research will be shown.

Sponsored by the NMSU RISE to the Postdoctorate Program
NIH NIGMS Grant # R25GM061222
http://rise.nmsu.edu/