SÉMINAIRES ET CONFÉRENCES

Paul François

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"Data driven theory: absolute discrimination and antigen encoding by immune cells."

An immune response is by essence a collective computation. Starting with the initial activations of a few T cells, a complex dance of immune actors self-organizes over multiple time scales. I will first introduce how specific and sensitive discrimination by T cells mathematically suggests an Adaptive Kinetic Proofreading model, leading in particular to unexpected predictions on immune antagonism that we validated experimentally. Over longer time-scales, understanding how and why immune cells communicate with one another to perform this response could be key to a better understanding of personalized medicine and immunotherapy. In collaboration with Grégoire Altan-Bonnet (NIH), we have developed a pipeline to study, decode and model cytokine communications between immune cells. I will show how simple machine learning allows to project the complex immune response into a 2D latent space, where immune parameters can be simply deconvolved. Remarkably, this suggests a simple model of collective communication and computation, highly reproducible and universal. I will show how our approach can be used to predict the quality of unknown antigens, and how it can potentially help to better estimate success of immunotherapy.

Lien zoom:
https://umontreal.zoom.us/j/87544994071?pwd=dEZMQllGNDYzMEw5eTNyeFBSdUZ3UT09

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Le lundi 21 mars 2022, 11h00

Invité de Pascale Legault

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