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INTERDISCIPLINARY GRADUATE PROGRAMME in the
BRAIN and MIND sciences
leading to Master's degree

Neurophysiological mechanisms supporting flexible computations, functions and learning

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Thursday, December 18, 2025

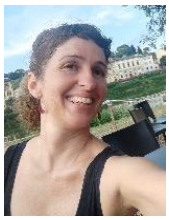
14:00-15:00

Alumni of the BRAIN and MIND Sciences Seminar Series ZOOM LINK
Meeting ID: 898 1282 5746
Passcode: 703942

Info: Vassilis Raos, 4512, raos@uoc.gr

The speaker:

Athanasia Papoutsi



BSc in Biology, University of National and Kapodistrian University of Athens, 2005; MSc in Brain and Mind Sciences, 2008; PhD, Department of Biology, University of Crete, and Institute of Molecular Biology and Biotechnology (IMBB), Foundation for Research and Technology-Hellas (FORTH), 2014; Thesis: Modeling approaches for analyzing the properties of persistent activity in the prefrontal cortex; Postdoctoral Fellow, Poirazi Lab, IMBB, FORTH, 2014-2016 & 2017-2018; Postdoctoral Fellow, Larkum Lab, Humboldt-Universität zu Berlin 2016 & 2018; H.F.R.I. Research Associate 2018-2020; Visiting Scientist, Larkum Lab, Humboldt-Universität zu Berlin 2020-2022; Principal Staff Scientist, Systems Neuroscience Lab, IMBB FORTH, 2020-until now; IBRO-PERC Committee affiliated member, 2024–until now; Board of Directors, Organization for Computational Neuroscience, 2024–until now. My research interests focus on identifying the computational processes and neuronal mechanisms that support diverse cognitive functions.

Summary of the presentation:

From the processing of environmental sensory cues to more complex cognitive functions, such as decision-making, the mammalian brain has evolved to efficiently resolve the task at hand. Alongside the basic building blocks of the neocortex, the pyramidal neurons have adapted to perform diverse computational tasks, greatly enriching the achieved functions at the systems level. Throughout my research career, I have investigated the properties of these computations, how they can be dynamically regulated, how they are integrated at the circuit level, and how they are linked to specific processes or functions underlying behavior, such as flexible learning during decision making. I am also interested in how this machinery is dysregulated in pathological conditions. To achieve these goals, I combine computational models at different levels of abstraction, along with behavioral and physiological studies in vivo in mice, focusing mainly on the prefrontal cortex. This approach enables the investigation how neurons and neuronal populations support diverse computations that create task-relevant encodings and enables a detailed, mechanistic understanding of complex cognitive functions. In this presentation, I will provide an overview of this work, focusing on the dynamics of neuronal computations and learning.