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## BIOGRAPHICAL SKETCH

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NAME LAURA BARONCELLI	POSITION TITLE Tenured Researcher
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EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
University of Pisa, Italy	B.A.	07/00	Biology
Scuola Normale Superiore, Pisa Italy	Ph.D.	10/05	Neurobiology
Scuola Normale Superiore, Pisa Italy	Postdoctoral training	01/10	Neurobiology
Neuroscience Institute CNR, Pisa Italy	Postdoctoral training	12/11	Neurobiology

### A. PERSONAL STATEMENT

A highly motivated PI with a broad background in Neuroscience and a specific training and expertise in brain physiology, and research on neurological disorders. I have the expertise, leadership, training, and motivation necessary to successfully carry out the proposed research project. As PI on Italian Ministry of Health, LUMOS Pharma, Lejeune Foundation and Telethon funded grants, I laid some groundwork for the proposed research. In addition, I already administered different research projects (research plan design, staffing, supervision of undergraduate and graduate research students, research protections, budget, communication), successfully collaborated with other researchers, and produced several peer-reviewed publications. The current application builds logically on my prior work. The Neuroscience Institute will provide strong support and assistance to this research, mainly by providing access to shared facilities, including two-photon and confocal microscopes, optical imaging rigs, behavioural facilities, surgery room, vertebrate animal house, digital library, tissue culture room and space for postdocs, PhD and undergraduate students enrolled in the project.

### B. POSITIONS AND HONORS

#### **Predoctoral Training:**

2006-2009 Predoctoral Fellow with L. Maffei, Scuola Normale Superiore, Pisa; PhD thesis: "Experience-dependent reactivation of ocular dominance plasticity in the adult visual cortex"

#### **Postdoctoral Training:**

2009-2010 Postdoctoral Fellow with L. Maffei, Scuola Normale Superiore, Pisa Italy  
2010-2011 Postdoctoral Fellow with L. Maffei, Neuroscience Institute CNR, Pisa Italy

#### **Professional experiences:**

2017 Visiting researcher at University Medical Center Göttingen, Dept. Neurophysiology and Sensory Physiology, Göttingen, Germany (Prof. Dr. Michael Müller lab).  
2011- present Tenured Researcher, Neuroscience Institute CNR, Pisa Italy  
2018- present Assigned Researcher, IRCCS Stella Maris Institute, Pisa Italy

#### **Awards and Honors:**

2005 Graduate in Biological Sciences achieved at Pisa University (with honors)  
2009 PhD in Neurobiology at Scuola Normale Superiore, Pisa (with honors)  
2010 Winner of a 'Giuseppe Levi' postdoctoral scholarship of Accademia dei Lincei  
2013 Participation to the opening ceremony of celebrations for the Ninety Years of the CNR, as younger researcher of the Institution

2016 Winner of a travel grant within the program "Post-Doctoral Fellowship- 2017" of Fondazione Umberto Veronesi

## C. CONTRIBUTIONS TO SCIENCE

### Current Research Activities:

#### 1. Creatine disorders

Our research is mainly focused on an inherited metabolic disorder of the brain, the creatine transporter deficiency (CTD). We generated a mouse model strictly recapitulating all the main hallmarks of the clinical picture of CTD (intellectual disability, autistic-like features, epilepsy), thus setting the translational value of this model for the preclinical research.

#### Main publications:

- **Baroncelli L**, Alessandrì MG, Tola J, Putignano E, Migliore M, Amendola E, Gross C, Leuzzi V, Cioni G, Pizzorusso T. 2014 A novel mouse model of creatine transporter deficiency. *F1000Res*, 2: 228.
- **Baroncelli L**, Molinaro A, Cacciante F, Alessandrì MG, Napoli D, Putignano E, Tola J, Leuzzi V, Cioni G, Pizzorusso T. 2016 A mouse model for creatine transporter deficiency reveals early onset cognitive impairment and neuropathology associated with brain aging. *Hum Mol Genet*, 25:4186.
- Molinaro A, Alessandrì MG, Putignano E, Leuzzi V, Cioni G, **Baroncelli L**\*, Pizzorusso T. 2019 A Nervous System-Specific Model of Creatine Transporter Deficiency Recapitulates the Cognitive Endophenotype of the Disease: a Longitudinal Study. *Sci Rep*. 9: 62. \*joint senior author
- Giusti L, Molinaro A, Alessandrì MG, Boldrini C, Ciregia F, Lacerenza S, Ronci M, Urbani A, Cioni G, Mazzoni MR, Pizzorusso T, Lucacchini A, **Baroncelli L**. 2019 Brain mitochondrial proteome alteration driven by creatine deficiency suggests novel therapeutic venues for creatine deficiency syndromes. *Neuroscience*. 409: 276.
- Mazziotti R, Cacciante F, Sagona G, Lupori L, Gennaro M, Putignano E, Alessandrì MG, Ferrari A, Battini R, Cioni G, Pizzorusso T, **Baroncelli L**. 2020 Novel translational phenotypes and biomarkers for Creatine Transporter Deficiency. *Brain Commun*. 2: fcaa089.
- Cacciante F, Gennaro M, Sagona G, Mazziotti R, Lupori L, Cerri E, Putignano E, Butt M, Do MT, McKew JC, Alessandrì MG, Battini R, Cioni G, Pizzorusso T, **Baroncelli L**. 2020 Cyclocreatine treatment ameliorates the cognitive, autistic and epileptic phenotype in a mouse model of Creatine Transporter Deficiency. *Sci Rep* 10: 18361.

