



McGill

Department of
Psychiatry | Département
de psychiatrie

Invited Lecturer Series

Dr. Loïc Binan, PhD

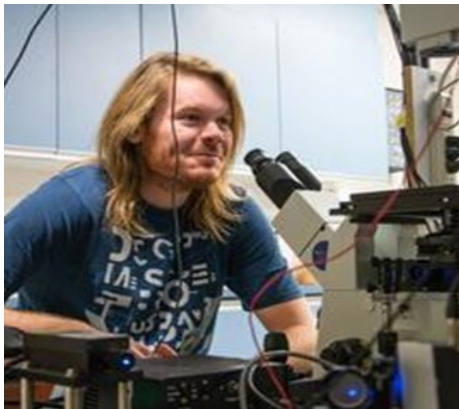
Postdoctoral Fellow
Broad Institute of Harvard and MIT, Cambridge

Title: Simultaneous CRISPR screening and spatial transcriptomics reveals intracellular, intercellular, and functional transcriptomics circuits

Date and Time: Monday, July 8th, 2024. The lecture will be from 11:00 - 12:00, including Q&A.

Location: In-person at the Bowerman Conference Room B-1127, Dobell Pavilion (Douglas Mental Health University Institute, 6875 Lasalle Boulevard, Montreal) and will also be [Via Zoom](#)

Biography:



After completing general engineering studies at Ecole Polytechnique in Paris, Dr. Binan joined Ecole Polytechnique, Montreal, for a master's in biomedical engineering during which he developed new scaffolds to grow stem cells into nerve grafts. He completed his PhD at the University of Montreal under the supervision of Dr. Santiago Costantino. While there, Dr. Binan developed a method that uses lasers to add molecular tags to single cells with imaging-based phenotypes of interest, without prior knowledge of their biochemistry. This work received the "etudiant chercheur étoile" award in 2016 and the prize for the best thesis of the year in biomedical engineering in 2019.

Dr. Binan is currently completing his post-doctoral work at the Broad Institute of MIT and Harvard with Drs Samouil Farhi and Brian Cleary. More recently, Dr. Binan developed Perturb-FISH, a technology that pairs high-throughput genetic screens with spatial transcriptomics. Dr. Binan is also involved in many collaborative projects involving spatial transcriptomics and high-throughput CRISPR perturbations screens.

Learning Objectives:

- After this presentation, attendees will understand the Perturb-FISH technology: how signal from CRISPR perturbations and transcriptome can be imaged under a microscope and how the technology can be applied to study genetic networks and their related phenotypes in other biological systems.
- After this presentation, attendees will know that local variations in seeding density affect immune gene regulatory networks and that this is a contributing factor to experimental noise. They will also remember that innate immune cells regulate each other's activation levels.
- After this presentation, attendees will know that autism spectrum disorder risk genes affect calcium activity in astrocytes and that Perturb-FISH allows the generation of hypotheses to explain the genetic mechanisms that cause the silencing of a gene to promote a specific functional signature.