

Sergio Fantini

Curriculum Vitae

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PART I: GENERAL INFORMATION

Name:

Sergio Fantini

Address:

Department of Biomedical Engineering
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Academic Appointments:

- 9/2006 – *present*: Professor, Department of Biomedical Engineering, Tufts University, Medford, MA.
- 9/2006 – 8/2009: Associate Dean for Graduate Education, School of Engineering, Tufts University, Medford, MA.
- 9/2004 – 8/2005: Acting Associate Dean, School of Engineering, Tufts University, Medford, MA.
- 9/2003 – 8/2006: Associate Professor, Department of Biomedical Engineering, Tufts University, Medford, MA.
- 11/2002 – 8/2003: Assistant Professor, Department of Biomedical Engineering, Tufts University, Medford, MA.
- 10/1999 – 10/2002: Assistant Professor, Department of Electrical Engineering and Computer Science, Tufts University, Medford, MA.
- 8/1996 – 9/1999: Research Assistant Professor, Department of Physics, University of Illinois at Urbana-Champaign, Urbana, IL.
- 8/1995 – 7/1996: Visiting Lecturer, Department of Physics, University of Illinois at Urbana-Champaign, Urbana, IL.

Postdoctoral training:

- 1/1993 – 7/1995: Postdoctoral Research Associate, Department of Physics, University of Illinois at Urbana-Champaign, Urbana, IL.
Research Area: Near-infrared spectroscopy of biological tissue.
Postdoctoral Advisor: Dr. Enrico Gratton.

Education:

- Doctoral Degree: University of Florence, Italy, 1983 – 1992; Physics.
Dissertation Topic: “Raman Spectroscopy of the Superconductor $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ in the Temperature Range 25–900 K”.
Dissertation Advisor: Dr. Lorenzo Ulivi.

Memberships in Professional Societies:

- International Society for Optical Engineering (SPIE) – Fellow
- American Institute for Medical and Biological Engineering (AIMBE) - Fellow
- Optical Society of America (OSA)

Professional activities at scientific meetings:

- *Member of the International Program Committee for the 2016 & 2017 PHOTOPTICS Conference (International Conference on Photonics, Optics, and Laser Technology), [Rome, Italy, Feb. 27-29, 2016], [Porto, Portugal, Feb. 27-Mar. 1, 2017].*
- *Member of the Program Committee for the NIH 8th Bench-to-Bedside Inter-institute Workshop, Bethesda, Maryland, September 24-25, 2015.*
- *Member of the Program Committee for the Diffuse Optical Imaging Program at the 2015 ECBO (European Conference on Biomedical Optics), Munich, Germany, June 21-25, 2015.*
- *Moderator of the “BiOS Hot Topics” plenary session at the SPIE (International Society for Optical Engineering) Photonics West, San Jose/San Francisco, CA, 2003-2016.*
- *Member of Program Committees for conferences on “Multimodal Biomedical Imaging” and “Optical Tomography and Spectroscopy of Tissue” at BiOS Symposium, part of SPIE (International Society for Optical Engineering) Photonics West Conference, San Jose/San Francisco, CA, (January 2008-2016).*
- *Member of the Organizing Committee for the Biomedical Optics track of the “World Congress on Medical Physics and Biomedical Engineering 2006 (WC2006),” Seoul, Korea, August 27 - September 1, 2006.*
- *Co-Chair of the Session on “Novel Instrumentations for Biological and Medical Imaging,” at the BMES (Biomedical Engineering Society) Annual Fall Meeting, Baltimore, MD, September 28-October 1, 2005.*
- *Member of the Scientific Organizing Committee for the PIBM (Photonics and Imaging in Biology and Medicine) 2005 International Conference, Tianjin, P.R.China, September 3-6, 2005.*
- *Chair of the Technical Program Committee for Medical and Biological Applications at CLEO (Conference on Lasers and Electro-Optics) 2005 (Baltimore, MD, May 22-27), 2004 (San Francisco, CA, May 16-21).*
- *Chair of the session on “Diffuse Optical Tomography” at the BMES (Biomedical Engineering Society) Annual Fall Meeting, Nashville, TN, October 2-4, 2003.*
- *Chair of the session on “Photon Migration Spectroscopy” at the 2nd International Symposium on Biophotonics, San Antonio, TX, August 2-3, 2003.*
- *Member of the Technical Program Committee for the 2003 OSA/SPIE (Optical Society of America/International Society for Optical Engineering) meeting on Biomedical Optics, Munich, Germany, June 23-27, 2003.*
- *Member of the Technical Program Committee for Medical and Biological Applications at CLEO (Conference on Lasers and Electro-Optics) 2003, Baltimore, MD, June 1-6, 2003.*
- *Organizer and Chair of the Industry Forum on Biomedical Optics at the SPIE (International Society for Optical Engineering) Photonics Boston Conference, Boston, MA, July 30-31, 2002.*
- *Co-chair of the Session on “Optical Computed Tomography and Optical Imaging” at the 2002 PIERS (Progress in Electromagnetics Research Symposium), Cambridge, MA, July 1-5, 2002.*
- *Member of the Technical Program Committee for the OSA (Optical Society of America) Biomedical Topical Meeting, Miami Beach, FL, (April 14-17, 2004; April 7-10, 2002; April 2-5, 2000).*

University committee appointments and special activities (Tufts University):

- Chair of Ad Hoc Committee on T&P Process (3/2015 – 5/2015)
- BME Undergraduate Program Director (9/2010 – present).
- Engineering Committee on Outcomes & Objectives Assessment (9/2010 – present)
- Member of the Interdisciplinary Doctorate Overseers Committee (1/2001 – present).
- Associate Dean for Graduate Education, School of Engineering (9/2006 – 8/2009).
- Acting Associate Dean of Engineering (9/2004 – 8/2005).
- Member of the Committee on Conflict of Interest in Research (9/2004 – 8/2009).
- Member (9/2003 – 8/2009) and Chair (9/2004 – 5/2005; 9/2006 – 8/2009) of the Engineering Graduate Studies Committee.

Honors and Awards:

- Elected Fellow of the International Society for Optical Engineering (SPIE) (2017).
- Elected Senior Member of the International Society for Optical Engineering (SPIE) (2016).
- Elected to the College of Fellows of the American Institute for Medical and Biological Engineering (AIMBE) (2016).
- Graduate Student Council's Award for *Outstanding Faculty Contribution to Graduate Studies*, Tufts University (2004).
- NSF CAREER Award, National Science Foundation, Division of Bioengineering and Environmental Systems, Directorate for Engineering, 2001 – 2007.
- *Outstanding Faculty Award*, Tufts University (2001).
- Placed on the "*Incomplete List of Teachers Ranked as Excellent by Their Students*," University of Illinois at Urbana-Champaign (Fall 1996).

PART II: TEACHING

Courses taught [numbers in square brackets are the average student evaluations of instructor on a scale of 1(worst)-5(best)]:

- Professor in the Department of Biomedical Engineering, Tufts University (2006 – present):
 - BME/BIO/EE131 (*Principles of Medical Imaging*), Spring 2016 [4.5], Spring 2015 [4.3], Spring 2014 [4.7], Spring 2013 [4.2], Spring 2012 [4.7], Spring 2011 [4.8], Spring 2009 [4.1].
 - BME141 (BME193-AT) (*Analytical Tools for Biomedical Engineering*), Fall 2016 [4.6], Fall 2015 [4.6], Fall 2014 [4.3], Fall 2012 [4.1], Fall 2011 [4.1], Fall 2010 [4.1], Fall 2008 [4.1], Fall 2007 [3.8], Fall 2006 [4.4].
 - BME8 (*BME Senior Project*), Spring 2013 [4.3].
 - BME93-1 (*BME Junior Project*), Fall 2007 [4.9].
- Associate Professor in the Department of Biomedical Engineering, Tufts University (2003 – 2006):
 - BME/BIO/EE131 (*Principles of Medical Imaging*), Spring 2004 [4.6], Spring 2005 [4.5], Spring 2006 [4.4].
 - BME193-AT (*Analytical Tools for Biomedical Engineering*), Fall 2005 [4.4].
 - BME/EE156 (*Medical Optics Laboratory*), Spring 2004 (team-taught) [N/A].
 - BME/EE101 (*Introduction to Medical Optics and Lasers*), Fall 2003 [4.5].
 - ES3 (*Introduction to Electrical Engineering*), Fall 2003 [3.4].
- Assistant Professor in the Department of Biomedical Engineering, Tufts University (2003):
 - EE/BIO/BME131 (*Principles of Medical Imaging*), Spring 2003 [4.3].

- EE/BME156 (*Medical Optics Laboratory*), Spring 2003 (team-taught) [**N/A**].
- Assistant Professor in the Department of Electrical Engineering and Computer Science, Tufts University (1999 – 2002):
 - ES3 (*Introduction to Electrical Engineering*), Fall 2001 [**4.3**], Fall 2002 [**4.4**].
 - EE101 (*Introduction to Medical Optics and Lasers*), Fall 2000 [**4.8**].
 - EE194-MII (*Medical Instrumentation for Imaging*), Spring 2000 [**4.3**], Spring 2001 [**4.8**].
 - EE193-BIO (*Biomedical Optics*), Fall 1999 [**4.9**].
- Research Assistant Professor in the Department of Physics, University of Illinois at Urbana-Champaign (1996 – 1999):
 - Physcs 113 (*General Physics: Thermal Physics*), Spring 1998 [**N/A**].
 - Physcs 108 (*Waves and Quantum Physics*), Spring 1997; Section 1: [**4.1**]; Section 2: [**4.9**].
 - Physcs 450 (*Biomolecular Physics*), Fall 1996 [**4.7**], Fall 1997 [**4.3**].
- Visiting Lecturer in the Department of Physics, University of Illinois at Urbana-Champaign (1995 – 1996):
 - Physcs 108 (*Waves and Quantum Physics*), Fall 1995 [**4.4**], Spring 1996 [**4.6**].

