

# ***Molecular-Guided Surgery: Molecules, Devices, and Applications VII***

**Sylvain Gioux**  
**Summer L. Gibbs**  
**Brian W. Pogue**  
*Editors*

**6–11 March 2021**  
**Online Only, United States**

*Sponsored and Published by*  
SPIE

**Volume 11625**

Proceedings of SPIE, 1605-7422, V. 11625

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

Molecular-Guided Surgery: Molecules, Devices, and Applications VII, edited by Sylvain Gioux,  
Summer L. Gibbs, Brian W. Pogue, Proc. of SPIE Vol. 11625, 1162501 · © 2021  
SPIE · CCC code: 1605-7422/21/\$21 · doi: 10.1117/12.2596804

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 *Molecular-Guided Surgery: Molecules, Devices, and Applications VII*, edited by Sylvain Gioux, Summer L. Gibbs, Brian W. Pogue, Proc. of SPIE 11625, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510640856  
ISBN: 9781510640863 (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

---

## COMPUTATIONAL SOLUTIONS FOR IMAGE GUIDED SURGERY

---

- 11625 09 **Machine learning and the Gegenbauer Kernel improve mapping of sub-diffuse optical properties in the spatial frequency domain** [11625-1]

---

## FGS IMAGING SYSTEMS

---

- 11625 0C **Fluorescence depth estimation in pre-clinical oral cancer models using spatial frequency domain imaging** [11625-4]
- 11625 0E **An 18-band snapshot hyperspectral imaging system for sentinel lymph node dissection with multiple near-infrared fluorophores** [11625-6]
- 11625 0I **Pulsed-light illumination optical system integrated into surgical microscope for 5-ALA-induced tumor fluorescence detection without surgical process interruption** [11625-10]
- 11625 0K **Smartphone-based surgical image guidance: future or fantasy?** [11625-21]

---

## CONTRAST AGENTS

---

- 11625 0N **An intravenous fluorophore for enhanced intraoperative nerve visualization** [11625-12]
- 11625 0P **A hyperspectral approach for recovering agent excretion biodistributions using whole-body fluorescence cryo-imaging** [11625-14]
- 11625 0Q **Monitoring cancer cell surface receptor expression during anti-angiogenesis therapy in vivo** [11625-15]

---

## FGS CLINICAL USE

---

- 11625 0W **ICG-based dynamic contrast-enhanced fluorescence imaging guided open orthopaedic surgery: pilot patient study** [11625-19]
- 11625 0X **A method for validating depth-resolved biodistributions in topically-stained specimen with multi-channel fluorescence cryo-imaging** [11625-20]

