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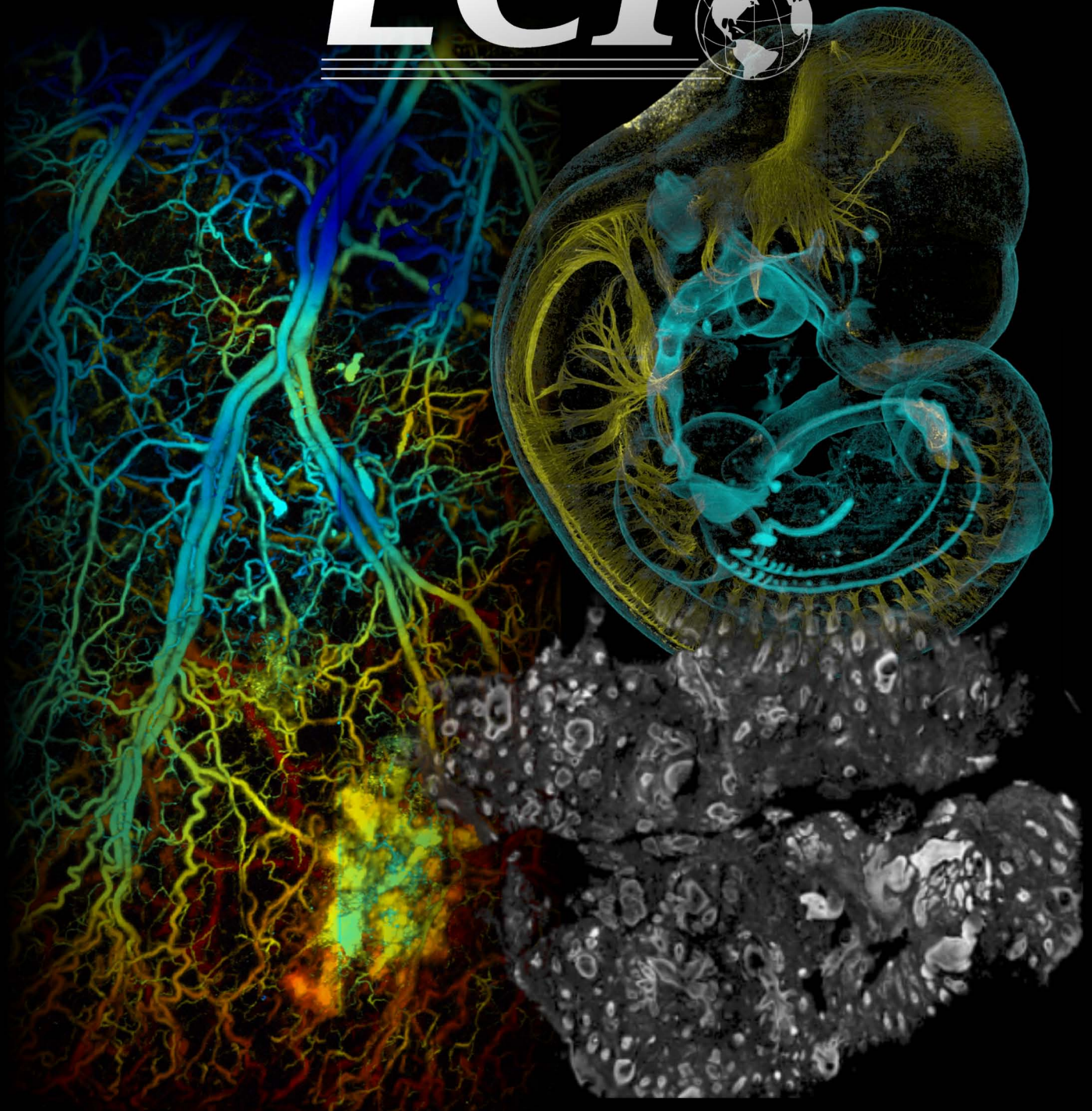

# Advances in Optics for Biotechnology, Medicine and Surgery XII

June 5-8 2011

Naples, FL

Engineering Conferences International (ECI) is a not-for-profit global engineering conferences program, originally established in 1962, that provides opportunities for the exploration of problems and issues of concern to engineers and scientists from many disciplines.



