

Visualizing and Quantifying Drug Distribution in Tissue IV

Kin Foong Chan
Conor L. Evans
Editors

1 February 2020
San Francisco, California, United States

Sponsored and Published by
SPIE

Volume 11219

Proceedings of SPIE, 1605-7422, V. 11219

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

Visualizing and Quantifying Drug Distribution in Tissue IV, edited by Kin Foong Chan,
Conor L. Evans, Proc. of SPIE Vol. 11219, 1121901 · © 2020 SPIE
CCC code: 1605-7422/20/\$21 · doi: 10.1117/12.2569599

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 *Visualizing and Quantifying Drug Distribution in Tissue IV*, edited by Kin Foong Chan, Conor L. Evans, Proceedings of SPIE Vol. 11219 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

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

ISBN: 9781510632011
ISBN: 9781510632028 (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.

**SPIE. DIGITAL
LIBRARY**

SPIDigitalLibrary.org

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	<i>Authors</i>
vii	<i>Conference Committee</i>

PHARMACOKINETIC AND PHARMACODYNAMIC TOMOGRAPHY IN PRECLINICAL RESEARCH

11219 07	Kernel principle component analysis applied to Raman spectra to differentiate drugs administered to rabbit cornea in blind study [11219-6]
11219 09	Estimating drug delivery using hybrid system for simultaneous dynamic MRI and fluorescence tomography [11219-8]

NOVEL MODEL AND IMAGING SCREENING TOOLS FOR DRUG DEVELOPMENT

11219 0C	Quantification of anti-HER2 drug internalization in human breast cancer cells using fluorescence lifetime FRET imaging [11219-11]
11219 0D	Alkyne-tag SERS imaging for visualizing small molecule drugs in live cells [11219-12]
11219 0F	Intracellular paired agent imaging enables improved evaluation of tyrosine kinase inhibitor target engagement [11219-14]
11219 0G	A paired-agent fluorescent molecular imaging strategy for quantifying antibody drug target engagement in in vivo window chamber xenograft models [11219-15]

ADVANCED METHODS IN DRUG DETECTION AND IMAGING

11219 0K	Noninvasive in vivo mapping of intracellular signaling proteins using a pairing of targeted and untargeted fluorescently labeled small molecule kinase inhibitors [11219-19]
11219 0L	Dye diffusion proximal to in situ forming implants is increased by ultrasound stimulation [11219-20]
11219 0M	Developing a novel hyperspectral imaging cryomacrotome for whole body fluorescence imaging [11219-21]

POSTER SESSION

- 11219 0O **Fluorescent imaging technologies for in situ measurement of drug target engagement and cell signaling pathways [11219-23]**
- 11219 0P **Effect of nonspecific binding of imaging agents to plasma protein in the paired-agent imaging for resection during surgery (PAIRS) [11219-24]**

Authors

Numbers in the index correspond to the last two digits of the seven-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first five digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Ando, Jun, 0D
Bando, Kazuki, 0D
Barroso, Margarida, 0C
Berndl, Elizabeth S. L., 0L
Budziszewski, Emily, 0L
Byrd, Brook K., 0M
Chang, Young-Hwan, 0O
Chin, Koei, 0O
Davis, Scott C., 09, 0G, 0M
Dodo, Kosuke, 0D
Exner, Agata A., 0L
Folaron, Margaret R., 09, 0G
Fujita, Katsumasa, 0D
Gibbs, Summer L., 0F, 0K, 0O
Gil, Eddie M., 07
Gray, Joe W., 0O
Haldar, Chandrika, 0G
Intes, Xavier, 0C
Jeganathan, Selva, 0L
Jones, Jocelyn, 0O
Kawata, Satoshi, 0D
Kayaalp-Nalbant, Elif, 0G
Keppler, Mark A., 07
Koike, Kota, 0D
Kolios, Michael C., 0L
Korber, Jesse R., 0F, 0K
Kwon, Sunjong, 0O
McMahon, Nathan P., 0F, 0O
Meng, Boyu, 09, 0G, 0M
Nederlof, Michel A., 0O
Ochoa, Marien, 0C
O'Connor, Sean P., 07
Rounds, Cody, 0G
Rudkouskaya, Alena, 0C
Sadeghipour, Negar, 0G
Samkoe, Kimberley S., 09, 0F, 0G, 0K, 0P
Scully, Marlan O., 07
Smith, Jason, 0C
Smith, Nicholas, 0D
Sodeoka, Mikiko, 0D
Solanki, Allison, 0F, 0K, 0O
Strawbridge, Rendall R., 09, 0G, 0M
Tichauer, Kenneth M., 09, 0F, 0G, 0K, 0P
Wang, Lei, 0F, 0K
Wirth, Dennis J., 0M
Xu, Xiaochun, 0P
Yakovlev, Vladislav V., 07

Conference Committee

Symposium Chairs

Jennifer K. Barton, The University of Arizona (United States)
Wolfgang Drexler, Medizinische Universität Wien (Austria)

Program Track Chairs

Brian Jet-Fei Wang, Beckman Laser Institute and Medical Clinic,
University of California, Irvine (United States)
Eva Sevick, The University of Texas Health Science Center at Houston
(United States)

Conference Chairs

Kin Fong Chan, Simpson Interventions, Inc. (United States)
Conor L. Evans, Wellman Center for Photomedicine (United States)

Conference Program Committee

Zane A. Arp, U.S. Food and Drug Administration (United States)
Huang-Chiao Huang, University of Maryland (United States)
Anand T. Kumar, Massachusetts General Hospital (United States)
Melissa L. Mather, Keele University (United Kingdom)
Wei Min, Columbia University (United States)
Alex J. Walsh, Morgridge Institute for Research (United States)
Cristina L. Zavaleta, The University of Southern California
(United States)
Kurt R. Zinn, The University of Alabama at Birmingham (United States)

Session Chairs

Introduction

Conor L. Evans, Wellman Center for Photomedicine (United States)
Kin Fong Chan, Simpson Interventions (United States)

- 1 Pharmacokinetic and Pharmacodynamic Tomography in
Translational Research
Alex J. Walsh, Texas A&M University (United States)
- 2 Pharmacokinetic and Pharmacodynamic Tomography in Preclinical
Research
Cristina L. Zavaleta, The University of Southern California
(United States)

- 3 Novel Model and Imaging Screening Tools for Drug Development
Cristina L. Zavaleta, The University of Southern California
(United States)
- 4 Advanced Methods in Drug Detection and Imaging
Sinyoung Jeong, Massachusetts General Hospital (United States)
Isaac Pence, Massachusetts General Hospital (United States)