

PERSONAL INFORMATION

Irene Costantini



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irene.costantini@unifi.it

Sex Female | Date of birth 06/04/1987 | Nationality Italian
Married, one daughter (born 01/03/2018)

POSITION

Researcher – Assistant Professor

h-index
citations

- Scopus 10, Web of Science 10
- Scopus 476, Web of Science 395

WORK EXPERIENCE

From 11/2020– to now

Research fellow

“Mapping the human brain cytoarchitecture in three dimensions through advanced microscopy and sample preparation techniques”

Scientific sector 05/B2 (Comparative Anatomy and Cytology), SSD BIO/06.

Biology Department – University of Florence – Italy Prot N. 0173315 - 30/10/2020 UNIFI affiliation with the European Laboratory for Non-Linear Spectroscopy

Research activity aiming at developing Imaging and Analysis Techniques to Construct a Cell Census Atlas of the Human Brain for the NIH BICCN project (Brain Initiative Cell Census Network) Number 1U01MH117023-01

- Development of tissue transformation techniques, staining and clearing methods for the study of the cytoarchitecture of various organs of human and mouse specimens in combination with advanced methods of optical imaging such as multi-photon and light sheet fluorescence microscopy
- Study of anatomical alterations in subjects affected by focal cortical dysplasia (FCD) for the development of new classification and diagnosis methods of the disease through the combination of clearing methods, high throughput imaging and image analysis with deep learning system
- Development of multiple staining techniques (multiplexing) for the molecular characterization of cleared tissues in three dimensions
- Development of correlative techniques between multi-photon microscopy, 3D-PLI (polarized light imaging) and MRI (magnetic resonance imaging) for the label-free study of the three-dimensional organization of neuronal fibers within brain slices of various species of mammal (mouse, rat, monkey, human).
- Mapping the neuronal activity of the entire murine brain by means of immediate early genes (cFos) markers for the study of diseases such as post-traumatic stress disorder, through the use of behavioral tests coupled with clearing and imaging techniques with light sheet microscopy..
- Application of correlative techniques between light sheet microscopy, OCT (Optical coherence tomography) and MRI (magnetic resonance imaging) for the census of cells within the human brain
- Big data: management of large quantities of data obtained through fluorescence microscopies through the use of specific software, in particular, stitching of consecutive stacks, deconvolution, 3D rendering and data analysis.
- Use of machine learning methodologies for the recognition, localization and characterization of cells in three dimensions in samples acquired with high resolution microscopy techniques (light sheet and two photon microscopy).
- Supervision of doctoral and master students
- Administration of chemical and biological laboratories

Business or sector Neuroscience

From 10/12/2020 to 24/12/2020

Consultant for National Research Council (CNR) – Istituto Nazionale di Ottica (INO-CNR).

“Pianificazione di tecniche di preparazione e analisi di campioni biologici di cervello umano da acquisire tramite microscopia a fluorescenza avanzata”

National Research Council (CNR) – Istituto Nazionale di Ottica (INO) – Sesto Fiorentino – Florence – Italy (www.ino.it)

Consultant contract stipulated as part of the European project Human Brain Project H2020 FET Flagship Project Specific Grant Agreement 945539 (SGA3, 2020-2023). Selection through a public competition based on qualifications. CNR-INO n. 9167 del 04/12/2020.

From 03/2018 – to 10/2020

Research fellow

“Development of new methodologies for neuroanatomical investigation of ex vivo samples of human brain through advanced optical microscopy” - “Sviluppo di nuove metodologie per l'indagine neuroanatomica di campioni ex vivo di cervello umano tramite microscopie ottiche avanzate”

National Research Council (CNR) – Istituto Nazionale di Ottica (INO) – Sesto Fiorentino – Florence – Italy (www.ino.it)

Research contract stipulated as part of the MMMI project. Project for the construction and maintenance of the multi-sited / Multi Modal Molecular Imaging Euro-Bioimaging Node. Selection through public competition based on qualifications and interview Protocol N. 42 of 03/01/2018 CNR-INO

Business or sector Neuroscience

From 11/2016 – to 02/2018

Research fellow

“Functional and structural brain imaging”

Physics department - European Laboratory for Non-Linear Spectroscopy - University of Florence – Italy (www.lens.unifi.it)

Post-doc contract stipulated as part of the "Functional and structural brain imaging - H2020 Flagship Human Brain Project - Specific Grant Agreement 1" project. Selection through public competition based on qualifications and interview Protocol Number 117962 (6180) of 2016.

