

## 5th course on Multiscale Integration in Biological Systems November 8-14, 2023



	Wednesday, November 8	Thursday, November 9	Friday, November 10	Wee kend	Monday, November 13	Tuesday November 14	
	Self-organization / Phase separation	Collective effects / Self- organization	Phase-separation / Mechanobiology / Organoids		Omics / Imaging / Machine learning	Evolution	
8:30-9:00	Welcome & Introduction						
9h00 10h30	Jonathon Howard New Haven, USA Branching morphogenesis of neuronal dendrites	Ray Goldstein Cambridge, UK Physical aspects of evolutionary transitions to multicellularity	Charlie Duclut Paris, FR Hydraulic and electric control of cell spheroids		Josh Waterfall Paris, France Single cell approaches for cancer immunology	Anne-Florence Bitbol EPFL, CH Evolution in spatially structured populations	COURSES (THEORY)
10h30 11h00	Coffee-break	Coffee-break	Coffee-break		Coffee-break	Coffee-break	
11h00 12h30	Edouard Hannezo Vienna, AT Active matter models of collective cell migration	Jan Brugues Dresden, DE Physical principles of cytoplasmic organization by the microtubule cytoskeleton	Stephan Grill Dresden, DE Protein condensation on and co- condensation with DNA		Barbara Bravi) Imperial College, UK Machine learning models for immune protein interactions	Clément Nizak Paris, FR Relating protein sequence to structure and function.	
12h30 14h00	Lunch	Lunch	Lunch		Lunch	Lunch	
14h00 15h00	Charlotte Aumeir Geneva, CH Phase separation of +TIP- networks regulates microtubule dynamics.	Manuel Théry Paris, FR Microtubules network self- patterning	Stephan Grill Dresden, DE Executing Hertwig's rule		Jean Ollion SABILab, FR Deep learning for bio-image analysis: cell tracking and self-supervised blind denoising	Lydia Robert Paris, FR Studying mutations at the single cell level	IN B
15h00 15h30	Coffee-break	Coffee-break	Coffee-break		Coffee-break	Coffee-break	(APPLICATIONS IN BIOLOGY)
15h30 16h30	Zoher Guéroui Paris, FR Engineering phase separations in cells to manipulate biomolecular condensates	Jens Elgeti Jülich, DE Cellular tissuescollective effects in self-replicating particles	Alice Nicolas Grenoble, FR Using mechanics to understand cell adhesion in biology		Laura Cantini Paris, FR TBA	Marta Luksza New York, USA From immune interactions to fitness models: predicting evolution of viruses and cancer	
16h30 16h45	Break	Break	Break		Break		
16h45 17h15	Flash posters	Flash posters Posters (2 groups, 1h30 each; with snacks and drinks)	01				
17h15 18h00	Short talks (10' talk + 5' questions each)		Short talk (10' talk + 5' questions each)		Short talks (10' talk + 5' questions each)		
18h00 20h00			Cocktail (starts at 18:30) Cour Lhomond / Green café				

Lectures: Amphi Curie / Coffee Break: Salle Maxime Dahan / Lunch: Green Café / Posters: Annexes 3 & 4 BDD. All conferences are open