

CURRICULUM VITAE: MICHELA MATTEOLI



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PERSONAL INFORMATION

Family name: Matteoli

First name: Michela

Date of birth: 26/12/1960

Nationality: italian

EDUCATION

1989 : PhD Degree (Dottorato di Ricerca), University of Pisa

1983 : Laurea in Biological Sciences - Faculty of Mathematical, Physical and Natural Sciences, University of Pisa. Graduates "Magna cum laude".

1979 : Maturita' classica , Liceo Classico, Pontedera (Pisa)

PROFESSIONAL CAREER

Since September 2019: Director of the Italian CNR Institute of Neuroscience (second term)

Since December 2016: Chair of Neuro Center Department, Humanitas Neuro Center, Rozzano, Milano

Since October 2015: Full Professor of Pharmacology, Humanitas University (on leave July 2014- June 2018 and from September 2019 to now)

July 2014- June 2018: Director of the Italian CNR Institute of Neuroscience

2011-2015: Full Professor of Pharmacology, Dept of Medical Biotechnology BIOMETRA Univ of Milano

2002-2011: Associate Professor of Pharmacology, Dept of Medical Pharmacology, Univ of Milano

Since 1997: First Researcher - National Research Council- Center of Cellular and Molecular Pharmacology

1991- 1997: Researcher - National Research Council, Center of Cytopharmacology

1989 - 1991: Postdoctoral fellow, Yale University School of Medicine - Dept. of Cell Biology
1988- 1991: Researcher - CNR Istituto Fisiologia Centri Nervosi - Milano (on leave June 1989 -o June 1991)
1986-1988: PhD student - CNR Center of Cytopharmacology and Dept. of Medical Pharmacology.
1983-1986: Graduate student - Dept. of Physiology and Biochemistry University of Pisa.

HONORS AND AWARDS

- 2022: Elected member of Accademia dei Lincei
- 2022: Recipient of ERC Advanced Grant Matilda
- Member of Top Italian Scientists (TIS)
- 2019: Recipient of Premio Feltrinelli for Biochemistry Physiology and Pharmacology, Accademia dei Lincei
- 2019: Lions Club "Guido Paolucci" Award of Honor
- 2016: Special Award from Sapio for contributions to Italian research (Rome, Montecitorio)
- 2015: Recipient of Atena Prize for scientific achievements (Rome, Campidoglio)
- 2014: Elected member of EMBO (European Molecular Biology Organization)
- 2013: Recipient of the mid-career Nature Mentoring Award 2013 (Rome, Quirinale)
- 2012: Member of the Academia Europaea, due to outstanding achievements as a researcher
- 2009: Selected Lombardy Representative for European Network of Female Entrepreneurship Ambassadors (European Commission Enterprise and Industry Directorate-General)
- 1989: European Molecular Biology Organization (EMBO) - long term fellow
- 1989: International Brain Research Organization (IBRO) - MacArthur travel fellow

PARTICIPATION TO INTERNATIONAL SCIENTIFIC BOARDS

- 2022: Member of the SAB for the **Center for Integrative Research in Biology, Collège de France**, Paris
- 2022: Member of the LS5 Panel (Neuroscience) for **ERC advanced grants**
- 2022: Member of the International Panel of **SNSF** (Swiss National Science Foundation) Starting Grants
- 2022: Member of International Research and Innovation Advisory Board Univ. Campus Bio-Medico Roma
- 2021: Member of the Adjudication Committee **doctoral exam, Faculty of Medicine University of Oslo**.
- 2021: Invited External Expert in the **Tenure Track Committee for the German Centre for Neurodegenerative Diseases (DZNE)**, Bonn.
- 2021: Member of the Committee for the selection of **Early Career Fellowship (ECF) Program, Human Technopole** (as expert nominated by the Ministry of University and Research).
- 2020: External Member of Committee for nomination procedure for **Associate Professor at the Department of Fundamental Neurosciences, University of Geneva School of Medicine**
- 2020: Member of the LS5 Panel (Neuroscience) for **ERC advanced grants**

