

Lisa Mapelli

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Graduated in *Biological Sciences* (2004, University of Pavia)

Ph.D. in *Physiological Sciences and Neuroscience* (2008, University of Pavia)

Current position: Associate Professor (University of Pavia)

Board member of the PhD course in Biomedical Sciences (University of Pavia) and member of the Committee for Quality assurance of the PhD course

Member of the Italian Physiological Society (SIF), Federation of European Physiological Societies (FEPS), Italian Society for Neuroscience (SINS), Federation of European Neuroscience Societies (FENS), Society for Neuroscience (SfN), ALBA Network.

EDUCATION AND SCIENTIFIC EXPERIENCE

2022 to present: Associate Professor at the University of Pavia, Dept of Brain and Behavioral Sciences, Neurophysiology Unit.

2019 to 2022: Assistant Professor (Senior Researcher - RTDb) at the University of Pavia, Dept of Brain and Behavioral Sciences, Neurophysiology Unit.

2016-2019: Assistant Professor (RTDa) at the Dept of Brain and Behavioral Sciences, funded by the University of Pavia.

2015: Postdoctoral position ("assegno di ricerca"-AR) awarded by the Museo Storico della Fisica e Centro Studi e Ricerche Enrico Fermi (Rome).

2012-2014: postdoctoral position (AR) at the Dept of Brain and Behavioral Sciences, University of Pavia.

2010-2012: postdoctoral position (AR) at the CNR-Institute of Neuroscience in Milan.

2009-2010: postdoctoral position (AR) at the Department of Biomolecular Sciences and Biotechnology at the University of Milan.

2008: postdoctoral position ("première assistante") at the Department of Cell Biology and Morphology at the University of Lausanne, funded by the *Synopsis Foundation*.

2004-2007: PhD student in *Physiological Sciences and Neuroscience* at the Dept of Cellular/Molecular Physiological and Pharmacological Sciences, University of Pavia.

PhD thesis: *Inhibitory control of neurotransmission in the cerebellar glomerular synapses.*

2004-2007: Student of the "Scuola Avanzata di Formazione Integrata" (SAFI) in the "Istituto Universitario di Studi Superiori" (IUSS), Pavia. Final thesis completed in October 2007.

2004: final degree at the Scuola Universitaria Superiore (SUS), in the IUSS.

2004: degree in Biology at the University of Pavia (110/110 *cum laude*).

Dissertation in Neurophysiology: *Neurotransmission and plasticity in an inhibitory synapse of rat cerebellum.*

TEACHING ASSIGNMENTS

Course: Neurophysiology (6 CFU, MSc in Psychology, Neuroscience and Human Sciences); University of Pavia

Course: Human Physiology (7CFU, faculty of Pharmacy); University of Pavia

Course: Neurophysiology and Biophysics for AI (4CFU, master's degree in Human-Centered Artificial Intelligence); joint program of the Universities of Milan, Milano-Bicocca and Pavia

Borromeo Neuroscience course: Lessons in 2023 and 2024 on Biophysics and Microcircuit functions.

Currently supervisor of 3 PhD students on the characterization of neuronal networks activity using high-density MEA, optogenetics, extracellular recordings, calcium imaging.

Previously supervisor and co-supervisor of 9 PhD students spanning from the electrophysiological characterization of cerebellar alterations in autism to neurovascular coupling in the cerebellum to cerebellar connectivity with the prefrontal cortex *in vivo*.

Supervisor and co-supervisor of several undergraduate thesis in Biological Sciences, Biotechnology, Psychology and Pharmacy at the Universities of Milan and Pavia

Teacher at the SIF "Course of Physiology and Biophysics" in Pavia (2021) on optical and electrophysiological techniques *in vivo*.

Teacher at the SIF "Course of Physiology and Biophysics" in Pavia (2015) on electrophysiological recordings using MEA and extracellular signals analysis.

