

# Elena Montagni

**Nationality:** Italian 📞 **Phone number:** (+39) 0

📍 **Home:** (Italy)

## ABOUT ME

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Knowledgeable neurobiologist with experience in the field of biotechnology. Competence of scientific tools and instruments for data collection. I am flexible and able to change. Throughout my PhD, I developed new ability and learned how to effectively lead a group that included 1 research assistant, 2 master's students and others partners. I managed numerous projects at once, prioritizing deadline-oriented tasks and aiming for project milestones. I work well in teams as well as in new situations and can adapt rapidly.

## WORK EXPERIENCE

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### Postdoctoral fellow

**CNR-IN - Istituto di Neuroscienze** [ 03/2023 – Current ]

City: Pisa

Country: Italy

- Developed a user-friendly Matlab analysis for investigating alteration of cortical functional connectivity in different mouse models.
- Prepare and collect data from complex experiments by using animals transfected with fluorescent calcium sensors, in order to study alterations and restorations in structural and functional cortical connectivity as biomarkers for a mouse model of autism.
- Develop experiments and procedures for transcranial direct current stimulation in mice.

### Postdoctoral researcher

**LENS - University of Florence** [ 12/2020 – 03/2022 ]

City: Firenze

Country: Italy

**Business or sector:** Activities of extraterritorial organisations and bodies

- Programmed, ran and analyzed experiments on cortical sensory response in different brain states collaborating closely with the Institut des Neurosciences (NeuroPSI), France. Scientific excellence project funded by the European research council (EU program H2020 EXCELLENT SCIENCE) as part of the Human Brain Project (HBP-SGA3).
- Investigating the alterations in functional connectivity and sensory responsiveness in mouse models of neurodevelopmental disorders. Project funded by the Scientific and Technological Research (CFR 2020) "Validation of functional connectivity as a biomarker for the diagnosis of autism".
- Developing an all-optical system to study the cortical circuits that control movement in a mouse model. Scientific excellence project funded by the European research council (EU program H2020 EXCELLENT SCIENCE) as part of the research project BrainBIT.

In charge of:

- Collaboration in the conception and drafting of the project for ministerial approvals.
- Management and organization of the workflow for the research projects.
- Team management and mentorship of our collaborators (PhD students, engineers, undergraduates, etc.).
- Data analysis and communication of results inside and outside the research group including conferences and publications.
- Responsible for relations with administration and organization for European and extra-European supplies.

## EDUCATION AND TRAINING

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### **II level Master in Methods And Data Analysis In Biomedical Research (MEDAL in Biomedical Research)**

**University of Milano-Bicocca** [ 03/2023 – 03/2024 ]

City: Milano

Country: Italy

### **Ph.D in Atomic and Molecular Photonics**

**University of Florence** [ 2017 – 2020 ]

Country: Italy

Final grade: con eccellenza – Level in EQF: EQF level 8

**TITLE :** *All-optical functional mapping of the forelimb motor cortex reveals two distinct grasping cortical representations*

During my PhD, I deal with:

- Studied the cortical circuits that control movement in mice.
- Developed an all-optical system for simultaneous imaging and stimulation of neurons, combining red-shifted calcium indicators and optogenetic actuators.
- Identification of a new functional cortical area called LFA.
- Developed a new device (optoelectrode) to combine simultaneously cortical imaging recording, subcortical optogenetic stimulation and electrophysiological recordings. Group meeting manager: I organized the weekly lab team meetings

### **Master of Science in Neurobiology**

**University of Pavia** [ 2014 – 2017 ]

Country: Italy

Final grade: 110 / 110 cum laude

Thesis: Imaging of cortical neuronal-activity with red-shifted functional indicators during a motor task

### **Bachelor of Science in Biotechnologies**

**University of Florence** [ 2009 – 2015 ]

Final grade: 102/110

Thesis: Selective preparation and polymorphism of gold nanoparticles from extracts of Cucurbita pepo L.

