STUDYING MECHANISMS OF NEURON-GLIAL INTERACTIONS AND ENERGY HOMEOSTASIS

Glial cell support functions appear critical in maintaining long-term neuronal integrity and brain energy metabolism. However, the mechanisms by which neuronal compartments interact with surrounding glial cells, and if/how/when glial cells control neural energy homeostasis, remain poorly explored. The seminar will focus on the role of myelinating oligodendrocytes in regulating axonal energy metabolism. We use two-photon microscopy and metabolite sensor imaging in optic nerve preparations to study axon-glial metabolic interactions. We are now establishing transgenic tools and imaging strategies to soon investigate how oxidative stress and demyelination impact axonal energy homeostasis in the corpus callosum in vivo. Our future goals are to elucidate how dysfunctions in glial metabolic support contribute to axonal damage and the pathogenesis of neurodegenerative diseases.