Fully funded PhD position in Computational Neuroscience at TU Graz, Austria, in collaboration with the University of Regensburg, Germany

Period: October 1st, 2024 – September 30th, 2027 (3 years)

Supervisor: Kerstin Lenk, Institute of Neural Engineering, TU Graz, Austria

Keywords: *Astrocytes; Blood-Brain Barrier; Endothelial Cells; Major Depressive Disorder; Computational Modeling*

Team: The Computational Neuroscience lab led by Dr. Kerstin Lenk in the Institute of Neural Engineering (https://www.tugraz.at/institute/ine/research/team-lenk) at Graz University of Technology (TU Graz) is looking for a creative and enthusiastic PhD student to join the lab! Our research is focused on the computational neuroscience of astrocytes. Broadly, we study how astrocytes interact with neurons and other glial cells.

We are looking for a PhD student who is interested in developing a computational model of the BBB in the following project:

Project Description: Interactions among astrocytes and endothelial cells (EC) forming blood vessels are essential to building a properly functional blood-brain barrier (BBB). Astrocyte-specific signaling molecules modulate tight junctions (TJ) between EC, thereby controlling BBB sealing properties and, thus, the transendothelial blood-brain trafficking of various substances. Any disruption in these events may lead to the onset of brain disorders. Indeed, an impaired morphology of astrocytes and reduced TJ protein expression characterizes the leaky BBB in postmortem brains of major depressive disorder (MDD) patients.
Epidemiological data also revealed sex differences in MDD prevalence, with women twice as affected as men. Intriguingly, the disruption of the BBB in female mice induces depression-like behaviors. Thus, there is a high need to investigate sex-dependent cellular and molecular mechanisms that link a leaky BBB with the etiopathogenesis of MDD to identify alternative disease trajectories, which might be targeted by personalized treatments. The project includes experimental and theoretical work, which is highly interconnected, and we will gain much more insights by combining *in vitro*, *in vivo,* and *in silico* studies.

The project is funded by FWF (Austrian Science Fund) under the scheme "Weave" (International Projects) and is in collaboration with Dr. Barbara Di Benedetto at the University of Regensburg, Germany.

Candidate: The candidate should be willing to work on a multidisciplinary project that combines computational modeling and *in vitro*/ *in vivo* experiments in neurosciences. They should have a good level of English, very good mathematical and programming skills, and an interest in neurobiology.

Application: Please send your application to **kerstin.lenk@tugraz.at** as a single PDF file, including a CV and the contact details of two academic references, **before July 6th, 2024**.