## LANGUAGE SKILLS

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Mother tongue(s): **Italian**

Other language(s):

**English**

**LISTENING B2 READING C1 WRITING B2**

**SPOKEN PRODUCTION B2 SPOKEN INTERACTION B2**

*Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user*

## DIGITAL SKILLS

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### **Imaging and Reconstruction Software:**

Fiji / ImageJ / AnimalTracker / Autodesk Fusion 360

### **Programming Languages:**

MATLAB / R / LaTeX

## Data Analyses and Graphing Software:

OriginPro

## Business communication platform:

Slack / Google Drive Suite

## Graphic design platform:

Canva / Prezi

## Operating Systems (OS) and Suites:

Windows / Microsoft Office 365

## PUBLICATIONS

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### Publications Overview

- h-index: 2 (Scopus)
- 3 peer-reviewed papers as 1th author
- Total number of citations: 31 (Scopus)
- 5 abstracts at national and international congresses

### Cortical mapping of sensory responses reveals strong brain-state dependence of the late component

DOI: 10.1101/2023.10.16.562034

**Montagni E.**, Resta F., N Tort-Colet, Scaglione A, Mazzamuto G, Destexhe A, Pavone FS, Mascaro ALA.

*Under Review (iScience)*

### Assessing brain state and anesthesia level with two-photon calcium signals

[2023]

DOI: 10.1038/s41598-023-30224-8

Tort-Colet N., Resta F., **Montagni E.**, Pavone F.S., Mascaro A.L.A., Destexhe A.

Scientific Reports

### Large-scale all-optical dissection of motor cortex connectivity shows a segregated organization of mouse forelimb representations

[2022]

DOI: 10.1016/j.celrep.2022.111627.

Resta F.\*, **Montagni E.\***, de Vito G., Scaglione A., Allegra M.A.L. and Pavone S.F.

*Cell Reports* (2022) 41, 6

### Wide-field imaging of cortical neuronal activity with red-shifted functional indicators during motor task execution

[2019]

DOI: 10.1088/1361-6463/aaf26c.

**Montagni E.**, Resta F., Conti E., Scaglione A., Pasquini M., Micera S., Allegra M.A.L. and Pavone S.F.

Journal of Physics D: Applied Physics, 52. 2019.

### Optogenetics in Brain Research: From a Strategy to Investigate Physiological Function to a Therapeutic Tool

[2019]

DOI: 10.3390/photonics6030092.

**Montagni E.**, Resta F., Allegra M.A.L. and Pavone S.F.

Photonics, 6. 2019

## DRIVING LICENCE

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**Driving Licence:** AM

**Driving Licence:** A1

**Driving Licence:** B

## CONFERENCES AND SEMINARS

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### **SINS National Congress 2023**

[ Torino , 09/2023 ]

Oral presentation

Montagni E., Martello A., Ambrosone M, Pavone FS, Mascaro ALA

'Sensory hypo-responsiveness is associated to cortical functional hyper-connectivity in Shank3B +/- mice'

### **XXI Convention Scientifica (Telethon)**

[ Riva del Garda (TN), 03/2023 ]

Poster Session

Montagni E., Martello A., Pavone F.S., Mascaro ALA.,

'Altered cortical sensory processing and functional connectivity in Shank3B +/- mice'

### **BASSES Workshop**

[ Roma, 06/2022 ]

Oral presentation

Montagni E., Martello A., Scaglione A., Pavone FS., Baroncelli L., Mascaro ALA

'Brain state dependence of functional connectivity in a mouse model of autism'

### **Neuroscience 2019 (SfN)**

[ Chicago, 09/2019 ]

Poster presentation

**Montagni E.**, Resta F., de Vito G., Scaglione A., Allegra M.A.L. and Pavone S.F.,

'Mesoscopic imaging of optogenetically-evoked motor maps reveals movement specific patterns of cortical activation'

### **National meeting of PhD students in Neuroscience (SINS)**

[ Napoli, 02/2019 ]

