PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 8591

, "Front Matter: Volume 8591," Proc. SPIE 8591, Optical Diagnostics and Sensing XIII: Toward Point-of-Care Diagnostics, 85910W (28 March 2013); doi: 10.1117/12.2021939

SPIE.

Event: SPIE BiOS, 2013, San Francisco, California, United States

PROGRESS IN BIOMEDICAL OPTICS AND IMAGING

Vol. 14 No. 27

Optical Diagnostics and Sensing XIII: Toward Point-of-Care Diagnostics

Gerard L. Côté
Editor

6 February 2013
San Francisco, California, United States

Sponsored and Published by
SPIE

Volume 8591

Proceedings of SPIE, 1605-7422, V. 8591

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

Optical Diagnostics and Sensing XIII: Toward Point-of-Care Diagnostics, edited by Gerard L. Côté,
Proc. of SPIE Vol. 8591, 85910W · © 2013 SPIE · CCC code: 1605-7422/13/\$18 · doi: 10.1117/12.2021939

Proc. of SPIE Vol. 8591 85910W-1

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 *Optical Diagnostics and Sensing XIII: Toward Point-of-Care Diagnostics*, edited by Gerard L. Coté, Proceedings of SPIE Vol. 8591 (SPIE, Bellingham, WA, 2013) Article CID Number.

ISSN: 1605-7422

ISBN: 9780819493606

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 © 2013, 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 1605-7422/13/\$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

SESSION 1 OPTICAL GLUCOSE MONITORING APPROACHES

- 8591 01 **Polarimetric glucose sensing *in vitro*: a high frequency approach** [8591-1]
C. W. Pirnstill, D. Grunden, G. L. Coté, Texas A&M Univ. (United States)
- 8591 02 **The development of an integrated Faraday modulator and compensator for continuous polarimetric glucose monitoring** [8591-2]
B. W. Clarke, B. D. Cameron, The Univ. of Toledo (United States)
- 8591 03 **Limitations of current fluorescent glucose sensing assays based on competitive binding** [8591-3]
B. M. Cummins, J. T. Garza, G. L. Coté, Texas A&M Univ. (United States)
- 8591 04 **Enzymatic glucose sensor compensation for variations in ambient oxygen concentration** [8591-4]
B. B. Collier, M. J. McShane, Texas A&M Univ. (United States)

SESSION 2 BLOOD AND TISSUE PERFUSION AND OXYGENATION MEASUREMENTS

- 8591 05 **Non-invasive measurement of blood and tissue parameters based on VIS-NIR spectroscopy** [8591-6]
J. Kraitl, U. Timm, H. Ewald, Univ. Rostock (Germany)
- 8591 06 **Optical modeling toward optimizing monitoring of intestinal perfusion in trauma patients** [8591-7]
T. J. Akl, Texas A&M Univ. (United States); M. A. Wilson, Univ. of Pittsburgh (United States) and VA Pittsburgh Healthcare System (United States); M. N. Ericson, Oak Ridge National Lab. (United States); G. L. Coté, Texas A&M Univ. (United States)

SESSION 3 OPTICAL APPROACHES FOR MEDICAL DIAGNOSIS

- 8591 09 **The study of esophageal cancer in an early stage by using Raman spectroscopy** [8591-10]
M. Ishigaki, A. Taketani, Y. Maeda, B. B. Andriana, Kwansei Gakuin Univ. (Japan); R. Ishihara, Osaka Medical Ctr. for Cancer and Cardiovascular Diseases (Japan); H. Sato, Kwansei Gakuin Univ. (Japan)
- 8591 0B **Urinary tract infection (UTI) multi-bacteria multi-antibiotic testing using surface enhanced Raman spectroscopy (SERS)** [8591-12]
K. Hadjigeorgiou, Univ. of Cyprus (Cyprus); E. Kastanos, Univ. of Nicosia (Cyprus); C. Pitris, Univ. of Cyprus (Cyprus)

- 8591 OC **Cholesterol accumulation in the cornea and in the aorta: imaging using europium chlortetracycline complex fluorescent probe** [8591-13]
L. C. Courrol, Univ. Federal de São Paulo (Brazil); L. B. Sicchieri, Instituto de Pesquisas Energéticas e Nucleares (Brazil); D. C. Silva, Univ. Federal de São Paulo (Brazil)

SESSION 4 REMOTE OPTICAL DIAGNOSIS AND POINT-OF-CARE APPROACHES

- 8591 OF **Sensing cocaine in saliva with infrared laser spectroscopy** [8591-16]
K. M.-C. Hans, M. Müller, M. Gianella, ETH Zurich (Switzerland); Ph. Wägli, Ecole Polytechnique Fédérale de Lausanne (Switzerland); M. W. Sigrist, ETH Zurich (Switzerland)