- Since 2017: Contributing member for **Faculty of 1000** (F1000Prime)
- Since 2015: Member of the Scientific Advisory Board, **Institute of Neuroscience and Psychiatry, Paris**
- 2015: Nominated International **Expert for Russian Science Foundation** (RSF)
- 2014-2017: Member of the Advisory Committee of the **Armenise Harvard-Italy Foundation**
- 2014: Member of the Panel for **Science Foundation Ireland** (SFI)
- Since 2014: Member of the Advisory Committee of the **EBRI Foundation**
- 2013-2019: member of the Scientific Advisory Board of the **Paris School of Neuroscience** (ENP).
- Since 2013: member of the International Scientific Committee of the **Umberto Veronesi Foundation**
- 2013-2019: Member of the Scientific Committee of the **Centro di Cultura Scientifica A. Volta**.
- Past Member of the Board of Directors of **the Center of Excellence for Neurodegenerative Diseases**
- Past Member of the Board of Directors of the **Italian Society for Neuroscience**
- Since 1992: Member of several national and international Committees for PhD School final examinations

INVITATIONS TO INTERNATIONAL MEETINGS /SEMINARS (*selected, from 2005*)

- September 2023: 11th International Brain Organization IBRO World Congress Granada, Special Lecture
- July 2023: XVI European Meeting on Glial Cell Function in Health and Disease, Berlin
- January 2023: FENS-Hertie Winter School 2022 on Neuroimmune interactions, Innsbruck, Austria
- July 2022: FENS Forum, Paris, Symposium Specifying neuronal connectivity across species
- June 2022: 15th World Congress on Inflammation, Rome, Chair and Speaker
- June 2022: Armenise Harvard Foundation's 18th Symposium, Neuroscience at the Edge, Varignana, Italy
- May 2022: College de France Symposium "From Development to Neurodegeneration: Roles of Microglia and Other Immune Brain Cells", Paris, France
- May 2021: Accademia dei Lincei, Roma, Italy
- April 2021: Bellvitge Biomedical Research Institute, Barcelona
- March 2021: Université de Lausanne
- March 2021: University of Edinburgh
- January 2021: CNR-EMBL Scientific Collaboration Meeting
- January 2020: Hungarian Neuroscience Society Annual Meeting, Szeged, Hungary
- September 2019: "Quantitative Synaptology" Meeting, Goettingen Germany
- July 2019: XIV European Meeting on Glial Cell Function in Health and Disease, Porto (Chair and Speaker)
- May 2019: International Conference "Perinatal Origins of Neuropsychiatric Disorders: from Molecular Mechanisms to Therapeutic Perspectives", Palermo
- May 2019: 6th Venusberg Meeting on Neuroinflammation, Bonn
- 2018: Fyssen Foundation seminar series on "News insights into neuro-glia communication", Paris
- 2018: Eibsee Meeting on "Cellular Mechanisms of Neurodegeneration", Elbsee, Germany

2018: International meeting on Toxins, Padova

2018: Plenary Lecturer at the PostDoc Symposium, Leibniz-Institute for Molecular Pharmacology and Max-Delbrück-Center, Berlin

2017: EMBO Keynote Lecture, the Mediterranean Neuroscience Society, St Julian, Malta

2017: FENS Satellite Meeting, Pécs, Hungary

2017: École des Neurosciences Paris Île de France, 10th year International Meeting

2015: SINS Plenary Lecture, Cagliari, October 2015

2015: Falan Course on New roles for glial cells in health and disease, Rio de Janeiro, July 7th

2015: Gordon Conference on Endocannabinoids, Il Ciocco, May 24-29

2015: American Society for Neurochemistry, Atlanta USA, March 13-17

2015: IBRO Meeting, Rio De Janeiro, 6-12 July

2015: EMBO conference on Neural Development, Academia Sinica, Taipei, Taiwan, Dec. 4-7.

