

PROCEEDINGS OF SPIE

# ***SPIE Advanced Biophotonics Conference (SPIE ABC 2021)***

**Euiheon Chung  
Ki-Hun Jeong  
Chulmin Joo  
Woonggyu Jung  
Hyun-Wook Kang  
Chang-Seok Kim  
Chulhong Kim  
Pilhan Kim  
Hongki Yoo**  
*Editors*

**4–6 November 2021  
Busan, Republic of Korea**

*Hosted by*  
Optical Society of Korea (OSK)

*Published by*  
SPIE

**Volume 12159**

Proceedings of SPIE 0277-786X, V. 12159

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

SPIE Advanced Biophotonics Conference (SPIE ABC 2021), edited by Euiheon Chung, Ki-Hun Jeong, Chulmin Joo, Woonggyu Jung, Hyun-Wook Kang, Chang-Seok Kim, Chulhong Kim, Pilhan Kim, Hongki Yoo, Proc. of SPIE Vol. 12159, 1215901 · © 2022 SPIE · 0277-786X · doi: 10.1117/12.2628261

Proc. of SPIE Vol. 12159 1215901-1

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](http://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 *SPIE Advanced Biophotonics Conference (SPIE ABC 2021)*, edited by Euiheon Chung, Ki-Hun Jeong, Chulmin Joo, Woonggyu Jung, Hyun-Wook Kang, Chang-Seok Kim, Chulhong Kim, Pilhan Kim, Hongki Yoo, Proc. of SPIE 12159, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X  
ISSN: 1996-756X (electronic)

ISBN: 9781510651944  
ISBN: 9781510651951 (electronic)

Published by

**SPIE**

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

[SPIE.org](http://SPIE.org)

Copyright © 2021 Society of Photo-Optical Instrumentation Engineers (SPIE).

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 fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at [copyright.com](http://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.

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](http://SPIDigitalLibrary.org)

---

**Paper Numbering:** A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE 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

## SPIE ADVANCED BIOPHOTONICS CONFERENCE (SPIE ABC 2021)

---

- 12159 02 **Noise reduction technique for fluorescence imaging in multifocal multiphoton microscopy** [12159-3]
- 12159 03 **2-D transition metal dichalcogenides assisted SPR biosensor for rapid detection of urine glucose** [12159-4]
- 12159 04 **Novel endoscopic laser treatment of common bile duct stenosis using balloon catheter-integrated diffusing applicator (BCDA)** [12159-6]
- 12159 05 **High-throughput screening platform for quantitative phenotype analysis of *Xenopus laevis* with deep learning** [12159-8]
- 12159 06 **Compact hyperspectral camera using angle-sensitive plasmonic structures** [12159-9]
- 12159 07 **Integrated photoacoustic and ultrasonic endoscopy mini-probe for use in the instrument channel of a clinical video endoscope** [12159-11]
- 12159 08 **Marker-free protein study by amplified light scattering** [12159-12]
- 12159 09 **Development of a portable ophthalmic OCT device and measurement of its performance** [12159-13]
- 12159 0A **Photobiomodulation-based skin-care effect of organic light-emitting diodes** [12159-14]
- 12159 0B **Integrated photoacoustic and ultrasonic endoscopy as a new tool for the early diagnosis of malignant biliary stricture** [12159-15]
- 12159 0C **Opto-chemical disinfection of bacterial pathogens in mature biofilms grown in flexible endoscope** [12159-17]
- 12159 0D **Phlorotannin-combined photobiomodulation for prevention of tracheal stomal stenosis post-tracheostomy: in-vitro and in-vivo evaluations** [12159-18]
- 12159 0E **Optical and thermal effects of air trap on cylindrical laser treatment of tubular stenosis** [12159-19]
- 12159 0F **Stimulatory effects of laser wavelengths on proliferation and angiogenesis of colon cancer: in-vitro and in-vivo evaluations** [12159-20]
- 12159 0G **Deep-learning-based characterization of laser-induced scar tissue** [12159-22]
- 12159 0H **Picosecond laser irradiation by using micro-lens arrays and diffractive optical elements on different skin types** [12159-23]