Teacher at the DiSFeB PhD training course of the Dept. of Biomolecular Sciences and Biotechnology of the University of Milan (2009) on: Electrophysiological approach to the study of an inhibitory connection.

2008: tutor of a PENS Summer School student at the University of Lausanne, with the project: Patch-clamp recordings and electroporation in the study of thalamic neurons.

EDITORIAL ROLES

Associate Editor at *Frontiers in Cellular Neuroscience*

Guest Editor at *Biomedicines*

Review Editor for *Frontiers in Cellular Neuroscience*

Invited reviewer for several international Journals including: *Journal of Physiology*, *PNAS*, *Scientific Reports*, *Plos One*, *International Journal of Molecular Sciences*, *Cells*, *Frontiers in Synaptic Neuroscience*, *Peer J*, *Frontiers in Neuroscience* (Web of Science profile at <https://www.webofscience.com/wos/author/record/1422267>)

Co-Editor of the following Special Issues:

“Distributed Networks: New Outlooks on the Cerebellar Functions – Volume II” for the Open Access journal *Frontiers in Systems Neuroscience* (2022-2023); co-Editors: Thomas Watson, Jimena Frontera, Richard Apps

“Insights in Cellular Neurophysiology: 2022” for the Open Access journal *Frontiers in Cellular Neuroscience* (2022-2023); co-Editors: Dieter Wicher, Jonathan Mapelli, Adrian Walton Moore, Barbara Jane Morley

“Synaptic Transmission: from Molecular to Neural Network Levels” for the Open Access journal *Biomedicines* (2022-2024); co-Editor: Simona Tritto

“From cell physiology to emerging brain functions” for *Frontiers in Cellular Neuroscience* (2018-2019); co-Editor: Philippe Isope, Alexander Tang, Marylka Yoe Uusisaari

TECHNICAL SKILLS

Electrophysiology (single cell and extracellular recordings) in brain slices, brain primary cultures, iPSC.

Multi-electrode array (MEA) recordings (single-unit and local field potentials) in vivo, in slices, and CNS organoids.

Voltage sensitive dye imaging (VSDi) in brain slices.
Optogenetics using adeno-associated viral vectors (ChR2, Chrimson, eNpHR 3.0).
Calcium-imaging (GCaMPs) in freely behaving mice.

FOREIGN LANGUAGES

Excellent written and spoken English language
School learning of French language
Basis of written and spoken Russian language

CURRENT RESEARCH ACTIVITIES

The current research activities mainly concern how single neurons contribute to network functions. The issue is approached using different techniques to investigate different but complementary levels. In particular, the cerebellum is the main target of these investigations, representing a well-organized circuit with relatively well-known anatomy.

Main research lines:

1) A first research line exploits the high spatial and temporal resolution of recent high-density multielectrode arrays (HD-MEA) to test, in mouse cerebellar slices, the network response to different inputs at the main frequency bands relevant for brain functioning. This approach is also used to investigate a possible region-dependence of the cerebellar response in different modules. In addition, this technique has been used to investigate neuronal activity determining vessels caliber changes in the cerebellum (neurovascular coupling).

2) A second research line is devoted to unraveling cerebellar contribution to other brain areas, in particular regulating non-motor functions. These studies are conducted in mice *in vivo*, in the anesthetized condition to describe the functional properties of specific connections (particularly the impact of cerebellar output on prefrontal cortex activity), and in awake freely moving condition to test cerebellar neurons activities during specific behaviors. The techniques used are a MEA for the anesthetized animal and endoscopic calcium imaging (using a miniscope) for the awake animal.

3) A third research line is devoted to describing brain alterations in pathological conditions, mainly using mouse models of autism spectrum disorders (the IB2 KO mouse), migraine (FHM1 and FHM2 mice), and PCDH19-related pathologies. This characterization combines whole-cell patch-clamp recordings and voltage-sensitive dye

imaging (VSDi) in cerebellar and brain slices, MEA recordings and endoscopic calcium imaging *in vivo*.

