

Design and Quality for Biomedical Technologies X

Saturday - Sunday 28 - 29 January 2017

Conference Sessions At A Glance

[SHOW](#) | [HIDE](#)

1: Phantoms I
2: 3D Printed Phantoms
3: Phantoms II
 BIOS Hot Topics
4: Quality of Biomedical Technologies
5: OCT System Development and Applications
6: Keynote
7: Imaging Systems and Applications
8: Special Session: NIH Funding Opportunities and Proposal Preparation
 Posters-Sunday

Important Dates

[SHOW](#) | [HIDE](#)

Abstract Due:
 18 July 2016

 Author Notification:
 26 September 2016

 Manuscript Due Date:
 3 January 2017

Conference Committee

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Conference Chairs

[Ramesh Raghavachari](#), U.S. Food and Drug Administration (United States)
[Rongguang Liang](#), College of Optical Sciences, The Univ. of Arizona (United States)

Conference Co-Chair

[T. Joshua Pfefer](#), U.S. Food and Drug Administration (United States)

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[Rudolf M. Verdaasdonk](#), Vrije Univ. Medical Ctr. (Netherlands)

SATURDAY 28 JANUARY

[Show All Abstracts](#)

Session 1: Phantoms I

Saturday 28 January 2017

10:20 AM - 11:20 AM

Location: Room 2002 (West Level 2)


 Session Chair: [Anthony J. Durkin](#), Beckman Laser Institute and Medical Clinic (United States)

Label-free hyperspectral dark-field microscopy for quantitative scattering imaging of tissue-mimicking phantoms

Paper 10056-39

Time: 10:20 AM - 10:40 AM

Author(s): Jeeseong Hwang, Philip P. Cheney, National Institute of Standards and Technology (United States); David M. McClatchy, Thayer School of Engineering at Dartmouth (United States); Daniel V. Samarov, National Institute of Standards and Technology (United States); Hyun-Jin Kim, National Institute of Science and Technology (United States); Stephen C. Kanick, Brian W. Pogue, Thayer School of Engineering at Dartmouth (United States)

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Polydimethyl siloxane tissue-mimicking phantoms for quantitative optical medical imaging standards

Paper 10056-40

Time: 10:40 AM - 11:00 AM

Author(s): Jeeseong Hwang, Nicholas Baer, Kimberly A. Briggman, National Institute of Standards and Technology (United States); Hyun-Jin Kim, National Institute of Science and Technology (United States); Paul Lemaître, David W. Allen, National Institute of Standards and Technology (United States); Heidrun Wabnitz, Dirk Grosenick, Physikalisch-Technische Bundesanstalt (Germany); David M. McClatchy, Brian W. Pogue, Thayer School of Engineering at Dartmouth (United States)

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Broadband spectral measurements of diffuse optical properties by a double integrating sphere instrument at the National Institute of Standards and Technology

Paper 10056-41

Time: 11:00 AM - 11:20 AM

Author(s): Paul Lemaillet, Jeeseong Hwang, David W. Allen, National Institute of Standards and Technology (United States)

[Add To My Schedule](#) **Lunch/Exhibition Break 11:20 AM - 1:10 PM****Session 2:
3D Printed Phantoms**

Saturday 28 January 2017

1:10 PM - 3:00 PM


Location: Room 2002 (West Level 2)

Session Chair: [T. Joshua Pfefer](#), U.S. Food and Drug Administration (United States)**Additive 3D bioprinting and mesoscopic molecular imaging** (*Invited Paper*)

Paper 10056-1

Time: 1:10 PM - 1:40 PM


Author(s): Xavier Intes, Guohao Dai, David T. Corr, Rensselaer Polytechnic Institute (United States)

[Add To My Schedule](#) **3D printing of microtube in solid phantom to simulate tissue oxygenation and perfusion**

Paper 10056-2

Time: 1:40 PM - 2:00 PM


Author(s): Xiang Lv, Yue Xue, Haili Wang, Shuwei Shen, Ximing Zhou, Guangli Liu, Erbao Dong, Univ. of Science and Technology of China (China); Ronald X. Xu, The Ohio State Univ. (United States)

[Add To My Schedule](#) **3D printed optical phantoms and deep tissue imaging for in vivo applications including oral surgery**

Paper 10056-3

Time: 2:00 PM - 2:20 PM


Author(s): Brian Z. Bentz, Purdue Univ. (United States); Vaibhav Gaind, KLA-Tencor (United States); Kevin J. Webb, Purdue Univ. (United States)

