BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
Tromberg, Bruce J.	Professor
eRA COMMONS USER NAME BRUCETROMBERG	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Vanderbilt University	B.A.	1979	Chemistry
Oak Ridge National Laboratory	Predoc Fellow	1986-1988	Dept. of Energy
University of Tennessee, Knoxville	Ph.D	1988	Chemistry
Beckman Laser Institute	Postdoc	1989	Photomedicine

A. Personal Statement

I have been involved in the development of Biophotonics technologies for more than 25 years. A major emphasis of my lab has been on in vivo imaging technologies based on non-linear optical microscopy and diffuse optical spectroscopy. We have pioneered methods based on broadband diffuse optical spectroscopy (DOS), spatial frequency domain imaging (SFDI), second harmonic generation tomography, and two-photon excited fluorescence. These are among several technologies, computational methods, and support facilities that are available in the Laser Microbeam and Medical Program (LAMMP), an NIH P41 Biotechnology center I direct in the Beckman Laser Institute and Medical Clinic (BLI).

B. Positions and Honors

Professional Appointments

1990-1995 Assistant Professor, Department of Surgery, Beckman Laser Institute, UC Irvine
1994-2004 Co-Director, Optical Biology Core and Photomedicine Program, NCI-Chao Family Comprehensive Cancer Center
1995-2002 Associate Professor, Department of Surgery, UC Irvine
1997-present Director, Laser Microbeam and Medical Program, (LAMMP), NIH-National Biomedical Technology Resource Center, Beckman Laser Institute, UC Irvine
2002–2005 Vice Chair, Department of Biomedical Engineering, UC Irvine
2002-present Professor, Department of Biomedical Engineering and Surgery, UC Irvine
2002-2003 Interim Director, Beckman Laser Institute, Chair, Beckman Division, Department of Surgery
2003-present Director, Beckman Laser Institute and Medical Clinic, UC Irvine
2004-present Co-Leader, Onco-Imaging and Biotechnology Program, NCI-Chao Family Comprehensive Cancer Center

Honors and Awards

1986-1988 DOE - Oak Ridge Assoc. Universities Pre-doctoral Fellowship, Oak Ridge National Laboratory
1987 R&D-100 Award
1988-1990 Hewitt Foundation Postdoctoral Fellow, Beckman Laser Institute
1992-1995 Whitaker Foundation Young Investigator Award
1994-1999 NIH FIRST Award
1998 Visiting Prof., Institute of Applied Optics, Swiss Federal Institute of Technology (EPFL)
1999 Cornelius Hopper Innovation Award, California Breast Cancer Research Program
2000 Avon Foundation Breast Cancer Research Scholar
2001 Coherent Young Investigator Award in Biophotonics
2001 OE Magazine Technology Innovator Award
2003-2006 Board member, International Society for Optical Engineering (SPIE)
2005 Athalie Clark Medical Research Award
2005-present Board member, Hewitt Foundation for Medical Research
2006 Fellow, American Institute of Medical and Biological Engineers (AIMBE)

2006	Fellow, The International Society of Optical Engineering (SPIE)
2009	SPIE Directors Award
2010-2012	Board member, International Society for Optical Engineering (SPIE)
2011	Sackler Lecturer, Tel Aviv University
2012	Council member, NIH National Institute of Biomedical Imaging and Bioengineering (NIBIB)

Professional Activities

1997	The Engineering Foundation, Conference co-Chair "Advances in Optical Technologies for Medicine and Surgery"
1998-present	Advisory Board, NIH P41 Center: Laboratory for Fluorescence Dynamics, UIUC and UC Irvine
1999-2009	Editor-in-Chief, Journal of Biomedical Optics
2000	Conference co-chair, OSA Topical Meetings, “Photon Migration 2000”
2001-2002	Chair, Optics in Biology and Medicine Division, Optical Society of America
2001-2011	Beckman Foundation Grants Advisory Council
2001-present	BiOS Conference Co-Chair, Optical Tomography & Spectroscopy of Tissue
2002	Co-chair, Optical Society of America Spring Topical Meetings on Biomedical Optics
2003-2008	Co-Chair, NCI steering committee for Optical Imaging Networks in Cancer
2004	U.S. Chair, Gordon Research Conference on Lasers in Biology and Medicine
2007-present	American College of Radiology Imaging Networks, Experimental Imaging Sciences Committee
2007-2008	Member, NIBIB, Program Progress Review Group, Optical Imaging
2007-present	Advisory Board, Department of Biomedical Engineering, Cornell University
2009	Co-Chair, NCRR Workshop on T1 Translational Research, National Institutes of Health
2009-present	Advisory Board, NIH P41 Center for Magnetic Resonance and Optical Imaging, UPENN
2011-present	Advisory Board, NIH P41 Laser Biomedical Research Lab, MIT
2010-2011	Department of Defense, CDMRP Era of Hope, Technical Program Committee
2010	Editorial Board Member, Measurement Science and Technology
2012-2013	Susan G. Komen for the Cure, Grant Advisory Committee
2013	Editorial Board Member, Cancer Research