Business or sector Neuroscience

From 12/2015 – to 11/2016

Research fellow

“Study of neuroanatomy through high resolution microscopic techniques” - “Studio della neuroanatomia attraverso tecniche microscopiche ad alta risoluzione”

Physics department - European Laboratory for Non-Linear Spectroscopy - University of Florence – Italy (www.lens.unifi.it)

Post-doc contract stipulated in the scientific area FIS03 as part of the Ente Cassa Technicolor project for the "Study of neuroanatomy through high resolution microscopic techniques". Selection through a public competition based on qualifications and interview Protocol Number 160108 (1819) of 25 November 2015.

Business or sector Neuroscience

From 01/2014 – to 03/2016

Project worker

Associazione Culturale Tethys - Florence - Italy

- Educational activities on DNA fingerprinting for secondary schools in the OpenLab project of the University of Florence

Business or sector Education

From 03/2012 – to 04/2012

Project worker

Fondazione Farmacogenomica - FiorGen - Florence - Italy

- Spectroscopy analysis: developing new NMR metabolomics techniques

Business or sector Metabolomics

From 02/2012 – to 03/2012

Project worker

Pharma D&S S.r.l - Florence - Italy

Business or sector Pharmacovigilance

EDUCATION AND TRAINING

From 30/11/ 2012- to 14/03/2016

International doctorate in atomic and molecular photonics - FIS03

Excellent/Excellent

European Laboratory for Non-Linear Spectroscopy - University of Florence - Italy

- Neuroscience, fluorescence microscopies, optics, biotechnology, chemistry, transgenic animal models.
- Thesis title: A morphological brain imaging study: a new versatile clearing agent for light sheet and two-photon fluorescence microscopy

June 2015

Biologist Professional Qualifications

Ministero dell'Istruzione, dell'Università e della Ricerca- Italy

From 30/11/ 2009- to 19/12/2011

Master degree in Medical and Pharmaceutical Biotechnology

110/110 cum laude

University of Florence - Italy

- Biotechnology, pharmacology, toxicology, molecular biology, microbiology, proteomics, medical chemistry, molecular modelling, study of chromatography (GC, HPLC), spectroscopy (UV, IR, NMR) and mass spectrometry techniques
- Thesis title: IL-32 promoter polymorphism modulates IL-32 expression and influences the outcome and the risk of epithelial cell derived thyroid cancer

From 02/ 2011- to 07/2011

Internship in immunology and oncology

Radboud University Nijmegen Medical Center - Nijmegen - Netherlands (lab of Prof. Mihai Netea)

- Analysis of the role of genetic variations of IL-32 in the development and severity of thyroid cancer. The techniques used include: isolation of PBMCs from blood samples, DNA and RNA extraction from PBMC, Real-time PCR, genotyping assays, immunohistochemistry, flow cytometry (FACS) and ELISA.

From 09/ 2006- to 11/2009

Bachelor Degree in Biotechnology

110/110 cum laude

University of Florence - Italy

- Biology, chemistry, pharmacology, toxicology, immunology, microbiology, biochemistry, molecular biology, enzymology, biophysics, ecology, physiology, chemical and biological laboratory techniques
- Thesis title: Characterization of fungal microflora in patients with inflammatory bowel diseases

From 01/ 2009- to 09/2009

Internship in microbiology

Biology Department - University of Florence - Italy (lab of Prof. Duccio Cavalieri)

- Analysis of the role of fungal microflora of pediatric patients with Crohn's disease (CD) and Ulcerative Colitis (UC). The techniques used include isolation of yeasts from stool samples, extraction of DNA from yeast cells, Colony-ITS-PCR (1-4), Colony-RAPD, sequencing, morphological and phenotypic characterization of yeast (invasiveness, sporulation, hyphae formation), wide-field and confocal microscopy.

