Internship opportunity

M1/M2 internships available

Neural Circuits and Behavior Team

Contact: Tihana Jovanic, tihana.jovanic@cnrs.fr

Influence of high-sugar diet on brain and behavior

Diet influences brain function however the underlying mechanisms are unknown. Given its promising potential in therapeutic use\textsuperscript{1,2}, it is of utmost importance to understand the mechanisms by which diet affects neural circuit function, and thus cognition and behavior. In order to study the effects of different diets and the resulting internal states on brain function, we use as a model an extensively described neural circuit in the drosophila larva\textsuperscript{3,4}. This well-known circuit controls the decision between startle and escape behaviors following a mechanical stimulus. Thanks to the refined genetic tools that exist in Drosophila, we can thus monitor the effect of diet on this circuit at all scales, from molecules, to single neuron activity in intact animals, to behavior.

We have recently found that a high-sugar diet changes the decision to startle or escape, as well as neuronal circuit activity. Still, we lack a comprehensive overview of the exact internal state produced by high-sugar feeding. Are larvae lacking amino acids from this diet? Thus, are they in a starvation-like state? Are they attracted or repelled by sugar after spending a long time in contact with it? What are the physiological consequences of this diet on their overall behavior?

We offer an M1 or M2 internship to answer these questions. The student will develop behavioral paradigms and new analyses based on the existing set ups in the lab (automated video-tracking, automated behavioral detection, quantitative behavioral analysis), by using both his/her ideas and existing protocols in the literature. This internship is also an opportunity to discover the Drosophila model, learn its advantages and other techniques used in the lab from Drosophula genetics to connectomics and functional imaging.