My lab uses a range of methods, including live-cell imaging, to examine the mechanisms regulating dynein-dependent axon transport. Lis1 and Nudel regulate dynein during developmental process. We find they also function in adult neurons to regulate axon transport, which could have implications for neurodegenerative disease. Phosphorylation of Nudel by a cyclin-dependent kinase, Cdk5, is critical in this process, potentially tying extracellular signaling pathways to dynein regulation. We have also uncovered a novel dynein regulatory pathway that involves insulin signaling and the tumor suppressor protein, APC. This study was been carried out in colon cells where APC mutations lead to cancer and disrupt this regulatory mechanism. However, early findings indicate that the same pathway is active in adult neurons. We are currently interested in how these two signaling pathways cooperate to regulate dynein-dependent transport.