PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 8214

, "Front Matter: Volume 8214," Proc. SPIE 8214, Advanced Biomedical and Clinical Diagnostic Systems X, 821401 (20 March 2012); doi: 10.1117/12.928772

Event: SPIE BiOS, 2012, San Francisco, California, United States

PROGRESS IN BIOMEDICAL OPTICS AND IMAGING

Vol. 13, No. 8

Advanced Biomedical and Clinical Diagnostic Systems X

**Tuan Vo-Dinh
Anita Mahadevan-Jansen
Warren S. Grundfest**
Editors

**22–24 January 2012
San Francisco, California, United States**

Sponsored and Published by
SPIE

Volume 8214

Proceedings of SPIE, 1605-7422, v. 8214

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

The papers included 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. The papers published in these proceedings 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 this book:

Author(s), "Title of Paper," in *Advanced Biomedical and Clinical Diagnostic Systems X*, edited by Tuan Vo-Dinh, Anita Mahadevan-Jansen, Warren S. Grundfest, Proceedings of SPIE Vol. 8214 (SPIE, Bellingham, WA, 2012) Article CID Number.

ISSN 1605-7422

ISBN 9780819488572

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 © 2012, 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 1605-7422/12/\$18.00.

Printed in the United States of America.

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

SPIDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first 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, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four 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. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID number.

Contents

vii *Conference Committee*

FLUORESCENCE SYSTEMS

- 8214 02 **A compact fluorescence and white light imaging system for intraoperative visualization of nerves** [8214-01]
D. Gray, E. Kim, V. Coterio, P. Staudinger, S. Yazdanfar, C. tan Hehir, GE Global Research (United States)
- 8214 03 **Tracking ophthalmic drugs in the eye using confocal fluorescence microscopy** [8214-02]
K. K. Buttenschön, J. M. Girkin, Durham Univ. (United Kingdom); D. Daly, Lein Applied Diagnostics Ltd. (United Kingdom)

SCATTERING AND REFLECTANCE TECHNIQUES

- 8214 05 **Plasmonic coupling interference: a new approach for cancer diagnostics using SERS detection** [8214-05]
H.-N. Wang, T. Vo-Dinh, Duke Univ. (United States)
- 8214 06 **Estimation of diffuse reflectance spectrum from RGB values by the synthesis of new colors for tissue measurements** [8214-06]
S. Chen, Q. Liu, Nanyang Technological Univ. (Singapore)
- 8214 07 **Diffuse reflectance spectral imaging for breast tumor margin assessment** [8214-07]
J. Y. Lo, S. Dhar, B. Yu, M. A. Brooke, Duke Univ. (United States); T. F. Kuech, Univ. of Wisconsin-Madison (United States); N. M. Jokerst, N. Ramanujam, Duke Univ. (United States)
- 8214 09 **Discrimination of selected species of pathogenic bacteria using near-infrared Raman spectroscopy and principal components analysis** [8214-09]
F. S. de Siqueira e Oliveira, Univ. Estadual Paulista (Brazil); H. E. Giana, Lab. Oswaldo Cruz (Brazil); L. Silveira, Jr., Univ. Camilo Castelo Branco (Brazil)
- 8214 0A **Effect of hormonal variation on in vivo high wavenumber Raman spectra improves cervical precancer detection** [8214-10]
S. Duraipandian, W. Zheng, National Univ. of Singapore (Singapore); J. Ng, J. J. H. Low, A. Ilancheran, National Univ. Hospital (Singapore) and National Univ. of Singapore (Singapore); Z. Huang, National Univ. of Singapore (Singapore)

MICROSCOPY AND CONFOCAL IMAGING

- 8214 0C **Cellular pattern recognition towards discrimination of normal skin from melanoma in non-invasive confocal imaging** [8214-12]
A. Swerdlin, E. Simpson, S. Jacques, Oregon Health & Science Univ. (United States); D. S. Gareau, Oregon Health & Science Univ. (United States) and The Rockefeller Univ. (United States)

BIOSENSING AND IMAGING I

- 8214 0E **Haematic pH sensor for extracorporeal circulation** [8214-15]
L. Ferrari, P. Fabbri, L. Rovati, F. Pilati, Univ. degli Studi di Modena e Reggio Emilia (Italy)
- 8214 0G **Validation study toward measuring the mechanical properties of blood clots using resonant acoustic spectroscopy with optical vibrometry** [8214-17]
G. Wu, A. S. Wolberg, A. L. Oldenburg, The Univ. of North Carolina at Chapel Hill (United States)

