



# Photobiomodulation Session Friday, April 16, 2010

2010 Annual Conference  
Pre-Conference Courses: April 14-15, 2010  
Annual Conference: April 16-18, 2010  
Phoenix Convention Center, Phoenix, AZ

Photobiomodulation - West 212A-C

1:00 pm - 6:00 pm

Directors: *Juanita J. Anders, Ph.D., Michael R. Hamblin, M.D.*

### Disclosures

*Juanita J. Anders, Ph.D.* received equipment from LiteCure and PhotoThera, research grant and royalties from PhotoThera, and intellectual property rights with Henry M. Jackson Foundation

*Michael R. Hamblin, M.D.* received equipment from Palomar; consulting fees from Laser Hair Therapy of North America and Lexington International; stockholder with Transdermal Cap; research grant from Laser Hair Therapy of North America, Lexington International, and Palomar

### Educational Needs

The purpose of this session is to present and discuss the latest findings in basic science (*in vitro* and *in vivo* experiments) and clinical investigations on the critical parameters, mechanism, and effectiveness of light as a therapy for a broad range of clinical applications. Light and its biological effects and photo-medicine in general have gained recognition as areas of innovative and novel research with significant clinical implications.

### Participants

Any scientist, engineer, medical practitioner, individual in industry, as well as other health care professional involved in biomedical applications of lasers are invited to participate in these sessions.

### Background Requirements

Participants should have an understanding of light interaction with biological tissues and basic and clinical research.

### Instructional Content and/or Expected Learning Outcomes

This session will provide the latest data on basic science and clinical application of low intensity light in a wide spectrum of applications. The participants will increase their knowledge in this area and hopefully be stimulated to formulate new ideas to identify the mechanisms involved and the critical parameters needed for successful clinical application of light.

### Hot Topics

- Mechanism - biphasic response to light, cellular signaling systems activated by light
- Light Interaction with stem cells from the heart and bone marrow.
- New clinical applications for photobiomodulation including:
  - Photoactivated Antimicrobial Collagen for Wound Care
  - Light Therapy as a Promising Treatment for Brain and Spinal Cord Injury and Parkinson's Disease
  - Light Therapy as a Potential Treatment of Diabetes and for Reducing Low Density Lipoprotein Levels
  - Transcutaneous Light Treatment for Reduction of Cellulite and Subcutaneous Fat

**PHOTOBIMODULATION - BASIC SCIENCE: MECHANISMS OF THE BIPHASIC BIOLOGICAL RESPONSE TO LIGHT, EFFECTS OF ALTERING LASER AND LED PARAMETERS AND WAVELENGTHS ON ALTERING CELLULAR FUNCTION, EFFECTS OF LIGHT ON STEM CELLS, AN EXAMINATION OF THE SYSTEMIC EFFECTS OF LIGHT**

### INVITED SPEAKER

1:00 pm - 1:24 pm

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EFFECTS OF LOW LEVEL LASER THERAPY ON STEM CELLS FROM THE HEART AND BONE MARROW - OVERVIEW OF *IN VIVO* AND *IN VITRO* STUDIES

*Uri Oron<sup>1</sup>, Hanna Tuby, Lidya Maltz, Vladimir Sorin, Abraham Czerniak<sup>1</sup>, Gabi Sheffer*, Tel-Aviv University, Tel-Aviv, Israel

