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Optical Biopsy VII

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Introduction

The conference Optical Biopsy VIII was held at the BiOS in SPIE Photonics West in San Francisco under the "Biomedical Spectroscopy, Microscopy and Imaging" and "Clinical Technologies and Systems" tracks on January 25–28, 2010. The optical biopsy field has grown tremendously in terms of researchers involved, manuscripts, and patents published, but most importantly, in terms of the recognition and acceptance of its potential by the medical community and medical devices manufacturers. At the same time, progress in basic research resulted in new ways or improvements in already developed methods that will make the in vivo optical pathology techniques more relevant for translation to a clinical setting and more attractive from a business point of view. These exciting developments will help further grow this field. The effort and level of funding are expected to grow as more interested parties (namely the industrial and the venture capital communities) are expected to participate and be part of the development of the next generation medical devices. These new devices are expected to be based on light-related technologies since light can offer the desired spatial resolution, while the spectral domain can offer the noninvasive in situ diagnostic information. The optical biopsy is and will remain at the core of these biomedical developments.

The conference on Optical Biopsy VIII was well attended by scientists from around the world. The conference consisted of five oral sessions and one poster session for a total of 44 papers presented. Among them, there are 12 invited talks, 26 oral, and 6 poster presentations. The papers presented encompassed several different spectral and imaging technologies: fluorescence and Raman diagnosis; quantum coherent effects in biology and medicine; tissue native emission and contrast agents imaging diagnosis; and biophotonic approaches for disease and virus detections. The invited talks on coherence in biology drew a large audience and interest, and may represent a growth area that has been overlooked in the past. The oral presentations on Stokes Shift Spectroscopy for cancer diagnosis and the UV supercontinuum used for ideal excitation source for native fluorescence spectroscopy may have been potential part of the most innovative presentations.

One could recognize that a large percentage of the attendees were from the industrial community. The invited talks by key leaders in the industrial community highlighted that they are now actively involved or carefully watching the rapid development of optical biopsy technologies. We expect this trend to continue especially as the world's economies emerge from the current downturn. Another trend observed during the years is the translation of research from the optical bench in the early years toward the bedside. A large number of the papers presented were dealing with the imaging of tissue at the microscopy level, demonstrating that optical techniques can capture cellular morphology and

organization in a manner similar to that provided by the current gold standard pathology based on extracting and staining tissue specimens. A number of talks focused on the use of spectroscopy to obtain information in real time including cancer detection, underlying conditions to skin appearance, and response to ischemia. We expect in the next conference to see more papers dealing with in vivo applications.

The attendees appreciated the talks from all of the invited speakers; in particular, the talks from pioneers and outstanding scientists: Professors Govindjee, Fleming, Matthews, and Lewis, and the corporate mangers from GE-Siavash Yazdanfar, Olympus-Kazuhiro Gono, J&J-Georgios Stamatas, and Ocean Optics-Jason Eichenholz, for their efforts for the review talks.

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

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