

BIOGRAPHICAL SKETCH

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NAME Tromberg, Bruce J.		POSITION TITLE Professor		
eRA COMMONS USER NAME BRUCETROMBERG				
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>				
INSTITUTION AND LOCATION		DEGREE <i>(if applicable)</i>	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. Positions and Honors.

Professional Appointments

- 1990-1995 Assistant Professor, Department of Surgery, Beckman Laser Institute, UC Irvine
1994-present Co-Director, Optical Biology and Photomedicine Programs, NCI-Chao Family Comprehensive Cancer Center, UC Irvine.
1995-2002 Associate Professor, Department of Surgery, UC Irvine.
1997-present Director, Laser Microbeam and Medical Program, (LAMMP), NIH-Biotechnology Resource, Beckman Laser Institute, UC Irvine
1998-2002 Associate Professor, Electrical and Computer Engineering, UC Irvine.
2000-present Associate Director, Center for Biomedical Engineering, UC Irvine.
2002-2005 Vice Chair, Department of Biomedical Engineering, UC Irvine.
2002 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

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
1996 Royal Society Lecture, Symposium on Near Infrared Spectroscopy and Imaging
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 National Academy of Engineering/Humboldt Foundation GAFOE participant
2003 Board member, International Society for Optical Engineering (SPIE)
2005 Athalie Clark Medical Research Award
2006 Fellow, American Institute of Medical and Biological Engineers
2006 Fellow, The International Society of Optical Engineering

Professional Activities

- 1997 The Engineering Foundation, Conference co-Chair "Advances in Optical Technologies for Medicine and Surgery,"
- 1997-1998 Joint Working Group on Functional Imaging in Cancer, U.S. Department of Health and Human Services, Office of Women's Health and National Cancer Institute
- 1998-present 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 (2001-2002);
- 2001-present Beckman Foundation Grants Advisory Council (2001- present);
- 2002 Co-chair, Optical Society of America Spring Topical Meetings on Biomedical Optics
- 2002-present Advisory Board, Laboratory for Fluorescence Dynamics, University of Illinois
- 2003-present Co-Chair, NCI steering committee for Optical Imaging Networks (2003-present);
- 2004 Chair, Gordon Research Conference on Lasers in Biology and Medicine (2004);