1:25 pm - 1:29 pm

Discussion

<sup>1</sup>Research grant from University Internal

• Content discusses non-FDA approved device or off-label use

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|--|-----|--|
| 1:30 pm - 1:39 pm                        | 162 | <p><b>LIGHT TO THE CAUSE OF THE BIPHASIC BIOLOGICAL RESPONSE IN DIFFERENT CELL TYPES</b></p> <p><i>Aaron Chen, Apostolos Doukas, Michael Hamblin, Wellman Center for Photomedicine, Boston, MA</i></p> <p><b>Discussion</b></p> <p>• <i>Content discusses non-FDA approved device or off-label use</i></p>   |
| 1:40 pm - 1:44 pm                        |     |  |
| 1:45 pm - 1:54 pm                        | 163 | <p><b>LED PHOTOMODULATION I: EFFECTS OF PULSED AND CONTINUOUS WAVE MODES ON PROCOLLAGEN PRODUCTS OF HUMAN SKIN FIBROBLASTS</b></p> <p><i>D.H. McDaniel<sup>1</sup>, C. Mazur, S. Wilson, R.G. Geronemus<sup>2</sup>, R.A. Weiss<sup>2</sup>, M. Weiss<sup>2</sup>, Laser Skin &amp; Vein Center of Virginia, Institute of Anti-Aging Research, Virginia Beach, VA, Laser &amp; Skin Surgery Center of New York, New York, NY, Maryland Laser Skin &amp; Vein Institute, Hunt Valley, MD</i></p> <p><b>Discussion</b></p> <p><sup>1</sup><i>Equipment, discount, consulting fees and research grant from Light BioScience; consulting fees, stockholder, equity position, and intellectual property rights with GentleWaves II</i></p> <p><sup>2</sup><i>Equipment and discount from Light BioScience; stockholder and equity position with GentleWaves II</i></p> <p>• <i>Content discusses non-FDA approved device or off-label use</i></p> |
| 1:55 pm - 1:59 pm                        |     |  |
| 2:00 pm - 2:09 pm                        | 164 | <p><b>LED PHOTOMODULATION II: EFFECT OF ENERGY FLUENCE ON PROCOLLAGEN PRODUCTS OF HUMAN SKIN FIBROBLASTS</b></p> <p><i>D.H. McDaniel<sup>1</sup>, C. Mazur, S. Wilson, R.G. Geronemus<sup>2</sup>, R.A. Weiss<sup>2</sup>, M. Weiss<sup>2</sup>, Laser Skin &amp; Vein Center of Virginia, Institute of Anti-Aging Research, Virginia Beach, VA, Laser &amp; Skin Surgery Center of New York, New York, NY, Maryland Laser Skin &amp; Vein Institute, Hunt Valley, MD</i></p> <p><b>Discussion</b></p> <p><sup>1</sup><i>Equipment, discount, consulting fees and research grant from Light BioScience; consulting fees, stockholder, equity position, and intellectual property rights with GentleWaves II</i></p> <p><sup>2</sup><i>Equipment and discount from Light BioScience; stockholder and equity position with GentleWaves II</i></p> <p>• <i>Content discusses non-FDA approved device or off-label use</i></p>                   |
| 2:10 pm - 2:14 pm                        |     |  |
| 2:15 pm - 2:24 pm                        | 165 | <p><b>DIFFERENTIAL RESPONSE OF NEURONS TO LIGHT IRRADIATION IN AN <i>IN VITRO</i> DIABETIC MODEL</b></p> <p><i>Xingjia Wu, Stephanie Alberico<sup>1</sup>, Isaac Erbele<sup>2</sup>, Helina Moges, Brian Pryor<sup>3</sup>, Juanita Anders<sup>4</sup>, Uniformed Services University of the Health Sciences, Bethesda, MD, LiteCure, LLC, Newark, DE</i></p> <p><b>Discussion</b></p> <p><sup>1</sup><i>Salary from LiteCure</i></p> <p><sup>2</sup><i>Travel expenses from LiteCure</i></p> <p><sup>3</sup><i>Stockholder and intellectual property rights with LiteCure</i></p> <p><sup>4</sup><i>Equipment from LiteCure</i></p> <p>• <i>Content discusses non-FDA approved device or off-label use</i></p>  |
| 2:25 pm - 2:29 pm                        |     |  |
| 2:30 pm - 2:39 pm<br>(ePoster Available) | 166 | <p><b>LOW LEVEL LASER, 820nm, ACTIVATES CREB BY AND ERK1/2 DEPENDENT MECHANISM</b></p> <p><i>Lennart Johns<sup>1</sup>, Xiaozhu Zhang, Elizabeth Davison, Jered Pasay, Stephen Straub, Quinnipiac University, Hamden, CT</i></p> <p><b>Discussion</b></p> <p><sup>1</sup><i>Received equipment from Chattanooga Group</i></p> <p>• <i>Content discusses non-FDA approved device or off-label use</i></p>   |
| 2:40 pm - 2:44 pm                        |     |  |

2:45 pm - 3:44 pm

**BREAK - VISIT THE EXHIBITS AND VIEW ePOSTERS**

**INVITED SPEAKER**

3:45 pm - 4:09 pm

**IMPACT OF RED LASER LIGHT ON NEURAL SYSTEM: *IN VITRO* AND *IN VIVO* EVIDENCES**

*Laura Calza*<sup>1</sup>, University of Bologna, Bologna, Italy

4:10 pm - 4:14 pm

**Discussion**

<sup>1</sup>*Study partially funded by RGMD-Genova, Italy*

4:15 pm - 4:24 pm

**MECHANISMS FOR THE SYSTEMIC EFFECTS LLLT**

*Mary Dyson*, King's College London, University of London, London, United Kingdom

4:25 pm - 4:29 pm

**Discussion**

4:30 pm - 4:39 pm

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**PRELIMINARY STUDIES OF THE ANTIMICROBIAL EFFECTS OF LIGHT ACTIVATED COLLAGEN-EMBEDDED RIBOFLAVIN-5 PHOSPHATE *IN VITRO***

