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# *Optical Biopsy IX*

**Robert R. Alfano**
**Stavros G. Demos**
*Editors*

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# Introduction

The symposium "Optical Biopsy IX", part of the SPIE Photonics West BiOS conference, was held on January 24-26, 2011 in San Francisco. Scientists from around the world participated in the symposium, where many presented their recent work in this field, while others attended the sessions and contributed with their insightful questions and suggestions after each talk. The quality of the invited presentations in the regular sessions was very high, and the sessions were well attended. The symposium consisted of six oral sessions and one poster session, for a total of 35 oral presentations and four poster presentations. As the recognition and acceptance of Optical Biopsy techniques increases by the medical community as a result of transfer of basic research into clinically relevant experimental conditions, it is evident that the medical devices manufacturers are closely attending. The promise of diagnosis in real-time with Optical Biopsy methods is no longer just a possibility, but a fact well documented with the results of multiple studies.

The past year was marked with the passing of two of the pioneers of this field: Professor Michael Feld and Professor Britton Chance. Their contributions have been tremendous in this field. Both of them have served as Committee members and/or Organizers of this symposium. Due to the earlier passing of Prof. Feld, we were able to organize a special session devoted to his memory. Coworkers and former students of Prof. Feld were invited to share their experiences and achievements working with him. This session provided not only a review of his achievements, but also insight in to the way Prof. Feld was engaging his students to work on specific questions or problems, and bring those efforts to a successful completion. It is currently our intention to organize a similar session next year in memory of Prof. Britton Chance.

Among the 35 oral presentations, there was a keynote presentation and six invited talks in the regular sessions, and eight presentations in the session in memory of Professor Michael Feld. The keynote presentation was devoted to the field of microscopy beyond the diffraction limit, and was presented by one of the leaders in the field, Dr. Stefan W. Hell. The papers presented encompassed several different spectral and imaging technologies, extending from the macro- to the micro-scale; using fluorescence, light scattering and vibrational spectoscopies, and biophotonic approaches to detect disease, the functional state of the tissue, and control viral activity. The presentations highlighted the potential of Optical Biopsy techniques to offer solutions in many different areas of clinical interest, from warrior wound assessment in the field, to in-vivo diagnosis in the operating room and continuous monitoring during recovery. A number of presentations on Stokes Shift Spectroscopy for cancer diagnosis have shown

potential not only by in-vivo examination of specimens, but also using urine and blood samples.

For one more year, a large percentage of the attendees were from the industrial community or researchers with joint academic-industrial interests seeking for the appropriate toolset to develop the next generation of medical devises. The maturing of order technologies towards translation to the industry and clinical practice is evident. At the same time, basic research remains innovative and continuously improves existing methods, while new methods with potential emerge. Imaging of tissue at the microscopy level in-vivo capturing cellular morphology and organization in a manner similar to that provided by the current gold standard pathology, is clearly doable using various methods. What remains to be decided is what is the most suitable technology for addressing each particular clinical problem. A number of talks focused on the use of spectroscopy to obtain information in real-time, including cancer detection, skin morphochemistry, and response to an external stimulus. We expect in the next conference to see more papers dealing with in-vivo applications of the Optical Biopsy technologies and for non-cancer-related applications.

We wish to thank Dr. Rob Randleman of Ocean Optics and Arkia Hiruma from Hamamatsu for support, and the session chairs and SPIE staff for their help in making this a successful conference.

**Robert R. Alfano**
**Stavros G. Demos**