Biophotonics - Riga 2013
1st International Conference

Programme

Training Course

(Auditorium #13, Raina Blvd.19)

Monday 26 August

08.30 Registration

08.55 Opening of the Training course

Biophotonic Environmental Sensors

09.00 M.Mak (SE). Photometric Nanolabels for Biosensors and Bioassays

09.45 N.Starodub (UA). Actual Problems in Environmental Monitoring, Diagnostics and Agriculture: Role of Biosensors in Solving Modern Practice Tasks

10.30 Coffee break

11.00 C.Nacke (EE). Industrial Approaches in Biosensors

12.00 Lunch break

13.30 M.Bechelany (FR). Integration of Metal Oxide Nanotechnology for Sensor/Biosensor Applications

14.15 R.Viter (UA). Introduction of IRSES/Metal Oxide Nanostructures for Sensors and Biosensors

15.00 Coffee break

15.30 S.Balme (FR). Confocal Microscopy for Biosensor Applications

16.15 V.Khranovskyy (SE). Photoluminescence Spectroscopy of Photonic Semiconductor Materials as Optical Transducers for Biosensors

17.15 ***Old City tour***

Tuesday 27 August

Biophotonic Medical Sensors

09.00 S.Andersson-Engels (SE). Fluorescence Diagnostics in Medicine

10.00 G.Salerud (SE). Multispectral Diffuse Reflectance Imaging of Superficial Tissue Methodology and Implementation

11.00 Coffee break

11.30 A.Priezzhev (RU). Light Scattering and Diffractometry Assessment of Biological Particles

12.30 Lunch break

13.30 K.Svanberg (SE). Laser Spectroscopy in the Therapy and Detection of Human Malignancies
14.30 S.Svanberg (SE). Multidisciplinary Applications of Gas in Scattering Media Absorption Spectroscopy (GASMAS)

15.30 Coffee break

16.00 S.Bagdonas (LT). Spectroscopy of Biological Tissues In Vivo

Wednesday 28 August

Challenging Problems of Biophotonics

09.00 J.Popp (DE). Linear- and Non-linear Raman Microspectroscopy for Biomedical Analysis
10.00 D.Sampson (AUS). Optical Coherence Tomography: How It Works, What It Can Do and Its Pitfalls

11.00 Coffee break

11.30 I.Meglinski (NZ). Monte Carlo Modelling for the Needs of Biophotonics and Biomedical Optics
12.30 R.Rotomskis (LT), R.Rudys (LT). Spectroscopy of Quantum Dot-biological Active Molecule Complex Formation

13.30 Lunch break

14.30 V.Tuchin (RU). Tissue Optics and Optical Clearing
15.30 V.Khranovskyy (SE). Publication Strategy for Young Researchers

17.00 *Conclusion of the training course and conference welcome reception*

Conference

(Main building of the University of Latvia, Raina Blvd.19)

Thursday 29 August
08.00 Registration
08.45 Opening of the Conference

Challenging Problems of Biophotonics

09.00 – 13.30 *Invited Presentations* (Aula Magnum)

Session chair: G.Salerud

09.00 J.Popp (DE). Raman Spectroscopy - an Essential Tool for Modern Biophotonic Research
09.40 V.Tuchin (RU). Nanobiophotonics: Skin Protection, Diagnostics and Therapy
10.20 K.Wardell (SE). Biomedical Optics in Neurosurgery

11.00 Coffee break. Opening of the exhibition (next room to the Aula Magnum)

11.30 I.Meglinski (NZ). Polarization and Its Use for Cancer/Tissue Diagnostics
12.10 K. Svanberg (SE). Diagnostics and Treatment of Tumours Using Laser Techniques
12.50 S.Andersson-Engels (SE). Upconverting Nanoparticles as a Novel Contrast Agent in Fluorescence Diagnostics

13.30 Lunch break

14.30 – 16.00 ***Oral Presentations*** (Aula Magnum)