From 09/ 2006- to 11/2009

High school diploma

100/100

Liceo Scientifico AME Agnoletti address PNI (National Plan Informatics), Florence, Italy

- Mathematics, Physics, Biology, Chemistry, Informatics, English

PERSONAL SKILLS

Mother tongue Italian

Other language

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	B2

Communication skills

- Good communication skills developed participating at international congresses as a public speaker
- Ability to work cross-culturally with global colleagues developed during the international PhD at the European Laboratory for Non-Linear Spectroscopy

Organisational / managerial skills

- Excellent teamwork and project organizer skills developed in years of work.
- Excellent project organizational skills and ability to maintain the overview of the big picture developed in yeas of research.
- Excellent skills in team leading developed in various projects for children education and activities for people with disabilities or social adaptation.

Job-related skills

- Good command of experiments design and testing in both biological and chemical lab
- Good writing skills developed writing scientific articles and project for research grants

Digital competence

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem solving
Proficient user	Proficient user	Proficient user	Independent user	Independent user

ADDITIONAL INFORMATION

- Good knowledge of image processing programs such as ImageJ/Fiji and Amira
- Good knowledge of graphic programs such as GIMP, Photoshop and Paint
- Base notions of LabView
- Good knowledge of Excel, Office and Latex
- Good knowledge of different operating systems: Windows, Mac OS X and Ubuntu

Driving licence

A1, B

Publications

1. Costantini, I.*, Mazzamuto, G.*, Roffilli M, Laurino A, Castelli FM, Neri M, Lughì G., Simonetto A, E Lazzeri, L Pesce, C Destrieux, L Silvestri, V Conti, R Guerrini, FS Pavone "Large-scale, cell-resolution volumetric analysis allows layer-specific investigation of human brain cytoarchitecture" BOE in press DOI 10.1364/BOE.415555
2. Costantini, I., Baria, E., Sorelli, M., Matuschke, F., Giardini, F., Menzel, M., Mazzamuto, G., Silvestri, L., Cicchi, R., Amunts, K., Axer, M., Pavone, F.S., 2021. "Autofluorescence enhancement for label-free imaging of myelinated fibers in mammalian brains". Scientific Reports, 2021, in press DOI: 10.1038/s41598-021-86092-7
3. Franceschini A, Costantini I, Pavone FS, Silvestri L. "Dissecting Neuronal Activation on a Brain-Wide Scale With Immediate Early Genes" Front. Neurosci., 23 October 2020
4. Yang J, Chen IA, Chang S, Tang J, Lee B, Kılıç K, Sunil S, Wang H, Varadarajan D, Magnain CV, Chen S, Costantini I, Pavone FS, Fischl B, Boas DA "Improving the characterization of ex vivo human brain optical properties using high numerical aperture optical coherence tomography by spatially constraining the confocal parameters". Neurophotonics, 7(4), 045005 (2020).
5. Costantini, I*; Olianti, C*; Giardini, F; Lazzeri, E; Crocini, C; Ferrantini, C; Pavone, F S; Camici, P G; Sacconi, L. "3D imaging and morphometry of the heart capillary system in spontaneously hypertensive rats and normotensive controls" Scientific Reports, 2020, 10(1),

