

Periklis (Laki) Pantazis PhD

Extended CV

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Education

- 2001–2005 **Ph.D., Biology and Bioengineering (Dr.rer.nat.)** **Dresden, Germany**
Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG)
Marcos A. González-Gaitán Lab
Thesis “Role of endocytic trafficking during Dpp gradient formation”
Summa Cum Laude
- 1995–2000 **Master of Science in Biochemistry (Dipl.-Biochem.)** **Hanover, Germany**
Leibniz University of Hanover
Magna Cum Laude

Institutional Appointments

- since 02/2021 **Director, Imperial College London and LEICA Microsystems Imaging Hub** **ICL, UK**
Centre of Excellence in Imaging to collaborate on joint research projects to drive scientific discoveries benefitting human health.
- since 09/2020 **Reader (equiv. Associate Professor) in Advanced Optical Precision Imaging** **ICL, UK**
Creating a mechanistic understanding of development and disease progression by conceiving and applying advanced bioimaging techniques.
- 2018 - 2020 **Senior Lecturer** **ICL, UK**
Conceiving and applying advanced bioimaging techniques.
- 2016 - 2018 **HHMI Janelia Visiting Scientist** **HHMI Janelia Research Campus, USA**
Cooperation with the lab of Eric Schreiter in conducting primed conversion-related research at the Janelia Research Campus of the Howard Hughes Medical Institute.
- 2012 - 2018 **Assistant Professor of Biosystems Analysis** **ETH Zürich, Switzerland**
Department of Biosystems Science and Engineering (D-BSSE)
Conducting research on advancing biosystems imaging, advising Postdocs, PhD, and Master students in the Laboratory of Nano Bio Imaging.
- 2006 - 2011 **Postdoctoral Scholar** **Caltech, USA**
Scott E. Fraser Lab – Division of Biology
Developed imaging tools required for the mechanistic dissection of stem cell and developmental biology problems.
- 07-11/2005 **Research Consultant** **Carl Zeiss MicroImaging GmbH, Germany**
Application Centre
Designed and implemented localized photoactivation experiments on the newly developed Zeiss LSM 710 NLO microscope system.
- 02-11/2005 **Postdoctoral Scholar** **MPI-CBG, Germany**
Marcos A. González-Gaitán Lab
Combined sophisticated imaging with *in silico* modelling to quantitatively analyze the distribution, diffusion, and clearance of eGFP-labelled morphogens during Drosophila embryogenesis.

Awards and Honours (incl. Group members)

- 2025 **2025 Royal Microscopical Society Scientific Achievement Award** **London, UK**
Awarded by the Royal Microscopical Society in recognition of scientific achievement in microscopy and imaging research.
- 2025 **Addgene Blue Flame Award for Widely Shared Plasmids** **Boston, USA**
Recognised for generating the GenEPi plasmid resource with broad international uptake and distribution through Addgene.

- 2024 **Fellow of the Royal Microscopical Society** **London, UK**
Serving on the Life Science Committee of the Royal Microscopical Society.
- 2018-2023 **Royal Society Wolfson Research Merit Award Holder** **London, UK**
5-year Research support and Salary enhancement from The Royal Society.
- 2017 **HHMI Janelia Visiting Scientist Award** **HHMI Janelia Research Campus, USA**
2-year HHMI Janelia Visiting Scientist Award to co-supervise primed conversion-related research at the Janelia Research Campus of the Howard Hughes Medical Institute. It covers travel and research expenses of \$15000/year.
- 2017 **Spark Award 2017 Nomination** **Zurich, Switzerland**
The invention 'Biodegradable SHG nanoprobe' was placed among the top innovations filed by ETH Zurich in 2016 and nominated for the prestigious Spark Award of ETH Zurich.
- 2008-2011 **German Science Foundation Postdoctoral Fellowship** **Caltech, USA**
3-year Postdoctoral Fellowship of €45.000/year to perform research at the Biological Imaging Center of the California Institute of Technology (Caltech).
- 2007 **Participant Award for the 57th Nobel Laureate Meeting** **Lindau, Germany**
Travel Stipend awarded among the leading applications of 500 young researchers from 64 countries to attend the 57th Meeting of Nobel Prize Winners in Physiology or Medicine.
- 2009 **NIH Travel Stipend Award** **Washington/DC, USA**
Travel Stipend Award of \$500 for presenting SHG nanoprobe for in vivo imaging at the 4th NIH Workshop "Imaging the Pancreatic Beta Cell".
- 2001-2005 **PhD Scholarship of the German Science Foundation** **Dresden, Germany**
Predoctoral Fellowship of €20.000/year to perform undergraduate studies at the Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG).

Group members

- 2024 **Wellcome Early Career Award** **London**
5-year Fellowship from the Wellcome Trust for my former postdoc/now visiting researcher Konstantinos Kalyvotiis about deciphering the form and function of novel Piezo1-rich organelles in cell extrusion using our GenEPI sensor.
- 2024 **Best Student Poster Award** **Birmingham, UK**
Advisor of the graduate student Julian Boecker who was awarded the best poster award at the Royal Society Theo Murphy meeting on "Cell lineages across scales, space and time"
- 2024 **Best Student Poster Award** **Caparica, Portugal**
Advisor of the graduate student Edagül Uluçay who was awarded the best poster award at the International Caparica Symposium on Nanoparticles/Nanomaterials and Applications (INSA 2024).
- 2023 **Christine Beattie Award** **International Zebrafish Society**
Advisor of the graduate student Manuel A. Mohr who was awarded the prestigious junior investigator award of the international zebrafish society (IZFS) for his graduate work on the force sensor GenEPI. The award recognises junior investigators who demonstrate excellence in the field of zebrafish research and exhibit promise as future leaders in the zebrafish field.
- 2020 **EuFishBioMed Society Meeting Registration Grant Award** **Online**
Advisor of the graduate student Konstantinos Kalyvotiis who was awarded a registration fee grant.
- 2018-2020 **Peter und Traudl Engelhorn Postdoctoral Fellowship Award** **Munich, Germany**
2-year Postdoctoral Fellowship from the Peter und Traudl Engelhorn Stiftung (head: Nobel Laureate Prof. Robert Huber) for the postdoc Maaïke Welling to conduct research about asymmetry in mouse embryos using primed conversion. Only 7 fellowships/year are awarded.
- 2016 **Janelia Graduate Research Fellowship Award** **HHMI Janelia Research Campus, USA**
Advisor of the graduate student Manuel A. Mohr who was granted a prestigious HHMI graduate fellowship that is awarded to only 5 applicants per year to conduct primed conversion-related research at the Janelia Research Campus of the Howard Hughes Medical Institute.

- 2015 **Best Student Participant Award for the 65th Nobel Laureate Meeting** Lindau, Germany
 Advisor of the graduate student Ali Y. Sonay who was selected among 650 young scientists from 88 countries to attend the 65th Meeting of Nobel Prize Winners in Physiology or Medicine, Chemistry, and Physics.
- 2013 **Best Student Poster Award** Zurich, Switzerland
 Advisor on the best student poster at the Zurich Center for Imaging Science and Technology (CIMST) Summer School.