Session chair: R.Rotomskis

14.30 S.Avtzi, A.Zacharopoulos, G.Zacharakis. Fabrication and Characterization of a 3-D Non-Homogeneous Tissue Like Mouse Phantom for Optical Imaging
14.45 S.Fomins, M.Ozolinsh. Modelling the Appearance of Chromatic Environment Using Hyperspectral Imaging
15.00 D.Khoptyar, A.A.Subash, M.Saleem, O.H.A.Nielsen, S.Andersson-Engels. Wide-bandwidth Photon Time of Flight Spectroscopy for Biomedical and Pharmaceutical Applications
15.15 D.Jakovels, I.Lihacova, I.Kuzmina, J.Spigulis. Application of Principal Component Analysis to Multispectral Imaging Data for Evaluation of Pigmented Skin Lesions
15.30 L.Vidovic, M.Milanic, B.Majaron. Assessment of Hemoglobin Dynamics in Traumatic Bruises Using Temperature Depth Profiling
15.45 M.Matulionyte, R.Marcinonyte, R. Rotomskis. Accumulation of Photoluminescent MES-Capped Gold Nanoparticles in MiaPaCa-2 Cancer Cells

16.00 Coffee break

16.30-18.00 ***Poster Session*** (Aula Magnum)

Friday 30 August

Biophotonic Medical Sensors

09.00 – 13.30 ***Invited Presentations*** (Auditorium #13)

Session chair: S.Andersson-Engels

09.00 D.Sampson (AUS). A Microscope in Needle, and Its Applications in Medicine
09.40 G.Salerud (SE). Biophotonic Assessment of Skin Morphology, Perfusion and Oxygenation in Healthy Newborns and Premature Children
10.20 A.Priezzhev (RU). Effect of Nanodiamonds on Blood Microrheology at *In Vitro* and *In Vivo* Administration

11.00 Coffee break

11.30 J.Spigulis (LV). Optical Non-contact Skin Sensors
12.10 R.Rotomskis (LT). Up-converting Nanoparticles: Merits and Challenges in Cancer Diagnostic and Therapy
11.50 S.Svanberg (SE). Probing Molecules on Different Length Scales – From Environmental Monitoring to Biophotonics

13.30 Lunch break

14.30-17.30 ***Oral Presentations*** (Aula Magnum)

Session chair: R.Viter

14.30 B.Majaron, L.Vidovic, M.Milanic, W.Jia, J.S.Nelson. Determination of the Maximal Safe Laser Radiant Exposure for Human Skin Using Pulsed Photothermal Radiometry

14.45 I.Yanina, N.A.Trunina, V.V.Tuchin. Detection of Phase Transition of Adipose Tissue by Spectral OCT Refractive-Index Measurement

15.00 E.Volkova, V.I.Kochubey, J.G.Konyukhova, A. A.Skaptsov. Effect of Biological Environment on Luminescence of ZnCdS Nanoparticles

15.15 L.Angelova, E.Borisova, Al.Zhelyazkova, M.Keremedchiev, B. Vladimirov. Fluorescence Spectroscopy of Gastrointestinal Tumours – In Vitro Studies and In Vivo Clinical Applications

15.30 D.Bukowska, M.Szkulmowski, M.Wojtkowski. Study of Blood Flow Behaviour in Microfluidics Device Using Spectral and Time Domain Optical Coherence Tomography

15.45 N.Talaykova, A.L.Kalyanov, V.V.Lychagov, V.P.Ryabukho, L.I.Malinova. Change Dynamics of RBC Morphology after Injection Glucose for Diabetes by Diffraction Phase Microscope

15.30 Coffee break

Session chair: S.Bagdonas

16.00 U.Rubins, J.Spigulis, A.Miscuks. Application of Colour Magnification Technique for Revealing Skin Microcirculation Changes under Regional Anaesthetic Input

16.15 A.Tereshchenko, R.Viter, I.Konup, V.Smyntyna, S.Geveliuk, V.Ivanitsa. TiO2 Optical Sensor for Amino Acid Detection

16.30 K.Kanders, A.Grabovskis, Z.Marcinkevics, J.I.Aivars. Assessment of Conduit Artery Vasomotion Using Photoplethysmography

16.45 D.Sodzel, V.Khranovskyy, E.Kolesneva, L.Dubovskaya, R.Yakimova. Hydrogen Peroxide and Glucose Biosensor Based on Photoluminescence Quenching of ZnO Nanoparticles