[Add To My Schedule](#) **NIRS-based hematoma detector performance testing with molded and 3D-printed phantoms**

Paper 10056-4

Time: 2:20 PM - 2:40 PM


Author(s): Jianting Wang, Stanley Huang, U.S. Food and Drug Administration (United States); Yu Chen, Univ. of Maryland, College Park (United States); Cristin G. Welle, T. Joshua Pfefer, U.S. Food and Drug Administration (United States)

[Add To My Schedule](#) **3D-printed biomimetic cerebrovascular phantoms for biophotonic imaging and spectroscopy**

Paper 10056-5

Time: 2:40 PM - 3:00 PM

Author(s): Pejman Ghassemi, U.S. Food and Drug Administration (United States); Andrew Depkon, Marquette Univ. (United States), U.S. Food and Drug Administration (United States); Jianting Wang, U.S. Food and Drug Administration (United States); Yu Chen, Univ. of Maryland, College Park (United States); T. Joshua Pfefer, U.S. Food and Drug Administration (United States)

[Add To My Schedule](#) **Coffee Break 3:00 PM - 3:30 PM****Session 3:
Phantoms II**

Saturday 28 January 2017

3:30 PM - 5:50 PM


Location: Room 2002 (West Level 2)

Session Chair: [David W. Allen](#), National Institute of Standards and Technology (United States)**Solid tissue phantoms for NIR water fraction studies**

Paper 10056-6

Time: 3:30 PM - 3:50 PM


Author(s): Gordon T. Kennedy, Griffin R. Lentsch, Rolf B. Saager, Anthony J. Durkin, Beckman Laser Institute and Medical Clinic (United States)

[Add To My Schedule](#) **Visibility of solid and liquid fiducial markers used for image-guided radiation therapy on optical coherence tomography: an esophageal phantom study**

Paper 10056-7

Time: 3:50 PM - 4:10 PM

Author(s): Pouya Jelvehgaran, Tanja Alderliesten, Academisch Medisch Centrum (Netherlands); Jelmer J. A. Weda, Vrije Univ. Amsterdam (Netherlands); Daniel M. de Bruin, Dirk J. Faber, Maarten C.C. M. Hulshof, Ton G. van Leeuwen, Academisch Medisch Centrum (Netherlands); Marcel B. van Herk, The Univ. of Manchester (United Kingdom), Academisch Medisch Centrum (Netherlands); Johannes F. de Boer, Vrije Univ. Amsterdam (Netherlands)


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Development and validation of a biologically realistic tissue-mimicking material for photoacoustics and other bimodal optical-acoustic modalities

Paper 10056-8

Time: 4:10 PM - 4:30 PM

Author(s): William C. Vogt, Congxian Jia, Keith A. Wear, Brian S. Garra, T. Joshua Pfefer, U.S. Food and Drug Administration (United States)


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Comparison of the temperature accuracy between smart phone based and high-end thermal cameras using a temperature gradient phantom

Paper 10056-9

Time: 4:30 PM - 4:50 PM

Author(s): John H. Klaessens, Albert J. van der Veen, Rudolf M. Verdaasdonk, Vrije Univ. Medical Ctr. (Netherlands)


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Study on the origin to change physiochemical properties of polydimethylsiloxane phantoms for biomedical application

Paper 10056-10

Time: 4:50 PM - 5:10 PM

Author(s): Han Saem S. Cho, Korea Research Institute of Standards and Science (Korea, Republic of); Heh-Young Moon, Gachon Univ. (Korea, Republic of); Heung-Soon Lee, Sae Chae Jeoung, Korea Research Institute of Standards and Science (Korea, Republic of)


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Simulating tissue fibration and polarization properties in solid phantoms

Paper 10056-11

Time: 5:10 PM - 5:30 PM

Author(s): Haili Wang, Shuwei Shen, Yingjie Qu, Mingzhai Z. Sun, Erbao Dong, Peng Fei Shao, Univ. of Science and Technology of China (China); Ronald X. Xu, The Ohio State Univ. (United States)


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Evaluation of a multi-layer diffuse reflectance spectroscopy system using optical phantoms

Paper 10056-12

Time: 5:30 PM - 5:50 PM

Author(s): Ingemar Fredriksson, Linköping Univ. (Sweden), Perimed AB (Sweden); Rolf B. Saager, Anthony J. Durkin, Beckman Laser Institute and Medical Clinic (United States); Tomas Strömberg, Linköping Univ. (Sweden), Beckman Laser Institute and Medical Clinic (United States)