*Raymond Lanza*fame<sup>1</sup>, *Istvan Stadler*<sup>2</sup>, *Ryan Cunningham*, *Jennifer Kasaraneni*, *Fred Khan*, *Barbara Soltz*<sup>3</sup>, *Robert Soltz*<sup>4</sup>, Rochester General Hospital, Rochester, NY, Conversion Energy Enterprises, Spring Valley, NY

4:40 pm - 4:44 pm

**Discussion**

<sup>1</sup>*Equipment from Carestream Health, Conversion Energy Enterprises, Patholase; consulting fees from LaserCure, PhotoThera; travel expenses and intellectual property rights with Conversion Energy Enterprises; research grant from NIH NIGM grant #1R43GM087753-01, Patholase; honoraria from ASLMS, SLS, Vermont Managed Care Association*

<sup>2</sup>*Equipment from Carestream Health, Conversion Energy Enterprises, Patholase; research grant from NIH NIGM grant #1R43GM087753-01, Patholase*

<sup>3</sup>*Salary, equity position, and intellectual property rights with Conversion Energy Enterprises; research grant from NIH NIGM grant #1R43GM087753-01, Patholase*

<sup>4</sup>*Salary from Conversion Energy Enterprises; research grant from NIH NIGM grant #1R43GM087753-01, Patholase*

•Content discusses non-FDA approved device or off-label use

4:45 pm - 4:54 pm

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**PHOTODYNAMIC THERAPY WITH NANOMETALOXIDES ON MICROORGANISMS**

*Anat Lipovsky*→, *Zeev Tzitrinovich*, *Guy Applerot*, *Aharon Gedanken*, *Yeshayahu Nitzan*, *Rachel Lubart*, Bar-Ilan University, Ramat-Gan, Israel

4:55 pm - 4:59 pm

**Discussion**

•Content discusses non-FDA approved device or off-label use

5:00 pm - 5:09 pm

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**PROPHYLAXIS EFFECTS OF INTRANASAL LOW INTENSITY LASER IRRADIATION ON INFLUENZA A**

*(ePoster Available)*

*Timon Cheng-Yi Liu*, *Min Wu*, *Xue-Mei Qu*, *Cheng-Zhang Li*, *Song-Hao Liu*, Laboratory of Laser Sports Medicine, South China Normal University, Laboratory of Photonic TCM, Guangzhou, China

5:10 pm - 5:14 pm

**Discussion**

•Content discusses non-FDA approved device or off-label use

→Recipient of ASLMS travel grant.

- 5:15 pm - 5:24 pm  
*(ePoster Available)*
- 172 **LED PHOTOMODULATION III: EFFECT OF WAVELENGTHS AND RATIO OF WAVELENGTHS ON GENE EXPRESSIONS IN HUMAN SKIN FIBROBLASTS**  
*D.H. McDaniel<sup>1</sup>, C. Mazur, S. Wilson, R.G. Geronemus<sup>2</sup>, R.A. Weiss<sup>2</sup>, M. Weiss<sup>2</sup>, Laser Skin & Vein Center of Virginia, Institute of Anti-Aging Research, Virginia Beach, VA, Laser & Skin Surgery Center of New York, New York, NY, Maryland Laser Skin & Vein Institute, Hunt Valley, MD*
- 5:25 pm - 5:29 pm
- Discussion**  
<sup>1</sup>*Equipment, discount, consulting fees and research grant from Light BioScience; consulting fees, stockholder, equity position, and intellectual property rights with GentleWaves II*  
<sup>2</sup>*Equipment and discount from Light BioScience; stockholder and equity position with GentleWaves II*  
• *Content discusses non-FDA approved device or off-label use*
- 5:30 pm - 5:39 pm  
*(ePoster Available)*
- 173 **PHOTOBIMODULATION ON TNF-ALPHA INDUCED EXPRESSION SUPPRESSION OF CIRCADIAN CLOCK GENES IN CULTURED NIH3T3 FIBROBLASTS**  
*De-Feng Wu, Yong-Qing Wang, Ling Zhu, Timon Cheng-Yi Liu, Song-Hao Liu, Laboratory of Laser Sports Medicine, South China Normal University, Photon TCM Laboratory, Guangzhou, China*
- 5:40 pm - 5:44 pm
- Discussion**  
• *Content discusses non-FDA approved device or off-label use*
- 5:45 pm - 5:54 pm  
*(ePoster Available)*
- 174 **RED LIGHT PROMOTION ON THE RECOVERY OF HYDROGEN PEROXIDE PRETREATED DIFFERENTIATED PC12**  
*Ling Zhu, Xiao-Yun Li, Timon Cheng-Yi Liu, Song-Hao Liu, Laboratory of Laser Sports Medicine, South China Normal University, Photon TCM Laboratory, Guangzhou, China*
- 5:55 pm - 6:00 pm
- Discussion**  
• *Content discusses non-FDA approved device or off-label use*