C. 15 Selected publications (>300)

1. Konecky, Soren D.; Tromberg, Bruce J. *Focusing light in scattering media,* Nature Photonics, 5, 135-136, 2011, PMC3204879.
2. O'Sullivan TD, Cerussi AE, Cuccia DJ, Tromberg BJ. *Diffuse optical imaging using spatially and temporally modulated light.*J Biomed Opt. 2012 Jul;17(7):071311. doi: 10.1117/1.JBO.17.7.071311. PMCID: PMC3607494
3. Koike MA, Lin AJ, Pham J, Nguyen E, Yeh JJ, Rahimian R, Tromberg BJ, Choi B, Green KN, LaFerla FM. *APP knockout mice experience acute mortality as the result of ischemia.* PLoS One. 2012;7(8):e42665. doi: 10.1371/journal.pone.0042665. Epub 2012 Aug 9. PMCID: PMC3415410
4. Liu G, Lin AJ, Tromberg BJ, Chen Z. *A comparison of Doppler optical coherence tomography methods.* Biomed Opt Express. 2012 Oct 1;3(10):2669-80. doi: 10.1364/BOE.3.002669. Epub 2012 Sep 26. PMCID: PMC3469988
5. Kim JG, Lee J, Mahon SB, Mukai D, Patterson SE, Boss GR, Tromberg BJ, Brenner M. *Noninvasive monitoring of treatment response in a rabbit cyanide toxicity model reveals differences in brain and muscle metabolism.*J Biomed Opt. 2012 Oct;17(10):105005. doi: 10.1117/1.JBO.17.10.105005. PMCID: PMC3603151
6. Balu M, Mazhar A, Hayakawa CK, Mittal R, Krasieva TB, König K, Venugopalan V, Tromberg BJ. *In vivo multiphoton NADH fluorescence reveals depth-dependent keratinocyte metabolism in human skin.* Biophys J. 2013 Jan 8;104(1):258-67. doi: 10.1016/j.bpj.2012.11.3809. Epub 2013 Jan 8. PMCID: PMC3540245
7. O'Sullivan TD, Leproux A, Chen JH, Bahri S, Matlock A, Roblyer D, McLaren CE, Chen WP, Cerussi AE, Su MY, Tromberg BJ. *Optical imaging correlates with magnetic resonance imaging breast density and reveals composition changes during neoadjuvant chemotherapy.*Breast Cancer Res. 2013 Feb 22;15(1):R14. [Epub ahead of print] PMCID: PMC3672664
8. Krasieva TB, Stringari C, Liu F, Sun CH, Kong Y, Balu M, Meyskens FL, Gratton E, Tromberg BJ. *Two-photon excited fluorescence lifetime imaging and spectroscopy of melanins in vitro and in vivo.*J Biomed Opt. 2013 Mar;18(3):31107. doi: 10.1117/1.JBO.18.3.031107. PMCID: PMC3595716

9. Alexander BS, Gelb AW, Mantulin WW, Cerussi AE, Tromberg BJ, Yu Z, Lee C, Meng L. *Impact of stepwise hyperventilation on cerebral tissue oxygen saturation in anesthetized patients: a mechanistic study.* Acta Anaesthesiol Scand. 2013 May;57(5):604-12. doi: 10.1111/aas.12054. Epub 2013 Jan 2. PMID: 23278596. PMCID in progress
10. Roblyer D, O'Sullivan TD, Warren RV, Tromberg BJ. *Feasibility of direct digital sampling for diffuse optical frequency domain spectroscopy in tissue.* Meas Sci Technol. 2013;24(4):045501. doi:10.1088/0957-0233/24/4/045501. PMCID in progress
11. Lin AJ, Ponticorvo A, Konecky SD, Cui H, Rice TB, Choi B, Durkin AJ, Tromberg BJ. *Visible spatial frequency domain imaging with a digital light microprojector.* J Biomed Opt. 2013 Sep 1;18(9):96007. doi: 10.1117/1.JBO.18.9.096007. PMCID: PMC3762936
12. Nadeau KP, Ponticorvo A, Lee HJ, Lu D, Durkin AJ, Tromberg BJ. Quantitative assessment of renal arterial occlusion in a porcine model using spatial frequency domain imaging. Opt Lett. 2013;38(18):3566-3569. http://dx.doi.org/10.1364/OL.38.003566 PMID: 24104815 PMCID in progress
13. Leproux A, Durkin A, Compton M, Cerussi AE, Gratton E, Tromberg BJ. *Assessing tumor contrast in radiographically dense breast tissue using Diffuse Optical Spectroscopic Imaging (DOSI).* Breast Cancer Res. 2013 Sep 26;15(5):R89. [Epub ahead of print] PMID: 24066941 PMCID in progress
14. Rice TB, Kwan E, Hayakawa CK, Durkin AJ, Choi B, Tromberg BJ. *Quantitative, depth-resolved determination of particle motion using multi-exposure, spatial frequency domain laser speckle imaging*. Biomedical Optics Express. 2013 Dec 1;4(12). DOI:10.1364/BOE.4.002880
15. Lin AJ, Castello NA, Lee G, Green KN, Durkin AJ, Choi B, Laferla F, Tromberg BJ. *In vivo optical signatures of neuronal death in a mouse model of Alzheimer's disease*. Lasers Surg Med. 2013 Nov 28. doi: 10.1002/lsm.22206. [Epub ahead of print]

