

## Track « Integrative Biology, Physiopathologies »

### Proposal for a Master 2 internship – 2025-2026

**Title :** Contribution of the satellite glial cells in PACAP-induced migraine-like symptoms

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**Summary :**

PACAP (pituitary adenylate cyclase-activating polypeptide) has emerged as a key mediator in migraine, but its mechanism remains unknown. The aim of this study is to assess the contribution of the trigeminal satellite glial cells (SGCs) in PACAP-induced migraine.

Using behavioral testing, including both cephalic and extracephalic von Frey mechanical sensitivity assessments, along with measurement of intracellular cyclic adenosine monophosphate (cAMP) levels and calcium imaging in living cells of female rats, we will investigate the effects of chronic administration of PACAP38 on mechanical sensitivity changes. Furthermore, we will explore the potential impact of PACAP38 on both cAMP signaling and calcium dynamics in cultured satellite glial cells (SGCs) derived from the rat trigeminal ganglion. In parallel, we will examine the possibility of modulating SGC activity—pharmacologically or genetically—to determine their role in mediating PACAP38-induced changes in trigeminal nociceptive processing.

*The project is being developed in collaboration with McGill University, Montreal, Canada.*

**Methodologies (key words) :** Intracellular cAMP measurement, Calcium imaging, Behavioral testing, Pharmacological and/or genetic modulation of cell activity, immunohistochemistry

**Publications of the research group on the proposed topic (3 max.)**

1. Dussol M, da Silva Borges G, Beaulieu C, Ghorbel H, Descheemaeker A, Herault K, Voisin D, Luccarini P, Gendron L, Dallel R. Contribution of peripheral and central delta opioid receptors in the relief of migraine-like headache in female and male rats. **Brit J Pharmacol** 2025
2. Mountadem S, Herault K, Peirs C, da Silva Borges G, Voisin DL, Antri M, Dallel R.. Astrocytic Kir4.1 ion channel deficit drives persistent inflammatory facial pain in males. **Brain** (2025)
3. Descheemaeker A, Poras H, Wurm M, Luccarini P, Ouimet T, Dallel R. Dual enkephalinase inhibitor PL37 as a potential novel treatment of migraine: evidence from a rat model. **Brain**. 2022 Aug 27;145(8):2664-2670.

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