In addition to regular submissions, the *Journal of Biophotonics* publishes topical issues on selected research areas. There are no page charges for authors. For more information about the *Journal of Biophotonics* you are welcome to visit the journal homepage at [www.biophotonics-journal.org](http://www.biophotonics-journal.org) or contact the Publisher at jbp@wiley.com.

**FORTHCOMING TOPICAL ISSUES 2018**

**Photonics meets Lymphatics**

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Lymphatic system plays a critical role in supporting healthy status and development of many diseases including cancer, infections, lymphedema, malformation and cardio-vascular disorders. Despite high importance, many aspects of lymphatic functions, morphology and regulation remain unclear because of methodological and technical limitations. Better understanding physiological processes (e.g., immunity) and mechanisms that are driving disease development as well as new opportunities for advanced early diagnosis and individualized therapy (theranostics) require detailed attention to study static (e.g., endothelial and smooth muscle cells) and circulating (e.g., tumor cells, immune cells) lymphatic cells, lymphangiogenesis, lymph chemistry, disease-associated small circulating objects in lymph flow (e.g., apoptotic and necrotic products, proteins, chylomicrons, exosomes and DNA), and pharmacokinetics of drugs and nanoparticles. Thus, to date, new methods and contrast agents are urgently needed to move beyond well-established biopsy of lymph nodes. Biophotonics has a wide spectrum of methods that hold promise to open new avenues in lymphatic experimental and clinical research. The scope of the current special issue covers lymphatic-related topics that includes, but not limited to:

- Lymphatic microscopy, imaging, spectroscopy, photoacoustics, Raman, MRI, PET, OCT and other optical and multi-modal technologies
- Optical clearing to improve lymphatic diagnosis
- Innovative technologies to study lymphatics in the Central Nervous System
- Lymphatic optogenetics and molecular regulation
- Lymphatic tissue engineering
- Nanoparticles, nanolasers, biosensors, molecular probes and reporters
- Innovative drug delivery systems
- Advanced lymphography and lymph node biopsy
- Lymph flow dynamics
- Normal and abnormal lymphangiogenesis
- Analysis of normal (e.g., lymphocytes, endothelial cells) and diseased (e.g., circulating tumor cells, bacteria) cells, their exosomes and aggregates.
- Lymphatic theranostics
- Translational research
- Clinical technologies
PUBLISHED TOPICAL ISSUES

**Tissue Ablation and Laser Surgery**

**Volume 10, Issue 10 (October 2017)**


**Guest Editor:** Florian Klämpfl

Lasers have great advantages when being used as a scalpel in medicine. They offer high precision, remove the tissue contact-free and selectively, further they can be used endoscopically. Applications like refractive eye surgeries already take advantage of these properties in clinics while new approaches are under way. However, the use of lasers for surgeries poses also new challenges like missing haptic feedback to the surgeon. This topical issue addresses the current state of research in tissue ablation and laser surgery on the engineering side as well as on the medical side and presents new results and developments.

**In-vivo Optical Imaging / Intravital Microscopy**

**Volume 10, Issue 6-7 (June 2017)**


**Guest Editors:** Laura Marcu, Elizabeth M.C. Hillman

In vivo optical imaging has become an important research tool not only in research laboratories but also in clinical settings. New paradigms for studying the biological processes in tissue and for diagnosis and clinical management of human diseases (e.g. improved diagnosis, real-time guidance of interventions, monitoring of the efficacy of therapy, and brain optical imaging) are needed. This can be achieved through development of novel optical imaging and microscopy techniques for in situ in vivo interrogation of tissue and through advancing new methods for analysis, visualization and correlation of bio-chemical, structural and functional characteristics of complex biological systems. This topical issue presents recent advances in a wide variety of optical techniques with applications in neuroscience and in pre-clinical and clinical diagnostics. These include optical coherence tomography (OCT), photoacoustic tomography and microscopy, laser speckle angiography, scanning near-field optical microscopy (SNOM), optical spectroscopy (fluorescence and Raman), hyperspectral imaging, and second harmonic generation (SHG).