D. Research Support

NIH - P41EB015890 Tromberg (PI) 04/15/13-03/31/18
"*A Laser Microbeam and Medicine Biotechnology Resource*"
The Laser Microbeam and Medical Program (LAMMP) is a National Biomedical Technology Center dedicated to the development, application, and dissemination of optical technologies in biology and medicine.

NIH - R01CA142989 Tromberg (PI) 01/01/14-12/31/17
"Developing DOSI Technology for Monitoring Response to Breast Cancer Chemotherapy"
Diffuse optical spectroscopic imaging is developed for clinical translational studies to monitor and predict pre-surgical neoadjuvant chemotherapy response early in treatment.

ACRIN - ACR-6691 Tromberg (PI) 07/01/12-12/31/13
"*Monitoring and Predicting Breast Cancer Neoadjuvant Chemotherapy Response Using Diffuse Optical Spectroscopic Imaging (DOSI)*"
This contract supports data management and patient care infrastructure for an ECOG-ACRIN multi-center trial.

NIH - R21EB014440 Tromberg (PI) 07/01/12-06/30/14
"Multi-Frequency Synthesis and Orientation Control in SFDI"
This award supports new, bedside medical imaging methods for detecting disease, monitoring therapy response, and guiding surgical procedures.

NIH - R21NS078634 Tromberg (PI) 05/01/12-04/30/14
"*Spectroscopic Localization of Hemodynamic Signals in the Rat Cortex*"
Broadband Spatial Frequency Domain Imaging and Tomography is developed for in vivo imaging studies of metabolic activity in cortex.

DOD-AFOSR - FA9550-10-1-0538 Berns (PI) 10/01/13-09/30/16
"Military Photomedicine Program"
This is a core grant for the Beckman Laser Institute. Dr. Tromberg's collaborative project involves development of optical diagnostic technologies for trauma and critical care monitoring.
Role: Co-I

NCI - 2P30CA62203 Meysekens (PI) 02/01/09-01/31/14
"*University of California, Irvine Cancer Center Support Grant*"
Supports the research and clinical programs of the UC Irvine Chao Family Comprehensive Cancer Center. Dr. Tromberg is *Onco-imaging and Biotechnology* Co-Program Leader.
Role: Program Leader

NIH - P50GM076516 Landers (PI) 08/02/13-07/31/17
"*Systems Biology of Morphogenesis and Spatial Information Flow*"
The center supports a program of interdisciplinary research, technology development, training, and outreach aimed at furthering the development of the spatial side of systems biology.
Role: Co-Investigator

NIH/NCRR - UL1RR031985 Cooper (PI) 07/01/10-06/30/15
"*An Institute for Clinical and Translational Science*"
This center grant supports clinical translational research at UC Irvine. Dr. Tromberg is the leader of the Translational Technology Core program.
Role: Co-Investigator

NIH - R01DE022820-01A1 Frangioni (PI) 02/01/2013-01/31/18
"Real-Time Flap Viability Monitoring during Facial Transplantation using SFDI"
This subaward supports the optimization of SFDI technology for intraoperative guidance during facial transplant.
Role: Subaward PI

NSF - DGE1144901 Venugopalan (PI) 07/01/12-06/30/17
"IGERT: Biophotonics across Energy, Space, and Time (BEST)"
The BEST IGERT is a training grant that provides graduate trainee support to participate in a new interdisciplinary model for graduate student education and training in Biophotonics than spans and includes graduate students in the biological sciences, physical sciences and engineering.
Role: Co-PI

Mentored Awards
NIH-NIA - F30AG039949 07/01/11-06/31/14
"Novel translatable optical imaging platform for staging vascular impairment in Alzheimer's disease".
Trainee: Alexander Lin

DOD- CDMRP Postdoctoral Fellowship Award 11/01/10- 10/03/13
"Development of a Quantitative Tissue Optical Index of Breast Density for Prediction of Hormone Therapy Response"
Trainee: Tom O'Sullivan

NIH-NIBIB K25EB007309 8/1/08-7/31/14,
"A Virtual Tissue Simulator for Biomedical Optics"
Trainee: Carole Hayakawa