**Digital Infrastructures to facilitate Neuroscience Research: EBRAINS-Italy and the multiscale data-driven neural models.**

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Understanding the brain requires investigating its multiscale interactions, from molecules to networks, through both experimental and theoretical approaches. In recent decades, the growing availability of large-scale datasets detailing brain circuit composition, connectivity, and activity has been transforming neuroscience; brain modeling has emerged as an essential tool for simulating neural activity that accurately reproduces experimentally observed dynamics, both under physiological and pathological conditions, transforming the model into a powerful framework for making experimentally testable predictions. Building multiscale, data-driven, models of neurons and brain regions require not only access to experimental data and analytical tools, but also complex simulation environments and large-scale computational resources. At the Computational Neuroscience group in Palermo, building on the legacy of our work within the HBP and EBRAINS projects, we are pioneering the creation and the development of EBRAINS-Italy, a full-fledged digital infrastructure, dedicated to neuroscience research that will be made publicly available to a wide range of stakeholders. In this talk, I will outline the architecture of EBRAINS-Italy and present preliminary results obtained from the full-scale models of the mouse, rat1,2, and human hippocampus3, whose development has been significantly facilitated and accelerated by the resources (data, models, tools, and cross-disciplinary collaborations) provided by EBRAINS-Italy.

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