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Multiphoton Microscopy in the Biomedical Sciences XVI

Ammasi Periasamy

Peter T. C. So

Karsten König

Editors

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Introduction

Multiphoton microscopy has been established as the 3D imaging method of choice for studying biomedical specimens from single cells and whole animals to patients with sub-micron resolution. 25 years have passed since the realization of two-photon laser scanning microscopy. The ever-expanding scope of applications and the continuing instrumental innovations require a forum where new ideas can be exchanged and presented. Our conference at the SPIE BIOS 2016 meeting continues to address this need.

The 16th year of this conference began with three keynote lectures from leaders in the field: Angelika C. Rueck, Universität Ulm (Germany), "Correlated phosphorescence and fluorescence lifetime imaging for cell metabolism" [9712-1]; Peter T. C. So, Massachusetts Institute of Technology (United States), "Depth-resolved incoherent and coherent wide-field high-content imaging" [9712-2]; and Xiaoliang S. Xie, Harvard University (United States), "Biomedical applications of SRS microscopy" [9712-3].

For the 5th year in a row, the conference was extremely pleased to have the JenLab Young Investigator Award in addition to our regular poster awards. This award was donated by Karsten König, President and Founder of JenLab GmbH (Germany). The award selection committee included Arnd Krueger, Spectra Physics®, a Newport Company (United States), Francesco S. Pavone, Università degli Studi di Firenze (Italy), Paul J. Campagnola, University of Wisconsin-Madison (United States), and the two conference chairs, Karsten König and Peter T. C. So. The selection process included the abstract, manuscript, and poster presentation. Two finalists were selected for oral presentation after their poster presentations.

The two finalists were

1. Lingjie Kong, Purdue University (United States), for "In vivo imaging flow cytometry based on laser scanning two-photon microscopy at kHz cross-sectional frame rate" [9712-59], and
2. Thomas Gottschall, Friedrich-Schiller-Universität Jena (Germany), for "Four-wave mixing based light sources for real-world biomedical applications of coherent Raman microscopy" [9712-61].

Thomas Gottschall, Friedrich-Schiller-Universität Jena (Germany) was selected as the **winner of the JenLab Young Investigator Award 2016**.

For the 16th year in a row, the conference organized poster awards for students and postdoctoral fellows. The poster awards were donated by our conference sponsors, including: Becker & Hickl GmbH, Chroma Technology Corp., Coherent Inc., ISS, Inc., Spectra Physics®, a Newport Company, Leica Microsystems, Semrock Inc., and Carl Zeiss.

The 3 poster award winners were:

1. Hequn Wang, Massachusetts General Hospital (United States), for "Noninvasive visualization of pheomelanin using coherent Raman scattering microscopy" [9712-62],
2. Eiji Hase, The University of Tokushima (Japan), for "Observation of tendon repair in animal model using second-harmonic-generation microscopy" [9712-70], and
3. Ximeng You, Purdue University (United States), for "Nonlinear optical Stokes ellipsometric (NOSE) microscopy for imaging the nonlinear susceptibility tensors of collagen" [9712-77].

Some of the most valuable contributions in this volume are articles written by highly experienced practitioners of multiphoton microscopy. They have enumerated the most important considerations in designing multiphoton microscopes and imaging experiments. Further, updates on the state-of-the-art commercial multiphoton microscope systems were presented. This volume also includes proceedings describing some recent advances in major multi-photon microscope components and applications, including laser light sources, ultra-fast optics, filters, FRET, FLIM, FCS, Raman, CARS, SRS and CRS microscopy and spectroscopy, single molecule, endoscopy, energy metabolism measurements including NADH, FAD, tryptophan in cells and tissues, and various scientific and clinical applications.

On a personal note, the conference chairs are grateful for the participation of all authors and session chairs, and acknowledge the innovation-driven manufacturers and sponsors of this conference (Becker & Hickl GmbH, Chroma Technology Corp., Coherent Inc., ISS, Inc., JenLab GmbH, Spectra-Physics®, a Newport Company, Leica Microsystems, Semrock Inc., and Carl Zeiss) for their enthusiastic support in organizing this conference successfully for the last 16 years. We look forward to other exciting conferences in the future and welcome your continued participation and support.

**Ammasi Periasamy
Peter T. C. So
Karsten König**

JenLab Young Investigator Award

presented to

Thomas Gottschall

Friedrich-Schiller-Universität Jena (Germany)

for

**Four-wave mixing based light sources for real-world biomedical
applications of coherent Raman microscopy [9712-61]**

Session Chair

Peter T. C. So, Massachusetts Institute of Technology (United States)

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