*Cover images*

Three-dimensional anatomical, chemical, and dynamic imaging by photoacoustic (PA) microscopy. Depth-projected microvasculature imaging of a mouse ear bearing a xenotransplanted B16 melanoma tumor at 584 nm. Note that there is a principal artery-vein pair feeding and draining the tumor region. Depth is coded by colors: blue (superficial) to red (deep) (courtesy of Junjie Yao and Lihong Wang, Washington University)

A E10.5 mouse embryo, antibody labelled for neurofilament (yellow) and E-cadherin (cyan). Imaged by Selective Plane Illumination Microscopy (SPIM), visualized by maximum-value projections (courtesy of Laura Quintana, Jürgen Mayer, Jim Swoger and James Sharpe, Centre for Genomic Regulation, Barcelona)

A fluorescence confocal strip mosaic of excised human skin from Mohs surgery, showing nests of basal cell carcinoma. The mosaic consists of 40 image strips, covering a 10 mm x 10 mm area in less than five minutes. Nuclear and morphologic detail is observed, similar to that in pathology. Strip mosaicing of confocal images may enable real-time pathology and detection of margins at the bedside, for complete and accurate excision of cancers (courtesy of Sanjee Abeytunge, Yongbiao Li, Bjorg Larson, Ricardo Toledo-Crow and Milind Rajadhyaksha, Research Engineering Laboratory and Dermatology Service, Memorial Sloan Kettering Cancer Center, New York)

## ***Conference Sponsors***

National Institutes of Health grant 1R13EB012903-01*
(National institute of Biomedical Imaging and Bioengineering NIBIB, National Institute of Neurological Disorders and Stroke NINDS and National Cancer Institute NCI)
National Science Foundation grant 1105324

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*The content of this meeting is solely the responsibility of the authors and organizers and does not necessarily represent the official views of the National Institute Of Biomedical Imaging and Bioengineering or the National Institutes of Health.

## ***Conference Chairs***

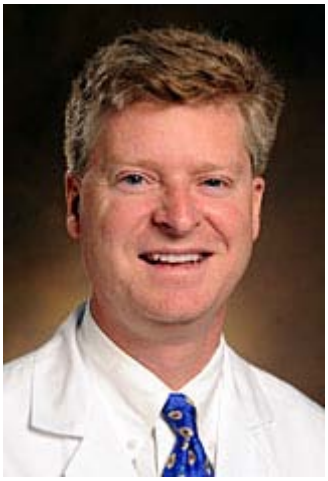
**Daniel Elson, Imperial College London**

Daniel Elson is a Senior Lecturer in the Hamlyn Centre for Robotic Surgery, Institute of Global Health Innovation, Institute of Biomedical Engineering and Department of Surgery and Cancer, Imperial College London. He completed a MSci and PhD in Physics at Imperial in 1999 and 2003 and became a Lecturer in the Institute of Biomedical Engineering in 2005. Research interests are based around the development and application of photonics technology to surgical imaging and surgical robotics. This includes developing imaging catheters for fluorescence lifetime imaging (FLIM), multispectral polarization sensitive laparoscopes with MEMS controlled spectral selection, illumination optics for flexible robotic endoscopes and optical detection of gold nanoparticles and thermal therapy. He has published over forty peer reviewed journal articles and book chapters.

**Elizabeth Hillman, Columbia University**

Elizabeth M. C. Hillman is an Assistant Professor of Biomedical Engineering and Radiology at Columbia University, and Director of the Columbia University Laboratory for Functional Optical Imaging. Prior to joining Columbia in 2006, she was junior faculty at the Massachusetts General Hospital / Harvard Medical School Martinos Center for Biomedical Imaging. She completed her PhD in Medical Physics and Bioengineering at University College London in 2002, where she also earned her undergraduate degree in Physics. Dr Hillman's research focuses on the development of in-vivo optical imaging and microscopy techniques, particularly for investigating the origins of blood flow modulations in the living brain, but also for studying brain development, disease pathogenesis and for clinical imaging applications.

