

## Francesco Vanzi

### TITLES AND WORK EXPERIENCES

1994: Degree in Biological Sciences, Biomolecular Course, UniFI: 110/110 cum laude  
1996-2002: PhD student in Biochemistry and Molecular Biophysics at the University of Pennsylvania, Philadelphia, USA  
1996: Visiting Scientist at NIMR, Mill Hill, London, UK  
2001: Visiting Scientist at Uppsala University, Sweden  
2002: PhD in Biochemistry and Molecular Biophysics at the University of Pennsylvania, Philadelphia, USA  
2002-2004: Research fellow (Ricercatore a tempo determinato) at the National Institute for Physics of Matter (INFM), Italy  
2004-2011: Research fellow (Ricercatore a tempo determinato) at the Department of Biology, University of Florence, Italy  
2004-2011: Research fellow at the European Laboratory for Nonlinear Spectroscopy (LENS), University of Florence, Italy.  
2011-2017: University Researcher - Dept. of Biology - University of Florence  
2017-present: Associate Professor - Dept. of Biology - University of Florence

### RESEARCH ACTIVITY

- Development of optical methods for functional imaging and behavioural assays in zebrafish  
- Disease modeling in zebrafish (functional imaging of neuronal activity in epilepsy and other disorders)  
Techniques: Optical microscopy for functional imaging in zebrafish (wide-field, confocal, two-photon, SPIM), Transmission electron microscopy, 3D TEM reconstructions.

### FUNDING

2004-2007 Ente Casa di Risparmio Promelab – “Progetto di ricerca avanzata su espressione, struttura, funzione di proteine di membrana” (Subgroup PI)  
2004-2008 EU Marie Curie Transfer of Knowledge Bical-“Biological and chemical applications of lasers” (Project member and outgoing fellow)  
2008-2010 POR-CREO Regione Toscana "Realizzazione di un biosensore ad onda evanescente" (Subgroup PI)  
2008-2011 EU-funded project NanomuBiop – “Enhanced sensitivity Nanotechnology-based Multiplexed Bioassay Platform for diagnostic applications” (Project member)  
2012-2018 Italia Flagship project Nanomax (Project member)  
2013 Ente Cassa di Risparmio di Firenze – “Metodi ottici avanzati per lo studio del differenziamento dei tessuti” (PI)  
2014 Ente Cassa di Risparmio di Firenze – “Imaging funzionale in zebrafish” (PI)  
2015 Ente Cassa di Risparmio di Firenze - Titolo “Multi-modal investigation of electrical defects in cardiac cells from pathological settings” (Subgroup PI)  
2020 Ente Cassa di Risparmio di Firenze - Titolo “Human Brain Mapping” (Subgroup PI)

### TEACHING, ACADEMIC AND EDITORIAL ACTIVITIES

2012-present: Supervisor of ca. 80 Bachelor's, Master's, PhD and post-doc students  
2012-present: holder of the course "Cytology and Histology", BS in Biology, UniFI  
2018-present: holder of the course "Comparative Anatomy", BS in Biology, UniFI  
2018-present: holder of the course "Advanced morpho-functional imaging", MS in Biology, UniFI  
2022-present: President of Biology Bachelor and Master's degrees at the University of Florence  
Associations: GEI-SIBSC (Italian Embryology and Developmental Cell Biology Association), EuFishBioMed European Consortium.  
Reviewer for international journals with IF and peer review  
Editor of one special issue of Frontiers in Bioscience

### COURSE AND MEETING ORGANIZATION

- 2012-present: Steering Committee (CIA), Department of Biology UniFI.  
- 2015-present: Member of the Scientific Committee of the “Centro di microscopie elettroniche” (Ceme) – CNR  
- 2016-present: Member of PhD School in Atomic and Molecular Photonics, UniFI.  
- 2006: Member of the organizing Committee of the 1st International Workshop on Expression, Structure and Function of Membrane Proteins”, Florence, Italy  
- 2008: Member of the organizing Committee of “New Frontiers in micro and nano photonics” congress, Florence, Italy  
- 2016: Member of the organizing Committee of the Human Brain Project Summit, Florence, Italy.

