PROGRESS IN BIOMEDICAL OPTICS AND IMAGING Vol. 24 No. 10

# Molecular-Guided Surgery: Molecules, Devices, and Applications IX

Sylvain Gioux Summer L. Gibbs Brian W. Pogue Editors

28–29 January 2023 San Francisco, California, United States

Sponsored by SPIE

Cosponsored by Intuitive Surgical (United States) Karl Storz SE & Co. KG (Germany) Modulim (United States) OnLume, Inc. (United States) Quel Imaging, LLC (United States) Stryker (United States) SurgiMab (France) Trace Biosciences (United States)

Published by SPIE

Volume 12361

Proceedings of SPIE, 1605-7422, V. 12361 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 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 *Molecular-Guided Surgery: Molecules, Devices, and Applications IX,* edited by Sylvain Gioux, Summer L. Gibbs, Brian W. Pogue, Proc. of SPIE 12361, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510658271 ISBN: 9781510658288 (electronic)

Published by **SPIE** P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) SPIE.org Copyright © 2023 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. 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.



**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

v Conference Committee

### IMAGING SYSTEMS AND ADVANCED IMAGING METHODS I

12361 02 Protoporphyrin IX delayed fluorescence imaging: a modality for wide range surgical guidance [12361-7]

#### IMAGING SYSTEMS AND ADVANCED IMAGING METHODS II

- 12361 03 An ambient light-compatible, fluorescence-guided surgery imaging platform for real-time clinical assessment of vascular perfusion and flap viability in breast reconstruction [12361-13]
- 12361 04 Automated motion artifact correction for dynamic contrast-enhanced fluorescence imaging during open orthopedic surgery [12361-15]
- 12361 05 Rapid, variable aperture approach to quantify depth of fluorescence in a heterogenous medium [12361-14]

#### **CONTRAST AGENTS**

12361 06 A new candidate agent for fluorescence-guided neurosurgery produces high, persistent tumor contrast shortly after administration [12361-19]

# PRECLINICAL AND CLINICAL TRANSLATION I

12361 07 Deriving clinical parameters for paired agent imaging in head and neck squamous cell carcinomas: efficient methodology for the measurement of plasma fluorescence [12361-23]

#### PRECLINICAL AND CLINICAL TRANSLATION II

- 12361 08 Fluorescence-guided and molecularly guided debridement: identifying devitalized and infected tissue in orthopaedic trauma (Invited Paper) [12361-24]
- 12361 09 Use of freshly amputated human limbs for pre-clinical evaluation of molecular-targeted fluorescent probes [12361-25]

- 12361 0A Risk prediction on orthopaedic trauma patients for fracture-associated infection using dynamic contrast enhanced-fluorescence imaging [12361-26]
- 12361 OB Early identification of life-threatening soft-tissue infection using dynamic fluorescence imaging: first-in-kind clinical study of first-pass kinetics [12361-27]

## PRECLINICAL AND CLINICAL TRANSLATION III

- 12361 OC Fluorescence mesoscopic imaging of whole lymph nodes for intraoperative sentinel lymph node biopsy procedures (Invited Paper) [12361-28]
- 12361 0D First demonstration of a novel nerve-targeting fluorophore in a cohort of ex vivo human tissues [12361-30]

# **CLINICAL APPLICATIONS**

12361 OETumor-targeted precision surgery (Invited Paper) [12361-34]12361 OFProceduralist criteria for evaluating interface utility of novel imaging modalities in early phase<br/>clinical trials: evaluating the need for standardized criteria [12361-37]12361 OGCorrelation of fluorescence optomics method classification performance to varying expression<br/>level of epidermal growth factor receptor [12361-36]

# POSTER SESSION

12361 OH Raman macroscopic imaging system for intraoperative brain cancer detection [12361-43]