**Reid C. Thompson, Vanderbilt University Medical Center**



Dr. Thompson received his M.D. degree in 1989 from the Johns Hopkins University School of Medicine in Baltimore, Maryland and completed the Halsted Internship in General Surgery and Residency in Neurological Surgery between 1989 and 1995 at the Johns Hopkins University School of Medicine in Baltimore, Maryland, followed by one year of service there as Advanced Clinical Instructor. He then completed a one-year fellowship in Cerebrovascular Surgery at Stanford University School of Medicine. While at Johns Hopkins University School of Medicine, Dr. Thompson received the Merck Foundation Medical Student Research Award for his study of the metabolism of the neuropeptide N-acetyl-aspartyl-glutamate. He also completed a neuro-oncology research fellowship while serving in the Hunterian Brain Tumor Research Laboratory at Johns Hopkins and received the NIH National Research Service Award. Current research interests include: Time-resolved laser-induced fluorescence spectroscopy for detection of brain tumors; Development of optical contrast agents for the detection of gliomas; Cytokine enhanced antitumor immunotherapy for brain tumors; Intra-operative thermal imaging of brain tumors and vascular malformations; Molecular mechanisms of cerebral edema; The role of the water channel aquaporin in brain edema; Pathogenesis of cerebral vasospasm.

**Sunday, June 5, 2011**

12:00 – 15:00 Registration (Orchid Atrium)

15:00 – 15:10 Opening Remarks – Conference Chairs and ECI Liaison

15:10 – 16:30 **Optical imaging in biology and research**
Session Chair: Irene Georgakoudi, Tufts, MA

15:10 – 15:20 Introduction

15:20 – 15:55 Gabriel Popescu, University of Illinois
*Quantitative phase imaging of cells and tissues: Are we there yet?*

15:55 – 16:30 Jim Swoger, Centre for Genomic Regulation, Barcelona (OPT)
*Mesoscopic multi-dimensional biological imaging*

16:30 – 18:30 Welcome dinner (River of Grass D and G)

18:30 – 20:30 **Commercialization of bio-optics**
Session Chair: Richard Levenson, Brighton Consulting Group

18:30 – 18:35 Introduction

18:35 – 19:00 Terry Fetterhoff, Roche
*What makes a novel technology innovative?*

19:00 – 19:25 Robert Filkins, General Electric Global Research
*Developing and Productizing New Bio-optical Technology: the View from an Industrial Research Lab*

19:25 – 19:50 Aydogan Ozcan, University of California, Los Angeles
*Lensfree On-Chip Microscopy and Tomography Toward Telemedicine Applications*

19:50 – 20:15 Brian Catanzaro, CFE Services
*Near infrared transcranial laser therapy for ischaemic stroke*

20:15 – 20:30 Discussion

20:30 – 22:00 Social hours and Poster Viewing

***Room Locations***

- Technical Sessions will be held in the Mangrove Room
- Poster Sessions will be held in River of Grass EFHI
- Breakfasts and Lunches will be served in River of Grass D and G
- Dinner locations are noted in the program

***Notes***

- *Audiotaping, videotaping and photography of presentations are prohibited.*
- *Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before).*
- *Speakers – Please leave at least 10 minutes for questions and discussion.*
- *Please do not smoke at any conference functions.*
- *Turn your cellular telephones to vibrate or off during technical sessions.*
- *Be sure to make any corrections to your name/contact information on the Master Participant List or confirm (by your initials) that the listing is correct. A corrected copy will be sent to all participants after the conference.*

**Monday, June 6, 2011**

07.00 – 08.30 Breakfast

08.30 – 10.30 **Clinical optical imaging & spectroscopy 1: In the clinic**
Session Chair: Milind Rajadhyaksha, Memorial Sloan-Kettering Cancer Center

