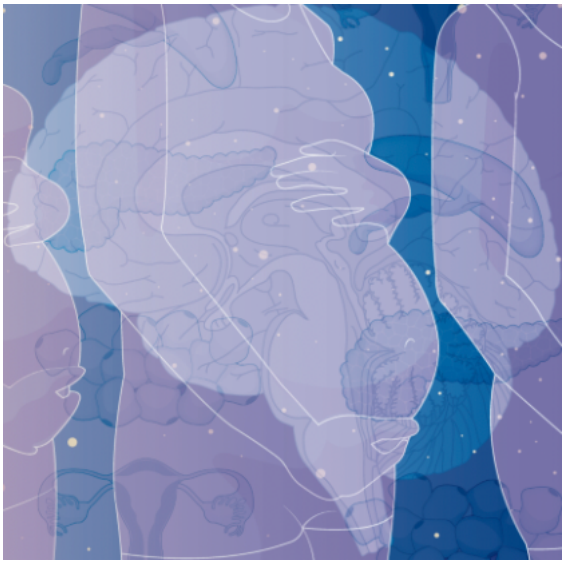
External seminars – Speaker



Nom de l'invitée/Name of the speaker :

Roberta Haddad

Laboratory of the speaker:

Neuroplasticity and Maternal Environment Group, Neuronal Control of Metabolism Laboratory

Invité par/Invited by

Karine Gauthier

Date 02/03/2026

Titre de la présentation/Title of the presentation

Mitochondrial iron governs postnatal POMC neuron development

Résumé/Short abstract

Hypothalamic pro-opiomelanocortin (POMC) neurons play a crucial role in regulating appetite, energy expenditure, glucose, and lipid metabolism. While research over the past decade has significantly advanced our understanding of the transcriptional programs orchestrating the ontogeny of the POMC lineage during embryonic development, the mechanisms underlying its postnatal maturation and the contribution of micronutrients to this biological process remain largely unknown. Here, we demonstrate that multiple and progressive morphological, molecular and functional mitochondrial adaptations occur during the postnatal

maturation of POMC neurons in the transition from birth to weaning. Notably, maturing POMC neurons show an enrichment of metal and cofactors genetic programs, particularly in iron-sulfur (Fe-S) cluster biosynthesis. These neurons exhibit a distinct dependence on iron-related pathways that is evidenced by postnatal POMC neuron loss following nutritional manipulations of iron homeostasis or genetic interference of mitochondrial Fe-S cluster machinery. Compromised POMC neuron survival, mediated by ferroptosis, promotes a reconfiguration of the melanocortin system that permits the upholding of energy homeostasis but not anxiety-like and cognition states. Our results introduce a novel perspective on the unexplored role of micronutrients in POMC neuron development and propose a new model of ferroptosis induction within neural circuits, shedding light on previously unexplored aspects of their early-life maturation.

Mini-CV/Short CV (+ Picture of you)

Roberta has a PhD in Neuroscience from the University of Heidelberg (Germany). She did a postdoc at the University of Campinas (Brazil) with Prof. Dr. Licio Velloso and later at the Neuronal Control of Metabolism in Barcelona with Dr. Marc Claret where she was a Marie Curie fellow. In 2024, she was awarded a Ramon and Cajal contract and establishied her own group focusing on the neurobiology of the female brain, with particular interest in the neuronal mechanisms underlying changes in ingestive behaviors during distinctive female physiological states and its transgenerational neuropsychological and metabolic impact.