2014: International Meeting Advances in Biology and Treatment of Malignant Brain Gliomas, Roma

2014: Lincei Academy, Rome "Dai segnali intracellulari alla coscienza"

2013: Neurex Workshop "Synaptic release", Strasbourg, France

2013: Singapore/Italy joint workshop on Cellular and Molecular Medicine, Singapore

2012: EUSynapse Alumni Meeting, Seville, Spain

2011: Gordon Conference on Neurotrophic Factors, Newport, RI, USA

2011: 8th IBRO World Congress of Neuroscience - Florence, Symposium organizer and speaker

2011: Glial cells in (patho)physiology ISN Satellite meeting, Ljubljana, Slovenia

2011: "The Synapse from physiology to pathology" ISN Satellite meeting, Stresa, Italy

2010: invited speaker and session chair at the 13th Annual Armenise-Harvard Foundation Symposium

2010: invited speaker and chair SYNAPSE Symposium, satellite FENS, Amsterdam

2009: International Neuroscience Winter Conference, Sölden Austria

2009: International Symposium "New vistas on nicotinic receptors and synaptic physiology", Milano, Italy

2008: First European Synapse Meeting, Bordeaux, France

2008: International Meeting "Mechanism(s) of Exocytosis 2008", Ljubljana, Slovenia

2008: Gordon Conference "Cell Biology of the Neuron", New London, NH, USA

2007: " 7th IBRO World Congress of Neuroscience, Melbourne , Australia

2007: Nanoforum Meeting, Session "Nanomedicine" Milano

2006: International Meeting "Molecular and Cellular Biology of the Synapse", Paris, France

2006: Symposium "Intracellular dynamics underlying synapse formation" FENS 2006, Vienna, Austria

2005: "Recent data on neuron-glia interaction". Collège de France, Paris, France

2005: BioScience2005, Session "Mechanisms of synapse assembly and plasticity", Glasgow, UK.

FUNDING

- 2022: **ERC Adv grant** Microglia as controller of brain metabolism during aging (MATILDA) (**PI**, 2.5 mln)
- 2022-2024: **European Community EraNET Neuron** -Physiological and molecular effects of inflammation episodes on the severity of Shank3-based autism spectrum disorder phenotype on mouse and hPSC models (**Partner**, 250K)
- 2021-2023: **Telethon** - Dissection of molecular and functional processes in Nasu–Hakola disease, a primary microglial disorder of the CNS (**PI**, 240K)
- 2021-2025: **AIRC** - Cancer-neuronal crosstalk in glioblastoma: novel therapeutic opportunities (**PI**, 770K)
- 2021-2023: **Ministry of Health RF-2019**: Predictive biomarkers of altered neurological trajectories consequent to prenatal inflammatory insults (**Coordinator**, 230K to the lab)
- 2020-2022: **FISM** (Multiple Sclerosis Foundation) A humanized model of blood brain barrier to investigate immune cells infiltration in multiple sclerosis: toward a personalized medicine approach (**PI**, 200K).
- 2020-2022: **PRIN** (Ministero dell'Istruzione dell'Università e della Ricerca) Immune-synaptopathies: dissecting the contribution of inflammation to synaptic dysfunctions (**Coordinator**, 200K to the lab).
- 2020-2021: **FERRING** COVID-19 Investigational Grant (SARS-CoV-2 infection and immune response during pregnancy: impact on fetal neurodevelopment (**PI**, Pilot, 15K)
- 2020-2022: **Fondazione Regionale per la Ricerca Biomedica** “Nuove frontiere nello sviluppo di nanofarmaci per miglioramento dell’efficacia e della sicurezza terapeutica nelle patologie neurologiche” (**Partner**, 600K)
- 2018: **FISM** (Multiple Sclerosis Foundation) A humanized model of blood brain barrier (**PI**, Pilot, 30K).
- 2018- 2021: **Ministry of Health RF-2016**: Mitophagy and autophagy in the ischemic brain: a new target to promote neuroprotection (**Partner**, 160K).
- 2018-21: **H2020 TUDCA-ALS** — H2020-SC1-2016-2017 (**Collaborator**, **WP co-lead**, 140K).
- Past grants:**
- 2018- 2020: Progetto Accordi per la Ricerca – regione Lombardia: Piattaforma per l’identificazione di target di rilevanza farmacologica per il trattamento di patologie del sistema nervoso e oncologiche ad elevato bisogno di cura (Partner, 450K).
- 2017-2019: Fondazione Pisa: Studio traslazionale dell’inflammatione nell’invecchiamento (Coordinator, 110K to the lab)
- 2017-2019 AIRC: Targeting glioblastoma cells by drug-loaded polymeric nanocarriers: translational studies toward the clinic (PI, 375K)
- 2017-2019 Regione Lombardia: Alterazioni metaboliche stress cellulari e processi neurodegenerativi (Partner, 70K to the lab)
- 2017-2019 Fondazione Vodafone: Costruzione di una piattaforma digitale per diagnosi e trattamento di difetti neurologici e neuropsichiatrici (co-PI, 200K)
- 2017-2019 Fond. Veronesi: Targeting brain tumor cells by drug-loaded polymeric nanoparticles (PI, 360K)
- 2016-2019 Cariplo: A systematic molecular study of neuroimmune mechanisms in aging (Coord., 211K)