08:30 – 08:45 Introduction and Questions

08:45 – 09:20 Chris Contag, Stanford University
*Miniature microscopes for point-of-care pathology, early detection of cancer, and image-guided resection*

09:20 – 09:55 Thomas Wang, University of Michigan
*Molecular imaging for guiding oncologic therapeutics in esophageal adenocarcinoma*

09:55 – 10:30 Allan Halpern, Memorial Sloane-Kettering Cancer Center
*Optical detection technologies for melanoma: a clinician's perspective*

10.30 – 11:00 Coffee Break

11:00 – 12.30 '**Hot Topics' Short talks** (also presented as posters, 15 minutes per talk)

- S. Derin Babacan,
  *Deconvolution Spatial Light Interference Microscopy for Subdiffraction Imaging of Live Cells*
- Priyaveena Puvanakrishnan,
  *Real-time near-infrared narrow band imaging of tumors using gold nanoparticles*
- Narasimhan Rajaram,
  *Optical molecular imaging of tumor metabolic demand and vascular oxygen saturation: Effect of cycling hypoxia*
- Lisa M. Richards,
  *Intraoperative Laser Speckle Contrast Imaging for Monitoring Cerebral Blood Flow*
- Bjorg Larson,
  *Performance of line-scanning confocal microscopy in human skin and oral mucosa for potential clinical translation*
- Jun Xia,
  *Small - animal whole - body imaging using a photoacoustic full - ring array system*

12:30 – 13:45 Lunch

13:45 – 15:30 **Poster session**

15:30 – 18:00 **Free time (organized sport / social events)**

18:00 – 19:30 Dinner (Ocean Lawn)

19:30 – 21:30 **Optical therapeutics**
Session Chair: Brian Wilson, University of Toronto, Canada

19:30 – 19:45 Introduction and Questions

19:45 – 20:20 Tayyaba Hasan, Wellman Center, Massachusetts General Hospital
*Imaging enabled platforms for development of therapeutics*

**<u>Monday, June 6, 2011</u> (continued)**

| | |
|---|---|
| 20:20 – 20:55 | Gang Zheng, University of Toronto<br>*Multimodal organic nanophotonics as cancer theranostics* |
| 20:55 – 21:30 | Robert W. Redmond, Wellman Center, Massachusetts General Hospital<br>*Light-Activated Tissue Repair and Regeneration* |
| 21:30 – 22:30 | Social hour and Poster Viewing |

**Tuesday, June 7, 2011**

07.00 – 08.30 Breakfast

08.30 - 10.30 **Clinical optical imaging & spectroscopy 2: Approaching the clinic**
Session Chair: Vadim Backman, Northwestern University

08:30 – 08:45 Introduction and Questions

08:45 – 09:20 Brian Pogue, Dartmouth College
*Quantifying optical molecular imaging in cancer tumors*

09:20 – 09:55 Joe Izatt, Duke University
*Spatial, spectral and coherence-multiplexed imaging systems for biomedicine and biotechnology*

09:55 – 10:30 Laura Marcu, University of California Davis
*Time-resolved fluorescence techniques: synergies and applications*

10.30 – 11:00 Coffee Break

11:00 – 13:00 **Hybrid optical / acoustic imaging**
Session Chair: Claude Boccara, Institut Langevin ESPCI-ParisTech

11:00 – 11:15 Introduction and Questions

11:15 – 11:50 Lihong Wang, Washington University
*Photoacoustic tomography: Ultrasonically breaking through the optical diffusion limit*

11:50 – 12:25 Daniel Razansky, Technical University of Munich, Germany
*Listening to light and seeing better: emerging optoacoustic imaging technologies*

12:25 – 13:00 Matthew O'Donnell, University of Washington
*Magnetomotive photoacoustic (mmPA) imaging to suppress background signals in molecular imaging*

13:00 – 16:00 Box Lunch and **Free time (organized sport / social events)**

16:00 – 18:00 **Image-guided intervention & real-time imaging**
Session Chair: Danail Stoyanov, Imperial College London, UK

