

PROGRESS IN BIOMEDICAL OPTICS AND IMAGING

Vol. 20 No. 31

Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues XVII

Daniel L. Farkas

Attila Tárnok

James F. Leary

Editors

4–6 February 2019

San Francisco, California, United States

Sponsored and Published by
SPIE

Volume 10881

Proceedings of SPIE, 1605-7422, V. 10881

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 *Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues XVII*, edited by Daniel L. Farkas, Attila Tárnok, James F. Leary, Proceedings of SPIE Vol. 10881 (SPIE, Bellingham, WA, 2019) Seven-digit Article CID Number.

ISSN: 1605-7422

ISSN: 2410-9045 (electronic)

ISBN: 9781510624047

ISBN: 9781510624054 (electronic)

Published 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

Copyright © 2019, Society of Photo-Optical Instrumentation Engineers.

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 copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online 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. The CCC fee code is 1605-7422/19/\$18.00.

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: *Proceedings of SPIE* follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article 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

vii *Authors*
ix *Conference Committee*

FUNCTIONAL IMAGING I

10881 03 **Improving quantitative fluorescence imaging with flat field illumination** [10881-3]

FUNCTIONAL IMAGING II

10881 06 **Optical absorbance study of three phosphorylatable amino acids using confocal Raman Spectroscopy** [10881-6]

10881 09 **High throughput analysis of plankton morphology and dynamic** [10881-8]

MONITORING AND REGENERATIVE MEDICINE I

10881 0B **Design of portable microfluidic cytometry devices for rapid medical diagnostics in the field (Invited Paper)** [10881-10]

10881 0C **Dynamic observation and quantification of type I/II collagen in chondrogenesis of mesenchymal stem cells by second-order susceptibility microscopy (Invited Paper)** [10881-11]

10881 0F **Raman spectroscopy quality controls for GMP compliant manufacturing of tissue engineered cartilage** [10881-14]

MONITORING AND REGENERATIVE MEDICINE II

10881 0H **Establishing the baseline for using plankton as biosensor** [10881-16]

10881 0I **Fluorescence molecular tomography based on L2,1-norm method for morphological reconstruction** [10881-17]

10881 0K **Cellular refractive index comparison of various prostate cancer and noncancerous cell lines via photonic-crystal biosensor** [10881-19]

10881 0L **Determination of extremely low concentration of sucrose in aqueous solution by Raman spectroscopy** [10881-20]

BIOMEDICAL IMAGING USING A DMD OR OTHER MIRROR ARRAY I: JOINT SESSION WITH 10881 AND 10932

- 10881 ON **A spherical mirror-based illumination system for fluorescence excitation-scanning hyperspectral imaging** [10881-22]
- 10881 OO **Optimization of light transmission through an excitation-scan hyperspectral mirror array system** [10881-23]
- 10881 OP **Hyperspectral imaging and spatial frequency domain imaging: combined acquisition for full face skin analysis** [10881-24]

CYTOMICS I

- 10881 OQ **Advancing methods for the analysis of glioblastoma cell motion using quantitative time lapse holographic imaging and cellular tomography (Invited Paper)** [10881-25]
- 10881 OS **External low frequency electric fields maximize the fluorescence enhancement through light-metal-fluorophore interactions of target biomolecules** [10881-28]
- 10881 OT **The use of coated glass substrates for signal enhancement in multiphoton imaging** [10881-29]
- 10881 OV **Comparison of two- and three-dimensional nuclear to cytoplasm ratios in analyzing lung cancer cell lines** [10881-27]

CYTOMICS II

- 10881 OX **Signal removal methods for highly multiplexed immunofluorescent staining using antibody conjugated oligonucleotides** [10881-32]
- 10881 IO **Putting (single-cell) data into orbit** [10881-35]

SPECTRAL IMAGING I

- 10881 14 **Snapshot multi-spectral-line imaging for applications in dermatology and forensics** [10881-39]
- 10881 16 **Raman imaging of α -synuclein aggregates in a rat model of Parkinson's disease** [10881-41]
- 10881 17 **A multispectral Bayesian-based computational microscopy method for enhancing image quality** [10881-42]

SPECTRAL IMAGING II

- 10881 19 **Dark-field hyperspectral imaging of single plasmonic gold nanorods and their scattering characteristics in complex biological environments** [10881-44]
- 10881 1A **Single blood cell Raman spectroscopy reveals elevated haemoglobin content in poikilocytosis** [10881-45]
- 10881 1B **Optimizing channel selection for excitation-scanning hyperspectral imaging** [10881-46]
- 10881 1C **Multimodal optical detection and toxicity testing of microplastics in the environment** [10881-47]

SPECTRAL IMAGING III

- 10881 1D **Improvement of analyzing method for human skin color separation by independent component analysis** [10881-48]
- 10881 1E **Effect of different variables on indocyanine green (ICG) in image- guided treatments** [10881-49]
- 10881 1F **Hyperspectral imaging microscopy for measurement of localized second messenger signals in single cells** [10881-50]

BIOINFORMATICS

- 10881 1G **Correlated simultaneous fluorescence and phosphorescence lifetime imaging reveals an association between intracellular oxygen tension and metabolic changes in living cells** [10881-51]
- 10881 1H **High-resolution MR image by high precision signal analysis method for accurately analyze complex signals** [10881-52]
- 10881 1I **Towards a Raman-based diagnostic approach for characterizing cytologically indeterminate thyroid nodules** [10881-53]
- 10881 1J **Bioluminescence tomography based on bilateral weight Laplace method for in vivo morphological imaging of glioma** [10881-54]
- 10881 1K **Fast and robust reconstruction method for fluorescence molecular tomography based on deep neural network** [10881-55]
- 10881 1L **Bone mineralization and collagen formation observed with principal component analysis of Raman scattering from healing calvarial defects** [10881-56]
- 10881 1N **A novel method for scatterers type enumeration in polydisperse suspensions through fiber trapping and unsupervised scattering analysis** [10881-58]

POSTER SESSION

- 10881 1P **Resolution-enhanced digital epiluminescence microscopy using deep computational optics** [10881-60]
- 10881 1Q **Increase of NMR/MIR signals under ultra-low B fields with hyperpolarized Xe using 1W CW single-frequency Ti:Sapphire laser** [10881-61]
- 10881 1S **Acoustic impedance measurement of radiotherapy-induced effect on the human tooth by 320 MHz scanning acoustic microscopy** [10881-63]
- 10881 1T **Multiphoton and harmonic generation imaging methods enable direct visualization of drug nanoparticle carriers in conjunction with vasculature in fibrotic prostate tumor mouse model** [10881-64]
- 10881 1U **Chemically etched plastic optical fiber probe for near-field scanning optical microscopy in liquids** [10881-65]
- 10881 1W **Towards laser-assisted microfluidic-cell transfection** [10881-67]