Elena Taverna, PhD

Research Group Leader
Human Technopole
Milan, Italy

Nationality: Italian

Education

2003 **PhD**, **Pharmacology and Toxicology**
University of Milan **,** Milan (Italy)

1998 **MSc**, **Molecular Biology**
University of Milan, Milan (Italy)

Research Positions

July 2021- **Research Group Leader**
Human Technopole, Milan (Italy)

April 2016 -April 2021 **Research Fellow and Team Leader**
Max Planck Institute of Evolutionary Anthropology, Svante Pääbo team, Leipzig (Germany)

2006-2015 **Postgraduate Research Fellow**
Max Planck Institute of Cell Biology and Genetics, Wieland Huttner Group, Dresden (Germany)

2002-2006 **Postgraduate Research Fellow**
National Research Council – CNR, Institute of Neuroscience, P. Rosa Group, Milan (Italy)

1998-2002 **Graduate Research Fellow**
National Research Council – CNR, Institute of Neuroscience, P. Rosa Group, Patrizia Rosa Group, Milan (Italy)

1997-1998 **Undergraduate Research Assistant**
National Research Council –CNR, Department of Pharmacology, E. Sher Group, Milan (Italy)

Fellowships, Awards and Grants

2005- 2006 **Philip Morris**, Postdoctoral Fellowship

2003-2004 **Centre of Excellence for the Study of Neurodegenerative Diseases**, Research Fellowship

2000 **University of Milan**, Young Researchers Grant

1999 **Rita Levi-Montalcini Onlus Foundation**, Young Researcher Prize

1998 **Heidelberg University**, Research Fellowship

1998 **European network for the study of regulated exocytosis in neuroendocrine cells and CNR**, Research Fellowship

Publications

2023 Mora-Bermudez, F., Testa, G. and **Taverna, E**. A wholistic view on the study of cell biology of brain development and evolution. Frontiers Cell and Dev. Biol. (*accepted*)

2022 Appiah, B. Fullio, C.L. Cheffer, A., Haffner, C., Zeis, P., Treppner, M., Bovio, P., Bertani, I., Schlichtholz, L., Mas-Sanchez, A., Zografidou, L., Jennifer Winter, J., Binder, H., Grün, D., Nereo Kalebic, N., **Taverna, E.*** and Vogel, T. ***** Asparagine metabolism is an epigenetically controlled determinant of division mode during cortical neurogenesis. **bioRxiv** 2022.04.08.487591
Under revision
(*co-corresponding authors)

2022 Mora- Bermúdez, F., **Taverna, E**. and Huttner, W.B. From stem and progenitor cells to neurons in the developing neocortex – key differences among hominids. **FEBS Journal**, 16:878950

2021 Lin, H,C., He, Z., Ebert, S., Schörnig, M., Santel, M., Nikolova, M.T., Weigert, A., Hevers, W., Kasri, N.N., **Taverna, E**, Camp, J.G. and Treutlein, B. NGN2 induces diverse neuron types from human pluripotency. **Stem Cell Rep**. S2213-6711(21)00372-6

2021 Schörnig, M. and **Taverna, E.**. Using iPSCs-derived neurons to unravel the cell biological principles of brain evolution. **Front Dev. Biol.**, *21;9:661113.*

2021 Shull, G., Haffner, C., Huttner, W.B., **Taverna, E.*** and Kodandaramaiah, S.B*****. Manipulation of Single Neural Stem Cells and Neurons in Brain Slices Using Robotic Microinjection. **J Vis Exp.** Jan 21;(167). doi: 10.3791/61599.
(*co-corresponding authors)

2021 Schörnig, M., Ju, X., Fast, L., Weigert, A., Schaffer, T., Ebert, S., Treutlein, B., Kasri, N.N., Peter, B., Hevers, W. and **Taverna, E**. Comparison of induced neurons reveals slower structural and functional maturation in humans than in apes, **Elife**, Jan 20;10:e59323

2019 **Taverna, E.*** and Huttner, W.B.* The Golgi apparatus in polarized neuroepithelial stem cells and their progeny: canonical and non-canonical features. Review in **The Golgi apparatus and centriole Springer Book**. 67:359-375.
(*co-corresponding authors).

