

FOREWORD

Special Issue Optical Technologies in the Study of Tissues and Biological Fluids

We are pleased to present this special issue of JIOHS, which focuses on optical technologies in the study of tissues and biological liquids. The selected papers were presented during Saratov Fall Meeting — XII International School for Junior Scientists and Students on Optics, Laser Physics and Biophotonics (September 23–26, 2008, Saratov, Russia) in the framework of the following workshops: “Optical Technologies in Biophysics and Medicine,” “Nanostructures and Nanoparticles,” “Microscopic and Low-Coherence Methods in Biomedical Applications,” and “Internet Biophotonics.” All eight papers in this special issue are research papers.

Daqing Piao and co-workers reported the first results of trans-rectal near-infrared (NIR) optical tomography of the normal canine prostate gland *in vivo*. The second paper is by Olivia Pucci *et al.*, who presented NIR sensor for the non-invasive recording of the changes in cerebral hemoglobin concentration during cigarette smoking.

Interferometric setup for biomedical analysis in transillumination modality was reported by Paulino Vacas-Jacques and colleagues. Next, Stephen P. Morgan and co-workers proposed a system for the control and analysis of the polarization state of the light entering and emerging from tissue using liquid crystal retarders. In both papers, the authors compared experimental data with results of Monte Carlo simulation.

Optical Coherence Tomography (OCT) remains a hot topic of research these days. Authors of several papers discuss the development and application of OCT technology to solve biomedical problems. Kirill Larin *et al.* evaluated the capability of OCT for structural 3D imaging in mouse embryos at different stages of the developmental process. The paper by Ekaterina Borisova and co-workers demonstrates the efficiency of the combined method of light-induced fluorescence spectroscopy and OCT for the diagnosis of non-melanoma skin cancer.

Skin optical clearing is a subject of interest of many researchers, and the search of effective enhancers of skin permeability remains an important problem. Zhongwei Zhi *et al.* evaluated the effect of propylene glycol as a chemical penetration enhancer on optical clearing of skin *in vitro*. Elina A. Genina *et al.* reported the results of clinical trials of a novel technique for accelerating drug delivery to the inflammation centers of acne lesions.

Overall, the papers in this special issue demonstrate well the exciting potential of optical imaging and diagnostic technologies for biomedical research and monitoring, as well as effective delivery of drugs and chemical compounds in tissue.

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