# Biophotonics and Immune Responses XIV

**Wei R. Chen** *Editor* 

4 February 2019 San Francisco, California, United States

Sponsored and Published by SPIF

**Volume 10879** 

Proceedings of SPIE, 1605-7422, V. 10879

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

Biophotonics and Immune Responses XIV, edited by Wei R. Chen, Proc. of SPIE Vol. 10879, 1087901  $\cdot$  © 2019 SPIE  $\cdot$  CCC code: 1605-7422/19/\$18  $\cdot$  doi: 10.1117/12.2523402

The papers 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. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers 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 these proceedings:

Author(s), "Title of Paper," in *Biophotonics and Immune Responses XIV*, edited by Wei R. Chen, Proceedings of SPIE Vol. 10879 (SPIE, Bellingham, WA, 2019) Seven-digit Article CID Number.

ISSN: 1605-7422

ISSN: 2410-9045 (electronic)

ISBN: 9781510624009

ISBN: 9781510624016 (electronic)

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

Copyright © 2019, Society of Photo-Optical Instrumentation Engineers.

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 1605-7422/19/\$18.00.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

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



**Paper Numbering:** Proceedings of SPIE follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

# **Contents**

∨ ∨ii	Authors Conference Committee
SESSION 1	PDT AND IMMUNE RESPONSES
10879 06	Monitoring vascular targeted PDT response with multimode optical imaging (Invited Paper) [10879-5]
SESSION 2	PHOTOIMMUNOTHERAPY
10879 OA	ALDH3A2 as a potential molecular marker for nasopharyngeal carcinoma [10879-9]
SESSION 3	MONITORING OF IMMUNE ACTIVITIES
10879 OC	Novel promising stroke therapy: new pharmacological and laser stimulation of brain clearance (Invited Paper) [10879-11]
10879 OE	Non-invasive monitoring of circulating melanoma cells by in vivo photoacoustic flow cytometry (Invited Paper) [10879-13]
SESSION 4	NOVEL DETECTION TECHNOLOGY
10879 01	Utilizing deep learning technology to develop a novel CT image marker for categorizing cervical cancer patients at early stage (Invited Paper) [10879-17]
10879 OL	Design of a multi-material loaded soft tissue phantom for the estimation of phase maps using a single exposure x-ray phase retrieval method [10879-20]
	POSTER SESSION
10879 ON	BSA-modified gold nanorods for combined photothermal therapy and immunotherapy of melanoma [10879-22]
10879 00	The characterization of graphene-reconstituted low-density lipoproteins and small molecule inhibitor nanoparticles in preparation for use in laser immunotherapy [10879-23]

10879 OR	Temperature detection by photoacoustic for nanoprobe-mediated photothermal therapy [10879-26]
10879 OT	Temperature feedback-controlled photothermal treatment based on thermal infrared imager [10879-28]
10879 OU	Evaluation of free radical scavenging and antioxidation capacity and immune enhancement effect of Mulberry Extracts [10879-29]
10879 OV	Evaluation of anti-inflammatory, antioxidant activity and protective effect on ulcerative colitis of traditional Chinese medicine Lian-ai jian [10879-30]
10879 OW	Evaluation of both antioxidant and anti-inflammatory activity of traditional Chinese Huzhentongfeng Extract [10879-31]
10879 OY	Evaluation of antioxidative capacity of Artemisiae Argyi Folium in vitro [10879-33]
10879 16	Magnetic resonance imaging thermometry for laser immunotherapy in orthotopic pancreatic cancer [10879-41]
10879 17	Subcellular localization of gold nanorods in cancerous cells [10879-42]
10879 1A	Near infra-red light treatment of Alzheimer's disease [10879-45]

### **Authors**

Numbers in the index correspond to the last two digits of the seven-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first five digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Castellano, Tara, Ol Chen, Haibin, OT

Chen, Tong-sheng, 0U, 0V, 0W, 0Y Chen, Wei R., 0L, 0N, 0O, 0R, 16, 17

Deng, Jian-ping, 0U, 0Y Doughty, Austin, 0O, 16, 17 Duarte Torres, E., 0C Gallagher, Kyra A., 0O Ghani, Muhammad U., 0L

