PROGRESS IN BIOMEDICAL OPTICS AND IMAGING
Vol. 16 No. 16

Optical Biopsy XIII: Toward Real-Time Spectroscopic Imaging and Diagnosis

Robert R. Alfano
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Editors

10–11 February 2015
San Francisco, California, United States

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Volume 9318

Proceedings of SPIE, 1605-7422, V. 9318

Optical Biopsy XIII: Toward Real-Time Spectroscopic Imaging and Diagnosis, edited by Robert R. Alfano, Stavros G. Demos · Proc. of SPIE Vol. 9318, 931801
© 2015 SPIE · CCC code: 1605-7422/15/$18 doi: 10.1117/12.2192360

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Please use the following format to cite material from this book:
Author(s), "Title of Paper," in *Optical Biopsy XIII: Toward Real-Time Spectroscopic Imaging and Diagnosis*, edited by Robert R. Alfano, Stavros G. Demos, Proceedings of SPIE Vol. 9318 (SPIE, Bellingham, WA, 2015) Article CID Number.

ISSN: 1605-7422
ISBN: 9781628414080

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445
SPIE.org

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.

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Introduction

The Optical Biopsy XIII conference, part of the SPIE Photonics West BiOS symposium, was held 10–11 February 2015, in San Francisco. The conference consisted of six sessions and hosted 25 oral presentations, with 14 of these from international contributors, and also included 10 poster presentations. The quality of the presentations was very high and the sessions were well attended. The speakers were informative, engaging, and knowledgeable, thus ensuring a very rewarding event, especially for the students.

The title of the Optical Biopsy XIII conference this year was followed by the descriptive: "Toward Real-Time Spectroscopic Imaging and Diagnosis" in order to encompass the focus area of this conference. As a result, about 70 percent of the oral presentations dealt with rapid evaluation or disease detection at the tissue level. Most presentations were concentrated in three main thematic areas: a) fluorescence, time-resolved fluorescence and multispectral imaging; b) light scattering methods including Raman scattering and polarization methods, and; c) the development of new methods and instrumentation or advancements of existing methods.

Last year, we discussed that "optical metabolomics" may be a future growth area in the field of optical biopsy. There were two presentations that focused on this area, both providing very promising results. We hope to see more submissions in this area next year. The rapid assessment of surgical specimens may also be another growth area for optical biopsy techniques. Although researchers in optical biopsy have largely focused on developing methods for in vivo detection of disease, the rapid evaluations of excised specimens may be the "first in line" application toward in vivo implementation. The current practice of cryosection for rapid tissue assessment (sectioning of frozen specimens) to perform rapid microscopic analysis of a specimen produces slides of lower quality than formalin fixed paraffin embedded tissue processing. While diagnosis can be rendered in many cases, the tissue is lost and cannot be used for further analysis. Alternatively, optical biopsy methods can provide an even faster method to evaluate the specimen and preserve the specimen for further analysis. We will focus on the potential of optical biopsy methods as a better alternative to cryosection in the next conference.

We wish to thank Bayspec Inc., Coherent Inc., Corning Inc., Energy Research Company, Fianium Ltd., Hamamatsu Corp., Intuitive Surgical Corp., LEUKOS, NKT Photonics A/S, PerkinElmer Inc., and Thorlabs, Inc. for their support of Optical Biopsy XIII *sessions*. We also thank the session chairs, program chairs, and SPIE staff for their help in making this conference successful.

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