**Photobiomodulation and Photodynamic Therapy**

**Volume 9, Issue 11-12 (December 2016)**


**Guest Editors:** Michael Hamblin, Peter Berlien

Low-Level Laser Therapy (now better known as Photobiomodulation) is one of the fastest growing areas of Biophotonics. Recent advances in the understanding of the basic mechanisms underlying the response of cells and tissue to low-levels of red or near-infrared light have elevated the field out of a "junk-science” backwater and into the scientific mainstream. The goal of the special issue is to showcase top-rate experimental papers and reviews in the field of photobiomodulation to continue to bring home to the scientific readership that in this "Year of Light” in the twenty-first century that human disease may literally benefit from having light shone on it.
Image Processing in Biomedical Diagnosis

**Volume 9, Issue 5 (May 2016)**


**Guest Editors:** Robert Koprowski, Thomas Bocklitz

Modern methods of image analysis and processing are one of the cornerstones of research for biophotonic diagnostics. The area of medical image analysis and processing represents a very broad concept and every photonic technique requires adapted image analysis routines. Rapid progress in methods for the analysis of medical images requires continuous knowledge updates. This overview of new trends in analysis and processing is intended to broaden the knowledge of practitioners (engineers and doctors) on the use of modern analysis and image processing methods in medical diagnostics. The issue starts with image analysis methods for ophthalmological tasks, where the photonic devices are already clinically applied. In particular, there are articles on the application of computational methods for the analysis of the biomechanics of the cornea in response to an air puff and for the analysis of images acquired from optical scanners. Another emerging area in the broad field of image analysis is the analysis of hyperspectral images. This analysis type is covered in the second part of the special issue. There are articles on the analysis of prostate tissue in OCT images, the hybrid method of differentiation-free strain estimation, methods of thermal image analysis and the use of IR spectral histology or biomedical Raman Spectroscopic imaging.

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**Photonic Biofluid Diagnostics**

**Volume 7, Issue 3-4 (April 2014)**


**Guest Editor:** Matthew J. Baker

The area of Photonic Biofluid Diagnostics is a rapidly increasing area of research. Biofluid based diagnostics offer a real chance for a rapid clinically based photonic diagnostic test that can be performed in the field, in a primary care centre and at the bedside. Biophotonic technologies, as the research presented in this special issue evidence, offer the ability to revolutionise the clinical arena, providing a responsive diagnostic environment with associated declines in mortality and morbidity. The issue provides review articles and original research articles to reflect the cutting edge research being performed in the area.

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**Photoacoustic Imaging and Spectroscopy for Biomedical Diagnosis**

**Volume 6, Issue 6-7 (June 2013)**

*http://onlinelibrary.wiley.com/doi/10.1002/jbio.v6.6/7/issuetoc*

**Guest Editor:** Vasilis Ntziachristos

Bio-optical methods have been an essential tool for biological observation and clinical diagnosis. Optoacoustic (photoacoustic) imaging is emerging to drive optical imaging beyond the penetration limits of conventional optical methods by allowing the formation of optical images several millimeters to centimeters inside tissue. Overall, optoacoustics is expected to be an area of significant growth both on the technological and the applications front. Likewise the expectations are high that this technology will improve biological and clinical sensing and bring the improved ability in interventional and diagnostic procedures. The topical issue on optoacoustics published in the Journal of Biophotonics intends to capture some of the recent progress in the field. The publications broadly address the diversity of the field with topics ranging from technology development, clinical applications and the use of agents for signal generation or the study of physical phenomena and interactions that could be employed for novel biomedical sensing.
Vibrational Spectroscopy in Medicine
Volume 6, Issue 1 (January 2013)

**Guest Editors:** Christoph Krafft, Benjamin Bird

Raman and infrared spectroscopic techniques allow the rapid and sensitive characterisation of sample chemistry and are reliant strictly on the vibrational signatures of the molecules present in the sampling volume. When applied to biological species, the techniques provide highly complex spectra that describe changes occurring for the entire genome, proteome and metabolome. Detection of cellular abnormalities or identification of unwanted exogenous species can be made, offering new label-free methods that require little or no sample preparation, and are also attractive for real time in-vivo applications. The issue provides insight into their most recent contributions, and also a commentary of possible future directions.

