

## **Adaptation of oligodendrocytes to the energetic demands of myelinated axons: from NMDA receptor signalling to regulated lactate metabolism**

**Speaker:**

Professor Klaus-Armin Nave, Ph.D.  
Max-Planck-Institut für experimentelle Medizin (MPIEM)  
Abteilung Neurogenetik

**Funding period:**

since 2014

**Project description:**

We have discovered a novel role of myelinating glial cells in supporting the axonal energy balance with the local release of pyruvate/lactate. Our subsequent finding that activation of oligodendroglial NMDA receptors upregulates glucose import and lactate release, suggests a novel aspect of oligodendroglial diversity in the CNS as a function of axonal spiking frequency and associated energy demands, which also supports recent findings of myelin plasticity in the cortex of adult mice. Here, we will use novel genetic tools and molecular imaging techniques to analyze the subcellular mechanisms of glucose transporter GLUT1 trafficking in oligodendrocytes. We will also monitor the axonal and oligodendroglial energy metabolism in white matter tracts that operate with different electrical activities, and will translate our findings from the acutely isolated optic nerve model to an in vivo system for the utilization of genetically encoded metabolite sensors in live mice.

**Quelle:**

<https://gepris.dfg.de/gepris/projekt/254859413?language=en>