

Optical Biopsy XXII: Toward Real-Time Spectroscopic Imaging and Diagnosis

**Robert R. Alfano
Angela B. Seddon
Lingyan Shi**
Editors

**30–31 January 2024
San Francisco, California, United States**

Sponsored by
SPIE

Cosponsored by
Photothermal Spectroscopy Corporation (United States)
Thorlabs, Inc. (United States)
Hamamatsu Corporation (United States)
Spectra-Physics, a division of MKS Instruments (United States)

Published by
SPIE

Volume 12836

Proceedings of SPIE, 1605-7422, V. 12836

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

Optical Biopsy XXII: Toward Real-Time Spectroscopic Imaging and Diagnosis, edited by Robert R. Alfano,
Angela B. Seddon, Lingyan Shi, Proc. of SPIE Vol. 12836, 1283601
© 2024 SPIE · 1605-7422 · doi: 10.1117/12.3030062

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 *Optical Biopsy XXII: Toward Real-Time Spectroscopic Imaging and Diagnosis*, edited by Robert R. Alfano, Angela B. Seddon, Lingyan Shi, Proc. of SPIE 12836, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 1605-7422
ISSN: 2410-9045 (electronic)

ISBN: 9781510669314
ISBN: 9781510669321 (electronic)

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time)
SPIE.org
Copyright © 2024 Society of Photo-Optical Instrumentation Engineers (SPIE).

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

v *Conference Committee*

SPECTRAL IMAGING I

- 12836 02 **Visualizing metabolites at the cellular level: advancements in advancements in 3-micron laser desorption mass spectrometry imaging (Invited Paper)** [12836-4]
- 12836 03 **Polarized light imaging sensitive to 100 to 300nm size range of light-scattering tissue structure (Keynote Paper)** [12836-47]

SPECTRAL IMAGING II

- 12836 04 **A high-resolution hyperspectral imaging system for the retina** [12836-7]
- 12836 05 **High-sensitivity 648x484-pixel CMOS image sensor for wide-field FLIM with four simultaneous time gates** [12836-8]

SPECTROSCOPIC METHODS I

- 12836 06 **Unveiling molecular signatures for disease classification by spectroscopic imaging (Invited Paper)** [12836-10]
- 12836 07 **Optical spectroscopic analysis of cerebrospinal fluid of human brain tumor using visible resonance Raman spectroscopy** [12836-13]

SPECTROSCOPIC METHODS II

- 12836 08 **Novel dual-channel configuration of non-contact diffuse reflectance spectroscopy towards assessing the spectral absorption at a depth below 1mm** [12836-15]

SPECTROSCOPIC METHODS III

- 12836 09 **Passive one-shot Fourier spectrometer for blood glucose measurements** [12836-19]
- 12836 0A **Spectral characterization of the formation of fluorescent advanced glycation end products in biological specimens** [12836-21]

SPECTRAL DATA PROCESSING

- 12836 0B **Acquiring both the slow-decay kinetics of delayed photoluminescence and the steady-state spontaneous ultraweak photon-emission using irradiation-acquisition interleaved time-integrated imaging** [12836-25]

NOVEL METHODS

- 12836 0C **Understanding the limiting patterns of the total diffuse reflectance from center-illuminated-central-acquired (CICA) geometry** [12836-27]
- 12836 0D **Morpho-molecular functional drug response analysis of patient-derived organoids of colorectal cancer** [12836-28]

POSTER SESSION

- 12836 0E **Spectral thin-film interference observed with diffuse reflectance in a center-illuminated-central-acquired geometry indicates potential effect of the substrate scattering and absorption on the interference fringe** [12836-30]
- 12836 0F **Towards high-accuracy noninvasive ocular melanoma imaging and prognostics** [12836-32]
- 12836 0G **Assessment of correlation in refractive indices through Fourier domain Mueller matrix imaging from unstained cervical tissue sections (Best Poster Award)** [12836-34]
- 12836 0H **Optical characterization of riboflavin as a potential biomarker in the diagnosis of cervical cancer** [12836-35]
- 12836 0I **Raman and fluorescence spectroscopic characterization of pteridines in the blood of normal subjects and oral cancer patients** [12836-36]

DIGITAL POSTER SESSION

- 12836 0J **Multifractal analysis for detection of different stages in cervical cancer from colposcopy images** [12836-33]

Conference Committee

Symposium Chairs

Sergio Fantini, Tufts University (United States)
Paola Taroni, Politecnico di Milano (Italy)

Program Track Chairs

Tuan Vo-Dinh, Duke University (United States)
Anita Mahadevan-Jansen, Vanderbilt University (United States)

Conference Chairs

Robert R. Alfano, The City College of New York (United States)
Angela B. Seddon, The University of Nottingham (United Kingdom)
Lingyan Shi, University of California, San Diego (United States)

Conference Program Committee

Isha Behl, Trinity College Dublin (Ireland)
Amir Gandjbakhche, National Institutes of Health (United States)
Israel Gannot, Johns Hopkins University (United States) and Tel Aviv University (Israel)
Zhiwei Huang, National University of Singapore (Singapore)
Nicusor V. Iffimia, Physical Sciences Inc. (United States)
Igor V. Meglinski, University of Oulu (Finland) and Aston University (United Kingdom)
Sangeeta Murugkar, Carleton University (Canada)
Yang Pu, Davinci Applied Technologies Inc. (United States)
Milind Rajadhyaksha, Memorial Sloan-Kettering Cancer Center (United States)
Gennady B. Shvets, Cornell University (United States)
Ganesan Singaravelu, Anna University, Chennai (India)
Lihong V. Wang, California Institute of Technology (United States)
Binlin Wu, Southern Connecticut State University (United States)
Min Xu, Hunter College (United States)
Anna N. Yaroslavsky, University of Massachusetts Lowell (United States)