Master's Theses Supervised (Tufts University):

- Namitha Mandayam-Krishnakumar, 2016 – present.
- Xuan Zang, received M.S. in Biomedical Engineering, 2016.
- Roni Cantor-Balan, received M.S. in Biomedical Engineering, 2013.
- Geethika Weliwitigoda, received M.S. in Biomedical Engineering, 2012.
- Elleesse Pillas, received M.S. in Biomedical Engineering, 2012.
- Feng Zheng, received M.S. in Biomedical Engineering, 2011.
- Xiao Da, received M.S. in Biomedical Engineering, 2010.
- Chia-Hui Chen, received M.S. in Biomedical Engineering, 2009.
- Asif Khan, received M.S. in Biomedical Engineering, 2009.
- Michael Coutts, received M.S. in Biomedical Engineering, 2009.
- Rich Matulewicz, received M.S. in Biomedical Engineering, 2006.
- Jeffrey Martin, received M.S. in Biomedical Engineering, 2006.
- Ning Liu, received M.S. in Electrical Engineering, 2004.
- Kathleen Chen, received M.S. in Electrical Engineering, 2003.
- Shalini Nadgir, received M.S. in Biomedical Engineering, 2003.
- Vivian Pera, received M.S. in Electrical Engineering, 2002.
- Payal Aggarwal, received M.S. in Electrical Engineering, 2002.
- Matthew Hoimes, received M.S. in Biomedical Engineering, 2002.

Ph.D. Dissertations Supervised (Tufts University):

- Thao Pham, 2015 – present.
- Kristen Tgavalekos, 2013 – present.
- Nishanth Krishnamurthy, 2012 – present.
- Pamela Anderson, 2011 – received Ph.D. in Biomedical Engineering, 2016.
- Michele Pierro, 2010 – received Ph.D. in Biomedical Engineering, 2013.
- Bertan Hallacoglu, 2009 – received Ph.D. in Biomedical Engineering, 2013.
- Yang Yu, 2006 – received Ph.D. in Biomedical Engineering, 2012.
- Debbie Chen, 2005 – received Ph.D. in Biomedical Engineering, 2010.
- Ning Liu, 2003 – received Ph.D. in Biomedical Engineering, 2009.
- Yunjie Tong, 2002 – received Ph.D. in Biomedical Engineering, 2008.

- Carl Geisler, 2001 – 2003 (co-advised with Prof. Ron Goldner).
- Erica Heffer, 2000 – received Ph.D. in Electrical Engineering, 2004.

Postdoctoral Fellows/Research Associates supervised (Tufts University):

- Arvind Saibaba, 10/2013 – 6/2015.
- Jana Kainerstorfer, 1/2012 – 6/2015.
- Angelo Sassaroli, 7/2002 – 8/2007.
- Francesco Fabbri, 4/2001 – 2/2004.

PART III: SCHOLARSHIP

Research interests:

- Optical spectroscopy and imaging of turbid media.
- Optical study of biological tissue *in vivo*.
- Medical applications of non-invasive near-infrared techniques: tissue oximetry, optical mammography, functional brain imaging, assessment of cerebral perfusion, etc.

Grant support:

- Grant support - Active:
 - *“Coherent hemodynamics spectroscopy for cerebral autoregulation and blood flow,”* 7/16 – 4/21; NIH/NINDS (R01 NS095334); \$2,591,347; PI.
 - *“Localized acousto-optics for cerebral coherent hemodynamics spectroscopy,”* 9/16 – 8/20; BSF (2015193); \$144,000; co-PI (PI: Michal Balberg, Holon Institute of Technology, Israel).
 - *“Non-invasive optical detection of cerebral hemodynamics and metabolic transients,”* 6/16 – 5/18; NIH/NIBIB (R21 EB020347); \$400,988; PI.
 - *“Near-infrared spectral imaging of the breast for cancer detection and monitoring,”* 7/11 – 4/17; NIH/NCI (R01 CA154774); \$2,223,119; PI.
 - *“Assessment of intracranial pressure, cerebral microcirculation, and tissue oxygenation with non-invasive near-infrared spectroscopy,”* 8/14 – 12/16; Pfizer, Inc.; \$300,000, co-PI (PI: Joshua Kornbluth, Tufts Medical Center).
- Grant support - Past:
 - *“Clinical validation of coherent hemodynamics spectroscopy,”* 6/14 – 12/15; Tufts Collaborates!; \$50,000; PI.
 - *“Bringing brain-computer interfaces into mainstream HCI,”* 9/2011 – 8/2014; NSF (IIS-1065154); \$935,522; Co-PI (PI: Rob Jacob, Tufts Comp Sci).
 - *“Functional near-infrared imaging using the phase of hemodynamic oscillations,”* 3/2011 – 2/2013; NIH/NIMH (R03 MH093846); \$148,865; Co-Investigator (PI: Angelo Sassaroli, Tufts BME).
 - *“Real-time near-infrared spectroscopy of the frontal lobe for neurofeedback,”* 9/2011 – 2/2013; NIH/NIDA (R21 DA027877); \$87,192; PI of subcontract (PI: Blaise Frederick, McLean Hospital).
 - *“Biological mechanism of fast near-infrared signals in peripheral nerves,”* 6/2008 – 5/2012; NIH/NINDS (R01 NS059933); \$645,901; PI of subcontract (PI: Peter Bergethon, BU Medical School).
 - *“HCC: Human-Computer Interaction and Brain Measurement Using fNIR Spectroscopy,”* 8/1/2007 – 7/31/2010; NSF (IIS-0713506); \$444,620; Co-PI (PI: Rob Jacob, Computer Science Dept., Tufts Univ.).

- “Concurrent fMRI and NIRS of frontal lobe activation during marijuana smoking,” 9/1/2007 – 8/31/2010; NIH/NIDA (R21 DA021817); \$125,300; Co-Investigator (PI: Blaise Frederick, McLean Hospital).
- “Multi-optode probe for evaluation of diabetic neuropathy,” 6/2009 – 6/2010; CIMIT/USAMRAA (W81XWH-07-2-0011); \$46,200; Co-Investigator (PI: Peter Bergethon, Boston University Medical School).
- “Near-infrared oximetry of breast tumors [R33 phase],” 2/1/2007 – 1/31/2010; NIH/NCI (R33 CA095885); \$695,197; PI.
- “Tissue Engineering Resource Center,” 8/04 – 7/09; NIH/NIBIB (P41 EB002520); \$3,957,834; Core Collaborator (PI: David Kaplan).
- “A device for imaging the neuroanatomy and transport function of peripheral nerves,” 10/2007 – 3/2009; CIMIT; \$14,304; Co-Investigator (PI: Peter Bergethon, Boston University Medical School).
- “Near-infrared oximetry of breast tumors [R21 phase],” 9/2004 – 8/2006; NIH/NCI (R21 CA095885); \$394,565; PI.
- “High Field MR Research in Drug Abuse: a Bioengineering Partnership,” 9/2001 – 8/2006, NIH/NIDA (R01 DA14178); \$4,500,000 (subcontract to Tufts University: \$235,000); PI of subcontract: “Concurrent Near-Infrared Imaging and fMRI”; (PI: Perry Renshaw, McLean Hospital).
- “Optical Spectroscopy and Imaging of Tissues,” 6/2001 – 5/2007; NSF (CAREER; BES-93840); \$375,000; PI.
- “Non-Invasive Optical Imaging of the Human Brain,” 7/2000 – 6/2003; NIH/NIMH (R01 MH62854); \$643,155; Co-Investigator (PI: Maria Franceschini).
- “Intensity-modulation of a laser beam at a frequency of 110 MHz,” 11/2001 – 10/2002; Faculty Research Fund Program, Tufts University; \$5,000; PI.
- “Frequency-Domain Optical Mammography,” 10/1999 – 9/2002; DoD/Department of the Army (DAMD17-99-1-9218); \$331,000; PI.
- “Frequency-domain optical sensor at 970 nm,” 3/2000 – 10/2000; Faculty Research Fund Program, Tufts University; \$5,000; PI.
- “Optical imaging of thick tissues,” 12/1998 – 11/2001; NIH/NCI (R01 CA57032); \$678,772; Co-Investigator (PI: Enrico Gratton).

Patents:

1. “Vascular oximetry system,” Inventors: J. K Kainerstorfer, S. Fantini, and A. Sassaroli, Filed: 8/31/2015 (U.S. Serial No. 14/840,468).
2. “Coherent Hemodynamics Spectroscopy and model based characterization of physiological systems,” Inventor: S. Fantini, Filed: 10/21/2013 (Appl. No.: PCT/US2013/065907; U.S. Serial No.: 14/654,133).
3. “Noninvasive Absolute Oximetry of Brain Tissue,” Inventors: B. Hallacoglu, S. Fantini, A. Sassaroli, Filed: 9/27/2012 (U.S. Serial No.: 61/706,275).
4. “Electro-Optical Sensor for Peripheral Nerves,” Inventors: P. R. Bergethon and S. Fantini, Serial No. 12/293,146 (Filed: 3/16/2007, Published: 3/5/2009).
5. “Optical Imaging and Oximetry of Tissue,” Inventor: S. Fantini, U.S. Patent No. 7,962,187 (Filed: 3/13/2003, Issued: 6/14/2011).
6. “Method for Measuring Venous Oxygen Saturation,” Inventors: M. A. Franceschini, S. Fantini, and D. A. Boas, U.S. Patent No. 6,985,763 (Filed: 11/30/2001, Issued: 1/10/2006).
7. “Method for Measuring Absolute Saturation of Time-Varying and Other Hemoglobin Compartments,” Inventors: M. A. Franceschini, S. Fantini, and E. Gratton, U.S. Patent No. 6,216,021 (Filed: 6/4/1999, Issued: 4/10/2001).
8. “Photosensor with Multiple Light Sources,” *Continuation-in-part of Pat. Nos. 5,497,769; 5,492,118 and 5,772,587*, Inventors: E. Gratton, S. Fantini, M. A. Franceschini,

- W. W. Mantulin, B. Barbieri, U.S. Patent No. 6,192,261 (Filed: 5/4/1998, Issued: 2/20/2001).
9. "Photosensor with Multiple Light Sources," *Continuation-in-part of Pat. Nos. 5,497,769 and 5,492,118*, Inventors: E. Gratton, S. Fantini, M. A. Franceschini, W. W. Mantulin, B. Barbieri, U.S. Patent No. 5,772,587 (Filed: 11/29/1995, Issued: 6/30/1998).
 10. "Determining Material Concentrations in Tissues," *Continuation-in-part of Pat. No. 5,497,769*, Inventors: E. Gratton, J. S. Maier, M. A. Franceschini, S. Fantini, S. A. Walker, U.S. Patent No. 5,492,118 (Filed: 6/3/1994, Issued: 2/20/1996); Canada No. 2,137,878; Europe No. 94309361.7; Japan No.332,542/94.
 11. "Photosensor with Multiple Light Sources," Inventors: E. Gratton, S. Fantini, M. A. Franceschini, W. W. Mantulin, B. Barbieri, U.S. Patent No. 5,497,769 (Filed: 12/16/1993, Issued: 3/12/1996); Canada No. 2,137,878; Europe No. 94309361.7; Japan No.332,542/94.

