

Photonic Diagnosis and Treatment of Infections and Inflammatory Diseases II

**Tianhong Dai
Jürgen Popp
Mei X. Wu**
Editors

**4–5 February 2019
San Francisco, California, United States**

Sponsored by
SPIE

Cosponsored by
National Institutes of Health/National Institute of Allergy and Infectious Diseases (United States)
GAMA Therapeutics, LLC (United States)
Kernel Medical Equipment Company (China)

Published by
SPIE

Volume 10863

Proceedings of SPIE, 1605-7422, V. 10863

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

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 SPIDigitalLibrary.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 *Photonic Diagnosis and Treatment of Infections and Inflammatory Diseases II*, edited by Tianhong Dai, Jürgen Popp, Mei X. Wu, Proceedings of SPIE Vol. 10863 (SPIE, Bellingham, WA, 2019) Seven-digit Article CID Number.

ISSN: 1605-7422
ISSN: 2410-9045 (electronic)

ISBN: 9781510623682
ISBN: 9781510623699 (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.

**SPIE. DIGITAL
LIBRARY**

SPIDigitalLibrary.org

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

v	<i>Authors</i>
vii	<i>Conference Committee</i>

PHOTONIC DIAGNOSIS I

10863 03	Antibiotic-derived molecular probes for bacterial imaging (Invited Paper) [10863-2]
10863 04	The utility of MolecuLight bacterial sensing in the management of burns and traumatic wounds [10863-3]
10863 07	Non-contact fast Mueller matrix measurement system for investigation of inflammatory skin diseases [10863-6]

PHOTONIC DIAGNOSIS II

10863 08	Plasmonic metasurfaces for sensing, typing, and killing of pathogens (Invited Paper) [10863-8]
----------	---

PHOTONIC DIAGNOSIS III

10863 0A	Spatiotemporal dynamics of molecular messaging in bacterial co-cultures studied by multimodal chemical imaging (Invited Paper) [10863-10]
10863 0D	Using multispectral photoacoustic tomography for imaging scleroderma in the hand [10863-13]
10863 0F	Estimating retinal vascular permeability from human fluorescein videoangiography data: optimization and sensitivity analysis of kinetic models [10863-15]

PHOTONIC DIAGNOSIS IV

10863 0G	A chemist's view of inflammation in contusion injured spinal cord in a rat model: noninvasive, noncontact, in vivo Raman spectroscopy minutes to hours after injury (Invited Paper) [10863-16]
----------	---

ANTIMICROBIAL PHOTODYNAMIC THERAPY

- 10863 ON **A genome-wide screen for tolerance to rose bengal photodynamic therapy and its use in onychomycosis treatment** [10863-22]
- 10863 OQ **Mn-doped Zn/S quantum dots as photosensitizers for antimicrobial photodynamic inactivation (Invited Paper)** [10863-25]

ANTIMICROBIAL/ANTI-INFLAMMATORY BLUE LIGHT

- 10863 OT **Photo-inactivation of Neisseria gonorrhoeae: a paradigm changing approach for combating antibiotic-resistant gonococcal infections (Invited Paper)** [10863-28]
- 10863 OU **Development of pulsed blue light technologies for bacterial biofilm disruption** [10863-29]
- 10863 OW **Management of all three phases of wound healing through the induction of fluorescence biomodulation using fluorescence light energy** [10863-31]

COMBINATION THERAPY OF LIGHT AND OTHER ANTIMICROBIALS

- 10863 OY **Synergistic effect of antimicrobial blue light (at 405 nm) and quinine against multidrug-resistant infections: in vitro and in vivo studies (Invited Paper)** [10863-33]
- 10863 OZ **Synergistic inactivation of Pseudomonas aeruginosa by oregano oil and blue light (Invited Paper)** [10863-34]
- 10863 11 **The effectiveness of nano-doxycycline activated by diode laser exposure to reduce S. aureus biofilms: an in vitro study** [10863-36]

UV IRRADIATION, PHOTOTHERMAL THERAPY AND MISCELLANEOUS

- 10863 14 **High-intensity UV LED inactivation of Clostridium difficile spores** [10863-39]
- 10863 16 **Growth inhibition of Staphylococcus Aureus by a combined treatment of ZnO nanoparticles and femtosecond laser light** [10863-41]

POSTER SESSION

- 10863 18 **Evaluating the potential for resistance development to antimicrobial blue light (at 405 nm) against gram-negative bacteria: in vitro and in vivo studies** [10863-42]
- 10863 1B **The susceptibility of oral bacteria to antibacterial photodynamic therapy** [10863-45]