

## CURRICULUM VITAE

**Date Prepared:** Sep 20, 2017  
**Name:** Stefan A. Carp  
**Office Address:** Athinoula A Martinos Center for Biomedical Imaging,  
Department of Radiology  
Massachusetts General Hospital  
Room 2301, 13<sup>th</sup> Street Building 149  
Charlestown MA 02129  
**Work Phone:** 617-643-2230  
**Work Email:** [carp@nmr.mgh.harvard.edu](mailto:carp@nmr.mgh.harvard.edu)  
**Work FAX:** 617-726-7422

### Education

2005	PhD	Chemical Engineering	Univ. of California, Irvine
2002	MS	Chemical Engineering	Univ. of California, Irvine
2000	BS	Chemical Engineering	MIT
2000	BS	Chemistry	MIT

### Postdoctoral Training

09/05-11/10	Research Fellow	Dept. of Radiology	Mass. General Hospital Harvard Medical School
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### Faculty Academic Appointments

7/14-	Assistant Professor	Dept. of Radiology	Harvard Medical School
11/10-6/14	Instructor	Dept. of Radiology	Harvard Medical School

### Appointments at Hospitals/Affiliated Institutions

11/10-	Assistant in Biomedical Engineering	Dept. of Radiology	Mass. General Hospital
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### Professional Societies

2004-	International Society for Optics and Photonics (SPIE)	Member
2005-	Optical Society of America	Member

## Grant Review Activities

2011- Grant Reviewer for the National Authority for Scientific Research of Romania  
2012 Grant Reviewer for the Harvard Catalyst Pilot Grant Program  
2012-2014 Grant Reviewer for the NIH Early Career Reviewer Program  
2014- Grant Reviewer for the VA Cardiology Merit Review Panel  
2016- Grant Reviewer for the DoD BCRP  
2016 Grant Reviewer for the Army MRMC BAA (ad-hoc reviewer)  
2017 Grant Reviewer for the NIH CSR ZRG1 BDCN-W 90 special emphasis panel

## Editorial Activities

Associate Editor – Ad-hoc

Medical Physics

Journal Reviewer

Radiology

NeuroImage

Academic Radiology

Breast Cancer Research and Treatment

Current Molecular Imaging Reviews

Journal of Innovative Optical Health Sciences

Journal of Biomedical Optics

Applied Optics

Optics Express

Biomedical Optics Express

Optics Letters

Medical Physics

Physical Review E

Measurement Science and Technology

IEEE Transactions in Medical Imaging

IEEE Transactions on Biomedical Engineering

Journal of Biophotonics

Journal of Modern Optics

Journal of Optical Society of America A: Optics, Image Science and Vision

Psychophysiology

Sensors

Microvascular Research

Review of Scientific Instruments

Biomedical Physics and Engineering Express

Scientific Reports

## **Other Editorial Roles**

2009	IEEE International Symposium on Biomedical Imaging (ISBI)	Program Reviewer
2011	IEEE International Symposium on Biomedical Imaging (ISBI)	Program Reviewer
2011	International Society for Magnetic Resonance Imaging in Medicine (ISMRM) Annual Meeting 2012	Program Reviewer
2013-2014	Optical Society of America, Biomedical Optics Topical Meeting 2014	Organizing Committee Member and Program Reviewer
2015-2016	Optical Society of America, Biomedical Optics Topical Meeting 2016	Organizing Committee Member and Program Reviewer

## **Honors and Prizes**

1998-1999	Undergraduate research scholarship	Beckman Foundation
2000-2001	Univ. of California Regents' Graduate Fellowship	University of California, Irvine
2001, 2002, 2004, 2006	Conference Travel Awards	Engineering Foundation, Gordon Conferences, SPIE

