

Internship offer  
NuMeCan Institute – Team “EAT”  
Rennes



**Contact:** Adélie Salin, [adelie.salin@univ-rennes.fr](mailto:adelie.salin@univ-rennes.fr)

## Microbiota-gut-brain axis and eating behavior

In our modern obesogenic food environment, abundant and accessible energy-dense foods are promoting the rise of eating disorders (EDs) characterized by an increased drive to eat in the absence of an energy deficit (i.e. hedonic hunger) <sup>1-3</sup>. The efficacy of ED therapies is modest<sup>4</sup>, with remission rates ranging from 40 to 60%, warranting the need to advance our understanding of the pathophysiology of this brain disease. Gut microbiota has recently emerged as a key player in the regulation of brain reward functions and the development of EDs<sup>5</sup>. Thus, the gut microbiota and the gut-brain axis represent relevant translational research pathways for understanding the etiology of these neurobehavioral disorders and for eventually developing microbiota-based therapeutics<sup>6</sup>.

Our preliminary results corroborate several recent reports indicating that the absence or depletion of intestinal microbiota enhances the consumption of palatable diets such as sucrose solution, sucrose pellets or high-fat diet in mice<sup>7-10</sup>, underscoring the suppressive function of a eubiotic gut microbiota on hedonic appetite. However, the mechanisms behind this modulatory effect of gut microbiota on hedonic appetite remain unknown. Paradoxically, an anorectic gut hormone (a proglucagon-derived peptide) is consistently increased in the context of increased hedonic appetite induced by certain microbiota signatures. This raises questions regarding the consequences of the persistent elevation of this gut hormone on its peripheral and central receptor, the brain reward system, and hedonic appetite.

We are looking for master's students (M2, or even M1) to contribute to addressing the technical and scientific challenges associated with this subject. The selected student(s) will take part in a project aimed at identifying the role of a gut hormone in mediating alterations in hedonic appetite induced by the gut microbiota using a mouse model. From a technical point of view, this project includes *in vivo* experiments (food intake and food-seeking measurements, oral glucose tolerance tests, pharmacological treatments, etc.) and biomolecular/histological analyses on sampled tissues (qPCR, western blot, immunohistochemistry). The recruited student(s) will join the team “EAT” at the NuMeCan Institute (UMR INSERM, INRAE, University of Rennes), composed of physiologists, neuroscientists, clinicians (psychologist, nutritionist) and brain imaging specialists.

**Required skills:** organizational skills (time management, rigor, autonomy), work ethic (integrity, responsible and dependable), interpersonal skills (collaboration, teamwork, communication), analytical skills and critical thinking.

**Keywords:** Eating disorders, microbiota-gut-brain axis, proglucagon-derived peptides, hedonic appetite, reward system

### References:

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### Links and ressources :

<https://numecan.fr/eat/>