14276

6. Menzel M, Axer M, De Raedt H, Costantini I, Silvestri L, Pavone F S, Amunts K, Michielsen K. "Toward a High-Resolution Reconstruction of 3D Nerve Fiber Architectures and Crossings in the Brain Using Light Scattering Measurements and Finite-Difference Time-Domain Simulations." *Physical Review X* 10, 021002. Published 2 April 2020.
7. **Costantini I**, Cicchi R, Silvestri L, Vanzi F, Pavone FS "In-vivo and ex-vivo optical clearing methods for biological tissues" *Bio. Optics Exp.* 2019
8. Di Bona A, Vita V, **Costantini I**, Zaglia T. "Towards a clearer view of sympathetic innervation of cardiac and skeletal muscles" *Prog Biophys Mol Biol.* 2019
9. Pianca N, Di Bona A, Lazzeri E, **Costantini I**, Franzoso M, Prando V, Armani A, Rizzo S, Fedrigo M, Angelini A, Basso C, Pavone FS, Rubart M, Sacconi L, Zaglia T, Mongillo M. "Cardiac sympathetic innervation network shapes the myocardium by locally controlling cardiomyocyte size through the cellular proteolytic machinery." *J Physiol.* 2019
10. Müllenbroich MC, Silvestri L, Di Giovanna AP, Mazzamuto G, **Costantini I**, Sacconi L, Pavone FS. High-Fidelity Imaging in Brain-Wide Structural Studies Using Light-Sheet Microscopy *eNeuro.* 2018 Nov 22;5(6). pii: ENEURO.0124-18.2018. doi: 10.1523/ENEURO.0124-18.2018. eCollection 2018 Nov-Dec.
11. Di Giovanna AP, Tibo A, Silvestri L, Müllenbroich MC, **Costantini I**, Allegra Mascaro AL, Sacconi L, Frasconi P, Pavone FS. "Whole-Brain Vasculature Reconstruction at the Single Capillary Level" *Sci Rep.* 2018
12. Silvestri L, **Costantini I**, Sacconi L, Pavone FS. "Clearing of fixed tissue: a review from a microscopist's perspective" *Journal of Biomedical Optics* 2016
13. Allegra Mascaro AL, **Costantini I**, Margoni E, Iannello G, Bria A, Sacconi L, Pavone F.S. "Label-free NIR reflectance microscopy as a complimentary tool for two-photon fluorescence brain imaging" *Biomedical Optics Express* 2015
14. Müllenbroich MC, Silvestri L, Onofri L, **Costantini I**, Hoff MV, Sacconi L, Iannello G, Pavone FS. "Comprehensive optical and data management infrastructure for high-throughput light-sheet microscopy of whole mouse brains." *Neurophotonics* 2015
15. **Costantini I**, Ghobril JP, Di Giovanna AP, Allegra Mascaro AL, Silvestri L, Müllenbroich MC, Onofri L, Conti V, Vanzi F, Sacconi L, Guerrini R, Markram H, Iannello G, Pavone FS. "A versatile clearing agent for multi modal brain imaging" *Scientific Reports* 2015
16. Rosentul DC, Delsing CE, Jaeger M, Plantinga TS, Oosting M, **Costantini I**, Venselaar H, Joosten LAB, van der Meer JWM, Dupont B, Kullberg BJ, Sobel JD and Netea MG. *Front.* "Gene polymorphisms in pattern recognition receptors and susceptibility to idiopathic recurrent vulvovaginal candidiasis" *Microbiology* 2014
17. Silvestri L, Bria A, **Costantini I**, Sacconi L, Peng H, Iannello G, Pavone FS . "Micron-scale resolution optical tomography of entire mouse brains with confocal light sheet microscopy." *J Vis Exp.* 2013
18. Silvestri L, Allegra Mascaro AL, **Costantini I**, Sacconi L, Pavone FS. "Correlative two-photon and light sheet microscopy." *Methods* 2013
19. Plantinga TS, **Costantini I**, Heinhuis B, Huijbers A, Semango G, Kusters B, Netea MG, Hermus AR, Smit JW, Dinarello CA, Joosten LA, Netea-Maier RT. "A promoter polymorphism in human interleukin-32 modulates its expression and influences the risk and the outcome of epithelial cell-derived thyroid carcinoma." *Carcinogenesis.* 2013