### WEB SITES

ZFIN: <https://zfin.org/ZDB-LAB-180206-3>  
ResearchGate: <https://www.researchgate.net/profile/Francesco-Vanzi>  
<http://bio.lens.unifi.it/personal-page/vanzi/>

## **PUBLICATIONS** (Source: Scopus, April 27, 2023)

75 publications; 2056 citations; h-index=25

Author of 2 Book Chapters and four contributions to University textbooks

ORCID: <https://orcid.org/0000-0002-6372-7747>

## **MEETING PRESENTATIONS**

>50 international presentations

## **MOST RELEVANT PUBLICATIONS (2008-now)**

Turrini L., Ricci P., Sorelli M., de Vito G., Marchetti M., Vanzi F., Pavone F.S. Two-photon all-optical neurophysiology for the dissection of larval zebrafish brain functional and effective connectivity. (2024) *Communications Biology*, 7 (1), art. no. 1261

Turrini L., Roschi L., de Vito G., Pavone F.S., Vanzi F. Imaging Approaches to Investigate Pathophysiological Mechanisms of Brain Disease in Zebrafish (2023) *International Journal of Molecular Sciences*, 24 (12), art. no. 9833

Turrini, L., Sorelli, M., de Vito, G., Credi, C., Tiso, N., Vanzi, F., Pavone, F.S. Multimodal Characterization of Seizures in Zebrafish Larvae (2022) *Biomedicines*, 10 (5), art. no. 951

Ricci, P., Marchetti, M., Sorelli, M., Turrini, L., Resta, F., Gavryusev, V., de Vito, G., Sancataldo, G., Vanzi, F., Silvestri, L., Pavone, F.S. Power-effective scanning with AODs for 3D optogenetic applications (2022) *Journal of Biophotonics*, 15 (4), art. no. e202100256

Vito, G.D.E., Turrini, L., Müllenbroich, C., Ricci, P., Sancataldo, G., Mazzamuto, G., Tiso, N., Sacconi, L., Fanelli, D., Silvestri, L., Vanzi, F., Pavone, F.S. Fast whole-brain imaging of seizures in zebrafish larvae by two-photon light-sheet microscopy (2022) *Biomedical Optics Express*, 13 (3), pp. 1516-1536.

Chicchi, L., Cecchini, G., Adam, I., de Vito, G., Livi, R., Pavone, F.S., Silvestri, L., Turrini, L., Vanzi, F., Fanelli, D. Reconstruction scheme for excitatory and inhibitory dynamics with quenched disorder: application to zebrafish imaging (2021) *Journal of Computational Neuroscience*, 49 (2), pp. 159-174.

Facchinello, N., Laquatra, C., Locatello, L., Beffagna, G., Brañas Casas, R., Fornetto, C., Dinarello, A., Martorano, L., Vettori, A., Risato, G., Celegghin, R., Meneghetti, G., Santoro, M.M., Delahodde, A., Vanzi, F., Rasola, A., Dalla Valle, L., Rasotto, M.B., Lodi, T., Baruffini, E., Argenton, F., Tiso, N. Efficient clofilium tosylate-mediated rescue of POLG-related disease phenotypes in zebrafish (2021) *Cell Death and Disease*, 12 (1), art. no. 100

Fornetto, C., Tiso, N., Pavone, F.S., Vanzi, F. Colored visual stimuli evoke spectrally tuned neuronal responses across the central nervous system of zebrafish larvae (2020) *BMC Biology*, 18 (1), art. no. 172

Meneghetti, N., Dedola, F., Gavryusev, V., Sancataldo, G., Turrini, L., de Vito, G., Tiso, N., Vanzi, F., Carpaneto, J., Cutrone, A., Saverio Pavone, F., Micera, S., Mazzoni, A. Direct activation of zebrafish neurons by ultrasonic stimulation revealed by whole CNS calcium imaging (2020) *Journal of Neural Engineering*, 17 (5), art. no. 056033

De Vito, G., Ricci, P., Turrini, L., Gavryusev, V., Müllenbroich, C., Tiso, N., Vanzi, F., Silvestri, L., Pavone, F.S. Effects of excitation light polarization on fluorescence emission in two-photon light-sheet microscopy (2020) *Biomedical Optics Express*, 11 (8), pp. 4651-4665.

Costantini, I., Cicchi, R., Silvestri, L., Vanzi, F., Pavone, F.S. In-vivo and ex-vivo optical clearing methods for biological tissues: Review (2019) *Biomedical Optics Express*, 10 (10), pp. 5251-5267.

Gavryusev, V., Sancataldo, G., Ricci, P., Montalbano, A., Fornetto, C., Turrini, L., Laurino, A., Pesce, L., De Vito, G., Tiso, N., Vanzi, F., Silvestri, L., Pavone, F.S. Dual-beam confocal light-sheet microscopy via flexible acousto-optic deflector (2019) *Journal of Biomedical Optics*, 24 (10), art. no. 106504

Sancataldo, G., Gavryusev, V., de Vito, G., Turrini, L., Locatelli, M., Fornetto, C., Tiso, N., Vanzi, F., Silvestri, L., Pavone, F.S. Flexible multi-beam light-sheet fluorescence microscope for live imaging without striping artifacts (2019) *Frontiers in Neuroanatomy*, 13, art. no. 7

Müllenbroich, M.C., Turrini, L., Silvestri, L., Alterini, T., Gheisari, A., Vanzi, F., Sacconi, L., Pavone, F.S. Bessel Beam Illumination Reduces Random and Systematic Errors in Quantitative Functional Studies Using Light-Sheet Microscopy (2018) *Frontiers in Cellular Neuroscience*, 12, art. no. 315

Giuliodori, A., Beffagna, G., Marchetto, G., Fornetto, C., Vanzi, F., Toppo, S., Facchinello, N., Santimaria, M., Vettori, A., Rizzo, S., Della Barbera, M., Pilichou, K., Argenton, F., Thiene, G., Tiso, N., Basso, C.

