

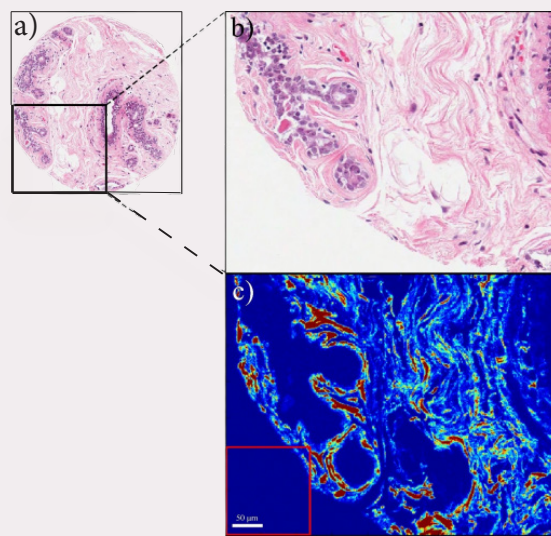


Research group activities

The group's scientific interests cover interdisciplinary research field aiming to create and develop new methods and technologies suitable for early diagnostics and combined treatment of cancerous and rheumatic diseases.

Research activities include application of optical methods and nanotechnological solutions to enhance selectivity and specificity of optical biopsy and phototherapy in the intersection of physics, chemistry and biomedicine, in particular:

- Studies on optical properties and spectroscopy of biologically active molecules, nanoparticles and photosensitizers;
- Optical biopsy of healthy and diseased tissues in vitro and in vivo;
- Experimental studies on light interaction with biological objects in vitro and in vivo;
- Experimental studies covering biomedical applications of the new combined technologies, including nanomedicine.



Ultrastructural Nonlinear Microscopy for Tissue Imaging and Cancer Pathology



Proposal

The group, together with local partners, offers technological base, facilities and scientific competence for model experiments combining application of photonic and nanotechnological techniques to

study photoinduced processes in biological systems in vitro and in vivo including different cellular cultures and the experimental animals.



Meet our team

Leading researchers: Prof. Ričardas Rotomskis,

Prof. Saulius Bagdonas

Staff:

Assist. Prof. Agnė Kalnaitytė

PhD students:

Greta Jarockytė,

Dominyka Dapkutė,

Akvilė Šlektaitė,

Marius Stašys



Research outcomes

More than 300 research publications including several book chapters.

Dr. Theodore Maiman Award at SPIE's International Biomedical Optics'93 Symposium in Los Angeles (USA). – Prof. R. Rotomskis.

Lithuanian Science Award in Biomedical Sciences in 2002 for scientific study in the field of the photosensitized tumour therapy in 1986-2001. – Prof. R. Rotomskis (with colleagues).

National and international scientific collaboration:

- National Cancer Institute - photosensitization and imaging of cancer stem cells;
- VU Faculty of Physics, Institute of Chemical Physics - EPR spectroscopy of photochemical processes;
- VU Faculty of Chemistry - synthesis and characterization of nanoparticles;
- Centre for Innovative Medicine - application of photonic technologies on rheumatoid arthritis model;

- Institute of Ecology of Nature Research Centre - toxicity of nanoparticles on aquatic ecosystems;

- Joint research projects with scientific partners from Australia, Canada, Germany, Latvia, Norway, Poland, Taiwan.

Ongoing projects

The project "Polarimetric non-linear microscopy for biomedical research and cancer diagnostics" (01.2.2-LMT-K-718-02-0016) financed by the Research Council of Lithuania from the EU Structural funds programme, project leader prof. Virginijus Barzda (Toronto university and Vilnius University).



Resources

The Biophotonics group has access to:

- Confocal multichannel fluorescence microscopy system with capacity for spectral registration and fluorescence lifetime imaging supplemented with thermostatic equipment for prolonged cellular observations.
- An atomic force microscopy system with possibility for measurements in liquid media.
- A femtosecond Ti:sapphire laser system and an optical parametric amplifier TOPAS for two-photon excitation.
- A CCD-based optical imaging system with a thermostatic life-support system for experimental animals under anaesthesia.
- A system for evaluation of a particle's size ZetaPALS (Brookhaven Inc., JAV)



Contacts

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