Besides the main research lines, several collaborations are active, among which:

Stefania Corti lab at the Foundation IRCCS Ca' Granda Ospedale Maggiore Policlinico, UOC Neurology, Milan, Italy – electrophysiological characterization of brain and spinal organoids from healthy subjects and patients with spinal muscular atrophy.

Alessandro Maccione, CSO of the 3Brain AG company, Zurich, Switzerland – development of new advances in HD-MEA technology.

Thierry Nieus at the University of Milan, Italy – electrophysiological characterization of neuronal network activity to investigate activity-dependent changes in network complexity.

Richard Apps lab at the University of Bristol, for the characterization of endocannabinoid receptor functions in the cerebellum using HD-MEA (as part of the CEN program).

Simona Lodato lab at the Humanitas Clinical and Research Center, Milan, Italy – electrophysiological characterization of human cortical organoids.

PUBLICATIONS ON PEER-REVIEWED JOURNALS

Author of 35 publications on peer-reviewed journals, with average Impact Factor 5.4, H-index 20, citations 1164 (Source: Scopus).

Apps R, Frontera J, **Mapelli L**, Watson T. Editorial: Distributed networks: new outlooks on cerebellar function, volume II. *Front Syst Neurosci*. 2024 Feb 1;18:1362963. doi: 10.3389/fnsys.2024.1362963. PMID: 38370324; PMCID: PMC10867315.

Mapelli L, Tritto S. Editorial for This Special Issue "Synaptic Transmission: From Molecular to Neural Network Levels". *Biomedicines*. 2024 Jan 10;12(1):145. doi: 10.3390/biomedicines12010145. PMID: 38255249; PMCID: PMC10812920.

Mapelli L, Mapelli J, Wicher D. Editorial: Insights in cellular neurophysiology: 2022. *Front Cell Neurosci*. 2023 Nov 13;17:1330849. doi: 10.3389/fncel.2023.1330849. PMID: 38034590; PMCID: PMC10683639.

Monteverdi A, Di Domenico D, D'Angelo E, **Mapelli L**. Anisotropy and Frequency Dependence of Signal Propagation in the Cerebellar Circuit Revealed by High-Density Multielectrode Array Recordings. *Biomedicines*. 2023 May 18;11(5):1475. doi: 10.3390/biomedicines11051475. PMID: 37239146; PMCID: PMC10216013.

Ciapponi C, Li Y, Osorio Becerra DA, Rodarie D, Casellato C, **Mapelli L**, D'Angelo E. Variations on the theme: focus on cerebellum and emotional processing. *Front Syst Neurosci*. 2023 May 10;17:1185752. doi: 10.3389/fnsys.2023.1185752. PMID: 37234065; PMCID: PMC10206087.

Di Domenico D, **Mapelli L**. Dopaminergic Modulation of Prefrontal Cortex Inhibition. *Biomedicines*. 2023 Apr 25;11(5):1276. doi: 10.3390/biomedicines11051276. PMID: 37238947; PMCID: PMC10215621.

Canciani A, Capitanio C, Stanga S, Faravelli S, Sciatti L, **Mapelli L**, Soda T, D'Angelo E, Kienlen-Campard P, Forneris F (2022). Deconstruction of Neurotrypsin Reveals a Multi-factorially Regulated Activity Affecting Myotube Formation and Neuronal Excitability. *Mol Neurobiol*, Oct 5. doi: 10.1007/s12035-022-03056-2

Mapelli L, Soda T, D'Angelo E, Prestori F (2022). The cerebellar involvement in autism spectrum disorders: from the social brain to mouse models. *Int J Mol Sci*, Mar 31;23(7):3894. doi: 10.3390/ijms23073894

