Advanced Chemical Microscopy for Life Science and Translational Medicine 2021

Ji-Xin Cheng Wei Min Garth J. Simpson Editors

6-11 March 2021 Online Only, United States

Sponsored by SPIE

Cosponsored by

Photothermal Spectroscopy Corporation (United States) • DRS Daylight Solutions (United States) APE Angewandte Physik & Elektronik GmbH (Germany) • VibroniX, Inc. (United States) • Leica Microsystems GmbH (Germany) • Spectra-Physics (United States) • Horiba Scientific (United States) Refined Laser Systems (Germany)

Published by SPIE

Volume 11656

Proceedings of SPIE, 1605-7422, V. 11656

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 Advanced Chemical Microscopy for Life Science and Translational Medicine 2021, edited by Ji-Xin Cheng, Wei Min, Garth J. Simpson, Proceedings of SPIE Vol. 11656 (SPIE, Bellingham, WA, 2021) Seven-digit Article CID Number.

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

ISBN: 9781510641471 ISBN: 9781510641488 (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 © 2021, 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 \$21.00 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 1605-7422/21/\$21.00.

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: 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

	RAMAN/CARS/SRS I
11656 OC	Hyper-Raman spectroscopy of the methyl group contributions to hydrogen bonding in DMSO-methanol mixtures [11656-34]
	DATA SCIENCE IN CHEMICAL MICROSCOPY I
11656 ON	Spectral super-resolution spectroscopy for biomedical applications [11656-3]
11656 OP	Second harmonic phase imaging enabled by deep learning [11656-5]
	RAMAN/CARS/SRS II
11656 OU	High-speed super-multiplex imaging of brain tissue [11656-38]
	IR AND PHOTOTHERMAL CHEMICAL IMAGING
11656 18	Photothermal infrared imaging: identification and visualization of micro- and nanoplastics in environmental matrices [11656-11]
	RAMAN/CARS/SRS III
11656 1H	Drug detection in different pharmaceutical dosage forms with Bessel beam-based Raman spectroscopy [11656-48]
	IR AND PHOTOTHERMAL CHEMICAL IMAGING & NEW METHODS FOR CHEMICAL IMAGING
11656 1P	Compact silicon photomultiplier detection of multimodal multiphoton microscopy signals [11656-21]