Pre print

1. **Irene Costantini**, Enrico Baria, Michele Sorelli, Felix Matuschke, Francesco Giardini, Miriam Menzel, Giacomo Mazzamuto, Ludovico Silvestri, Riccardo Cicchi, Katrin Amunts, Markus Axer, Francesco Saverio Pavone 2020 *BioRxiv* MAGIC: A label-free fluorescence method for 3D high-resolution reconstruction of myelinated fibers in large volumes doi: <https://doi.org/10.1101/2020.07.28.225011>
2. **Irene Costantini**, Giacomo Mazzamuto, Matteo Roffilli, Filippo Castelli, Mattia Neri, Giovanni Lughì, Andrea Simonetto, Annunziata Laurino, Erica Lazzeri, Luca Pesce, Christophe Destrieux, Ludovico Silvestri, Valerio Conti, Renzo Guerrini, Francesco S. Pavone 2020 *BioRxiv* "A combined pipeline for quantitative analysis of human brain cytoarchitecture" doi: <https://doi.org/10.1101/2020.08.06.219444>
3. Miriam Menzel, Markus Axer, Hans De Raedt, **Irene Costantini**, Ludovico Silvestri, Francesco S. Pavone, Katrin Amunts, Kristel Michielsen "Transmittance assisted interpretation of 3D nerve fibre architectures" 2018 *ArXiv* :1806.07157v2 doi:<https://arxiv.org/abs/1806.07157>
4. Ludovico Silvestri, Marie Caroline Muellenbroich, **Irene Costantini**, Antonino Paolo Di Giovanna, Leonardo Sacconi, Francesco Saverio Pavone "RAPID: Real-time image-based autofocus for all wide-field optical microscopy systems" 2018 *BiorXiv* doi: <https://doi.org/10.1101/170555>

Conference Proceeding

1. V Gavryusev, L Pesce, A Laurino, G Mazzamuto, G Sancataldo, M Scardigli, M Roffilli, L Silvestri, **I Costantini**, and F S Pavone "Swift light sheet volumetric charting of large human brain portions" Biomedical Optics 2020
2. L. Pesce, A. Laurino, V. Gavryusev, G. Mazzamuto, G. Sancataldo, M. Roffilli, L. Silvestri, I. Costantini, F. S. Pavone "Fast volumetric mapping of human brain slices" SPIE Photonics West February 2020
3. I Costantini, G Mazzamuto, A Laurino, E Lazzeri, L Sacconi, M Neri, A Simonetto, M Roffilli, L Silvestri, F. S. Pavone. "Three-dimensional analysis of human brain cytoarchitectonics by means of a SWITCH/TDE-combined clearing method". Advances in Microscopic Imaging II 11076, 110760B
4. Costantini, I.*, Mazzamuto, G*, Neri, M., Roffilli, M., Silvestri, L., Pavone, F. S. "Automatic Segmentation of Neurons in 3D Samples of Human Brain Cortex". Conf Proceeding EvoApplications 2018
5. Costantini I, Menzel M., Silvestri L., Schubert N., Axer M., Amunts K., Pavone F.S. "Correlative Polarized Light Imaging and Two-Photon Fluorescence Microscopy for 3D myelinated fibers reconstruction" Conf Proceeding ECBO 2017
6. Acciai L, Costantini I, Pavone FS, Conti V, Guerrini R, Soda P, Iannello G "Towards automated neuron tracing via global and local 3d image analysis" Conf Proceeding IEEE ISBI 2016
7. Costantini I, Allegra Mascaro AL, Margoni E, Iannello G, Bria A, Sacconi L, Pavone F.S "Combination of two-photon fluorescence microscopy and label-free near-infrared reflectance: A new complementary approach for brain imaging" Conf Proceeding OSA 2016
8. Silvestri L, Mascaro ALA, Costantini I, Sacconi L, Pavone, FS "Brain imaging from the nano- to the macro-scale" Conf Proceeding IEEE NER 2015
9. Soda P, Acciai L, Cordelli E, Costantini I, Sacconi L, Pavone FS, Conti V, Guerrini R, Frasconi P, Iannello G. "Computer-based automatic identification of neurons in gigavoxel-sized 3D human brain images." Conf Proceeding IEEE Eng Med Biol Soc. 2015
10. Costantini, I, Di Giovanna AP, Mascaro ALA, Silvestri L, Mullenbroich MC, Sacconi L, Pavone FS "A versatile new technique to clear mouse and human brain" Conf Proceeding SPIE ECBO 2015
11. Mascaro, ALA, Silvestri, L, Costantini, I, Sacconi, L, Maco, B, Knott, GW, Pavone, FS "Multiphoton microscopy in brain imaging" Conf Proceeding SPIE BIOS 2015
12. Silvestri L, Mascaro ALA, Costantini I, Sacconi L, Pavone, FS "Whole brain optical imaging" Conf Proceeding SPIE BIOS 2015
13. Costantini, I, Di Giovanna AP, Mascaro ALA, Silvestri L, Mullenbroich MC, Sacconi L, Pavone FS "A new versatile clearing method for brain imaging" Conf Proceeding SPIE BIOS 2015
14. Silvestri L, Allegra Mascaro AL, Costantini I, Sacconi L, Pavone FS "Brain imaging from the nano- to the macro-scale" Conf Proceeding IEEE/EMBS 2015
15. Costantini, I, Mascaro ALA, Di Giovanna AP, Silvestri L, Mullenbroich MC, Sacconi L, Pavone FS "A multi modal clearing method for brain imaging" Conf Proceeding OSA 2015
16. Silvestri L, Rudinskiy N, Paciscopi M, Mullenbroich M.C, Costantini I, Sacconi L, Frasconi P, Hyman B.T., Pavone F.S. "Brain-wide charting of neuronal activation maps with cellular resolution" Conf Proceeding OSA 2015
17. Silvestri L, Allegra Mascaro AL, Costantini I, Sacconi L, Pavone FS "Exploring the brain on multiple scales with correlative two-photon and light sheet microscopy" Conf Proceeding SPIE BIOS 2014
18. Mascaro, ALA, Silvestri, L, Costantini, I, Sacconi, L, Maco, B, Knott, GW, Pavone, FS "Neural plasticity explored by correlative two-photon and electron/SPIM microscopy" Conf Proceeding SPIE ECBO 2013