Publications

Refereed Primary Papers

Group members in bold

*contributed equally

#corresponding author

- In Revision [48] Gaudiano, E., Eisert, R., Bradshaw, G., **Kalyviotis, K.**, Montero Llopis, P., Clark, M., Anekal, P., LaFleur, M., Markson, S., Buck, S., Sorger, P., Freeman, G., **Pantazis, P.**, Kalocsay, M.# and Sharpe, A.#. "PD-1 inhibits Piezo1 on CD8+ T cells to impair antitumor immunity." *Revision in Nature*
- 2026 [47] **Boecker, J., Pantazis, P.**, # (2026). "From Recording to Intervention: Causal Lineage Tracing with Primed Conversion." *IEEE Photonics Journal* (99):1-8.
- [46] Vagena-Pantoula, C., **Kalyviotis, K.**, Sanchez, A., Kondrychyn, I., Fukumoto, M., Pan, X., Juan, T., Stainier, D.Y.R., **Pantazis, P.**, Phng, L.-K., Vermot, J.#, (2026) "Piezo1-mediated mechanohydraulic control of cell volume drives cardiac morphogenesis." *Science Advances* 12(17):eaea7025.
- 2024 [45] Guo, K., **Kalyviotis, K.**, **Pantazis, P.**, and Rowlands, C.J.#, "Hyperspectral Oblique Plane Microscopy enables Spontaneous, Label-free Imaging of Biological Dynamic Processes in Live animals." *Proc Natl Acad Sci USA* 22;121(43):e2404232121.
- [44] **Ulucay, E.***, **Bollier, P.***, **Spilioti, M.***, **Sonay, A.Y.**, **Kalyviotis, K.** # and **Pantazis, P.#**, "Synthesis and Functionalization of Biodegradable Second Harmonic Generation Nanoprobes for Cell Targeting." *Curr Protoc.* 2024 4(7):e1089.
- [43] Suba, K., Patel, Y., Alonso, A.M., Hansen, B., Xu, X., Roberts, A., Norton, M., Chung, K., Shrewsbury, J.V., Kwok, R., Kalogianni, V., Chen, S., Liu, X., **Kalyviotis, K.**, Rutter, G.A., Jones, B.J., Miniion, J., Owen, B.M., **Pantazis, P.**, Distaso, W., Drucker, D.J., Tan, T.M., Bloom, S.R., Murphy, K.G., Salem, V., "Intra-islet glucagon signalling regulates beta-cell connectivity, first-phase insulin secretion and glucose homeostasis." *Mol Metab.* 85:101947.
- 2023 [42] **Yaganoglu, S.***, **Kalyviotis, K.***, Vagena-Pantoula, C., Jülich, D., Gaub, B.M., **Welling, M.**, Lopes, T., Lachowski, D., **Tang, S.S.**, Del Rio Hernandez, A., Salem, V., Müller, D.J., Holley, S.A., Vermot, J., Shi, J., Helassa, N., Török, K., and **Pantazis, P.#**, (2023) "Highly specific and non-invasive imaging of Piezo1-dependent activity across scales using GenEPi". *Nature Communications* 14 (1), 4352.
- Featured in: Landhuis, E. (2021) "Seven technologies to watch in 2021" Nature 589: 630-632 (2021)*
- "Nobel-winning bodily 'pressure sensors' filmed for first time at Imperial" Imperial College London News.*
- 2021 [41] **Sonay, A.Y.**, **Kalyviotis, K.**, **Yaganoglu, S.**, **Unsal, A.**, Konantz, M., Teulon, C., Jiang, S., Behzadi, S., Crespy, D., Landfester, K., Roke, S., Lengerke, C., and **Pantazis, P.#**, (2021) "Biodegradable harmonophores for targeted high-resolution in vivo tumor imaging". *ACS Nano* 15, 4144-4154.
- Invention nominated for the SPARK Award 2017 at ETH Zurich and publication featured in: Brogan, C. (2021) "Tumours illuminated brightly and precisely with new biodegradable nanoprobe" Imperial College London News.*
- 2020 [40] **Welling, M.**, **Kalyviotis, K.**, and **Pantazis, P.#** (2020), "Primed Track: Reliable Volumetric Single-cell Tracking and Lineage Tracing of Living Specimen with Dual-labeling Approaches". *Bio-protocols*, 10(11), June 05.

- [39] Malkinson, G.*, Mahou, P.*, Chaudan, E., Gacoin, T., **Sonay, A.Y., Pantazis, P.**, Beaufepaire, E., and Supatto, W.# (2020), "Fast in vivo imaging of SHG nanoprobe with multiphoton light-sheet microscopy". *ACS Photonics*. 7:1036-1049.
- 2019 [38] **Welling, M.A.*, Mohr, M.A.***, Ponti, A., **Sabater, L.R.**, Boni, A., Kitazawa, Y., Liberali, P., Peters, A., Pelczar, P., and **Pantazis, P.#** (2019), "High fidelity lineage tracing in mouse pre-implantation embryos using primed conversion of photoconvertible proteins". *eLIFE*. 21(8): e44491.
- 2018 [37] Slenders, E., Bové, H., Urbain, M., Mugnier, Y., **Sonay, A.Y., Pantazis, P.**, Bonacina, L., Vanden Berghe, P., vandeVen, M., and Ameloot, M.#, (2018) "Image Correlation Spectroscopy with Second Harmonic Generating Nanoparticles in Suspension and in Cells." *J Phys Chem Lett*. 20:6112-6118.
- [36] **Sugiyama, N.*, Sonay, A.Y.***, Tussiwand, R., Cohen, B., and **Pantazis, P.#**, (2018) "Effective Labeling of Primary Somatic Stem Cells with BaTiO₃ Nanocrystals for Second Harmonic Generation Imaging". *Small* 8:1703386.
- Provided cover of the journal*
- 2017 [35] **Nugraha, B., Mohr, M.A.**, Ponti, A., Emmert, M.Y., Weibel, F., Hoerstrup, S.P., Moll, S., Certa, U., Prunotto, M., and **Pantazis, P.#**, (2017) "Monitoring and manipulating cellular crosstalk during kidney fibrosis inside a 3D in vitro co-culture". *Scientific Reports* 7:14490.
- [34] **Mohr, M.A.**, Kobitski, A.Yu., **Sabater, L.R.**, Nienhaus, K., Obara, C.J., Lippincott-Schwartz, J., Nienhaus, G.U.#, and **Pantazis, P.#**, (2017) "Rational Engineering of Photoconvertible Fluorescent Proteins for Dual-Color Fluorescence Nanoscopy Enabled by a Triplet-State Mechanism of Primed Conversion". *Angew. Chem. Int. Ed.* 56:11628-11633.
- Featured in: Bergman, F. (2017) "Red fluorescence in two steps" ETH Zurich News.*
- [33] Zhang, W., Lohman, A.W., Zhuravlova, Y., Lu, X., Wiens, M.D., Hoi, H., **Yaganoglu, S., Mohr, M.A.**, Kitova, E.N., Klassen, J.S., **Pantazis, P.**, Thompson, J.R., and Campbell, R.E.#, (2017) "Optogenetic control with a photocleavable protein" *Nature Methods* 14:391-394.
- 2016 [32] **Mohr, M.A.**, Argast, P., and **Pantazis, P.#**, (2016) "Labeling cellular structures in vivo using confined primed conversion of photoconvertible fluorescent proteins" *Nature Protocols* 11:2419-2431.
- 2015 [31] **Dempsey, W.P.***, Hodas, N.O.*, Ponti, A., and **Pantazis, P.#**, (2015) "Determination of the source of SHG verniers in zebrafish skeletal muscle" *Scientific Reports* 5:18119.
- [30] **Dempsey, W.P.***, Georgieva, L.*, Helbling, P.M., **Sonay, A.Y.**, Truong, T.V., **Haffner, M.**, and **Pantazis, P.#**, (2015) "In vivo single cell labeling by confined primed conversion" *Nature Methods* 12:645-648.
- Featured in 11 news outlets and scientific blogs among them: Bergman, F. (2015) "Chameleon proteins make individual cells visible" ETH Zurich News.*
- 2012 [29] Culic-Viskota, J.*, **Dempsey, W.P.***, Fraser, S.E., and **Pantazis, P.#**, (2012) "Surface functionalization of barium titanate SHG nanoprobe for in vivo imaging in zebrafish" *Nature Protocols* 7:1618-33.
- [28] **Dempsey, W.P.**, Fraser, S.E., and **Pantazis, P.#**, (2012) "PhOTO Zebrafish: A transgenic resource for in vivo lineage tracing during development and regeneration" *PLoS ONE* 7:e32888.
- Featured in: "PhOTO zebrafish: a transgenic resource for in vivo lineage tracing during development and regeneration, Significance statement" Global Medical Discovery.*
- 2011 [27] Plachta, N., Bollenbach, T., Pease, S., Fraser, S.E., and **Pantazis, P.#**, (2011) "Oct4 kinetics predict cell lineage patterning in the early mammalian embryo" *Nature Cell Biology* 13:117-23.
- Provided cover of the journal and featured in: Zernicka-Goetz, M., (2011) "Proclaiming fate in the early mouse embryo" Nature Cell Biology 13:112-4.*
- [26] Caneparo, L.*, **Pantazis, P.***, Dempsey, W.P., and Fraser, S.E., (2011) "Intercellular bridges in vertebrate gastrulation" *PLoS ONE* 6:e20230.
- 2010 [25] **Pantazis, P.#**, Maloney, J., Wu, D., and Fraser, S.E., (2010) "Second Harmonic Generating (SHG) nanoprobe for in vivo imaging" *Proc Natl Acad Sci USA* 107:14535-40.
- Featured in: Cohen, B., (2010) "Biological imaging: Beyond fluorescence" Nature 467:407-8; Evanko, D., (2010) "Microscope harmonies" Nature Methods 7:779.*

