University of Basel

DBM Basel
Department of Biomedicine

MASTER THESIS RESEARCH PROJECT IN SYSTEMS NEUROSCIENCE

Neuronal Mechanisms Underlying Curriculum Learning

Project Background

Throughout human history, the process of learning has been strategically designed to optimize efficiency. We often use a method, where we start with simpler tasks before moving on to more complex ones. Take education, for instance. We don't dive headfirst into advanced math like calculus; we build a solid foundation with arithmetic and algebra first. This pedagogical segmentation, referred to as 'Curriculum Learning', expedites the process of acquiring proficiency in a more complex task by harnessing the knowledge and skills gained from simpler tasks.

In this project, we are investigating the neuronal mechanisms that underlie curriculum learning. To study this, we perform behavior experiments in which mice are trained on tasks progressively increasing in difficulty and complexity. We use chronic in vivo electrophysiology to record neurons across learning to investigate learning-related functional changes

Short Project Description

In this project, we are investigating the neuronal mechanisms that underlie curriculum learning. To study this, we perform behavior experiments in which mice are trained on tasks progressively increasing in difficulty and complexity. We use chronic in vivo electrophysiology to record neurons across learning to investigate learning-related functional changes. Additionally, we are increasingly interested in how this strategy might impact learning differently depending on whether the subject is young or old. To explore this, we train mice across developmental stages to study these differences, which will be the main focus of the master's thesis project.

Contact

If you are interested in learning about learning and would like to be a part of this project for your master's thesis, please contact us. The selected candidate will have the opportunity to be trained on behavior tasks, imaging, in vivo electrophysiology and data analysis.

This work will take place in the Brain and sound lab (http://www.brainsoundlab.com/) directed by Prof. Tania Rinaldi Barkat at the University of Basel under the supervision of Maria Shujah. Motivated candidates should send CV and a motivation letter to Prof. Tania Rinaldi Barkat (tania.barkat@unibas.ch) and Maria Shujah (maria.shujah@unibas.ch).