Publications:

- **A. Original Articles (i.e., reports of original investigations in refereed journals):**
 1. K. T. Tgavalekos, J. M. Kainerstorfer, A. Sassaroli, and S. Fantini, "Blood-pressure-induced oscillations of deoxy- and oxy-hemoglobin concentrations are synchronous in the healthy breast and asynchronous in the healthy brain," *J. Biomed. Opt.* **21**, 101410 (2016).
 2. J. M. Kainerstorfer, A. Sassaroli, and S. Fantini, "Optical oximetry of volume-oscillating vascular compartments: Contributions from oscillatory blood flow," *J. Biomed. Opt.* **21**, 101408 (2016).
 3. N. Krishnamurthy, J. M. Kainerstorfer, A. Sassaroli, P. G. Anderson, and S. Fantini, "Broadband optical mammography instrument for depth-resolved imaging and local dynamic measurements," *Rev. Sci. Instrum.* **87**, 024302 (2016).
 4. P. G. Anderson, A. Sassaroli, J. M. Kainerstorfer, N. Krishnamurthy, S. Kalli, S. S. Makim, R. A. Graham, and S. Fantini, "Optical mammography: Bilateral breast symmetry in hemoglobin saturation maps," *J. Biomed. Opt.* **21**, 101403 (2016). PMID: PMC4742791
 5. A. Sassaroli, J. M. Kainerstorfer, and S. Fantini, "Nonlinear extension of a hemodynamic linear model for coherent hemodynamics spectroscopy," *J. Theor. Biol.* **389**, 132-145 (2016). PMID: PMC4679556
 6. A. K. Saibaba, M. Kilmer, E. L. Miller, and S. Fantini, "Fast algorithms for hyperspectral diffuse optical tomography," *SIAM J. Sci. Comput.* **37**, B712-B743 (2015).
 7. P. G. Anderson, J. M. Kainerstorfer, A. Sassaroli, N. Krishnamurthy, M. J. Homer, R. A. Graham, and S. Fantini, "Broadband optical mammography: Chromophore concentration and hemoglobin saturation contrast in breast cancer," *PLOS ONE* **10**, e0117322 (23pp) (2015). PMID: PMC4363570
 8. J. M. Kainerstorfer, A. Sassaroli, K. T. Tgavalekos, and S. Fantini, "Cerebral autoregulation in the microvasculature measured with near-infrared spectroscopy," *J. Cereb. Blood Flow Metab.* **35**, 959-966 (2015). PMID: PMC4640259
 9. A. Sassaroli, J. Kainerstorfer, and S. Fantini, "Study of capillary transit time distribution in coherent hemodynamics spectroscopy," *J. Innov. Opt. Health Sci.* **8**, 1550025 (9pp) (2015).
 10. J. M. Kainerstorfer, A. Sassaroli, and S. Fantini, "Coherent hemodynamics spectroscopy in a single step," *Biomed. Opt. Express* **5**, 3403-3416 (2014). PMID: PMC4206311
 11. M. E. Shaul, B. Hallacoglu, A. Sassaroli, B. Shukitt-Hale, S. Fantini, I. H. Rosenberg, and A. M. Troen, "Cerebral blood volume and vasodilation are independently diminished by aging and hypertension: A near infrared spectroscopy study," *J. Alzheimers Dis.* **42**, S189-S198 (2014).
 12. M. L. Pierro, J. M. Kainerstorfer, A. Civileto, D. E. Weiner, A. Sassaroli, B. Hallacoglu, and S. Fantini, "Reduced speed of microvascular blood flow in hemodialysis patients

- versus healthy controls: A coherent hemodynamics spectroscopy study,” *J. Biomed. Opt.* **19**, 026005 (9pp) (2014). PMID: PMC3922146
13. J. M. Kainerstorfer, A. Sassaroli, B. Hallacoglu, M. L. Pierro, and S. Fantini, “Practical steps for applying a new dynamic model to near-infrared spectroscopy measurements of hemodynamic oscillations and transient changes: Implications for cerebrovascular and functional brain studies,” *Acad. Radiol.* **21**, 185-196 (2014). PMID: 24439332
 14. J. M. Kainerstorfer, A. Sassaroli, M. L. Pierro, B. Hallacoglu, and S. Fantini, “Coherent hemodynamics spectroscopy based on a paced breathing paradigm – Revisited,” *J. Innov. Opt. Health Sci.* **7**, 1450014 (9pp) (2014).
 15. S. Fantini, “A new hemodynamic model shows that temporal perturbations of cerebral blood flow and metabolic rate of oxygen cannot be measured individually using functional near-infrared spectroscopy,” *Physiol. Meas.* **35**, N1-N9 (2014). PMID: 24346036
 16. M. L. Pierro, B. Hallacoglu, A. Sassaroli, J. M. Kainerstorfer, and S. Fantini, “Validation of a novel hemodynamic model for coherent hemodynamics spectroscopy (CHS) and functional brain studies with fNIRS and fMRI,” *NeuroImage* **85**, 222-233 (2014). PMID: PMC3740017
 17. S. Fantini, “Dynamic model for the tissue concentration and oxygen saturation of hemoglobin in relation to blood volume, flow velocity, and oxygen consumption: Implications for functional neuroimaging and coherent hemodynamics spectroscopy (CHS),” *NeuroImage* **85**, 202-221 (2014). PMID: PMC3760999
 18. H. Choi, E. Y. S. Yew, B. Hallacoglu, S. Fantini, C. J. R. Sheppard, and P. T. C. So, “Improvement of axial resolution and contrast in temporally focused widefield two-photon microscopy with structured light illumination,” *Biomed. Opt. Express* **4**, 995-1005 (2013).
 19. B. Hallacoglu, A. Sassaroli, and S. Fantini, “Optical characterization of two-layered turbid media for non-invasive, absolute oximetry in cerebral and extracerebral tissue,” *PLoS ONE* **8**, e64095 (2013). PMID: PMC3660388
 20. J. M. Kainerstorfer, Y. Yu, G. Weliwitigoda, P. G. Anderson, A. Sassaroli, and S. Fantini, “Depth discrimination in diffuse optical transmission imaging by planar scanning off-axis fibers: Initial applications to optical mammography,” *PLoS ONE* **8**, e58510 (2013). PMID: PMC3597739
 21. F. Larusson, P. G. Anderson, E. Rosenberg, M. E. Kilmer, A. Sassaroli, S. Fantini, and E. L. Miller, “Parametric estimation of 3D tubular structures for diffuse optical tomography,” *Biomed. Opt. Express* **4**, 271-286 (2013). PMID: PMC3567714
 22. H. Tao, J. M. Kainerstorfer, S. M. Siebert, E. M. Pritchard, A. Sassaroli, B. J. B. Panilaitis, M. A. Brenckle, J. J. Amsden, J. Levitt, S. Fantini, D. L. Kaplan, and F. G. Omenetto, “Implantable, multifunctional, bioresorbable optics,” *Proc. Natl. Acad. Sci. (USA)* **109**, 19584-19589 (2012).
 23. F. Larusson, S. Fantini, and E. L. Miller, “Parametric level set reconstruction methods for hyperspectral diffuse optical tomography,” *Biomed. Opt. Express* **3**, 1006-1024 (2012). PMID: PMC3342179
 24. M. Pierro, A. Sassaroli, P. R. Bergethon, B. L. Ehrenberg, and S. Fantini, “Phase-amplitude investigation of spontaneous low-frequency oscillations of cerebral hemodynamics with near-infrared spectroscopy: A sleep study in human subjects,” *NeuroImage* **63**, 1571-1584 (2012).
 25. B. Hallacoglu, A. Sassaroli, M. Wysocki, E. Guerrero-Berroa, M. Schnaider Beerli, V. Haroutunian, M. Shaul, I. H. Rosenberg, A. M. Troen, and S. Fantini, “Absolute measurement of cerebral optical coefficients, hemoglobin concentration and oxygen saturation in old and young adults with near-infrared spectroscopy,” *J. Biomed. Opt.* **17**, 081406 (2012).
 26. E.T. Solovey, P. Schermerhorn, M. Scheutz, A. Sassaroli, S. Fantini, R.J.K. Jacob, “Brainput: Enhancing Interactive Systems with Streaming fNIRS Brain Input,” *Proc. ACM*

- Conference on Human Factors in Computing Systems CHI'12, ACM Press (2012). (*Refereed: Acceptance Rate ~23%*).
27. E. T. Solovey, F. Lalooses, K. Chauncey, D. Weaver, M. Parasi, M. Scheutz, A. Sassaroli, S. Fantini, P. Schermerhorn, A. Girouard, and R. J. K. Jacob, "Sensing cognitive multitasking for a brain-based adaptive user interface," Proc. ACM Conference on Human Factors in Computing Systems CHI'11, ACM Press (2011). (*Refereed: Acceptance Rate ~27%*).
 28. F. Larusson, S. Fantini, and E. L. Miller, "Hyperspectral image reconstruction for diffuse optical tomography," Biomed. Opt. Express **2**, 946-965 (2011).
 29. A. Sassaroli, F. Zheng, M. Pierro, P. R. Bergethon, and S. Fantini, "Phase difference between low-frequency oscillations of cerebral deoxy- and oxy-hemoglobin concentrations during a mental task," J. Innov. Opt. Health Sci **4**, 151-158 (2011). PMID: PMC3170731
 30. B. Hallacoglu, A. Sassaroli, I. Rosenberg, S. Fantini, and A. Troen, "Cerebral perfusion and oxygenation are impaired by folate deficiency in rat: Absolute measurements with non-invasive near-infrared spectroscopy," J. Cereb. Blood Flow Metab. **31**, 1482-1492 (2011).
 31. Y. Yu, A. Sassaroli, D. K. Chen, M. J. Homer, R. A. Graham, and S. Fantini, "Near-infrared, broad-band spectral imaging of the human breast for quantitative oximetry: Applications to healthy and cancerous breasts," J. Innov. Opt. Health Sci. **3**, 267-277 (2010).
 32. M. K. Erb, D. K. Chen, A. Sassaroli, S. Fantini, and P. R. Bergethon, "Diffuse optical signals in response to peripheral nerve stimulation reflect skeletal muscle kinematics," Biomed. Optics Express **1**, 943-954 (2010).
 33. D. K. Chen, M. K. Erb, Y. Tong, Y. Yu, A. Sassaroli, P. R. Bergethon, and S. Fantini, "Spectral and spatial features of diffuse optical signals in response to peripheral nerve stimulation," Biomed. Optics Express **1**, 923-942 (2010).
 34. F. Zheng, A. Sassaroli, and S. Fantini, "Phasor representation of oxy- and deoxyhemoglobin concentrations: what is the meaning of out-of-phase oscillations as measured by near-infrared spectroscopy?" J. Biomed. Opt. (Letters) **15**, 040512/1-3 (2010). [Selected for the Virtual Journal of Biological Physics Research **20**(5), Sept. 1, 2010]. PMID: PMC2941517
 35. A. Sassaroli, F. Martelli, and S. Fantini, "Perturbation theory for the diffusion equation by use of the moments of the generalized temporal point-spread function. III. Frequency-domain and time-domain results," J. Opt. Soc. Am. A **27**, 1723-1742 (2010). [Selected for the Virtual Journal for Biomedical Optics **5**(11), August 25, 2010]
 36. B. Hallacoglu, R. S. Matulewicz, H. J. Paltiel, H. Padua, P. Gargollo, G. Cannon, A. Alomari, A. Sassaroli, and S. Fantini, "Noninvasive assessment of testicular torsion in rabbits using frequency-domain near-infrared spectroscopy: Prospects for pediatric urology," J. Biomed. Opt. **14**, 054027/1-7 (2009).
 37. Y. Yu, N. Liu, A. Sassaroli, and S. Fantini, "Near-infrared spectral imaging of the female breast for quantitative oximetry in optical mammography," Appl. Opt. **48**, D225-D235 (2009). [Selected for the Virtual Journal for Biomedical Optics **4**(6), May 26, 2009]. PMID: 19340113
 38. A. Sassaroli, F. Martelli, and S. Fantini, "Higher-order perturbation theory for the diffusion equation in heterogeneous media: application to layered and slab geometries," Appl. Opt. **48**, D62-D73 (2009). [Selected for the Virtual Journal for Biomedical Optics **4**(6), May 26, 2009].
 39. L. M. Hirshfield, E. T. Solovey, A. Girouard, J. Kebinger, R. J. K. Jacob, A. Sassaroli, and S. Fantini, "Brain measurements for usability testing and adaptive interfaces: an example of uncovering syntactic workload with functional near infrared spectroscopy," Proc. ACM Conference on Human Factors in Computing Systems CHI'09, ACM Press (2009).