BIOSENSING AND IMAGING II

- 8214 0K **Multispectral image enhancement by spectral shifting** [8214-20]
P. A. Bautista, Y. Yagi, Harvard Medical School (United States)
- 8214 0L **Multidepth imaging by chromatic dispersion confocal microscopy** [8214-21]
C. A. Olsovsky, R. L. Shelton, M. A. Saldua, O. Carrasco-Zevallos, B. E. Applegate, K. C. Maitland, Texas A&M Univ. (United States)
- 8214 0M **Stroboscopic illumination scheme for seamless 3D endoscopy** [8214-22]
N. T. Clancy, Imperial College London (United Kingdom); D. Stoyanov, Univ. College London (United Kingdom); G. Yang, D. S. Elson, Imperial College London (United Kingdom)

MEDICAL DEVICES AND METHODS

- 8214 0Q **Breast cancer imaging and tomography using a hand-held optical imager** [8214-26]
S. J. Erickson, M. Roman, J. Gonzalez, Florida International Univ. (United States); R. Kiszonas, Sylvester Comprehensive Cancer Ctr. (United States); C. Lopez-Penalver, Advanced Medical Specialities (United States); A. Godavarty, Florida International Univ. (United States)
- 8214 0R **Development and evaluation of a light-emitting diode endoscopic light source** [8214-27]
N. T. Clancy, R. Li, Imperial College London (United Kingdom); K. Rogers, Univ. of Glamorgan (United Kingdom) and Cymtec Ltd. (United Kingdom); P. Driscoll, Cymtec Ltd. (United Kingdom); P. Excel, Glyndwr Univ. (United Kingdom); R. Yandle, Cymtec Ltd. (United Kingdom); G. Hanna, Imperial College London (United Kingdom); N. Copner, Univ. of Glamorgan (United Kingdom) and Cymtec Ltd. (United Kingdom); D. S. Elson, Imperial College London (United Kingdom)
- 8214 0S **In vitro cell system for studying molecular mechanisms of action associated with low intensity focused ultrasound** [8214-28]
M. Babakhanian, R. E. Fan, A. P. Mulgaonkar, R. Singh, M. O. Culjat, Ctr. for Advanced Surgical and Interventional Technology (United States) and Univ. of California, Los Angeles (United States); S. M. Danesh, L. Toro, Univ. of California, Los Angeles (United States); W. S. Grundfest, Ctr. for Advanced Surgical and Interventional Technology (United States) and Univ. of California, Los Angeles (United States); W. P. Melega, Univ. of California, Los Angeles (United States)

- 8214 0T **Optical measurements of microvascular circulatory function in the foot for detection of peripheral neuropathy** [8214-29]
G. Zamora, VisionQuest Biomedical, LLC (United States); V. Chekh, VisionQuest Biomedical, LLC (United States) and The Univ. of New Mexico (United States); M. Burge, The Univ. of New Mexico Health Science Ctr. (United States); E. S. Barriga, VisionQuest Biomedical, LLC (United States); S. Luan, The Univ. of New Mexico (United States); P. Heintz, The Univ. of New Mexico Health Science Ctr. (United States); A. Edwards, E. McGrew, P. Soliz, VisionQuest Biomedical, LLC (United States)

COHERENCE TECHNIQUES I

- 8214 0X **In vitro observation of cartilage-degeneration progression by Fourier-domain OCT** [8214-33]
U. Marx, Fraunhofer Institute for Production Technology (Germany); R. Schmitt, Fraunhofer Institute for Production Technology (Germany) and RWTH Aachen Univ. (Germany); S. Nebelung, M. Tingart, C. Lüring, B. Rath, Aachen Univ. Hospital (Germany)
- 8214 0Y **Office based multi-functional anterior eye segment optical coherence tomography** [8214-34]
Y. Lim, M. Yamanari, Y.-J. Hong, S. Makita, Univ. of Tsukuba (Japan); M. Miura, Tokyo Medical Univ. (Japan); Y. Yasuno, Univ. of Tsukuba (Japan)

DIGITAL PATHOLOGY

- 8214 12 **Strip mosaicing confocal microscopy for rapid imaging over large areas of excised tissue** [8214-39]
S. Abeytunge, Y. Li, B. Larson, G. Peterson, R. Toledo-Crow, M. Rajadhyaksha, Memorial Sloan-Kettering Cancer Ctr. (United States)
- 8214 14 **Photoacoustic detection of induced melanoma in vitro using a mouse model** [8214-41]
S. Gupta, K. Bhattacharya, J. R. Newton, T. P. Quinn, J. A. Viator, Univ. of Missouri-Columbia (United States)
- 8214 16 **Tri-modal confocal margin screening for the presence of residual squamous cell carcinoma in Mohs surgical excisions** [8214-13]
A. Bar, N. Snavey, N. Chen, S. Jacques, D. S. Gareau, Oregon Health & Science Univ. (United States)