- [24] Tu, C., Ma, X., **Pantazis, P.**, Kauzlarich, S.#, and Louie, A.#, (2010) "Paramagnetic, silicon quantum dots for magnetic resonance and two photon imaging of macrophages" *J Am Chem Soc* 132:2016-23.
- 2008 [23] Bollenbach, T.#, **Pantazis, P.***, Kicheva, A.#, Boekel, C., Kruse, K., Gonzalez-Gaitan, M.#, and Juelicher, F.#, (2008) "Precision of the Dpp gradient" *Development* 135:1137-46.
- 2007 [22] Kicheva, A.#, **Pantazis, P.***, Bollenbach, T.#, Kalaidzidis, Y., Bittig, T., Juelicher, F.#, and Gonzalez-Gaitan, M.#, (2007) "Kinetics of morphogen gradient formation" *Science* 315(5811):521-5.
- Featured in: Kritikou, E., (2007) "Reaching one's range" Nature Reviews Molecular Cell Biology 8:181.*
- [21] **Pantazis, P.#**, and González-Gaitán, M., (2007) "Localized multiphoton photoactivation of paGFP in Drosophila wing imaginal discs" *J Biomed Opt* 12:044004.
- [20] Bollenbach, T., Kruse, K., **Pantazis, P.**, Gonzalez-Gaitan, M., Juelicher, F.#, (2007) "Morphogen transport in epithelia." *Phys Rev E Stat Nonlin Soft Matter Phys.* 75 (1 Pt 1):011901.
- 2005 [19] Bollenbach, T., Kruse, K., **Pantazis, P.**, Gonzalez-Gaitan, M., and Juelicher, F.#, (2005) "Robust formation of morphogen gradients" *Phys Rev Lett* 94:018103(1-4).
- [18] Kruse, K.#, **Pantazis, P.***, Bollenbach, T., Juelicher, F.#, and Gonzalez-Gaitan, M.#, (2004) "Dpp gradient formation by Dynamin-dependent endocytosis: receptor trafficking and the diffusion model" *Development* 131:4843-56.
- 1999 [17] Tsikas, D.#, Sandmann, J., Holzberg, D., **Pantazis, P.**, Raida, M., and Frolich, J.C., (1999) "Determination of S-nitrosoglutathione in human and rat plasma by high-performance liquid chromatography with fluorescence and ultraviolet absorbance detection after precolumn derivatization with o-phthalaldehyde" *Anal Biochem* 273:32-40.

Refereed Reviews Publications

- 2024 [16] **Kalyviotis, K.**, and **Pantazis, P. #**, "Primed conversion: The emerging player of precise and nontoxic photoconversion." *Microsc. 2024 Nov;296(2):154-161.*
- 2018 [15] **Mohr, M.A.**, and **Pantazis, P.#**, "Primed conversion: the new kid on the block for photoconversion" *Chemistry* 33:8268-8274.
- 2016 [14] **Welling, M.**, Ponti, A., and **Pantazis, P.#**, (2016) "Symmetry breaking in the early mammalian embryo: the case for quantitative single-cell imaging analysis" *MHR-Molecular Human Reproduction* 22:172-181.
- 2014 [13] **Pantazis, P.#**, and Supatto W., (2014) "Advances in whole-embryo imaging: a quantitative transition is underway" *Nature Reviews Molecular Cell Biology* 15:327-39.
- 2013 [12] Mikut R.#, Dickmeis T., Driever W., Geurts P., Hamprecht F.A., Kausler B.X., Ledesma-Carbayo M.J., Marée R., Mikula K., **Pantazis P.**, Ronneberger O., Santos A., Stotzka R., Strähle U., and Peyriéras N., (2013) "Automated processing of zebrafish imaging data: A survey" *Zebrafish* 10:401-21.
- 2012 [11] **Pantazis, P.#**, and Bollenbach, T., (2012) "Transcription factor kinetics and the emerging asymmetry in the early mammalian embryo" *Cell Cycle* 11:2055-8.
- [10] **Dempsey, W.P.**, Fraser, S.E., and **Pantazis, P.#**, (2012) "SHG nanoprobe: Advancing harmonic imaging in biology" *Bioessays* 34:351-60.
- 2004 [9] Dudu, V.#, **Pantazis, P.***, and Gonzalez-Gaitan, M.#, (2004) "Membrane traffic during embryonic development: epithelial formation, cell fate decisions and differentiation" *Curr Opin Cell Biol* 16:407-414.

Refereed Conference Publications

- 2020 [8] Malkinson, G., Maioli, V., Boniface, A., Mahou, P., Ortas, J.F., Chaudan, L.A.E., **Sonay, A.Y.**, Gacoin, T., **Pantazis, P.**, Beaurepaire, E., and Supatto, W.#, (2020) "Advances in fast multiphoton microscopy using light-sheet illumination." *Biomedical Optics 2020.*
- 2018 [7] Nienhaus, K., **Mohr, M.A.**, Kobitski, A, Y., **Sabater, L.R.**, Obara, C.J., Lippincott-Schwartz, J., Nienhaus, G.U.#, and **Pantazis, P.#** (2018) "Primed Green-to-Red Photoconversion of Fluorescent Proteins Occurs via a Triplet State." *Biophysical Journal* 114:533a.

- 2017 [6] **Sonay, A.Y., and Pantazis, P.#**, (2017) "Bioinspired Second Harmonic Generation" *Proc. SPIE 10411, Clinical and Preclinical Optical Diagnostics, 104110D*.
- 2009 [5] **Pantazis, P.#**, Pu, Y., Psaltis, D., and Fraser, S.E., (2009) "Second Harmonic Generating (SHG) Nanoprobes: A new tool for biomedical imaging" *Proc. SPIE* 7183:71831-5.

Refereed Books and/or Book Chapters

- 2021 [4] Fang, C., Drobizhev, M., Ng, H.L., **Pantazis, P.**, "Mechanisms of Fluorescent Proteins" *Front Mol Biosci*, 8:701523.
- 2020 [3] **Konstantinos, K., Qin, H., and Pantazis, P.#**, "Chapter 19 - PhOTO zebrafish and primed conversion: advancing the mechanistic view of development and disease" *Behavioral and Neural Genetics of Zebrafish*, Academic Press, Pages: 309-322.
- 2016 [2] **Mohr, M.A., and Pantazis, P.#**, "Single neuron morphology in vivo with confined primed conversion" *Methods Cell Biology* 133:125-38.
- Figure selected as cover image for: Volume 1, Methods in Cell Biology, The Zebrafish: Cellular and Developmental Biology, Part A Cellular Biology 4th Edition.*
- 2014 [1] **Dempsey, W.P., Qin, H., and Pantazis, P.#**, "In vivo cell tracking using PhOTO Zebrafish" *Methods Molecular Biology* 1148:217-28.

Patents

Total number of issued patents and pending patent applications: 13

- 2021 [13] **Pantazis, P., Sonay, A.Y., Landfester, K., and Crespy, D.**, "Biodegradable second harmonic generating nanoprobes" *E.P. patent granted* (12 November 2021, EP 3518986).
- 2018 [12] **Pantazis, P., Dempsey, W.P., Truong, T.V., Fraser, S.E., and Georgieva, L.** "Method And Device To Achieve Spatially Confined Photointeraction At The Focal Volume Of A Microscope" *U.S. patent granted* (15 May 2018, US 90,971,136).
- [11] **Pantazis, P., Pu, Y., Hong, J., Psaltis, D., and Fraser, S.E.** "Second Harmonic Imaging Nanoprobes And Techniques For Use Thereof" *U.S. patent granted* (20 Feb 2018, US 9,971,136).
- 2017 [10] **Pantazis, P. and Yaganoglu, S.**, "Piezo1-based fluorescent reporter" *E.P. patent pending* (2017, EP 2017/17210479.6).
- [9] **Mohr, M.A., and Pantazis, P.**, "Engineered photoconvertible fluorescent proteins (pcFPs) for primed conversion" *U.S. patent pending* (2017, US 62/446,023).
- 2016 [8] **Pantazis, P., Pu, Y., Hong, J., Psaltis, D., and Fraser, S.E.** "Second Harmonic Imaging Nanoprobes And Techniques For Use Thereof" *U.S. patent granted* (25 Oct 2016, US 9,476,830).
- [7] **Pantazis, P., Culic-Viskota, J., Dempsey, W.P., and Fraser, S.E.** "Functionalization of and use of functionalized second harmonic generating nanoprobes" *U.S. patent granted* (31 May 2016, US 9,352,055).
- 2015 [6] **Pantazis, P., Culic-Viskota, J., Dempsey, W.P., and Fraser, S.E.** "Functionalization of and use of functionalized second harmonic generating nanoprobes" *U.S. patent granted* (29 Dec 2015, US 9,221,919).
- [5] **Pantazis, P., Masmanidis, S., and Fraser, S.E.** "Multipurpose Analysis Using Second Harmonic Generating Nanoprobes" *U.S. patent granted* (03 Feb 2015, US 8,945,471 B2).
- 2014 [4] **Pantazis, P., Dempsey, W.P., Truong, T.V., Fraser, S.E., and Georgieva, L.** "Method And Device To Achieve Spatially Confined Photointeraction At The Focal Volume Of A Microscope" *W.O. patent pending* (2014, WO 2014/147211).
- [3] **Pantazis, P., Dempsey, W.P., Truong, T.V., Fraser, S.E., and Georgieva, L.** "Method And Device To Achieve Spatially Confined Photointeraction At The Focal Volume Of A Microscope" *E.P. patent pending* (2014, EP 2014/055669).
- 2010 [2] **Pantazis, P., Masmanidis, S., and Fraser, S.E.** "Multipurpose Analysis Using Second Harmonic Generating Nanoprobes" *W.O. patent pending* (2010, WO 2010/090844).

