

MASTER'S PROJECT IN GENE EDITING AND NEURAL DEVELOPMENT

The Knoblich laboratory at IMBA studies brain development using human cerebral organoids as a model system. We are offering a position for a master student to join a project involving the development of prime editing to model human evolution in brain organoids.

Our lab is interested in the development of the human brain and the mechanisms of neurodevelopmental disorders. To study this process, we have developed cerebral organoids, a 3D culture method that recapitulates the early steps of human brain development starting from pluripotent stem cells. By growing organoids from patients, we could model microcephaly and demonstrate for the first time that human neurodevelopmental disorders can be studied in 3D culture. Using the new model system, we have developed in vitro models for the long-distance migration of human interneurons between brain areas; recapitulated brain tumor formation; and pioneered the development of CRISPR screening methods to probe the cellular mechanisms of microcephaly and autism spectrum disorder.

To facilitate research of the genetic determinants of neurodevelopment, we are continuously developing new tools and technologies using the latest methods in genetic engineering. The masters project would primarily be in the field of technology development, with a focus on the application of prime editing to generate precision genetic engineered cell lines in a novel high-throughput workflow. Secondary to establishing the gene editing method, it will be applied to generate stem cell lines that harbor protein coding SNPs which potentially drive modern human evolution. The aim will be to uncover the effect of these SNPs in brain organoids using a variety of phenotypic readouts.

The techniques that the applicant will be exposed to include human stem cell and organoid culture, Prime-Editing, CRISPR-activation, scDNA/RNA-sequencing, CRISPR-screening, FACS, immunohistochemistry.

This is an offer for an exciting project at one of the leading institutes in the life sciences in Europe with unparalleled scientific infrastructure and a great work environment. Applicants should be highly motivated and have an outstanding interest in brain development and neuroscience. Experience in molecular biology and cell culture is essential. The masters project term is for a 12-month term and the successful candidate will receive a monthly stipend.

Please send your application to office@imba.oeaw.ac.at by 20th March.

Interviews will take place from end of March; starting date is possible from beginning of May.

For more information, visit: <https://www.imba.oeaw.ac.at/research/juergen-knoblich/>