Gagliano G, Monteverdi A, Casali S, Laforenza U, Gandini Wheeler-Kingshott CAM, D'Angelo E, **Mapelli L** (2022). Non-linear frequency dependence of neurovascular coupling in the cerebellar cortex implies vasodilation-vasoconstriction competition. *Cells*, Mar 19;11(6):1047. doi: 10.3390/cells11061047 (last and corresponding author)

Prestori F, Montagna I, D'Angelo E, **Mapelli L** (2020). The optogenetic revolution in cerebellar investigations. *Int J Mol Sci*, Apr 3;21(7):2494. doi: 10.3390/ijms21072494 (last and corresponding author)

Tapella L, Soda T, **Mapelli L**, Bortolotto V, Bondi H, Ruffinatti FA, Dematteis G, Stevano A, Dionisi M, Ummarino S, Di Ruscio A, Distasi C, Grilli M, Genazzani AA, D'Angelo E, Moccia F, Lim D (2020). Deletion of calcineurin from GFAP-expressing astrocytes impairs excitability of cerebellar and hippocampal neurons through astroglial Na⁺/K⁺ ATPase. *GLIA*, Oct 18, doi: 10.1002/glia.23737

Prestori F, **Mapelli L**, D'Angelo E (2019). Diverse Neuron Properties and Complex Network Dynamics in the Cerebellar Cortical Inhibitory Circuit. *Front Mol Neurosci*, doi: 10.3389/fnmol.2019.00267

Moscato L, Montagna I, De Propriis L, Tritto S, **Mapelli L***, D'Angelo E* (2019). Long-Lasting Response Changes in Deep Cerebellar Nuclei *in vivo* Correlate With Low-Frequency Oscillations. *Front Cell Neurosci*, 6;13:84, ISSN: 1662-5102, doi: 10.3389/fncel.2019.00084 (* co-last author and corresponding author)

Soda T*, **Mapelli L***, Locatelli F, Botta L, Goldfarb M, Prestori F, D'Angelo E (2019). Hyper-excitability and hyper-plasticity disrupt cerebellar signal transfer in the IB2 KO mouse model of autism. *J Neurosci*, 27;39(13):2383-2397, ISSN: 1529-2401, doi: 10.1523/JNEUROSCI.1985-18.2019 (* co-first author)

Lim D, **Mapelli L**, Canonico PL, Moccia F, Genazzani AA (2018). Neuronal Activity-Dependent Activation of Astroglial Calcineurin in Mouse Primary Hippocampal Cultures. *International Journal of Molecular Sciences*, vol. 19, ISSN: 1422-0067, doi: 10.3390/ijms19102997

Gandolfi D, Cerri S, Mapelli J, Polimeni M, Tritto S, Fuzzati-Armentero MT, Bigiani A, Blandini F, **Mapelli L**, D'Angelo E (2017). Activation of the CREB/c-Fos Pathway during Long-Term Synaptic Plasticity in the Cerebellum Granular Layer. *Frontiers in Cellular Neuroscience*, vol. 11, ISSN: 1662-5102, doi: 10.3389/fncel.2017.00184

Mapelli L, Gagliano G, Soda T, Laforenza U, Moccia F, D'Angelo E (2017). Granular layer neurons control cerebellar neurovascular coupling through an NMDA receptor/NO-dependent system. *Journal of Neuroscience* 37(5):1340-1351 doi: 10.1523/JNEUROSCI.2025-16.2016

Lim D, Rocchio F, **Mapelli L**, Moccia F (2016). From pathology to physiology of calcineurin signalling in astrocytes. *Opera Medica et Physiologica* 2;46-61, ISSN: 2500-2295, doi: 10.20388/OMP2016.002.0029

D'Angelo E, Antonietti A, Casali S, Casellato C, Garrido JA, Luque N, **Mapelli L**, Masoli S, Pedrocchi A, Prestori F, Rizza MF, Ros E (2016) Modelling the cerebellar microcircuit: new strategies for a long-standing issue. *Frontiers in Cellular Neuroscience*. ISSN: 1662-5102 doi:10.3389/fncel.2016.00176