## **Report of Funded and Unfunded Projects**

### **Funding Information**

#### **Past**

9/2008-3/2009	Early Evaluation of Breast Cancer Response to Therapy with Dynamic Multi-Spectral Optical Tomography NIH NCI R43CA132253 Collaborator (PI: William Johnson, TechEn, Inc., Milford, MA) The goal of this Phase I SBIR project is to extend the spectral and spatial coverage of the CW6 real-time continuous-wave optical imager for dynamic breast optical tomography
9/2009-9/2014	Functional Metabolic Near-Infrared Tomography Optical Breast Imaging (TOBI) to Monitor Response to Neoadjuvant Therapy in Breast Cancer KOMEN BREAST CANCER FOUNDATION KG090591 Co-Investigator (PI: Steven J. Isakoff) This is a pilot clinical trial to evaluate the ability of dynamic breast optical tomography to predict neoadjuvant therapy outcome one week after initiation of treatment
6/2010-6/2012	Time Resolved Breast Imaging Using a Combined MRI and Optical Tomography Approach NIH NIBIB K99EB011889 – Pathway to Independence Career Development Award <b>PI</b> (\$176,750) The goal of this project is to build an integrated optical/MRI dynamic breast imaging platform and use it to enhance the accuracy of dynamic breast biomarkers revealed through

- tissue compression
- 1/2014-  
4/2015      Dynamic optical imaging biomarkers of tumor response to therapy  
NCI Proton Beam Program Income Federal Share Program  
**PI** (\$106,322)  
The goal of this project is to develop methods for breast neoadjuvant chemotherapy monitoring using a combined dynamic optical tomography and digital breast tomosynthesis multi-modal imaging system.
- 11/2008-  
11/2014      3D Optical Imaging and Digital Xray of Breast Lesions  
NIH NCI R01CA097305  
Co-Investigator (PI: David Boas)  
This study aims to improve the accuracy and effectiveness of mammographic screening techniques by combining functional optical imaging with structural x-ray mammography.
- 9/2012-  
9/2014      MetaOx, Optical Monitor of Metabolic Rate of Oxygen Consumption  
NIH NICHD (1R43HD071761)  
Co-Investigator (Barbieri B. ISS Inc. (PI), Franceschini (Subcontract PI))  
The overall goal of this SBIR is to develop an instrument with which to quantify cerebral oxygen metabolism at the bedside to be used in neonatal intensive care units. Such a device will have significant clinical utility for assessing cerebral tissue injury and disease, and to follow response to treatment.
- 2/2010-  
2/2016      Integrated 3D X-Ray and Dynamic Tomographic Optical Breast Imaging System  
NIH NCI R01CA142575  
Co-Investigator (PI: David Boas)  
This study aims to develop an simultaneous diffuse optical imaging and X-ray mammography system using fast optical instrumentation and radiolucent optical probes for improved breast cancer diagnosis
- 8/2012-  
12/2015      Combined FDNIRS/DCS System to monitor infant's brain health and development  
Canon USA, \$760,703  
Co-Investigator (PI: David Boas)  
This project is to develop a robust and turnkey system to measure cerebral oxygen consumption in infants at the bedside and demonstrate its clinical value.
- 6/2012-  
5/2016      Time Resolved Breast Imaging Using a Combined MRI and Optical Tomography Approach  
NIH NIBIB R00EB011889  
**PI** (\$249,000)  
The goal of this project is to build an integrated optical/MRI dynamic breast imaging platform and use it to enhance the accuracy of dynamic breast biomarkers revealed through tissue compression
- Current**
- 4/2015-  
3/2020      Dynamic Optical Imaging Biomarkers of Tumor Response to Therapy  
NIH NCI R01CA187595  
**PI** (\$304,947)  
The goal of this project is to validate the variation of tissue HbT and SO<sub>2</sub> due to breast

compression as biomarkers for guiding breast cancer neoadjuvant chemotherapy. Our main approach is to develop a combined optical+x-ray mammography scanner for ease of clinical translation, but we will also employ Magnetic Resonance Imaging and MR Elastography to investigate the physiological basis of the compression response.