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Session HT: BiOS Hot Topics

Saturday 28 January 2017

7:00 PM - 9:00 PM

Location: Room 3009 (West Level 3)

SUNDAY 29 JANUARY

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Session 4: Quality of Biomedical Technologies

Sunday 29 January 2017

8:00 AM - 10:00 AM

Location: Room 2002 (West Level 2)


Session Chair: [Ramesh Raghavachari](#), U.S. Food and Drug Administration (United States)

Standardized assessment of infrared thermographic fever screening system performance

Paper 10056-13

Time: 8:00 AM - 8:20 AM

Author(s): Pejman Ghassemi, T. Joshua Pfefer, Jon Casamento, Quanzeng Wang, U.S. Food and Drug Administration (United States)


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Ray-traced Monte Carlo simulation tool for computer-aided design of tissue fluorescence sensing systems

Paper 10056-14

Time: 8:20 AM - 8:40 AM

Author(s): Seung Yup Lee, Mary-Ann Mycek, Univ. of Michigan (United States)


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Near-infrared fluorescence image quality test methods for standardized performance evaluation

Paper 10056-15

Time: 8:40 AM - 9:00 AM

Author(s): Udayakumar Kaniyappan, Univ. of Maryland (United States); Bohan Wang, Charles Yang, Univ. of Maryland, College Park (United States); Pejman Ghassemi, Quanzeng Wang, U.S. Food and Drug Administration (United States); Yu Chen, Univ. of Maryland, College Park (United States); T. Joshua Pfefer, U.S. Food and Drug Administration (United States)

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Traceable working standards with SI units of radiance for characterizing the measurement performance of investigational clinical NIRF imaging devices

Paper 10056-16

Time: 9:00 AM - 9:20 AM

Author(s): Banghe Zhu, John C. Rasmussen, The Univ. of Texas Health Science Ctr. at Houston (United States); Maritoni Litorja, National Institute of Standards and Technology (United States); Eva M. Sevick-Muraca, The Univ. of Texas Health Science Ctr. at Houston (United States)



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Image quality assessment for teledermatology: from consumer devices to a dedicated medical device

Paper 10056-17

Time: 9:20 AM - 9:40 AM

Author(s): Marine Amouroux, Walter C.P.M. Blondel, Univ. de Lorraine (France)


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Simulating tissue oxygenation by encapsulating hemoglobin in polymer microcapsules

Paper 10056-18

Time: 9:40 AM - 10:00 AM

Author(s): Guangli Liu, Qiang Wu, Shuwei Shen, Gang Zhao, Erbao Dong, Univ. of Science and Technology of China (China); Ronald X. Xu, The Ohio State Univ. (United States)

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Coffee Break 10:00 AM - 10:30 AM

Session 5: OCT System Development and Applications

Sunday 29 January 2017

10:30 AM - 11:50 AM

Location: Room 2002 (West Level 2)


Session Chair: [Gracie Vargas](#), The Univ. of Texas Medical Branch (United States)

Depth-of-focus extended chromatic dual-foci OCT

Paper 10056-19

Time: 10:30 AM - 10:50 AM

Author(s): Jinhan Li, Nanyang Technological Univ. (Singapore)


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A comparative study of noise in supercontinuum light sources for ultra-high resolution optical coherence tomography at 1300 nm

Paper 10056-20

Time: 10:50 AM - 11:10 AM

Author(s): Michael Maria, Univ. of Kent (United Kingdom), NKT Photonics (Denmark); Ivan B. Gonzalo, Technical Univ. of Denmark (Denmark); Magalie M. Bondu, Univ. of Kent (United Kingdom), NKT Photonics (United Kingdom); Rasmus Dybbro Engelsholm, DTU Fotonik (Denmark); Thomas Feuchter, Peter Morten Moselund, Lasse Leick, NKT Photonics A/S (Denmark); Adrian G. Podoleanu, Univ. of Kent (United Kingdom); Ole Bang, DTU Fotonik (Denmark)


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Analysis of polygonal scanning heads: from industrial to high-end applications in swept sources for OCT

Paper 10056-21

Time: 11:10 AM - 11:30 AM

Author(s): Virgil-Florin Duma, Aurel Vlaicu Univ. of Arad (Romania)


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Integrated-optics based multi-beam imaging for speed improvement of OCT systems

Paper 10056-22

Time: 11:30 AM - 11:50 AM

Author(s): Imran B. Akca, Nicolas M. Weiss, Frank A. W. Coumans, Ton G. van Leeuwen, Academisch Medisch Centrum (Netherlands)

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Lunch/Exhibition Break 11:50 AM - 1:00 PM

