

Enrica Boda

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http://www.neuroscienze.unito.it/do/docenti.pl/Show?_id=eboda

<http://www.nico.ottolenghi.unito.it/ita/Ricerca/Gruppi-di-ricerca/Fisiopatologia-delle-cellule-staminali-cerebrali/Ricercatori/Enrica-Boda>

Born in Turin (Italy), 08/05/1981

PRESENT POSITION

Associate Professor in Human Anatomy (BIO/16), Dept. Neuroscience Rita Levi Montalcini, Neuroscience Institute Cavalieri Ottolenghi (NICO), Univ. of Turin (UNITO), Italy

PREVIOUS POSITIONS AND EDUCATION

October 2017-September 2020 Assistant Professor on tenure track (RTD-B) in Human Anatomy (BIO/16), Dept. Neuroscience, NICO, UNITO, Italy

May-October 2018 Maternity Leave

2017 Abilitazione Scientifica Nazionale – ASN, II fascia in Human Anatomy (05/H1)

2010-2017 Post-doc Fellow. Dept. Neuroscience, NICO, UNITO, Italy. PI: Prof. A. Buffo (Lab. Physiopathology of neural stem cells). Fellowships granted by Fondazione Veronesi (2014-2015) and Accademia Nazionale dei Lincei (Giuseppe Levi Fellowship 2012-2014). Independent funds (Cariplo Ricerca Biomedica condotta da Giovani Ricercatori; 2015-2017).

June-August 2015 Visiting Scholar in Dr. A. Nishiyama's lab, Dept. Physiology and Neurobiology, Univ. of Connecticut, Storrs, CT (USA)

May 2015 and Feb 2015 Short stays in Dr. V. Taylor's lab, Embryology and Stem Cell Biology, Dept. Biomedicine, Univ. of Basel, Basel, Switzerland.

2010 PhD in Neuroscience. Dept. Neuroscience, UNITO, Italy. PI: Prof. F. Tempia (Lab. Neurophysiology of Neurodegenerative Diseases)

2005 Master's Degree in Neurobiology. 110/110 cum laude and honourable mention. Dept. Human and Animal Biology, UNITO, Italy. PI: Prof. I. Perroteau (Lab. Cellular and Molecular Biology)

ACADEMIC ROLES AND TEACHING (2020-2021)

Tutor of the PhD Program in Neuroscience

Human Anatomy (2CFU), Master Program in Medical Biotechnology

Human Anatomy (8CFU), Master Program in Pharmacy

Human Anatomy (1CFU), Bachelor Program in Nursing Science

Human Anatomy (1CFU), Specialization in Medical Physics

Tirocinio Anatomia Umana II, Master Program in Medicine and Surgery

In vitro and ex vivo approaches to study neural cells: from primary cultures to human organoids (1CFU), PhD Program in Neuroscience

RESEARCH INTERESTS

Neurodegenerative and neurodevelopmental disorders (Multiple Sclerosis, microcephaly). Glial cell biology and heterogeneity. Glia-neurons cross-talk in health and disease. Molecular mechanisms involved in the regulation of the self-renewal and differentiation of neural progenitors and glial cells.

PRESENT COLLABORATIONS

Prof. Ferdinando di Cunto (Dept. Neuroscience and NICO, UNITO, Italy)

Dr. Francesca Montarolo, Dr. Antonio Bertolotto (CRESM and NICO, Orbassano, Italy)

Dr. Davide Lecca, Prof. Maria Pia Abbracchio (Dept. Pharmacological Sciences, Univ. of Milan, Italy);

Dr. Luca Ferrari, Prof. Valentina Bollati (EPIGET--Dept. Clinical Sciences and Community Health, Univ. of

Milan, Italy);
Dr. Brian Harding (Univ. of Pennsylvania, Children's Hospital of Philadelphia, USA);
Prof. Stephanie Bielas (Dept. Human Genetics, Univ. of Michigan, Ann Arbor, MI, USA)

RESEARCH GRANTS

2020 Italian Multiple Sclerosis Foundation (FISM) Pilot Project: Air pollution and Multiple Sclerosis: role of particulate matter (PM) exposure and associated extracellular vesicle trafficking in neuroinflammation and Demyelination (ID 2019/PR-Multi/003). Role: PI

2015 Cariplo Ricerca Biomedica condotta da Giovani Ricercatori, 3-years project granted by Cariplo Foundation, Milan, Italy. Characterization of a novel microRNA involved in myelination: a new potential pathogenetic mechanisms in Multiple Sclerosis (ID: 2014-1207). Role: co-PI (PI: Davide Lecca, Dept. Pharmacological Sciences, Univ. of Milan).