- 2008 [1] **Pantazis, P.**, Pu, Y., Hong, J., Psaltis, D., and Fraser, S.E. "Second Harmonic Imaging Nanoprobes And Techniques For Use Thereof" W.O. patent pending (2008, WO 2008/140584).

Industry Brochure

- 2007 [1] **Pantazis, P.**, (2007) "Localized Photoactivation / Lokalisierte Photoaktivierung" Brochure - Carl Zeiss MicroImaging GmbH.

Invited Talks

3 keynote talk, more than 20 invited plenary talks and more than 60 invited talks

Various online talks – available online: [Imaging ONEWORLD Series – Royal Microscopy Society](#)
[The London Stem Cell Network Conference](#)

12/2026	Society of Electron Microscope Technology (SEMT) Invited Talk	London, UK
09/2026	RMS Microscopy: Advances, Innovation, Impact 2026 Keynote Talk	London, UK
07/2026	6th International Symposium on Mechanobiology. Invited Talk	Glasgow, UK
05/2026	Osnabrück University Invited Talk	Osnabrück, Germany
02/2026	CRUK Convergence Science Centre Annual Symposium Invited Talk	London, UK
01/2026	International Caparica Symposium on Nanoparticles/Nanomaterials and Applications (INSA 2026) Invited Talk	Caparica, Portugal
01/2026	University of Geneva Invited Talk	Geneva, CH
10/2025	Sabancı Üniversitesi Invited Talk	Istanbul, Turkey
10/2025	Patras University Invited Talk	Patras, Greece
09/2025	Carpathian Biophotonics Meeting (CBM 2025) Invited Talk	Sinaia, Romania
07/2025	Microscience Microscopy Congress (mmc2025) Invited Talk	Manchester, UK
06/2025	NanoSeries 2025 Invited Talk	Valencia, Spain
05/2025	CLEO 2025 Invited Talk	Long Beach, CA/USA
05/2025	Genentech Invited Talk	San Francisco, CA/USA
03/2025	National Physical Laboratory (NPL) Imaging Symposium Invited Talk	Teddington, UK
12/2024	Advanced Light Microscopy Symposium at GSK Keynote Talk	Stevenage, UK
06/2024	3rd Annual Nanoseries Conference on Global Nanotechnology Invited Talk	Lisbon, Portugal
06/2024	European Light Microscopy Initiative 2024 (elmi2024) Invited Talk	Liverpool, UK

05/2024	Royal Society Theo Murphy Meeting 'Cell lineages across scales, space and time' Birmingham, UK Invited Talk	
01/2024	International Caparica Symposium on Nanoparticles/Nanomaterials and Applications (INSA 2024) Keynote Talk	Caparica, Portugal
01/2024	Caltech Invited Talk	Pasaden/CA, USA
01/2024	10th Strategic Conference of Zebrafish Investigators Plenary Talk	Pacific Grove/CA, USA
10/2023	EMBL/EMBO meeting 'Seeing is Believing' Plenary Talk (given to my PDRA due to MBE welcoming event)	Heidelberg, Germany
09/2023	See the Hidden LEICA Workshop: Advanced Imaging of Disease Invited Online Talk	London, UK
07/2023	Microscience Microscopy Congress 2023 (mmc2023) Invited Talk	Manchester, UK
01/2023	London Zebrafish Meeting Invited Talk	London, UK
10/2022	Harvard Medical School, Department of Immunology Invited Talk	Boston/MA, USA
09/2022	Mini-Conference Raman Nanotheranostics (RaNT2022) Invited Talk	Exeter, UK
06/2022	Cancer Diagnostic Technology Summit 2022 Invited Online Talk	London, UK
05/2022	Physics of Living Systems Annual Symposium 2022 Invited Talk	London, UK
04/2022	6th European Zebrafish PI Meeting Invited Plenary Talk	Dresden, Germany
02/2021	Royal Microscopy Society Invited Online Talk 'Imaging ONEWORLD Series'	Cambridge, UK
01/2022	See the Hidden LEICA Workshop: Cancer Research Invited Online Talk	London, UK
02/2020	LMS-Helmholtz Metabolism Meeting Invited Talk	London, UK
12/2019	American Society of Cell Biology Annual Meeting Invited Talk	Washington/DC, USA
12/2019	Materials Research Society Fall 2019 Meeting Invited Talk	Boston/MA, USA
10/2019	EMBO/EMBL Symposium 'Seeing is Believing' Invited Plenary Talk	Heidelberg, Germany
09/2019	International workshop in cardiac mechanoelectric coupling and arrhythmia Invited Plenary Talk	Freiburg, Germany
10/2018	Princeton University Invited Talk	Princeton/NJ, USA
10/2018	Fluorescent Proteins and Biological Sensors VI at Janelia Research Campus Invited Plenary Talk	Ashburn/VA, USA
07/2018	EPFL, School of Engineering Invited Talk	Lausanne, Switzerland

11/2017	Bioengineering Symposium at EPFL Invited Plenary Talk	Lausanne, Switzerland
11/2017	University of Geneva Invited Talk	Geneva, Switzerland
10/2017	ETH Zurich, D-ITET Invited Talk	Zurich, Switzerland
10/2017	ETH Zurich, D-CHAB Invited Talk	Zurich, Switzerland
07/2017	International Symposium on Imaging Frontier 2017 Invited Plenary Talk	Tokyo, Japan
07/2017	10th European Zebrafish Meeting Plenary Talk	Budapest, Hungary
05/2017	University of Washington Invited Talk	Seattle/WA, USA
05/2017	Max Planck Institute for Biophysical Chemistry Invited Talk	Göttingen, Germany
04/2017	University of Chicago Invited Talk	Chicago/IL, USA
03/2017	Technical University of Munich Invited Talk	Munich, Germany
02/2017	University of Münster Invited Talk	Münster, Germany
01/2017	University of California Irvine (UCI) Invited Talk	Irvine/CA, USA
11/2016	NanoBioTech-Montreux Invited Session Talk	Montreux, Switzerland
11/2016	Labeling & Nanoscopy 2016 Deutsches Krebsforschungszentrum (DKFZ) Contributed talk	Heidelberg, Germany
10/2016	Harvard, Department of Systems Biology Invited Talk	Boston/MA, USA
06/2016	68th Annual Meeting of the Japan Society of Cell Biology Invited Session Talk	Kyoto, Japan
06/2016	Swiss-Kyoto Symposium 2016 Invited Talk	Kyoto, Japan
05/2016	16th European Light Microscopy Initiative (ELMI) Meeting Invited Talk	Debrecen, Hungary
04/2016	NIH Invited Talk	Washington/DC, USA
04/2016	HHMI Janelia Research Campus Invited Talk	Ashburn/VA, USA
03/2016	4th European Zebrafish Principal Investigator Meeting Invited Talk Session 6 – Emerging Technologies	Lisbon, Portugal
03/2016	7th Annual EFOR Meeting FIAP Jean Monnet Plenary Talk	Paris, France
02/2016	ETH Zurich, D-BIO, Institute of Biochemistry Invited Talk	Zurich, Switzerland

11/2015	Karlsruhe Institute of Technology (KIT) Invited Talk	Karlsruhe, Germany
10/2015	European Molecular Biology Laboratory (EMBL) Symposium "Seeing is Believing - Imaging the Processes of Life" Invited Fast Track Talk	Heidelberg, Germany
05/2015	15th European Light Microscopy Initiative (ELMI) Meeting Invited Fast Track Talk	Barcelona, Spain
03/2015	Max Planck Institute for Polymer Research (MPIP) Invited Talk	Mainz, Germany
02/2015	Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG) Invited Talk	Dresden, Germany
01/2015	6th Strategic Conference of Zebrafish Investigators Plenary Talk	Pacific Grove/CA, USA
11/2014	Max Planck Institute for Molecular Biomedicine Invited Talk	Münster, Germany
10/2014	Novartis Workshop "Using 3D cell cultures and organ printing in drug discovery - cells, biosensors and imaging technology" Plenary Talk	Basel, Switzerland
10/2014	University of Hasselt µFiBR 2014: Optical Imaging in Biomedical Nanotechnology Plenary Talk	Hasselt, Belgium
09/2014	Institut de Genetique et de Biologie Moleculaire and Cellulaire (IGBMC) Invited Talk	Strasbourg, France
05/2014	Agency for Science, Technology and Research (A*STAR) Invited Talk	Singapore
05/2014	Nanyang Technological University (NTU) META'14: 5th International Conference on Metamaterials, Photonic Crystals and Plasmonics Invited Talk	Singapore
05/2014	Korea Research Institute of Bioscience & Biotechnology (KRIBB) Swiss-Korean Life Science Symposium Invited Talk	Seoul, Korea
03/2014	Weizmann Institute 3rd European Zebrafish Principal Investigator Meeting Symposium on Imaging and Image Processing Plenary Talk	Rehovot, Israel
03/2014	Biomedical Research Foundation Academy of Athens (BRFAA), Invited Talk	Athens, Greece
11/2013	Swiss-Kyoto Symposium 2013 Invited Talk	Zurich, Switzerland
10/2013	Quantitative Single Cell Biology in Stem Cell Research Abcam Meeting Invited Talk	Munich, Germany
07/2013	European Zebrafish Meeting Workshop "Strategies for cell lineage tracing" Plenary Talk	Barcelona, Spain

