Speaker
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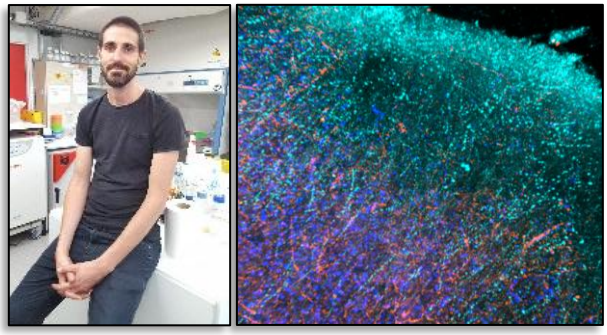

Title

In the intimacy of virus-brain interactions: From molecular mechanistic to functional impact.

Abstract

Neurotropic virus infections represent a worldwide public health burden, but the impact of viruses on the central nervous system remains incompletely understood. Beyond encephalitis, the recent rise of long COVID and symptoms such as the so-called “brain fog”, shed light on our lack of knowledge on the molecular mechanisms leading to subtle neurocognitive dysfunctions. Cognition is mostly mediated by inter-neuronal connection rewiring, occurring through tightly-regulated synaptic remodelling. Hence, investigating synaptic plasticity in physiologically relevant contexts is essential to decipher the mechanisms underlying viro-induced brain perturbations. During the talk, I will present our recent work on how viruses destabilize molecular and cellular pathways as well as neuronal circuitry using combinations of advanced 3D models (stem cell derived cerebral organoids and human brain explants), live imaging, proteomic-based drug discovery, and machine learning frameworks. Our results highlight innovative approaches to investigate the functional consequences of virus neuroinfections, offering the opportunity to develop new antiviral strategies that are symptom-oriented rather than solely viro-centric.

Recent selected articles from the Gaudin lab

1. Bernou C et al., Organotypic culture of post-mortem adult human brain explants exhibits synaptic plasticity. *Brain Stimulation*. 2024 Aug.
2. Brychka D et al., Targeting monocytic Occludin impairs transendothelial migration and HIV neuroinvasion. *EMBO Reports*, 2024 July.
3. Partiot E et al., Brain exposure to SARS-CoV-2 virions perturbs synaptic homeostasis. *Nature Microbiology*. 2024 Apr.
4. Partiot E, Gorda B, et al., Organotypic culture of human brain explants as a preclinical model for AI-driven antiviral studies. *EMBO Molecular Medicine*. 2024 Mar. Journal’s cover.