#### 2. Development and plasticity of visual cortex

A central dogma in Neuroscience field is that the brain is endowed with high levels of plasticity only during development and that plasticity declines with age. We extensively investigated the molecular mechanisms of plasticity during the critical period and we discovered environmental and pharmacological approaches effective in increasing plasticity in the adult visual cortex.

#### Main publications:

- Baho E, Chattopadhyaya B, Lavertu-Jolin M, Mazziotti R, Awad PN, Chehraz P, Groleau M, Jahannault-Talignani C, Vaucher E, Ango F, Pizzorusso T, **Baroncelli L**, Di Cristo G. 2019 p75 Neurotrophin Receptor Activation Regulates the Timing of the Maturation of Cortical Parvalbumin Interneuron Connectivity and Promotes Juvenile-like Plasticity in Adult Visual Cortex. *J Neurosci*. 39: 4489-4510.
- Sansevero G\*, **Baroncelli L**\*, Scali M, Sale A. 2018 Intranasal BDNF administration promotes visual function recovery in adult amblyopic rats. *Neuropharmacology*. \*first joint author
- **Baroncelli L**, Sale A, Viegi A, Maya Vetencourt JF, De Pasquale R, Baldini S, Maffei L. 2010. *Experience-dependent reactivation of ocular dominance plasticity in the adult visual cortex*. *Exp Neurol*. 226:100
- Maya Vetencourt JF, Sale A, Viegi A, **Baroncelli L**, De Pasquale R, O'Leary OF, Castrén E, Maffei L. 2008. The antidepressant fluoxetine restores plasticity in the adult visual cortex. *Science*. 320: 385-8.
- Sale A, Maya Vetencourt JF, Medini P, Cenni MC, **Baroncelli L**, De Pasquale R, Maffei L. 2007 Environmental enrichment in adulthood promotes amblyopia recovery through a reduction of intracortical inhibition. *Nat Neurosci*. 10: 679-81.

#### 3. Retinal degenerative disorders

Retinitis Pigmentosa (RP) is a class of inherited disorders caused by the progressive death of photoreceptors in the retina. RP is still orphan of an effective treatment, but considerable hope derives

by research aimed at arresting neurodegeneration or replacing light-responsive elements. All these therapeutic strategies rely on the anatomical and functional integrity of the visual system downstream of photoreceptors. However, very little is known about the visual cortex. Using the rd10 mouse, we demonstrated that visual cortical circuits retain high levels of plasticity, preserving their capability of input-dependent remodeling even at a late stage of retinal degeneration.

Main publications:

- Begenisic T, Mazziotti R, Sagona G, Lupori L, Sale A, Galli L, **Baroncelli L**. 2020 Preservation of Visual Cortex Plasticity in Retinitis Pigmentosa. Neuroscience, 424: 205-210.

**Total number of publications: 44**

**Total number of citations: 3361 (Google Scholar)**

**H index: 23 (Google Scholar)**

<https://pubmed.ncbi.nlm.nih.gov/?term=baroncelli%20l&sort=date>

<b>Journal</b>	<b># of papers</b>
Science	1
Nature Neuroscience	1
Nature Communications	3
Cell Death and Differentiation	1
Human Molecular Genetics	1
Brain Communications	1
J. Neuroscience	4
Scientific Reports	6
Neurobiology of Disease	2
Experimental Neurology	2
Molecular Neurobiology	1
Neuropharmacology	3
Neuroscience	3
Frontiers in Cellular Neuroscience	3
Neural Plasticity	2
Experimental Gerontology	1
PLoS One	1
Biosensors and Bioelectronics	1
F1000 research	1
Neuroncology	1
Oncotarget	1
International Journal of Molecular Sciences	1
International Journal of Environmental Research and Public Health	1
Aging Clinical Experimental Research	1
Hypertension	1
<b>Total</b>	<b>44</b>

**Reviewer and Editor activity:**

- Academic Editor of Neural Plasticity and Scientific Reports.
- Review Editor for Frontiers in Cellular Neuroscience and Frontiers in Neural Circuits.
- Reviewer for various international journals (Biological psychiatry, Cerebral cortex, Journal of Neuroscience, Scientific Report, European Journal of Neuroscience, Neural plasticity, International Journal of Developmental Neuroscience, Neurochemistry International, Frontiers in Cellular Neuroscience, Brain stimulation, Journal of Clinical Investigation; Oncotarget).
- Reviewer for the French National Agency (ANR), Kuwait Foundation for the Advancement of Sciences (KFAS), MUR.

