bmpn.ch the biomedical photonics network

# Progress in Biomedical Photonics 2022

**December 6, 2022 from 9:30 to 16:40**

## Program

09:30-10:00 Registration and coffee in the Atrium of the BC Building, EPFL

Presentations (Room MAP BC 420): Chair Georges Wagnières

10:00-10:10 Welcome and introduction
Martin Wolf, President BMPN

10:10-10:25 Real-time neural network-based fluorescence lifetime imaging with SPAD sensors
Yang Lin*, P Mos, A Ardelean, C Bruschini, E Charbon
EPFL

10:25-10:40 Selective large-area retinal pigment epithelial removal by microsecond laser in preparation for cell therapy
Christian Burri*, S Salzmann, C Meier, M Frenz, M Ader, B Stanzel
University of Bern, TU Dresden etc.

10:40-10:55 Multiphoton polymerization using upconversion nanoparticles for adaptive feature-size printing
Qianyi Zhang*, A Boniface, VK Parashar, MAM Gijs, C Moser
EPFL

10:55-11:10 Investigation of single-walled carbon nanotubes enriched hydrogels for ascorbic acid sensing and release monitoring
Hanxuan Wang*, SC Erünsal, X Liu, AA Boghossian
EPFL, Konya Food and Agriculture University etc

11:10-11:25 Prediction of mycotoxin response of DNA-wrapped nanotube sensor with machine learning
Yahya Rabbani*, S Behjati, B Lambert, S Sajjadi, M Shariaty-Niassar, AA Boghossian
EPFL, University of Tehran

11:25-11:40 Implementation of an audiovisual task to assess hearing on a cortical level using fNIRS
Andras Balint*, W Wimmer, C Rummel, M Caversaccio, S Weder
University of Bern, Inselspital

11:40-12:20 Invited talk: Nanophotonics: Enabling Technology for Biosensing, BioImaging and Spectroscopy
Hatice Altug
EPFL

12:20-14:20 Lunch break and poster viewing (MAP BC Atrium)

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Presentations (Room MAP BC 420): Chair Martin Frenz

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| 14:20-14:35 | Light-based tomographic volumetric bioprinting of 3D human tissue models<br>Jorge Madrid-Wolff*<br>EPFL |
| 14:35-15:15 | Invited talk: Optical Glucose Sensing for Diabetes Management<br>Lilian Witthauer<br>University of Bern |
| 15:15-15:45 | Invited talk: Advantages and limitations of multiphoton microscopy in 3D imaging<br>Stefanie Kiderlen<br>Prospective Instruments |
| 15:45-16:00 | Technical and numerical approaches to speed up near-infrared optical tomography<br>Alexander Kalyanov, J Jiang, A Di Costanzo Mata, M Ackermann, E Russomano, M Wolf<br>University of Zurich, University Hospital Zurich |
| 16:00-16:15 | 3D morphological analysis of folliculogenesis<br>G Fiorentino, S Garagna, M Zuccotti, Annapaola Parrilli<br>University of Pavia, EMPA |
| 16:15-16:30 | Label-free imaging with Digital Holographic Microscopy: what added information can be extracted?<br>Benjamin Rappaz<br>Lyncée Tec |
| 16:30-16:40 | Award ceremony and closing |

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**We gratefully acknowledge financial support:**

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**Registation** is **required.** Register at **Registration** at the latest by Nov. 29th, 2022. Registration is 50Fr. to be paid in cash on site. Registration is **free** for members of the SSOM:
to **become member of SSOM for 40Fr./year, go to Membership**
For further information about the Biomedical Photonics Network: www.bmpn.ch.