(Refereed: Acceptance Rate ~25%).

40. E. T. Solovey, A. Girouard, K. Chauncey, L. M. Hirshfield, A. Sassaroli, F. Zheng, S. Fantini, and R. J. K. Jacob, "Using fNIRS Brain Sensing in Realistic HCI Settings: Experiments and Guidelines," *UIST 2009 Symposium on User Interface Software and Technology*, ACM Press, pp. 157-166 (2009). (Refereed: Acceptance Rate ~18%).
41. A. Sassaroli, F. Zheng, L. H. Hirshfield, A. Girouard, E. T. Solovey, R. J. K. Jacob, and S. Fantini, "Discrimination of mental workload levels in human subjects with functional near-infrared spectroscopy," *J. Innov. Opt. Health Sci.* **1**, 227-237 (2008).
42. K. H. Kim, C. Buehler, K. Bahlmann, T. Ragan, W.-C. A. Lee, E. Nedivi, E. L. Heffer, S. Fantini, and P. T. C. So, "Multifocal multiphoton microscopy based on multianode photomultiplier tubes," *Opt. Express* **15**, 11658-11678 (2007).
43. N. Liu, A. Sassaroli, and S. Fantini, "Paired-wavelength spectral approach to measuring the relative concentrations of two localized chromophores in turbid media: an experimental study," *J. Biomed. Opt.* **12**, 051602/1-7 (2007). [Selected for the Virtual Journal of Biological Physics Research (Instrumentation Development section) **14**(7), October 1, 2007].
44. T. V. Vo, P. E. Hammer, M. L. Hoimes, S. Nadgir, and S. Fantini, "Mathematical model for the hemodynamic response to venous occlusion measured with near-infrared spectroscopy in the human forearm," *IEEE Trans. Biomed. Eng.* **54**, 573-584 (2007). PMID: 17405365
45. A. Sassaroli, B. deB. Frederick, Y. Tong, P. F. Renshaw, and S. Fantini, "Spatially weighted BOLD signal for comparison of functional magnetic resonance imaging and near-infrared imaging of the brain," *NeuroImage* **33**, 505-514 (2006).
46. Y. Tong, J. M. Martin, A. Sassaroli, P. R. Clervil, P. R. Bergethon, and S. Fantini, "Fast optical signals in the peripheral nervous system," *J. Biomed. Opt.* **11**, 044014/1-5 (2006).
47. A. Sassaroli, F. Martelli, and S. Fantini, "Perturbation theory for the diffusion equation by use of the moments of the generalized temporal point spread function. II. Continuous-wave results," *J. Opt. Soc. Am. A* **23**, 2119-2131 (2006).
48. A. Sassaroli, F. Martelli, and S. Fantini, "Perturbation theory for the diffusion equation by use of the moments of the generalized temporal point-spread function. I. Theory," *J. Opt. Soc. Am. A* **23**, 2105-2118 (2006).
49. N. Liu, A. Sassaroli, and S. Fantini, "Two-dimensional phased-arrays of sources and detectors for depth discrimination in diffuse optical imaging," *J. Biomed. Opt.* **10**, 051801/1-7 (2005).
50. N. Liu, A. Sassaroli, M. A. Zucker, and S. Fantini, "Three-element phased-array approach to diffuse optical imaging based on post-processing of continuous-wave data," *Opt. Lett.* **30**, 281-283 (2005).
51. A. Sassaroli and S. Fantini, "Comment on the modified Beer-Lambert law for scattering media," *Phys. Med. Biol.* **49**, N255-N257 (2004).
52. E. L. Heffer, V. E. Pera, O. Schütz, H. Siebold, S. Heywang-Köbrunner, L. Götz, A. Heinig, and S. Fantini, "Near-infrared imaging of the human breast: Complementing hemoglobin concentration maps with oxygenation images," *J. Biomed. Opt.* **9**, 1152-1160 (2004).
53. V. Quaresima, M. Ferrari, M. A. Franceschini, M. L. Hoimes, and S. Fantini, "Spatial distribution of vastus lateralis blood flow and oxyhemoglobin saturation measured at the end of isometric quadriceps contraction by multichannel near-infrared spectroscopy," *J. Biomed. Opt.* **9**, 413-420 (2004).
54. F. Fabbri, A. Sassaroli, M. E. Henry, and S. Fantini, "Optical measurements of absorption changes in two-layered diffusive media," *Phys. Med. Biol.* **49**, 1183-1201 (2004).
55. F. Fabbri, M. E. Henry, P. F. Renshaw, S. Nadgir, B. L. Ehrenberg, M. A. Franceschini, and S. Fantini, "Bilateral near-infrared monitoring of the cerebral concentration and oxygen-saturation of hemoglobin during right unilateral electro-convulsive therapy," *Brain*

- Research **992**, 193-204 (2003).
56. M. A. Franceschini, S. Fantini, J. H. Thompson, J. P. Culver, and D. A. Boas, "Hemodynamic evoked response of the sensorimotor cortex measured noninvasively with near-infrared optical imaging," *Psychophysiology* **40**, 548-560 (2003).
 57. F. Fabbri, M. A. Franceschini, and S. Fantini, "Characterization of spatial and temporal variations in the optical properties of tissue-like media with diffuse reflectance imaging," *Appl. Opt.* **42**, 3063-3072 (2003).
 58. V. E. Pera, E. L. Heffer, H. Siebold, O. Schütz, S. Heywang-Köbrunner, L. Götz, A. Heinig, and S. Fantini, "Spatial second-derivative image processing: An application to optical mammography to enhance the detection of breast tumors," *J. Biomed. Opt.* **8**, 517-524 (2003).
 59. S. Fantini, "A haemodynamic model for the physiological interpretation of *in vivo* measurements of the concentration and oxygen saturation of haemoglobin," *Phys. Med. Biol.* **47**, N249-N257 (2002). PMID: 12375832
 60. E. L. Heffer and S. Fantini, "Quantitative oximetry of breast tumors: A novel near-infrared method that identifies two optimal wavelengths for each tumor," *Appl. Opt.* **41**, 3827-3839 (2002).
 61. M. A. Franceschini, D. A. Boas, A. Zourabian, S. G. Diamond, S. Nadgir, D. W. Lin, J. B. Moore, and S. Fantini, "Near-Infrared Spiroximetry: Non-Invasive Measurement of Venous Saturation in Piglets and Human Subjects," *J. Appl. Physiol.* **92**, 372-384 (2002). PMID: PMC3786737
 62. D. M. Hueber, M. A. Franceschini, H. Y. Ma, Q. Xu, J. R. Ballesteros, S. Fantini, D. Wallace, V. Ntziachristos, and B. Chance, "Non-Invasive and Quantitative Near-Infrared Hemoglobin Spectrometry in the Piglet Brain During Hypoxic Stress, Using a Frequency-Domain Multi-Distance Instrument," *Phys. Med. Biol.* **46**, 41-62 (2001).
 63. C. Casavola, L. A. Paunescu, S. Fantini, and E. Gratton, "Blood Flow and Oxygen Consumption with Near-Infrared Spectroscopy and Venous Occlusion: Spatial Maps and the Effect of Time and Pressure of Inflation," *J. Biomed. Opt.* **5**, 269-276 (2000).
 64. V. Toronov, M. A. Franceschini, M. Filiaci, M. Wolf, S. Fantini, and E. Gratton, "Near-Infrared Study of Fluctuations in Cerebral Hemodynamics During Rest and Motor Stimulation: Spatial Mapping and Temporal Analysis," *Med. Phys.* **27**, 801-815 (2000).
 65. M. A. Franceschini, V. Toronov, M. E. Filiaci, E. Gratton, and S. Fantini, "On-Line Optical Imaging of the Human Brain with 160-ms Temporal Resolution," *Opt. Express* **6**, 49-57 (2000).
 66. S. Fantini and E. Gratton, "Fluorescence Photon-Density Waves in Optically Diffusive Media," *Opt. Comm.* **173**, 73-79 (2000).
 67. M. R. Stankovic, D. Maulik, W. Rosenfeld, P. G. Stubblefield, A. D. Kofinas, E. Gratton, M. A. Franceschini, S. Fantini, and D. M. Hueber, "Role of frequency domain optical spectroscopy in the detection of neonatal brain hemorrhage: A newborn piglet study," *J. Matern. Fetal Med.* **9**, 142-149 (2000).
 68. C. Casavola, L. A. Paunescu, S. Fantini, M. A. Franceschini, P. M. Lugarà, and E. Gratton, "Application of near-infrared tissue oxymetry to the diagnosis of peripheral vascular disease," *Clin. Hemorheol. Microcirc.* **21**, 389-393 (1999).
 69. S. Fantini, M. A. Franceschini, E. Gratton, D. Hueber, W. Rosenfeld, D. Maulik, P. G. Stubblefield, and M. R. Stankovic, "Non-invasive optical mapping of the piglet brain in real time," *Opt. Express* **4**, 308-314 (1999).
 70. M. A. Franceschini, E. Gratton, and S. Fantini, "Non-Invasive Optical Method to Measure Tissue and Arterial Saturation: an Application to Absolute Pulse Oximetry of the Brain," *Opt. Lett.* **24**, 829-831 (1999). PMID: 18073868
 71. M. R. Stankovic, D. Maulik, W. Rosenfeld, P. G. Stubblefield, A. D. Kofinas, S. Drexler, R. Nair, M. A. Franceschini, D. Hueber, E. Gratton, and S. Fantini, "Real-Time Optical Imaging of Experimental Brain Ischemia and Hemorrhage in Neonatal Piglets," *J. Perinat.*