16:00 – 16:15 Introduction and Questions

16:15 – 16:50 Jonathan Sorger, Intuitive Surgical, CA
*Integration of image acquisition and visualization in surgical robotics*

16:50 – 17:25 Philippe Poignet, LIRMM, CNRS, France
*Robust 3D motion tracking for robotic-assisted beating heart surgery*

17:25 – 18:00 Cameron Riviere, Carnegie Mellon University
*Handheld robotics for intraocular laser surgery*

18:00 – 19:30 **Low-cost optical technologies for wider markets and the developing world**
Session Chair: Tomasz Tkaczyk, Rice University, TX

18:00 – 18:15 Introduction and Questions

**Tuesday, June 7, 2011 (continued)**

| | |
|---|---|
| 18:15 – 18:50 | Changhuei Yang, California Institute of Technology<br>*Optofluidic microscopy: Chip-scale imaging cell cytometry* |
| 18:50 – 19:25 | Kenneth Hawkins, Center for POC Diagnostics for Global Health, PATH<br>*A strategy for creating low-cost, optical-detection, diagnostic systems appropriate for the developing world* |
| 19.30 – 20:00 | Reception |
| 20:00 – 22:00 | **Conference Banquet** (Everglades Dining Room) |
| 22:00 – 23:00 | Social hour |

**Wednesday, June 8, 2011**

07.00 – 08.30 Breakfast

08.30 - 10.30 **Neuroimaging and neuromanipulation**
Session Chair: Irving Bigio, Boston University

08:30 – 08:45 Introduction and Questions

08:45 – 09:20 Xue Han, Boston University
*Development of a new generation neural silencers*

09:20 – 09:55 David Boas, Massachusetts General Hospital
*Energetics of brain activation and the role of optics*

09:55 – 10:30 Joe Culver, Washington University of St. Louis
*Optical imaging of spontaneous brain activity*

10.30 – 11:00 Coffee Break

11:00 – 13:00 **Novel microscopy technologies**
Session Chair: Peter So, Massachusetts Institute of Technology

11:00 – 11:15 Introduction and Questions

11:15 – 11:50 Jerome Mertz, Boston University
*Optical sectioning microscopies: improvements and new techniques*

11:50 – 12:25 Thomas Planchon, Janelia Farms Research Campus (HHMI)
*Rapid three-dimensional isotropic imaging of living cells using Bessel beam plane illumination*

12:25 – 13:00 Wei Min, Columbia University
*Label-Free Imaging of Non-Fluorescent Molecules: Stimulated Raman Scattering and Stimulated Emission Microscopy*

13:00 – 14:15 Lunch

14:15 Conference Close and Departures

# Advances in Optics for Biotechnology, Medicine and Surgery XII
## An ECI Conference Series

## Poster List

**June 5-8, 2011**
**Naples Beach Hotel**
**Naples, Florida, USA**

**May 15, 2011**

1. **QUANTITATIVE MEASUREMENT OF THE REDUCED SCATTERING COEFFICIENT OF TURBID MEDIA USING MULTI-DIAMETER SINGLE FIBER REFLECTANCE**
   Ute A. Gamm, Erasmus Medical Center, The Netherlands

2. **CONFOCAL BACKSCATTERING-BASED DETECTION OF LEUKEMIC CELLS IN FLOWING BLOOD SAMPLES**
   Martin Hunter, Tufts University, USA

3. **REAL-TIME NEAR-INFRARED NARROW BAND IMAGING OF TUMORS USING GOLD NANOPARTICLES**
   Priyaveena Puvanakrishnan, The University of Texas at Austin, USA

4. **QUANTITATIVE MULTI-PHOTON EXCITED FLUORESCENCE IMAGING TO EVALUATE ENGINEERED ADIPOSE TISSUE DEVELOPMENT**
   Kyle P. Quinn, Tufts University, USA