OTHER FUNDS

2020 Departmental Funds. Project: Role of particulate matter (PM) exposure in neuroinflammation and demyelination. Role: PI

2018-2019 Departmental Funds. Project: Unveiling oligodendrocyte precursor heterogeneity in CNS physiology and pathology. Role: PI

2017 Individual funding for basic research (Ffabr), granted by the Italian Agency for the Evaluation of University and Research.

FELLOWSHIPS (*obtained on a National competitive basis*)

2015 Postdoctoral Fellowship granted by Fondazione Veronesi, Milan, Italy. Project: Targeting oligodendrocyte progenitor cell division mode to improve myelin repair in the aging CNS.

2014 Postdoctoral Fellowship granted by Fondazione Veronesi, Milan, Italy. Project: Rejuvenating the brain: targeting neural stem/progenitor cell division mode to improve cognitive functions and repair abilities of the aging CNS.

2012 2-years Postdoctoral Fellowship Giuseppe Levi granted by Accademia Nazionale dei Lincei, Rome, Italy. Project: Oligodendrocyte progenitor self-renewal and differentiation: insights into symmetric and asymmetric divisions and possible implications in dysmyelination following peri-natal hypoxia.

AWARDS AND TRAVEL GRANTS

2020 Finalist of the Woman of the Year Prize (<https://premiodonna.it/>), granted by the Innovation Future School, for her studies on Air pollution and Multiple Sclerosis

2016 Poster Prize 23rd Meeting of the French Glial Cell Club, Carry-le-Rouet 1-3 June 2016

2014 Poster prize Basel Stem Cell Network Meeting, 9-10 September 2014, Basel, Switzerland

2006 OPTIME Award 2005-2006 (The best graduate student at the Faculty of Biology, UNITO) by Unione Industriale di Torino

2005 Antonio Marzullo Award (The best undergraduate students in Cellular Biology), granted by Univ. of Trieste, Italy

2015 IBRO International Travel Grant, to attend European Meeting on Glial Cells in Health and Disease 2015, Bilbao, Spain

2015 Travel Grant to attend XVI Congress of the Italian Society for Neuroscience (SINS), granted by SINS

2014 Selected for the *Summer School for Young PIs*, UNITO and Post-Doc Development Center, Imperial College (London, UK), Bardonecchia, Italy

2011 Travel grant to attend the 2011 IBRO congress (granted by SINS)

MEMBERSHIPS OF SCIENTIFIC SOCIETIES:

Federation of the European Neuroscience Societies (FENS)

International Society of Neurochemistry (ISN)

European Society of Neurochemistry (ESN)
Italian Society of Neuroscience (SINS)
Italian Group for the Study of Neuromorphology (GISN)
Italian Society of Neuroimmunology (AINI)

EDITORIAL DUTIES AND REVIEWER ACTIVITY

Guest Editor for the Research Topic “The Role of Astroglia and Oligodendroglia in CNS Development, Plasticity, and Disease – Novel Tools and Investigative Approaches”, Front Cell Neurosci (<https://www.frontiersin.org/research-topics/13033/the-role-of-astroglia-and-oligodendroglia-in-cns-development-plasticity-and-disease---novel-tools-an>)

Guest Editor for the Special Issue “Glial Cells in CNS Pathology and Repair”, J Clin Med, MDPI (https://www.mdpi.com/journal/jcm/special_issues/Glial_Cell_CNS)

Review Editor for Frontiers in Neuroanatomy, Frontiers in Cellular Neuroscience – Section Non-neuronal cells, Frontiers in Neurogenesis

