

Curriculum Vitae

Personal data

Name and Surname *Francesca Talpo*

Date of birth *April 27, 1985*

Place of birth *Calcinate (BG – Italy)*

Work Experience

September 2017 to date *Postdoctoral Assistant*

University of Pavia

Dept. Biology and Biotechnology "L. Spallanzani" – Toselli & Biella Lab

Via Forlanini 6, 27100 Pavia (PV) (Italy)

RESEARCH FIELD

Electrophysiological patch-clamp recordings on brain slices of mice/rats and on cell cultures aimed to investigate:

1. Stem cells functional differentiation into striatal medium-sized spiny neuron;
2. Altered functionality of striatal medium-sized spiny neurons in mouse models of Huntington's disease.

September 2016 – May 2017 *Postdoctoral Assistant*

Yale University

School of Medicine – Dept Neuroscience – Sestan Lab

333 Cedar Street, 06510 New Haven (CT) (USA)

RESEARCH FIELD

1. Development of electrophysiology for use as a resource in the Sestan Lab.
2. Electrophysiological patch-clamp recordings in vitro and ex vivo for neurodevelopmental studies.
3. Electrophysiological patch-clamp recordings on cell cultures to test stem cells functional differentiation into specific neurons

May 2015 – April 2016 *Postdoctoral Assistant*

University of Milano-Bicocca

School of Medicine and Surgery – Sancini Lab

Via Cadore 48, 20900 Monza (MB) (Italy)

RESEARCH FIELD

Electrophysiological patch-clamp recordings on brain slices of mice/rats and on cell cultures aimed to investigate:

1. Altered functionality of striatal medium-sized spiny neurons in mouse models of Huntington's disease;
2. Stem and fetal cells functional differentiation into striatal medium-sized spiny neurons.
3. Oxytocinergic modulation of the hippocampus

March 2013 – April 2015

Postdoctoral Assistant

University of Pavia

Dept. Biology and Biotechnology "L. Spallanzani" – Toselli & Biella Lab

Via Forlanini 6, 27100 Pavia (PV) (Italy)

RESEARCH FIELD

Electrophysiological patch-clamp recordings on brain slices of mice/rats and on cell cultures aimed to investigate:

1. Stem and fetal cells functional differentiation into striatal medium-sized spiny neuron;
2. Altered functionality of striatal medium-sized spiny neurons in mouse models of Huntington's disease;
3. Role of the Rac proteins in the brain: epilepsy and anomalies caused by the absence of Rac proteins in the hippocampus and neocortex.

November 2009 – October 2012

PhD student

University of Pavia

Dept. Physiological-Pharmacological, Cellular, and Molecular Sciences – Toselli & Biella Lab

Via Forlanini 6, 27100 Pavia (PV) (Italy)

RESEARCH FIELD

Electrophysiological patch-clamp recordings on brain slices of mice/rats and on cell cultures aimed to investigate:

1. Role of the Rac proteins in the brain: epilepsy and anomalies caused by the absence of Rac proteins in the hippocampus and neocortex;
2. Stem and fetal cells functional differentiation into striatal medium-sized spiny neuron;
3. Muscarinic modulation of the perirhinal cortex (PRC) and resonance properties of the PRC neurons.

September 2008 – September 2009

Master's thesis internship

University of Pavia

Dept. Physiological-Pharmacological, Cellular, and Molecular Sciences

Via Forlanini 6, 27100 Pavia (PV) (Italy)

RESEARCH FIELD

Electrophysiological patch-clamp recordings on brain slices of mice/rats and on cell cultures aimed to investigate the muscarinic modulation of the perirhinal cortex (PRC) and the resonance properties of the PRC neurons.

September 2006 – July 2007

Bachelor's thesis internship

IRCCS Policlinico San Matteo

Dept. Pediatric Sciences - Research Laboratories

Viale Camillo Golgi 19, 27100 Pavia (PV) (Italy)

RESEARCH FIELD

Medical diagnosis. Molecular analysis of donor/recipient chimerism in pediatric patients after hematopoietic stem cells transplantation.

