Date:
Reg. No.: 2023/221

UNIVERSITY OF GOTHENBURG

THE SAHLGRENSKA ACADEMY

INSTITUTE OF NEUROSCIENCE AND PHYSIOLOGY

Department of physiology
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Announcement - scholarship at undergraduate/advanced level

The Department of Physiology, Institute of Neuroscience and Physiology, hereby announces a vacant scholarship at undergraduate/advanced level in electrophysiological field recordings.

Training plan

Subject: the impact of varied extracellular calcium concentrations on synaptic efficacy during burst stimulation, as measured by electrophysiological field recordings.

Background: Previous in vivo experiments on rodents have recorded neuronal activation frequencies between 4.5 and 62Hz. It stands to reason that the patterns observed in living creatures should be replicated in ex vivo preparations. Mounting evidence points to functionally distinct vesicle pools that contribute to different components of synaptic efficacy during such burst activity. These components are to varying degrees affected by extracellular calcium concentrations. By altering both the frequency and the concentrations, we may be able to discern the contribution of each component, gaining new knowledge about the composition and kinetics of the synaptic vesicle pool.

Purpose: The overall objective of this project is to examine the effects of different calcium concentrations on the response to physiologically relevant stimulation trains. The changes in response observed over the course of such trains, in varied calcium concentrations, could give vital information about some of the different mechanisms that determine synaptic efficacy.

Method: Acute hippocampal slices harvested from wistar rats will be subjected to stimulus trains at 5, 10, 20 or 40 Hz, while submerged in artificial cerebrospinal fluid with 0.5, 1, 2 or 4 mM calcium.

Time plan: During the first two weeks, the student will be trained in electrophysiological field recordings, with a particular focus on finding an appropriate stimulation strength for the highest possible signal to noise ratio, while not exceeding currents that would trigger

postsynaptic action potentials (which would obfuscate the excitatory postsynaptic potential). These skills will then be applied to a pilot study, examining how the response to these trains is affected by a varied calcium concentration. At the end of the project, time will be dedicated for the student to summarize the results.

Learning outcome: Following completion of the stipend period the student will have obtained practical and theoretical research training in the extraction of acute hippocampal slices, the field of electrophysiological recordings, and the handling of live rats. This educational training position comes with a stipend that does not represent a salary and the activities performed by the student are not regarded as work at the University of Gothenburg.

Period
2023-04-24 to 2023-05-26

Financing
1 payment of 12 000 SEK for the whole period.

If you require any further information, please contact Mats Andersson, mats.olof.andersson@gu.se, supervisor.

Application
To apply please fill out the form "Scholarship application" and send it to Mats Andersson, mats.olof.andersson@gu.se, supervisor.

To be eligible for a scholarship you must be a registered student at undergraduate or advanced level at the University of Gothenburg, other Swedish university or an international university with which the University of Gothenburg has a collaboration agreement.

Please attach a copy of your registration certificate with your application. The certificate must demonstrate that you are a registered student throughout the scholarship period.

Closing date is 20xx-xx-xx.