FLORIDA INTERNATIONAL UNIVERSITY

BIOMEDICAL ENGINEERING LECTURE SERIES

New Advances in Nanomedicine: from Bench to Bedside

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Room EC 2410

Nanomedicine is the medical diagnosis, monitoring and applying treatment at the level of single molecules or molecular assemblies that provide structure, control, signals, homeostasis, and motility in living cells. It is a very important research direction to understand the cellular mechanisms in living cells and developing advanced technologies for early diagnosis and early treatment of various diseases – at the nano level. The nanomedicine research will exploit and build upon other research in nanotechnology, and apply it to studies of molecular systems in living cells which contain a multitude of nanoscale structures, such as membrane transporters; processes, such as self-assembly of protein-nucleic acid complexes; and nanomachines, such as molecular motors. To date, assessing single molecule properties in living cells has been restricted by either the size of the probe or the photobleaching of the small fluorescent labels. Quantum dots (QDs) are nanometer-sized fluorescent probes suitable for advanced biological imaging. The unique fluorescent spectral characteristics and photostability of the QDs position them above traditional organic dyes for live cells, time-resolved imaging applications. The nanotechnology will be very useful for the drug delivery and diagnostic approach. Magnetic nanotechnology is finding wide applications in medicine, most notably in magnetic resonance imaging and magnetic separation. The impedance biosensor is expected to find applications in monitoring cancer, and understanding neurological disease.

Dr. Chiming Wei

MD, PhD, FACC, FAHA, FCCP, FAAN, is the Director of Cardiovascular Molecular Research Program at the Johns Hopkins University School of Medicine. Before joining Johns Hopkins University, he held positions in the Mayo Clinic, Harvard University and University of Maryland School of Medicine. Dr. Wei discovered a new vasonatrain peptide (VNP) and received an American Patent. Dr. Wei has served as the President of the American Academy of Nanomedicine (AANM), Editor-in-Chief of NANOMEDICINE, and Editor-in-Chief of the Journal of Cardiothoracic-Renal Research (JCRR). The major research areas of Dr. Wei include new approach of nanomedicine in basic and clinical medicine, oxidative DNA damage and DNA repair pathways in ischemia-reperfusion injury and in cardiovascular and renal diseases. Dr. Wei published over 140 academic research papers in peer-reviewed journals and book chapters, and one of them has been chosen as a key paper in heart failure research by American Heart Association. Dr. Wei has received grants from the National Institutes of Health (NIH) and American Heart Association, American Society of Hypertension and American College of Cardiology. Dr. Wei has been appointed to be the reviewer of the NIH grant study section and the Irish National Nature Science Foundation. He is an Over-Sea Reviewer of the Chinese Academy of Science, and a Board Member of the Chinese National Key Grant on the Mechanisms of Heart-Brain Vascular Disease.

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