04/2013	Annual Meeting of the Basel Stem Cell Network (BSCN) Plenary Talk	Basel, Switzerland
02/2013	LS2 Annual Meeting, "(R)evolutions in Biology" Invited Talk	Zurich, Switzerland
10/2012	École Polytechnique CNRS Conference "Microscopie non-linéaire en sciences du vivant" Invited Talk	Palaiseau, France
09/2012	University of Cambridge EMBO Workshop "Cell Biology of Early Mouse Development" Invited Talk	Cambridge, UK
09/2012	Lawrence Berkeley National Laboratory (LBNL) The Molecular Foundry Workshop Invited Talk	Berkeley/CA, USA
01/2012	3rd Annual EFOR Meeting FIAP Jean Monnet Invited Talk	Paris, France
11/2011	Institute of Science and Technology Austria (IST Austria) Invited Talk	Klosterneuburg, Austria

External Funding

Raised over £7.8M since 2012 in research funding and infrastructure support from government agencies, charities, foundations and institutional schemes (EPSRC, BBSRC, MRC, CRUK, The Royal Society, the European Commission, SNF, HHMI, NWO, the US Department of Energy, the Peter und Traudl Engelhorn Stiftung and Imperial College London's President's Excellence Fund for Frontier Research) and industry partners (Leica Microsystems Ltd, including two Centre of Excellence support periods, and F. Hoffmann-La Roche).

2027-2030	President's Excellence Fund for Frontier Research Lead-PI of proposal "Genetically Encoded Second-Harmonic Nanocages for Optical Voltage Sensing"; <u>£250,000</u> .	ICL
2026-2030	Imperial-Leica Microsystems Imaging Hub Leica Microsystems Director of the Centre of Excellence in Advanced Optical Imaging; Leica contribution <u>>£1.5M</u>	Leica
2026-2027	BBSRC Grant PI of grant "Beyond Fluorescence: Advanced Precision Imaging Using Genetically-Encoded Bioharmonophores"; <u>£210,000</u>	BBSRC
2025-2029	MRC DTP Studentship PI of studentship "Engineering a human Pancreas-on-Chip to dissect Piezo1 signalling in immune extravasation and test extrinsic-intrinsic strategies for β -cell protection in Type 1 Diabetes Mellitus"; <u>£90,230</u>	MRC
2025-2026	Convergence Science Centre Development Fund PI of proposal "Amplifying Precision: Bioharmonophores and SPR for Next-Generation Cancer Detection". <u>£80,000</u>	Cancer Research UK
2025-2028	Convergence Science Centre Training Grant PI of grant "Identifying and Characterising Interaction Partners of Piezo1 in Cancer"; <u>£108,400</u>	Cancer Research UK
2024-now	EPSRC Core Equipment Grant Co-PI of proposal "Mica WideFocal Live Cell System"; <u>£213,000</u>	EPSRC
2023-now	EPSRC CDT Grant PI of proposal " ¹⁸ F-PSMA-bioharmonophore conjugates: a smart PET/optical tracer for improved prostate cancer detection and localization"; <u>£100,000</u>	EPSRC

2023-now	MRC Grant (MR/X019837/1) Co-PI of proposal "Dissecting the molecular crosstalk between mechanotransduction and primary cilia in models of congenital valvulopathies "; <u>£620.000</u>	MRC
2022-now	Convergence Science Centre Grant PI of proposal "Winners versus Losers: Deciphering the mechanism of cell competition via optogenetics and single cell tracking of organoids"; <u>£120.000</u>	Cancer Research UK
2021-now	Imperial College London and LEICA Microsystems Imaging Hub Director of the Centre of Excellence in Imaging; LEICA contribution <u>>£1.5M</u>	LEICA Microsystems
2021-now	Convergence Science Centre Grant PI of the grant 'Bioharmonophores: Redefining Photodynamic Therapy of Cancer'; <u>£120.000</u>	Cancer Research UK
2021-now	BBSRC Grant (BB/T017929/1) PI of the grant 'A digital light-sheet microscope for the analysis of biological processes under almost natural conditions'; <u>£0.60M</u>	BBSRC
2021-2022	BBSRC Grant (BB/T011947/1) Co-PI of the grant 'Primed Conversion Oblique Plane Microscopy'; <u>£200.000</u>	BBSRC
2018-2023	Royal Society Wolfson Research Merit Award 5-year Research support and Salary enhancement, London/UK; <u>£220.000</u>	The Royal Society
2018-2020	Postdoctoral Fellowship for Maaïke Welling 2-year Postdoctoral Fellowship from the Peter und Traudl Engelhorn Stiftung, Munich/Germany; <u>CHF200.000</u>	Peter und Traudl Engelhorn Stiftung
2016-2018	Janelia Graduate Research Fellowship for Manuel A. Mohr 2-year Graduate Fellowship to perform part of the PhD research at the Janelia Research Campus of the Howard Hughes Medical Institute; <u>\$96.000</u>	HHMI
2016-2018	Rubicon Postdoctoral Fellowship for Maaïke Welling 2-year Postdoctoral Fellowship from the Netherlands Organization for Scientific Research; <u>€150.000</u>	NWO
2016-2017	R'Equip Grant: 316030_164087/1 co-PI of the Equipment grant "Light-Sheet Microscopy" to acquire a light-sheet microscope for performing fast volumetric imaging; <u>CHF461.364</u>	SNF
2015-2016	Project Grant: #3776 PI of the grant "Synthesis and fractionation of BaTiO ₃ nanocrystals as SHG nanoprobe" to perform nanocrystal fractionation at the Lawrence Berkeley National Laboratory Molecular Foundry; <u>\$10.000</u>	US Department of Energy
2013-2016	Project Grant: 310034A_144048 PI of the grant "Imaging of pluripotency in systems biology"; <u>CHF471.500</u>	SNF
2013-2016	Marie Curie Career Integration Grant: RPF-ID277 PI of the grant "Systems imaging of emerging asymmetry in vertebrate development (SIEAVD)"; <u>€100.000</u>	European Commission (FP7)
2013-2015	Project Grant: RPF-ID277 PI of the grant "Establishing 3D in vitro reconstructed renal microenvironment through advanced multiphoton microscopy imaging"; <u>CHF420.000</u>	F. Hoffman-La Roche
2012-2013	Project Grant: #1603 PI of the grant "Synthesis and functionalization of BaTiO ₃ Nanocrystals as SHG nanoprobe" to synthesize nanocrystals at the Lawrence Berkeley National Laboratory Molecular Foundry; <u>\$10.000</u>	US Department of Energy
2012-2013	NCCR Nano Module 1 Project Grant PI of the grant "Optical tracking of neutrophil dynamics in vivo"; <u>CHF80.000</u>	SNF
2011	Zeiss LSM780NLO Donation Global donation from Roche Pharma Research and Early Development (pRED) to ETH Zurich that included a share intended for the purchase of a non-linear optical microscope; <u>CHF1.4M</u>	F. Hoffman-La Roche

