

# Journal of Biomedical Optics

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## **Laser Technologies for Biomedical Applications**

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## Laser Technologies for Biomedical Applications

This special section of the *Journal of Biomedical Optics* (JBO) was planned as a collection of selected papers presented at the Nineteenth International Conference on Advanced Laser Technologies—ALT'2011 (September 3–8, 2011, Golden Sands Resort, Bulgaria). Participants at the conference as well as other authors whose research is focused on laser technologies for biomedical applications were invited to submit manuscripts.

The Institute of Electronics of the Bulgarian Academy of Sciences was the national host and organizer of this event, and for the first time Bulgaria became a host of this prestigious international conference in the field of laser technologies and applications. Co-organizers were the Prokhorov General Physics Institute, Russian Academy of Sciences, International Laser Center of Moscow State University, and the Center for Laser Technologies and Material Sciences, Russia.

The ALT conference series, held annually since 1993, is focused on recent achievements and advances in laser technology and laser applications in various areas. This series of conferences was founded by the Russian Nobel Prize holder Academician Alexander M. Prokhorov, director of the General Physics Institute of Russian Academy of Sciences, Moscow, Russia. The previous meetings were held in Russia, Czech Republic, Germany, Greece, France, Italy, Romania, Switzerland, United Kingdom, China, Hungary, Finland, Turkey, and The Netherlands. Leading scientists and researchers from all over the world were invited to attend the conference and present the latest results in their fields of interest.

The 19th ALT conference was focused on the biophotonics research area, where we had 35 invited lectures and oral reports, and more than 30 poster presentations. Other key topics in the conference covered laser spectroscopy, laser-matter interactions, new laser systems and new materials, remote sensing and ecology, micro- and nanophotonic devices, optoacoustics, active optical sensing, and metrology. The conference program was subdivided into two parallel sessions with 9 plenary lectures, 40 invited lectures, and 40 oral presentations, as well as 67 contributions presented in a poster session. More than 180 participants attended the conference, including university researchers, students, and industrial entrepreneurs from 23 countries.

We are pleased to introduce in this special section a set of selected articles related to the field of laser technologies for biomedical applications, comprising 17 contributed papers, mainly authored by the participants of the conference, but also by other researchers in the field. Contributions cover different areas of laser technologies in the biomedical field,

ranging from nanosurgery of cell organelles, to laser microscopy and spectral techniques for biomedical research, to optical coherence tomography, low-level laser therapy, and blood investigations using optical techniques. These manuscripts report on some exciting progress in these areas of biophotonics and demonstrate that some of the significant barriers between basic laboratorial research and clinical applications could be overcome by focusing advanced laser technology developments on longstanding research as well as on medical problems and needs.

The editors would like to express deep gratitude to the members of ALT International Programme Committee for their great support, as well as to all ALT'2011 sponsors and exhibitors, who made this event possible. We would also like to thank all the lecturers and participants of the international conference on Advanced Laser Technologies 2011 for making this event a very fruitful and positive experience. Thanks to all the authors of the papers included in this special section for their excellent and interesting contributions, as well as to the many reviewers from all over the world, who provided high-quality reviews of the manuscripts submitted.

The editors would like to express their gratitude to the editorial board of JBO for permitting this special section on laser technologies for biomedical applications to be published.

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**Special Section Guest Editors**