Education

February 11, 2013

Doctor of Philosophy degree in Physiology and Neuroscience (EQF 8)

University of Pavia, Pavia, Italy

Thesis title: *Electrophysiological analysis of the role of Rac1 and Rac3 in the development of the hippocampal circuit*

- September 14, 2009 *Master's degree in Neurobiology (EQF 7) – graduated with honors*
University of Pavia, Pavia, Italy
 Thesis title: *Effect of the muscarinic modulation on GABAergic interneurons of the mouse perirhinal cortex*
- July 27, 2007 *Bachelor's degree in Biotechnology (EQF 6) – graduated with honors*
University of Pavia, Pavia, Italy
 Thesis title: *Analysis of hematopoietic reconstitution in a pediatric patient undergoing allogeneic transplantation of stem cells obtained from two umbilical cord blood units, one of which propagated ex vivo*

Language Skills

- Mother tongue *Italian*
- Other languages *Fluent English*
Basic French

Publications *h-index: 4*

IN EXTENSIO

- 1) *Pennucci R*, Talpo F*, Astro V, Montinaro V, Morè L, Cursi M, Castoldi V, Chiaretti S, Bianchi V, Marenga S, Cambiaghi M, Tonoli D, Leocani L, Biella G, D'Adamo P, de Curtis I (2015). Loss of Either Rac1 or Rac3 GTPase Differentially Affects the Behavior of Mutant Mice and the Development of Functional GABAergic Networks. CEREBRAL CORTEX, 26:873-90. doi: 10.1093/cercor/bhv274. Epub 2015 Nov 17. ***co-first authors***
- 2) *Onorati M., Castiglioni V, Biasci D, Cesana E, Menon R, Vuono R, Talpo F, Goya RL, Lyons PA, Bulfamante GP, Muzio L, Martino G, Toselli M, Farina C, Barker RA, Biella G, Cattaneo E (2014). Molecular and Functional Definition of the Developing Human Striatum. NATURE NEUROSCIENCE, 17(12):1804-15. doi: 10.1038/nn.3860. Epub 2014 Nov 10.*
- 3) *Vaghi V, Pennucci R, Talpo F, Corbetta S, Montinaro V, Barone C, Croci L, Spaiardi P, Consalez GG, Biella G, de Curtis I (2014). Rac1 and Rac3 GTPases Control Synergistically the Development of Cortical and Hippocampal GABAergic Interneurons. CEREBRAL CORTEX, 24(5):1247-58. doi: 10.1093/cercor/bhs402. Epub 2012 Dec 20.*
- 4) *DelliCarri A, Onorati M, Lelos J, Castiglioni V, Faedo A, Menon R, Camnasio S, Vuono R, Spaiardi P, Talpo F, Toselli M, Martino G, Barker RA, Dunnett SB, Biella G, Cattaneo E (2013). Developmentally coordinated extrinsic signals drive human pluripotent stem cell differentiation toward authentic DARPP-32+ medium-sized spiny neurons. DEVELOPMENT, 140(2):301-12. doi: 10.1242/dev.084608.*
- 5) *Spaiardi P, Talpo F, Toselli M, Biella G, Marinoni A, Savazzi P, Favalli L (2010). Analysis of the noise associated to the muscarinic modulation of the mouse perirhinal cortex. In: proceedings of The 3rd International Symposium on Applied Sciences in Biomedical and Communication Technologies. Roma, 7-10 novembre, Roma: CTIF , IEEE, p. 1-5, ISBN/ISSN: 9781424481316, doi: 10.1109/ISABEL.2010.5702765.*

ABSTRACTS & ORAL COMMUNICATIONS

- 1) *Talpo F, de Curtis I, Pennucci R, Astro V, Biella G. "Lowering of the epileptogenic threshold in mouse models lacking Rac1 and Rac3 GTPases in neurons". 67° SIF National Congress (The Physiological Society of Italy). Catania (Italy), 21-23 September 2016.*

