Optics and Biophotonics in Low-Resource Settings VI

David Levitz Aydogan Ozcan Editors

1-2 February 2020 San Francisco, California, United States

Sponsored and Published by SPIE

Volume 11230

Proceedings of SPIE, 1605-7422, V. 11230

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 Optics and Biophotonics in Low-Resource Settings VI, edited by David Levitz, Aydogan Ozcan, Proceedings of SPIE Vol. 11230 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

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

ISBN: 9781510632233 ISBN: 9781510632240 (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 © 2020, 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 1605-7422/20/\$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

v Authors

vii Conference Committee

OPTICS FOR LOW RESOURCE SETTINGS

11230 05 Low cost microscope for malarial parasitemia quantification in microfluidically generated blood smears [11230-4]

MOBILE MICROSCOPY, SENSING AND DIAGNOSTICS TECHNOLOGIES

11230 0A Field-portable multi-modal chip-based fluorescence, bright field and quantitative phase microscopy using smartphone detecting system [11230-9]

EMERGING PLATFORMS FOR IMAGING, SENSING AND DIAGNOSTICS

- 11230 01 **Optical imaging using an oil droplet and a cellphone camera** [11230-19]
- 11230 0K Light-assisted drying (LAD) for anhydrous preservation of biologics: using Raman spectroscopy to assess the uniformity of drying in processed samples [11230-21]
- 11230 OL Visual field self-evaluation by free-focus retinal-scanning laser display technology [11230-22]
- 11230 0M Thin-film plastics used in microfluidic channels for microscopy imaging in low resource settings [11230-23]

POSTER SESSION

- 11230 0Y A portable device using a single-board computer for white light and fluorescence widefield images [11230-33]
- 11230 12 Multi-spectral vascular oximetry of rat dorsal spinal cord [11230-38]