17.00 M.Mousavi. Novel Combined Fluorescence/Reflectance Spectroscopy System for Guiding Brain Tumor Resections: Confirmation of Capability in Lab Experiments

17.15 R.Rudys, S.Bagdonas, G.Kirdaite, R.Rotomskis. Application of FLIM for Diagnostic Imaging of Sensitized Tissues

18.15 ***Departure to Conference Dinner*** *(main entrance of the Raina Blvd.19 building)*

<u>Saturday 31 August</u>

Biophotonic Environmental Sensors

09.00 – 13.30 ***Invited Presentations*** (Aula Magnum)

Session chair: A.Priezzhev

09.00 S.Bagdonas (LT). Spectrometry and Reflectometry of Biological Tissues for Diagnostic Purposes

09.40 M.Mak (SE). State of Art of Biosensors

10.20 R.Viter (UA). Metal Oxide Nanostructures for Sensors and Biosensors

11.00 Coffee break

11.30 S.Balme (FR). Confocal Microscopy for Biosensor Applications

12.10 V.Khranovskyy (SE) Application of Zinc Oxide for Optical Biosensing Technologies

12.50 N.Starodub (UA). Optical Immune Biosensors Based on the SPR and TIRE: Problems and Perspectives of their Practical Application at the Registration of Some Biochemical Parameters.

13.30 Lunch break

14.30-15.30 ***Oral Presentations*** (Aula Magnum)

Session chair: D.Sampson

14.30 F.Vanholsbeeck, S.Swift, E.Bogomolny. Near Real Time, Accurate, and Sensitive Microbiological Safety Monitoring Using an All-Fibre Spectroscopic Fluorescence System

14.45 K.Shavanova, M.V.Taran, O.A.Marchenko, N.F.Starodub. Express Control of Plants General State by Using the New Generation of the Instrumental Tools

15.00 N.Slyshyk, N.F.Starodub. Structured Nano-Porous Silicon as Novel Transducer at Control of Mycotoxins in Environmental Objects

15.15 R.Sonko, K.Lopatko, N.Starodub. Effect of Solutions of Ferum and Zinc Nano-particles on the Plant Photosynthetic Activity

15.30 Cofee break

16.00 Closing remarks: Biophotonics Round Table

Poster Presentations

1. **L.Asare.** Signal Analysis of Multi-spectral Photoplethysmograph Biosensor.
2. **A.Bekina, V.Garancis, U.Rubin, E.Zaharans, J.Zaharans, L.Elste, J.Spigulis.** Multimodal Device for Assessment of Skin Malformations.
3. **M.A.Bezuglyi, N.V.Bezuglaja**. Ellipsoidal Reflectors in Biomedical Diagnostic.
4. **N.V.Bezuglaya, M.A.Bezuglyi**. Spatial Photometry of Scattered Radiation by Biological Objects.
5. **I.Brice, I.Ferulova, J.Spigulis, J.Alnis.** Towards Skin Fluorescence Diagnostics Using Femtosecond Frequency Comb Laser
6. **M.Canpolat, T.Denkceken, A.Akman, E.Alpsoy, R.Tuncer, M.Akyuz, M. Baykara, S.Yucel, I. Bassorgun, M.A.Ciftcioglu, G.A.Gokhan, E.Inanc Gurer, E.Pestereli, S. Karaveli**. Elastic Light Single-Scattering Spectroscopy for Detection of Dysplastic Tissues.
7. **B.Choiński.** A Program to Assist in Recognition of Emotional States.
8. **M.O.Eriksson, Z.N.Urgessa, J.R.Botha, K.F.Karlsson, P.Bergman, P.O.Holtz.** Optical Properties of ZnO Nanorods Grown by Chemical Bath Deposition.
9. **S.Fomins, I.Zakutajeva, M.Ozolinsh.** Identification of Deposits on Contactlens Surface.
10. **R.Fuksis, M.Pudzs, R.Ruskuls, T.Eglitis, D.Barkans, M.Greitans.** Bi-Spectral Palm Image Acquisition for Person Recognition.
11. **O.A.Izotova, A.L.Kalyanov, V.V.Lychagov.** Correlation Mapping Method of OCT for Visualization Blood Vessels in Brain.
12. **D.Jakovels, A.Lihachev, J.Spigulis, S.Satkauskas, M.Tamosiunas, C.W.Lo, W.S.Chen.** Assessment of Efficiencies of Electroporation and Sonoporation Methods by Fluorescence RGB Imaging Method.
13. **M.Jedrzejewska-Szczerska**. Low-coherent Measurement Method of Human Blood Hematocrit.
14. **K.Karpienko, M.S.Wrobel.** Reliability and Validity of Optoelectronic Method for Biophotonical Measurements.
15. **A.Kuznetsov, A.Frorip, M.Ots-Rosenberg, A.Sunter.** Blue Autofluorescence of Biological Fluids and Carbon Nanodots and Its Eventual Use in Clinical Praxis.
16. **A.Lihachev, I.Ferulova, J.Spigulis.** Fluorescence Lifetime Spectroscopy: Potential for In-vivo Estimation of Skin Fluorophores Changes after Low Power Laser Treatment.