D'Angelo E, **Mapelli L**, Casellato C, Garrido JA, Luque N, Monaco J, Prestori F, Pedrocchi A, Ros E (2015) Distributed circuit plasticity: new clues for the cerebellar mechanisms of learning. *Cerebellum*. ISSN: 1473-4222 doi:10.1007/s12311-015-0711-7

Mapelli L, Pagani P, Garrido JA, D'Angelo E (2015) Integrated plasticity at inhibitory and excitatory synapses in the cerebellar circuit. *Frontiers in Cellular Neuroscience*. ISSN: 1662-5102 doi:10.3389/fncel.2015.00169

Moccia F, Zuccolo E, Soda T, Tanzi F, Guerra G, **Mapelli L**, Lodola F, D'Angelo E (2015). Stim and Orai proteins in neuronal Ca²⁺ signalling and excitability. *Frontiers in Cellular Neuroscience*. ISSN: 1662-5102 doi:10.3389/fncel.2015.00153

Mignogna ML, Giannandrea M, Gurgone A, Fanelli F, Raimondi F, **Mapelli L**, Bassani S, Fang H, van Anken E, Alessio M, Passafaro M, Gatti S, Esteban JA, Hugarir R, and D'Adamo P (2015). The Intellectual Disability protein RAB39B regulates selectively GluA2 trafficking determining synaptic AMPAR composition. *Nature Communications*, 6(6504) doi:10.1038/ncomms7504

Ronco V, Potenza DM, Denti F, Vullo S, Gagliano G, Tognolina M, Guerra G, Pinton P, Genazzani AA, **Mapelli L**, Lim D, Moccia F (2015). A novel Ca²⁺-mediated cross-talk between endoplasmic reticulum and acid organelles: implications for NAADP-dependent Ca²⁺ signalling. *Cell Calcium*, 57(2):89-100, doi: 10.1016/j.ceca.2015.01.001

Curatolo P, Ben-Ari Y, Bozzi Y, Catania MV, D'Angelo E, **Mapelli L**, Oberman LM, Rosenmund C, Cherubini E (2014). Synapses as therapeutic targets for autism spectrum disorders: an international symposium held in Pavia on July 4th, 2014. *Frontiers in Cellular Neuroscience*, ISSN: 1662-5102

*Nieus TR, ***Mapelli L**, D'Angelo E (2014). Regulation of output spike patterns by phasic inhibition in cerebellar granule cells. *Frontiers in Cellular Neuroscience*, ISSN: 1662-5102 (* equally contributed).

Folci A, **Mapelli L**, Sassone J, Prestori F, D'Angelo E, Bassani S, Passafaro M (2014). Loss of hnRNP K Impairs Synaptic Plasticity in Hippocampal Neurons. *The Journal of Neuroscience*, ISSN: 0270-6474

Mapelli L, Solinas S, D'Angelo E (2014). Integration and regulation of glomerular inhibition in the cerebellar granular layer circuit. *Frontiers in Cellular Neuroscience*, vol. 8, ISSN: 1662-5102, doi: 10.3389/fncel.2014.00055

Prestori F, Bonardi C, **Mapelli L**, Lombardo P, Goselink R, De Stefano ME, Gandolfi D, Mapelli J, Bertrand D, Schonewille M, De Zeeuw C, D'Angelo E (2013). Gating of long-term potentiation by nicotinic acetylcholine receptors at the cerebellum input stage. *Plos One*

D'Angelo E, Solinas S, Mapelli J, Gandolfi D, **Mapelli L**, Prestori F (2013). The cerebellar Golgi cell and spatiotemporal organization of granular layer activity. *Frontiers in Neural Circuits*, vol. 7, ISSN: 1662-5110

Brandalise F, **Mapelli L**, Gerber U, Rossi P (2012). Golgi Cell-Mediated Activation of Postsynaptic GABAB Receptors Induces Disinhibition of the Golgi Cell-Granule Cell Synapse in Rat Cerebellum. *Plos One*

