

PROGRESS IN BIOMEDICAL OPTICS AND IMAGING

Vol. 27 No. 24

# ***Biomedical Vibrational Spectroscopy 2026: Advances in Research and Industry***

**Zhiwei Huang**

*Editor*

**17–18 January 2026**

**San Francisco, California, United States**

*Sponsored and Published by*  
SPIE

**Volume 13846**

Proceedings of SPIE, 1605-7422, V. 13846

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](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 *Biomedical Vibrational Spectroscopy 2026: Advances in Research and Industry*, edited by Zhiwei Huang, Proc. of SPIE 13846, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 1605-7422

ISSN: 2410-9045 (electronic)

ISBN: 9781510696051

ISBN: 9781510696068 (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 © 2026 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

v *Conference Committee*

---

## STIMULATED RAMAN IMAGING WITH AI IN BIOMEDICINE

---

13846 02 **Toward real-time non-invasive transdermal glucose sensing via stimulated Raman scattering (SRS)** [13846-3]

---

## RAMAN SPECTROSCOPY WITH AI FOR BIOMEDICAL APPLICATIONS I

---

13846 03 **Label-free Raman spectroscopy integrated with machine learning for cancer early detection** [13846-8]

---

## RAMAN SPECTROSCOPY WITH AI FOR BIOMEDICAL APPLICATIONS II

---

13846 04 **Raman imaging and principal component analysis for cell vibrational morphology** [13846-11]

13846 05 **Spectroscopic roadmap to non-ionizing radiation bone screening** [13846-13]

13846 06 **Fixed pattern and aberration correction for improved spectral analysis of intact and exposed human finger specimens** [13846-14]

---

## SERS AND AI IN BIOMEDICAL DIAGNOSIS

---

13846 07 **Surface-enhanced Raman spectroscopy with Ag@Ni-NiO core-shell nanowires for breast cancer detection** [13846-16]

13846 08 **SpectraGuru: a community-guided path toward scalable Raman and SERS analysis** [13846-19]

13846 09 **Towards high throughput live cell FTIR for drug discovery** [13846-20]

13846 0A **Optoexposomics: integrating biophotonics and exposomics towards precision health** [13846-21]

**POSTER SESSION**

---

- 13846 0B **Classification of kidney transplant rejection using 1D-CNN and SHAP explainability on Raman spectroscopy** [13846-23]
- 13846 0C **Background-free correlation spectroscopy using time-resolved stimulated Raman scattering** [13846-24]
- 13846 0D **RAMBO: an open-source web application for Raman spectral analysis and tissue characterization** [13846-25]
- 13846 0E **PFA fixation effects on mouse brain microstructure via Brillouin–Raman imaging** [13846-26]