- Med. **27**, 279-286 (1999).
72. S. Fantini, D. Hueber, M. A. Franceschini, E. Gratton, W. Rosenfeld, P. G. Stubblefield, D. Maulik, and M. R. Stankovic, "Non-Invasive Optical Monitoring of the Newborn Piglet Brain Using Continuous-Wave and Frequency-Domain Methods," *Phys. Med. Biol.* **44**, 1543-1563 (1999).
 73. M. A. Franceschini, S. Fantini, L. A. Paunescu, J. S. Maier, and E. Gratton, "Influence of a Superficial Layer in the Quantitative Spectroscopic Study of Strongly Scattering Media," *Appl. Opt.* **37**, 7447-7458 (1998).
 74. V. Toronov, M. Filiaci, S. Fantini, and E. Gratton, "Photon-Density Wave Correlation Spectroscopy Detects Large-Scale Fluctuations in Turbid Media," *Phys. Rev. E* **58**, 2288-2297 (1998).
 75. S. Fantini, S. A. Walker, M. A. Franceschini, M. Kaschke, P. M. Schlag, and K. T. Moesta, "Assessment of the Size, Position, and Optical Properties of Breast Tumors *in Vivo* by Non-Invasive Optical Methods," *Appl. Opt.* **37**, 1982-1989 (1998). PMID: 18273118
 76. K. T. Moesta, S. Fantini, H. Jess, S. Totkas, M. A. Franceschini, M. Kaschke, and P. M. Schlag, "Contrast Features of Breast Cancer in Frequency-Domain Laser Scanning Mammography," *J. Biomed. Opt.* **3**, 129-136 (1998).
 77. E. Gratton, S. Fantini, M. A. Franceschini, G. Gratton, and M. Fabiani, "Measurements of Scattering and Absorption Changes in Muscle and Brain," *Phil. Trans. R. Soc. of Lond. B* **352**, 727-735 (1997).
 78. M. A. Franceschini, S. Fantini, A. E. Cerussi, B. Barbieri, B. Chance, and E. Gratton, "Quantitative Spectroscopic Determination of Hemoglobin Concentration and Saturation in a Turbid Medium: Analysis of the Effect of Water Absorption," *J. Biomed. Opt.* **2**, 147-153 (1997).
 79. M. A. Franceschini, K. T. Moesta, S. Fantini, G. Gaida, E. Gratton, H. Jess, W. W. Mantulin, M. Seeber, P. M. Schlag, and M. Kaschke, "Frequency-Domain Instrumentation Enhances Optical Mammography: Initial Clinical Results," *Proc. Natl. Acad. Sci. (USA)* **94**, 6468-6473 (1997). PMID: PMC21073
 80. A. E. Cerussi, J. S. Maier, S. Fantini, M. A. Franceschini, W. W. Mantulin, and E. Gratton, "Experimental Verification of a Theory for the Time-Resolved Fluorescence Spectroscopy of Thick Tissues," *Appl. Opt.* **36**, 116-124 (1997).
 81. S. Fantini, M. A. Franceschini, and E. Gratton, "Effective Source Term in the Diffusion Equation for Photon Transport in Turbid Media," *Appl. Opt.* **36**, 156-163 (1997).
 82. S. A. Walker, S. Fantini, and E. Gratton, "Image Reconstruction Using Back-Projection from Frequency-Domain Optical Measurements in Highly Scattering Media," *Appl. Opt.* **36**, 170-179 (1997).
 83. S. Fantini and J. C. Grossman, "How Likely Is It that Two Classmates Have the Same Birthday?" *Phys. Teach.* **35**, 42-44 (1997).
 84. J. B. Fishkin, S. Fantini, M. J. vandeVen, and E. Gratton, "Gigahertz Photon Density Waves in a Turbid Medium: Theory and Experiments," *Phys. Rev. E* **53**, 2307-2319 (1996).
 85. S. Fantini, M. A. Franceschini, G. Gaida, E. Gratton, H. Jess, W. W. Mantulin, K. T. Moesta, P. M. Schlag, and M. Kaschke, "Frequency-Domain Optical Mammography: Edge Effect Corrections," *Med. Phys.* **23**, 149-157 (1996).
 86. R. A. De Blasi, S. Fantini, M. A. Franceschini, M. Ferrari, and E. Gratton, "Cerebral and Muscle Oxygen Saturation Measurement by Frequency-Domain Near-Infrared Spectrometer," *Med. Biol. Eng. Comput.* **33**, 228-230 (1995).
 87. J. B. Fishkin, P. T. C. So, A. E. Cerussi, S. Fantini, M. A. Franceschini, and E. Gratton, "Frequency-Domain Method for Determining Spectral Properties in Multiply Scattering Media: Methemoglobin Absorption Spectrum in a Tissue-Like Phantom," *Appl. Opt.* **34**, 1143-1155 (1995).

88. G. Gratton, M. Fabiani, D. Friedman, M. A. Franceschini, S. Fantini, P. M. Corballis, and E. Gratton, "Rapid Changes of Optical Parameters in the Human Brain During a Tapping Task," *J. Cognitive Neuroscience* **7**, 446-456 (1995).
89. S. Fantini, M. A. Franceschini-Fantini, J. S. Maier, S. A. Walker, B. Barbieri, and E. Gratton, "Frequency-Domain Multichannel Optical Detector for Non-Invasive Tissue Spectroscopy and Oximetry," *Opt. Eng.* **34**, 32-42 (1995).
90. S. Fantini, L. Ulivi, and M. Zoppi, "High Temperature Study of the Raman-Active Phonon Modes of $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$," *Solid State Commun.* **93**, 519-523 (1995).
91. J. S. Maier, S. A. Walker, S. Fantini, M. A. Franceschini and E. Gratton, "Possible Correlation between Blood Glucose Concentration and Reduced Scattering Coefficient of Tissues in the Near-Infrared," *Opt. Lett.* **19**, 2062-2064 (1994).
92. S. Fantini, M. A. Franceschini, and E. Gratton, "Semi-Infinite-Geometry Boundary Problem for Light Migration in Highly Scattering Media: a Frequency-Domain Study in the Diffusion Approximation," *J. Opt. Soc. Am. B* **11**, 2128-2138 (1994).
93. S. Fantini, M. A. Franceschini, J. B. Fishkin, B. Barbieri, E. Gratton, "Quantitative Determination of the Absorption Spectra of Chromophores in Strongly Scattering Media: a Light-Emitting-Diode Based Technique," *Appl. Opt.* **33**, 5204-5213 (1994). PMID: 20935909
94. S. Fantini, L. Ulivi, and M. Zoppi, "Direct Investigation of the Oxidation of YBCO by *in situ* Raman Spectroscopy," *Il Nuovo Cimento* **16D**, 1777-1784 (1994).

• **B. Invited Review Articles (peer-reviewed):**

1. S. Fantini, A. Sassaroli, K. T. Tgavalekos, and J. Kornbluth, "Cerebral blood flow and autoregulation: Current measurement techniques and prospects for non-invasive optical methods," *Neurophoton.* **3**, 031411 (2016).
2. A. Sassaroli, M. Pierro, P. R. Bergethon, and S. Fantini, "Low-frequency spontaneous oscillations of cerebral hemodynamics investigated with near-infrared spectroscopy: A review," *IEEE J. Sel. Topics Quant. Electron.* **18**, 1478-1492 (2012).
3. S. Fantini and A. Sassaroli, "Near-infrared optical mammography for breast cancer detection with intrinsic contrast," *Annals Biomed. Eng.* **40**, 398-407 (2012). PMID: PMC3678374
4. S. Fantini, E. L. Heffer, V. E. Pera, A. Sassaroli, and N. Liu, "Spatial and spectral information in optical mammography," *Technology in Cancer Research & Treatment* **4**, 471-482 (2005).

• **C. Books:**

1. I. J. Bigio and S. Fantini, *Quantitative Biomedical Optics: Theory, methods, and applications* (Cambridge University Press, Cambridge, UK, 2016).

• **D. Book Chapters:**

1. S. Fantini and A. Sassaroli, "Frequency-Domain Techniques for Tissue Spectroscopy and Imaging," in *Handbook of Optical Biomedical Diagnostics – Second Edition: Volume 1: Light-Tissue Interactions*, V. V. Tuchin, Editor, (SPIE Press, Bellingham, WA, 2016), Chapter 7, pp.477-532.
2. S. Fantini and P. Taroni, "Optical mammography," in *Cancer imaging: Lung and breast carcinomas, Vol. 1*, M. A. Hayat, Editor, (Elsevier Academic Press, London, UK, 2008), Chapter 16, pp. 445-453.
3. E. Gratton and S. Fantini, "Reflectance and transmittance spectroscopy," in *Lasers and current optical techniques in biology*, Comprehensive Series in Photochemistry and photobiology, Vol. 4, G. Palumbo and R. Pratesi, Editors, (Royal Society of Chemistry, Cambridge, UK, 2004), pp. 211-258.

