



## SAHLGRENKA AKADEMIN INSTITUTIONEN FÖR BIOMEDICIN

### Utlysning

**Project Title:** **Molecular mechanisms of age-related inflammation**

**Project duration and dates:** 12 months, From 2026-02-16 Till: 2027-01-15.

**Application deadline:** January 31

**Amount:** 20 000SEK/month

#### **Project summary:**

Aging is associated with chronic low-grade inflammation, commonly referred to as *inflammaging*, which contributes to functional decline and increases the risk of neurodegenerative diseases. Increasing evidence indicates that age-related inflammation in the brain is driven not only by neurons, but also by brain-associated immune and glial cells. However, the molecular mechanisms linking aging to sustained neuroinflammatory signaling remain poorly understood.

Recent findings from our laboratory demonstrate that LRRK2, a kinase strongly linked to immune regulation and neurodegeneration, plays a key role in controlling age-related inflammatory responses by regulating vesicle-associated signaling pathways. Dysregulation of vesicular trafficking and extracellular vesicle-mediated communication may promote the spread of inflammatory signals in the aging brain.

In this project, the student will use transcriptomic approaches to investigate age-dependent molecular changes in brain-associated cells, with a particular focus on LRRK2-regulated inflammatory and vesicle-mediated signaling pathways. The project aims to uncover how alterations in gene expression contribute to chronic inflammation and impaired immune homeostasis during aging.

#### **Objectives:**

- Perform transcriptomic analysis of brain-associated cells from young and aged samples
- Identify age-dependent inflammatory gene expression signatures
- Characterize LRRK2-associated signaling pathways involved in immune activation
- Analyze vesicle-associated and trafficking-related signaling pathways linked to age-related inflammation
- Integrate transcriptomic data to understand mechanisms of neuroimmune aging

**Applicant:****Application:**

Applications should be emailed to [anetta.hartlova@gu.se](mailto:anetta.hartlova@gu.se) .The application should include; Motivation letter, CV including contact info.