2015-2018 Italian Ministry of Health: Microfluidic integration of a model of the blood-brain barrier to investigate immune trafficking in multiple sclerosis

2015-2017 Cariplo (Role of the NFAT signaling pathway during aging and neurodegeneration)

2014-2015 European Center of Nanotechnology (Nanocomposite for Glioblastoma Imaging and Treatment)

2014-2015 Progetto CNR Invecchiamento (A low-copper diet as a preventive strategy for AD)

2013-2015 Telethon (Mutant prion protein impairs delivery of voltage gated calcium channels to the presynaptic membrane: mechanisms of neurotoxicity and potential therapeutic strategies)

2013-2015 Ministry of Education University and Research (Excitatory/inhibitory balance in the central nervous system: synaptic transmission, plasticity and synaptopathies)

2012-2013 Cariplo (Toxicology of chronic exposure to engineered silver nanoparticles)

2012-2015 Responsible of grant from G. Vollaro Foundation

2011-2014 Ministry of Health (SNAP25 het mice to identify safer pharmacological treatment for ADHD)

2010-2013 European Community Large-scale integrating project on Synaptic Protein Networks In Neurological and Psychiatric Diseases EUROSPIN

2009-2012 Finanziamento CARIPOLO "A micro biodevice for the assessment of neuroprotective factors in PD

2009-2011 Finanziamento CARIPOLO ("Physiopathological role of the prion protein in modulation of calcium channels: implications for neurodegeneration")

2009-2011 Finanziamento Compagnia S. Paolo (The synapsins and membrane trafficking in nerve terminals)

2009-2010 Responsabile Progetto di Ateneo (Ruolo delle proteine che legano l'actina nella formazione e funzione delle reti neuronali)

2009-2010 PRIN 2008 (Sinapsine e traffico di membrane nelle terminazioni nervose)

2008-2010 Finanziamento Compagnia S. Paolo (Meccanismi molecolari della trasmissione dell'informazione nel SNC: dalla plasticita' sinaptica alla patogenesi delle malattie neurologiche)

2006-2009: Finanziamento CARIPOLO (Brain on a chip)

2005-2007 COFIN2005 (Modulazione del traffico delle vescicole sinaptiche e del rilascio di neurotrasmettitore in neuroni GABAergici e glutamatergici)

2005-2009: European Community Integrated Project (EUSynapse From molecules to networks: understanding synaptic physiology and pathology in the brain through mouse models)

2003-2006: National Project FIRB Neuroscienze (Project Coordinator).