Loss of cardiac Wnt/ $\beta$ -catenin signalling in desmoplakin-deficient AC8 zebrafish models is rescuable by genetic and pharmacological intervention (2018) *Cardiovascular Research*, 114 (8), pp. 1082-1097.

Tempestini, A., Monico, C., Gardini, L., Vanzi, F., Pavone, F.S., Capitanio, M.  
Sliding of a single lac repressor protein along DNA is tuned by DNA sequence and molecular switching (2018) *Nucleic Acids Research*, 46 (10), pp. 5001-5011.

Turrini, L., Fornetto, C., Marchetto, G., Müllenbroich, M.C., Tiso, N., Vettori, A., Resta, F., Masi, A., Mannaioni, G., Pavone, F.S., Vanzi, F. Optical mapping of neuronal activity during seizures in zebrafish (2017) *Scientific Reports*, 7 (1), art. no. 3025

Crocini, C., Ferrantini, C., Scardigli, M., Coppini, R., Mazzoni, L., Lazzeri, E., Pioner, J.M., Scellini, B., Guo, A., Song, L.S., Yan, P., Loew, L.M., Tardiff, J., Tesi, C., Vanzi, F., Cerbai, E., Pavone, F.S., Sacconi, L., Poggesi, C.  
Novel insights on the relationship between T-tubular defects and contractile dysfunction in a mouse model of hypertrophic cardiomyopathy (2016) *Journal of Molecular and Cellular Cardiology*, 91, pp. 42-51.

Costantini, I., Ghobril, J.-P., Di Giovanna, A.P., Allegra Mascaro, A.L., Silvestri, L., Müllenbroich, M.C., Onofri, L., Conti, V., Vanzi, F., Sacconi, L., Guerrini, R., Markram, H., Iannello, G., Pavone, F.S. A versatile clearing agent for multi-modal brain imaging (2015) *Scientific Reports*, 5, art. no. 9808

Bisel, B., Calamai, M., Vanzi, F., Pavone, F.S. Decoupling polarization of the Golgi apparatus and GM1 in the plasma membrane (2013) *PLoS ONE*, 8 (12), art. no. e80446

Ferrantini, C., Crocini, C., Coppini, R., Vanzi, F., Tesi, C., Cerbai, E., Poggesi, C., Pavone, F.S., Sacconi, L.  
The transverse-axial tubular system of cardiomyocytes (2013) *Cellular and Molecular Life Sciences*, 70 (24), pp. 4695-4710.

Monico, C., Capitanio, M., Belcastro, G., Vanzi, F., Pavone, F.S.  
Optical methods to study protein-DNA interactions in vitro and in living cells at the single-molecule level (2013) *International Journal of Molecular Sciences*, 14 (2), pp. 3961-3992.

Capitanio, M., Canepari, M., Maffei, M., Beneventi, D., Monico, C., Vanzi, F., Bottinelli, R., Pavone, F.S.  
Ultrafast force-clamp spectroscopy of single molecules reveals load dependence of myosin working stroke (2012) *Nature Methods*, 9 (10), pp. 1013-1019.

Vanzi, F., Sacconi, L., Cicchi, R., Pavone, F.S. Protein conformation and molecular order probed by second-harmonic-generation microscopy (2012) *Journal of Biomedical Optics*, 17 (6), art. no. 060901, .

Nucciotti, V., Stringari, C., Sacconi, L., Vanzi, F., Fusi, L., Linari, M., Piazzesi, G., Lombardi, V., Pavone, F.S.  
Probing myosin structural conformation in vivo by second-harmonic generation microscopy (2010) *Proceedings of the National Academy of Sciences of the United States of America*, 107 (17), pp. 7763-7768.

Rutkauskas, D., Zhan, H., Matthews, K.S., Pavone, F.S., Vanzi, F. Tetramer opening in LacI-mediated DNA looping (2009) *Proceedings of the National Academy of Sciences of the United States of America*, 106 (39), pp. 16627-16632.

Normanno, D., Vanzi, F., Pavone, F.S.  
Single-molecule manipulation reveals supercoiling-dependent modulation of lac repressor-mediated DNA looping (2008) *Nucleic Acids Research*, 36 (8), pp. 2505-2513.  
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