“Membrane Remodeling by BAR and Amyloid Proteins in Health and Disease”

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Date: Monday, January 12, 2015  
Time: 12:00 pm – 1:00 pm  
Note: A light lunch will be served before the seminar at 11:30 am  
Location: Aresty Auditorium, NRT, LG  
Website: http://pibbs.usc.edu/faculty/profile/?fid=80

Abstract:

Regulation of cellular membrane curvature is essential for nearly all membrane-remodeling events, including endocytosis and exocytosis. It becomes increasingly clear that several classes of proteins control membrane curvature by either sensing or inducing different membrane shapes. How proteins can accomplish this feat and how aberrations in this process result in disease remains poorly understood. To investigate these questions, our laboratory has studied the interaction of amyloid and BAR proteins with membranes. Amyloid proteins are involved in a number of diseases and disruption of membrane integrity is considered to be a cause of their pathogenesis. Our studies on α-synuclein (Parkinson’s disease) and IAPP (diabetes) show that these amyloid proteins have the ability to cause uncontrolled membrane remodeling, which, in turn, disrupts membrane integrity. Sequence inspection indicates that several other amyloid proteins are likely to disrupt membrane integrity via similar mechanisms. Thus, this mechanism may be of general relevance to the pathogenesis of amyloid proteins. BAR domain proteins are a family of proteins involved in a wide range of membrane remodeling event. Our data indicate that these proteins use different structures and mechanisms in order to generate spherical or tubular membrane shapes. The ability to generate the correct curvature is controlled by post-translational modifications and is compromised by several mutants involved in centronuclear myopathy.