B. Selected peer-reviewed publications (in chronological order).

Selected Publications

1. **Tromberg BJ**, Coquoz O., Fishkin JB, Pham T, Anderson ER, Butler J, Cahn M, Gross JD, Venugopalan, V., Pham, D. *Non-Invasive Measurements of Breast Tissue Optical Properties using Frequency-Domain Photon Migration*. Phil. Trans. Royal Society London B. 352, 661-668 (1997).
 2. Chance B, Cope M, Gratton E, Ramanujam N, **Tromberg B**, *Phase Measurement of Light Absorption and Scatter in Human Tissue*. Rev. Of Sci. Instr., 69, 3457-3481, (1998).
 3. Bevilacqua F, Piquet D, Marquet P, Gross JD, **Tromberg BJ**, Depeursinge C, *In Vivo Local Determination of Tissue Optical Properties: Applications to Human Brain*. Appl.Opt. 52, 4939-4950, (1999).
 4. Hornung R, Pham TH, Keefe KA, Berns MW, Tadir Y, **Tromberg BJ**, *Quantitative Near-Infrared Spectroscopy of Cervical Dysplasia In Vivo*, Human Reproduction, 14, 2908-2916, (1999).
 5. **Tromberg BJ**, Shah N, Lanning R, Cerussi A, Espinoza J, Pham T, Svaasand L, Butler J, *Non-Invasive In Vivo Characterization of Breast Tumors using Photon Migration Spectroscopy*. Neoplasia, 2, 1-15, (2000).
 6. Pham TH, Coquoz O, Fishkin JB, Anderson E, **Tromberg BJ**, *A Broad Bandwidth Frequency Domain Instrument for Quantitative Tissue Optical Spectroscopy*. Rev. of Sci. Instr., 71 6, 1-14, (2000).
 7. Dunn AK, Wallace VP, Coleno M, Berns MW, **Tromberg BJ**, *Influence of Optical Properties on Two-Photon Fluorescence Imaging in Turbid Samples*, App. Opt., 39, 1-8, (2000).
 8. Shah N, Cerussi A, Eker C, Espinoza J, Butler J, Fishkin J, Hornung R, **Tromberg BJ**, *Non-Invasive Functional Optical Spectroscopy of Human Breast Tissue*. Proc. Nat. Acad. Sci., 98, 4420-4425, (2001).
 9. Wallace VP, Dunn AK, Coleno ML, **Tromberg BJ**, *Two-Photon Microscopy in Highly Scattering Tissue* in Methods In Cellular Imaging, Oxford University Press, Editor: Ammasi Periasamy, (2001).
 10. Cerussi AE, Berger AJ, Bevilacqua F, Shah N, Jakubowski D, Butler J, Holcombe RF, **Tromberg BJ**, *Sources of Absorption and Scattering Contrast for Near-Infrared Optical Mammography*. Acad. Rad., 8, 211 – 218, (2001).
 11. Zoumi A, Yeh A, **Tromberg BJ**, *Imaging Cells and Extracellular Matrix In Vivo using Second-Harmonic Generation and Two-Photon Excited Fluorescence*, Proc. Nat. Acad. Sci., 99, 11014 – 11019, (2002).
 12. Yeh A, Nassif N, Zoumi A, **Tromberg BJ**, *Selective Corneal Imaging using Combined Second-Harmonic Generation And Two-Photon Excited Fluorescence*, Opt. Let., 27, 2082 – 2084, (2002).
 13. Merritt S, Bevilacqua F, Durkin AJ, Cuccia DJ, Lanning R, **Tromberg BJ**, Gulsen G, Yu H, Wang J, Nalcioglu O, *Monitoring Tumor Physiology using Near-Infrared Spectroscopy and MRI Co-Registration*, Appl. Opt., 42, 2951-2959, (2003).
 14. Merritt S, Gulsen G, Chiou G, Chu Y, Chengw D, Cerrussi AE, Durkin AJ, **Tromberg BJ**, Nalcioglu O, *Comparison of Water and Lipid Content Measurements using Diffuse Optical Spectroscopy and MRI in Emulsion Phantoms*. Tech. in Can. Res. and Treat., 2, 563-569, (2003).
 15. Yeh AT, Choi B, Nelson JS, **Tromberg BJ** *Reversible Dissociation of Collagen in Tissues*. Journal of Investigative Dermatology, 121, 1332-1335, (2003).
 16. Yeh AT, Kao B, Jung WG, Chen Z, Nelson JS, **Tromberg BJ**, *Imaging Wound Healing using OCT and Multiphoton Microscopy in an In Vitro Skin Equivalent Tissue Model*. J. Biomed. Opt. 9, 248-253, (2004).
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17. Zoumi A, Lu X, Kassab GS, **Tromberg BJ**, *Imaging Coronary Artery Microstructure Using Second-Harmonic and Two-Photon Fluorescence Microscopy*, *Biophys. J.* 87, 2778-2786, (2004).
18. Jakubowski DB, Cerussi AE, Bevilacqua FE, Shah N, Hsiang D, Butler J, **Tromberg BJ**, *Monitoring Neoadjuvant Chemotherapy in Breast Cancer using Quantitative Diffuse Optical Spectroscopy: A Case Study* *J. Biomed. Opt.* 9, 230-238 (2004)
19. Cuccia D, Bevilacqua F, Durkin AJ, **Tromberg BJ** *Modulated Imaging: Quantitation and Tomography of Turbid Media in the Spatial Frequency Domain*, *Opt. Lett.*, 30, 1354-1356, (2005).
20. Yeh AT, Hammer-Wilson M, Van Sickle D, Benton H, Zoumi A, **Tromberg BJ**, Peavy G, *Nonlinear Optical Microscopy of Articular Cartilage*, *Osteoarthritis and Cartilage* 13, 345-352, (2005).
21. Hsiang D, Shah N, Yu H, Su MY, Cerussi A, Butler J, Baick C, Mehta R, Nalcioğlu O, **Tromberg B**, *Coregistration of Dynamic Contrast Enhanced MRI and Broadband Diffuse Optical Spectroscopy for Characterizing Breast Cancer* *Tech. Can. Res. Treat.*, 4, 549-558, (2005).
22. Shah N, Gibbs J, Wolverton D, Cerussi A, Hylton N, **Tromberg BJ**, *Combined Diffuse Optical Spectroscopy and Contrast-Enhanced MRI for Monitoring Breast Cancer Neoadjuvant Chemotherapy: A Case Study* *J. Biomed. Opt.* 10, 051503 (2005).
23. **Tromberg BJ**, Cerussi A, Shah N, Compton M, Fedyk A, Hsiang D, Butler J, Mehta M *Diffuse Optics in Breast Cancer: Detecting Tumors in Pre-Menopausal Women and Monitoring Neoadjuvant Chemotherapy*, *Breast Cancer Research* 7, 279-285 (2005).
24. Lee J, El-Abaddi N, Cerussi AE, Duke A, Brenner M, **Tromberg BJ**, *Non-Invasive In Vivo Monitoring of Methemoglobin Formation and Reduction with Broadband Diffuse Optical Spectroscopy*, *J. Appl. Phys.*, 100, 615-622, (2006).
25. Lyubovitsky JG, Krasieva TB, Spencer JA, Andersen B, **Tromberg BJ**, *Imaging Corneal Pathology in a Transgenic Mouse Model using Nonlinear Microscopy*. *J. Biomed. Opt.* 11, 014013 (2006)
26. Cerussi A, Shah N, Hsiang D, Durkin A, Butler J, **Tromberg B**, *In Vivo Absorption, Scattering, and Physiologic Properties of 58 Malignant Breast Tumors Determined by Broadband Diffuse Optical Spectroscopy*, *J. Biomed Opt.*, 11, 044005 (2006)
27. Lee J, Saltzman DJ, Cerussi AE, Gelfand DV, Milliken J, Waddington T, **Tromberg BJ**, Brenner M, *Broadband Diffuse Optical Spectroscopy Measurements of Hemoglobin Concentration during Hypovolemia in Rabbits*, *Physiol. Meas.*, 27, 757-67, (2006)
28. Tang S, Krasieva TB, Chen Z, **Tromberg BJ**, *Combined Multiphoton Microscopy and Optical Coherence Tomography using a 12-fs Broadband Source*, *J. Biomed Opt.*, 11, 020502 (2006)
29. Tang S, Krasieva TB, Chen Z, Tempea G, **Tromberg BJ**, *Effect of Pulse Duration on Two-photon Excited Fluorescence and Second Harmonic Generation in Nonlinear Optical Microscopy*, *J. Biomed. Opt.* 11, 020501 (2006)
30. Madsen SJ, Sun CH, **Tromberg BJ**, Cristini V, De Magalhaes N, Hirschberg H, *Multicell Tumor Spheroids in Photodynamic Therapy*, *Lasers Surg. Med.*, 38, 555-64 (2006)
31. Raub CB, Suresh V, Krasieva T, Lyubovitsky J, Mih JD, Putnam AJ, **Tromberg BJ**, George SC, *Noninvasive Assessment of Collagen Gel Microstructure and Mechanics using Multiphoton Microscopy*, *Biophys. J.* (2006)
32. Cerussi A, Hsiang D, Shah N, Mehta R, Durkin A, Butler J, **Tromberg BJ**, *Predicting Response to Breast Cancer Neoadjuvant Chemotherapy Using Diffuse Optical Spectroscopy* *Proc. Nat. Acad. Sci.* (in press)