Topical Problems of Biophotonics
Volume 5, Issue 11-12 (November 2012)

**Guest Editors:** Michail Kirillin, Natalia Shakhova, Konstantin Sokolov, Rudolf Steiner

Optical methods in biomedicine have experienced an outstanding development in recent decades and are currently successfully translated from research laboratories to medical practice. Some of them, such as OCT and photodynamic therapy, have become a common tool for clinicians while others, such as optical diffuse tomography or laser-driven acceleration for radiation therapy, are on their way from optical bench to medical instrumentation. This issue presents a collection of papers based on reports delivered at the 3rd biannual International Symposium “Topical Problems of Biophotonics – 2011”, covering a wide range of topics varying from microscopic studies at subcellular scale to diagnostics and treatment in clinical practice.

Lab-on-a-Chip based Diagnostics
Volume 5, Issue 8-9 (August 2012)

**Guest Editors:** Timo Mappes, Holger Schmidt

This topical issue is dedicated to biophotonic lab-on-a-chip devices for diagnostics. It aims for providing a representative and comprehensive overview on the broad range of current biophotonics on-chip, spanning the full range from chip fabrication to applications in biomedical sensing and related fields. To this end, a balanced mix of original research work and reviews for broader perspective is presented.

Multimodal Imaging for Biomedical Diagnosis
Volume 5, Issue 5-6 (May 2012)

**Guest Editors:** Benjamin Dietzek, Ji-Xin Cheng

A number of advanced optical imaging modalities have been invented over the past 20 years. Each of these modalities has been successfully applied to biological and biomedical research. This special issue aims to highlight the significance of multimodal optical imaging through a collection of papers showing some most recent advances in this area.
Advanced Pathology
Volume 5, Issue 4 (April 2012)

Guest Editor: Axel Niendorf

This issue of the Journal of Biophotonics entitled “Advanced Pathology” aims at bridging the two worlds of pathologists and biologists, on the one hand posing biological and clinical questions, and that of physicists and engineers on the other hand, providing the tools necessary to answer them.

Clinical Biophotonics
Volume 4, Issue 10 (October 2011)

Guest Editors: Henricus JCM Sterenborg, Niels Bendsoe, Katarina Svanberg

Photonics is a rapidly expanding field of technology generating a broad spectrum of new technologies, materials and components. To reach maximum impact to the society, however, it is of major importance for the Photonics field to go beyond technology and component development and engage into the development of applications. This requires intense multidisciplinary interaction between clinicians and dedicated photonics researchers. The key behind a success is a long and often cumbersome path into uncharted areas of science. This topical issue deals with a variety of the newest research results within the field of biomedical optics.

Advanced Endoscopy
Volume 4, Issue 7-8 (August 2011)

Guest Editors: Ralf Kiesslich, Andreas Stallmach, Alastair Watson

The issue reports on advances in endoscopy and offers review articles on specific areas like endoscopic imaging of colorectal neoplasia, autofluorescence imaging of early colorectal cancer, and confocal laser endomicroscopy in gastrointestinal diseases.

Advanced Markers and Labels for Life Science and Biomedical Applications
Volume 4, Issue 6 (June 2011)

Guest Editors: Markus Sauer, Duncan Graham, Philip Tinnfeld

BioImaging is a topic of great interest in medical and biological science because it enables the almost non-invasive imaging of cellular structures in three dimensions. Various super-resolution imaging methods have been developed over the last years that are unified by the demand for efficient photostable fluorescent labels and probes that selectively label target molecules in cells or reflect the presence of specific target molecules (e.g. enzymes) by a change in their photophysical characteristics. The special issue covers the development of new biomedical markers and life cell labels and demonstrates their successful use in medical and biological imaging applications.
**Laser Applications in Life Sciences**

Volume 4, Issue 3 (March 2011)  

**Guest Editors:** Alexey Popov, Tapio Fabritius, Victor Zadkov

This issue includes papers from selected keynote and invited speakers of the XII International Conference on Laser Applications in Life Sciences (LALS-2010) held in Oulu, Finland, June 9-11, 2010. The LALS series of meetings is intended to provide a platform for the presentation of the latest developments in research areas where lasers are used to investigate biologically relevant molecular and microscopic systems and processes. Traditionally, this meeting is a forum for scientists in the fields of physics, technology, biology and medicine, connecting optical engineers, physicists and medical doctors.