Ad-hoc reviewer for Glia, Front Neurosci, Sci Rep, Mech Ageing Dev, JAD, Plos One, Biochem Pharm, Gene, Neurochem Res, Purinergic Signal, Int J Mol Sci, BMC Mol Biol, Theriogenology, Cells, Exp Mol Pathol, Eur J Histochem

GRANT REVIEWER ACTIVITY

Italian Foundation Multiple Sclerosis (FISM)
Multiple Sclerosis Research Australia Foundation
Bando Vinci – Italian-French University

PhD THESIS REVIEWER

2021 Dr. Electra Brunialti - β -glucocerebrosidase mediates microglial neuroprotective functions: a possible link between Parkinson’s and Gaucher’s diseases. PhD Program in Pharmacological, Experimental and Clinical Sciences, University of Milan, Italy

2021 Dr. Elena Albizzati - Searching for novel molecular targets in astrocytes for the treatment of Rett Syndrome. PhD Program in Experimental Medicine and Medical Biotechnologies, University of Milan, Italy.

MENTORING ACTIVITY

2017-present (as PI)

Dr. Maryam Khastkhoudeh Ardakani, PhD student in Neuroscience, UNITO

Dr. Roberta Parolisi, Postdoc fellow (hired on Cariplo Foundation grant and then on the FISM Project).

Dr. Cecilia Astigiano, Junior fellow

Supervision of Master’s and Bachelor’s students: Cecilia Astigiano, Cecilia Zen, Gloria Fornaro, Irene Floris, Annapia Vitacolonna (Master Program in Medical Biotech), Giulia Colombero, Francesco Gobbi (Master Program in Pharmacy), Marta Ravizzotti (Bachelor’s degree in Molecular Biotech), Alessia Zotta (Master Program in Medical Biotech, co-supervision with Prof. Francesco Retta, Dept. of Biological and Clinical Sciences).

ORGANIZATION OF SYMPOSIA AND CONFERENCES

2018-present BraYn (*Brainstorming Research Assembly for Young Neuroscientists*) (<https://www.braynconference.com/>)

2020 Workshop: “*Glial cell-neuron crosstalk in health and disease*” 1-3 Oct 2020, Turin, Italy (<https://www.nico.ottolenghi.unito.it/Agenda/GLIAL-CELLS-NEURON-CROSSTALK-IN-CNS-HEALTH-AND-DISEASE>).

2020 XXXI Meeting of the Italian Group for the Study of Neuromorphology (GISN), 13-14 Nov 2020, Turin, Italy

2020 2nd National Meeting “Morfologia e dintorni”, 22-23 Feb 2020, Turin, Italy

2019 Satellite symposium: “*Molecular mechanisms regulating oligodendroglia functions and re-/myelination*” 1 Sept 2019, 23rd ESN (European Society of Neurochemistry) Meeting 2019, Milan, Italy

2015 Symposium: “*Intrinsic and extrinsic regulation of oligodendrocyte progenitor cell self-renewal and differentiation*” 9 Oct 2015, SINS (Italian Society of Neuroscience) Meeting 2015, Cagliari, Italy