Mapelli L, Canale C, Pesci D, Averaimo S, Guizzardi F, Fortunati V, Falasca L, Piacentini M, Gliozzi A, Relini A, Mazzanti M, Jodice C (2012) Toxic effects of expanded ataxin-1 involve mechanical instability of the nuclear membrane. *Biochimica et Biophysica Acta* 1822(6):906-17

Mapelli L, Rossi P, Nieuw T, D'Angelo E (2009) Tonic activation of GABA-B receptors reduces release probability at inhibitory connections in the cerebellar glomerulus. *J Neurophysiol* 101(6), 3089-99

Rossi P, **Mapelli L**, Roggeri L, Gall D, de Kerchove d'Exaerde A, Schiffmann SN, Taglietti V, D'Angelo E (2006) Inhibition of constitutive inward rectifier currents in cerebellar granule cells by pharmacological and synaptic activation of GABAB receptors. *European J Neurosci* 24, 419-432

Offenhauser N*, Castelletti D*, **Mapelli L**, Ekalle Soppo B, Regondi MC, Rossi P, D'Angelo E, Frassoni C, Amadeo A, Tocchetti A, Pozzi B, Disanza A, Guarnieri D, Betsholtz C, Scita G, Heberlein U, Di Fiore PP (2006) Increased ethanol resistance and consumption in eps8 knockout mice correlates with altered actin dynamics. *CELL* 127, 213-226

Under revision (currently on bioRxiv):

Mapelli L, Dubochet O, Tedesco M, Sciacca G, Ottaviani A, Monteverdi A, Battaglia C, Tritto S, Cardot F, Surbled P, Schildknecht J, Gandolfo M, Imfeld M, Cervetto C, Marcoli M, D'Angelo E, Maccione A (2022) Design, implementation, and functional validation of a new generation of microneedle 3D high-density CMOS multi-electrode array for brain tissue and spheroids. bioRxiv <https://doi.org/10.1101/2022.08.11.503595>

Mapelli L, Dubochet O, Tedesco M, Sciacca G, Ottaviani A, Monteverdi A, Battaglia C, Tritto S, Cardot F, Surbled P, Schildknecht J, Gandolfo M, Imfeld M, Cervetto C, Marcoli M, D'Angelo E, Maccione A (2022) Design, implementation, and functional validation of a new generation of microneedle 3D high-density CMOS multi-electrode array for brain tissue and spheroids. bioRxiv <https://doi.org/10.1101/2022.08.11.503595>

Submitted to peer-review journals:

Mapelli L, Tedesco M, Sciacca G, Ottaviani A, Monteverdi A, Battaglia C, Tritto S, Gandolfo M, Imfeld K, Kiderlen S, Krainer L, Cervetto C, Marcoli M, Sing A, Andersen J, Birey F, Sloan SA, Maccione A, D'Angelo E: Enhanced recording capabilities of a 3D high-density multi-electrode array on acute brain slices, spheroids, and organoids. A version currently on bioRxiv at <https://doi.org/10.1101/2022.08.11.503595>

Faravelli I, Rinchetti P, Mancinelli S, **Mapelli L**, Tambalo M, Rizzuti M, Cordiglieri C, Forotti G, Peano C, Kunderfranco P, Calandriello L, Bresolin N, Comi GP, D'Angelo E, Nizzardo M, Lodato S, Corti S: Spinal Muscular Atrophy CNS organoids unravel developmental and functional disease signatures reverted by antisense oligonucleotides. *Under revision*

CONTRIBUTIONS IN SCIENTIFIC TEXTBOOKS

Co-author of the following chapters of the textbook: "Fisiologia e nutrizione per scienze motorie" (Poletto Editore, ed. 2019): "Funzione cellulare", "Funzione endocrina", "Adattamenti omeostatici all'esercizio e heart rate variability - box Regolazione dei processi vitali"