5. **INFLUENCES OF TISSUE ABSORPTION AND SCATTERING ON DIFFUSE CORRELATION SPECTROSCOPY BLOOD FLOW MEASUREMENTS**
   Daniel Irwin, University of Kentucky, USA

6. **DIFFUSE OPTICAL SPECTROSCOPIC IMAGING (DOSI) FOR PREDICTION OF RESPONSE TO NEOADJUVANT CHEMOTHERAPY ONE DAY AFTER THE START OF TREATMENT IN BREAST CANCER PATIENTS**
   Darren Roblyer, University of California, Irvine, USA

7. **MINIATURE MICROSCOPES FOR POINT-OF-CARE PATHOLOGY, EARLY DETECTION OF CANCER, AND IMAGE-GUIDED RESECTION**
   Christopher H. Contag, Stanford University, USA

8. **EX-SITU AND IN-SITU INTRA-OPERATIVE OPTICAL BIOPSY USING LIGHT-CT**
   A. Claude Boccara, Institut Langevin ESPCI and LLtech, France

9. **MACROSCOPIC AND MICROSCOPIC OPTICAL IMAGING FOR SURGICAL MARGIN DELINEATION IN HEAD AND NECK CANCER**
   Mark Pierce, Rice University, USA

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10. **MATHEMATICAL CHARACTERIZATION OF SINGLE FIBER REFLECTANCE IN TERMS OF REDUCED SCATTERING COEFFICIENT AND SCATTERING PHASE FUNCTION**
    Stephen Chad Kanick, Erasmus Medical Center, The Netherlands

11. **PATHOPHYSIOLOGY OF HUMAN RED BLOOD CELL PROBED BY QUANTITATIVE PHASE MICROSCOPY**
    YongKeun Park, KAIST, Korea

12. **DIFFUSE OPTICAL EVALUATION OF REVASCULARIZATION EFFECT ON ISCHEMIC MUSCLE HEMODYNAMICS IN LOWER EXTREMITIES**
    Yu Shang, University of Kentucky, USA

13. **USE OF DIFFUSE OPTICAL SPECTROSCOPIES AND ELECTROENCEPHALOGRAM FOR CEREBRAL MONITORING DURING CAROTID ENDARTERECTOMY**
    Yu Shang, University of Kentucky, USA

14. **TRACING CANCER IN VIVO: FROM ENDOMICROSCOPY TO GAUSSIA LUCIFERASE IMAGING**
    Euiheon Chung, Gwangju Institute of Science and Technology, Korea

15. **HIGH-THROUGHPUT CHEMICAL IMAGING IN LIVING CELLS**
    Wei-Chuan Shih, University of Houston, USA

16. **INTEGRATED MULTISENSING OPTRODE FOR NEURAL STIMULATION AND RECORDING**
    Wei-Chuan Shih, University of Houston, USA

17. **AUTOMATED CLASSIFICATION OF GASTROINTESTINAL TISSUES USING OPTICAL COHERENCE TOMOGRAPHY**
    P. Beatriz Garcia-Allende, Imperial College London, United Kingdom

18. **NON-CONTACT DIFFUSE REFLECTANCE PROBE WITH A DMD SPATIAL FILTER FOR TUNABLE COLLECTION GEOMETRIES**
    Sheldon F. Bish, The University of Texas at Austin, USA

19. **RAMAN SPECTROSCOPY: A REAL TIME ANALYSIS TOOL FOR IDENTIFYING MICROCALCIFICATIONS AT BREAST CORE NEEDLE BIOPSY.**
    Anushree Saha, Case Western Reserve University, USA

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20. **LONGITUDINAL IMAGING OF CEREBRAL BLOOD FLOW IN MICE USING MULTI-EXPOSURE SPECKLE IMAGING**
    S. M. Shams Kazmi, The University of Texas at Austin, USA

21. **SIMULTANEOUS QUANTITATIVE PHASE AND SORET BAND ABSORPTION MICROSCOPY FOR COMPREHENSIVE BLOOD SCREENING**
    Mustafa Mir, University of Illinois at Urbana-Champaign, USA