PUBLICATIONS

Publications: 27 + 2 book chapters

H-index (Scopus 08/04/2021): 14

Total citations (Scopus 08/04/2021): 740

1. Parolisi R, Montarolo F, Pini A, Rovelli S, Cattaneo A, Bollati V, **Boda E** (2021) *Particulate matter 2.5 (PM2.5) exposure hampers myelin repair in a mouse model of white matter demyelination*. *Neurochem Int*, 145,104991.
2. Lorenzati M, **Boda E**, Parolisi R, Bonato M, Borsello T, Herdegen T, Buffo A, Vercelli A (2021) *c-Jun N-terminal Kinase 1 (JNK1) modulates oligodendrocyte progenitor cell architecture, proliferation and myelination*. *Sci Rep*, 11:7264
3. Balbo I, Montarolo F, **Boda E**, Tempia F, Hoxha E (2021) *Elov15 expression in the central nervous system of the adult mouse*. *Front Neuroanatomy* (accepted)
4. Marangon D, **Boda E**, Parolisi R, Negri C, Giorgi C, Montarolo F, Perga S, Bertolotto A, Buffo A, Abbracchio MP, Lecca D (2020) *In vivo silencing of miR-125a-3p promotes myelin repair in models of white matter demyelination*. *Glia*, 68:2001-2014. <https://doi.org/10.1002/glia.23819>
5. **Boda E****, Rigamonti AE, Bollati V (2020) *Understanding the effects of air pollution on neurogenesis and gliogenesis in the growing and adult brain*. *Curr Opin Pharmacol*, 50:61-66. doi: 10.1016/j.coph.2019.12.003. (**Corresponding author)
6. Finetti F, Schiavo I, Ercoli J, Zotta A, **Boda E**, Retta SF, Trabalzini L (2020) *KRIT1 loss-mediated upregulation of NOX1 in stromal cells promotes paracrine proangiogenic responses*. *Cell Signal*. 2020 Jan 6:109527. doi: 10.1016/j.cellsig.2020.109527.
7. **Boda E** (2019) *Myelin and oligodendrocyte lineage cell dysfunctions: New players in the etiology and treatment of depression and stress-related disorders*. *Eur J Neurosci*. 2019 Nov 17. doi: 10.1111/ejn.14621.
8. Vieceli Dalla Sega F, Mastrocola R, Aquila G, Fortini F, Fornelli C, Zotta A, Cento AS, Perrelli A, **Boda E**, Pannuti A, Marchi S, Pinton P, Ferrari R, Rizzo P, Retta SF (2019) *KRIT1 Deficiency Promotes Aortic Endothelial Dysfunction*. *Int. J. Mol. Sci.* 20, 4930. doi: 10.3390/ijms20194930.
9. Kempf A, **Boda E**, Kwok J, Fritz R, Grande V, Kaelin AM, Ristic Z, Schmandke A, Schmandke A, Tews B, Fawcett JW, Pertz O, Buffo A, Schwab ME (2017). *Control of cell shape, neurite outgrowth and migration by a Nogo-A/HSPG interaction*. *Dev Cell*, 43:24-34.e5
10. **Boda E****, Nato G, Buffo A (2017). *Emerging pharmacological approaches to promote neurogenesis from endogenous glial cells*. *Biochem Pharmacol*, vol. pii: S0006-2952(17)30453-7, p. 30453-30457, doi: 10.1016/j.bcp.2017.06.129 (**Corresponding author)
11. Fucà E, Guglielmotto M, **Boda E**, Rossi F, Leto K, Buffo A (2017). *Preventive motor training but not progenitor grafting ameliorates cerebellar ataxia and deregulated autophagy in tambaleante mice*. *Neurobiol Dis*. 102:49-59. doi: 10.1016/j.nbd.2017.02.005
12. Joshi P, Gabrielli M, Ponzoni L, Pelucchi S, Stravalaci M, Beeg M, Mazzitelli S, Braidà D, Sala ME, **Boda E**, Buffo A, Gobbi M, Gardoni F, Matteoli M, Marcello E, Verderio C (2017). *Fingolimod limits acute A β neurotoxicity and promotes synaptic versus extrasynaptic NMDA receptor functionality in hippocampal neurons*. *Sci Rep*, 7:41734. doi: 10.1038/srep41734
13. Pellegrino PM*, **Boda E***, Montarolo F, Boero M, Saglio G, Buffo A, Roetto A (2016). *Transferrin Receptor 2-dependent alterations of brain iron metabolism affect anxiety circuits in mouse* *Sci Rep*. 6:30725. (*the two authors contributed equally to the work)
14. **Boda E****, Di Maria S, Rosa P, Taylor V, Abbracchio MP, Buffo A (2015). *Early phenotypic asymmetry of sister oligodendrocyte progenitor cells after mitosis and its modulation by aging and extrinsic factors*. *Glia*. 63:271-86. (**Corresponding author)