**Optical Bioimaging and Neuroimaging**

Volume 3, Issue 12 (December 2010)  

**Guest Editors:** Mikhail Kirillin, Karsten Koenig, Natalia Shakhova, Bruce Tromberg, Alexey Semyanov

Methods of optical bioimaging and neuroimaging are rapidly evolving and penetrate both to experimental laboratories and clinics. Among their advantages are non-invasiveness and abilities varying from multiscale image acquisition to functional real-time imaging. This Special Issue presents a collection of papers contributed by the leading groups in bio- and neuroimaging depicting their state-of-the-art results discussed at “Optical Bioimaging” and “Neuroimaging and Neurodynamics” Conferences being parts of the Second International Symposium “Topical Problems of Biophotonics – 2009”.

**Nanobiophotonics**

Volume 3, Issue 10-11 (October 2010)  

**Guest Editors:** Christian Tom Brown, Volker Deckert, Alexander Sergeev, Alexey Zheltikov

Nanobiophotonics integrates concepts and instruments from nanoscience, photonics, and biotechnologies and is an impressive example of a rapidly progressing multidisciplinary field. The methods of nanoscience and photonics give a powerful momentum to life sciences, offering advanced tools to confront some of the greatest challenges in biosciences and biotechnologies. This special issue offers a collection of contributions from leading scientists in the field, who presented their state-of-the-art research at the Nanobiophotonics conference, organized as part of the Second International Symposium on Topical Problems of Biophotonics (Nizhny Novgorod, July 19–24, 2009).

**Modern Biophotonic Trends in Microbiological and Medical Diagnostics**

Volume 3, Issue 8-9 (August 2010)  

**Guest Editors:** Dieter Naumann, Max Diem

The bi-annual workshop “Vibrational Spectroscopy in Microbiological and Medical Diagnostics” brings together researchers from across the word to discuss the applications of infrared and Raman spectroscopy, micro-spectroscopy and related techniques for the identification and classification of micro-organisms, and for the detection and diagnosis of disease in individual human cells. The articles in this special issue highlight the progress in optical methods of pathogen detection, and diagnosis of disease.
Advanced Micro and Nanoscopy for Biomedicine
Volume 3, Issue 7 (July 2010)

Guest Editors: Gert von Bally, Min Gu, Colin Sheppard

This issue presents most advanced technologies in Micro- and Nanoscopy for applications in biomedical sciences, operating down to the single molecule level. Furthermore, cutting edge contributions to manipulations by light as well as of light (as in STED Nanoscopy) and with light (as in optical tweezing) are presented.

Therapeutic Laser Application and Tissue Interactions
Volume 3, Issue 5-6 (June 2010)

Guest Editors: Stephan Andersson-Engels, Herbert Stepp

The issue provides an overview over the current status in established applications and highlights forthcoming new applications. Applications include the full span from intracellular microsurgical applications to large volume coagulation, from photochemical internalization via antimicrobial photodynamic therapy to interstitial PDT.

Innovative Photonic Micromanipulation Tools
Volume 3, Issue 4 (April 2010)

Guest Editor: Kishan Dholakia

The issue aims to give a snapshot of some of the new and emerging studies that are forthcoming where micromanipulation plays a key role. Novelty is emerging in this field with the use of new technology in trapping, such as fast camera technology and dynamic holographic elements, and through the combination of trapping with other forms of microscopic analysis such as spectroscopy (e.g. Raman), fluorescence and imaging. These and other advances ensure that this field remains exciting and relevant for 21st century biophotonics.