2001-2004: "International Human Frontier Science Program" Research Grant

2000-2003: European Program Quality of Life and Management of Living Resources QLG3-CT-2000-01343

1998-2000 Telethon Italia (grant 1042)

1998-2000: European Community Biotechnology Contract BIO4-98-0408

1997-1999 Il Progetto Sclerosi Multipla, Istituto Superiore di Sanita' (progetto n. 61).

1995-1997 Telethon Italia (Grant n.672).

1995-1998: "International Human Frontier Science Program" Research Grant (Project Coordinator).

1993-1994 CNR USA Bilateral Project "Recycling di vescicole sinaptiche e secrezione di neurotrasmettitori".

1992: NATO Collaborative Research Grant (Project Coordinator)

ACTIVITY AS REFEREE

grant referee:

European Research Council (StG; CoG; AdG); National Science Foundation (NSF); Medical Research Council (MRC); Human Frontier Science Program Organization (research grants and fellowships); Deutsche Forschungsgemeinschaft (DFG); The Israel Science Foundation; Research Council for Earth and Life Sciences in the Netherlands; Helmholtz Center, Germany; German-Israeli Foundation for Scientific Research and Development; Agence Nationale de la Recherche (ANR); Federation pour la Recherche sur le Cerveau (FRC); University of Wien (expert for neuroimmunology); Long term EMBO fellowships; Academy of Medical Sciences, UK; Ministero Italiano dell'Università e della Ricerca Scientifica (MIUR); Telethon Italia; Comitato di Indirizzo per la Valutazione della Ricerca in Italia (CIVR); Università di Padova; Federazione Italiana Sclerosi Multipla (FISM).

manuscript referee:

Science, Nature, Nature Metabolism, Immunity, Nature Rev Neurosci, PNAS, Cell Stem Cell, EMBO Journal, Brain, Neuron, Nature Comm, TINS, Journal of Cell Biology, Journal of Neuroscience, Journal of Neurobiology, Journal of Neurocytology, Journal of Cell Science, Journal of Neurochemistry, Journal of Comparative Neurology, European Journal of Cell Biology, European Journal of Neuroscience, Neuroscience, Exp Cell Research, FEBS Letters, PLoS One.

ORGANIZATION OF MEETINGS AND SYMPOSIA

2022: XIV Ed. Science for Peace and Health, Fond. Veronesi, Milano November 2022, Scientific Committee

2022: III Ed. More than Neurons Conference Torino December 2022

2018: EMBO Workshop Neural development. Taipei, Taiwan; Scientific Advisory Committee.

2016: Co-organizer of the international Meeting "More than Neurons", University of Turin

2016, 2018, 2021: Organizer of the Como Lake International School of Neuroscience

2014: Member of the 9th FENS Forum Host Society Committee, Milano

2014: Dagli atomi al cervello, Politecnico di Milano

2013: Co-organizer of the 4th European Synapse Meeting, Bordeaux

2013: Ninth World Conference "The future of science", Venezia

2011: Symposium Organizer 8th IBRO World Congress of Neuroscience - Florence, July 14-18

2009: Member of Programme Committee FENS Meeting 2009, Amsterdam

2008: Meeting "New Challenges in Neurotechnology and Nanomedicine", Università di Milano

2008: V Meeting "Molecular Mechanisms in Neuroscience", Università di Milano,

2008: Meeting Società Italiana di Neuroscienze, Università di Milano

2007: Meeting "Glial cells in health and disease", Università di Milano

2007: meeting “Deciphering how nerve cells talk”, Università di Milano

2007: Symposium “Synaptic vesicles and epilepsy”, Società Italiana di Neuroscienze, Verona

2006: International Meeting Transporters, Parma

2006: Meeting ABCD, Pontignano

2006: Course Physiological imaging, Università di Pisa

EDITORIAL ACTIVITY

Present or past member of the Editorial Board of the following journals: Current Research in Neurobiology, Frontiers in Neuroscience, Archives Italiennes de Biologie - A Journal of Neuroscience, Brain Cell Biology (Journal of Neurocytology) (2005-2009), European Journal of Neuroscience (2008-2012)