- 5/2016-4/2021 A versatile high-performance optical mammography co-imager  
NIH NCI R01CA204443  
Sub-contract PI (PI: Qianqian Fang, Northeastern University)  
The goal of this project is to build a standalone diffuse optical imager for breast cancer detection/diagnosis and co-registration techniques that will allow the use of standard clinical mammograms as structural prior information.
- 4/2017-3/2018 Non-invasive monitoring of brain health during cardio-pulmonary bypass  
MGH ECOR Interim Funding  
**PI** (\$75,000)  
This is an interim funding award based on a well-received but unfunded NIH R01 application to monitor brain health during cardio-pulmonary bypass using a combination of frequency domain infrared oximetry and blood flow monitoring using diffuse correlation spectroscopy in conjunction with advanced light transport modeling to ensure accuracy for adult brain measurements.
- 7/2016-4/2018 Non-Contact Mobile Oximeter for Rapid Birth Asphyxia and Childhood Pneumonia Assessment  
USAID AID-OAA-F-15-00018 (Saving Lives at Birth)  
**PI** (\$250,000)  
The goal of this project is to develop a smartphone based non-contact oximeter to assess birth asphyxia and childhood pneumonia in low resource settings.

## **Report of Local Teaching and Training**

### **Teaching of Students in Courses**

2000-2005	Teaching Assistant, undergraduate chemical engineering curriculum courses	University of California, Irvine (a total of 7 academic quarters)
2008, 2010	Guest Lecturer, MIT HST 563, "Imaging Biophysics and Clinical Applications" (HST graduate students)	Harvard-MIT HST program 3 hour laboratory session, and 6 hours on homework creation and grading each time
2015	Part-Time Lecturer, NEU EECE2150/2151 "Circuits and Signals for Biomedical Applications"	Northeastern University 5.75 hours combined lectures and laboratory session per week; 6-8 hrs/week lecture, lab, quiz/exams and homework development
2017	Guest Lecturer, NEU BIOE 5810 "Design of Biomedical Instrumentation"	Northeastern University 2 hour guest lecture on "Introduction to Near Infrared Spectroscopy and Imaging"

### Laboratory and Other Research Supervisory and Training Responsibilities

2010-	Co- mentored/supervised graduate students/postdoctoral fellows to advance projects on which I was a Co-Investigator – daily-to-weekly mentorship for approx. 4-8 hours a week	I provided mentorship/supervision through one-on-one meetings
2014	Mentor for the MIT Research Science Institute – 6 weeks, approx. 10 hrs/week	I created a feasible short research project for the student and provided one-on-one tutorials and mentorship
2006-2009	Mentor for the NIH/NSF sponsored HST Institute for Biomedical Optics – daily mentorship for approx. 16 hours a week for the duration of the program (2 months each in '06,'07,'08,'09)	Guided summer students in research, writing and presentations over the 10 week program each year
2006-2008	Co-mentor and thesis committee member for two Northeastern graduate students (Dibo Ntuba, Eleonora Vidolova) – weekly or bi-weekly meeting approx.. 1-2 hours a week in 2006 and 2007-2008, respectively	Periodic meetings during research collaborations and participation in thesis defense evaluation

### Formally Supervised Trainees and Faculty

6/2017-	Supervisor of Ms. Kathleen Deabill (Research Assistant) – daily mentorship since 1/2017, approx. 3-6 hours a week	I hired Ms. Deabill as a co-op temporary research assistant to work on my optical breast cancer imaging projects. I provide training on biomedical instrumentation and biomedical optics both theoretically and hands-on.
1/2017- 8/2017	Supervisor of Mr. Lance Barcelona (Research Assistant) – daily mentorship since 1/2017, approx. 4-8 hours a week	I hired Mr. Barcelona as a co-op temporary research assistant to work on my optical breast cancer imaging projects. I provide training on biomedical instrumentation and biomedical optics both theoretically and hands-on.
9/2015-	Supervisor of Dr. Bin Deng (Research Fellow) – daily mentorship since 9/2015, approx. 8-16 hours a week	I hired Dr. Deng to work on my optical breast cancer imaging projects as well as additional collaborative projects. I provide training on biomedical optics and translational research and career development advice. Helped her submit

