

PANEL SESSION
WEDNESDAY AUGUST 10, 2005, 10:20-12:20
HOSPITALITY SUITE

Challenges in Biomedical Research: Electrophysiology

Panelists

Michael Behbehani, PhD
Professor, Molecular and Cell Physiology
University of Cincinnati

H. Casey Cromwell, PhD
Assistant Professor, Psychology
Bowling Green State University

Jeffrey D. Johnson, Session Chair
Associate Professor, Biomedical Engineering
University of Cincinnati

Scott Molitor, PhD
Assistant Professor, Bioengineering
University of Toledo

Eric Gruenstein, PhD
Professor, Molecular Genetics & Biochemistry
Director, Center for Image Analysis
University of Cincinnati Medical School

Raymond Pun, PhD
Research Associate Professor, Molecular & Cell Physiology
University of Cincinnati

Summary

The goal of the session is to facilitate collaborations between engineers and neuroscientists by introducing conference attendees to the challenges and needs in the area of biomedical research known as electrophysiology.

Electrophysiology is the study of the electrical aspects of physiology. In the case of this special session, we narrow our interest to neuroelectrophysiology, that is, the study of the

electrical aspects of neurons. Neuroelectrophysiology is dependent on the following technology: small signal amplifiers, electrodes, microelectrode arrays, microscopy, imaging, signal and image processing, data mining, databases, and simulation and modeling. (A common approach in neuron modeling is to simulate the neuron as an electrical circuit.) Because of the small and delicate nature of neurons, nanotechnology presents a significant opportunity for advancement in recording technology.

Long Term Outlook: The National Institutes of Health (NIH) is a \$29B federal funding agency. Recently NIH created the National Institute of Biomedical Imaging and Bioengineering (NIBIB). The mission of the NIBIB is to "improve health by promoting fundamental discoveries, design and development, and translation and assessment of technological capabilities." In other words, NIH recognized that medicine will only advance if engineers and physical scientists are actively engaged in medical research. This special session is designed to introduce engineers and physical scientists to one aspect of medical research.

The session will be informal and hosted by a panel of electrophysiologists and engineers familiar with specific technology used in electrophysiology. Each panelist will briefly discuss their technology and the application of that technology in his or her specific medical research. The majority of the session will be reserved for a question and answer period.