

Jean X. Jiang, Ph.D.

Professor, Department of Biochemistry
Location: 4.084v, MED
Phone: (210) 567-3796
Fax: (210) 567-6595
E-mail: jiangj@uthscsa.edu
Web links: <http://www.biochem.uthscsa.edu/~jiang>

Research interests:

Intercellular and intracellular signaling, and amino acid transport

We are focusing on two major research areas: molecular mechanisms of gap junctions and hemichannels in intercellular/intracellular signaling, and characterization of function and regulation of amino acid transporters.

Cells connect and communicate via an information superhighway named gap junctions. Gap junctions are clusters of transmembrane channels that connect the cytoplasm of adjacent cells. These channels are formed by a family of proteins called connexins. Gap junction channels permit small metabolites, ions, and second messengers to pass from cell to cell. Cells like lens fibers within the interior of the vertebrate eye lens have neither a blood supply nor organelles. Thus, lens survival and homeostasis are uniquely dependent upon intercellular communication via gap junctions with the cells localized at the lens surface. For cells like bone osteocytes, signals generated by mechanical loading can be transmitted extensively at high speed through gap junction channels. Therefore, gap junctions provide the critical means for cell survival and for physiological regulation of cellular functions. In addition to forming gap junctions, connexins are recently shown to form hemichannels, un-opposed halves of gap junction channels. Hemichannels mediate the passage of biological molecules, especially for cells under stress conditions. Our current research interests are: 1). To determine the gap junction or hemichannel-dependent and independent roles of connexins in cell growth, differentiation and lens development. 2). To explore the functional significance of gap junctions and hemichannels in transmitting the signals generated by mechanical stress for mineralized tissue formation and remodeling.

Cellular metabolic needs are fulfilled by import of amino acids across the plasma membrane via specialized transporter proteins. We have identified a new family of amino acid transporters. Our current research interests are: 1). To characterize the functions and the structure-function relationship of identified transporters. 2). To investigate the biological roles of the amino acid transporters *in vivo* using our recently generated gene knockout mouse model in neuronal tissues.