



Emilia Conti

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WORK EXPERIENCE

Ph.D.

European Laboratory for Non-linear Spectroscopy (LENS), University of Florence [

01/11/2015 – 31/10/2018]

City: Sesto Fiorentino

Country: Italy

Under the supervision of Professor Pavone and Dr. Anna Letizia Allegra Mascaro.

I exploited several imaging techniques to investigate structural and functional plasticity in a mouse model of stroke.

More in detail I compared different kinds of rehabilitative therapies (i.e. robotic platform motor training, contralateral inhibition through intra-cortical injection of botulin neurotoxin, and the combination of those two strategies) to promote functional recovery.

I performed *in vivo* two-photon imaging to dissect spines turnover both in peri-infarct and more distal cortical regions of Thy1-GFPm mice.

Then to investigate how stroke impact on cortical communication, I performed wide-field fluorescence imaging on Thy1-GCaMP6f mice during the execution of a pulling task. Finally, by applying optogenetic stimulation I investigated interhemispheric connectivity both in healthy condition and after a focal cortical stroke.

Master Degree Internship

European Laboratory for Non-linear Spectroscopy (LENS), University of Florence [10/2014 – 10/2015]

City: Sesto Fiorentino

Country: Italy

Under the supervision of Prof. Francesco S. Pavone and Dr. Anna Letizia Allegra Mascaro.

I have acquired basic notions of optics. I have learned mouse handling and mouse surgery techniques (i.e. photothrombotic stroke, cranial window preparations, intra-cortical injections of Adeno Associated Virus). I performed longitudinal two-photon imaging on anaesthetised mice.

Emilia Conti

Bachelor Internship

Department of Experimental Pathology and Oncology, University of Florence [2012 – 2012]

City: Florence

Country: Italy

Under the supervision of Professor. Anna Rosa Arcangeli and Dr. Elena Lastraioli.

I performed a citofluorimeter analysis to identify the presence of endothelial progenitors cell in patients affected by Crohn's disease.

Post-doctorate

Department of Physics and Astronomy, University of Florence [01/11/2018 – 31/10/2020]

City: Sesto Fiorentino

Country: Italy

During my post-Doc, I have designed a novel post-stroke rehabilitative protocol by exploiting the combination of ipsilesional optogenetic stimulation of the periinfarct area with motor training. To characterize this rehabilitative therapy I performed behavioral experiments on mice (e.g. Schallert Cylinder test) and *in vivo* calcium imaging over a large field of view. I have performed image processing and analysis using common software (e.g. ImageJ, Origin Pro). I performed intravenous injections in the mouse tail vein of fluorescent dye to estimate blood vessel permeability both in periinfarct and more distal areas of the mouse cortex. Finally, I performed *ex vivo* immunohistochemical analysis in order to quantify the lesion volume and to investigate the expression of plasticity markers.

Research grants:

- Prot. 178978, 25/10/2018 (1/11/2018 - 31/10/2019)
- Prot. 201339, 5/11/2019 (1/11/2019 - 31/10/2020)

Post-doctorate

National Research Council Neuroscience Institute [01/11/2020 – Current]

City: Pisa

Country: Italy

In the framework of the translational project NIMBLE in collaboration with the Neurology Department of Careggi, I'm working on the development of a novel experimental model of stroke by setting up and characterizing the photothrombotic occlusion of the middle cerebral artery with or without recanalization in mice. By taking advanced optical imaging techniques I'm investigating how the structural reorganization of neurons at the cellular and subcellular level correlates with the extravasation and with the levels of circulating biomarkers at different time points after stroke.

EDUCATION AND TRAINING

PhD in Atomic and Molecular Photonics

European Laboratory for Non-linear Spectroscopy (LENS), University of Florence [01/11/2015 – 31/10/2018]

Address: Via Nello Carrara 1, 50019 Sesto Fiorentino

Level in EQF: EQF level 8

Master Degree in Biology (LM6)

University of Florence [01/10/2012 – 14/10/2015]

Address: Florence (Italy)

Final grade : 110/110 magna cum laude – Level in EQF: EQF level 7

Title: In vivo structural and functional plasticity in an ischemia mouse model

Bachelor Degree in Biology (L-12)

University of Florence [01/10/2008 – 20/06/2012]

Address: Florence (Italy)

Final grade : 107/110 – Level in EQF: EQF level 6

Title: Evaluation of the presence of lymphatic endothelial progenitor cells in Crohn's disease patients

High School Diploma

Liceo Dante [2001 – 2006]

Address: Florence (Italy)

Field(s) of study: Liceo Classico

Final grade : 92/100 – Level in EQF: EQF level 5

TRAINING

Use and care of laboratory animals

[29/05/2019 – 30/05/2019]

12 hours course held by CeSAL, University of Florence.

