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BioSim Talk #13
Marco Ruscone, PhD.

Barcelona Supercomputing Center, Life Science Department

February 26th 2025 (Wednesday), 16:30-18:00
Institute for Protein Science, Osaka U. (Suita Campus)
2nd floor conference room (large)

Hands-on tutorial

Computational Biology Across Scales: From Pathway Modelling Tools to Cell-Level Simulations

Understanding biological systems, particularly complex diseases like cancer, requires integrating multiple levels of description, from intracellular signaling pathways to multicellular interactions. The dynamic feedback between cells and their microenvironment plays a crucial role in shaping cellular behavior. Chemical and mechanical perturbations can activate intracellular signaling cascades, leading to phenotypic switches that influence cell-cell interactions and tissue dynamics. These processes unfold across different spatial and temporal scales, making multiscale modeling essential.
In this hands-on session, participants will learn how to construct and simulate multiscale models using NeKo (https://github.com/sysbio-curie/Neko), MaBoSS (https://github.com/sysbio-curie/MaBoSS), and PhysiCell (https://github.com/MathCancer/PhysiCell). They will gain practical experience in building protein-protein interaction networks, converting them into Boolean models for stochastic simulations with MaBoSS, and integrating them into PhysiCell, a physics-based multicellular simulator. Through guided exercises in Jupyter Notebooks, attendees will explore how to bridge intracellular and multicellular modeling, leveraging the new PhysiCell graphical interface to conduct *in silico* experiments in their own virtual laboratory.

*** Please refer to the attached document for software installation instructions and install in advance**

Link for online participation via Zoom:
Meeting ID: 858 8282 3946
Passcode: 1ipmwQ
For inquiries email:
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