2019 Shull, G., Haffner, C., Huttner, W.B., Kodandaramaiah, S.B. and **Taverna, E.** Robotic platform for microinjection into single cells in intact tissue. **EMBO Reports**, e47880. doi: 10.15252/embr.201947880.

2018 Tavano, S., **Taverna**, **E.**, Kalebic, N., Wilsch-Brauninger, M., Paridaen, J.T.M.L. and Huttner, W.B. Insm1 Induces Neural Progenitor Delamination in Developing Neocortex via Downregulation of the Adherens Junction Belt-Specific Protein Plekha7. **Neuron** 97, 1299-1314.

2017 Arai, Y. and **Taverna, E.** Neural Progenitor Cell Polarity and Cortical Development. **Front Cell Neurosci**. 11:384.

2016 **Taverna*, E.**, Mora-Bermúdez, F., Strzyz, P.J., Florio, M., Icha, J., Haffner, C., Norden, C., Wilsch-Bräuninger, M. and Huttner, W.B.* Non-canonical features of the Golgi apparatus in bipolar epithelial neural stem cells. Sci. Reports. Feb 16; 6:21206
(*co-corresponding authors).

2016 Kalebic, N.*****, **Taverna, E. ***, Tavano, S., Wong, F., Suchold, D., Winkler, S., Huttner, W.B. and Sarov, M. CRISPR/Cas9-induced disruption of gene expression in mouse embryonic brain and single neural stem cells in vivo. **EMBO Reports.** 17(3):338-348
(*****equal contribution)

2015 Wong, F. *, Fei, J. *, Mora-Bermúdez, F., **Taverna, E.**, Haffner, C., Fu, F., Anastassiadis, K., Stewart, A.F. and Huttner, W.B. Sustained Pax6 expression generates primate-like basal radial glia in developing mouse neocortex. **PLoS Biology**. Aug 7;13(8):e1002217.

2015 Florio, E., Albert, M. *****, **Taverna, E**. *****, Namba, T. *****, Brandl, H., Lewitus, E., Prüfer, K., Wong, F., Sykes, A., Haffner, C., Peters, J., Guhr, E., Nüsslein, I., Kelso, J., Klemroth, S., Dahl, A., Lachmann, R., Pääbo, S. and Huttner, W.B. Human-specific gene ARHGAP11B promotes basal progenitor amplification and neocortex expansion. **Science** 347, 1465-1470
(*****equal contribution)

2014 **Taverna, E**., Götz, M. and Huttner, W.B. The cell biology of neurogenesis: towards an understanding of the development and evolution of the neocortex. **Ann. Rev. Cell Dev. Biol.** 30, 465-502.

2014 Wong, F., Haffner, C., Huttner W.B. and **Taverna, E**. Microinjection of membrane-impermeable molecules into single neural stem cells in brain tissue. **Nature Protocols** 9, 1170-1182.

2012 **Taverna, E**., Haffner C., Pepperkok R., Huttner W.B., A new approach to manipulate the fate of single neural stem cells in tissue. **Nature Neurosci.** 15, 329-337.

2010 **Taverna, E**., Huttner W.B., Neural progenitor nuclei IN Motion. **Neuron** 67, 906-910.

2010 Linetti A., Fratangeli A., **Taverna, E.**, Valnegri P., Francolini M., Cappello V., Matteoli M., Passafaro M., Rosa P., Cholesterol reduction impairs exocytosis of synaptic vesicles. **J. Cell Sci**. 123, 595-605.

