

PROGRESS IN BIOMEDICAL OPTICS AND IMAGING

Vol. 22 No. 63

Opto-Acoustic Methods and Applications in Biophotonics V

Chulhong Kim
Jan Laufer
Roger J. Zemp
Editors

20–24 June 2021
Online Only, Germany

Sponsored by
The Optical Society (United States)
SPIE

Published by
SPIE

Volume 11923

Proceedings of SPIE-OSA Biomedical Optics, 1605-7422, V. 11923

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:

Author(s), "Title of Paper," in *Opto-Acoustic Methods and Applications in Biophotonics V*, edited by Chulhong Kim, Jan Laufer, Roger J. Zemp, Proc. of SPIE-OSA 11923, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 1605-7422

ISSN: 2410-9045 (electronic)

ISBN: 9781510647121

ISBN: 9781510647138 (electronic)

Copublished by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

SPIE.org

and

The Optical Society

210 Massachusetts Ave., N.W., Washington, D.C., 20036 USA

Telephone 1 202/223-8130 (Eastern Time) · Fax 1 202/223-1096

<http://www.osa.org>

Copyright © 2021 Society of Photo-Optical Instrumentation Engineers (SPIE) and The Optical Society

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.

SPIE. DIGITAL LIBRARY

SPIDigitalLibrary.org

Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

ALGORITHMS AND RECONSTRUCTION METHODS I

- 11923 02 **Deep-learning-based electrical noise removal for localized spectral optoacoustic contrast in deep tissue** [11923-1]
- 11923 03 **Gradient filter reconstruction approach to fluorescence photoacoustic-based pharmacokinetic tomography** [11923-2]
- 11923 04 **Removal of blurring induced by band-limited transducers and broad laser pulse in photoacoustic tomography** [11923-3]
- 11923 05 **Towards model-based control techniques for retinal laser treatment using only one laser** [11923-4]
- 11923 06 **First principle simulation package for arbitrary acousto-optic interaction in scattering materials** [11923-5]
- 11923 07 **Relaxed data-consistency for limited bandwidth photoacoustic tomography** [11923-6]
- 11923 08 **Computationally efficient forward model for photoacoustic tomography** [11923-7]

ALGORITHMS AND RECONSTRUCTION METHODS II

- 11923 09 **Compensating modeling errors of diffusion approximation in quantitative photoacoustic tomography using a Bayesian approach** [11923-8]
- 11923 0A **Sampling and resolution in sparse view photoacoustic tomography** [11923-9]
- 11923 0B **Perturbation Monte Carlo in quantitative photoacoustic tomography** [11923-10]
- 11923 0C **3D photoacoustic fluctuation imaging provides visibility artefacts removal and enhanced contrast. Simultaneous implementation with ultrasound doppler imaging** [11923-11]
- 11923 0D **Correcting visibility artefacts in photoacoustic imaging with a deep learning approach** [11923-12]

NOVEL INSTRUMENTATION, MICROSCOPY, AND DETECTORS I

- 11923 0E **High-speed photoacoustic-guided wavefront shaping with a real-valued intensity transmission matrix** [11923-13]

- 11923 0F **Pump-probe photoacoustic spectroscopy of red fluorescent proteins** [11923-14]
- 11923 0G **Transparent capacitive micromachined ultrasound transducer arrays for multimodal imaging systems** [11923-15]
- 11923 0H **3D optoacoustic tomography via spatially coded detectors** [11923-16]
- 11923 0I **Multimodal preclinical imaging system using transparent ultrasonic transducer** [11923-17]
- 11923 0J **Single pulse optoacoustic temperature measurement** [11923-18]

NOVEL INSTRUMENTATION, MICROSCOPY, AND DETECTORS II

- 11923 0K **Wideband ultrasound PVDF detectors for raster-scan optoacoustic angiography** [11923-19]
- 11923 0L **Benchtop photoacoustic tomograph with camera-based ultrasound detection** [11923-20]
- 11923 0M **Imaging speckle decorrelation effect with combined acousto-optical imaging with off-axis heterodyne holography for biomedical applications** [11923-21]
- 11923 0N **Multimode fibre-based optical-resolution photoacoustic endo-microscopy with a real-valued intensity transmission matrix** [11923-22]
- 11923 0O **Photoacoustic imaging using structured illumination and a single-pixel ultrasound detector** [11923-23]
- 11923 0P **Improving the sensitivity of Fabry-Perot pressure sensors for photoacoustic imaging** [11923-24]
- 11923 0Q **Sensitive optomechanical ultrasound sensor in a silicon photonic chip towards single-shot photoacoustic imaging with an ultrasound sensor matrix** [11923-25]

PRECLINICAL IMAGING

- 11923 0R **Development of a realistic phantom of a mouse's head: application to photoacoustic temperature monitoring during photothermal therapy** [11923-26]
- 11923 0S **Design and characterization of donor- π -acceptor vinyl-BODIPY derivatives as molecular photoacoustic contrast agents** [11923-27]
- 11923 0T **Applications of raster-scan optoacoustic angiography in experimental oncology** [11923-28]
- 11923 0U **Optoacoustic angiography for assessment of experimental tumor vascular reaction to radiation therapy** [11923-29]
- 11923 0V **A low-cost multiwavelength time-domain LED-based optoacoustic system for unmixing absorbers** [11923-30]

11923 OW **PVDF spherical matrix array for high resolution cerebral optoacoustic micro-angiography of rodents** [11923-31]

TOWARDS CLINICAL APPLICATIONS

11923 OX **Impulse response correction enables high-resolution clinical hand-held optoacoustics** [11923-32]

11923 OY **Increase of optoacoustic-induced auditory brainstem response amplitudes using an absorbing patch** [11923-33]

11923 OZ **Simultaneous in-vivo characterization of blood oxygen saturation and perfusion with bimodal multispectral optoacoustic tomography and ultrafast ultrasound Doppler imaging.** [11923-34]

11923 10 **Imaging results from a semi-anthropomorphic photoacoustic-ultrasound breast phantom carrying blood vessels** [11923-35]

11923 11 **A novel all-optical focused ultrasound detector for intravascular lipid imaging** [11923-36]

11923 12 **Virtual histological assessment of human breast tumor specimens using spectral-domain optical coherence tomography augmented with ultraviolet photoacoustic remote sensing microscopy** [11923-37]

11923 13 **Atopic dermatitis classification models of 3D optoacoustic mesoscopic images** [11923-38]

11923 14 **Quantification of microvasculature parameters in normal and pathological tissues based on three-dimensional raster-scan optoacoustic angiography** [11923-39]

POSTER SESSION I

11923 15 **Design and development of a photoacoustic set up for breath analysis: a preliminary study** [11923-40]

11923 16 **Microstructured optoacoustic lens of black-TiO_x for focused ultrasound and confined cavitation bubbles** [11923-41]

11923 17 **Quantification of blood oxygen saturation with photoacoustic imaging in phantom, animals, and in-vivo validation** [11923-42]

11923 18 **Facile synthesis of a croconaine-based nanoformulation for optoacoustic imaging and photothermal therapy** [11923-43]

11923 19 **Plasmonic nanoparticles as contrast agents for photoacoustics: strategies to improve their photostability** [11923-44]

POSTER SESSION II

11923 1A **Water-in-elastomer micro-emulsions as phantom materials in photoacoustic imaging and multimodal theranostics** [11923-45]