FY 2025 Annual Report

Unit Name

Computational Neuroscience Unit

Professor Erik De Schutter

Collaborations

Professor H.P. Thier, Akshay Markanday, Junya Inoue, University of Tübingen, Germany, Spiking activity of monkey cerebellar neurons

Prof. Dr. Silvio O. Rizzoli and Dr. Svilen V., Medical University Göttingen, Germany, Quantitative molecular identification of hippocampal synapses

Professor M. Häusser, Professor A. Roth, Dr. S. Dieudonné, Taro Yasuhi, Ecole Normale Supérieure, Paris, France, United Kingdom, France, Purkinje cell morphology and physiology, modeling

Prof. F. Schürmann, Dr. G. Castiglioni and Dr. A. Cattabiani,, École Polytechnique Fédérale de Lausanne, Switzerland, Human Brain Project: simulator development

Prof Christian Hansel, University of Chicago, USA, Diversity of Purkinje cell morphologies in humans: phylogenetic origin and functional implications'

Professor J. Myung, Taipei Medical University, Taiwan, Circadadian rhythm generation

Professor C. De Zeeuw, Professor L.W.J. Bosman and Dr. M. Negrello, Erasmus Medical Center, The Netherlands, Cerebellar anatomy and physiology

Research Personnel

Weiliang Chen, Staff Scientist

YinYun Li, Postdoctoral Scholar

Domas Linkevicius, Postdoctoral Scholar

William Redmond, Postdoctoral Scholar

Gabriela Cirtala, Postdoctoral Scholar

Christopher Earl, Research Unit Technician

Iain Hepburn, Research Unit Technician

~~Yifei Ma, Research Unit Technician~~

Jules Lallouette, Research Unit Technician

Chie Narai, RUA

Juliana Silva de, PhD Student

Richa Agarwal, PhD Student

Ryo Nakatani, PhD Student

Andrea Palomares Rodriguez, Research Intern

~~Konstantin Strauss, Research Intern~~

Scholarly Contributions and Creative Productions (by Faculty)

Journal Article

1. Gallimore, A. R.; Hepburn, I.; Georgiev, S. V.; Rizzoli, S. O.; De Schutter, E.
   Dynamic Regulation of Vesicle Pools in a Detailed Spatial Model of the Complete Synaptic Vesicle Cycle. Science Advances 2025, 11.
2. Denizot, A.; Castillo, M. F. V.; Puchenkov, P.; Calì, C.; De Schutter, E.
   The Ultrastructural Properties of the Endoplasmic Reticulum Govern Microdomain Signaling in Perisynaptic Astrocytic Processes. GLIA 2025.

Scholarly Contributions (by Unit Members)

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Yinyun Li	Journal Article	Investigate channel rectifications and neural dynamics by an electrodiffusive Gauss-Nernst-Planck approach	Computational Biology	PLOS	June 30, 2025
Jules Lallouette	Poster Presentation at Conference	Reaction leaping for reaction-diffusion simulations in STEPS	OIST Neuroscience Symposium		2025
Iain Hepburn, Andrew R Gallimore, Tomohiko Taniguchi, Jules Lallouette, Weiliang Chen, Erik De Schutter.	Poster Presentation at Conference	Molecular simulation with STEPS: recent developments and applications	OIST Neuroscience Symposium		2025
Christopher Earl	Poster Presentation at Conference	Hybridizing Machine Reinforcement Learning with Neuromimetic Navigation Systems	34th Annual Computational Neuroscience Meeting	Organization For Computational Neurosciences	
Ryo Nakatani	Presentation at Conference	Mechanisms of neurotransmitter driven depolarization in perisynaptic astrocytic processes	34th Annual Computational Neuroscience Meeting	Organization For Computational Neurosciences	

Workshops and Seminars [Organized and Hosted by Faculty/Units]

Speaker Name(s)	Title	Location	Co-Organizers	Date
Alexander Mathis (EPFL, Switzerland), Mackenzie Mathis (EPFL, Switzerland), Lucy Palmer (University of Melbourne, Australia), Padmini Rangamani (University of California, San Diego, USA), Sam Reiter (OIST), Yu Takagi (Nagoya Institute of Technology), Kazumasa Tanaka (OIST), Tim Vogels (IST Austria), and Jeff Wickens (OIST)	OIST Computational Neuroscience Course	OIST Seaside House	Kenji Doya (OIST), Tomoki Fukai (OIST), Bernd Kuhn (OIST) and Gerald Pao (OIST)	2025-06-23
Dr Arnd Roth (UCL)	Ultrastructural readout of in vivo synaptic activity for functional connectomics			2025-05-29