2007 Santillo, M., Secondo, A., Seru R., Damiano S., Garbi C., **Taverna E.**, Rosa P., Giovedi, S., Benfenati F., Mondola P., Evidence of calcium- and SNARE-dependent release of CuZn superoxide dismutase from rat pituitary GH3 cells and synaptosomes in response to depolarization. **J Neurochem.** 102, 679-685.

2007 **Taverna, E**., Saba, E., Linetti, A., Longhi, R., Jeromin, A., Righi, M., Clementi, F and Rosa, P. Localization of synaptic proteins involved in neurosecretion in different membrane microdomains**. J Neurochem.** 3, 664-677.

2004 **Taverna**, E., Saba, E., Rowe, J., Francolini, M., Clementi, F., Rosa P., Role of lipid microdomains in P/Q-type calcium channel (Cav2.1) clustering and function in presynaptic membranes. **J. Biol. Chem.** 279, 5127-5134.

2003 Rimoldi, V., Reversi, A., **Taverna, E.,** Rosa, P., Francolini, M., Cassoni, P., Parenti, M., Chini, B., Oxytocin receptor elicits different EGFR/MAPK activation patterns depending on its localization on caveolin-1 enriched microdomain. **Oncogene.** 22, 6054-6060.

2002 Coco, S., Calegari, F., Pravettoni, E. , Pozzi, D., **Taverna, E.**, Rosa, P., Matteoli, M., Verderio., C. Storage and release of ATP from astrocytes in culture. **J. Biol. Chem.** 278, 1354-1362.

2002 **Taverna**, **E.**, Francolini, M., Jeromin, A., Hilfiker, S., Roder, J., Rosa, P., Neuronal calcium sensor 1 and phosphatidylinositol 4-OH kinase beta interact in neuronal cells and are translocated to membranes during nucleotide-evoked exocytosis. **J. Cell Sci**. 115, 3909-3922.

2002 Koizumi, S., Rosa, P., Willars G.B., Challiss, R.A., **Taverna**, **E**., Francolini, M., Bootman, M.D., Lipp, P., Inoue, K., Roder, J., Jeromin, A., Mechanisms underlying the neuronal calcium sensor-1-evoked enhancement of exocytosis in PC12 cells. **J. Biol. Chem.** 277, 30315-30324.

2002 Scalettar, B.A., Rosa, P., **Taverna, E**., Francolini, M., Tsuboi, T., Lipp, P., Terakawa, S., Koizumi, S., Roder, J., Jeromin A., Neuronal calcium sensor-1 binds to regulated secretory organelles and functions in basal and stimulated exocytosis in PC12 cells. **J. Cell Sci.** 115, 2399-2412.

2001 Rowe, J., Calegari, F., **Taverna**, **E.** Longhi, R., Rosa P., Syntaxin 1A is delivered to the apical and basolateral domains of epithelial cells: the role of munc-18 proteins. **J. Cell Sci.** 114, 3323-3332.

1999 Calegari, F., Coco, S., **Taverna**, **E.,** Bassetti, M., Verderio, C., Corradi, N., Matteoli, M., Rosa, P., A regulated secretory pathway in cultured hippocampal astrocytes. **J. Biol Chem.** 274, 22539-22547.

1999 Rowe, J., Corradi, N., Malosio, M.L., **Taverna**, **E**., Meldolesi, J., Rosa, P., Blockade of membrane transport and disassembly of the Golgi complex by expression of syntaxin 1A in neurosecretion-incompetent cells: prevention by rbSEC1. **J. Cell Sci**. 112, 1865-1877.

1998 Sher, E., Rosa, P., Francolini, M., Codignola, A., Morlacchi, E., **Taverna**, **E**., Giovannini, F., Brioschi, A., Clementi, F., McEnery, M.W., Passafaro M., Metabolism and trafficking of N-type voltage operated calcium channels in neuro-secretory cells. **J. Bioener. and Biomem**. 30, 399-407.