4. S. Fantini, "Biomedical optics," in *Encyclopedia of Biomaterials and Biomedical Engineering*, G. E. Wnek and G. L. Bowlin, Editors (Marcel Dekker, Inc., New York, NY, 2004), pp. 1143-1152.
5. S. Fantini and M. A. Franceschini, "Frequency-Domain Techniques for Tissue Spectroscopy and Imaging," in *Handbook of Optical Biomedical Diagnostics*, V. V. Tuchin, Editor, (SPIE Press, Bellingham, WA, 2002), Chapter 7, pp.405-453.
6. S. Fantini and M. A. Franceschini, "Tomografia Ottica" ("Optical Tomography"), in *Enciclopedia Medica Italiana, Aggiornamento II, Tomo III, (Italian Medical Encyclopedia, Update 2, Volume 3)*, L. Vella, Ed., (USES, Florence, Italy, 2000), pp. 5824-5832.
7. S. Fantini, B. Barbieri, M. A. Franceschini, and E. Gratton, "Frequency-Domain Spectroscopy," in *Applications of Optical Engineering to the Study of Cellular Pathology*, E. Kohen, Ed., (Research Signpost, Trivandrum, India, 1997), pp. 57-66.
8. E. Gratton, S. Fantini, M. A. Franceschini, S. Walker, and J. Maier, "Spectroscopy and tomography of tissues in the frequency-domain," in *Analytical Use of Fluorescent Probes in Oncology* NATO ASI Series, Series A: Life Sciences Vol. 286, E. Kohen and J. G. Hirschberg, eds., (Plenum Press, New York, 1996), pp. 41-52.
9. S. Fantini and M. A. Franceschini, "Studio Ottico di Tessuti Biologici nel Vicino Infrarosso: Spettroscopia e Tomografia" ("Optical Study of Biological Tissues in the Near-Infrared: Spectroscopy and Tomography"), in *Laser e Luce in Chirurgia e Medicina ed in Biotecnologia (Laser and Light in Surgery and Medicine and in Biotechnology)*, R. Pratesi, ed., (Consiglio Nazionale delle Ricerche-Area della Ricerca di Firenze, Florence, Italy, 1995), pp. 415-426.

• **E. Comments, Technical Reports, Editorials:**

1. S. Fantini and A. Sassaroli, "Kohärente Hämodynamik-Spektroskopie," *BioPhotonik*, September 2016 (*in German*).
2. S. Fantini, "A new tool to assess brain vascular health," *Neurology Times*, March, 9, 2015. (<http://www.neurologytimes.com/stroke/new-tool-assess-brain-vascular-health>)
3. V. Quaresima, M. Ferrari, and S. Fantini, "Accuracy of Oxygen Desaturation of Hemoglobin in Muscle by Near-Infrared Oximeters," *Med. Sci. Sports. Exerc.* **45**, 1217 (2013).
4. S. Fantini, C. Bennis, and D. Kaplan, "Biomedical engineering continues to make the future," *IEEE Pulse* **2**(4), 70-73 (2011).
5. S. Fantini, N. Liu, Y. Yu, and A. Sassaroli, "Bildgebendes Verfahren zur Oxymetrie optisch inhomogener biologischer Gewebe," *BioPhotonik*, September 2008 (*in German*).
6. N. Liu, A. Sassaroli, and S. Fantini, "2D source-detector arrays enhance spatial information in diffuse imaging," *SPIE newsroom* (online industry and technical news source), March 2006, <http://spie.org/x8879.xml?highlight=x2416>.
7. R. K. Wang, A. V. Priezzhev, and S. Fantini, "Special issue in honour of Professor Valery V Tuchin's contribution to the field of biomedical optics," *Editorial*, *J. Phys. D* **38**(15), (2005).
8. S. Fantini, K. Thomas Moesta, and B. W. Pogue, "Optics in Breast Cancer," *J. Biomed. Opt.* **9**, 1121 (2004).
9. S. Fantini, E. L. Heffer, H. Siebold, and O. Schütz, "Using near-infrared light to detect breast cancer," *OPN Optics & Photonics News* **14**(11), 24-29 (2003).
10. S. Fantini, P. Aggarwal, K. Chen, and M. A. Franceschini, "Monitoring Brain Activity Using Near-Infrared Light," *American Laboratory* **33**(20), 15-17 (2001).

• **F. Proceedings of Meetings (i.e., published full-length articles of meeting presentations which contain new data):**

1. A. Sassaroli, X. Zang, K. T. Tgavalekos, and S. Fantini, "Depth resolution in coherent hemodynamics spectroscopy," Proc. 4th International Conference on Photonics, Optics and Laser Technology (PHOTOPTICS 2016), 187-193 (2016).
2. S. Fantini, A. Sassaroli, J. M. Kainerstorfer, K. T. Tgavalekos, and X. Zang, "Non-invasive assessment of cerebral microcirculation with diffuse optics and coherent hemodynamics spectroscopy," Proc. SPIE **9690**, 96900S (9pp) (2016).
3. N. Krishnamurthy, J. M. Kainerstorfer, P. G. Anderson, A. Sassaroli, and S. Fantini, "Optical mammography instrument for broadband spectral imaging with depth discrimination," Proc. SPIE **9319**, 93190J (7 pp) (2015).
4. P. G. Anderson, A. Sassaroli, J. M. Kainerstorfer, N. Krishnamurthy, and S. Fantini, "Broadband optical mammography: Breast tissue thickness compensation algorithm," Proc. SPIE **9319**, 93190L (7pp) (2015).
5. J. M. Kainerstorfer, A. Sassaroli, K. T. Tgavalekos, and S. Fantini, "Dynamic cerebral autoregulation measured with coherent hemodynamics spectroscopy (CHS)," Proc. SPIE **9319**, 93190N (6 pp) (2015).
6. B. F. Yuksel, E. M. Peck, D. Afergan, S. W. Hincks, T. Shibata, J. Kainerstorfer, K. Tgavalekos, A. Sassaroli, S. Fantini, and R. J. K. Jacob, "Functional near-infrared spectroscopy for adaptive human computer interfaces," Proc. SPIE **9319**, 93190R (9 pp) (2015).
7. A. Sassaroli, J. Kainerstorfer, and S. Fantini, "Comparison of linear and nonlinear models for coherent hemodynamics spectroscopy (CHS)," Proc. SPIE **9319**, 931916 (7 pp) (2015).
8. A. K. Saibaba, N. Krishnamurthy, P. G. Anderson, J. Kainerstorfer, A. Sassaroli, E. L. Miller, S. Fantini, and M. E. Kilmer, "3D parameter reconstruction in hyperspectral diffuse optical tomography," Proc. SPIE **9319**, 93191B (5 pp) (2015).
9. M. L. Pierro, A. Sassaroli, B. Hallacoglu, J. M. Kainerstorfer, and S. Fantini, "Frequency-resolved measurements of hemodynamic oscillations and quantitative analysis with a novel hemodynamic model," Proc. SPIE **8578**, 85780C 1-7, 2013.
10. J. M. Kainerstorfer, M. L. Pierro, B. Hallacoglu, A. Sassaroli, and S. Fantini, "Applications of a novel hemodynamic model to functional brain studies with fNIRS and fMRI," Proc. SPIE **8578**, 857806 1-8, 2013.
11. P. G. Anderson, J. M. Kainerstorfer, G. Weliwitigoda, A. Sassaroli, and S. Fantini, "Broadband optical mammography: Visualization, oximetry, and depth assessment of blood vasculature," Proc. SPIE **8578**, 85780M 1-8, 2013.
12. B. Hallacoglu, A. Sassaroli, and S. Fantini, "Optical characterization of two-layered tissue-like phantoms using multi-distance, frequency-domain near-infrared spectroscopy," Proc. SPIE **8578**, 85780B 1-6, 2013.
13. M. Pierro, A. Sassaroli, P. R. Bergethon, and S. Fantini, "Relative phase of oscillations of cerebral oxy-hemoglobin and deoxy-hemoglobin concentrations during sleep," Proc SPIE **8207**, doi: 10.1117/12.909116 (2012).
14. F. Larusson, S. Fantini, and E. L. Miller, "Parametric level-set approach for hyperspectral diffuse optical tomography," IEEE international symposium on biomedical imaging, March 2011, Chicago, USA.
15. A. Sassaroli, F. Martelli, and S. Fantini, "General perturbative approach to the diffusion equation in the presence of absorbing defects: Frequency-domain and time-domain results," Proc. SPIE **7896**, 78961N 1-7 (2011).
16. M. K. Erb, D. K. Chen, A. Sassaroli, S. Fantini, and P. R. Bergethon, "Electrical stimulation of peripheral nerves induces optical responses via skeletal muscle kinematics," Proc. SPIE **7896**, 789609 1-12 (2011).

17. M. Pierro, A. Sassaroli, F. Zheng, and S. Fantini, "Phase characterization of oscillatory components of the cerebral concentrations of oxy-hemoglobin and deoxy-hemoglobin," Proc. SPIE **7896**, 78960G 1-7 (2011).
18. Y. Yu, A. Sassaroli, M. J. Homer, R. A. Graham, and S. Fantini, "Near-infrared optical mammography with broadband spectral imaging for spatially-resolved oximetry," Proc. SPIE **7896**, 78962G 1-9 (2011).
19. B. Hallacoglu, A. Sassaroli, I. H. Rosenberg, A. M. Troen, and S. Fantini, "Non-invasive detection and quantification of brain microvascular deficits by near-infrared spectroscopy in a rat model of vascular cognitive impairment," Proc. SPIE **7896**, 789608 1-7 (2011).
20. Y. Yu, N. Liu, A. Sassaroli, and S. Fantini, "Spectral imaging of the human breast for quantitative oximetry," Proc. SPIE **7174**, 71740M 1-5 (2009).
21. B. Hallacoglu, R. S. Matulewicz, H. J. Paltiel, H. Padua, P. Gargollo, G. Cannon, A. Alomari, A. Sassaroli, and S. Fantini, "Absolute near-infrared oximetry for urology: A quantitative study of the tissue hemoglobin saturation before and after testicular torsion in a rabbit model," Proc. SPIE **7174**, 71740L 1-6 (2009).
22. A. Sassaroli, F. Martelli, and S. Fantini, "Fourth order perturbation theory for the diffusion equation: Continuous wave results for absorbing defects," Proc. SPIE **7174**, 717402 1-12 (2009).
23. A. Sassaroli, F. Zheng, M. Coutts, L. H. Hirshfield, A. Girouard, E. T. Solovey, R. J. K. Jacob, Y. Tong, B. deB. Frederick, and S. Fantini, "Application of near-infrared spectroscopy for discrimination of mental workloads," Proc. SPIE **7174**, 7174H 1-8 (2009).
24. S. Fantini, D. K. Chen, J. M. Martin, A. Sassaroli, and P. R. Bergethon, "Near-infrared signals associated with electrical stimulation of peripheral nerves," Proc. SPIE **7174** 7174C 1-7 (2009).
25. L. M. Hirshfield, K. Chauncey, R. Gulotta, A. Girouard, E. T. Solovey, R. J. K. Jacob, A. Sassaroli, and S. Fantini, "Combining electroencephalograph and functional near infrared spectroscopy to explore users' mental workload," HCI International 2009 (16), pp. 239-247 (2009). (*Refereed*).
26. A. Girouard, E. T. Solovey, L. M. Hirshfield, K. Chauncey, A. Sassaroli, S. Fantini, and R. J. K. Jacob, "Distinguishing difficulty levels with non-invasive brain activity measurements," *INTERACT 2009*, T. Gross *et al.*, Eds., Part I, LNCS **5726**, 440-452 (2009). (*Refereed*).
27. A. Sassaroli, Y. Tong, C. Benes, and S. Fantini, "Data analysis and statistical tests for near-infrared functional studies of the brain," Proc. SPIE **6850**, 685012 1-6 (2008).
28. A. Sassaroli, N. Liu, and S. Fantini, "Dual wavelength approach for the estimation of the relative concentration of two absorbers: Monte Carlo simulations," Proc SPIE **6434**, 643412 1-5 (2007).
29. D. K. Chen, Y. Tong, A. Sassaroli, P. R. Bergethon, and S. Fantini, "Fast Optical Response to Electrical Activation in Peripheral Nerves," Proc. SPIE **6431**, 643103 1-5 (2007). (**Invited**).
30. A. Sassaroli, B. B. Frederick, Y. Tong, P. F. Renshaw, and S. Fantini, "Comparison of optical imaging and functional magnetic resonance imaging of the human brain using a photon-hitting density weight in the calculation of the BOLD signal," Proc. SPIE **6081**, 60810C 1-5 (2006).
31. N. Liu, A. Sassaroli, M. Zucker, and S. Fantini, "Three-element phased arrays to enhance the spatial resolution and achieve depth discrimination in diffuse optical imaging," Proc SPIE **5693**, 232-237 (2005).
32. Vo Van Toi, M. L. Hoimes, S. Nadgir, and S. Fantini, "Hemodynamic variations measured with near-infrared spectroscopy in human forearm muscles in response to venous occlusion: An electrical model," Proc SPIE **5693**, 495-502 (2005).

