

PROGRESS IN BIOMEDICAL OPTICS AND IMAGING

Vol. 10, No.15

Optical Interactions with Tissue and Cells XX

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Editors

26–28 January 2009

San Jose, California, United States

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Published by

SPIE

Volume 7175

Proceedings of SPIE, 1605-7422, v. 7175

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in *Optical Interactions with Tissue and Cells XX*, edited by Steven L. Jacques, E. Duco Jansen, William P. Roach, Proceedings of SPIE Vol. 7175 (SPIE, Bellingham, WA, 2009) Article CID Number.

ISSN 1605-7422

ISBN 9780819474216

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

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Printed in the United States of America.

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Introduction to the 20th year

Optical Interactions with Tissues and Cells

This 20th year of the laser-tissue Interactions conferences offers a moment to remember the history of this conference. In 1989, a conference called Thermal and Optical Interactions with Biological and Related Composite Materials (SPIE Proceedings 1064) was organized by Michael V. Berry (Rice University) and A. J. Welch (The University of Texas at Austin). It brought together people from the aeronautics and materials science communities and the biomedical optics community, with talks alternating between one discipline and the other. The cross-fertilization of ideas was tremendous. The conference was so successful that the following year I organized a second conference. The first "laser-tissue interactions" conference was held in Los Angeles in January, 1990. So it could easily be said that this 2009 conference is the 21st laser-tissue interaction conference, starting with the Berry/Welch conference.

The conference series has always emphasized three areas of laser-tissue interaction: (1) photochemical, (2) photothermal, and (3) photomechanical. These are mechanisms for how light can cause an effect in a tissue, used for surgical and therapeutic cutting, dissecting, machining, processing, coagulating, welding, and oxidizing tissues and biomaterials. We have also always included a section on (4) optics, where the tissue exerts an effect on the light, used for diagnostic sensing, imaging, and spectroscopy of tissues and biomaterials. The conference emphasis has been on the basic science of such interactions.

In the early conferences, Tayyaba Hasan (Harvard Medical School/Massachusetts General Hospital) organized the photochemistry, Joseph T. (Jay) Walsh (Northwestern University) organized the photothermal, and Thomas J. Flotte (Harvard Medical School/Massachusetts General Hospital) organized the photomechanics. Many others participated in the chairing of sessions, and I thank them all for contributing to the success of the conference. To name a few: Alfred Vogel (Medical Laser Center, Lübeck, Germany), E. Duco Jansen (Vanderbilt University), and Benjamin A. Rockwell (Air Force Research Laboratory, Brooks City-Base, TX) organized mechanical and thermal effects. Lihong Wang (Washington Univ. at St. Louis) and Alexander A. Oraevsky (University of Texas Medical Branch at Galveston, now at Fairway Medical Technologies Inc.) developed opto-acoustic interactions, which spun into a new conference. Wei R. Chen (University of Central Oklahoma) developed PDT/immunologic interactions, which spun into a new conference. Sean J. Kirkpatrick and Donald Duncan (both at Oregon Health & Science University) developed a tissue engineering program, which also spun into a new conference.

William P. (Pat) Roach (Air Force Research Laboratory) became involved in conference IV (1993), bringing a community of Air Force investigators and contractors who reported all their preliminary work. Hence, the conference became a home for much of the early work on pulsed laser effects, especially in the eye. Moreover, Pat annually obtained funding from the Air Force Office of Scientific Research to support invited speakers. Hence, the conference always had a set of fresh faces. Pat became co-chair in conference XV (2004). The name of the 16th conference (2005) was changed to Optical Interactions with Tissue and Cells, which more appropriately encompasses the variety of light sources and biological targets.

Now, Pat and I are stepping down and Duco Jansen and Robert J. Thomas (Air Force Research Laboratory) will carry on as conference chairs. There remains a great deal of work to accomplish. The early investigations have broken the ice, but the foundation of standards and calibration for laser effects in biological tissues and materials still needs to be laid to enable future protocols, devices and techniques, and to provide the professionalism that will facilitate medical community and FDA acceptance of new applications. There is much room for increased sophistication, since the early work has to some degree only surveyed the basic interactions. There is much to be done, and I encourage young investigators in photomedicine to include laser-tissue interactions in their scope of studies.

A handwritten signature in black ink that reads "Steven L. Jacques". The signature is written in a cursive, flowing style with a large, prominent 'S' and 'J'.

Steven L. Jacques