POSTER SESSION

- 8214 18 **The cervical cancer detection system based on an endoscopic rotary probe** [8214-44]
Y. Yang, Q. Hou, H. Zhao, Z. Qin, F. Gao, Tianjin Univ. (China)
- 8214 19 **Fluorescence yield and lifetime tomography from time-resolved transmittances of a breast tumor phantom** [8214-45]
Y. Lu, F. Gao, W. Zhang, L. Wu, Z. Zhou, Tianjin Univ. (China)
- 8214 1A **Induction and identification of rabbit peripheral blood derived dendritic cells** [8214-46]
J. Zhou, F. Yang, W. Chen, South China Normal Univ. (China)

- 8214 1B **A combined time-domain diffuse fluorescence and optical tomography system for breast tumor detection** [8214-47]
W. Zhang, F. Gao, L. Wu, W. Ma, Y. Lu, Z. Zhou, Tianjin Univ. (China)
- 8214 1D **Towards surface analysis on diabetic feet soles to predict ulcerations using photometric stereo** [8214-49]
C. Liu, F. van der Heijden, Univ. Twente (Netherlands); J. J. van Netten, Hospital Group Twente (Netherlands)
- 8214 1E **Application of Tikhonov regularization to the restoration of phase contrast images** [8214-50]
Z. Zhou, Q. Zhu, F. Gao, H. Zhao, L. Zhang, Tianjin Univ. (China)
- 8214 1H **Bacterial biofilm disruption using laser-generated shockwaves** [8214-53]
A. Navarro, Z. D. Taylor, Univ. of California, Los Angeles (United States); A. Z. Matolek, VA Greater Los Angeles Healthcare System (United States); A. Weltman, V. Ramaprasad, S. Huang, Univ. of California, Los Angeles (United States); D. O. Beenhouwer, D. A. Haake, Univ. of California, Los Angeles (United States) and VA Greater Los Angeles Healthcare System (United States); V. Gupta, W. S. Grundfest, Univ. of California, Los Angeles (United States)

Author Index

Conference Committee

Symposium Chairs

James G. Fujimoto, Massachusetts Institute of Technology (United States)
R. Rox Anderson, Wellman Center for Photomedicine, Massachusetts General Hospital, Harvard School of Medicine (United States)

Program Track Chairs

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

Conference Chairs

Tuan Vo-Dinh, Duke University (United States)
Anita Mahadevan-Jansen, Vanderbilt University (United States)
Warren S. Grundfest, University of California, Los Angeles (United States)

Program Committee

Maurice C. G. Aalders, Universiteit van Amsterdam (Netherlands)
Francesco Baldini, Istituto di Fisica Applicata Nello Carrara (Italy)
Jennifer K. Barton, The University of Arizona (United States)
Stephen A. Boppart, University of Illinois at Urbana-Champaign (United States)
Daniel S. Gareau, Oregon Health & Science University (United States)
Hong Liu, The University of Oklahoma (United States)
Laura Marcu, University of California, Davis (United States)
Mary-Ann Mycek, University of Michigan (United States)
Jianan Y. Qu, Hong Kong University of Science and Technology (Hong Kong, China)
Urs Utzinger, The University of Arizona (United States)
Georges A. Wagnières, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Session Chairs

- 1 Fluorescence Systems
Urs Utzinger, The University of Arizona (United States)
- 2 Scattering and Reflectance Techniques
Tuan Vo-Dinh, Duke University (United States)
Hong Liu, The University of Oklahoma (United States)

- 3 Microscopy and Confocal Imaging
 Tuan Vo-Dinh, Duke University (United States)
- 4 Biosensing and Imaging I
 Francesco Baldini, Istituto di Fisica Applicata Nello Carrara (Italy)
- 5 Biosensing and Imaging II
 Francesco Baldini, Istituto di Fisica Applicata Nello Carrara (Italy)
 Jianan Y. Qu, Hong Kong University of Science and Technology (Hong Kong, China)
- 6 Medical Devices and Methods
 Warren S. Grundfest, University of California, Los Angeles (United States)
 Laura Marcu, University of California, Davis (United States)
- 7 Coherence Techniques I
 A. Claude Boccara, Ecole Supérieure de Physique et de Chimie Industrielles (France)
- 8 Coherence Techniques II
 Jennifer K. Barton, The University of Arizona (United States)
- 9 Digital Pathology
 Daniel S. Gareau, The Rockefeller University (United States)