I am interested in the cellular mechanisms underlying growth and plasticity of neuronal connectivity. The gaseous messenger nitric oxide (NO) is one of the intercellular signals that regulate synaptic plasticity. In target cells, NO stimulates its main effector enzyme guanylyl cyclase to produce cGMP. Our developmental studies in insects implicate the NO/cGMP cascade as a permissive factor for axonal elongation, axonal regeneration, and enteric neuron migration. By employing small bioactive enzyme activators and inhibitors in both gain and loss of function experiments, we could identify NO/cGMP signaling also as a positive regulator of migration in cultures of developing human brain cells. Since NO signaling regulates cell movements from insect to mammalian nervous systems, this transduction pathway may have evolutionary conserved functions. These findings have relevance for the development of therapeutic strategies to mobilize neuroblast migration after brain injury.

Selected References:


I am a founding member of the Center for Systems Neuroscience (ZSN) Hannover:

Profile