



Biomedical
Engineering

Biomedical Engineering
Wallace H. Coulter Foundation
Lecture Series



FLORIDA INTERNATIONAL UNIVERSITY

ELECTROCHEMICAL DEVICES AND SYSTEMS FOR BIOANALYSIS

Dr. Kosuke Ino
Tohoku University, Japan

Friday, September 12th, 2014
LECTURE: 9:00 AM - 10:00 AM

ENGINEERING CENTER
ROOM EC 2300
10555 WEST FLAGLER STREET
MIAMI, FL 33174



Abstract:

Bioanalysis, such as bioimaging, has been a useful technology for modern biology. Among several bioimaging technologies, fluorescence-based imaging has been the most popular since fluorescence measurement usually has high sensitivity and its chemicals are commercially available. Electrochemical imaging has also been used to evaluate biomaterials because of its simplicity, lower detection limit, and selectivity. For bioanalysis using an electrochemical way, the most common tool is scanning electrochemical microscope (SECM), a type of scanning probe microscope. SECM has been used to detect the local electrochemical characteristics on surfaces, and applied for bioanalysis, such as cell analysis. However, the SECM technique may take a long time to acquire an electrochemical image due to time required for scanning with the probe, and might be unsuitable for high throughput bioanalysis and real-time imaging. To obtain a higher temporal resolution toward and achieve high throughput analysis, several electrochemical devices and systems have been developed using technology based on microelectro-mechanical-systems (MEMS). Recently, our group has developed a novel electrochemical devices and systems based on redox cycling and CMOS for bioanalysis. These electrochemical devices and systems is useful for bioanalysis, such as bioimaging, and will play a major role in the future development of biotechnology.

Biography

Kosuke Ino is an assistant professor in Tohoku University in Japan. He received his Ph.D degree in engineering from Nagoya University in 2008. He has worked as an assistant professor at Tohoku University from 2008, His research interests include BioMEMS, electrochemistry, and analytical chemistry. He has published >60 peer-reviewed papers.

Contact: Claudia E. Estrada 305-348-6717

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