		postdoctoral grant applications, prepare manuscripts and oral and poster presentations.
1/2015-11/2016	Supervisor of Dr. Bhawana Singh (Research Fellow) – daily mentorship, approx. 8-16 hours a week	I hired Dr. Singh to work on my optical breast cancer imaging projects as well as additional collaborative projects. I provide training on biomedical optics and translational research and career development advice. Helped her prepare poster presentations at international conferences.
11/2012-5/2014	Supervisor of Dr. Amir Sajjadi (Research Fellow) – daily mentorship from 11/2012 to 5/2014, approx. 8-16 hours a week. Amir is now a postdoctoral fellow at the MGH Cutaneous Biology Research Center.	I hired Dr. Sajjadi to work on my optical breast cancer imaging projects. I provide training on biomedical optics and translational research and career development advice. Published one manuscript and submitted one other, as well as given one oral and one poster presentation at international conferences.
6/2010-8/2012	Supervisor of Mr. Mark Martino (Research Assistant) – daily mentorship, approx. 8-16 hours a week. Mark is now with Dow Corning after completing a Masters Degree in Biomedical Engineering at U. of Rochester.	Mr. Martino was hired to work on developing a novel breast fiber optic probe for our second generation breast optical-Xray imager. I directly supervised Mr. Martino through daily discussions, weekly progress meetings and I helped him develop his programming and machining skills. I also advised Mark on applying to graduate school and he attended U. of Rochester graduating with a Masters degree.

**Local Invited Presentations**

No presentations below were sponsored by outside entities

2008	“Dynamic optical imaging of the compressed breast” Brigham and Women’s Hospital, Radiation Oncology Group
2012	“Dynamic Diffuse Optical Tomography for Breast Cancer Imaging” Massachusetts General Hospital, Martinos Center Molecular Imaging Seminar Series
2013	“Non Invasive Tissue Perfusion Measurement using Diffuse Correlation Spectroscopy” Massachusetts General Hospital, Martinos Center Brain Map Seminar Series

2014 “Optical Imaging to Monitor Therapy in Patients with Breast Cancer”  
MGH Breast Imaging Division Research Seminar Series

## **Report of Regional, National and International Invited Teaching and Presentations**

Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified

### Regional

2007 “Physiological response of breast tissue during external compression”  
Northeastern University, Biomedical Signal Processing Lab

2010 “Dynamic Diffuse Optical Tomography of the Compressed Breast”  
Boston University, Biomedical Optics Lab

2014 “A tale of wandering photons: non-invasive physiological monitoring using near-infrared light”, Neurology Grand Rounds, Children’s Hospital of Philadelphia

2015 “Non-invasive metabolism quantification using near-infrared light”, Boston Children’s Hospital, Center for Fetal-Neonatal Neuroimaging & Developmental Science

### International

2012 “Non-invasive functional imaging using near-infrared light”  
Ulsan National Institute of Science and Technology (UNIST), Ulsan, South Korea  
Korea Basic Science Institute (KBSI), Ochang, South Korea  
(talk given in both locations, travel expenses sponsored jointly by UNIST and KBSI)

2016 “Translation research in diffuse optical imaging: breast cancer and neuromonitoring”  
ICFO – Institute of Photonic Sciences, Barcelona (Castelldefels), Spain

## **Report of Technological and Other Scientific Innovations**

Cancer detection by optical measurement of compression-induced transients	US Patent Application #20080004531, filed June 21, 2007  As a member of the Boas lab, my colleagues and I created a method for assessing tissue metabolic information relevant to breast cancer detection using dynamic optical measurements during fractional mammographic compression
Optical Probe Fiber for use with X-ray Mammography	US Patent Application #20150110242, filed October 17, 2014; issues as Patent # 9,265,460 on Feb 23, 2016.  Together with colleagues from the Martinos Optics Division, we have developed x-ray translucent optical fiber probes that enable simultaneous optical tomography and x-ray digital breast tomosynthesis scans.



Near Infrared Spectroscopy and Diffuse Correlation Spectroscopy Device and Methods	US Patent Application #20160345880, filed Jan 14, 2014  Together with collaborators from Canon USA we have developed a combined near-infrared frequency domain and diffuse correlation spectroscopy device capable of simultaneous measurements and real-time feedback for neonatal brain health monitoring
System and Method for Characterizing Biological Material using Near-Infrared Spectroscopy	PCT Patent Application filed Sep 13, 2017  Together with Dr. Dieter Manstein's group we have developed technology to detect the onset of phase transition during cryolipolysis procedures.