Biophotonics for Dermatology: Science and Applications
Volume 3, Issue 1-2 (January 2010)

Guest Editors: Valery V. Tuchin, Anna N. Yaroslavsky, Steven L. Jacques, Rox Anderson

This issue focuses on state-of-the-art research in biophotonics for dermatology and its applications with particular emphasis on novel optical methods, skin disease diagnosis and treatment as well as monitoring disease treatment on the cellular and molecular level. General topics include skin light scattering, digital video microscopy, polarization, laser-scanning, fluorescence, Raman, multi-photon, second harmonic, photothermal, and photoacoustic methods and their combinations for skin diagnostics and monitoring of disease treatment. Also included are PDT and photothermal treatment technologies of skin disease.
Biophotonics in Regenerative Medicine
Volume 2, Issue 11 (November 2009)  

**Guest Editors:** Thomas Huser, Dennis Matthews, Brian Wilson

Recent advances made in the optical characterization, tracking, and imaging of stem cells are discussed. Stem cells, in particular in their pluripotent form, are an unlimited source of self-renewal for injured tissue and offer significant promise for a cure of a wide range of diseases from cancer, neurodegenerative diseases, and even infectious disease. The issue highlights recently introduced label-free characterization techniques, novel probes that enable optical tracking, in-vitro an in-vivo imaging applications in regenerative medicine.

Towards in vivo Flow Cytometry
Volume 2, Issue 8-9 (September 2009)  

**Guest Editors:** Valery V. Tuchin, Attila Tárnok, Vladimir P. Zharov

This special topic focuses on state-of-the-art research in novel field, non-invasive *in vivo* cytometry and its applications with particular emphasis on the novel biophotonic methods, disease diagnosis, and monitoring of disease treatment at single cell level in stationary and flow conditions. General topics include light scattering, fast video microscopy, polarization, laser-scanning, fluorescence, Raman, multi-photon, photothermal, and photoacoustic methods for cellular diagnostics and monitoring of disease treatment in living organisms.

OCT – Optical Coherence Tomography
Volume 2, Issue 6-7 (July 2009)  

**Guest Editors:** Peter E. Andersen, Wolfgang Drexler

This issue encompasses a variety of OCT applications in the biophotonics as well as medical field. It focuses on OCT technology development including light source and delivery probe technology, OCT signal processing as well as multi-modal and functional extensions of OCT.

Chip-Based Detection Methods
Volume 2, Issue 4 (April 2009)  

**Guest Editors:** Wolfgang Fritzche, Robert Möller, Cornelius Knabbe

The integration and parallelization of different lab-based processes is one of the challenging tasks for the development of portable diagnostic devices. In recent years, a plentitude of different approaches, like micro array, lab-on-a-chip and other chip-based developments, have been described that will help the emergence of point-of-care devices. This issue highlights some interesting recent developments in chip-based diagnostics and describes some selected applications that show the potential of chip-based applications.
Vibrational Spectroscopy in Medicine: Applications to Diagnosis of Disease

Volume 2, Issue 1-2 (February 2009)

Guest Editor: Max Diem

Over the past three decades, many new diagnostic methodologies have been introduced into the practice of medicine. While these techniques have revolutionized medicine, no single technique can provide all answers required by a diagnostician. Thus, novel optical (biophotonic) techniques are being developed to provide more and complementary diagnostic information. This issue is dedicated to exploit the diagnostic and prognostic potential of vibrational spectroscopy and spectral imaging.

Multiphoton Imaging and FLIM

Volume 1, Issue 6 (December 2008)

Guest Editors: Alberto Diaspro, Karsten König

This topical issue was arranged at the 3rd Workshop on Advanced Multiphoton and Fluorescence Lifetime Imaging Techniques FLIM 2008 held in Saarbrücken. The articles present a number of technical advances and several new applications in biological and medical research.

From Single Molecule To Single Cell Up To Tissue Imaging

Volume 1, Issue 4 (September 2008)

Guest Editor: Francesco S. Pavone

This special issue provides contributions from single molecule biophysics in in vitro operation, optical tweezers, hybrid solutions such as magneto/optical manipulators, Raman and CARS spectroscopy, time resolved and fluorescence correlation spectroscopy.