C. Research Support.

Ongoing Support

NIH - P41-RR01192 Tromberg (PI)

05/01/03 - 03/31/08

“A Laser Microbeam and Medicine Biotechnology Resource”

The Laser Microbeam and Medical Program (LAMMP) is a National Biomedical Technology Center dedicated to the use of lasers and optics in biology and medicine. Core programmatic research areas involve development of technologies for enhancing our understanding of how light interacts with and propagates through cells and tissues.

California BCRP - 10EB-0208 Tromberg (PI) 07/01/04 - 06/30/07

“Breast Cancer Functional Imaging with Optics and MRI”

This translational research grant supports combined optical –MRI imaging for characterizing optical and physiological properties of breast tumors and measuring the effects of neoadjuvant chemotherapy on tumors.

NIH - U54CA105480 Tromberg (PI) 09/01/03 - 08/31/08

“A Network for Translational Research in Optical Imaging: Multi-Dimensional Diffuse Optical Imaging in Breast Cancer”

This multi-center grant supports the formation of a national network to standardize diffuse optical imaging in breast cancer.

Air Force - F49620-00-1-0371 Berns (PI) 01/01/04 -12/31/06

“A Center for Free Electron Laser Related Biomedical Research”

The purpose of this program is to define the medical role of the Free Electron Laser. 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

NIH - RFA-CA-R21/R33 Nalcioglu (PI) 03/01/04 - 02/28/08

“Combined MR-Diffuse Optics for Functional Imaging”

This supports the development of co-registered optical and MRI technologies in pre-clinical animal models.

Role: Co-PI

NCI - 2P30CA62203 Meysekens (PI) 08/01/02 - 07/31/07

“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 a Program Leader in Photomedicine.

Role: Program Leader

NIH - R01 CA92063-01 Venugopalan (PI) 07/01/01 - 06/30/07

“Photon Migration for Measurement of Small Tissue Volumes”

The main objective of this project is to develop non-invasive optical technologies for the real-time, quantitative measurement of optical and physiological properties in small tissue volumes.

Role: Co-PI

NIH - R01 HL-067954 George (PI) 08/01/03 - 07/31/08

“Mechanisms of Subepithelial Fibrosis in Asthma”

Three aims are addressed in this project: 1) Integrate validated molecular assays of collagen expression with new non-invasive optical techniques, 2) characterize the response of the *in vitro* tissue model to a physical denudation wound to the epithelium, and 3) characterize the response of the *in vitro* tissue model to a compressive stress wound to the epithelium.

Role: Co-I
