

## **Biophysical Engineering Approaches for studying Alzheimer's disease: Membrane Biophysics and Mechanics in Cellular Pathways**

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**Thursday, May 8th, 2014**  
**LECTURE: 9:00 AM - 10:00 AM**

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



**Abstract:** Alzheimer's disease (AD) is the most prevalent aging disease afflicting more than 44 million worldwide and projected increase to 75.6 million in 2030, and 135.5 million in 2050. AD has become an urgent health problem putting a heavy economic and emotional burden in the society. Thus this disease has been top research priority in many countries. The etiology of AD is not well understood, and the pathophysiology is complex involving different aberrant cellular and molecular mechanisms in the brain. Recent studies have demonstrated the important role of lipids, lipid signaling pathways and cytoskeletal reorganization in modulating pivotal cellular processes, physical property of membranes, amyloid precursor protein (APP) processing, neuroinflammation, oxidative stress and apoptosis. These are crucial factors and pathways leading to the decline of cognitive functions in AD. This talk will address the roles of cell membrane phase properties, membrane fluidity, membrane mechanics in oxidative stress, mitochondrial dysfunction, APP processing, and altered cerebral endothelial functions in AD.

**Biography:** Dr. James Lee is an Associate Professor of Bioengineering, and an active member of the Interdisciplinary Neuroscience Program at University of Missouri. He received his B.S. in Chemical Engineering from University of California, Berkeley in 1996, and Ph.D. from University of Pennsylvania in 2000. In 2001-2003, he was a NIH-funded postdoctoral fellow at Lawrence Berkeley National Laboratory. Lee has established an interdisciplinary research program mainly focusing on Alzheimer's disease, which has been funded by National Institutes of Health, Alzheimer's Association, Missouri Spinal Cord Injury Research Program, and Ministry of Education in the Republic of Kazakhstan. Lee received an Alzheimer's Association New Investigator Award in 2006, and was invited as a keynote speaker for the International Conference of Regenerative Medicine & Healthy Aging in 2012. He has co-authored in over 38 peer-reviewed articles, and over 2700 citations.

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**Map:** <http://campusmaps.fiu.edu/Engineering Center>