

NAME Pogue, Brian William	POSITION TITLE Professor of Engineering Sciences		
eRA COMMONS USER NAME BWPOGUE	Dean of Graduate Studies, Dartmouth College		
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
York University, North York, ON, Canada	B.Sc. Hons.	1985-1989	Physics
York University, North York, ON, Canada	M.Sc.	1989-1991	Physics
McMaster University, Hamilton, ON, Canada	Ph.D.	1991-1996	Medical Physics
Harvard Medical School/Massachusetts General Hospital	Research Fellow	1995-1996	Photobiology/ Photochemistry

### A. Positions and Honors.

- 09/96 -12/96 Adjunct Instructor: Quincy College, Quincy, MA.  
12/96 - 09/00 Visiting Research Fellow: Wellman Laboratories of Photomedicine, Mass. General Hospital, Dept. of Dermatology, Harvard Medical School, Boston, MA  
12/96 - 6/01 Research Assistant Professor, Thayer School of Engineering, Dartmouth College, Hanover, NH.  
07/01 – 06/08 Associate Professor, Thayer School of Engineering, Dartmouth College, Hanover NH.  
09/05 – 12/08 Director, M.S. and Ph.D. Programs, Thayer School of Engineering, Dartmouth College.  
10/00 - present **Research Scientist**, Wellman Center for Photomedicine, Mass. General Hospital, Boston, MA  
06/08 – present **Professor**, Thayer School of Engineering, Dartmouth College, Hanover NH.  
09/07 – present **Adjunct Associate Professor**, Department of Surgery, Dartmouth Medical School.  
09/08 – present **Dean of Graduate Studies**, Dartmouth College.

### Editorial Work

- **Deputy Editor**, *Optics Letters*, published by the Optical Society of America (2008-present).
- **Editorial Board** *Medical Physics*, published by the AAPM (2006-present).
- **Editorial Board**, *Journal of Biomedical Optics*, published by SPIE (2007-present).
- **Writer & Reviewer** of questions on MCAT exam, American Institute for Research, (1996 – 2006).
- **Editor** of textbook Fluorescence in Biomedicine, Marcel Dekker Publ., (2003).

### Honors

- Graduate Studies Mentoring Award, Dartmouth College, 2006.

### B. Selected peer-reviewed publications (from over 120 peer-reviewed publications).

- Pogue BW**, Paulsen KD, "High resolution near infrared tomographic imaging simulations of rat cranium using a priori MRI structural information," *Optics Letters* **23**(21) 1716-8, (1998).  
**Pogue BW**, Momma T, Wu H, Hasan T, "Investigation of transient absorption in vivo during photodynamic therapy with pulsed laser light," *Br. J. Cancer* **80**(3-4) pp.344-351, (1999).  
**Pogue BW**, Redmond RW, Chen N, Ortel B, Hasan T, "A Photobiological and Photophysical-Based Study of Phototoxicity of two chlorines," *Cancer Research*.**61**, 717-24, 2001.  
**Pogue BW**, McBride TO, Osterman S, Poplack SP, Osterberg U, Paulsen KD, "Quantitative Hemoglobin Tomography Diffuse Near-Infrared Spectroscopy: Pilot Results in the Breast," *Radiology*, 218(1), 261-6, 2001.  
**Pogue BW**, O'Hara J, Wilmot C, Paulsen KD, Swartz H, "Estimation of capillary oxygen concentration in RIF-1 tumors with model-based interpretation of hypoxia & Eppendorf measurement," *Rad. Res.* **155**, 15-25, 2001.  
Srinivasan S, **Pogue BW**, Jiang S, Dehghani H, Kogel C, Soho S, Gibson JJ, Tosteson TD, Poplack SP, Paulsen KD, "Interpreting Hemoglobin and Water Conc., Oxygen Saturation, and Scattering Measured by Near-Infrared Tomography of Normal Breast In Vivo," *PNAS USA*, 100(21) 12349-12354 (2003).