Teaching Experience

Lectures and Workshops

01-02/2026	BE9-MBMI "Brain Machine Interfaces" Undergraduate class of >100 students (25% cover) Feedback pending	ICL
10-12/2025	BIOE97159 "Principles of Biomedical Imaging" Undergraduate class of >100 students (50% cover) Feedback (50% participation): 91% definitely agree/mostly agree to be satisfied with the module Feedback (50% participation): 87% definitely agree/mostly agree to be satisfied with the lecturer	ICL
10-12/2025	BIOE60015 "Advanced Imaging Technologies for Systems Biology and Biomedical Research" Undergraduate class of <50 students (100% cover) Feedback (40% participation) :60% definitely agree/mostly agree to be satisfied with the module Feedback (40% participation): 68% definitely agree/mostly agree to be satisfied with the lecturer	ICL
01-02/2025	BE9-MBMI "Brain Machine Interfaces" Undergraduate class of >100 students (25% cover)	ICL
10-12/2024	BIOE97159 "Principles of Biomedical Imaging" Undergraduate class of >100 students (50% cover)	ICL
10-12/2024	BIOE60015 "Advanced Imaging Technologies for Systems Biology and Biomedical Research" Undergraduate class of <50 students (100% cover)	ICL
01-02/2024	BE9-MBMI "Brain Machine Interfaces" Undergraduate class of >100 students (25% cover)	ICL
10-12/2023	BIOE97159 "Principles of Biomedical Imaging" Undergraduate class of >100 students (50% cover)	ICL
10-12/2023	BIOE60015 "Advanced Imaging Technologies for Systems Biology and Biomedical Research" Undergraduate class of <50 students (100% cover)	ICL
10-12/2022	BIOE97159 "Principles of Biomedical Imaging" Undergraduate class of >100 students (50% cover)	ICL
10-12/2022	BIOE60015 "Advanced Imaging Technologies for Systems Biology and Biomedical Research" Undergraduate class of <50 students (100% cover)	ICL
01-02/2022	BE9-MBMI "Brain Machine Interfaces" Undergraduate class of >100 students (25% cover)	ICL
10-12/2021	BIOE96041 "Principles of Biomedical Imaging" Undergraduate class of >100 students (50% cover)	ICL
10-12/2021	BIOE60015 "Advanced Imaging Technologies for Systems Biology and Biomedical Research" Undergraduate class of <50 students (100% cover)	ICL
01-02/2021	BE9-MBMI "Brain Machine Interfaces" Undergraduate class of >100 students (25% cover)	ICL
10-12/2020	BIOE96041 "Principles of Biomedical Imaging" Undergraduate class of >100 students (50% cover)	ICL
10-12/2020	BIOE96072 "Advanced Imaging Technologies for Systems Biology" Undergraduate class of <50 students (100% cover)	ICL
01-02/2020	BIOE97075 "Brain Machine Interfaces" Undergraduate class of >100 students (25% cover)	ICL
11-12/2019	BIOE96041 "Principles of Biomedical Imaging" Undergraduate class of >100 students (25% cover)	ICL
01-02/2019	BE9-MBMI "Brain Machine Interfaces" Undergraduate class of >100 students	ICL

09-12/2017	636-0014-00L "Advanced Imaging Technologies" Master class of ~17 students	ETH Zurich
02-06/2017	636-0014-00L "Imaging in Systems Biology" Master class of ~15 students	ETH Zurich
02-06/2016	636-0014-00L "Imaging in Systems Biology" Master class of ~15 students	ETH Zurich
12/2015	41130-01 "Genetic Approaches in Biomedical Research" Bachelor class of ~100 students; Lecture "In vivo single-cell labeling by confined Primed Conversion"	UNI Basel
11/2015	Workshop "2nd course on Optogenetics" Institut Curie Workshop of ~30 students; Lecture "In vivo single-cell labeling by confined Primed Conversion"	Paris, France
02-06/2015	636-0014-00L "Imaging in Systems Biology" Master class of ~15 students	ETH Zurich
12/2014	35823-01 "Genetic Approaches in Biomedical Research" Bachelor class of ~100 students; Lecture "Advances in whole embryo imaging: A quantitative transition is underway"	UNI Basel
05/2014	35823-01 "Genetic Approaches in Biomedical Research" Bachelor class of ~100 students; Lecture "PhOTO Zebrafish: A transgenic resource for in vivo lineage tracing during development and regeneration"	UNI Basel
02-06/2014	636-0014-00L "Imaging in Systems Biology" Master class of ~15 students	ETH Zurich
11/2013	32672-01 "Genetic Approaches in Biomedical Research" Bachelor class of ~100 students; Lecture "Tracking pluripotency: Advanced imaging tools for probing asymmetry in early mammalian embryos"	UNI Basel
02-06/2013	636-0014-00L "Imaging in Systems Biology" Master class of ~15 students	ETH Zurich

Advising and Mentoring (Past and Present)

Present lab members

Postdoctoral Fellows

Ferdinando Sereno (PhD, UCL)
 Larry O'Connell (PhD, Université Grenoble Alpes)
 Moe Fukumoto (co-supervised with Julien Vermot) (PhD, Osaka University; start in 01/2026)

PhD Students

Margaret Gheorghita (MS, UCL; PhD expected 07/2027)
 Julian Boecker (MD, Imperial College London; PhD expected 07/2025)
 Maja Witowska (MRes, Imperial College London; start in 10/2025)
 Dorian Puzovic (MD, Imperial College London; start in 07/2025)

Visiting

Konstantinos (visiting research fellow)
 Benjamin Hansen (visiting PhD student)

Past

Postdoctoral Fellows

Daniel Baird (co-supervised with Julien Vermot) (PhD, Copenhagen University)
 Current position: Postdoctoral Research Associate at University of Sheffield, UK

Maria Antonetta 'Maaiké' Welling (PhD, Utrecht University)
 Current position: Grant Advisor at UMC Utrecht, Netherlands

Nami Sugiyama (PhD, University of Helsinki)
 Current position: Assistant Professor, Kyoto University, Japan

Bramasta Nugraha (PhD, National University of Singapore)
 Current position: Deputy Director (R&D), Zhejiang Tianyuan Biotechnology Co. Ltd, Zhejiang/China

William P. Dempsey (PhD, California Institute of Technology)
 Current position: Head of Research, Esperto Medical, Los Angeles/CA, USA

PhD Students

ICL/HHMI/ETH Zurich

Edagül Uluçay (MD, Imperial College London; PhD 09/2024)

Current position: MD student, Imperial College London, London, UK

Konstantinos Kalyviotis (MS, Democritus University of Thrace; PhD 05/2023)

Current position: Postdoctoral Fellow, Crick, London, UK

See Swee (Elijah) Tang (MS, Imperial College London; PhD 02/2024)

Current position: Postdoctoral Fellow, Kings College London, London, UK

Hanyu Qin (MS, Uppsala University; PhD 01/2019)

Current position: Director in Business Development, Artivila Therapeutics, Shenzhen, China

Manuel Mohr (MS, ETH Zurich; PhD 08/2018)

Current position: Blavatnik Entrepreneurial Fellow, Yale, West Haven/CT, USA

Ali Yasin Sonay (MS, Yeditepe University; PhD 02/2018)

Current position: Postdoctoral Fellow, MSKCC, New York/NY, USA

Sine Yaganoglu (MS, ETH Zurich; PhD 01/2018)

Current position: Strategy Manager, F. Hoffmann-La Roche AG, Basel, CH

Outside Lab activities

2020-present	PhD Thesis Committee Member and Co-Referee	ICL
	Serving as examiner on the PhD committee/PhD Thesis of numerous candidates	
2018	MSc Thesis Co-Referee	UNI Basel
	Served as examiner of the MSc Thesis of Deborah Huber (Prof. Markus Affolter)	
2018	MSc Thesis Co-Referee	EPFL
	Served as examiner of the MSc Thesis of Anton Stroganov (Prof. Aleksandra Radenovic)	
2018	PhD Thesis Co-Referee	IBM
	Served as examiner of the PhD Thesis of Deborah Huber (Dr. Govind Kaigala)	
2018	PhD Thesis Co-Referee	EPFL
	Served as examiner of the PhD Thesis of Daniel Strebing (Prof. David Suter)	
2016-2019	PhD Thesis Committee Member	University of Zurich
	Served on the PhD committee of Karin Prummel (Prof. Christian Mosimann)	
2013-2017	PhD Thesis Committee Member	ETH Zurich
	Served on the PhD committee of Joanna Torres (Prof. Renato Paro)	
2012-2017	PhD Thesis Committee Member	ETH Zurich
	Served on the PhD committee of Allwyn Pereira (Prof. Renato Paro)	
2013-2017	PhD Thesis Committee Member	ETH Zurich
	Served on the PhD committee of Tetjana Serdiuk (Prof. Daniel Müller)	
2012-2015	PhD Thesis Committee Member	ETH Zurich
	Served on the PhD committee of Moritz Freundsuh (Prof. Daniel Müller)	
2015	PhD Thesis Co-Referee	ETH Zurich
	Served as examiner of the PhD Thesis of Moritz Freundsuh (Prof. Daniel Müller)	
2015	PhD Thesis Co-Referee	ETH Zurich
	Served as examiner of the PhD Thesis of Subramanian Ramanathan (Prof. Daniel Müller)	
2012	PhD Thesis Co-Referee	Caltech
	Served as examiner of the PhD Thesis of Jelena Čilić-Viskota (Prof. Scott E. Fraser & Prof. Mark E. Davis)	