33. A. Sassaroli, Y. Tong, B. B. Frederick, P. F. Renshaw, B. L. Ehrenberg, and S. Fantini, "Studying brain function with concurrent near-infrared spectroscopy (NIRS) and functional magnetic resonance imaging (fMRI)," Proc SPIE **5693**, 161-165 (2005).
34. Y. Tong, E. J. Rooney, P. R. Bergethon, J. M. Martin, A. Sassaroli, B. L. Ehrenberg, Vo Van Toi, P. Aggarwal, N. Ambady, and S. Fantini, "Studying brain function with near-infrared spectroscopy concurrently with electroencephalography," Proc SPIE **5693**, 444-449 (2005).
35. V. Y. Toronov, M.-A. Franceschini, S. Fantini, A. G. Webb, and E. Gratton, "Study of complex hemodynamic fluctuations in the human brain by simultaneous near-infrared spectro-imaging and functional magnetic resonance imaging," Proc. SPIE **5330**, 22-28 (2004).
36. A. Sassaroli, Y. Tong, F. Fabbri, B. Frederick, P. Renshaw, and S. Fantini, "Functional mapping of the human brain with near-infrared spectroscopy in the frequency-domain," Proc. SPIE **5312**, 371-377 (2004).
37. S. Fantini, E. L. Heffer, V. E. Pera, S. Heywang-Köbrunner, L. Götz, A. Heinig, O. Schütz, and H. Siebold, "Optical mammography with single-wavelength contrast enhancement and multi-wavelength oxygenation assessment," Proc. SPIE **4955**, 183-190 (2003).
38. S. Fantini, F. Fabbri, S. Nadgir, M. E. Henry, P. F. Renshaw, and M. A. Franceschini, "Near-infrared spectroscopy of the human brain during electro-convulsive therapy," Proc. SPIE **4955**, 1-5 (2003).
39. F. Fabbri, M. A. Franceschini, and S. Fantini, "Quantitative estimate of spatial/temporal variations in the optical properties of tissue-like media from diffuse reflectance data," Proc. SPIE **4955**, 567-574 (2003).
40. M. Wolf, M. A. Franceschini, L. A. Paunescu, V. Toronov, A. Michalos, U. Wolf, E. Gratton, and S. Fantini "Absolute Frequency-Domain Pulse Oximetry of the Brain: Methodology and Measurements," Adv. Exp. Med. Biol. **536**, 61-74 (2003).
41. S. Fantini, P. Aggarwal, K. Chen, M. A. Franceschini, and B. L. Ehrenberg, "Near-infrared spectroscopy and polysomnography during all-night sleep in human subjects," Proc. SPIE **5068**, 155-162 (2003). **(Invited)**.
42. M. A. Franceschini, A. Zourabian, J. B. Moore, A. Arora, S. Fantini, and D. A. Boas, "Local Measurement of Venous Saturation in Tissue with Non-Invasive, Near-Infrared Respiratory-Oximetry," Proc. SPIE **4250**, 164-170 (2001).
43. S. Fantini, M. L. Hoimes, C. Casavola, and M. A. Franceschini, "Spatial Mapping of Blood Flow and Oxygen Consumption in the Human Calf Muscle Using Near-Infrared Spectroscopy," Proc. SPIE **4241**, 69-77 (2001). **(Invited)**.
44. S. Fantini, E. L. Heffer, M. A. Franceschini, L. Götz, A. Heinig, S. Heywang-Köbrunner, Oliver Schütz, and Horst Siebold, "Optical Mammography with Intensity-Modulated Light," Proceedings of Inter-Institute Workshop on In Vivo Optical Imaging at the NIH, A. H. Gandjbakhche, Ed. (Optical Society of America, Washington, DC 2000), pp. 111-117. **(Invited)**.
45. M. A. Franceschini, S. Fantini, V. Toronov, M. E. Filiaci, and E. Gratton, "Cerebral Hemodynamics Measured by Near-Infrared Spectroscopy at Rest and During Motor Activation," Proceedings of Inter-Institute Workshop on In Vivo Optical Imaging at the NIH, A. H. Gandjbakhche, Ed. (Optical Society of America, Washington, DC 2000), pp. 73-80. **(Invited)**.
46. M. Balberg, G. Barbastathis, S. Fantini, and D. J. Brady, "Confocal Imaging through Scattering Media with a Volume Holographic Filter," Proc. SPIE **3919**, 69-74 (2000).
47. G. Donzelli, S. Pratesi, S. Fantini, and M. A. Franceschini, "Near infrared spectroscopy in neonatal apnea," Proc. 2nd International Congress on New Technologies in Reproductive Medicine, Neonatology and Gynecology, 451-459 (1999).
48. M. A. Franceschini, E. Gratton, D. Hueber, and S. Fantini, "Near-Infrared Absorption and Scattering Spectra of Tissues *in Vivo*," Proc. SPIE **3597**, 526-531 (1999).

49. M. R. Stankovic, D. M. Hueber, D. Maulik, P. G. Stubblefield, W. Rosenfeld, E. Gratton, M. A. Franceschini, and S. Fantini, "Real-Time Optical Imaging and Spectroscopy of Brain Ischemia and Hemorrhage," *Proc. SPIE* **3597**, 676-684 (1999).
50. V. Toronov, M. Filiaci, M. A. Franceschini, S. Fantini, and E. Gratton, "Photon-density-wave fluctuation-correlation-spectroscopy: study of coherence in the brain and muscles," *Proc. SPIE* **3597**, 244-251 (1999).
51. C. Casavola, L. A. Paunescu, M. A. Franceschini, S. Fantini, L. Winter, J. Kim, D. Wood, and E. Gratton, "Near-infrared spectroscopy and tilting table protocol: a novel method to study the blood flow and the oxygen consumption in tissue," *Proc. SPIE* **3597**, 685-692 (1999).
52. L. A. Paunescu, C. Casavola, M. A. Franceschini, S. Fantini, L. Winter, J. Kim, D. Wood, and E. Gratton, "Calf muscle blood flow and oxygen consumption measured with near-infrared spectroscopy during venous occlusion," *Proc. SPIE* **3597**, 317-323 (1999).
53. D. M. Hueber, S. Fantini, A. E. Cerussi, and B. Barbieri, "New Optical Probe Designs for Absolute (Self-calibrating) NIR Tissue Hemoglobin Measurements," *Proc. SPIE* **3597**, 618-631 (1999).
54. A. E. Cerussi, E. Gratton, and S. Fantini, "Fluorescence Lifetime Spectroscopy in Multiple-Scattering Environments: An application to Biotechnology," *Proc. SPIE* **3600**, 171-182 (1999).
55. S. Fantini, O. Schütz, J. Edler, S. Heywang-Köbrunner, L. Götz, M. A. Franceschini, and H. Siebold, "Clinical Applications of Frequency-Domain Optical Mammography," *Proc. SPIE* **3566**, 194-199 (1998).
56. S. Fantini, S. A. Walker, M. A. Franceschini, K. T. Moesta, P. M. Schlag, M. Kaschke, and E. Gratton, "Optical Characterization of Breast Tumors by Frequency-Domain Optical Mammography," *OSA Trends in Optics and Photonics on Advances in Optical Imaging and Photon Migration*, J. G. Fujimoto and M. Patterson, eds., (Optical Society of America, Washington, DC 1998), Vol XXI, pp. 289-293; *OSA Trends in Optics and Photonics on Biomedical Optical Spectroscopy and Diagnostics*, E. Sevick-Muraca and J. A. Izatt, eds., (Optical Society of America, Washington, DC 1998), Vol XXII, pp. 143-147.
57. M. A. Franceschini, A. Paunescu, S. Fantini, S. Pratesi, J. S. Maier, G. P. Donzelli, and E. Gratton, "Frequency-Domain Optical Measurements *in Vitro* on Two- and Three-Layered Tissue-Like Phantoms and *in Vivo* on Infant Heads," *OSA Trends in Optics and Photonics on Advances in Optical Imaging and Photon Migration*, J. G. Fujimoto and M. Patterson, eds., (Optical Society of America, Washington, DC 1998), Vol XXI, pp. 232-236.
58. M. Filiaci, V. Toronov, S. Fantini, and E. Gratton, "Optical Probe and Frequency-Domain Instrumentation to Study Spatial and Temporal Correlations of Fluctuations in Tissues," *OSA Trends in Optics and Photonics on Advances in Optical Imaging and Photon Migration*, J. G. Fujimoto and M. Patterson, eds., (Optical Society of America, Washington, DC 1998), Vol XXI, pp. 183-187.
59. V. Toronov, M. Filiaci, S. Fantini, and E. Gratton, "Study of Fluctuations in Turbid Media by Intensity-Modulated Correlation Spectroscopy," *OSA Trends in Optics and Photonics on Advances in Optical Imaging and Photon Migration*, J. G. Fujimoto and M. Patterson, eds., (Optical Society of America, Washington, DC 1998), Vol XXI, pp. 60-62.
60. L. A. Paunescu, M. A. Franceschini, S. Fantini, A. E. Cerussi, and E. Gratton, "Effective Optical Properties of Two-Layered Turbid Media Using the Frequency-Domain Multi-Distance Method," *OSA Trends in Optics and Photonics on Advances in Optical Imaging and Photon Migration*, J. G. Fujimoto and M. Patterson, eds., (Optical Society of America, Washington, DC 1998), Vol XXI, pp. 79-83.
61. A. E. Cerussi, S. Fantini, and E. Gratton, "Frequency-Domain Fluorescence Spectroscopy in the Multiple Scattering Regime," *OSA Trends in Optics and Photonics on Biomedical*