TECHNOLOGY TRANSFER

2008-2014: Responsible of the Cell Model Platform, Fondazione Filarete for Technology Transfer, Milano

From 2007 to 2014: President and Co-founder of Neuro-Zone srl (www.neuro-zone.com)

2008: Provincia di Milano “Bando Imprese Creative e Innovative” ranked 1st (M.Matteoli Scientific Coordinator)

2008: FIXO (SME financing from Ministero del Lavoro) (Scientific Coordinator)

2007: Regione Lombardia, Misura INTEC 3 (SME financing for innovative project in the field of biotechnology and advanced materials) (Scientific Coordinator)

2007: MIUR Financing for Applied Research Project aimed at new Entrepreneurship (Scientific Coordinator)

2009: NeuroZone: Semifinal Winner of the Eurecan European Venture Contest Award. Selected among 120 award-winning high-tech companies celebrated in Düsseldorf at the European Venture Summit

Patents: Co-owner (25%) European Patent. 09154389.2 dep. 05-03-2009; Coowner (10%) European patent, under deposition

SCIENTIFIC DISSEMINATION (*selected, from 2014*)

- Recent articles and interviews in newspapers

- 07-10-2021 *Corriere Salute: Prevenire l'Alzheimer (di corsa)*

- 06/11/2021 *Corriere IO Donna: Restate sintonizzate*

- 05/06/2021 *Repubblica Salute: Longevità*

- 25/02/2021 *Repubblica Salute: Così i neuroni sanno battere l'invecchiamento*

- 02/04/2021 *Famiglia Cristiana: Contro L'Alzheimer curiamo le sinapsi*
- August 2020 *Natural Style: Cuore e Cervello*
- 26/03/2020 *La Repubblica: Over 50, nel cervello di una donna*
- 21/05/2020 *Grazia: La scienza siamo noi*
- 08/03/2020 *Mind: Cervello e genere, diversi ma non troppo*
- 10/06/2020 *Corriere Salute: La parola alle scienziate*
(<https://www.facebook.com/watch/?v=546909415984817>)

- February 2021: Participation to Roundtable "Milano attrattiva e inclusiva" **Your Next Milano, Assolombarda**, Milano & Partners
- Since 2020: member of a group of scientists addressing society issues using the scientific method (Scienziate per la Società), several articles published on **Corriere della Sera and Huffington Post**
- 2020: speaker at **#Trustyourself, Alley Oop- Accenture, Sole 24 Ore**, Milano
- 2020: panelist at **FareMilano, Comune di Milano**, "Una città in salute"
(<https://www.faremilano.it/blog/una-citta-in-salute>),
- October 2019: Participation to **Scienza Ultima Frontiera 2019** (<https://www.mbnews.it/2019/10/a-brugherio-la-sesta-edizione-di-scienza-ultima-frontiera/>)
- April 2019: **Lions Club Cattolica**, New research directions in neuroncology
- September 2018: Il tempo delle donne, **Corriere della Sera, Triennale Milano**
- June 2018: Interview, **Superquark, RAI1**, Train the Brain
- June 2018: Interview, **Obiettivo Salute Radio24**, Cervello e infiammazione
- May 2018: Conferenza, Soroptimist Club, **Progetto Nazionale SifaSTEM**, Isola d'Elba "Cosa c'è di diverso nel cervello di uomini e donne"
- April 2018: **Stem in The City**, Opening Ceremony, Teatro alla Scala, IMAGINING A NEW WORLD
- October 2017: Conferenza, **Casa della Cultura**, Milano "Dal neurone al cervello, come è e come funziona"
- October 2017: Lectures "**La Scienza a Scuola**"-Zanichelli <https://www.zanichelli.it/scuola>
- October 2016: **TEDxCNR**, Roma "La prevenzione delle malattie del cervello inizia sempre troppo tardi"
https://www.youtube.com/watch?v=_ih05A0Ypkg
- September 2016: "Cervello e differenze di genere" **Notte dei Ricercatori - Museo della Scienza** e della tecnologia, Milano.
- October 2015: "Neuroscienze e Disabilità Intellettiva: percorsi terapeutici innovativi nei disturbi del neurosviluppo", **palazzo Montecitorio, Camera dei Deputati**
- September 2015: "CERVELLO E NEUROSCIENZE" **Notte dei Ricercatori - Museo della Scienza** e della tecnologia, Milano.
- October 2015: Elisir, RaiTre, La notte dei Ricercatori
- September 2015: "Food and brain: feeding the mind" **Expo Milano**
- June 2015: I meccanismi della memoria. **Rai Uno, Unomattina**.

