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Research Interests

(1) Phosphoinositide-mediated signal transduction. Cells possess an array of signal transduction pathways for controlling their growth and proliferation, in which inositol lipids and inositol phosphates play a pivotal role. My research interests in this area include (a) molecular and functional diversity of inositol phosphates and (b) phosphoinositide 3-kinase-mediated signaling pathway. Both projects are aimed at understanding the molecular mechanisms for these important second messengers, based on which one can gain insight into the cell biology of intracellular information highway and the pathology of many disease states.



(2) Biomimetic molecular recognition. This research employs a peptide-library approach to explore the mode of recognition between peptides and small ligands such as carbohydrates and phospholipids, from which the knowledge obtained may provide a molecular basis for designing therapeutics for many diseases.

(3) Asymmetric biocatalysis in synthesis of chiral molecules. Enzymes are useful asymmetric agents for the synthesis of chiral pharmaceuticals. My laboratory is developing new methodologies and exploring new applications of enzyme-assisted organic synthesis.

Representative Publications

P.-J. Lu, W.-R. Shieh, and C.-S. Chen (1996) "Antagonist effect of inositol pentakisphosphate on the inositol trisphosphate receptor," *Biochem. Biophys Res. Comm.* 220, 637-642.

W.R. Shieh, and C.S. Chen (1995) "Preparation and characterization of a D-myo-inositol 1,4,5-tris-phosphate-specific antibody," *Biochem. J.* 311, 1009-1014.

L.E. Rameh, C.-S. Chen, and L.C. Cantley (1995) "Phosphatidylinositol-3,4,5-P₃ interacts with SH2 domains and modulates phosphoinositide 3-kinase association with tyrosine-phosphorylated proteins," *Cell* 83, 821-830.

Lu, P.-J., Gou, D.-M., Shieh, W.-R., and Chen, C.-S. (1994) "Molecular interactions of endogenous D-myo-inositol phosphates with the intracellular D-myo-inositol 1,4,5-trisphosphate recognition site," *Biochemistry* 33, 11586-11597.