LANGUAGE SKILLS

Mother tongue(s):

Italian

Other language(s):

English

LISTENING C1 READING C1 WRITING C1

SPOKEN PRODUCTION C1 SPOKEN INTERACTION C1

DIGITAL SKILLS

main Operating Systems / Microsoft Office / Fiji-ImageJ / OriginPro 85

PUBLICATIONS

Publications

Since 2018 I have published 6 papers, 2 of which as first author, in the Neuroscience field in peer-review journals. Furthermore, I have published 7 conference proceedings.

My articles received globally 9 citations (Scopus), resulting in an h-index of 3 (Scopus).

Enrica Cusi

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[2021]

Cortical propagation tracks functional recovery after stroke

Cecchini, G., Scaglione, A., Allegra Mascaro, A.L., Checcucci, C., **Conti, E.**, Adam, I., Fanelli, D., Ulivi, R., Pavone, F.S., Kreuz, T.

Plos Computational Biology, May 2021; 17(5)

doi: 1008963

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[2020]

Inferring network structure and local dynamics from neuronal patterns with quenched disorder

Adam, I., Cecchini, G., Fanelli, D., Kreuz, T., Livi, R., diVolo, M., Allegra Mascaro, A.L., **Conti, E.**, Scaglione, A., Silvestri, L., Pavone F.S.

Chaos, Solitons & Fractals, Volume 140, November 2020, 110235

doi:2020.110235

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[2020]

Experimental and Computational Study on Motor Control and Recovery After Stroke: Toward a Constructive Loop Between Experimental and Virtual Embodied Neuroscience

Allegra Mascaro, A.L., Falotico, E., Petkoski, S., Pasquini, M., Vannucci, L., Tort-Colet, N., **Conti, E.**, Resta, F., Spalletti, C., Ramalingasetty, S.T., [von](#) Arnim, A., Formento, E., Angelidis, E., Blixhavn, C., B. Leergaard, T., Caleo, M., Destexhe, A., Ijspeert, A., Micera, S., Laschi, C., Jirsa, V., Gewaltig, M.O., Pavone F.S.

Frontiers in Systems Neuroscience, 14:31

doi: 10.3389/fnsys.2020.00031

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[2019]

Combined Rehabilitation Promotes the Recovery of Structural and Functional Features of Healthy Neuronal Networks after Stroke

Conti, E.*, Allegra Mascaro, A.L.*, Lai, S., DI Giovanna, A.P., Spalletti, C., Alia, C., Panarese, A., Scaglione, A., Sacconi, L., Micera, S., Caleo, M., Pavone F.S.

Cell Reports, Vol 8, Issue 13.

doi: 2019.08.062

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[2019]

Large Scale Double-Path Illumination System with Split Field of View for the All-Optical Study of Inter-and Intra-Hemispheric Functional Connectivity on Mice

Conti, E., Allegra Mascaro A.L., Pavone F.S.

Methods and Protocols, 2(1):11

doi: 10.3390/mps2010011

1

[2018]

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

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

Journal of Physics D: Applied Physics 52.7 (2018): 074001

doi:10.1088/1361-6463/aaf26c

PROCEEDINGS

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[2019]

Combined rehabilitation promotes recovery of motor functionality in a mouse model of stroke

Conti, E., Mascaro, A.L.A., Francesco Resta, Alessandro Scaglione, Maria Pasquini, Micera, S., M., Pavone, F.S.

SPIE BiOS, 2019, San Francisco, California, United States, 2-7 February 2019

Progress in Biomedical Optics and Imaging - Proceedings of SPIE, 10865, art. no. 108650R

doi: 12.2508321

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[2018]

All-Optical Simultaneous Stimulation and Readout of Motor Cortex Activity in Awake Mice

Resta, F., **Conti, E.**, Montagni E., Sacconi L., Mascaro, A.L.A., Pavone, F.S.

Clinical and Translational Biophotonics 2018, Hollywood, Florida United States, 3-6 April 2018.

Optics InfoBase Conference Papers, Part F91-TRANSLATIONAL 2018

doi: 10.1364/TRANSLATIONAL.2018.JTu3A.47

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[2018]

All-Optical Rehabilitation Promotes Motor Recovery in a Mouse Model of Stroke

Conti, E., Mascaro, A.L.A., Resta, F., Scaglione, A., Pasquini, M., Micera, S., M., Pavone, F.S.

