THE SAHLGRENSKA ACADEMY
INSTITUE OF NEUROSCIENCE AND PHYSIOLOGY

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Announcement - scholarship at undergraduate/advanced level

The Department of Psychiatry and Neurochemistry, Institute of Neuroscience and Physiology, hereby announces a vacant scholarship at advanced level in analytical neurochemistry research with molecular mechanisms underlying Alzheimer's disease pathology.

Training plan

Subject: The source and fate of small amyloid β plaques in evolving Alzheimer's pathology in mouse and man

Background: The research will be to study the fate amyloid deposits with focus on small plaques that either grow into mature deposits or stay small. For this we developed an advanced a method, iSILK, for probing the spatial amyloid peptide dynamics in brain tissue from both experimental mouse models and patients of Alzheimer's disease. We have been labelling mice and patients with ^{15}N protein diet leading to metabolic incorporation of the stable isotope into the amyloid beta (Aß) sequence. This in turn that allows us to follow Aß aggregation in developing AD pathology.

Purpose: We have previously performed a large-scale stable isotope labelling experiment in APP NL-G-F knock in mouse model of AD. The work here will focus on other mice carrying both APP mutations (NL-F) and genetic risk factors (Trem2, hTau, APOE4). We will use iSILK for probing Aß dynamics in tissues from these animals as well as in human brain.

Method: For this purpose for this we will establish a comprehensive chemical imaging paradigm. combining MALDI imaging mass spectrometry and Histological Staining Techniques as well as spatial genomics followed by Multivariate Image Data Analysis using advanced bioinformatic tools.

Time plan

1) Introduction to mass spectrometry- and chemical histological imaging

2) Training in Sample Preparation for imaging MS and chemical amyloid staining

3) Develop a correlative imaging method imaging in brain tissue combing IMS followed by subsequent amyloid staining and hyperspectral microscopy

4) Work on brain tissue in mouse models of Alzheimer's disease

5) Implement spatial genomics performed on consecutive section

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6) Training in multivariate image analysis strategies for multimodal imaging data to achieve tissue classification

Learning outcome: The applicant will be trained on new technologies in protein and lipid imaging and spatial genomics and will enhance his/her knowledge to have a better understanding of the function of amyloidogenic peptides and plaque associated cell types in neurodegenerative Alzheimers disease pathology.

Period
2023-11-01 to 2024-10-31

Financing
12 payments of 15000 SEK. A total of 180 000 SEK for the whole period

If you require any further information, please contact Jörg Hanrieder, jh@gu.se, supervisor.

Application
To apply please fill out the form "Scholarship application" and send it to Jörg Hanrieder, jh@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 2023-10-25.