15. **Boda E****, Buffo A (2014). *Beyond cell replacement: unresolved roles of NG2-expressing progenitors*. Front. Neurosci., 8:122. doi: 10.3389/fnins.2014.00122 (**Corresponding author)
16. Montarolo F, Parolisi R, Hoxha E, **Boda E**, Tempia F (2013). *Early enriched environment exposure protects spatial memory and accelerates amyloid plaque formation in APP^{Swe}/PS1^{L166P} mice*. PLoS One;8:e69381.
17. Rolando C, Parolisi R, **Boda E**, Schwab ME, Rossi F, Buffo A (2012). *Distinct roles of Nogo-A and Nogo receptor 1 in the homeostatic regulation of adult Neural Stem Cell function and neuroblast migration*. J. Neurosci;32: 17788-17799.
18. **Boda E**, Hoxha E, Pini A, Montarolo F, Tempia F (2012). *Brain expression of Kv3 genes in development, adulthood, aging and in a murine model of Alzheimer's disease*. J Mol Neurosci;46:606-15
19. Hoxha E, **Boda E**, Montarolo F, Parolisi R, Tempia F (2012). *Excitability and synaptic alterations in the cerebellum of APP/PS1 mice*. PLoS One;7:e34726.
20. **Boda E**, Viganò F, Fumagalli M, Rosa P, Labat-gest V, Tempia F, Abbracchio MP, Dimou L, Buffo A (2011). *The GPR17 receptor in NG2+ cells: focus on in vivo cell maturation and participation in acute trauma and chronic damage*. Glia;59:1958-73.
21. Bianchi FT, Camera P, Ala U, Imperiale D, Migheli A, **Boda E**, Tempia F, Berto G, Bosio Y, Oddo S, LaFerla FM, Taraglio S, Dotti CG, Di Cunto F (2011). *The collagen chaperone HSP47 is a new partner of APP that modulates the levels of beta-amyloid peptides*. PlosONE;6:e22370.
22. Ceruti S, Viganò F, **Boda E**, Ferrario S, Magni G, Boccazzi M, Rosa P, Buffo A, Abbracchio MP (2011). *Expression of the new P2Y-like receptor GPR17 during oligodendrocyte precursor cell maturation regulates sensitivity to ATP-induced death*. Glia;59:363-78.
23. **Boda E**, Buffo A (2010). *Glial cells in non-germinal territories: insights into their stem/progenitor properties in the intact and injured nervous tissue*. Arch Ital Biol 148 (2).
24. Sacco T*, **Boda E***, Hoxha E, Pizzo R, Cagnoli C, Brusco A, Tempia F (2010). *Mouse brain expression patterns of Spg7, Afg3l1, and Afg3l2 transcripts, encoding for the mitochondrial m-AAA protease*. BMC Neurosci;11:55 (**the two authors contributed equally to the work).
25. Di Bella D, Lazzaro F, Brusco A, Plumari M, Battaglia G, Pastore A, Finardi A, Cagnoli C, Tempia F, Frontali M, Veneziano L, Sacco T, **Boda E**, Brussino A, Bonn F, Castelletti B, Baratta S, Mariotti C, Gellera C, Fracasso V, Magri S, Langer T, Pievani P, Di Donato S, Muzi-Falconi M, Taroni F (2010). *Mutations in the mitochondrial protease gene AFG3L2 cause dominant hereditary ataxia SCA28*. Nat Genet;42:313-21.
26. **Boda E****, Pini A, Hoxha E, Parolisi R, Tempia F (2009). *Selection of reference genes for quantitative real-time RT-PCR studies in mouse brain*. J Mol Neurosci;37:238-53. (**Corresponding author)
27. Giampietro C, Luzzati F, Gambarotta G, Giacobini P, **Boda E**, Fasolo A, Perroteau I (2005). *Stathmin expression modulates migratory properties of GN-11 neurons in vitro*. Endocrinology;146:1825-34.

Book chapters

1. Parolisi R, **Boda E** (2018) *NG2 glia: novel roles beyond re-/myelination*. Neuroglia, 1(1), 11. <https://doi.org/10.3390/neuroglia1010011>. In: Sergey Kasparov, Neuroglia, MDPI, ISBN 978-3-03897-991-3.
2. Rolando C, **Boda E**, Buffo A (2012). *Immune system modulation of parenchymal and germinal neural progenitor cells in physiological and pathological conditions*, In: Sun Tao. Neural Stem Cells and Therapy. p. 413-440, 51000 RIJEKA:InTech, ISBN: 9789533079585

