

The Center for Neurogenomics and Cognitive Research in Amsterdam (CNCR, see www.cncr.nl) and the Swammerdam Institute for Life Sciences (SILS, see www.science.uva.nl/sils) are seeking applications for

1 PhD-student

(computational neuroscience/systems biology)

fixed term, each 1+3 years

Systems Biology of the Synapse

Synapses are the fundamental processing elements that form the basis for the unsurpassed computational power of our brain. At the same time, synapses are in itself rather simple, well-defined structures of +/- $1\mu\text{m}^3$ with probably a maximum of 2 thousand different types of proteins present. We will apply a systems biology approach to identify protein networks underlying synapse function and to translate this into a realistic dynamical model for synaptic signalling. This PhD project is part of a larger project which contains a “wet” proteomics research line and a “dry” network modelling research line. Researchers on both research lines will collaborate intensively. This project is supported by and embedded in the Netherlands Institute for Systems Biology (NISB, see www.sysbio.nl).

Research project: Synapse Protein Network Modeling

The project consists of two phases. First the network of interaction between synaptic proteins (interactome) has to be established from prior knowledge, existing data and data generated in the “wet” proteomics research line. The important proteins that play a role in the functioning of the synapse can then be identified in the network. The tools to be used in this research are primarily from network theory, statistics and computer science. In the second phase of the project the dynamic interactions of the proteins that form core-hubs in the synaptic interactome will be modeled using coupled linear differential equations. Model parameters are fitted from experimental data on synaptic signaling in hippocampal neurons. Model predictions will be experimentally tested in our lab.

Suitable candidates:

We are looking for candidates with a master degree in Mathematics, Statistics, (Bio)physics, Computational Neuroscience, or Systems biology and an interest in neuroscience. A strong motivation to pursue a career in science, an interest in working as a team and the ability to work across disciplines are required.

Applications and more info

Please send CV and cover letter to Els Borghols at els.borghols@cncr.vu.nl with position 32B subject line **before February 15th, 2009**. More info can be obtained from Matthijs Verhage (project coordinator) at matthijs.verhage@cncr.vu.nl or Niels Cornelisse at niels.cornelisse@cncr.vu.nl.