## **Report of Scholarship**

### **Publications**

#### **Peer reviewed publications in print or other media**

- Research Investigations (h-index: 19)
  1. Spector, S., M. H. Wang, S.A. Carp et al. (2000). "Rational modification of protein stability by the mutation of charged surface residues." *Biochemistry* **39**(5): 872-879.
  2. Carp, S. A., S. A. Prahl, et al. (2004). "Radiative transport in the delta-P-1 approximation: accuracy of fluence rate and optical penetration depth predictions in turbid semi-infinite media." *Journal of Biomedical Optics* **9**(3): 632-647.
  3. Carp, S. A., A. Guerra, et al. (2004). "Optoacoustic imaging using interferometric measurement of surface displacement." *Applied Physics Letters* **85**(23): 5772-5774.
  4. Carp, S. A., T. Kauffman, et al. (2006). "Compression-induced changes in the physiological state of the breast as observed through frequency domain photon migration measurements." *Journal of Biomedical Optics* **11**(6): 064016.
  5. Boverman, G., Q. Fang, S.A. Carp, et al. (2007). "Spatio-Temporal Imaging of the Hemoglobin in the Compressed Breast With Diffuse Optical Tomography." *Physics in Medicine and Biology* **52**(12): 3619-3641.
  6. Carp, S. A. and V. Venugopalan (2007). "Optoacoustic imaging based on the interferometric measurement of surface displacement." *Journal of Biomedical Optics* **12**(6), 064001.
  7. Carp, S. A., J. Selb, et al. (2008). "Dynamic functional and mechanical response of breast tissue to compression." *Optics Express* **16**(20): 16064-16078.
  8. Fang, Q. Q., S. A. Carp, et al. (2009). "Combined Optical Imaging and Mammography of the Healthy Breast: Optical Contrast Derived From Breast Structure and Compression." *Ieee Transactions on Medical Imaging* **28**(1): 30-42.
  9. Roche-Labarbe, N., S.A. Carp, et al. (2010), "Non-invasive Optical Measures of CBV, StO<sub>2</sub>, CBF Index, and rCMRO<sub>2</sub> in Premature Brains in the First 6 Weeks", *Human Brain Mapping*, **31**(3): 341-352
  10. Franceschini, M.A., Radhakrishnan, H., Thakur, K., Wu, W., Ruvinskaya, S., Carp, S.A., Boas, D.A. (2010). "The effect of different anesthetics on neurovascular coupling", *NeuroImage*, **51**(4): 1366-1377
  11. Carp S.A., Dai G.P. et al. (2010), "Validation of diffuse correlation spectroscopy measurements of