Service

Leadership Service to Imperial College London

- 2021-now **Imperial College London and LEICA Microsystems Imaging Hub**, Director
- 2021-now **Facility for Imaging by Light Microscopy steering committee**, Academic Member for Engineering
- 2021-2024 **MEng Molecular Bioengineering**, Programme Director
- 2021-2023 **Co-Director, Imperial College London Cancer Technology Network**
- 2021-2023 **Department Research Committee**, Member covering Optical Imaging and Fellowships
- 2018-2022 **Animal Welfare and Ethical Review Body**, Academic Member for Engineering

Scientific Journal Reviewer

ACS Nano
Advanced Science
Angewandte Chemie International Edition
Biophysical Journal
Chemical Communications
Development
Developmental Biology
Faculty of 1000 (F1000)
International Journal of Developmental Biology
Journal of Applied Physics
Journal of the American Chemical Society (JACS)
Journal of Visualized Experiments (JoVE)
Molecular Human Reproduction (MHR)
Nanoscale
Nature
Nature Biotechnology
Nature Cell Biology
Nature Chemical Biology
Nature Communications
Nature Communications Biology
Nature Methods
Nature Nanotechnology
Nature Protocols
Proceedings of the National Academy of Science (PNAS)
Public Library of Science ONE (PLoS ONE)
Royal Society Open Science
Scientific Reports
Science Advances
Small
Theranostics

Scientific Journal Editorial Boards

- 2020-now **Nature Communications Biology**
Serving as External Editor for the Research Topics "Bioengineering, Biotechnology & Methods"
- 2019-now **Frontiers in Molecular Biosciences**
Serving as an Editor on the Research Topic "Mechanisms of Fluorescent Proteins"
- 2015-now **Stem Cell Reviews and Reports (SCRR)**
Serving on the Editorial Board supervising the review of manuscripts and reviews

Advisory Service

- 2025 **Engineering and Physical Sciences Research Council (EPSRC) Reviewer** **Swindon, UK**
Reviewed grant proposal asking for ~£1.5M
- 2025 **The Swiss National Science (SNF) Reviewer** **Bern, Switzerland**
Reviewed grant proposal asking for ~£1.5M

2024	Royal Academy of Engineering (RAEng) Reviewer Reviewed grant proposal asking for ~£1.5M	London, UK
2024	The Royal Society Reviewer Reviewed grant proposal asking for ~£1.5M	London, UK
2024	Innovation Grant UKRI Reviewer Reviewed grant proposal asking for ~£0.5M	Swindon, UK
2023	Future Leaders Fellowships (FLF) Scheme Reviewer Reviewed grant proposal asking for ~£1.5M	Swinton, UK
2023	Engineering and Physical Sciences Research Council (EPSRC) Reviewer Reviewed grant proposal asking for ~£1.5M	Swindon, UK
2022	Review Board Member, Cyprus University of Technology Assessing the Biomedical Engineering program	Limassol, CY
2021	Engineering and Physical Sciences Research Council (EPSRC) Reviewer Reviewed grant proposal asking for ~£1.5M	Swindon, UK
2021	ETH Grants Reviewed grant proposal asking for ~ CHF 1.0M	Zurich, Switzerland
2020	Austrian Science Fund (FWF) Reviewer Reviewed grant proposal asking for ~€1.5M	Vienna, Austria
2017	Department of Research and Development Ministry of Education, Youth and Sports of the Czech Republic Assessing the large research infrastructure, CzechBioImaging RI	Prague, CZ
2015	Netherlands Organization for Scientific Research (NOW) Reviewer Reviewed grant proposal asking for ~€250.000	The Hague, NL
2015	The French National Research Agency (ANR) Reviewer Reviewed grant proposal asking for ~€150.000	Paris, France
2015	The Austrian Academy of Science (ÖAW) Reviewer Reviewed fellowship proposal asking for ~€100.000	Vienna, Austria
2014	The German Science Foundation (DFG) Reviewer Reviewed grant proposal asking for ~€750.000	Bonn, Germany
2014	The Austrian Academy of Science (ÖAW) Reviewer Reviewed fellowship proposal asking for ~€100.000	Vienna, Austria
2013	The Swiss National Science (SNF) Reviewer Reviewed grant proposal asking for ~CHF500.000	Bern, Switzerland

Leadership Service to the Academic Community

07/2025	Organiser mmc2025 Conference of the Royal Microscopical Society Member of the conference steering committee of the Royal Microscopical Society and organising a session on 'Live Imaging Across Scales: From Single Cells to Whole Organisms in Development and Disease' with international speakers.	Manchester, UK
11/2024	Organiser Symposium "Advanced Multiplexing in Optical Imaging" Organising with LEICA Microsystems a symposium to celebrate the ongoing partnership with Leica Microsystems featuring scientific talks from renowned researchers and product showcases.	London, UK
04/2024	Organiser Symposium "Advanced microscopy applications in London" Organizing with LEICA Microsystems a symposium to celebrate the ongoing partnership with Leica Microsystems featuring scientific talks from renowned researchers and product showcases.	London, UK
2021/22	Co-Organiser Workshop "See the Hidden" Organizing with LEICA Microsystems a workshop about advanced imaging in translating cancer research within the framework of the LEICA and Imperial College Imaging Hub.	London, UK

- 2017 **Co-Chair “Technological Breakthroughs”** **Pacific Grove/CA, USA**
Organizing a workshop about advanced imaging in the framework of the 7th Strategic Conference for Zebrafish Investigators at Asilomar in Pacific Grove, California.
- 2016 **Co-Category Chair “Transdisciplinary Imaging - Developmental Biology”** **New York/NY, USA**
for the World Molecular Imaging Congress
Identified abstract reviewers, managed the review process in the category, and assisted with identifying abstracts for oral or poster presentation.
- 2016 **EXCITE Summer School 2016** **Zurich, CH**
Presented imaging lecture and organized practical session.
- 2015 **Practical Day on aquatic animals in the framework of the LTK module 20** **Basel, CH**
Co-organized the practical animal experimentation course and participated as speaker and my laboratory members as tutors.
- 2012-now **European Zebrafish Image Processing Expert Group, Member** **Karlsruhe, Germany**
Identifying and exchanging knowledge about key areas for automation of embryo handling and automated image acquisition and processing.

Professional Organizations

- 2024-now **Royal Microscopical Society (RMS)**, Committee Member, Life Science Section
- 2020-now **British Society for Developmental Biology (BSDB)**, Member
- 2019-2021 **Material Research Society (MRS)**, Member
- 2016-now **American Chemical Society (ACS)**, Member
- 2016-now **International Zebrafish Society (IZFS)**, Member
- 2011-now **European Zebrafish Society**, Member

Research Profile

Live imaging offers the unique advantage of observing biological processes with high spatiotemporal resolution in whole organisms, offering a path to more refined, quantitative dynamic models. The introduction of advanced imaging tools and automated instrumentation is the focus of my laboratory, which will enable us to apply imaging for both hypothesis-driven research and high-throughput analysis.

Since establishing my lab, the aim of my research activity was to develop advanced imaging technologies (probes, imaging modality, and quantitative analysis; see **Fig. 1**) to establish an effective acquisition and interpretation workflow i) for the mechanistic analysis of biological systems in animal models such as mouse and zebrafish and ii) for the use in novel diagnostic and therapeutic strategies.

1. **Primed Conversion - nontoxic, precise labelling for inferring development and disease progression**

To get more insight into the elaborate cell and protein dynamics that underlie development and disease^{1,2}, my lab introduced a unique optical mechanism, primed conversion, where dual-wavelength illumination results in pronounced photoconversion of photoconvertible fluorescent proteins (pcFPs)³⁻⁵. As two-photon-based photoconversion is extremely inefficient, primed conversion is the only way to precisely photoconvert in 3D pcFPs for real-time *in vivo* studies aiming to unravel complex structural and dynamic information. Using confined primed conversion, we revealed the complex anatomy of individual neurons packed between neighbouring cells in zebrafish^{3,6}. The combination of primed conversion and a spatial drift correction algorithm, primed Track, allowed us to accomplish high-fidelity volumetric lineage tracing in mouse pre-implantation embryos^{7,8}. Primed conversion has also been successfully extended to manipulate the pcFP-based optogenetic effector, photocleavable protein (PhoCl). PhoCl spontaneously dissociates into two fragments after light-induced cleavage of a specific bond in the protein backbone, opening the path to transcriptional manipulation of cells *in vivo* at single cells resolution⁹. Using engineered optimized primed convertible FPs (pr-FPs), we (and others) have applied primed conversion also in non-toxic single molecule dynamic analysis using super-resolution imaging¹⁰. The combination of the primed conversion toolbox with light-sheet microscopy and machine-learning algorithms will soon allow to capture with high precision the emergence of cell lineages and heterogeneities in embryos/organoids/tissue that will prove critical in gaining a fundamental understanding of many biological and pathological processes such as cancer.