ORAL COMMUNICATIONS

Invited speaker at the Neuro Friday Seminars of the CNR – Neuroscience Institute in Milan, 26 May 2023, Vedano al Lambro (MB), Italy

Oral communication title: *Hyperexcitability and altered functional connectivity in a mouse model of autism spectrum disorders: focus on the cerebellum and prefrontal cortex.*

Invited speaker at the International School of Brain Cells & circuits “Camillo Golgi” – Modeling the Brain, 30 November – 3 December **2022** in Erice, Italy.

Didactical lecture: *Foundations of cell physiology and biophysics.*

Invited speaker for the Joint Seminars in Neuroscience at the Policlinico di Milano, May 2022, Milan, Italy

Oral communication title: *Revealing neurovascular coupling dynamics in cerebellar slices by high-density multi electrode array: current achievements and its near future technological breakthrough; with Alessandro Maccione*

Invited speaker at the 5th Cerebellum Day, 9-10 March **2022** in Bordeaux, France.

Oral communication title: *New perspectives on neurovascular coupling dynamics in the cerebellum.*

Invited speaker at the 71st SIF National Congress in Milan (online event), 7-9 September **2021**. Part of the symposium: New vistas on cerebellar circuit dynamics.

Oral communication title: *Single neurons and circuits of the cerebellum.*

Invited speaker at the XXIV School of Physiology and Biophysics, topic Neuronal Biophysics: From Experiments to Models, held in Pavia, 5-7 June **2021**.

Oral communication title: *Optical and electrophysiological techniques in vivo.*

Invited speaker at the 3th HBP Student Conference On Interdisciplinary Brain Research, held at Ghent University, Ghent (Belgium), 6-7 February **2019**.

Keynote lecture: *Excitation, inhibition and plasticity in the cerebellar network.*

Invited speaker at the event "Pint of Science" held in Pavia in May **2018**.

Oral communication title: *Human Brain Project. Neuroscience and neural functions modeling.*

Invited speaker for the "SIF Prize Lecture" at the 68th SIF National Congress, held in Pavia in September **2017**.

Oral communication title: *Synaptic transmission: from physiology to pathology.*

Invited Speaker at the "XXVII Ottorino Rossi Award" entitled "Big Data for Neuroscience", organized by the IRCCS C. Mondino Neurological Institute and the University of Pavia, held in Pavia in October **2017**.

Oral communication title: *New Approaches in Neuronal Network Research.*

Invited speaker at the European Researcher Night, at the session organized in Pavia by the Human Brain Project in September **2016**.

Speaker at the SIF "Course of Physiology and Biophysics" held in Pavia in June **2015**.
First oral communication title: *Extracellular recordings of spikes and MEA recordings*
Second oral communication title: *MEA signal processing and spike sorting*.

Speaker of a brief communication for the Best Poster Award challenge at the 66th SIF National Congress, Genoa (Italy), held in September **2015**.
Oral communication title: *Neurovascular coupling at the cerebellar granular layer*.

Speaker of a brief communication at the 7th International Symposium of the Society for Research in the Cerebellum. Bruxelles (Belgium), held in May **2015**.
Oral communication title: *Cerebellar hyper-plasticity in the Ib2 KO mouse model of ASD*.

Speaker at the FENS Satellite Meeting held in Pavia in July **2014**: Synapses as therapeutic targets for Autism Spectrum Disorders.
Oral communication title: *Cerebellar plasticity in the Ib2 KO mouse model of ASD*.

Speaker at the informal seminar at the Division of Pharmacology and Neurobiology of the Biozentrum, University of Basel, Switzerland, July **2008**.
Oral communication title: *Quantal properties and dynamics of synaptic inhibition in the cerebellar glomerulus*.