- rodent cerebral blood flow with simultaneous arterial spin labeling MRI; towards MRI-optical continuous cerebral metabolic monitoring”, *Biomedical Optics Express*, **1**(2): 553-565.
12. Fang Q., J. Selb, S.A. Carp, et al. (2011). “Combined Optical and X-ray Tomosynthesis Breast Imaging”, *Radiology*, **258**(1): 89-97
  13. Mazhar A., Cuccia D.J., Rice T.B., Carp S.A., et al. (2011),”Laser speckle imaging in the spatial frequency domain”, *Biomedical Optics Express*, **2**(6): 1553-1563.
  14. Carp S.A, Roche-Labarbe, N., et al. (2011), “Due to intravascular multiple sequential scattering, Diffuse Correlation Spectroscopy of tissue primarily measures relative red blood cell motion within vessels”, *Biomedical Optics Express*, **2**(7): 2047-2054
  15. Roche-Labarbe, N.; Fenoglio, A.; Aggarwal, A.; Surova, A.; Dehaes, M.; Carp, S.A.; Franceschini, M.A.; Grant, P.E. (2012) “Near infrared spectroscopy assessment of cerebral oxygen metabolism in the developing premature brain”, *J. Cerebral Blood Flow and Metab.*, **32**(3): 481-488.
  16. Lin, P.Y., Roche-Labarbe, N., Dehaes, M., Carp, S., Fenoglio, A., Barbieri, B., Hagan, K., Grant, P.E. and Franceschini, M.A. (2013). "Non-invasive optical measurement of cerebral metabolism and hemodynamics in infants." *Journal of Visualized Experiments* (73): e4379. doi:10.3791/4379
  17. Carp S.A., A.Y. Sajjadi, C.M. Wanyo, et al. (2013) “Hemodynamic signature of breast cancer under fractional mammographic compression using a dynamic diffuse optical tomography system”, *Biomedical Optics Express*, **4**(12):2911-24. doi: 10.1364/BOE.4.002911
  18. Roche-Labarbe, N.; Fenoglio, A.;Radhakrishnan H., Kocienski-Filip M., Carp, S.A.; Dubb J.;Boas D.A.; Grant P.E.;Franceschini M.A. (2014) “Somatosensory evoked changes in cerebral oxygen consumption measured non-invasively in premature neonates”, *NeuroImage*, **85**(1): 279-286
  19. Selb J., Boas D.A., Chan. S., Evans K.C., Buckley E.M., Carp S.A. (2014) “Sensitivity of Near-Infrared Spectroscopy and Diffuse Correlation Spectroscopy to Brain Hemodynamics: Simulations, and Experimental Findings during Hypercapnia”, *Neurophotonics* **1**(1): Art. No. 015005;
  20. B. B. Zimmermann, Q. Fang, D. A. Boas, and S. A. Carp. Frequency domain near-infrared multiwavelength imager design using high-speed, direct analog-to-digital conversion. *J Biomed Opt.* 2016 Jan; **21**(1), 16010
  21. Boas DA, Sakadzic S, Selb J, Farzam P, Franceschini MA, Carp SA (2016). Establishing the diffuse correlation spectroscopy signal relationship with blood flow. *Neurophotonics*, 2016 Jul; **3**(3): 031412.
  22. Tromberg BJ, Zhang Z, Leproux A, O'Sullivan TD, Cerussi AE, Carpenter PM, Mehta RS, Roblyer D, Yang W, Paulsen KD, Pogue BW, Jiang S, Kaufman PA, Yodh AG, Chung SH, Schnall M, Snyder BS, Hylton N, Boas DA, Carp SA, Isakoff SJ, Mankoff D; ACRIN 6691 investigators. Predicting Responses to Neoadjuvant Chemotherapy in Breast Cancer: ACRIN 6691 Trial of Diffuse Optical Spectroscopic Imaging. *Cancer Res.* 2016 Oct 15;**76**(20):5933-5944.
  23. Sajjadi, A. Y., S. J. Isakoff, B. Deng, B. Singh, C. M. Wanyo, Q. Q. Fang, M. C. Specht, L. Schapira, B. Moy, A. Bardia, D. A. Boas and S. A. Carp (2017). "Normalization of compression-induced hemodynamics in patients responding to neoadjuvant chemotherapy monitored by dynamic tomographic optical breast imaging (DTOBI)." *Biomedical Optics Express* **8**(2): 555-569.
  24. Sakadžić, S., D. A. Boas and S. A. Carp (2017). "Theoretical model of blood flow measurement by diffuse correlation spectroscopy." *Journal of Biomedical Optics* **22**(2): 027006-027006.
  25. Kumar, A. T. N., S. A. Carp, J. Yang, A. Ross, Z. Medarova and C. Ran (2017). "Fluorescence lifetime-based contrast enhancement of indocyanine green-labeled tumors." *Journal of Biomedical Optics* **22**(4): 040501-040501.
  26. Zimmerman B.B., Deng B., Singh B., Martino M., Selb J., Fang Q., Sajjady A.Y., Cormier J.,

