

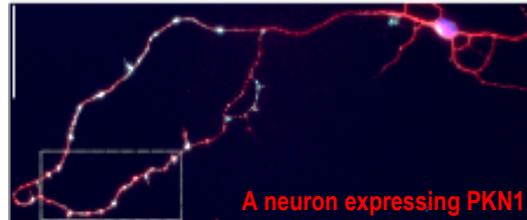
Diploma thesis for Molecular Medicine MSc/human medicine students

Title: **The role of Protein kinase N1 in neurodegeneration and neuroregeneration**

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Start: as soon as possible



Project description

Stroke is a major global cause of death and permanent disability. Due to its stringent selection criteria only a small percentage of stroke patients qualify for the only FDA-approved treatment, tissue-plasminogen-activator. Therefore, ongoing research into cerebroprotective mechanisms aim to uncover novel therapeutic approaches that improve the functional recovery after a stroke and would eventually be available to a greater percentage of stroke patients.

We have recently established that protein kinase N (PKN), an enzyme mapped at the heart of signaling networks governing differentiation and cell survival, acts as a critical gatekeeper of the AKT pro-survival-signaling pathway during brain development (zur Nedden *et al.*, 2018, *Journal of Clinical Investigation*, Safari et al, 2021, *Frontiers in Synaptic Neuroscience*). Additionally, we found that PKN1 regulates protective signalling cascades after ischemic stroke, and may therefore serve as a novel target for cerebroprotective interventions (zur Nedden *et al.*, Manuscript in prep).

We seek a master student who performs phosphorylation status analysis of PKN1 to establish the relevant sites for inducible PKN1 activity. By using specific antibodies against those sites, we aim to establish a novel tool to measure PKN1 activity in intact cells. At the molecular level we will study if and how the inducible phosphorylation sites on PKN1 serve to target the kinase to the membrane and if they are important for protein:protein interactions of PKN1 with scaffolds and/or downstream effectors. The prospective candidate will be trained in a whole range of methods including molecular biological techniques, cell culture, transfections, primary neuronal culture and acute brain slice techniques, western blotting and Immunoprecipitation.