- June 2014: **Palazzo Marino, Assessorato Politiche per il Lavoro**, Sviluppo Economico, Università e Ricerca, COLLOQUI PER LA SCIENZA A MILANO, “Eccellenze e Integrazione: occasioni per Milano”
- March 2014: Università La sapienza, Rome. **The future of Science**, Fondazione Veronesi, I segreti della longevità
- March 2014: Verona, **InfinitaMente**, “Yes we can, con le nostre sinapsi che cambiano”
- March 2014: **BrainForum**, Milano. Le sinapsi come magazzino della memoria: cosa succede quando si ammalano?

MAJOR RESEARCH ACHIEVEMENTS

The scientific career of Michela Matteoli has focused on the synapse as the site of communication between neurons and, more recently, on how synapse function is affected by inflammation.

Her major scientific contributions include:

- 1) setting of a **method to monitor synaptic vesicle recycling in living neurons** -which has been used in laboratories worldwide- through which she described the maturation of synaptic vesicles recycling during synaptogenesis (Matteoli et al., J Cell Biol 1992; Verderio et al., J. Cell Biol 1994; Verderio et al., PNAS 1995; Matteoli et al. Trends in Cell Biol. 2004).
- 2) Demonstration that **clostridial toxins use synaptic vesicle recycling** as trojan horses to enter nerve terminals (Matteoli et al., PNAS 1996; Verderio et al., J Neurosci 1999; Schiavo et al., Physiol. Rev 2000; Verderio et al., EMBO Rep 2006).
- 3) Demonstration that the protein **SNAP-25, which mediates synaptic vesicle fusion and is cleaved by clostridial toxins, is differentially distributed in excitatory and inhibitory neurons** (Verderio et al., Neuron 2004), where it **controls calcium channel function** (Pozzi et al., PNAS 2008; Condliffe et al., J Biol. Chem 2010; Antonucci et al., EMBO Rep 2013; Corradini et al. Cer Cor 2012).
- 4) Demonstration that **SNAP-25 controls spine morphogenesis and postsynaptic functions** (Tomasoni et al. Nature Comm. 2013; Fossati et al., Cell Death and Differentiation 2015).

The findings reported in 3) and 4) **primarily contributed to the establishment of the key concept of “synaptopathies” i.e. brain diseases caused by synaptic dysfunctions**, and had implications for the understanding of ADHD and schizophrenia, where SNAP-25 levels are expressed at reduced levels.

In the last years M. Matteoli became interested in dissecting the concept that **environmental stimuli, and in particular inflammation, cooperate with the genetic background to induce a pathological state of the synapse**. The major contributions she obtained in this field are:

- 1) Contribution to the demonstration that **inflammation induces release of microvesicles which affect synaptic function** (Antonucci et al., EMBO J 2012; Verderio et al., Ann Neurol. 2012)
- 2) Demonstration that **IL-1b mediated inflammation disrupts synaptic plasticity and increases the levels of MeCP2**, a protein involved in Rett syndrome and MeCP2 duplication syndrome (Tomasoni et al. eLife 2017)
- 3) Demonstration that **prenatal immune activation delays in the offspring the excitatory to inhibitory switch of GABA** and increases susceptibility to epilepsy (Corradini et al., Biol. Psych. 2018)
- 4) Demonstration that **lack of TREM2 from microglia impairs synaptic pruning and causes sociability defects** and TREM2 levels are reduced in **autistic patients** (Filipello et al., Immunity 2018)
- 5) Demonstration that **prenatal elevations of IL-6 promote excitatory synaptogenesis** (Mirabella et al., Immunity 2021)
- 6) Contribution to demonstration that **closure of a barrier at the choroid plexus impairs the communication between gut and brain causing anxiety** (Carlioni et al., Science 2021)

These findings have opened a completely novel avenue of research, **leading to the new concept of immune-synaptopathies** (Pozzi et al. Frontiers Mol Neurosci 2018). Given the relevance of these findings, the journals Biological Psychiatry (Impact Factor 11,4) and Immunity (Impact Factor 22,8) have reserved their covers to these studies. Also, these findings have been reported in a Nature Feature focused on the relevance of inflammation in brain diseases (The Brain Inflamed, A. Abbott, Nature April 2018).

PUBLICATIONS

Total number of publications: 166

H index: 60 (Scopus); 71 (Google Scholar)

number of citations: >12000 (Scopus)

- 1) Pellegrino M., Nencioni B. and Matteoli M. (1984) Response to axotomy of an identified leech neuron, in vivo and in culture. **Brain Res.** 298: 347-352. **(IF 2.865)**
- 2) Pellegrino M., Matteoli M. and Bertolacci L. (1985) Effect of colchicine and vinblastine on identified leech neurons. **Comp. Biochem. Physiol.** 82: 353-356. **(IF 2.53)**
- 3) Matteoli M., Nencioni B. and Pellegrino M. (1986) Differential time course of the response to axotomy induced by cut or crush in the leech AP cell. **J. Neurobiol.** 17: 373-381 **(IF 2.803)**
- 4) Matteoli M., Haimann C., Torri Tarelli F., Polak J.M., Ceccarelli B. and De Camilli P. (1988) Differential exocytosis from small synaptic vesicles and from CGRP containing large dense core vesicles at the frog neuromuscular junction. **Proc. Natl. Acad. Sci. USA** 85: 7366-7370. **(IF 10.48)**
- 5) Matteoli M., Navone F., Haimann C., Cameron P.L., Solimena M. and De Camilli P. (1989) Secretory organelles of neurons and their relationship to organelles of other cells. **Cell Biol. Intl. Rep.**,13: 981-992.
- 6) Matteoli M., Haimann C. and De Camilli P. (1990) Substance P immunoreactivity at the frog neuromuscular junction. **Neuroscience**, 37: 271-275. **(IF 4.324)**
- 7) Matteoli M., Balbi S., Sala C., Chini B., Cimino M., Vitadello M. and Fumagalli G. (1990) Developmentally regulated expression of calcitonin gene-related peptide at the mammalian neuromuscular junction. **J. Mol. Neurosci.**, 2: 175-184. **(IF 2.351)**
- 8) Vitadello M., Matteoli M. and Gorza L. (1990) Neurofilaments proteins are co-expressed with desmin in heart conduction system myocytes. **J. Cell Science**, 97: 11-21. **(IF 6.044)**
- 9) Reetz A., Solimena M., Matteoli M., Folli F., Takei K. and De Camilli P. (1991) GABA and pancreatic b-cells: colocalization of glutamic acid decarboxylase (GAD) and GABA with synaptic-like microvesicles suggests their role in GABA storage and secretion. **EMBO J.**,10: 1275-1284. **(IF 12.634)**
- 10) Matteoli M., Takei K., Cameron R., Johnston P.A., Hurlbut P., Jahn R., Sudhof T.C. and De Camilli P. (1991) Association of rab3 with synaptic vesicles at late stages of the secretory pathway. **J. Cell Biol.** 115: 625-633. **(IF 11.118)**
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Milano, June 20th, 2022



Michela Matteoli