Project

- **Scientific leader**, European Laboratory for Non-Linear Spectroscopy (LENS), of the Project: Ordinary Project of Research Finalized Call 2013 of the Ministry of Health, Project Code: RF-2013-02355240 "New strategies for diagnostic, therapeutic and clinical care in Neurologic diseases " until June 2020
- **Scientific leader**, European Laboratory for Non-Linear Spectroscopy (LENS), of the Project: "Studio del consolidamento della memoria aversiva attraverso l'utilizzo di microscopia avanzata ad alta risoluzione per la mappatura tridimensionale dell'attivazione neuronale nell'intero cervello murino" by Ente cassa di Risparmio di Firenze private foundation. Number #24135, 01/08/2019 to 31/07/2020.
- Scientific member of Eurobioimaging Italian Nodes (ESFRI research infrastructure) - Advanced Light Microscopy Italian Node
- Scientific member of the European Human Brain Project H2020 FET Flagship Project Specific Grant Agreement 7202070 (SGA1). Contribution to the tasks: T1.3.3 "Methodical Development in Optical Imaging, Data Analysis, Integration and Atlasing", T1.3.4 "Whole-Brain Cell-Resolution Activity Maps ", T2.2.2" Cell Types, Synapses, and their Quantitative Characterization in the Human Brain ",

T2.2.3" Transmitter Receptors in Cortical and Subcortical Regions and Layers of the Human Brain ", T2.6.4" Big Data Methods for Extracting Quantitative Data in High-Resolution Imagery " 01/04/2016 to 01/04/2018

