Chunlai Wu, PhD
Assistant Professor of Cell Biology & Anatomy, and Neuroscience

Education

2002-2008	Postdoc, Washington University in St. Louis
1997-2002	PhD, Washington University in St. Louis
1994-1997	MSc , Shanghai Institute of Biochemistry, Chinese Academy of Sciences, Shanghai, China
1990-1994	BSc, Sichun University, Chengdu, China

Positions

2008-Present	Assistant Professor of Cell Biology and Anatomy, and Neuroscience; Neuroscience Center, LSU Health Sciences Center, New Orleans, LA
2002-2008	Postdoctoral fellow; Department of Developmental Biology, Washington University in St. Louis, MO

Current Research

A central goal of my research is to identify the molecular pathways and matrix that shape the structure and strength of synaptic connections formed during development. Understanding the developmental plasticity and pre- and post-synaptic organization of synapses is crucial to illuminating the mechanisms by which neuronal circuits form and change in the healthy and diseased brain. Using *Drosophila* as a model system, we have identified mutants that show altered structure/function in the neuromuscular junction synapses. We are currently characterizing these mutants in the context of synaptic development. In addition, the powerful fly genetics has also been combined with biochemical techniques, especially *tandem affinity purification* of TAP-tagged synaptic proteins, to identify novel molecules that play a structural or signaling role in shaping the synapse.

Studies from our lab and many others demonstrate that ubiquitination and ubiquitin-mediated pathways play essential roles in not only protein quality-control and homeostasis, but also a multitude of other processes including protein trafficking, neuronal connectivity, synaptogenesis, synaptic transmission and neural degeneration. To understand these ubiquitin-mediated events in the brain, we combine the *Drosophila* genetics with comparative proteomics to analyze the difference of ubiquitination profiles between normal and degenerating fly brains. The goal is to identify specific ubiquitin targets in response to a particular pathological condition, especially age-related neurodegenerative diseases such as Alzheimer Disease and Parkinson's Disease.

Research Interests and Goals

We combine the powerful fly genetics with proteomic and biochemical approaches to understand the mechanisms underlying learning and memory, mental retardation, and age-related neural disorders, such as Parkinson's Disease and Alzheimer's Disease.

Key Recent Papers

Taro Kaneuchi*, **Chunlai Wu***, Xinping Qiu, Colin DeMill, Marta Kisiel, Owen Randlett, Aaron DiAntonio, Toshiro Aigaki, and Bryan A. Stewart (2008). NSF interacts with *highwire* to regulate *wallenda/*DLK and synaptic development. *Submitted. **Co-first author***

Chunlai Wu, Richard W. Daniels, and Aaron DiAntonio. (2007). DFsn collaborates with Highwire to down-regulate the Wallenda/DLK kinase and restrain synaptic terminal growth. ***Neural Development*** 2:16.

Jeffrey M. C. Lau, **Chunlai Wu**, and Anthony J. Muslin. (2006) Differential role of 14-3-3 family members in Xenopus development. ***Developmental Dynamics*** 235, 1761-1776.

Chunlai Wu, Yogesh P. Wairkar, Cathrine A. Collins, and Aaron DiAntonio. (2005). Highwire function at the Drosophila neuromuscular junction: spatial, structural, and temporal requirements. ***Journal of Neuroscience*** 25, 9557-9566.

Chunlai Wu and Anthony J. Muslin. (2002) Role of 14-3-3 proteins in early Xenopus development. ***Mechanisms of Development*** 119, 45-54.

Qi-heng Yang, Zheng Zhu, Meng-qiu Dong, Song Ling, **Chun-lai Wu**, and Lin Li. (2001) Binding of ATP to the Fructose-2,6-bisphosphatase Domain of Chicken Liver 6-Phosphofructo-2-kinase/Fructose-2,6-bisphosphatase Leads to Activation of Its 6-Phosphofructo-2-kinase. ***Journal of Biological Chemistry*** 276, 24608-24613.

Chunlai Wu, Qingyi Zeng, Kendall J. Blumer, and Anthony J. Muslin. (2000) RGS proteins inhibit Xwnt-8 signaling in Xenopus embryonic development. ***Development*** 127, 2773-2784.

Qi-Heng Yang, **Chun-lai Wu**, Kai Lin, and Lin Li. (1997) Low Concentration of inducer favors production of active form of 6-phosphofructo-2-kinase/fructose-2,6-bisphosphatase in Eschericia coli. ***Protein Expression and Purification*** 10, 320-324.

Lin Li, Song Ling, **Chun-lai Wu**, Wei-zhe Yao, and Gen-jun Xu. (1997) Separate bisphosphatase domain of chicken liver 6-phosphofructo-2-kinase/fructose-2,6-biphosphatase: the role of the C-terminal tail in modulating enzyme activity. ***Biochemical Journal*** 328, 751-756.