- Pogue BW**, O'Hara JA, Demidenko E, Wilmot CJ, Goodwin IA, Chen B, Swartz HM, Hasan T, "Non-Vascular Targeting Photodynamic Therapy of the RIF-1 Tumor with Verteporfin Causes Enhanced Radiation Sensitivity," *Cancer Research*, 63,1025-1033 (2003).
- Dehghani H, **Pogue BW**, Jiang S, Brooksby B, Paulsen KD, "Three-dimensional optical tomography: resolution in small-object imaging," *Applied Optics* 42(16) 3117-3128 (2003).
- Pogue BW**, Jiang S, Dehghani H, Kogel C, Soho S, Srinivasan S, Song X, Tosteson TD, Poplack SP, Paulsen KD, "Characterization of Hemoglobin, Water and NIR Scattering in Breast Tissue: Analysis of inter-subject variability and menstrual cycle changes," *Journal of Biomedical Optics*, 9(3), 541-552 (May/June 2004).
- Pogue BW**, Gibbs SL, Chen B, Savellano M, "Fluorescence Imaging In Vivo: Raster Scanned Point-Source Imaging Provides More Accurate Quantification than Broad Beam Geometries," *Technology in Cancer Research and Treatment* 3(1) 15-21 (2004).
- Pogue BW**, Jiang S, Dehghani H, Kogel C, Soho S, Srinivasan S, Song X, Tosteson TD, Poplack SP, Paulsen KD, "Characterization of Hemoglobin, Water and NIR Scattering in Breast Tissue: Analysis of inter-subject variability and menstrual cycle changes," *Journal of Biomedical Optics*, 9(3) 541-552 (2004).
- Poplack SP, Paulsen KD, Hartov A, Meaney PM, **Pogue BW**, Tosteson TD, Grove MR, Soho SK, Wells WA, "Electromagnetic Breast Imaging: Average Tissue Property Values in Women with Negative Clinical Findings," *Radiology* 231(2) 571-580 (2004).
- Chen, B., **Pogue, B. W.**, Hoopes, P. J., Hasan, T. "Combining vascular and cellular targeting regimens enhances the therapeutic effect of photodynamic therapy" *International Journal of Radiation Oncology, Biology, Physics*, 61(4) 1216-1226 (2005).
- Chen, B., **Pogue, BW**, Hasan, T, "Liposomal Delivery of Photosensitizing Agents" *Expert Opinion on Drug Delivery*, 2(3) 477-487 (2005).
- del Carmen, MG, Rizvi, I, Moor, ACE, Oliva, E, Chang, Y, **Pogue, BW** and Hasan, T, "Epidermal Growth Factor Receptor Targeted Immunotherapy is Synergistic with Photodynamic Treatment of Ovarian Cancer In Vivo", *Journal of the National Cancer Institute*, 97(20) 1516-1524 (2005).
- Zhou, X., **Pogue, B. W.**, Chen, B., Demidenko, E., Joshi, H., Hoopes, P. J., Hasan, T., "Pretreatment photosensitizer dosimetry reduces variation in treatment response" *International Journal of Radiation Oncology Biology Physics*, 64(4) 1211-1220 (2006).
- Dehghani, H., Davis, S., Jiang, S., **Pogue, B. W.**, Paulsen, K. D., "Spectrally-resolved bioluminescence optical tomography" *Optics Letters* 31(3) 365-367 (2006).
- Brooksby, B., **Pogue, B. W.**, Jiang, S., Dehghani, H., Srinivasan, S., Kogel, C., Tosteson, T. D., Weaver, J., Poplack, S. P., Paulsen, K. D., "Imaging Breast Adipose and Fibroglandular Tissue Molecular Signatures using Hybrid MRI-Guided Near-Infrared Spectral Tomography" *Proceedings of the National Academy of Sciences*, 103(23) 8828-8833 (2006).
- Yalavarthy. P. K., Dehghani, H., **Pogue, B. W.**, Paulsen, K. D., "Structural information with regularization matrices improves near infrared diffuse optical tomography" *Optics Express* 15(13) 8043-8058 (2007).
- Yalavarthy. P. K., Dehghani, H., **Pogue, B. W.**, Paulsen, K. D., "Weight-matrix structured regularization provides optimal generalized least-squares estimate in diffuse optical tomography" *Medical Physics* 34(6) 2085-2098(2007).
- Poplack, S. P., Tosteson, T. D., Wells, W. A., **Pogue, B. W.**, Meaney, P. M., Hartov, A., Kogel, C., Soho, S. K., Gibson, J. J., Paulsen, K. D., "Electromagnetic Breast Imaging –Results of a Pilot Study in Women with Abnormal Mammograms" *Radiology*, 243(1) 350-359 (2007).
- Davis, S. C., Dehghani, H., Wang, J., Jiang, S., **Pogue, B. W.**, Paulsen, K. D., "Image-Guided Diffuse Optical Fluorescence Tomography Implemented with Laplacian-Structured Regularization" *Optics Express* 15(7) 4066-4082 (2007).
- Carpenter, C., Pogue, B. W., Jiang, S., Dehghani, H., Wang, X., Paulsen, K. D., Wells, W. A., Forero, J., Kogel, C., Weaver, J. B., Poplack, S. P., Kaufman, P. A., "Image-guided optical spectroscopy provides molecular specific information in vivo: MRI guided spectroscopy of breast cancer hemoglobin, water and scatterer size" *Optics Letters* 32(8) 933-935 (2007).
- Davis, S. C., Springett, R., Leussler, C., Mazurkewitz, P., Tuttle, S., Gibbs-Strauss, S. L., Jiang, S., Dehghani, H., **Pogue, B. W.**, Paulsen, K. D. "Magnetic resonance-coupled fluorescence tomography scanner for molecular imaging of tissue" *Review of Scientific Instruments* (in press, 2008).
- Marc Schegerin, Peter A. Kaufman, Anna A. Tosteson, Keith D. Paulsen, **Brian W. Pogue** "Prognostic Imaging in Neoadjuvant Chemotherapy of Locally-Advanced Breast Cancer should be Cost Effective" *Breast Cancer Research & Treatment* (OnlineFirst published, pending final issue assignment, 2008).