22. **MULTISPECTRAL FLUORESCENCE IMAGING IN A MOUSE MODEL OF TONGUE CARCINOGENESIS**
    Anne Hellebust, Rice University, USA

23. **DESIGN AND IMPLEMENTATION OF AN LED BASED CLINICAL SPATIAL FREQUENCY DOMAIN IMAGING SYSTEM**
    Amaan Mazhar, University of California, Irvine, USA

24. **DECONVOLUTION SPATIAL LIGHT INTERFERENCE MICROSCOPY FOR SUBDIFFRACTION IMAGING OF LIVE CELLS**
    S. Derin Babacan, University of Illinois at Urbana-Champaign, USA

25. **MULTI-MODAL OPTICAL IMAGING FOR THE DETECTION OF CERVICAL NEOPLASIA**
    Mark Pierce, Rice University, USA

26. **LABEL-FREE BREAST CANCER DIAGNOSIS IN HUMAN BIOPSIES**
    Gabriel Popescu, University of Illinois at Urbana-Champaign, USA

27. **CLINICAL STUDY FOR SPECTRAL DIAGNOSIS OF IN VIVO MELANOMA AND NON-MELANOMA SKIN CANCER DIAGNOSIS**
    Liang Lim, University of Texas at Austin, USA

28. **MONTE CARLO SIMULATION OF FLUORESCENCE IMAGING OF MICROVASCULATURE**
    Mitchell Davis, The University of Texas at Austin, USA

29. **COMPARISON OF INDOCYANINE GREEN FLUORESCENCE AND LASER SPECKLE CONTRAST IMAGING**
    Erica L. Weber, The University of Texas at Austin, USA

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30. **A COMPARATIVE STUDY OF PHOTOTHERMAL HEATING EFFICIENCY OF GOLD NANOSHELLS AND NANORODS**
    Varun P. Pattani, The University of Texas at Austin, USA

31. **NON-INVASIVE LONGITUDINAL ASSESSMENT OF TUMOR OXYGENATION IN-VIVO IN IRRADIATED HEAD AND NECK HUMAN CANCERS USING DIFFUSE REFLECTANCE SPECTROSCOPY**
    Karthik Vishwanath, Duke University, USA

32. **STUDY OF MASS TRANSPORT IN LIVE CELLS WITH DISPERSION-RELATION FLUORESCENCE SPECTROSCOPY**
    Ru Wang, University of Illinois at Urbana-Champaign, USA

33. **INTRAOPERATIVE LASER SPECKLE CONTRAST IMAGING FOR MONITORING CEREBRAL BLOOD FLOW**
    Lisa M. Richards, University of Texas at Austin, USA

34. **EFFECTS OF RADIOGRAPHIC BREAST DENSITY ON THE OPTICAL PROPERTIES OF TREATMENT NAIVE BREAST TISSUE MARGINS**
    Torre M. Bydlon, Duke University, USA

35. **OPTICAL MOLECULAR IMAGING OF TUMOR METABOLIC DEMAND AND VASCULAR OXYGEN SATURATION: EFFECT OF CYCLING HYPOXIA**
    Narasimhan Rajaram, Duke University, USA

36. **HIGH RESOLUTION VITAL FLUORESCENCE IMAGING AND ANALYSIS OF TUMOR MICROANATOMY FOR SURGICAL MARGIN ASSESSMENT**
    Jenna Mueller, Duke University, USA

37. **MULTIFLUORESCENT, DISPOSABLE PHANTOMS FOR CALIBRATION OF OPTICALLY-GUIDED RESECTION INDTRUMENTS IN NEUROSURGERY**
    Pascal Gallant, INO, Canada

38. **REAL-TIME OFF-AXIS QUANTITATIVE PHASE IMAGING USING CUDA**
    Hoa Pham, University of Illinois at Urbana-Champaign, USA

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39. **DEVELOPING FLUORESCENT DEOXYGLUCOSE (2-NBDG) AS AN OPTICAL BIOMARKER TO DETECT ESOPHAGEAL ADENOCARCINOMA**
Nadhi Thekkek, Rice University, USA