POSTER SESSION

- 8591 OK **Tunable mid-infrared laser spectroscopy based on fiber optic sensor for glucose measurement** [8591-5]
S. Yu, D. Li, H. Chong, C. Sun, K. Xu, Tianjin Univ. (China)
- 8591 OL **Blood circulatory system for noninvasive diagnostics** [8591-21]
D. Fricke, J. Kraitl, H. Ewald, Univ. Rostock (Germany)
- 8591 OM **Software-assisted live visualization system for subjacent blood vessels in endonasal endoscopic approaches** [8591-22]
B. Lempe, Ch. Taudt, R. Maschke, J. Gruening, M. Ernstberger, F. Basan, T. Baselt, West Saxon Univ. of Applied Sciences (Germany); R. Grunert, Fraunhofer Institute for Machine Tools and Forming Technology (Germany); P. Hartmann, West Saxon Univ. of Applied Sciences (Germany)
- 8591 ON **Direct model for thin wetting film focusing** [8591-23]
D. Migliozi, Ecole Polytechnique ParisTech (France); C. P. Allier, Y. Hennequin, J.-C. Coutard, J.-M. Dinten, CEA-LETI-Minatec (France)
- 8591 OO **Novel algorithm for background correction of the quantitative spectroscopic tomography of the biogenic-substances** [8591-24]
P. K. W. Abeygunawardhana, W. Qi, D. Kojima, S. Suzuki, Kagawa Univ. (Japan); A. Nishiyama, Faculty of Medicine, Kagawa Univ. (Japan); I. Ishimaru, Kagawa Univ. (Japan)
- 8591 OP **Glucose measurement by surface plasmon resonance with borate polymer binding** [8591-25]
D. Li, J. Yang, P. Wu, D. Yang, Tianjin Univ. (China); B. Wang, Y. Lin, Changchun Institute of Applied Chemistry (China); K. Xu, Tianjin Univ. (China)
- 8591 OQ **Deep-ultraviolet resonance Raman spectroscopy for chemical sensing** [8591-26]
M. Troyanova-Wood, G. I. Petrov, V. V. Yakovlev, Texas A&M Univ. (United States)
- 8591 OS **Optical imaging of oxidative stress in retinitis pigmentosa (RP) in rodent model** [8591-28]
Z. Ghanian, S. Maleki, S. Gopalakrishnan, R. Sepehr, J. T. Eells, M. Ranji, Univ. of Wisconsin-Milwaukee (United States)

- 8591 OT **Determining the amounts of urea and glucose in urine of patients with renal complications from *diabetes mellitus* and hypertension by near-infrared Raman spectroscopy** [8591-29]
J. A. Martins Bispo, Univ. Camilo Castelo Branco (Brazil) and Faculdades Integradas do Tapajós (Brazil); L. Silveira Jr., Univ. Camilo Castelo Branco (Brazil); E. E. de Sousa Vieira, Univ. Camilo Castelo Branco (Brazil) and Faculdades Integradas do Tapajós (Brazil); A. B. Fernandes, Univ. Camilo Castelo Branco (Brazil)
- 8591 OU **Profilometry and subsurface imaging in point of care diagnosis in ocular disease and lymphedema after breast cancer treatment** [8591-30]
S. I. Sayegh, The Eye Center (United States); A. Taghian, Massachusetts General Hospital (United States) and Harvard Medical School (United States)

Author Index

Conference Committee

Symposium Chairs

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

Program Track Chairs

Ammasi Periasamy, University of Virginia (United States)
Daniel L. Farkas, University of Southern California (United States)

Conference Chair

Gerard L. Coté, Texas A&M University (United States)

Conference Program Committee

Rafat R. Ansari, NASA Glenn Research Center (United States)
Werner Gellermann, The University of Utah (United States)
Yuri I. Gurfinkel, Central Clinical Hospital (Russian Federation)
Jürgen M. Lademann, Charité Universitätsmedizin Berlin (Germany)
Michael J. McShane, Texas A&M University (United States)
Kenith E. Meissner, Texas A&M University (United States)
Risto Myllylä, University of Oulu (Finland)
Gert E. Nilsson, University Hospital Linköping (Sweden)
Jeffery S. Reynolds, Bayer Healthcare LLC (United States)
Kexin Xu, Tianjin University (China)
Shaoqun Zeng, Britton Chance Center for Biomedical Photonics
(China)
Dmitry A. Zimnyakov, N.G. Chernyshevsky Saratov State University
(Russian Federation)

Session Chairs

- 1 Optical Glucose Monitoring Approaches
Michael J. McShane, Texas A&M University (United States)
Brent D. Cameron, The University of Toledo (United States)
- 2 Blood and Tissue Perfusion and Oxygenation Measurements
Babak Shadgan, The University of British Columbia (Canada)

- 3 Optical Approaches for Medical Diagnosis
 Gerard L. Côté, Texas A&M University (United States)
- 4 Remote Optical Diagnosis and Point-of-Care Approaches
 Matthew A. Coleman, Lawrence Livermore National Laboratory
 (United States)