Optics and the Brain 2018, Hollywood, Florida United States, 3–6 April 2018.

Optics InfoBase Conference Papers, Part F88-BRAIN 2018

doi: 10.1364/BRAIN.2018.BTh2C.2

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[2018]

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

Montagni, E., Resta, F., **Conti, E.**, Pasquini, M., Mascaro, A.L.A., Pavone, F.S.

20th Italian National Conference on Photonic Technologies (Fotonica 2018), Lecce, Italy; 23-25 May 2018.

IET Conference Publications, 2018 (CP748)

doi: 10.1049/cp.2018.1653

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[2017]

Multi-scale optical investigation of robotic rehabilitation-induced cortical plasticity after stroke

Mascaro, A.L.A., **Conti, E.**, Lai, S., Spalletti, C., Di Giovanna, A.P., Alia, C., Panarese, A., Sacconi, L., Micera, S., Caleo, M., Pavone, F.S.

Optics and the Brain 2017, San Diego, California United States, 2–5 April 2017

Optics InfoBase Conference Papers, Part F76-BRAIN 2017

doi: 10.1364/BRAIN.2017.BrW3B.4

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[2016]

Multi-modal optical imaging of brain plasticity after stroke

Conti, E., Mascaro, A.L.A., Sacconi, L., Spalletti, C., Lai, S., Alia, C., Panarese, A., Micera, S., Caleo, M., Pavone, F.S.

18th Italian National Conference on Photonic Technologies, Fotonica 2016; Rome, Italy; 6-8 June 2016

IET Conference Publications

doi: 10.1049/cp.2016.0924

Multi-level imaging of brain plasticity after stroke

Mascaro, A.L.A., Spalletti, C., Lai, S., **Conti, E.**, Alia, C., Sacconi, L., Micera, S., Caleo, M., Pavone, F.S.,
Optics and the Brain 2016, Fort Lauderdale, Florida United States, 25–28 April 2016.

Optics InfoBase Conference Papers

doi: 10.1364/BRAIN.2016.BTh3D.3

CONFERENCES AND SEMINARS

New perspectives in Neuroscience: Research Results of Young Italian Neuroscientists (SINS)

[Naples, Italy, 14/04/2016]

Talk: Optical imaging of brain plasticity after stroke

18th Convegno italiano delle tecnologie fotoniche

[Rome, Italy, 07/06/2016 – 08/06/2016]

Talk: Multi-modal optical imaging of brain plasticity after stroke

Neuroscience 2016, Society for Neuroscience 46th annual meeting (SFN)

[San Diego, CA, USA, 11/11/2016 – 13/11/2016]

Dynamic Poster: Robotic rehabilitation promotes stabilization of peri-infarct cortical circuits and inter-hemispheric connectivity: in vivo study of structural and functional plasticity

Neuroscience 2017, Society for Neuroscience 47th annual meeting (SFN)

[Washington, D.C., USA, 11/11/2017 – 15/11/2017]

Poster: Optogenetic rehabilitation promotes functional remodeling after stroke: an in vivo imaging study

Optics and the Brain 2018

[Fort Lauderdale (FL), USA, 03/04/2018 – 06/04/2018]

Talk and travel grant: All-Optical Rehabilitation Promotes Motor Recovery in a Mouse Model of Stroke

Poster: All-Optical Simultaneous Stimulation and Readout of Motor Cortex Activity in Awake Mice

11th FENS Forum of Neuroscience poster presentation

[Berlin, Germany, 07/07/2018 – 11/07/2018]

Poster: Optogenetic rehabilitation promotes functional remodelling in a mouse model of stroke

18 th Brain Ischemia and Stroke conference

[Rome, Italy, 13/12/2018 – 15/12/2018]

Poster: Synergic effect of intensive motor training and optogenetic stimulation promotes recovery of motor functionality in a mouse model of stroke

2nd Brayn Conference

[Milan, Italy, 14/11/2019 – 16/11/2019]

Poster: Generalized recovery of motor functionality after stroke by combined ipsi-lesional excitation and motor training

PUBLIC OUTREACH

Kid's workshop day

[14/12/2019]

"La Fluorescenza", laboratory experience focused on fluorescence for elementary school.

Istituto Madre Mazzarelli, Firenze.

ScienzEstate

[06/06/2019 – 07/06/2019]

"Microscopia nelle Neuroscienze", laboratory experience regarding the application of microscopy in the Neuroscience field.

European Laboratory for Non-linear Spectroscopy (LENS), Sesto Fiorentino.