1998 Passafaro, M., **Taverna**, **E**., Morlacchi, E., Rosa, P., Clementi, F., Sher. E., Transient translocation of N-type calcium channels from secretory granules to cell surface. **Ann. New York Academy of Sci.** Myasthenia Gravis and Related Deseases: Disorders of the Neuromuscular Junction. 841.

Manuscripts in preparation

Polenghi, M. and **Taverna, E.** Intracellular traffic in brain development. *Submitted*

Schörnig, M., Ju, X., Fast, L., Hellmer, H., Maricic, T., Weigert, A., Schaffer, T., Hevers, W., Pääbo, S. and **Taverna, E**. Using mRNA-mediated reprogramming to study brain evolution in recent human history

Schörnig, M., Ju, X., Fast, L., Weigert, A., Schaffer, T., Kasri, N.N., Hevers, W., Pääbo, S. and **Taverna, E**. Neanderthalization of the speech gene Foxp2 in iPSC-derived dopaminergic neurons.

Teaching, Academic & Editorial activities (selection)

2000-2001 **Teaching Assistantship,** *Histology Course*, Biology Master - University of Milan

2001-2005 **Teaching Assistantship,** *Biotechnology applied to Pharmacology Practical Course,* Biotechnology Master - University of Milan

2008-2013 **Teaching Assistantship,** *Mouse neurogenesis: advanced techniques in molecular neuroscience*
DIGGS Phd Program - MPI-CBG Dresden

2000-2014 **Master Thesis Supervisor** of
@University of Milan: Beatrice Soliani (current position: Case Management Manager at Celgene); Pamela Senesi (current position: Researcher, University of Milan, Italy)
@MPI-EVA: Luise Fast (current position PhD student, Svante Paabo lab); Henning Hellmer (current position: PhD student, University of Munich)
@Human Technopole: Valentina Rava (from University of Mian); Margherita Beltrame (from University of Pavia); Paola Campo (from Univesity Milano Bicocca); Romain Lecat (from University of Strasbourg)

PhD Thesis Supervisor of
@University of Milan: Elena Saba (current position: Researcher, Istituto Clinico Humanitas, IRCCS Italy); Anna Linetti (current position founder A spoonful of)
@MPI-CBG: Fong Kuan Wong (current position: Research Group leader, University of Manchester); Stefania Tavano (current position Postdoc IST Austria); Marta Florio (current position postdoc, Harvard)
@MPI-EVA: Maria Schörnig (current position: postdoc, Uni Jena); Anne Weigert (current position: lab manager, Leipzig Uniklinikum)
@Human Technopole: Martina Polenghi (from Crick Institute); Giulia Visani (from Univesity of Trieste); Jacob O'Brien (current position research scientist, Uni Minnesota)

2016- present **Review editor**, *Science Matters, PLoS, Scientific Reports, Frontiers*

2016- 2021 **Teacher,** *Brain evolution*, Master in Biology, Molecular Anthropology course - University of Leipzig

2017- 2021 **Teacher,** *Brain evolution*, IMPRS School - University of Leipzig

2019 **Teacher,** EMBO Course on *Mouse genome editing* - Dresden

2021-2022 **Topic Editor Special Issue**, Frontiers in Developmental Biology
Cell biology of brain development and evolution

2022 **Organizer, speaker and teacher**
BrainOmics Workshop, Human Technopole, Milan

2023 **Topic Editor**, Frontiers in Genetics
Stem cell and organoid models for complex psychiatric diseases

Public outreach

2022 Interview, Mapping the brain, **Science Festiva**l, Rome, IT

2022 Radio interview**, Radio3 Scienze**, IT

2022 Interview, Brain Evolution**, Festival della comunicazione,** Camogli, IT

2023 Interview, **Havas**

Patent

2018 Robotic platform for high throughput single cell gene manipulation in intact tissue Filed by **Elena Taverna**, Wieland B. Huttner, Suhasa B. Kodandaramaian
Max Planck Ref. 1305-5499 MSG
EU and USA