Rigshospitalet

Preclinical neuroimage analysis of the GABA-A receptor during development of Fragile-X Syndrome

Master Project (30 ECTS)
Starting spring 2017
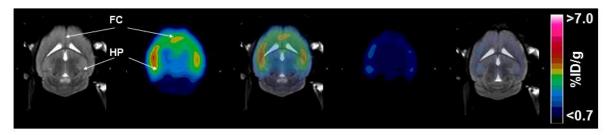Neurobiology Research Unit, Rigshospitalet and
Stanford University

Deadline for application 1st of February 2017

Title: Neuroimage analysis of Positron Emission Tomography images in Fragile-X KO mice.

Background
Fragile-X syndrome is a genetic variant of the Autism Spectrum disorder. It is characterised with a deficiency in the GABA-A receptor. We have investigated the developmental changes of GABA-A receptor expression in Fragile-X KO mice, in collaboration between Frederick T. Chin at Stanford University and Mikael Palner at the Neurobiology Research Unit. We have already collected an image dataset in the KO mice at different stages of their development using the Positron Emission Tomography tracer [^{18}F]-Flumazenil.

Project
Your project will be to construct a mouse brain atlas based on mouse MR structural images to be used for analysing [^{18}F]-Flumazenil PET images. The atlas should be used for quantification of GABA-A receptor levels to be able to measure development in Fragile-X KO mice. The data for the project, MR and PET images have already been collected, but you will be introduced to the techniques and the procedure. A visit to Stanford will be encouraged.

Your background
You have a background in a biological image analysis and have a keen interest in neuroscience. You thrive in a collaborative environment and can be creative and self-thinking. We encourage all interested candidates to apply, in spite of gender or cultural background.

More information
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Please read:
Palner M, Beinat C, Banister S, Zanderigo F, Park JH, Shen B, et al. Effects of common anesthetic agents on [(18)F]flumazenil binding to the GABAA receptor. EJNMMI Res. 2016 Dec;6(1):80. Available from: http://www.ncbi.nlm.nih.gov/pubmed/27826950

Vállez Garcia D, Casteels C, Schwarz AJ, Dierckx RAJO, Koole M, et al. (2015) A Standardized Method for the Construction of Tracer Specific PET and SPECT Rat Brain Templates: Validation and Implementation of a Toolbox. PLOS ONE 10(3): e0122363. Available from: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0122363