Poster presentation

**Montagni E.**, Resta F., de Vito G., Scaglione A., Allegra M.A.L. and Pavone S.F.,

'Simultaneous all-optical imaging and manipulation of motor cortex activity in awake mice'

### **Optogen 2018**

[ Glasgow, 11/2018 ]

Oral and poster presentation

**Montagni E.**, Resta F., de Vito G., Scaglione A., Allegra M.A.L. and Pavone S.F.

'Simultaneous all- optical imaging and manipulation of motor cortex activity in awake mice'

### **20° National convention of photonic technologies**

[ Lecce, 04/2018 ]

Oral and poster presentation

**Montagni E.**, Resta F., de Vito G., Scaglione A., Allegra M.A.L. and Pavone S.F.

'Imaging of cortical neuronal-activity with red-shifted functional indicators during motor task execution',

## **School of Brain Cells & Circuits "Camillo Golgi"**

[ Erice, 10/2017 ]

Poster presentation

**Montagni E.**, Resta F., de Vito G., Scaglione A., Allegra M.A.L. and Pavone S.F.

'Imaging of cortical neuronal-activity with red-shifted functional indicators during motor task execution'

## **HONOURS AND AWARDS**

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### **The best poster award in "Novel methods and technology in neuroscience"**

National meeting of PhD students in Neuroscience (SINS) [ 05/2019 ]

## **MANAGEMENT AND LEADERSHIP SKILLS**

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### **Student supervisor**

2022 - Manuel Ambrosone "Study of cortical functional connectivity in valproic acid mouse model." Master Degree in Biology of the Environment and Behavior, University of Florence

## **COMMUNICATION AND INTERPERSONAL SKILLS**

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### **Qualifications**

- Expertise in initiating and managing complex, interdisciplinary research and development projects and teams.
- Expertise in scientific publications in the field of neurobiology.
- Cutting-edge analytical, communication and presentation skills.
- Expertise in neuroscience, biology, imaging processing and programming
- Expertise to deliver and execute complex programs / projects with the ability to communicate clearly and concisely across technology and the business teams.
- Ability to collaborate closely with colleagues and partners in a multicultural and multidisciplinary setting.
- Huge capacity of problem-solving.

## **VOLUNTEERING**

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### **Volontaria per "Envolve Afrique"**

[ Benin, 2008 ]

Volunteer in the project 'Envolve Afrique' for medicinal transport, first assistance and preparation of a farm in Parakou (BN) Afrique, Aug 2009.

## **VISITING SCIENTIST**

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### **Daniel Dombeck's Lab, Neurobiology department at Northwestern University, Chicago, Illinois, USA**

[ 04/2019 – 10/2019 ]

During my PhD I carried out a six-month research period abroad at Daniel Dombeck's Lab, Neurobiology department, Northwestern University (Chicago). I was entrusted with a short research project. I studied the memory formation and the specific mechanisms that allow memory storage and recall in mice. I worked with virtual reality system and laser based imaging techniques (two-photon microscopy) for monitoring neuronal activity at hippocampal level during navigation.

Link: <http://www.dombecklab.org/>

## **PROFESSIONAL SKILLS**

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### **Research Fields**

- Advanced photonics
- Optical microscopy and imaging

- Biomedical optics
- Neuroimaging and functional imaging
- Fluorescence microscopy
- Basic neuronal mechanisms
- Neurological and neurodevelopmental disorders (such as autism)
- Cortical and subcortical neuronal circuits

## **PUBLIC OUTREACH**

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### **ScienzEstate**

[ 05/2018 – 06/2018 ]

"Microscopia nelle Neuroscienze" a laboratory experience to sensitize young school-age children to the neuroscience field.

LENS - Sesto Fiorentino

## **PRIVACY**

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### **Authorization to use personal data**

According to the Italian Legislative Decree no.196 dated 30/06/2003 and GDPR 679/16, I hereby express my consent to process and use my data provided in this CV

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