

Two positions

Gene regulatory mechanisms of the interplay between cell metabolism and morphology in cortical evolution.

Preferred Course of Study/Expertise of Candidate: Molecular biology, cell biology, genetics, neurobiology.

The projects are part of the **METAMORH Marie Skłodowska-Curie Actions (MSCA)** doctoral network

About METAMORPH: Studying the interplay between cell metabolism and cell morphogenesis is a new, important entry point to unravel understudied mechanisms regulating human brain evolution and potential causes of neurodevelopmental disorders. The ambitious METAMORPH Doctoral Network will be an interdisciplinary platform for doctoral candidates (DCs), aiming to provide high-quality education and training, with an emphasis on inclusive, supportive structures that foster DCs' personal and professional growth and promote optimal standards of research integrity, while achieving excellence in research. To accomplish the goal of METAMORPH, 6 highly qualified academic partners and 3 industrial partners from 6 countries (Croatia, Finland, France, Germany, Italy and UK) have teamed up to address the following scientific objectives: to determine the role of cell METABolism and cell MORPHogenesis interplay in i) human cortical development, ii) the aetiology of neurodevelopmental disorders, and iii) human neocortical evolution, by exploiting the complementary expertise and strengths of the teams. The network will bring together not only top-notch training to provide DCs with an opportunity to METAMORPHose into world-class, leading professionals, but also advanced knowledge to improve diagnostic strategies and identify potential druggable targets for neurodevelopmental disorders.

Project 1

Gene regulatory mechanisms of metabolic genes in cortical development and evolution

Project Objectives:

Which cis-regulatory regions regulate metabolic genes in NPCs?

Tasks: Characterise gene regulatory networks underlying metabolic gene expression. The project aims to identify enhancers critical for NPC metabolism by combining analysis of epigenomic data, screening with massive parallel reporter assays and functional characterisation of metabolic gene enhancers in human cortical organoids.

Secondments: 3-month secondment at the University of Helsinki in Finland.

Project 2

Characterisation of human-specific gene regulatory elements in morphoregulatory genes.

Project Objectives: Gene regulatory networks of morphoregulatory genes in cortical evolution.

Tasks:

Identify putative enhancer regions with gained activity in humans compared to other primate species. The project aims to characterise gene regulatory networks of morphoregulatory genes by harnessing our epigenomic data sets, followed by functional studies in primate cerebral organoids.

Secondments: 3-month secondment at Human Technopole in Italy.

General information

Project Starting Date: 1 Sep 2027

MSCA Mobility Rule: At the time of recruitment, the researcher must not have resided or carried out their main activity (work, studies, etc.) in Germany for more than 12 months in the three years immediately prior to the recruitment date. Compulsory national service and/or short stays such as holidays are not considered.