- Moore R.H., Kopans D.B., Boas D.A., Saksena M.A., Carp S.A., (2017) “Multimodal breast cancer imaging using coregistered dynamic diffuse optical tomography and digital breast tomosynthesis”, *Journal of Biomedical Optics*, 22(4): 046008-046008
27. Tang J., Erdener S.E., Li B., Fu, S., Sakadzic, S., Lee J., Carp, S.A., Boas, D.A., (2017) “Shear-induced diffusion of red blood cells measured with dynamic light scattering-optical coherence tomography”, *Journal of Biophotonics*, e201700070.
  28. Carp S.A., Farzam P., Redes N., Hueber D.M., Franceschini, M.A., (2017), “Combined multi-distance frequency domain and diffuse correlation spectroscopy system with simultaneous data acquisition and real-time analysis”, *Biomedical Optics Express* 8(9): 3993-4006.
  29. Leproux A., O’Sullivan T.D., Cerussi A.E., Durkin A., Hill B., Hylton N., Yodh A.G., Carp S.A., Boas, D.A., Jiang S., Paulsen K.D., Pogue B.W., Roblyer D., Yang W., Tromberg, B.J. (2017), “Standardization of diffuse optical spectroscopic imaging (DOSI) instruments in a two-year multicenter breast cancer trial”, *Journal of Biomedical Optics*, 22(12), Art. No. 121604

### Non-peer reviewed scientific or medical publications/materials in print or other media

- Proceedings of meetings or other non-peer reviewed research publications
  1. Stefan A. Carp, Arnold Guerra III, Samuel Q. Duque, Jr., and Vasan Venugopalan, “POISe: pulsed optoacoustic interferometric spectroscopy and imaging”, *Proc. SPIE* 5320, 214 (2004)
  2. Stefan A. Carp and Vasan Venugopalan, “3D interferometric optoacoustic imaging”, *Proc. SPIE* 5697, 307 (2005)
  3. Stefan A. Carp, Juliette Selb, Qianqian Fang, Richard H. Moore, Daniel B. Kopans, Elizabeth Rafferty, David A. Boas, “Compression Induced Changes in the Physiological State of the Breast as Derived from Combined Frequency Domain Photon Migration and White Light Spectroscopy Measurements”, *OSA Biomedical optics topical meeting Technical Digest (BIOMED 2006)*, paper: SD7 (2006).
  4. Qianqian Fang, Juliette Selb, Stefan A. Carp, Greg Boverman, Daniel B. Kopans, Richard H. Moore, and David A. Boas, “Clinical data analysis for the combined optical and tomosynthesis breast imaging”, *Proc. SPIE* 6431, 64310H (2007)
  5. Gregory Boverman, Eric L. Miller, Dana H. Brooks, Qianqian Fang, S. A. Carp, J. J. Selb, and David A. Boas, “Reconstruction of tissue dynamics in the compressed breast using multiplexed measurements and temporal basis functions”, *Proc. SPIE* 6434, 643413 (2007)
  6. Stefan A. Carp, Young R. Kim, Guangping Dai, David A. Boas, Maria A. Franceschini, “Validation of Optical Measurements of Cerebral Blood Flow and Volume with SPION and ASL fMRI”, *OSA Biomedical optics topical meeting Technical Digest (BIOMED 2008)*, paper: BMD2 (2008)
  7. Qianqian Fang, Stefan A. Carp, Juliette Selb, Richard Moore, Daniel B. Kopans, Eric L Miller, Dana H. Brooks, David A. Boas, “A Multi-Modality Image Reconstruction Platform for Diffuse Optical Tomography”, *OSA Biomedical optics topical meeting Technical Digest (BIOMED 2008)*, paper: BMD24 (2008)
  8. Qianqian Fang, Stefan A. Carp, Juliette Selb, Richard Moore, Daniel B. Kopans, Eric L. Miller, Dana H. Brooks, David A. Boas, “Spectrally Constrained Optical Breast Imaging with Co-Registered X-ray Tomosynthesis”, *OSA Biomedical optics topical meeting Technical Digest (BIOMED 2008)*, paper: BSuB2 (2008)
  9. Stefan A. Carp, Juliette Selb, Qianqian Fang, Richard Moore, Daniel B. Kopans, Elizabeth Rafferty, David A. Boas, “Dynamic Functional and Mechanical Response of Breast Tissue to

