Preliminary Program (September 21, 2023)

# Advances in Optics for Biotechnology, Medicine and Surgery

October 15-19, 2023 Tomar, Portugal

# **Conference Chairs:**

**Frederic Leblond** Polytechnique Montreal, Canada Mark Niedre Northeastern University, USA

## **Conference Co-Chairs**

Summer Gibbs Oregon Health and Science University, USA David Cuccia Modulim, Inc., USA Jonathan Liu University of Washington, USA





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### Sunday, October 15, 2023

17:30 – 18:30	Conference check-in
18:30 – 19:00	Welcome reception (with music)
19:30 – 21:00	Dinner

#### Monday, October 16, 2023

07:30 – 08:30	Breakfast and Discussion Time
	Session 1: Optics in Surgical Interventions I
08:30 - 09:00	Can near infrared nerve-specific imaging improve surgical outcomes? Summer Gibbs, Oregon Health and Science University, USA
09:00 - 09:30	Seeing early cancer in a new light with hyperspectral endoscopy Sarah Bohndiek, University of Cambridge, United Kingdom
09:30 – 10:00	Advanced optical imaging for surgical vision Sylvain Gioux, Intuitive Surgical, Switzerland
10:00 – 10:30	Intraoperative detection of insufficient surgical margins in head and neck cancer resection using dual aperture fluorescence ratio imaging Kenneth Tichauer, Illinois Institute of Technology, USA
10:30 - 11:00	Coffee Break and Discussion Time
	Session 2: Optics in Surgical Interventions II
11:00 – 11:30	What role in surgery for Raman spectroscopy? Frederic Leblond, Polytechnique Montreal, Canada
11:30 – 12:00	Development of imaging probes for fluorescence guided surgery of GI and endocrine tumors Michael Bouvet, University of California San Diego, USA
12:00 – 12:30	<b>TBA</b> Pablo Valdes, University of Texas Medical Branch, USA
12:30 – 13:00	Beyond tumor-to-background ratios: Methods for improved decision making in fluorescence guided surgery Kimberley Samkoe, Thayer School at Dartmouth, USA
13:00 – 14:30	Lunch
	Session 3: Microscopic Imaging in Biomedicine I
14:30 – 15:00	<b>TBA</b> Jonathan Liu, University of Washington, USA
15:00 – 15:30	<b>Low-cost, in vivo microscopy</b> Dongkyun Kang, University of Arizona, USA
15:30 – 16:00	Autofluorescence lifetime imaging to monitor immune cell metabolism and function Melissa Skala, Morgridge Institute for Research, USA
16:00 – 16:30	<b>Cell tracking in vivo: From hematopoietic stem cells to mature leukocytes</b> Charles P. Lin, Wellman Center for Photomedicine, Massachusetts General Hospital, USA
16:30 – 18:00	Coffee Break and Poster Session I

## Monday, October 16, 2023 (continued)

	Session 4: Microscopic Imaging in Biomedicine II
18:00 – 18:30	Label-free fluorescence lifetime techniques for image-guided interventions Laura Marcu, University of California, Davis, USA
18:30 – 19:00	Fast mid-infrared imaging with non-degenerate two-photon absorption Eric Potma, University of California, Irvine, USA
19:00 – 19:30	Investigating cellular metabolic changes in response to therapy using two- photon excited autofluorescence Narasimhan Rajaram, University of Arkansas, USA
19:30 – 21:00	Dinner

## Tuesday, October 17, 2023

07:30 - 08:30	Breakfast and Discussion Time
	Session 5: Vascular Imaging and Biofluid Studies
08:30 – 09:00	<b>Towards fluorescence molecular in vivo liquid biopsy of circulating tumor cells</b> Mark Niedre, Northeastern University, USA
09:00 – 09:30	Minimally-invasive surgical application of multispectral and polarization resolved imaging Dan Elson, Imperial College, United Kingdom
09:30 – 10:00	Extreme imaging cytometry - From instrumentation to AI acceleration Kevin Tsia, The University of Hong Kong, Hong Kong
10:00 – 10:30	Shortwave infrared imaging and spectroscopy in the time and spatial frequency domains Darren Roblyer, Boston University, USA
10:30 – 11:00	Coffee Break and Discussion Time
	Session 6: Optics in Neurosciences and Neuropathology I
11:00 – 11:30	Minimally invasive monitoring of the central nervous system David Busch, University of Texas Southwestern, USA
11:30 – 12:00	High-resolution imaging of myelin loss and degradation in neurodegenerative diseases with birefringence microscopy Irving Bigio, Boston University, USA
12:00 – 12:30	<b>Optical spectroscopy for real-time neuronavigation during deep brain stimulation surgeries</b> Daniel Côté, CERVO Brain Research Center, Université Laval, Canada
12:30 – 14:00	Lunch
14:00 – 18:00	Excursion – Guided tour of the Convento de Cristo
	Session 7: Optics in Neurosciences and Neuropathology II
18:30 – 19:00	Non-invasive evaluation of microvascular and endothelial function with hybrid near-infrared spectroscopies Turgut Durduran, ICFO-The Institute of Photonic Sciences, Spain
19:00 – 19:30	Assessing cerebrovascular insufficiency and neural risk with diffuse optical methods Maria Angela Franceschini, Massachusetts General Hospital, Harvard Medical School, USA
19:30 – 20:00	Changes in neurovascular coupling as an indicator of cerebral health Jana Kainerstorfer, Carnegie Mellon, USA
20:00 – 21:30	Dinner