Speaker at the First Meeting of the Italian Doctorate and Bursars in Neuroscience and Related Subjects, Torino, March **2007**.
Oral communication title: *Quantal transmission at the Golgi cell to granule cell synapse of rat cerebellum*.

GRANTS

2023-2025

Principal Investigator (PI – Project coordinator) of the PRIN 2022 PNRR funding with the project: “Mechanisms of susceptibility to cortical spreading depression in migraine: a multiscale approach”

2023-2025

Principal Investigator (PI – Unit coordinator) of the PRIN 2022 funding with the project: “Functional and computational investigation of brain networks in PCDH19-related developmental and epileptic encephalopathy-9. A close-up on Parvalbumin interneurons”

2021-2024

Marie Skłodowska-Curie Innovative Training Network (ITN), funded by the European Research Council: CEN – Cerebellum and Emotional Network (PI: Prof. Egidio D'Angelo) - <https://www.cen-itn.net/>

Scientific coordinator of ESR4 (Cerebellar neuronal activity during emotional control) and ESR8 (Signal processing in cerebellar modules involved in emotional, cognitive and motor control loops), *and supervisor* of the PhD students (Early Stage Researchers - ESR) specifically enrolled for the project.

Past grants:

2020-2023

Scientific coordinator in the tasks and vouchers specified below in the European Union Human Brain Project [Third Specific Grant Agreement (SGA3) Grant Agreement ID: 945539; PI: Prof. Egidio D'Angelo].

WP1: Task T1.5 (Multiscale regional models of human cerebral cortex, hippocampus, cerebellum and basal ganglia), Task T1.6 (Simulation of whole-brain network dynamics and its rhythmic activity, constrained by region-wide differences), Task T1.15 [Whole-brain rodent Spiking neural Networks (RisingNet)]

Vouchers: i) Enhanced mouse atlas for cerebellar connectivity (ATLAS-cer); ii) BOLD signal reconstruction and simulation from cellular data-driven models (BOLDsim); iii) SODIUM signal reconstruction and simulation from cellular data-driven models (SODIUMsim)

2017-2019: *Principal Investigator (PI)* of the Blue Sky Research (BSR) grant of the University of Pavia (BSR77992), with the project "Disentangling the role of prefrontal cortex and cerebellum in autism spectrum disorders".

2017-2018: *Principal Investigator (PI)* of the FFABR (Fondo per il Finanziamento delle Attività Base di Ricerca) granted by the Italian Ministero dell'Istruzione, dell'Università e della Ricerca (MIUR).

2018-2020: *Scientific coordination* of the following tasks in the European Union Human Brain Project [Second Specific Grant Agreement (SGA2) Grant Agreement ID: 785907; PI: Prof. Egidio D'Angelo].

SP1: T1.2.5 Structure and function of the interneurons of microcircuits within the cerebellar cortex
T1.4.2 Multiscale organization of circuit activity and plasticity in the mouse cerebellum following patterned sensory stimulation
T1.4.5 Structural and functional connectomics of brain subcircuits using multiscale recording techniques with cellular resolution
Co designed project: CDP2 Mouse-Based Cellular Cortical and Subcortical Microcircuit Models

2016-2018: *Participation and coordination* of specific tasks in the European Union Human Brain Project [First Specific Grant Agreement (SGA1) Grant Agreement ID: 720270; PI: Prof. Egidio D'Angelo].

SP1 - T1.2.4 - Morphological Reconstruction and Physiological Characterization of Cerebellar Neurons
CDP2 - Mouse-Based Cellular Cortical and Sub-Cortical Microcircuit Models

AWARDS

2017: SIF Prize, as best Young Researcher in Physiology for 2017 (awarded by the Italian Physiological Society).

2008: Best Poster Award in the session Plasticity at the meeting: Molecular Mechanisms in Neuroscience (Milan), with the poster: Tonic activation of GABA-B receptors regulate release probability and the dynamics of synaptic inhibition in the cerebellar glomerulus.

Pavia, 27/05/2024