2. **GenEPi - a fluorescent reporter for non-invasively investigating cellular mechanosensing**

Throughout an organism's lifetime, cell mechanosensation (i.e., the ability to perceive and respond to mechanical stimuli in the form of shear stress, tension, or compression) is essential in a myriad of developmental, physiological, and pathophysiological processes including embryogenesis, homeostasis, metastasis, and wound healing. To investigate how physical forces and changes in mechanical properties of cells contribute to development and disease, we designed the fluorescent reporter GenEPi for visualizing dynamics and mechanical stimuli of Piezo1^{11,12}, an essential mechanosensitive ion channel found in plants and animals. We show that the intensimetric, genetically-encoded reporter GenEPi has high specificity and spatiotemporal resolution for Piezo1-dependent mechanical stimuli, exemplified by resolving repetitive mechanical stimuli of spontaneously contracting cardiomyocytes within microtissues and revealing mobile and functionally dynamic Piezo1 clusters in the plasma membrane using time-lapse TIRF imaging. GenEPi is an ideal tool to elucidate the full extent to which mechanical signals, and more specifically Piezo1 channels, regulate development, physiology, and disease.

3. **Bioharmonophores - a precision imaging approach for biomedical applications**

Previously, we introduced inorganic second harmonic generating (SHG) nanocrystals, SHG nanoprobe, as a class of imaging probes that can be used for *in vivo* imaging¹³⁻¹⁶. Given that SHG imaging employs near-infrared (NIR) incident light for contrast generation, SHG nanoprobe can be utilized for deep tissue imaging. Unlike commonly used fluorescent probes, SHG nanoprobe neither bleaches nor blinks, and their signal does not saturate with increasing illumination intensity, ensuring high probe sensitivity¹⁷⁻¹⁹. To create a foundation for safe SHG nanoprobe-based clinical imaging, we generated bioharmonophores as a novel class of imaging probes that retain all the photophysical advantages of previously introduced inorganic SHG nanoprobe. Because bioharmonophores consist of a biodegradable peptide core and a polymer shell, they can be metabolized within cells, which render them ideal contrast agents for clinical imaging applications. The straightforward implementation of robust functionalization strategies and a sufficiently high metabolic stability *in vivo* allowed us to target bioharmonophores with high detection sensitivity to individual tumour cells *in vivo*^{20,21}. The biocompatible and biodegradable bioharmonophores hold great potential as very bright clinical contrast agents for more accurate diagnosis and staging of disease. Importantly, their nonlinear signal can be also used for fast and powerful light-induced functional modulation which can benefit photodynamic therapy and photoimmunotherapy.

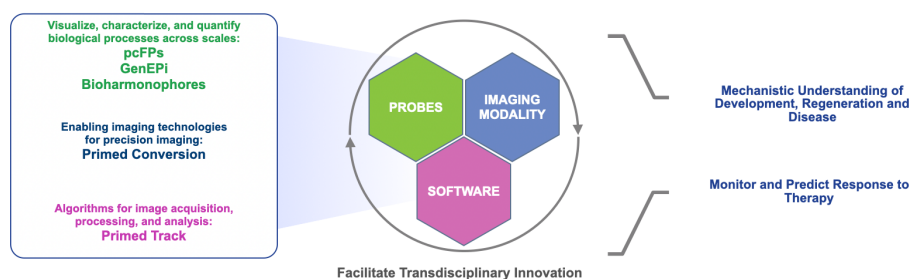


Figure 1: Advanced Optical Precision Imaging. The interplay between probes, imaging modality, and software leads to an effective acquisition and interpretation workflow to accurately display complex dynamics in biological systems.

References of own work

- 1 Plachta, N., Bollenbach, T., Pease, S., Fraser, S. E. & Pantazis, P. Oct4 kinetics predict cell lineage patterning in the early mammalian embryo. *Nat Cell Biol* **13**, 117-123 (2011). <https://doi.org:10.1038/ncb2154>
- 2 Dempsey, W. P., Fraser, S. E. & Pantazis, P. PhOTOfish: a transgenic resource for in vivo lineage tracing during development and regeneration. *PloS one* **7**, e32888 (2012). <https://doi.org:10.1371/journal.pone.0032888>
- 3 Dempsey, W. P. et al. In vivo single-cell labeling by confined primed conversion. *Nat Methods* **12**, 645-648 (2015). <https://doi.org:10.1038/nmeth.3405>
- 4 Mohr, M. A., Argast, P. & Pantazis, P. Labeling cellular structures in vivo using confined primed conversion of photoconvertible fluorescent proteins. *Nat Protoc* **11**, 2419-2431 (2016). <https://doi.org:10.1038/nprot.2016.134>
- 5 Mohr, M. A. & Pantazis, P. Primed Conversion: The New Kid on the Block for Photoconversion. *Chemistry* **24**, 8268-8274 (2018). <https://doi.org:10.1002/chem.201705651>
- 6 Mohr, M. A. & Pantazis, P. Single neuron morphology in vivo with confined primed conversion. *Methods in cell biology* **133**, 125-138 (2016). <https://doi.org:10.1016/bs.mcb.2015.12.005>
- 7 Welling, M. et al. Primed Track, high-fidelity lineage tracing in mouse pre-implantation embryos using primed conversion of photoconvertible proteins. *eLife* **8** (2019). <https://doi.org:10.7554/eLife.44491>
- 8 Welling, M., Kalyviotis, K. & Pantazis, P. P. Primed Track: Reliable Volumetric Single-cell Tracking and Lineage Tracing of Living Specimen with Dual-labeling Approaches. *Bio-Protocol* **10** (2020). <https://doi.org:10.21769/BioProtoc.3645>
- 9 Zhang, W. et al. Optogenetic control with a photocleavable protein, PhoCl. *Nat Methods* **14**, 391-394 (2017). <https://doi.org:10.1038/nmeth.4222>
- 10 Mohr, M. A. et al. Rational Engineering of Photoconvertible Fluorescent Proteins for Dual-Color Fluorescence Nanoscopy Enabled by a Triplet-State Mechanism of Primed Conversion. *Angewandte Chemie (International ed. in English)* **56**, 11628-11633 (2017). <https://doi.org:10.1002/anie.201706121>
- 11 Yaganoglu, S. et al. Highly specific and non-invasive imaging of Piezo1-dependent activity across scales using GenEPi. *Nature communications* **14**, 4352 (2023). <https://doi.org:10.1038/s41467-023-40134-y>
- 12 Landhuis, E. Seven technologies to watch in 2021. *Nature* **589**, 630-632 (2021). <https://doi.org:10.1038/d41586-021-00191-z>
- 13 Pantazis, P., Pu, Y., Psaltis, D. & Fraser, S. Second Harmonic Generating (SHG) Nanoprobes: a New Tool for Biomedical Imaging. *Proc Spie* **7183** (2009). <https://doi.org:10.1117/12.808434>
- 14 Pantazis, P., Maloney, J., Wu, D. & Fraser, S. E. Second harmonic generating (SHG) nanoprobes for in vivo imaging. *Proc Natl Acad Sci U S A* **107**, 14535-14540 (2010). <https://doi.org:10.1073/pnas.1004748107>
- 15 Cohen, B. E. Beyond fluorescence. *Nature* **467**, 407-408 (2010). <https://doi.org:10.1038/467407a>
- 16 Culic-Viskota, J., Dempsey, W. P., Fraser, S. E. & Pantazis, P. Surface functionalization of barium titanate SHG nanoprobes for in vivo imaging in zebrafish. *Nat Protoc* **7**, 1618-1633 (2012). <https://doi.org:10.1038/nprot.2012.087>
- 17 Dempsey, W. P., Fraser, S. E. & Pantazis, P. SHG nanoprobes: advancing harmonic imaging in biology. *BioEssays : news and reviews in molecular, cellular and developmental biology* **34**, 351-360 (2012). <https://doi.org:10.1002/bies.201100106>
- 18 Pantazis, P. & Supatto, W. Advances in whole-embryo imaging: a quantitative transition is underway. *Nat Rev Mol Cell Biol* **15**, 327-339 (2014). <https://doi.org:10.1038/nrm3786>
- 19 Sugiyama, N., Sonay, A. Y., Tussiwand, R., Cohen, B. E. & Pantazis, P. Effective Labeling of Primary Somatic Stem Cells with BaTiO₃ Nanocrystals for Second Harmonic Generation Imaging. *Small* **14** (2018). <https://doi.org:10.1002/sml.201703386>
- 20 Sonay, A. Y. & Pantazis, P. in *Clinical and Preclinical Optical Diagnostics* Vol. 10411 (2017).
- 21 Sonay, A. Y. et al. Biodegradable Harmonophores for Targeted High-Resolution In Vivo Tumor Imaging. *ACS Nano* **15**, 4144-4154 (2021). <https://doi.org:10.1021/acsnano.0c10634>