Session 6: Keynote

Sunday 29 January 2017

1:00 PM - 1:40 PM

Location: Room 2002 (West Level 2)

Session Chair: [Ramesh Raghavachari](#), U.S. Food and Drug Administration (United States)

Open explorations of the microcosmos

Paper 10056-42

Time: 1:00 PM - 1:40 PM

Author(s): Manu Prakash, Stanford Univ. (United States)

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Session 7: Imaging Systems and Applications

Sunday 29 January 2017

1:40 PM - 3:20 PM

Location: Room 2002 (West Level 2)


Session Chair: [Jeeseong Hwang](#), National Institute of Standards and Technology (United States)

Laser assisted robotic surgery in cornea transplantation

Paper 10056-25

Time: 1:40 PM - 2:00 PM

Author(s): Francesca Rossi, Filippo Micheletti, Istituto di Fisica Applicata "Nello Carrara" (Italy); Giada Magni, Istituto di Fisica Applicata (Italy); Roberto Pini, Istituto di Fisica Applicata "Nello Carrara" (Italy); Luca Menabuoni, Azienda USL 4 (Italy); Fabio Leoni, Scuola Superiore Sant'Anna (Italy), Fastenica srl (Italy); Bernardo Magnani, Ekymed srl (Italy)


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Surgical instrument biocontaminant fluorescence detection in ambient lighting conditions for hospital reprocessing and sterilization department

Paper 10056-24

Time: 2:00 PM - 2:20 PM

Author(s): François Baribeau, Annie Bubel, Guillaume Dumont, Carl Vachon, André Lépine, Stéphane Rochefort, Martin Massicotte, Louis Buteau-Vaillancourt, Pascal Gallant, Ozzy Mermut, INO (Canada)


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Design and implementation of a dual-wavelength intrinsic fluorescence camera system

Paper 10056-26

Time: 2:20 PM - 2:40 PM

Author(s): Antonio Ortega-Martinez, Joseph J. Musacchia, Wellman Ctr. for Photomedicine (United States); Enoch Gutierrez-Herrera, Univ. Nacional Autónoma de México (Mexico); Ying Wang, Wellman Ctr for Photomedicine (United States); Walfré Franco, Wellman Ctr. for Photomedicine (United States)


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On the origin of the visible light responsible for proton dose measurement using plastic optical fibers

Paper 10056-27

Time: 2:40 PM - 3:00 PM

Author(s): Arash Darafsheh, Perelman Ctr. for Advanced Medicine, Univ. of Pennsylvania (United States); Reza Taleei, Univ. of Texas SW Medical Ctr. (United States); Alireza Kassaei, Jarod C. Finlay, Univ. of Pennsylvania (United States)


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Reliable determination of tissue optical properties from spatially resolved reflectance

Paper 10056-28

Time: 3:00 PM - 3:20 PM

Author(s): Thomas Gladysz, Alexander Hoppe, Physikalisch-Technische Bundesanstalt (Germany); Kathleen Cantow, Institut für Vegetative Physiologie, Charité Universitätsmedizin Berlin (Germany); Andreas Pohlmann, Berlin Ultrahigh Field Facility, Max-Delbrück-Ctr. für Molekulare Medizin Berlin-Buch (Germany); Bert Flemming, Institut für Vegetative Physiologie, Charité Universitätsmedizin Berlin (Germany); Thoralf Niendorf, Berlin Ultrahigh Field Facility (B.U.F.F.), Max-Delbrück-Ctr. für Molekulare Medizin Berlin-Buch (Germany); Erdmann Seeliger, Institut für Vegetative Physiologie, Charité Universitätsmedizin Berlin (Germany); Dirk Grosenick, Physikalisch-Technische Bundesanstalt (Germany)

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Coffee Break 3:20 PM - 3:50 PM

Session 8: Special Session: NIH Funding Opportunities and Proposal Preparation

Sunday 29 January 2017

3:50 PM - 5:20 PM

Location: Room 2002 (West Level 2)

Scientific programs and funding opportunities at the national institute of biomedical imaging and bioengineering (NIBIB) and the national cancer institute (NCI)

Speakers: **Behrouz Shabestari**, Program Director, Optical Imaging and Spectroscopy, National Institute of Biomedical Imaging and Bioengineering, NIH
Robert J. Nordstrom, Branch Chief, Image Guided Interventions, Cancer Imaging Program, National Cancer Institute, NIH

The NIBIB mission is to improve health by leading the development and accelerating the application of biomedical technologies. The Institute is committed to

integrating the physical and engineering sciences with the life sciences to advance basic research and medical care. The NCI coordinates the National Cancer Program, which conducts and supports research, training, health information dissemination, and other programs with respect to the cause, diagnosis, prevention, and treatment of cancer, rehabilitation from cancer, and the continuing care of cancer patients and the families of cancer patients. This presentation will provide an overview of the scientific programs and funding opportunities supported by NIBIB and NCI, highlighting those that are of particular important to the field of optical imaging and spectroscopy.