- Compression”, OSA Biomedical optics topical meeting Technical Digest (BIOMED 2008), paper: BSuB7 (2008)
10. Eleonora Z. Vidolova, Stefan A. Carp, Eric L. Miller, David A. Boas, Dana H. Brooks, “Hemodynamically Constrained Dynamic Diffuse Optical Tomography under Mammographic Compression”, OSA Biomedical optics topical meeting Technical Digest (BIOMED 2008), paper: BSuE20 (2008)
  11. Harsha Radakrishnan, Weicheng Wu, Stefan A. Carp, David A. Boas, Maria A. Franceschini, “Effect of GABA on Somatosensory Evoked Potentials and Hemodynamic Evoked Responses”, OSA Biomedical optics topical meeting Technical Digest (BIOMED 2008), paper: BTuE1 (2008)
  12. Stefan A. Carp, Nadege Roche-Labarbe, Qianqian Fang, Juliette Selb, David A. Boas, “Multi-Modality Imaging of the Compressed Breast”, OSA Biomedical optics topical meeting Technical Digest (BIOMED 2010), paper: BMB2 (2010)
  13. Qianqian Fang, Stefan A. Carp, Richard H. Moore, Daniel B Kopans, David A. Boas, “Imaging Benign and Malignant Breast Lesions with Combined Optical Imaging and Tomosynthesis”, OSA Biomedical optics topical meeting Technical Digest (BIOMED 2010), paper: BSuB1 (2010)
  14. Nadege Roche-Labarbe, Stefan A. Carp, Andrea Surova, David A. Boas, Ellen P. Grant, Maria A. Franceschini, “Non-Invasive Optical Measures of CBV, StO<sub>2</sub>, CBF Index, and rCMRO<sub>2</sub> in Human Premature Neonates’ Brains in the First 6 Weeks of Life”, OSA Biomedical optics topical meeting Technical Digest (BIOMED 2010), paper: BTuE8 (2010)
  15. Stefan A. Carp, Maria A. Franceschini, David A. Boas, Young R. Kim, “Evaluation of Cerebral Energy Demand during Graded Hypercapnia and Validation of Optical Blood Flow Measurements against ASL fMRI”, OSA Biomedical optics topical meeting Technical Digest (BIOMED 2010), paper: JMA71 (2010)
  16. Bernhard Zimmerman, Juliette Selb, Stefan A. Carp, Qianqian Fang, Joe Stadtmiller, Robert Dewsnap, Ron Altman, David A. Boas, “A frequency domain near-infrared spectroscopy oximeter using high-speed, direct analog to digital conversion”, OSA Biomedical Optics Conference (BIOMED 2012), paper: Bsu3A.78 (2012)
  17. Qianqian Fang, Stefan A. Carp, Mark M. Martino, Richard H. Moore, Daniel B. Kopans, David A. Boas, “Joint image reconstruction for breast tumor diagnosis using both structural and functional information”, OSA Biomedical Optics Conference (BIOMED 2012), paper: BW3A.2
  18. Mark M. Martino, Qianqian Fang, David A. Boas, Stefan A. Carp, “Monte Carlo simulation of realistic transmission breast optical tomography data for optimization of finite element image reconstruction”, OSA Biomedical Optics Conference (BIOMED 2012), paper: BSu3A.97
  19. Stefan A. Carp, Sava Sakadzic, Vivek J. Srinivasan, Nadege Roche-Labarbe, Maria A. Franceschini, David A. Boas, “Within Vessel Multiple Sequential Scattering Sensitize Diffuse Correlation Spectroscopy Measurements to Erythrocyte Shear Induced Diffusion”, OSA Biomedical Optics Conference (BIOMED 2012), paper: BW3B.5
  20. Stefan A. Carp, Christy M. Wanyo, Qianqian Fang, David A. Boas, Steven J. Isakoff, “Neoadjuvant Chemotherapy Monitoring using Dynamic Breast Compression Imaging”, OSA Biomedical Optics Conference (BIOMED 2012), paper: BW3A.7
  21. Amir Y. Sajjadi, Christy M. Wanyo, Qianqian Fang, David A. Boas, Steven J. Isakoff, Stefan A. Carp, “Dynamic optical breast imaging for neoadjuvant therapy monitoring”, Proc. SPIE. 8578, Optical Tomography and Spectroscopy of Tissue X, 85780I (2013)
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## Thesis

Stefan A. Carp, PhD Thesis: “Pulsed Optoelastic Interferometric Spectroscopy and Imaging”  
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## Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings

### Conference Presentations Within Last 6 Years

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