### **Organization of International meetings (member of the program committee):**

- European COST Meeting “Brain Extracellular Matrix Targeting in Regeneration and Rehabilitation” 2014, Volterra (Pisa)

### **Didactic activities:**

- Supervisor of postdoctoral training of Mariangela Gennaro (1 year), Gianluca Pietra (2 years), Tatjana Begenisic (1 year), Francesco Cacciante (1 year), Elsa Ghirardini (2 years).  
- Member of the Doctoral Board ‘Pegaso’ (Universities of Florence, Pisa and Siena).  
- Supervisor of PhD training within ‘Pegaso’ programme (Universities of Florence, Pisa and Siena) of Mr Angelo Molinaro (dissertation on 2018), Ms Giulia Sagona, Mr Francesco Calugi.  
- Co-supervisor of PhD training within Scuola Normale Superiore programme of Mr Francesco Cacciante.  
- Supervisor of master degree thesis at University of Pisa (Ms Federica Maltese, Ms Martina Migliore, Ms Francesca D’Ambrosio, Ms Chiara Bosetti), University of Florence (Ms Federica Guelfi, Ms Alice Maisto), University of Trieste (Mr Davide Talamonti).  
- Series of lessons “Arte e Cervello (neuroscienze e riflessioni verso una neuroestetica)”, Conservatorio Luigi Cherubini di Firenze, March 17-May 19, 2014, Firenze, Italy. Prot. A/2 n. 1527 (March, 21 2014).

### **Dissemination activities:**

- Sale A, **Baroncelli L**, Spolidoro M, Maffei L. *The dynamic building of the brain*. In: Cerebral Plasticity, Eds: Chalupa LM, Berardi N, Caleo M, Galli- Resta L, Pizzorusso T, MIT Press, Cambridge MA, 2011. <https://doi.org/10.7551/mitpress/9780262015233.001.0001>.  
- **Baroncelli L**, entries *Amblyopia, Critical period, Hearing, Perceptual learning, Phantom limb, Taste, Touch*, in: Collana I Dizionari Treccani, Cervello Mente Psiche, Istituto della Enciclopedia Italiana, Roma 2010.  
- **Baroncelli L**, Maffei L, entry *Cerebral plasticity*, in: Collana I Dizionari Treccani, Cervello Mente Psiche, Istituto della Enciclopedia Italiana, Roma 2010.  
- **Baroncelli L**, Spolidoro M, entry *Olfaction*, in: Collana I Dizionari Treccani, Cervello Mente Psiche, Istituto della Enciclopedia Italiana, Roma 2010.  
- Lesson “Brain elasticity: gene and experience” in the cycle of seminars “Areaperta CNR”, December 4, 2013, Pisa, Italy.  
- **Baroncelli L**, Sale A, entry Environment and Brain, in: Europa Le Sfide della Scienza, Istituto della Enciclopedia Italiana, Roma 2018.

### **Invited presentations:**

**2020** Fens 2020 Virtual Forum

**2019** Rotterdam, The Netherlands, Symposium Inborn Cerebral Creatine Deficiency Syndromes; Perugia, Italy, 18<sup>th</sup> National Congress of the Italian Society for Neuroscience

**2017** Pavia, Italy, 68<sup>th</sup> SIF convention

**2016** Paris, France, Interdisciplinary Workshop on Creatine Transporter Deficiency SLC6A8; Roma, Italy, SSIEM 2016

**2015** Milano, Italy, San Raffaele Telethon Institute for Gene Therapy (invited by Prof. Aiuti); Mestre (VE), Italy, 47<sup>th</sup> EMG Conference; Roma, Italy, XVII Incontro Nazionale di Genetica clinica

**2009** Paris, France, Collège de France (invited by Prof. Prochiantz); Genova, Italy, IIT (invited by Dr. Medini and Prof. Benfenati)

**2008** Pisa, Italy, convention Cerebral plasticity: new perspectives; Villasimius (CA), Italy, 59<sup>th</sup> SIF convention

### **D. RESEARCH SUPPORT**

**2020- in progress** ‘Creatine Deficiency Syndrome: novel insight into brain function and therapeutic strategies’. Granting agency: Telethon Foundation. Role in the project: PI

**2019- in progress** ‘Creatine Transporter Deficiency: Insights into New Therapeutic Strategies’. Granting agency: Lejeune Foundation. Role in the project: PI

**2018-in progress** ‘Congenital creatine transporter disorder: insight into new therapeutic preclinical strategies’. Granting Agency: Italian MoH. Role in the project: PI

**2017-in progress** 'Cyclocreatine treatment to creatine transporter knock out mice with, PK, PD, neurobehavioral and biomarker endpoints'. Granting Agency: LUMOS Pharma. Role in the project: PI

**2015- 2019** 'Cortical Plasticity in Retinitis Pigmentosa: an integrated study from animal models to humans'. Granting Agency: Fondazione Roma. Role in the project: Unit 2 team leader

**2013-2018** 'Nanotechnology-based therapy and diagnostics of brain diseases'. Granting Agency: MIUR. Role in the project: Co-investigator