

Annex B – BIOSKETCH

NAME: Alessandra Folci

POSITION TITLE: PhD

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Milano, Italy	BSc	07/2007	Immunology
University of Milano, Italy	MSc	12/2008	Neuroimmunology
CNR-Institute of Neuroscience, Milano, Italy	PhD	03/2012	Neuroscience
CNR-Institute of Neuroscience, Milano, Italy	Postdoctoral training	07/2014	Neuroscience
Medical University of Graz, Austria (including a total of 5 months as a guest in the Lab of Dr Heine at the Liebniz Institute for neuroscience, Magdeburg, Germany)	Postdoctoral training	12/2016	Neuroscience
CNRS-IPMC, Valbonne, France	Postdoctoral training	12/2018	Neuroscience
Istituto Clinico Humanitas, Rozzano, Italy.	Postdoctoral training (funded by "Marie Curie Individual fellowship 2018")	08/2021	Neuroscience
CNR-Institute of Neuroscience, Milano, Italy	Senior Researcher (permanent position)	-	Neuroscience

A. Personal Statement

Dr Folci, is a molecular and cellular neuroscientist with a career fully dedicated to deciphering mechanisms underlying mental disorders. In 2012, she received her PhD in Biotechnology under the supervision of Dr Passafaro at the University of Milano, where she developed a solid expertise in molecular and cellular neuroscience. From 2014 to 2019, she worked as postdoc at the Medical University of Graz (Austria) and at the Institute of Molecular and Cellular Pharmacology (CNRS, France). During this period, she mastered imaging and biochemistry approaches to tackle the trafficking of membrane and assembling of excitatory synapses. She also acquired a deep knowledge on neuronal sumoylation during her postdoc in Dr Martin's lab, a leader in the field.

In 2019, she returned to Italy supported by the prestigious Marie Skłodowska-Curie Individual Fellowship in the team of Prof. Matteoli. In September 2021 she has been recruited as independent investigator at the Institute of Neuroscience of the CNR (IN-CNR) and in 2022 she stated establishing her own team and define her research line focused on sumoylation in neuronal physiology and brain pathology.

She is currently leading a group formed by three PhD student and one predoctoral student.

Her research is supported, among others, by Jérôme Lejeune Foundation, Royal Society, Italian Ministry of Health and Italian Ministry of University and Research.

B. Positions, Scientific Appointments, and Honors

POSITIONS

2021-to date	Principal Investigator (permanent position); CNR-Institute of Neuroscience, Milano, Italy.
2019-2021	Senior Postdoc (Marie Curie IF) in Matteoli's Lab; Istituto Clinico Humanitas, Italy.
2017- 2019	Post-doctoral fellow in Dr Stéphane Martin's Lab; IPMC-CNRS Valbonne, France.
2014-2017	Post-doctoral fellow in Dr Valentina Di Biase's Lab; Medical University of Graz, Austria.
2012-2014	Post-doctoral fellow in Dr Maria Passafaro's Lab; CNR-Institute of Neuroscience, Milano, Italy.
2008-2012	PhD student under the supervision of Dr Passafaro; CNR-Institute of Neuroscience, Milano, Italy.

COMMISSIONS OF TRUST

Reviewer for scientific journals:

- Plos One
- Scientific Reports
- Frontiers in Molecular neuroscience
- Frontiers in Neuroscience

RESEARCH GRANT

- 2025-2027: International Exchanges 2024: CNR-Royal Society, in collaboration with the team of Michael Cousin, University of Edimburg. Project title: "Investigating the role of PCDH10 in excitatory synapse assembling and physiology" (**12k€**)
- 2023-2027: Ricerca Finalizzata/Giovani Ricercatori 2021 (Ministero della Salute). Project title: "Investigating the role of Oligophrenin-1 sumoylation in the etiology and treatment of X-Linked Intellectual Disability". (**450k€**)
- 2023-2026: PRIN 2022 (Ministero dell'Università e della Ricerca). Project title: "New insights into physiology of aged-related cognitive disorders: unexpected role of DNA repair proteins ATM and ATR". (Partner unit: **99k€**)
- 2021-2024: "Jerome Lejeune Foundation" (Spring call 2021). Project title: "Investigating the functional consequences of Oligophrenin-1 sumoylation in X-Linked Intellectual Disability". (**80 k€**)
- 2019-2021: "Marie Curie Individual fellowship 2018" (Call H2020-MSCA-IF-2018). Project title: "Physiological consequences of Protocadherin-10 SUMOylation on neuronal function". (**171 k€**)

PRIZE & HONOURS

2020: Travel Grant for "FENS Forum 2020"

2018: Post-Doctoral Fellowship Fondazione Umberto Veronesi. (28.5 k€; not taken up).

2017: Seal of Excellence for the project: "FMRP-SUMO In AMPAR Trafficking" from the EU Commission.

2016: Selected for the "Young Investigator Training Programme" promoted by the FENS Forum.

2016: Post-Doctoral Fellowship Fondazione Umberto Veronesi. (27.5 k€; not taken up).