#### Wednesday, October 18, 2023

07:30 – 08:30	Breakfast and Discussion Time
	Session 8: Automated Learning Approaches in Biomedicine
08:30 - 09:00	<b>Multimodal computational pathology</b> Faisal Mahmood, Harvard Medical School, USA
09:00 – 09:30	<b>Real-time label-free Al-enhanced digital histopathology using SLAM microscopy</b> Stephen Boppart, University of Illinois Urbana-Champaign, USA
09:30 - 10:00	<b>Multimodal computational colonoscopy</b> Nicholas Durr, Johns Hopkins University, USA
	Session 9: Imaging Device Standards and Tissue Phantoms
10:00 – 10:30	Phantoms to accelerate technology development and standardization in Biophotonics Stefan Andersson-Engels, Tyndall National Institute, Ireland
10:30 – 11:00	Tools to build consensus and accelerate clinical translation of intraoperative fluorescence imaging Ethan LaRochelle, QUEL Imaging, USA
11:00 – 11:30	Coffee Break and Discussion Time
	Session 10: Nanomedicine
11:30 – 12:00	Nano-complex-therapy: A novel approach for the development of biocompatible hybrid nanovectors Jolanda Spadavecchia, CNRS, France
12:00 – 12:30	Nanobody-based fluorescent contrast agents for rapid and specific intra- operative tumor visualization Sophie Hernot, Vrije Universiteit Brussel, Belgium
12:30 – 13:00	Multifunctional porphyrin-lipid nanoparticles for cancer theranostics: From discovery to first-in-human and beyond Brian Wilson, University Health Network, Canada
13:00 – 14:30	Lunch
14:30 – 16:00	Free Time / Discussions
16:00 – 17:30	Coffee Break and Poster Session II
	Session 11: Contributed Talks
17:30 – 17:45	The tauVIVO time-domain fluorescence imaging system for the simultaneous imaging of ICG and targeted NIR tracers Hans Ingelberts, Vrije Universiteit Brussel, Belgium

#### Wednesday, October 18, 2023 (continued)

17:45 – 18:00	Fluorescence depth quantification using spatial frequency imaging and deep learning reconstruction Michael Daly, Princess Margaret Cancer Centre, Canada
18:00 – 18:15	Near infrared fluorescent anti-mucin antibodies target and brightly label colonic polyps in CPC-APC mice Kristin Cox, UC San Diego, USA
18:15 – 18:30	Bimodal characterization of human skin in vivo by combining diffuse reflectance spectroscopy and photothermal radiometry Boris Majaron, Jozef Stefan Institute, Slovenia
18:30 – 19:30	Free Time
19:30 – 21:00	Conference Banquet

### Thursday, October 19, 2023

07:30 – 08:30	Breakfast and Discussion Time
	Session 12: Clinical Translation of Emerging technologies
08:30 – 09:00	<b>Coherent spatial imaging of hemodynamics</b> Bernard Choi, University of California, Irvine, USA
09:00 – 09:30	Monitoring radiotherapy with functional OCT: Microvascular responses and correlations with MRI Alex Vitkin, University of Toronto / Princess Margaret Cancer Centre, Canada
09:30 – 10:00	<b>Computational approaches for model-based Diffuse Optical Tomography</b> Hamid Dehghani, University of Birmingham, United Kingdom
10:00 – 10:30	Low-cost optoacoustics? Prospects for miniaturizing and democratizing optoacoustic imaging systems in biomedical research and the clinics Daniel Razansky, ETH Zurich, Switzerland
11:00	Check-out and Departure