

PROGRESS IN BIOMEDICAL OPTICS AND IMAGING

Vol. 25 No. 22

Microfluidics, BioMEMS, and Medical Microsystems XXII

Bonnie L. Gray
Bastian E. Rapp
Colin Dalton
Editors

28–29 January 2024
San Francisco, California, United States

Sponsored and Published by
SPIE

Volume 12837

Proceedings of SPIE, 1605-7422, V. 12837

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.

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 *Microfluidics, BioMEMS, and Medical Microsystems XXII*, edited by Bonnie L. Gray, Bastian E. Rapp, Colin Dalton, Proc. of SPIE 12837, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 1605-7422

ISSN: 2410-9045 (electronic)

ISBN: 9781510669338

ISBN: 9781510669345 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2024 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.

**SPIE. DIGITAL
LIBRARY**

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*

MICROFLUIDICS I

12837 02 **Modeling the coulometric data for on-chip flow rate detection as a first order decay problem in a microfluidic device** [12837-4]

MICROFABRICATION I

12837 03 **Adaptable gold solid microneedle arrays for drug delivery (Best Student Paper Award)** [12837-7]

12837 04 **Vibrational strength of piezoelectric array in flexible substrates for conductive hearing aids** [12837-32]

OPTOFLUIDICS I

12837 05 **Surface-enhanced Raman spectroscopic system combined with dielectrophoresis using nanostructured microfluidic chip** [12837-11]

MICROFABRICATION II

12837 06 **Low-cost production of biocompatible single-sized micron-sized iron particles in microfluidic channels under strong magnetic field (Invited Paper)** [12837-12]

12837 07 **Femtosecond laser 3D printing in three colors of fluorescent protein (Invited Paper, 3D Printing Best Paper Award in BiOS)** [12837-13]

12837 08 **High-resolution structuring of transparent spinel ceramics** [12837-14]

12837 09 **Replicative manufacturing of metal molds for low surface roughness polymer replication** [12837-15]

APPLICATIONS I

12837 0A **Nano-sieve-based on-chip particle concentration for nucleic acid sensing** [12837-17]

APPLICATIONS II

12837 0B **A 3D printed microfluidic particle sorting device [12837-21]**

OPTOFLUIDICS II

12837 0C **Integrated opto-fluidic device for high-power living cell exposure and detection [12837-26]**

12837 0D **Discrimination of bacterial concentrations of *Staphylococcus aureus* based on statistical spectral analysis using a smart-spacer prototype with a low-resolution spectrometer unit as an application during two-stage total endoprosthesis (TEP) revision [12837-36]**

DIGITAL POSTER SESSION

12837 0E **3D-printed droplet-based microfluidic sensor based on ion beam-induced graphitic electrodes on diamond for dopamine detection [12837-18]**