**Contacts:** Prof. Martin Wolf (Martin.Wolf@usz.ch), Tel 044 2555346

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# Poster Session

Poster 1 Exploration with senbiosys analogue front end for photoplethysmography based applications
Pierre Louis Gaudillière*,
CSEMx

Poster 2 Photoresponsive nanocarriers based on lithium niobate nanoparticles for harmonic imaging and on-demand release of anticancer chemotherapeutics
Pauli Figueras*, A Gheata, G Gaulier, G Campargue, T Leinen, J Vuilleumier, S Kaiser, I Gautschi, F Riporto, S Beauquis, D Staedler, D Diviani, L Bonacina, S Gerber-Lemaire
University of Geneve,

Poster 3 Toward thermal damage detection using optical coherence tomography during laser osteotomy
Aikaterina Grava*, A Hamidi, PC Cattin, F Canbaz
University of Basel

Poster 4 Engineering pH resilience in optical nanotube sensors for biomedical applications
Sara Behjati*, L Huang, R Di Costanzo, H Wang, SH Sajjadi, AA Boghossian
EPFL

Poster 5 Differentiation of cancerous tissues using laser-induced breakdown spectra.
Sébastien Muheim*, A Hamidi, YA Bayhaqi, PC Cattin, F Canbaz
University of Basel

Poster 6 Artifacts in optical projection tomography due to refractive-index mismatch: model and correction
Yan Liu*, J Dong, C Schmidt, A Boquet-Pujadas, J Extermann, M Unser
EPFL

Poster 7 Towards time of flight polarimetry for tissue diagnosis
Lynn Roth*, A Stefanov, M Frenz
University of Bern

Poster 8 Optimization of the distance between cylindrical light distributors used for interstitial light delivery in biological tissues
Aurélien Gregor*, S Sase, G Wagnières
EPFL, Rakuten Medical K.K.

Poster 9 Optical coherence tomography navigated laser retinopexy for retinal breaks
Simon Salzmann*, C Burri, S Al-Nawaiseh, P Wakili, C Meier
Bern University of Applied Sciences, University of Bern, etc.

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Poster 10 Excluding noisy data in real-time pulse-echo mode speed-of-sound imaging
Parisa Salemi*, NK Martiartu, UR Gerber, M Frenz, M Jaeger
University of Bern

Poster 11 A textile-integrated NIRS sensor: Accuracy of tissue oxygen saturation measurements
Tarcisi Cantieni*, O Kress, E Morlec, M Camenzind, M González, M Michler, R Grabher, G Piai, LF Boesel, U Wolf
University of Bern, OST, EMPA

Poster 12 Optical coherence tomography as a feedback system for laser osteotomy: depth and temperature feedback
Arsham Hamidi*, YA. Bayhaqi, A Navarini, PC Cattin, F Canbaz, A Zam
University of Basel, University Hospital of Basel

Poster 13 Tracking the metabolic effects induced by photobiomodulation in human umbilical vein endothelial cells (HUVEC) using fluorescence lifetime imaging microscopy (FLIM)
Cyrus Kazemiraad*, J Joniová, E Gerelli, G Wagnières
EPFL

Poster 14 A simple micropreparative gel electrophoresis technique for purification of nanoscale fluorescent probes
Sayyed Hashem Sajjadi*, SJ Wu, V Zubkovs, H Ahmadzadeh, EK Goharshadi, AA Boghossiana
EPFL, Ferdowsi University of Mashhad

Poster 15 Handheld SWIR optical reader for monitoring carbon nanotube-based optical sensors
Vitalijs Zubkovs*, KJ Leeners, V Basoli, S Grad, S Hashem Sajjadi, AA Boghossian, S Cattaneo
CSEM, ARI, EPFL

**Posters not competing for the award:**

Poster 16 Deep-tissue imaging with fully integrated laser-diode based handheld photoacoustic and ultrasound probe
Michael Jaeger, HM Schwab, A Humblet, RGP Lopata, M Frenz, P Brands
University of Bern

Poster 17 Changes in cerebral oxygenation and systemic physiology in good, moderate, and poor performers of a verbal fluency task under blue light exposure
Hamoon Zohdi, F Scholkmann, U Wolf
University of Bern, University of Zurich

Poster 18 Infradian rhythms in cerebrovascular oxygenation and blood volume in humans at rest: A 5 year-long study
Felix Scholkmann, H Zohdi, M Wolf, U Wolf
University of Bern, University of Zurich

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Poster 19 Changes in water properties in human tissue after double filtration plasmapheresis – A near-infrared spectroscopy investigation using the aquaphotomics approach
Felix Scholkmann, R Tsenkova
University of Zurich, University of Kobe

Poster 20 Carbon nanotube-based sensors for intelligent packaging
Niloufar Sharif, AA Boghossian
EPFL

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