



## DEPARTMENT OF MEDICAL BIOCHEMISTRY AND BIOPHYSICS

### **C2F2780 The Developing Brain, 1.5 credits (hec)**

Hjärnans utveckling, 1,5 högskolepoäng

*Third-cycle level / Forskarnivå*

---

#### **Approval**

This syllabus is approved by the The Committee for Doctoral Education on 2023-11-02, and is valid from Spring semester 2024.

#### ***Responsible department***

Department of Medical Biochemistry and Biophysics, Faculty of Medicine

#### **Prerequisite courses, or equivalent**

No prerequisite courses, or equivalent, demanded for this course.

#### **Purpose & Intended learning outcomes**

##### **Purpose**

Developmental biology lies at the heart of an effort to understanding complex biological systems. By studying how neural circuits are assembled we can extrapolate key aspects of their function as well as devise strategies for their repair. This course is given to deepen the understanding of how molecular and cellular mechanisms underlie neurobiological function and to widen the horizon of students within the strong Karolinska neuroscience community.

##### **Intended learning outcomes**

By the end of the course the student shall be able to describe the major steps contributing to the development of the nervous system and transfer new knowledge acquired in the course into their specific projects or fields of research.

#### **Course content**

The course will cover the main steps of development from neural stem cells to mature circuits, including the patterning of the neural plate and thus the origin of cell types, the interplay between intrinsic and extrinsic factors, gene regulation including epigenetics, neuro-glia

interactions and the role of network activity in shaping the final circuits. Different molecular and tracing technologies, and model organisms will be covered. An important aspect of the course regards molecular technologies for labeling, transcriptional analysis and genetic manipulation of defined neural populations. Connections between aberrant developmental processes and neurological disorders will be discussed.

## **Forms of teaching and learning**

Lectures by invited international experts, group work and seminar presentations.

### ***Language of instruction***

The course is given in English.

## **Grading scale**

Pass (G) /Fail (U)

## **Compulsory components & forms of assessment**

### **Compulsory components**

All lectures and the seminar presentation (examination) are compulsory.

### **Forms of assessment**

The students should demonstrate their knowledge about the intended learning outcomes stated above including reflect on which aspects are relevant for their own research in a seminar presentation and in discussions.

## **Course literature**

Relevant original research papers and review papers will be provided by the course organizers as recommended reference literature.