## **C. Research Support.**

### **Ongoing Research**

PO1 CA80139 (Paulsen) 05/01/06 - 04/30/11

NIH  
“Near-Infrared Spectroscopy and Imaging” within program project “Alternative Breast Cancer Imaging Modalities”  
This project focuses on the technological development of a near-infrared imaging system which can sample signals transmitted through breast tissue and image hemoglobin-related.  
Role: PI of Project 4

R01 CA109558 05/01/05 – 03/31/10

NIH  
“Fluorescence Imaging to Optimize Cancer Therapy”  
The goal of this project is to develop and utilize NIR fluorescence imaging of protoporphyrin IX induced by administration of aminolevulinic acid as a measurement of tumor metabolism, to monitor changes in response to therapy, examining the effects of radiation therapy, chemotherapy and photodynamic therapy.  
Role: PI

R01 CA120368 02/12/07 - 01/31/12

NIH  
“Micro CT/NIR Molecular Imaging of Cancer”  
The goal of this project is to develop and utilize MicroCT guided NIR luminescence tomography to image vascular and cellular networks within tumor tissue, using luminescent reporters in vivo.  
Role: PI

### **Completed Research Support (in the last 3 years)**

R21/R33 CA100984 05/01/04 – 07/31/08

NIH  
“Spectral-Encoding for Video-Rate Hemodynamic Tomography”  
The goal of this project is to develop and utilize NIR tomography at 30 Hz frame rate, allowing visualization of images of blood and water changes in tissue. The R21 phase of the grant is proof of feasibility of imaging tissue phantoms quantitatively at video rate and in vivo image acquisition at video rate.  
Role: PI

U54 CA105480 (Tromberg, UC Irvine) 09/23/03 – 08/31/08

NIH  
“Spatial/Spectral Tomography for Localized Functional Spectroscopy” subcontract project title within “Breast Cancer Multi-dimensional Diffuse Optical Imaging”  
The goal of this work is to develop diffuse tomography guided NIR spectroscopy of breast tissue, and to contribute NIR technology ideas towards a future multicenter study in breast disease. This project is centered through UCI, and subcontracts out to MGH, U Penn and Dartmouth.  
Role: Consortium PI

PO1 CA84203 (Hasan) 08/01/01 - 07/31/07

Subcontract through Massachusetts General Hospital (NIH)  
“Online-measurement and Model-based PDT dosimetry” within program project “Biological and Physical Determinants for Optimal PDT”  
This program looks at methods to improve the treatment of dysplastic tissues with photodynamic therapy. The biological and physical conditions that affect treatment efficacy are examined in murine models and in human clinical trials. The component on dosimetry (P.I. Pogue) examines the development of dosimetry tools that can provide fundamentally new information about dose in tissue.  
Role : Consortium PI

Philips Sponsored Research Agreement 01/01/06 – 12/31/07

Philips Medical Research

"Analysis of Combined MRI and Fluorescence Optical Tomography"

This project is focused on developing an optimized small animal and breast cancer tomography system within the 3T MRI unit.

Role: PI

R43CA105650 05/01/05 - 03/31/06

Radiation Monitoring Devices (NIH SBIR subcontract)

"Cancer Detection Using Luminescent Imaging"

This project focuses on development of antibody bound oxygen sensitive phosphors to image oxygen concentration in vivo.

Role: PI

ART Sponsored Research Agreement 05/09/05 - 03/31/07

ART (Advanced Research Technologies), Inc.

"Time Domain (TD) Optical Imaging Technology Platform"

This project is a sponsored agreement with ART Inc. to help calibrate their systems and assist with computer simulations to optimize imaging procedures.

Role: PI

RO1 CA69544 (Paulsen) 12/01/02 - 11/30/06

NIH

"Frequency Domain Optical Imaging of Breast Cancer"

This grant examines the potential of combining NIR imaging with MRI breast examination to enhance the image reconstruction and diagnostic potential of NIR tomography.

Role: Co-Investigator