- 2) Maniezzi C, Talpo F, Spaiardi P, Petrella M, Tamamaki N, Biella G, Toselli M. "Oxytocin modulates phasic and tonic GABAA receptor-mediated inhibition of firing in CA1 pyramidal cells". 10TH FENS Forum of European Neuroscience. Copenhagen (Denmark), 2-6 July 2016.
- 3) Biella G, Talpo F, Zuccato C, Cattaneo E, Sancini G, Toselli M. "Impairment of cortico-striatal glutamatergic synapses in two mouse models of Huntington's Disease (HD)". XVI National Congress of the Italian Society of Neuroscience. Cagliari (Italy), 8-11 October 2015.
- 4) Talpo F, Zuccato C, Cattaneo E, Sancini G, Toselli M, Biella G. "Impairment of cortical inputs towards striatal medium-spiny neurons and fast-spiking GABAergic interneurons in two mouse models of Huntington's Disease (HD)". 66° SIF National Congress (The Physiological Society of Italy). Genoa (Italy), 16-18 September 2015.
- 5) Talpo F, de Curtis I, Pennucci R, Astro V, Biella G "Rac1 and Rac3 GTPases influence the development of the hippocampal GABAergic circuits". 66° SIF National Congress (The Physiological Society of Italy). Genoa (Italy), 16-18 September 2015.
- 6) Battaglia E, Conforti P, Talpo F, Saftig P, Biella G, Cattaneo E, Zuccato C. "Role of ADAM10 in Huntington's Disease". XVIII Telethon Scientific Convention. Riva del Garda (Italy), 9-11 March 2015.
- 7) Cesana E, Talpo F, Bina L, Cobelli F, Motta B, Castiglioni V, Onorati M, Conforti P, Cattaneo E, Toselli M, Biella G. "Comparative functional evaluation of medium-sized spiny neurons differentiated from human embryonic- and induced- stem cells". 65° SIF National Congress (The Physiological Society of Italy). Anacapri (Italy), 28-30 September 2014.
- 8) Cesana E, Talpo F, Bina L, Cobelli F, Motta B, Castiglioni V, Onorati M, Delli Carri A, Cattaneo E, Toselli M, Biella G. "Functional characterization of medium-sized spiny neurons derived from human embryonic stem cells and human fetal cells". 9TH FENS Forum of European Neuroscience. Milan, 5-9 July 2014.
- 9) Macco R, Pennucci R, Vaghi V, Talpo F, Croci L, Morè L, Botta M, Biella G, Consalez G, D'Adamo P, de Curtis I. "Role of Rac GTPases in the development of cortical GABAergic interneurons". 9TH FENS Forum of European Neuroscience. Milan, 5-9 July 2014.
- 10) Binini N, Maniezzi C, Talpo F, Yanagawa Y, Spaiardi P, Toselli M, Biella G. "Resonance properties of the perirhinal neurons in the mouse". 9TH FENS Forum of European Neuroscience. Milan (Italy), 5-9 July 2014.
- 11) Talpo F, Cesana E, Onorati M, Castiglioni V, Vuono R, Barker RA, Cattaneo E, Toselli M, Biella G. "Electrophysiological characterization of human cortical and striatal primary neurons". XV National Congress of the Italian Society of Neuroscience. Rome, 3-5 October 2013.
- 12) Binini N, Talpo F, Spaiardi P, Maniezzi C, Toselli M, Biella G. "Resonance, oscillations and muscarinic modulation in the mouse perirhinal cortex". XV National Congress of the Italian Society of Neuroscience. Rome, 3-5 October 2013.
- 13) Biella G, Onorati M, Cesana E, Talpo F, Castiglioni V, Vuono R, Toselli M, Barker RA, Cattaneo E. "Functional benchmarking of human fetus-derived cortical and striatal primary neurons". 11th Annual Meeting ISSCR (International Society for Stem Cell Research). Boston (MA, USA), 12-15 June 2013.
- 14) Talpo F, Spaiardi P, Biella G, Chini B, Toselli M. "Oxytocin modulates a class of hippocampal GABAergic interneurons in mice". 63° SIF National Congress (The Physiological Society of Italy). Verona (Italy), 21-23 September 2012.
- 15) Cesana E, Spaiardi P, Talpo F, Delli Carri A, Onorati M, Toselli M, Cattaneo E, Biella G. "Electrophysiological characterization of human pluripotent stem cells differentiated towards authentic fully functional medium spiny neurons". 63° SIF National Congress (The Physiological Society of Italy). Verona (Italy), 21-23 September 2012.
- 16) Talpo F, Spaiardi P, Biella G, Chini B, Toselli M. "Comparison of GABAergic synaptic activity in the hippocampus of wild-type and oxytocin receptor null mice". 8TH FENS Forum of European Neuroscience. Barcelona (Spain), 14-18 July 2012.
- 17) Pennucci R, Vaghi V, Talpo F, Barone C, Montinaro V, D'Adamo P, Biella G, de Curtis I. "Rac1 and Rac3 GTPases regulate the development of specific populations of cortical and hippocampal interneurons". 8TH FENS Forum of European Neuroscience. Barcelona (Spain), 14-18 July 2012.
- 18) Talpo F, Spaiardi P, Toselli P, de Curtis I, Biella G. "Analysis of the hyperexcitability of CA3 pyramidal neurons in a Rac1^N/Rac3^{KO} knock-out mouse model". SIF National Congress (The Physiological Society of Italy). Sorrento (Italy), 25-27 September 2011.

