

Recent Activities in the Center for Membrane Biosciences

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The Center for Membrane Biosciences (CMB) is active in facilitating collaborative research among center members and other IUPUI community members. A number of seed grants have been made and the results from two will be presented. Recent major funding from the NSF supports a CMB-centered program that promotes intensive undergraduate research opportunities.

Project 1: Autosomal dominant polycystic kidney disease (ADPKD) is characterized by the slow growth of fluid-filled cysts in the kidney tubules and liver bile ducts. We identified LPA (lysophosphatic acid) as a component of cyst fluid that stimulates secretory Cl⁻ and compensatory water flux into cysts through binding of receptors on the basolateral membrane of renal cells. LPA concentrations measured in ADPKD cyst fluid and in normal serum are sufficient to maximally stimulate ion transport. Thus, cyst fluid seepage and/or leakage of vascular LPA into the interstitial space are capable of stimulating secretion from epithelial cells resulting in cyst enlargement.

Project 2: Upon the recent acquisition of Center-supported high-resolution mass spectrometers at IUPUI, methods for the analysis of lipid and protein samples to support nascent research endeavors within the CMB are being developed. Identification and quantification of sphingolipids in biological samples as well as other lipidomic experiments will be presented.

Project 3: The IUPUI URM Immersion in Interdisciplinary Research in Biological Signaling program targets underrepresented minorities in the biological sciences, and through early and sustained undergraduate research experiences that are intensely mentored at multiple levels, aims to increase the number of underrepresented minorities achieving graduate degrees in the Biological Sciences. The first cohort will begin research in the program during the summer of 2011 and are currently in the selection process.