- Optical Spectroscopy and Diagnostics*, E. Sevick-Muraca and J. A. Izatt, eds., (Optical Society of America, Washington, DC 1998), Vol XXII, pp. 70-75.
62. M. A. Franceschini, S. Fantini, R. Palumbo, L. Pasqualini, G. Vaudo, E. Franceschini, E. Gratton, B. Palumbo, S. Innocente, and E. Mannarino, "Quantitative Near-Infrared Spectroscopy on Patients with Peripheral Vascular Disease," *Proc. SPIE* **3194**, 112-115 (1998).
 63. V. Quaresima, M. A. Franceschini, S. Fantini, E. Gratton, and M. Ferrari, "Difference in Leg Muscles Oxygenation During Treadmill Exercise by a New Near-Infrared Frequency-Domain Oximeter," *Proc. SPIE* **3194**, 116-120 (1998).
 64. S. Fantini, K. T. Moesta, M. A. Franceschini, H. Jess, H. Erdl, E. Gratton, P. M. Schlag, and M. Kaschke, "Instrumentation and Clinical Applications in Frequency-Domain Optical Mammography," *Proc. 19th Int. Conf.-IEEE/EMBS on Photon Migration Tomography (MS21)*, A. H. Hielscher and L. Wang, chairs, pp. 2741-2744 (1997). **(Invited)**.
 65. M. A. Franceschini, D. Wallace, B. Barbieri, S. Fantini, W. W. Mantulin, S. Pratesi, G. P. Donzelli, and E. Gratton, "Optical Study of the Skeletal Muscle During Exercise with a Second Generation Frequency-Domain Tissue Oximeter," *Proc. SPIE* **2979**, 807-814 (1997).
 66. S. Fantini, M. A. Franceschini, and E. Gratton, "Effect of Spatially Distributed Light Sources on the Frequency-Domain Solution to the Diffusion Equation," *Proc. SPIE* **2979**, 509-514 (1997).
 67. S. A. Walker, S. Fantini, and E. Gratton, "Effect of Index of Refraction Mismatch on the Recovery of Optical Properties of Cylindrical Inhomogeneities in an Infinite Turbid Medium," *Proc. SPIE* **2979**, 219-225 (1997).
 68. J. S. Maier, A. E. Cerussi, S. Fantini, and E. Gratton, "Experimental Recovery of Absorption, Scattering and Fluorescence Parameters in Highly-Scattering Media from a Single Frequency Measurement," *Proc. SPIE* **2979**, 6-13 (1997).
 69. A. E. Cerussi, S. Fantini, J. S. Maier, W. W. Mantulin, and E. Gratton, "Chromophore Detection by Fluorescence Spectroscopy in Tissue-Like Phantoms," *Proc. SPIE* **2979**, 139-150 (1997).
 70. A. Cerussi, J. Maier, S. Fantini, M. A. Franceschini, and E. Gratton, "The Frequency-Domain Multi-Distance Method in the Presence of Curved Boundaries," *OSA Trends in Optics and Photonics on Biomedical Optical Spectroscopy and Diagnostics*, E. Sevick-Muraca and D. Benaron, eds. (Optical Society of America, Washington, DC 1996), Vol. 3, pp. 92-97.
 71. M. A. Franceschini, S. Fantini, A. E. Cerussi, B. Barbieri, B. Chance, and E. Gratton, "The Effect of Water in the Quantitation of Hemoglobin Concentration in a Tissue-Like Phantom by Near-Infrared Spectroscopy," *OSA Trends in Optics and Photonics on Biomedical Optical Spectroscopy and Diagnostics*, E. Sevick-Muraca and D. Benaron, eds. (Optical Society of America, Washington, DC 1996), Vol. 3, pp. 126-130.
 72. J. S. Maier, A. E. Cerussi, S. Fantini, M. A. Franceschini, and E. Gratton, "Quantitative Fluorescence in Tissue-Like Media," *OSA Trends in Optics and Photonics on Biomedical Optical Spectroscopy and Diagnostics*, E. Sevick-Muraca and D. Benaron, eds. (Optical Society of America, Washington, DC 1996), Vol. 3, pp. 206-209.
 73. S. Fantini, M. A. Franceschini, G. Gaida, H. Jess, H. Erdl, W. W. Mantulin, E. Gratton, K. T. Moesta, P. M. Schlag, and M. Kaschke, "Contrast Enhancement by Edge Effect Corrections in Frequency-Domain Optical Mammography," *OSA Trends in Optics and Photonics on Advances in Optical Imaging and Photon Migration*, R. R. Alfano and J. G. Fujimoto, eds. (Optical Society of America, Washington, DC 1996), Vol. 2, pp. 160-163.
 74. H. Jess, H. Erdl, K. T. Moesta, S. Fantini, M. A. Franceschini, E. Gratton, and M. Kaschke, "Intensity-Modulated Breast Imaging: Technology and Clinical Pilot Study Results," *OSA Trends in Optics and Photonics on Advances in Optical Imaging and*

- Photon Migration*, R. R. Alfano and J. G. Fujimoto, eds. (Optical Society of America, Washington, DC 1996), Vol. 2, pp. 126-129. **(Invited)**.
75. S. A. Walker, S. Fantini, and E. Gratton, "Back-Projection Reconstructions of Cylindrical Inhomogeneities from Frequency-Domain Optical Measurements in Turbid Media," *OSA Trends in Optics and Photonics on Advances in Optical Imaging and Photon Migration*, R. R. Alfano and J. G. Fujimoto, eds. (Optical Society of America, Washington, DC 1996), Vol. 2, pp. 137-141.
 76. G. P. Donzelli, S. Pratesi, G. Marconi, R. Salimbeni, S. Fantini, M. A. Franceschini, E. Gratton, and R. Pratesi, "Monitoring and Imaging in Neonatology: Nuova Tecnica NIRS nel Dominio delle Frequenze," ("Monitoring and Imaging in Neonatology: a New NIRS Technique in the Frequency-Domain"), Proc. of the 6th National Conference of the Italian Society of Perinatal Medicine, Spoleto (Italy), June 3-6, 1996 (Monduzzi Editore S.p.A., Bologna, Italy, 1996), pp. 329-337.
 77. K. T. Moesta, H. Kaisers, S. Fantini, M. Tonnie, M. Kaschke, and P. M. Schlag, "Laser Mammography of the Breast - Sensitivity Improvement by High Frequency Modulation," *Langenbecks Archiv fur Chirurgie*: 543-548, Suppl. 1, (1996).
 78. S. Fantini, M. A. Franceschini, G. Gaida, and M. Kaschke, "Frequency-Domain Optical Mammography: the Correction of Tissue Thickness Variations within the Scanned Region", Proc. SPIE **2626**, 228-236 (1995).
 79. S. Fantini, M. A. Franceschini, S. A. Walker, J. S. Maier, and E. Gratton, "Photon Path Distributions in Turbid Media: Applications for Imaging," Proc. SPIE **2389**, 340-349 (1995).
 80. M. A. Franceschini, S. Fantini, S. A. Walker, J. S. Maier, and E. Gratton, "Multi-Channel Optical Instrument for Near-Infrared Imaging of Tissue," Proc. SPIE **2389**, 264-272 (1995).
 81. W. W. Mantulin, S. Fantini, M. A. Franceschini, S. A. Walker, J. S. Maier, and E. Gratton, "Tissue Optical Parameter Map Generated with Frequency-Domain Spectroscopy," Proc. SPIE **2396**, 323-330 (1995).
 82. J. S. Maier, B. Barbieri, A. Chervu, I. Chervu, S. Fantini, M. A. Franceschini, M. Levi W. W. Mantulin, A. Rosenberg, S. A. Walker, and E. Gratton, "*In Vivo* Study of Human Tissues with a Portable Near-Infrared Tissue Spectrometer," Proc. SPIE **2387**, 240-248 (1995).
 83. M. Ferrari, R. A. De Blasi, S. Fantini, M. A. Franceschini, B. Barbieri, V. Quaresima, and E. Gratton, "Cerebral and Muscle Oxygen Saturation Measurement by a Frequency-Domain Near-Infrared Spectroscopic Technique," Proc. SPIE **2389**, 868-874 (1995).
 84. S. Fantini, M. A. Franceschini, J. S. Maier, S. A. Walker, and E. Gratton, "Frequency-Domain Multi-Source Optical Spectrometer and Oximeter," Proc. SPIE **2326**, 108-116 (1995).
 85. E. Gratton, S. Fantini, M. A. Franceschini, J. B. Fishkin, and J. S. Maier "Near-Infrared Optical Spectroscopy of Tissues Using an LED Frequency Domain Spectrometer," *OSA Proceedings on Advances in Optical Imaging and Photon Migration*, R. R. Alfano, ed., (Optical Society of America, Washington, DC 1994), Vol. 21, pp. 278-282.
 86. S. Fantini, M. A. Franceschini, J. B. Fishkin, W. W. Mantulin and E. Gratton, "The Absorption Spectra of a Chromophore in Highly Scattering Media," Proc. SPIE **2100**, 114-123 (1994).
 87. S. Fantini, M. A. Franceschini, J. B. Fishkin, and E. Gratton, "Absolute Measurement of Absorption and Scattering Coefficients Spectra of a Multiply Scattering Medium," Proc. SPIE **2131**, 356-364 (1994).
 88. M. A. Franceschini, S. Fantini, and E. Gratton, "LEDs in Frequency-Domain Spectroscopy of Tissues," Proc. SPIE **2135**, 300-306 (1994).