- **Scientific coordinator** of Task 2.3.1 "Distribution and morphological characterization of neurons and fibers of different layers of the human hippocampus" of the European Human Brain Project H2020 FET Flagship Project Specific Grant Agreement 785907 (SGA2). Contribution to tasks T2.3.2 "Three-dimensional multiple staining of neuronal structures ", T 2.3.4" Integration of high-resolution connectivity across scales and modalities ", T2.5.2" Integration of physiological with morphological data of interneurons in selected regions of human brain ", T2.6.4" A machine learning / image analysis toolbox to high-resolution histological data label ", T1.3.2" Technological development in both imaging and data analysis ", T1.3.3" Whole-brain cell-resolution activity mapping ". From 01/04/2018 to 01/04/2020
- Scientific member of the European Human Brain Project H2020 FET Flagship Project Specific Grant Agreement 945539 (SGA3, 2020-2023). **Co-Deputy** Task T1.3 "Nested structural connectomes enriched with region-specific features". Contribution to the task T1.1 "Human brain region-specific molecular and cellular data organisation". From 01/04/2020 to 01/04/2023
- Scientific member of the international project RFA-MH-17-210, BRAIN Initiative Cell Census Network (BICCN) of the National Institutes of Health, USA, "Imaging and Analysis Techniques to Construct a Cell Census Atlas of the Human Brain". From 01/11/2018 to 01/11/2023

Honours and awards

- [2018] Carl Zeiss Award for Young Researchers - Ernst Abbe Foundation - Zeiss International
- [2018] Edmund Optics Educational Award 2018 - Edmund Optics Ltd
- [2017] Congress Grant Award - SPIE/OSA - Optics and the Brain - Optics in the Life Sciences Congress
- [2016] Biomedical Optics Student Poster Presenter Finalist Award - SPIE/OSA - Optics and the Brain
- [2015] PhD student best poster award – LENS poster session – University of Florence
- [2010 - 2011] ERASMUS Placement mobility -University of Florence
- [2008 - 2009] Award for graduated with merit at the University of Florence

Guest editor

- Frontiers In Neuroanatomy

Board reviewer member
Peer reviewer activity

- Photonics
- Acta Neuropathologica journal
- Biomedical Optics Express
- Microscopy Research and Technique
- SoftwareX
- Neurophotonics
- Microscopy Research and Technique
- Journal of Biophotonics
- Scientific Reports
- Biomaterials
- Brain research
- Frontiers In Neuroanatomy
- Communication Biology

Project reviewer activity

[2020] Evaluator designated by the members of the technical-scientific committee of the project proposals in response to the extraordinary covid-19 emergency call published by the artes 4.0 competence center "ARTES 4.0 - 2020 Extraordinary Call for the financing of industrial research and experimental development projects that provide for the use of 4.0 technologies in response to the covid-19 pandemic "

Training

- [2015] Participation at "Connectomics" Neuroscience School of Advanced Studies. NSAS - Florence – Italy.
- [2014] Participation at "ZEISS on Your Campus" LENS European Laboratory for Non-Linear Spectroscopy - Sesto Fiorentino – Italy
- [2014] Participation at "Interdisciplinary school on clinical biophotonics" Photonics4Life - Jena –

Germany

- [2013] Participation at “ZEISS Lightsheet Z.1 Technology Workshop” Carl Zeiss S.p.A - Arese – Italy
- [2012] Participation at “Helium microscope ORION ® PLUS operator training course” Carl Zeiss S.p.A – NTS – LLC - Peabody - Boston -USA

Teaching activity

- [2021 to date] Assistant professor, Advanced morpho-functional imaging, Department of Biology, University of Florence, Italy.
- [2021 to date] Assistant professor, Developmental biology, Department of Biology, University of Florence, Italy.
- [2017 - 2019] Seminars on optical clearing of tissue at the Faculty of Engineering at the University of Florence and at the European Laboratory for Non-Linear Spectroscopy.

