

Light-Based Diagnosis and Treatment of Infectious Diseases

Tianhong Dai

Editor

29–31 January 2018

San Francisco, California, United States

Sponsored by

SPIE

Cosponsored by

Ondine Biomedical Inc. (Canada)

Ushio America, Inc. (United States)

Gel4Med LLC (United States)

Published by

SPIE

Volume 10479

Proceedings of SPIE 1605-7422, V. 10479

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 *Light-Based Diagnosis and Treatment of Infectious Diseases*, edited by Tianhong Dai, Proceedings of SPIE Vol. 10479 (SPIE, Bellingham, WA, 2018) Seven-digit Article CID Number.

ISSN: 1605-7422

ISSN: 1996-756X (electronic)

ISBN: 9781510614437

ISBN: 9781510614444 (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 © 2018, 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 1605-7422/18/\$18.00.

Printed in the United States of America

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

- vii *Authors*
- ix *Conference Committee*
- xi *Introduction*

PHOTONIC DIAGNOSIS II

- 10479 07 **Unraveling bacterial networks and their antimicrobial susceptibility on silicon microarchitectures using intrinsic phase-shift spectroscopy (Invited Paper) [10479-6]**
- 10479 09 **Elastic light scattering for clinical pathogens identification: application to early screening of *Staphylococcus aureus* on specific medium (Invited Paper) [10479-8]**

PHOTONIC DIAGNOSIS III

- 10479 0D **Noninvasive monitoring local variations of fever and edema on human: potential for point-of-care inflammation assessment [10479-12]**

ANTIMICROBIAL BLUE LIGHT I

- 10479 0J **Antimicrobial blue light: a drug-free approach for inactivating pathogenic microbes (Invited Paper) [10479-18]**
- 10479 0K **Blue light enhances the antimicrobial activity of honey against *Pseudomonas aeruginosa* [10479-19]**
- 10479 0L **Microbial photoinactivation by 470 nm radiation: an investigation into the underlying photobiological mechanism [10479-20]**
- 10479 0M **In vitro results of flexible light-emitting antimicrobial bandage designed for prevention of surgical site infections [10479-21]**
- 10479 0N **Antimicrobial blue light inactivation of biofilms formed by clinical isolates of multidrug-resistant microorganisms [10479-22]**
- 10479 0O **Antimicrobial blue light inactivation of *Neisseria gonorrhoeae* [10479-23]**

ANTIMICROBIAL BLUE LIGHT II

- 10479 0R **Staphyloxanthin photobleaching sensitizes methicillin-resistant *Staphylococcus aureus* to reactive oxygen species attack (Translational Best Paper Award Winner) [10479-26]**
- 10479 0S **Photodynamic activity of natural anthraquinones on fibroblasts [10479-27]**

ANTIMICROBIAL PHOTODYNAMIC INACTIVATION/THERAPY II

- 10479 0Z **A quaternary ammonium modified coumarin derivative for antimicrobial photodynamic therapy [10479-34]**
- 10479 11 **Potassium iodide potentiates antimicrobial photodynamic inactivation mediated by Rose Bengal: in vitro and in vivo studies [10479-36]**

ANTIMICROBIAL PHOTODYNAMIC INACTIVATION/THERAPY III

- 10479 12 **Progress toward development of photodynamic vaccination against infectious/malignant diseases and photodynamic mosquitocides (Invited Paper) [10479-37]**
- 10479 14 **A comparative analysis of aPDI effect of phenothiazinium dyes in presence of inorganic salt as potentiator [10479-39]**

ANTIMICROBIAL PHOTODYNAMIC INACTIVATION/THERAPY IV

- 10479 17 **Photodynamic therapy to destroy pneumonia associated microorganisms using external irradiation source [10479-42]**
- 10479 18 **Potential by potassium iodide using TPPS4 for antimicrobial photodynamic inactivation [10479-43]**

ULTRAVIOLET AND INFRARED IRRADIATION TREATMENT

- 10479 1A **Healthcare acquired infection (HAIs): a deadly problem that is preventable: UV can help, what's holding it back? (Invited Paper) [10479-45]**
- 10479 1B **Identification of barriers and research opportunities to improve the effective and efficient application of adjunct UVC surface disinfection in healthcare (Invited Paper) [10479-46]**
- 10479 1C **Insights into the working mechanism of water filtered infrared A (wIRA) irradiation on *Chlamydia trachomatis* serovar E [10479-48]**
- 10479 1D **Far-UVC light applications: sterilization of MRSA on a surface and inactivation of aerosolized influenza virus [10479-60]**

POSTER SESSION

- 10479 1G **Efficacy of antimicrobial 405 nm blue-light for inactivation of airborne bacteria [10479-51]**
- 10479 1K **Effectiveness of photobiomodulation therapy and aerobic exercise training on articular cartilage in an experimental model of osteoarthritis in rats [10479-55]**
- 10479 1L **Effects of the photodynamic therapy on microbial reduction of diabetic ulcers in humans [10479-56]**