



THE SAHLGRENKA ACADEMY
INSTITUTE OF NEUROSCIENCE AND 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 “Interaction between Genetic Susceptibility and Perinatal Immune Activation in Shaping Hippocampal Interneuron Development”.

Training plan

Background: Autism spectrum disorder (ASD) is a common neurodevelopmental condition with a higher prevalence in males. While genetic factors contribute substantially to ASD risk, increasing evidence highlights the importance of environmental influences, particularly early-life immune challenges. Perinatal immune activation, such as neonatal infection, is a frequent complication in very preterm infants and has been associated with long-term neurodevelopmental impairments. However, the biological mechanisms linking early immune insults to altered brain development remain poorly understood. Inhibitory interneurons are critical for maintaining the balance between excitation and inhibition in neural circuits. The hippocampus, a region essential for learning and memory, is particularly sensitive to disruptions in interneuron maturation. Altered development and function of inhibitory interneurons have been implicated in ASD, suggesting that early-life immune disturbances may interfere with these processes and contribute to disease-related phenotypes.

Purpose: This study aims to investigate how the interaction between genetic vulnerability and perinatal immune activation influences the maturation of hippocampal interneurons and related behavioral outcomes.

Method: To model gene–environment interactions relevant to ASD, we will use 16p11.2 deletion mice, a well-established genetic model of autism. Perinatal immune activation will be induced on postnatal day 4 (P4) via intraperitoneal injection of *Staphylococcus epidermidis* (3.5×10^7 CFU), with saline-treated animals serving as controls. Behavioral assessments will be conducted at $P45 \pm 5$, including the three-chamber test to evaluate social behavior and the marble burying test to assess repetitive behavior. Following behavioral testing, brain tissue will be collected for histological analysis. Interneuron number and morphology in the hippocampus will be quantified using stereological methods combined with light microscopy on immunostained sections. All procedures will be conducted in accordance with the ARRIVE international guidelines.

Learning outcome: This project will provide insights into how interaction between genetic factor and perinatal inflammation as an environmental factor influences autism-related behaviors and hippocampal synaptic plasticity, while also equipping the student with skills in animal behavior testing, neuroanatomical analysis, and data interpretation relevant to

neurodevelopmental disorders. This training position comes with a stipend, which does not represent a salary, and the activities performed are not regarded as work.

Period

2026-09-01 to 2027-02-28

Financing

2 payments of 54 000 SEK. A total of 108 000 SEK for the whole period

If you require any further information, please contact Carina Mallard, carina.mallard@gu.se, supervisor.

Application

To apply please fill out the form “Scholarship application” and send it to Carina Mallard, carina.mallard@gu.se, supervisor.

Please attach a copy of:

CV

Letter of motivation

Closing date is 2026-06-19.