



SAHLGRENKA AKADEMIN INSTITUTIONEN FÖR BIOMEDICIN

Utlysning

Project Title: Advanced profiling of stem cell–derived islets using multielectrode arrays, immunostaining, and single-cell sequencing

Project duration and dates: 12 months, 22/09/25-20/09/26

Application deadline: 1st September 2025

Amount: 2 payments of 120,000 SEK

Project

A scholarship in single-cell genomics is hereby announced at the Institute of Biomedicine, Dept. of Medical Biochemistry and Cell Biology.

Background and Purpose

This project will investigate beta cell function in both primary human islets and stem cell–derived islets by combining high-density multielectrode array (HD-MEA) electrophysiology with single-cell sequencing and immunostaining. The aim is to map functional heterogeneity, molecular signatures, and protein marker expression of beta cells under different physiological and disease-relevant conditions.

The scholar will work closely with postdocs and PhD students to design and execute experiments involving stem cell differentiation, islet culture, functional electrophysiological recordings, immunostaining for maturation and cell identity markers, and subsequent transcriptomic profiling. In addition to project-specific experiments, the role will involve contributing to other ongoing molecular biology activities in the lab, including RNA extraction for liquid biopsies, and performing key lab management duties such as reagent ordering, sample organization, and instrument upkeep.

Method

The main tasks will include:

- Preparing and culturing stem cell–derived islets and human islets.
- Performing HD-MEA recordings to measure beta cell activity.
- Conducting immunostaining for relevant markers and analyzing microscopy images.
- Isolating single cells or nuclei for single-cell RNA sequencing.
- Assisting in experimental design, protocol optimization, and troubleshooting.
- Contributing to RNA extraction and library preparation for other lab projects, including cell-free RNA studies.
- Performing lab management tasks such as maintaining lab inventories, ordering supplies, coordinating instrument maintenance, and training new members in basic lab techniques.

Work plan/Timetable

The first months will be dedicated to establishing cell culture, HD-MEA protocols, and immunostaining workflows in coordination with ongoing single-cell sequencing experiments. Midway through the project, data collection will be performed, followed by sample preparation for sequencing and image analysis. Throughout the project, the scholar will contribute to lab organization and assist with related molecular biology tasks.

Learning objectives

- Acquire hands-on expertise in culturing stem cell-derived islets and human islets.
- Gain experience in functional electrophysiological analysis using HD-MEA.
- Learn immunostaining and quantitative image analysis.
- Learn single-cell RNA sequencing workflows from sample preparation to library prep.
- Develop skills in lab organization, inventory management, and experimental troubleshooting.

Applicant:

The ideal candidate should meet the following qualifications:

- M.Sc. in Biotechnology, Molecular Biology, Systems Biology, Biochemistry, Cell Biology, or related fields.
- Strong motivation, proactivity, and diligence.
- Experience with molecular biology techniques (cell culture, DNA/RNA extraction, PCR, qPCR, NGS library prep).
- Experience with immunostaining or single-cell RNA sequencing is a plus.
- Meticulous work habits and accurate record-keeping in lab notebooks. Familiarity with programming or image analysis tools (Python, R, ImageJ/Fiji) is advantageous
- Experience in electrophysiology is a plus.
- Ability to work both independently and collaboratively.
- Good skills in both written and spoken English are required

Application:

Applications should be emailed to Dr. Joan Camuñas Soler: joan.camunas@gu.se

The application should include: Motivation letter, Transcript of Records, CV including contact info.