ORAL COMMUNICATIONS AT MEETINGS

1. *Are oligodendrocyte progenitors all born equal? A lesson from a microcephaly model.* 1 October 2020, in the frame of the workshop: "Glial cell-neuron crosstalk in health and disease" 1-3 October 2020, Turin, Italy (webinar).
2. *Oligodendroglia heterogeneity in physiology and pathology: a confocal study in vivo and in vitro.* 26 May 2020, in the frame of the 9th workshop "Advanced microscopy techniques for biomedical applications", Dept. of Clinical and Biological Sciences, Orbassano (Turin), Italy (webinar)
3. *Oligodendroglia differently respond to DNA damage depending on their developmental origin.* 22 Feb 2020, 2nd National Meeting "Morfologia e dintorni", Turin, Italy
4. *Strategies to support neural progenitor survival and maturation during CNS development: a lesson from the microcephalic Cit-K KO mouse model.* November 2019, 39th Meeting of the Italian Society of Pharmacology (SIF), Florence, Italy
5. *Are oligodendrocyte progenitors all born equal? A lesson from a microcephaly model.* 1 September 2019, 23rd ESN (European Society of Neurochemistry) Meeting 2019, Milan, Italy
6. *Heterogeneity of the response to DNA damage in oligodendroglia populations: a functional study in vivo and in vitro.* 24 May 2019, in the frame of the 8th workshop "Advanced microscopy techniques for biomedical applications", Dept. of Clinical and Biological Sciences, Orbassano (Turin), Italy
7. *Are oligodendrocyte progenitors all born equal? A lesson from a microcephaly model.* 30 November 2018, "More than Neurons Meeting", Turin, Italy
8. *Are oligodendrocyte progenitors all born equal? A lesson from a microcephaly model.* 1 December 2017, XXVII Meeting of the Italian Group for the Study of Neuromorphology (GISN), Bologna, Italy
9. *Inherent heterogeneity in dorsal and ventral OPCs of the mouse CNS unveiled by Citron-kinase deletion.* 3 December 2016, "More than Neurons Meeting: toward a less neuronocentric view of brain disorders", Turin, Italy
10. *Inherent heterogeneity in dorsal and ventral OPCs of the mouse CNS unveiled by Citron-kinase deletion.* 23 November 2016, XXVI Meeting of the Italian Group for the Study of Neuromorphology (GISN), Verona, Italy
11. *Balancing self-renewal and differentiation of the oligodendrocyte progenitor pool: insights into cell intrinsic regulatory mechanisms.* 9 October 2015, SINS (Italian Society of Neuroscience) Meeting 2015, Cagliari, Italy
12. *Heterogeneity and balance between proliferation and differentiation in the oligodendrocyte progenitor pool.* 24 September 2015, XVI Congress of the Spanish Society of Neuroscience, Granada, Spain (in place of Prof. Annalisa Buffo)
13. *The GPR17 receptor in oligodendroglial cells: cell maturation, heterogeneity and participation in CNS damage.* November 2011, IV Convegno Monotematico della SIF, 'Immunità e infiammazione nelle malattie del cervello. Nuovi bersagli farmacologici per terapie innovative', Milan, Italy

INVITED SEMINARS

14. *Are oligodendrocyte progenitors all born equal? A lesson from a microcephaly model.* 28 July 2020, Institute of Neuroscience, National Research Council (CNR), Pisa, Italy (via live streaming). Host: Dr. Eleonora Vannini
15. *Heterogeneity and balance between proliferation and differentiation in the oligodendrocyte progenitor pool.* 18 November 2015, Department of Pharmacological and Biomedical Sciences, University of Milan, Italy. Host: Prof. Roberto Melcangi
16. *Dynamics of self-renewal and differentiation of the oligodendrocyte progenitor pool in the CNS parenchyma.* 29 November 2013, CNR, Institute of Neuroscience, Milan, Italy (invited by Dr. Patrizia Rosa)
17. *The GPR17 receptor in oligodendroglial cells: focus on cell heterogeneity, maturation and participation in CNS damage.* July 2012, Advanced School on New Approaches in Glial Cell Research, International Society for Neurochemistry, Barcelona, Spain (poster selected for oral presentation).

Torino, 08/04/2021

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