- 19) *Talpo E, Spaiardi P, Toselli M, de Curtis I, Biella G. "Analysis of the Hyperexcitability of CA3 Pyramidal Neurons in a Mouse-Model Presenting the Inactivation of Rac1 and Rac3 GTPases." International School of Biophysics "Antonio Borsellino". EMBO/FEBS Lecture Course on Channels and Transporters. Erice (Italy), 11-17 May 2011.*
- 20) *Talpo E, Spaiardi P, Marinoni A, Savazzi P, Toselli M, Favalli L, Biella G. "Muscarinic modulation of the perirhinal cortex: effects on GABAergic interneurons and pyramidal cells". 61° SIF National Congress (The Physiological Society of Italy). Varese (Italy), 15-17 September 2010.*
- 21) *Biella G, Yanagawa Y, Talpo E, Toselli M, Spaiardi P. "Muscarinic effects on GABAergic and pyramidal neurons of the mouse perirhinal cortex". 7TH FENS Forum of European Neuroscience. Amsterdam (Netherlands), 3-7 July 2010.*
- 22) *Talpo E, Spaiardi P, Marinoni A, Savazzi P, Favalli L, Yanagawa Y, Toselli M, Biella G. "Muscarinic modulation of the mouse perirhinal cortex and associated noise". Annual Meeting of Young Researchers in Physiology. Pisa (Italy), 16-19 June 2010.*

Invited talks

- 1) *"Neuronal electrophysiology: how to study the electrical properties of the neurons". New Haven, 4 May 2017.*
- 2) *"Role of the Rac1 and Rac3 proteins in the functional development of the hippocampal GABAergic circuits". Pavia, 23 June 2016.*
- 3) *"Role of the Rac1 and Rac3 GTPases in the development of the hippocampal GABAergic circuits" Neurogenesis and Neural plasticity – in memory of Elda Scherini. Pavia, 24 September 2015.*
- 4) *"Laboratory of voltage-clamp data analysis" School of Physiology and Biophysics 2015: Molecular and cellular biophysics of excitable cells - Società Italiana di Fisiologia. Pavia, 29 June-2 July 2015.*
- 5) *"Rac1N/Rac3KO mice: a new model of epilepsy" The First 10 Years of the Master Program in Neurobiology at the University of Pavia. Pavia, 30 May 2014.*

Honors, Grants, and Awards

- 1) *Travel Grant, International School of Biophysics "Antonio Borsellino". EMBO/FEBS Lecture Course on Channels and Transporters (Erice, Italy, 11-17 May 2011).*
- 2) *Best Poster Award "62° Congresso Nazionale SIF" (Sorrento, 25-27 September 2011).*
- 3) *Best Poster Award "Annual Meeting of Young Researchers in Physiology" (Pisa, 16-19 June 2010).*

Professional Development

- 1) *Neurogenesis and Neural plasticity – in memory of Elda Scherini. Pavia, 24 September 2015.*
- 2) *66° Congresso Nazionale SIF (Società Italiana Fisiologia). Genoa, 16-18 September 2015.*
- 3) *School of Physiology and Biophysics 2015: Molecular and cellular biophysics of excitable cells - Società Italiana di Fisiologia. Pavia, 29 June-2 July 2015.*
- 4) *9TH FENS Forum of European Neuroscience. Milan, 5-9 July 2014.*
- 5) *The First 10 Years of the Master Program in Neurobiology at the University of Pavia. Pavia, 30 May 2014.*
- 6) *XV National Congress of the Italian Society of Neuroscience. Rome, 3-5 October 2013.*
- 7) *63° Congresso Nazionale SIF (Società Italiana Fisiologia). Verona, 21-23 September 2012.*
- 8) *8TH FENS Forum of European Neuroscience. Barcelona, 14-18 July 2012.*
- 9) *International School of Biophysics "Antonio Borsellino". EMBO/FEBS Lecture Course on Channels and Transporters. Erice, 11-17 May 2011.*

- 10) *Symposium in honour of Jacopo Meldolesi. Intracellular signalling, calcium ions and membrane trafficking. Milano, 30 March 2011.*
- 11) *61° Congresso Nazionale SIF (Società Italiana Fisiologia). Varese, 15-17 September 2010.*
- 12) *The cerebellum: from neurons to higher control and cognition. Pavia, 8-9 July 2010.*
- 13) *Annual Meeting of Young Researchers in Physiology. Pisa, 16-19 June 2010.*

