

## **“Developing Cross-linking Mass Spectrometry to Define Protein Interactions and Structures”**

Friday, April 14, 2023  
12:00 – 1:00 p.m.

McDonnell Douglas Engineering Auditorium  
(MDEA)



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**Abstract:** Protein-protein interactions (PPIs) are essential for the assembly of protein complexes, which are the active molecular modules for controlling various biological processes to maintain cell viability and homeostasis. Perturbations of PPIs can cause deleterious effects on cellular activities and thus lead to various human diseases. Detailed characterization of PPIs is not only critical to unraveling molecular details underlying human pathologies, but also important for developing novel interaction-based therapeutics. In recent years, cross-linking mass spectrometry (XL-MS) have become a powerful tool for global profiling of protein interaction networks. In comparison to other PPI methods, XL-MS is unique due to its capability of capturing native PPIs from cellular environments, and uncovering their identities and connectivity simultaneously without cell engineering. Despite its great potential, XL-MS analysis remains difficult in effective detection and identification of cross-linked peptides from complex samples. To advance XL-MS studies, we have developed a series of sulfoxide-containing MS-cleavable cross-linkers for simplified and accurate identification of cross-linked peptides. Our MS-cleavable reagents have been successfully applied to define global PPIs and elucidate architectures of protein complexes *in vitro* and *in vivo*. Here, we will present the development of MS-cleavable XL-MS technologies and their applications to enable biological discoveries.

**Biography:** Dr. Lan Huang is Professor of Physiology & Biophysics and the director of high-end Mass Spectrometry Facility in School of Medicine, University of California, Irvine (UCI). She received her Ph.D. in Analytical Chemistry from University of Florida with Prof. Robert T. Kennedy and did her postdoctoral training in biological mass spectrometry with Prof. Al Burlingame at UCSF. She was recruited to UCI as an Assistant Professor in 2003 and became a Full Professor in 2012. Her research focuses on developing novel, integrated mass spectrometry-based proteomic strategies to characterize dynamic proteomes of macromolecular protein complexes and understand their functions, particularly those in the ubiquitin-proteasome system.