Gu, Bobo, 0E Gu, Ying, 06

Gunderson, Camille C., 01

He, Hao, 0E Iskra, T., 0C

Khorovodov, A., 0C Klimova, M., 0C Kurths, J., 0C Layton, Elivia, 0O, 17 Li, Buhong, 06 Li, Dezi, 0T

Li, Yong, 16 Li, Zhifang, 0T Liang, Fuqiang, 06 Lin, Huiyun, 06 Liu, Hong, 0I, 0L Liu, Liwei, 0R Liu, Siyu, 0R

Liu, Wei, Ol Lu, Lisen, OA

Mamedova, A., 0C Mannel, Robert S., 0I

Mesiya, Sana, 17 Moore, Kathleen, 01

Niu, Yanhui, 06 Pavlov, A., 0C Ping, Kai, 0E

Qi, Shuhong, 0A

Qiu, Yuchen, 0I Qu, Junle, 0N, 0R

Qui, Yuchen, OL Saranceva, E., OC

Saunders, Debra, 16

Semyachkina-Glushkovskaya, O., 0C

Shareef, A. E., 0C Shen, Yi, 06

Shi, Fan, OV Smith, Nataliya, 16

Song, Jun, 0N Tao, Lechan, 1A Terskov, A., OC Thai, Theresa C., Ol Towner, Rheal, 16 Wang, Meng, ON, 16

Wang, Xue, 1A

Wang, Yi-fei, 0U, 0V, 0W, 0Y Wang, Zhi-ping, 0U, 0V, 0W, 0Y

Wei, Xunbin, OE, 1A Wilson, Brian C., 06 Wu, Haiwei, OE Wu, Xizeng, OL Wu, Zi-cong, OV, OW Yan, Aimin, OL Zargaria, Abolfazl, Ol Zhang, Zhihong, OA

Zhao, Yue, OR Zhao, Zhen-ling, OV, OW

Zheng, Bin, Ol

Zhou, Benqing, 0N, 0O, 17 Zhou, Feifan, 0N, 0R, 16, 17

Zhou, Huan, 0E Zhou, Quanqu, 1A Zhou, Quanyu, 0E Zukerman, Sara, 0O

## **Conference Committee**

#### Symposium Chairs

**James G. Fujimoto**, Massachusetts Institute of Technology (United States)

**R. Rox Anderson**, Wellman Center for Photomedicine, Massachusetts General Hospital (United States) and Harvard Medical School (United States)

#### Symposium Co-chairs:

**Jennifer K. Barton**, The University of Arizona (United States) **Wolfgang Drexler**, Medical University of Vienna (Austria)

#### **Program Track Chairs**

E. Duco Jansen, Vanderbilt University (United States)Jessica C. Ramella-Roman, Florida International University (United States)

#### Conference Chair

Wei R. Chen, University of Central Oklahoma (United States)

#### Conference Program Committee

Sandra O. Gollnick, Roswell Park Cancer Institute (United States)Michael R. Hamblin, Wellman Center for Photomedicine (United States)

Yih-Chih Hsu, Chung Yuan Christian University (Taiwan)

Mladen Korbelik, BC Cancer Research Center (Canada)

Hong Liu, The University of Oklahoma (United States)

Mark F. Naylor, Dermatology Associates of San Antonio (United States)

Junle Qu, Shenzhen University (China)

Oxana V. Semyachkina-Glushkovskaya, Saratov State University (Russian Federation)

Robert T. van Kooten, Universiteit van Amsterdam (Netherlands)

Xunbin Wei, Shanghai Jiao Tong University (China)

**Da Xing**, South China Normal University (China)

**Zhihong Zhang**, Huazhong University of Science and Technology (China)

Feifan Zhou, University of Central Oklahoma (United States)

#### Session Chairs

PDT and Immune Responses
Yih-Chih Hsu, Chung Yuan Christian University (Taiwan)
Feifan Zhou, University of Central Oklahoma (United States)

2 Photoimmunotherapy

Mark F. Naylor, Dermatology Associates of San Antonio (United States)

Tomas Hode, Immunophotonics, Inc. (United States)

3 Monitoring of Immune Activities

**Zhihong Zhang**, Huazhong University of Science and Technology (China)

Xunbin Wei, Shanghai Jiao Tong University (China)

4 Novel Detection Technology

Yuchen Qiu, The University of Oklahoma (United States)

Oxana V. Semyachkina-Glushkovskaya, Saratov State University (Russian Federation)