Didactics

- 1) *Assistant Lecturer (2014 – 2015 & 2015 – 2016) at the University of Pavia for the courses:
- General physiology (cod. 502241) (BIO/09 – Fisiologia) – Bachelor's Degree in Biological Sciences;
- Neural basis of behavior and general neuropsychology (cod. 502342) (M-PSI/02 – Psicobiologia e Psicobiologia fisiologica) – Master's Degree in Neurobiology.*
- 2) *Lectures given during the course of "General Physiology", Bachelor's Degree in Biological Sciences, University of Pavia (2011 – 2012 & 2012 – 2013).*
- 3) *Lectures given during the course of "Membrane biophysics and electrophysiology", Master's Degree in Neurobiology, University of Pavia (2009 – 2010).*

Theses correlator

- 1) *Master's Degree in Neurobiology (2015-2016 – University of Pavia) of Beatrice Badone; Thesis title: Functional impairment of cortical inputs towards striatal cells in two mouse models of Huntington's disease.
Supervisor: Gerardo Biella; Correlator: Francesca Talpo*
- 2) *Master's Degree in Neurobiology (2015-2016 – University of Pavia) of Anna Fontana; Thesis title: Lowering of the epileptogenic threshold in mouse models lacking Rac1 and Rac3 proteins in the nervous system.
Supervisor: Gerardo Biella; Correlator: Francesca Talpo*
- 3) *Master's Degree in Neurobiology (2014-2015 – University of Pavia) of Beatrice Ferrari; Thesis title: Anatomical and morphological alterations of striatal fast-spiking interneurons in two mouse models of Huntington's disease.
Supervisor: Mariagrazia Bottone; Correlator: Francesca Talpo*
- 4) *Bachelor's Degree in Biological Sciences (2013-2014 – University of Pavia) of Beatrice Badone; Thesis title: Alterations of the excitatory synaptic input to the striatal neurons in a mouse model of Huntington's disease.
Supervisor: Gerardo Biella; Correlator: Francesca Talpo*
- 5) *Master's Degree in Neurobiology (2012-2013 – University of Pavia) of Claudia Maniezzi; Thesis title: Resonance, oscillations and muscarinic modulation in the mouse perirhinal cortex.
Supervisor: Gerardo Biella; Correlator: Francesca Talpo*
- 6) *Bachelor's Degree in Biological Sciences (2011-2012 – University of Pavia) of Lorenzo Bina; Thesis title: Oxytocin-dependent modulation of a class of GABAergic interneurons in mouse hippocampus
Supervisor: Mauro Toselli; Correlator: Francesca Talpo*
- 7) *Bachelor's Degree in Biological Sciences (2011-2012 – University of Pavia) of Federica Di Mauro; Thesis title: Analysis of the susceptibility to epileptiform activity induction in Rac1^N/Rac3^{KO} mice
Supervisor: Gerardo Biella; Correlator: Francesca Talpo*
- 8) *Bachelor's Degree in Biological Sciences (2009-2010 – University of Pavia) of Mauro Piemontese; Thesis title: Noise analysis during the cholinergic modulation of the mouse perirhinal neurons
Supervisor: Gerardo Biella; Correlator: Francesca Talpo*

Personal skills

Social skills - *Good teaching and training skills derived from the educational experiences and the supervision of students during their thesis internships.*

Organizational skills	- Good organizational skills derived from both the experimental planning and the management of the laboratory activities.
Technical Skills	<p>- Fully competent in the use of the electrophysiological laboratory equipments and the patch-clamp set-up. Excellent command of the intracardiac perfusion procedure and murine brain dissection. Excellent knowledge of the whole-cell patch-clamp technique on isolated cells and brain slices. Full mastery of immunofluorescence techniques on free –floating brain slices.</p> <p>- Fully competent in the use of biological and chemical laboratory instrumentation. Knowledge of the main techniques of chemistry, biochemistry, cell biology, genetics, and microbiology. Knowledge of specific molecular biology techniques: separation of mononuclear cells from whole blood; DNA extraction and purification; DNA amplification by PCR; electrophoresis on polyacrylamide gel.</p>
Informatic Skills	<ul style="list-style-type: none"> - Good knowledge of Windows operating system. - Good knowledge of Microsoft Office (Word, Excel, and PowerPoint) and OpenOffice. - Good knowledge of the main Internet Browsers and the database Entrez-Pubmed. - Good knowledge of the software for acquisition and data analysis "p-Clamp" (Clampex & Clampfit). - Good knowledge of the software for statistic and data analysis "Microcal Origin". - Good knowledge of the graphics software "Adobe PhotoShop". - Good knowledge of the software for image analysis "ImageJ". - Basic knowledge of the statistic software R. - Basic knowledge of the Matlab programming language.