Master Thesis Projects: Optogenetics and all-optical electrophysiology in neurons

We are offering Master’s thesis projects in optogenetics and generation of nerve impulses commencing September or as soon as possible hereafter. We are looking for a candidate with a Master’s project duration of 12-18 months.

**Project description** Nerve impulses are initiated in a small subdomain in the beginning of the axon, the axon initial segment (AIS). We are interested in developing a wide palette of optogenetic probes with specific localization to the AIS. This is done to overcome the technical difficulties using the currently available optogenetic probes that hinder selective detection and manipulation of the activity in the AIS. You can help us develop a toolbox of different optogenetic probes which will benefit the general neuroscience environment.

**Main methods (Depending on the project):** Primary hippocampal cell cultures, various cloning techniques, transfections of cultured neurons, various imaging techniques (confocal microscopy, live cell imaging, super resolution), optogenetics, all-optical electrophysiology, Western blotting, immunoprecipitations.

**Scientific environment**
The candidate will be part of the Membrane Trafficking group headed by Associate Professor Hanne Borger Rasmussen. The Membrane Trafficking group is embedded within the Ion Channel Group at Department of Biomedical Sciences. We offer an interesting and challenging project in an international environment focusing on ion channel research. The research focus of the Membrane Trafficking group is on the subcellular organization of ion channels in neurons, how this organization is established and regulated and how deficits in ion channel organization contribute to neurological disease. Visit our website for a more detailed description of the research activities and the members. ([https://bmi.ku.dk/english/research/the_ion_channel_group/membrane Trafficking/?fbclid=IwAROlAPzoNEbiwklHJ6MZInzCwaT-1IHvK8KaN Tw2w7lzwsDNAvNsTHvM70](https://bmi.ku.dk/english/research/the_ion_channel_group/membrane Trafficking/?fbclid=IwAROlAPzoNEbiwklHJ6MZInzCwaT-1IHvK8KaN Tw2w7lzwsDNAvNsTHvM70))

**Your qualifications:** You are highly motivated and studying Human Biology, Molecular Biomedicine, Biology, Biochemistry, Molecular Biology, Biotechnology or a similar course of studies. You are flexible, ambitious and can work independently.

**Application:** Contact Hanne Borger Rasmussen ([hannebr@sund.ku.dk](mailto:hannebr@sund.ku.dk)), including a CV and grade transcript.

**Place of project and contact information:**
Associate Professor Hanne Borger Rasmussen, Department of Biomedical Sciences, The Maersk Tower, Blegdamsvej 3, 7.09.46, 2200 Copenhagen N. For further information, please contact Hanne Borger Rasmussen ([hannebr@sund.ku.dk](mailto:hannebr@sund.ku.dk)).