Preparing successful and competitive NIH grant applications

Speaker: **Behrouz Shabestari**, Program Director, Optical Imaging and Spectroscopy, National Institute of Biomedical Imaging and Bioengineering, NIH

Session PSun: Posters-Sunday

Sunday 29 January 2017

5:30 PM - 7:30 PM

Location: Moscone West Levels 2 and 3


Conference attendees are invited to attend the BIOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions. Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

Single camera full range high resolution spectral domain optical coherence tomography

Paper 10056-23

Time: 5:30 PM - 7:30 PM

Author(s): En Bo, Linbo Liu, Nanyang Technological Univ. (Singapore)

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Scanning-free multimode fiber based endoscope

(Canceled)

Paper 10056-30

Time: 5:30 PM - 7:30 PM


Author(s):

Development of an antimicrobial blended white LED system containing pulsed 405-nm LEDs for decontamination applications

Paper 10056-31

Time: 5:30 PM - 7:30 PM

Author(s): Jonathan B. Gillespie, Michelle Maclean, Mark P. Wilson, Martin J. Given, Scott J. MacGregor, Univ. of Strathclyde (United Kingdom)


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Multispectral fluorescence diffuse optical tomography

Paper 10056-33

Time: 5:30 PM - 7:30 PM

Author(s): Pei-An Lo, National Yang-Ming Univ. (Taiwan); Jaedu Cho, Farouk Nouzi, Univ. of California, Irvine (United States); Huihua K. Chiang, National Yang Ming Univ. (Taiwan); Chang-Seok Kim, Pusan National Univ. (Korea, Republic of); Gultekin Gulsen, Univ. of California, Irvine (United States)

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3D splint prototype system for applications in muscular rehab by transcutaneous electrical nerve stimulation (TENS)

Paper 10056-34

Time: 5:30 PM - 7:30 PM

Author(s): Mauricio I. Saldaña Martínez, Univ. Autónoma De Nuevo León (Mexico); Jose V. Guzman-Gonzalez, Oscar G. Barajas Gonzalez, Univ. Autónoma De Nuevo León, FIME (Mexico); Ana Karen García Garza, Univ. Autónoma De Nuevo León, FCQ (Mexico); Valentín Guzmán-Ramos, Univ. Autónoma De Nuevo León, FCFM (Mexico); Mario A. Garcia Ramirez, Univ. Autónoma De Nuevo León, FIME (Mexico)


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Development of a hybrid NIRS/LDF sensor system for microcirculation detection

Paper 10056-35

Time: 5:30 PM - 7:30 PM

Author(s): Ting-Ying Li, Chia-Wei Sun, National Chiao Tung Univ. (Taiwan)


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Continuous control systems for non-contact ECG

Paper 10056-36

Time: 5:30 PM - 7:30 PM

Author(s): Vladimir L. Kodkin, Galina V. Yakovleva, Alexey Smirnov, South Ural State Univ. (Russian Federation)

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A capillary-mimicking optical tissue phantom for diffuse correlation spectroscopy

Paper 10056-37

Time: 5:30 PM - 7:30 PM

Author(s): Jameson P. O'Reilly, Northeastern Univ. (United States), Radiation Monitoring Devices, Inc. (United States); Noah J. Kolodziejcki, Daniel R. McAdams, Dan E. Fernandez, Christopher J. Stapels, James F. Christian, Radiation Monitoring Devices, Inc. (United States)

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Towards a clinical implementation of micro-optical coherence tomography instrument for in vivo imaging of human airway

Paper 10056-38

Time: 5:30 PM - 7:30 PM

Author(s): Hui Min Leung, Wellman Ctr. for Photomedicine (United States), Massachusetts General Hospital; Harvard Medical School (United States); Dongyao Cui, Nanyang Technological Univ. (Singapore), The Wellman Ctr. for Photomedicine (United States), Massachusetts General Hospital (United States); Kengyeh K. Chu, Duke Univ. (United States); Guillermo J. Tearney, Wellman Ctr. for Photomedicine (United States), Massachusetts General Hospital, Harvard Medical School (United States)

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