SUPERVISION OF STUDENTS

- 2024-present: Supervisor of PhD student Chiara Scacchi within the project: “Investigating the role of Oligophrenin-1 SUMOylation in X-Linked Intellectual Disability hIPSC”; PhD program in Molecular and Experimental Medicine of Humanitas University.
- 2023-present: Supervisor of PhD student Alessia Seccia within the project: “Investigating the role of Oligophrenin-1 SUMOylation in X-Linked Intellectual Disability animal model”; PhD program in Molecular and Experimental Medicine of Humanitas University.
- 2023-2024: Supervisor of MSc thesis of Ninoska Sarai Polona Diestra in Biotechnology at University of Milano Bicocca. Thesis: “Role of Protocadherin-10 in the formation and function of excitatory synapses”. Currently, predoctoral fellow in the Dr Folci’s lab at the CNR-Institute of Neuroscience, Milano, Italy.
- 2020-2022: Supervisor of MSc thesis of Cristina Guglielmetti in Neurobiology at University of Pavia. Thesis: “OPHN1 sumoylation in synaptic function and dysfunctions”.
- 2017- 2020: Co-supervisor of Ph.D student Marta Prieto within the project: “Impact of novel Fmr1 missense mutations on FMRP sumoylation and function”.
- 2013 -2014: Supervisor of MSc thesis of Fabiana Longo in Medical Biotechnology and Molecular Medicine at University of Milan. Thesis: “Characterization of unconventional myosin IXA role in brain using knockout mouse model”.
- 2010: Supervisor of BSc thesis of Dr Biggi in Medical biotechnology at University of Milan. Thesis: “The role of hnRNP K protein in hippocampal neurons”.

C. Contributions to Science

- **16 publications** in peer-reviewed journals (8 as main first author)
- **H-index: 13** (from Scopus)
- **Citations > 500**
- More than 20 oral/poster presentations in national and international conferences.

MAJOR RESEARCH ACHIEVEMENTS

The scientific career of Alessandra Folci has focused on the synapse physiology and synaptic disfunctions associated with the development of intellectual disability. Recently, she started exploring the role of neuronal sumoylation in synapse physiology and brain pathology.

Her major scientific contributions include:

- * Identification of novel mechanisms controlling the trafficking of AMPA receptor in physiological and pathological conditions;
- * Characterization of the impact of phosphorylation in controlling the surface dynamics of the Cav1.2 Voltage-Gated Calcium Channel in hippocampal neurons;
- * Characterization of a novel and pathological FMRP missense mutations on synapse physiology and plasticity;
- * Identification of neuronal pathway regulating the balance between sumoylation and desumoylation in synapse physiology.
- * Identification of novel SUMO target essential for neuronal physiology including FMRP, Protocadherin-10 and Oligophrenin-1.

D. Relevant Publications

List of the most relevant publications:

- Seccia A., Busnelli M., Erreni M., ...and **Folci A.** “Bidirectional coupling between SUMOylation and protein conformational dynamics regulates OPHN1 function”. **Manuscript submitted**.
- Lanzetti S., Mesirca P., Polona Diestra N., Torre E., Mari M., Haddad S., Obermair G.J., Campiglio M., **Folci A.**, Mangoni M.E. and Di Biase V. “The expression level of CACNA1C-encoded CaV1.2 is a tipping point between promotion and inhibition of dendritic growth in neurons”. **BioRxiv (2025)**

- Fossati M, Erreni M, Biagioni M, **Folci A**. “Assessing the Nanoscale Organization of Excitatory and Inhibitory Synapses Using Recombinant Probes to Visualize Endogenous Synaptic Proteins”. **Book chapter for the volume “Translational Research Methods in Neurodevelopmental Disorders”** edited by Springer. (2022)
- Prieto M*, **Folci A***, Poupon G, ...and Martin S. “Missense mutation of Fmr1 results in impaired AMPAR-mediated plasticity and sociocognitive deficits in mice”. ***Co-first authors Nat.Comm (2021)**
- **Folci A***, Mirabella F., Fossati M*. “Ubiquitin and ubiquitin-like proteins in the critical equilibrium between synapse physiology and intellectual disability” **eNeuro (2020) *Co-corresponding authors**
- Prieto M*, **Folci A***, Martin S. “Post-translational modification of the Fragile X Mental Retardation Protein in neuronal function and dysfunction” **Mol. Psy. (2019) *Co-first authors**
- **Folci A**, Steinberger A, Ruslan S., Campiglio M., Ramprecht C., Obermair GJ, Heine M, Di Biase V. Molecular mimicking of C-terminal phosphorylation tunes the surface dynamics of CaV1.2 calcium channels in hippocampal neurons. **J Biol Chem (2018)**.
- Khayachi A., Gwizdek C., Poupon G., Alcor D., Chafai M., Cassè F., Maurin T., Prieto M., **Folci A**., De Graeve F., Castagnola S., Gautier R., Schorova L., Loriol C., Pronot M., Besse F., Brau F., Deval E., Bardoni B. and Martin S. Sumoylation regulates FMRP-mediated dendritic spine elimination and postsynaptic maturation. **Nat Commun (2018)**.
- **Folci A***, Murru L*, Vezzoli E, Ponzoni L, Gerosa L, Moretto E, Longo F, Zapata J, Braida D, Pistillo F, Bhler M, Francolini M, Sala M, Bassani S. Myosin IXa binds AMPAR and regulates synaptic structure, LTP and cognitive function. **Front Mol Neurosci (2016). *Co-first author**.
- Maraschi A, Ciammola A, **Folci A**, Sassone F, Ronzitti G, Cappelletti G, Silani V, Sato S, Hattori N, Mazzanti M, Chieregatti E, Mülle C, Passafaro M, Sassone J. Parkin regulates kainite receptors by interacting with the GluK2 subunits. **Nat Commun (2014)**.
- **Folci A**, Mapelli L, Sassone J, Prestori F, D'Angelo E, Bassani S, Passafaro M. Loss of hnRNP K impairs synaptic plasticity in hippocampal neurons. **J Neurosci (2014)**.
- Bassani S, Cingolani LA, Valnegri P, **Folci A**, Zapata J, Gianfelice A, Sala C, Goda Y, Passafaro M. The X-linked intellectual disability protein TSPAN7 regulates excitatory synapse development and AMPAR trafficking. **Neuron (2012)**.