40. **PERFORMANCE OF A LOOK-UP TABLE BASED INVERSE MODEL FOR STEADY STATE DIFFUSE OPTICAL SPECTROSCOPY**
Brandon S. Nichols, University of Texas at Austin, USA

41. **A MULTIMODAL APPROACH TO COMPLEX CHARACTERIZATION OF ATHEROSCLEROTIC PLAQUE COMPOSITIONAL, STRUCTURAL AND FUNCTIONAL FEATURES**
Yang Sun, University of California, Davis, USA

42. **UTILIZING 2-NBDG FLUORESCENCE TO STUDY HYPOXIA-INDUCED CHANGES IN BREAST CANCER GLYCOLYSIS**
Amy E. Frees, Duke University, USA

43. **INTRAOPERATIVE LASER SPECKLE CONTRAST IMAGING FOR MONITORING CEREBRAL BLOOD FLOW**
Lisa M. Richards, University of Texas at Austin, USA

44. **COMBINED TWO-PHOTON MICROSCOPY AND OPTICAL COHERENCE TOMOGRAPHY USING INDIVIDUALLY OPTIMIZED SOURCES**
Ki Hean Kim, Pohang University of Science and Technology, Korea

45. **SMALL-ANIMAL WHOLE-BODY IMAGING USING A PHOTOACOUSTIC FULL-RING ARRAY SYSTEM**
Jun Xia, Washington University in St. Louis, USA

46. **THREE-DIMENSIONAL IMAGING TECHNIQUES AND APPLICATIONS FOR MINIMALLY INVASIVE SURGERY**
Neil Clancy, Imperial College London, United Kingdom

47. **MULTIMODAL FLUORESCENCE DOT-SPECT/CT FOR IN VIVO SENTINEL LYMPH NODE IMAGING**
Metasebya Solomon, Washington University in Saint Louis, USA

48. **A NOVEL MULTISPECTRAL NEAR-INFRARED AND MAGNETIC RESONANCE IMAGING TECHNIQUE TO MONITOR BRAIN TUMOR VASCULARIZATION**
Vishal Saxena, Technical University Munich, Germany

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49. **PERFORMANCE OF LINE-SCANNING CONFOCAL MICROSCOPY IN HUMAN SKIN AND ORAL MUCOSA FOR POTENTIAL CLINICAL TRANSLATION**
Bjorg Larson, Memorial Sloan Kettering Cancer Center, USA

50. **RAPID CONFOCAL IMAGING OF LARGE AREAS OF EXCISED TISSUE WITH STRIP MOSAICING**
Bjorg Larson, Memorial Sloan Kettering Cancer Center, USA

51. **MULTIMODAL CONFOCAL MOSAICING MICROSCOPY: DIGITAL STAINING OF FLUORESCENCE-AND-REFLECTANCE IMAGES TO SIMULATE HISTOLOGY-LIKE APPEARANCE**
Milind Rajadhyaksha, Memorial Sloan-Kettering Cancer Center, USA

52. **IMAGING OF FUNCTIONAL CONNECTIVITY IN THE MOUSE BRAIN**
David J. Hinkle, Washington University School of Medicine, USA

53. **ANALYSIS OF SKIN LESIONS USING LAMINAR OPTICAL TOMOGRAPHY**
Timothy J. Muldoon, Laboratory for Functional Optical Imaging, Columbia University Department of Biomedical Engineering and Radiology, USA

54. **ULTRAFAST MULTISPECTRAL OPTICAL IMAGING OF THE HUMAN CORTEX DURING NEUROSURGERY**
Sasha Rayshubskiy, Columbia University, USA

55. **MULTIMODALITY QUANTITATIVE INTRAVASCULAR FLUORESCENCE MOLECULAR IMAGING THROUGH BLOOD BY INCORPORATING AUXILIARY INFORMATION FROM INTRAVASCULAR ULTRASOUND (IVUS)**
Dana Brooks, Northeastern University, USA