Conference

Invited:

1. **Costantini I**, M. Scardigli, L. Pesce, V. Gavryusev, F. M. Castelli, L. Silvestri, G. Mazzamuto, F S Pavone “Tissue clearing for human brain imaging”, IEEE-ISBI 2021
2. **Costantini I**, Silvestri L., Menzel M., Axer M., Amunts K., Pavone F.S. “Correlative Polarized Light Imaging and Two-Photon Fluorescence Microscopy for 3D myelinated fibers reconstruction” ECBO 2017.
3. **Costantini I**, Silvestri L., Pavone F.S “High-resolution structural imaging of the hippocampus in mice and humans” HBP Hippocampal meeting 2017
4. **Costantini I**, Di Giovanna AP, Allegra Mascaro AL, Silvestri L, Muellenbroich MC, Sacconi L, Pavone FS “A new approach for brain clearing: clarity method” GISN 2014

Oral presentation:

1. **Costantini I**, G Mazzamuto, A Laurino, E Lazzeri, A Simonetto, M Roffilli, L Silvestri, F S. Pavone. “Three-dimensional analysis of human brain cytoarchitectonics by means of a SWITCH/TDE-combined clearing method”. ECBO 2019
2. **Costantini I**, G Mazzamuto, A Laurino, E Lazzeri, L Sacconi, V Conti, R Guerrini, M Roffilli, L Silvestri, F S. Pavone “A SWITCH/TDE -combined clearing method to reconstruct the three-dimensional cytoarchitectonics of human brain” FOM 2019
3. **Costantini I**, “A label-free fluorescence approach for high resolution imaging of myelinated fiber” INO annual symposium 2019
4. **Costantini I**, Silvestri L., Menzel M., Axer M., Amunts K., Pavone F.S. “Correlative label-free two-photon fluorescence microscopy and polarized light imaging” FOM 2017.
5. **Costantini I**, Silvestri L., Menzel M., Axer M., Amunts K., Pavone F.S. “Correlative label-free two-photon fluorescence microscopy and polarized light imaging for 3D reconstruction of myelinated fibers orientation” OSA – Optics and the brain 2017.
6. **Costantini I**, Menzel M, Silvestri L, Schubert N, Axer M, Amunts K, Pavone FS “Correlative Polarized Light Imaging and Two-Photon Fluorescence Microscopy for 3D myelinated fibers reconstruction” ECBO 2017
7. **Costantini I**, Silvestri L., Menzel M., Axer M., Amunts K., Pavone F.S “Correlative label-free two-photon fluorescence microscopy and polarized light imaging for 3D reconstruction of myelinated fibers orientation” GISN 2016.
8. **Costantini I**, Di Giovanna AP, Allegra Mascaro AL, Silvestri L, Sacconi L, Pavone FS. “Tde: a new versatile method for brain clearing” FOM 2015
9. **Costantini I**, Di Giovanna AP, Allegra Mascaro AL, Silvestri L, Sacconi L, Pavone FS. “New clearing method for one- and two-photon imaging” SIF 2014
10. **Costantini I**, Silvestri L, Allegra Mascaro AL, Sacconi L, Pavone FS “Brain imaging with correlative two-photon and light sheet microscopy” MAF 2013.

Poster:

1. **Costantini I**, G Mazzamuto, A Laurino, E Lazzeri, A Simonetto, M Roffilli, L Silvestri, F S. Pavone. “Three-dimensional cytoarchitectonic analysis of the human brain”. Sfn 2019.
2. **Costantini I**, Silvestri L, Lazzeri, R Cicchi, E Baria, G Mazzamuto, L Sacconi, M Menzel M Axer, K Amunts, F S. Pavone “A label-free, effective approach for high-resolution myelin imaging in the mammal brain”. SPIE/BIOS 2019
3. **Costantini I**, Mazzamuto G, Silvestri L, M. Neri, M. Roffilli, Conti V, Sacconi L, Guerrini R, Pavone “3D human brain digital histopathology” SPIE/OSA 2018
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- Organizer and chair of the plenary session "Brain atlas services: navigate the brain in 3D - find, contribute, and analyze brain data, based on location" at the HBP Summit 2020 congress held from February 3rd to 6th in Athens, Greece.
 - Member of the organizing committee of the "HBP - Young Researchers Event 2017" congress held on 12-13 September 2017 in Geneva, Switzerland