



Mathieu Coppey

Title:

How shall we perturb intracellular signaling with optogenetics?

Abstract:

Signals are processed and transduced inside cells by a very complex network of biochemical reactions with many crosstalks and feedbacks. To avoid this molecular circuitry being just a mess, cells have implemented many layers of spatial and temporal regulations at almost all scales from molecules to the whole cell. To understand the logic of intracellular signal functioning, we need tools to poke the system while measuring its response. But how shall we design our perturbation and what shall we measure? A hammer on a fly does not give a lot of hints. Focusing on optogenetics tools to perturb intracellular RhoGTPase signaling with spatial and temporal control, I will present several ways we have addressed this issue from practical considerations to conceptual ones.

Biography:

Mathieu Coppey is a physicist and cell biologist with expertise on optogenetic tools to control RhoGTPase activity in the context of cell migration and polarity. He is leading the Team LOCCO at the Physico-Chemistry department of the Curie Institute in Paris. He did a PhD in statistical physics on reaction-diffusion processes in Paris, followed by a postdoc on developmental biology at Princeton, working on morphogen gradients in the early drosophila embryo. He came back to Paris to work on magnetogenetics and single molecule imaging, and got a permanent position at the CNRS in 2010.