17. **A.Lihachev, M.Tamosiunas, S.Satkauskas, J.Spigulis.** Fluorescence Spectroscopy for Estimation of Anticancer Drug Sonodestruction in Cell Culture.
18. **I.Lihacova, A.Derjabo, A.Bekina, J.Zaharans, J.Spigulis.** Development of Multispectral Imaging Method for Skin Pathology Diagnostics.
19. **M.Mantineo, A.M.Morgado, J.P.Pinheiro.** Methodology for Assessment of Low Level Laser Therapy (LLLT) Irradiation Parameters in Muscle Inflammation Treatment.
20. **P.Naglic, L.Vidovic, M.Milanic, L.L. Randeberg, B.Majaron.** Applicability of Diffusion Approximation in Analysis of Diffuse Reflectance Spectra from Healthy Human Skin.
21. **I.Saknite, E.Kviesis, J.Spigulis.** Water Detection In Skin By Dual-Band Photodiodes
22. **A.Shaharin, E.K.Svanberg, I.Ellerstrom, A.A.Subash, D.Khoptyar, S.Andersson-Engels, J.Akeson.** Muscle Tissue Saturation in Humans Studied with Two Non-invasive Optical Techniques: a Comparative Study.
23. **L.Surazynski, Sz.Buda, M.Jedrzejewska-Szczerska.** Biophotonic Sensor of Small Changes in the NaCl Concentration in Aqueous Solution.
24. **M.V.Taran, N.F.Starodub, A.M.Katsev, M.Guidotti, V.D.Khranovskyy, A.A.Babanin, M.D.Melnychuk.** Biocidal Effects of Silver and Zink Oxide Nanoparticles on the Bioluminescent Bacteria.
25. **N.Lippok, S.Murdoch, F.Vanholsbeeck.** Micron Scale Dispersion Mapping for Tissue Recognition in Optical Coherence Tomography.
26. **K.Volceka, L.Ozolina-Moll, E.Svampe, J.Zaharans, E.Zaharans, Z.Marcinkevics.** A Development of Multispectral Approach to Evaluate the Cardiometabolic Risk Related to Alterations in Body Composition.
27. **Z.Xie, H.Xie, M.Mousavi, M.Brydegaard, J.Axelsson, S.Andersson-Engels.** Novel Combined Fluorescence/Reflectance Spectroscopy System for Guiding Brain Tumor Resections – Hardware Considerations.
28. **A.Zhelyazkova, E.Borisova, L.Angelova, E.Pavlova, M.Keremedchiev.** Excitation-Emission Matrices Measurements of Human Cutaneous Lesions – Tool for Fluorescence Origins Evaluation.
29. **V.Zubkovs, F.Jamme, S.Kascakova, F.Chiappini, F.Le Naour, M.Refregiers.** Multimodal Imaging: Combined DUV, SHG and TPEF Microscopy.

Exhibition
Biophotonic Technologies – Baltics 2013

(Auditorium #5 next to Aula Magnum, Raina Blvd.19)

Working hours:

29 August **11.00 – 18.00**

30 August **09.00 – 17.00**

31 August **09.00 – 15.00 (optional)**