

Harvard Medical School/Harvard School of Dental Medicine

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Place of Birth: Fontana, California

Education

1988	B.A. cum laude	Applied Mathematics	Harvard University
1997	Ph.D.	Electrical Engineering and Computer Science Advisor: James G. Fujimoto	Massachusetts Institute of Technology
1998	M.D. magna cum laude	Medicine	Harvard Medical School

Postdoctoral Training

1998-2001	Resident	Pathology	Massachusetts General Hospital
1999-2000	Clinical/Research Fellow	Pathology	Massachusetts General Hospital

Faculty Academic Appointments

2001-2004	Assistant Professor	Pathology	Harvard Medical School
2003-	Affiliated Faculty	Health Sciences and Technology	Harvard-MIT Division of Health Sciences and Technology
2004-2010	Associate Professor	Pathology	Harvard Medical School
2010	Professor	Pathology	Harvard Medical School

Appointments at Hospitals/Affiliated Institutions

Past

2001-2004	Assistant Physicist	Dermatology	Massachusetts General Hospital
2001-2008	Assistant Pathologist	Pathology	Massachusetts General Hospital
2004-2012	Associate Physicist	Dermatology	Massachusetts General Hospital
2008-2012	Associate Pathologist	Pathology	Massachusetts General Hospital

Current

2012	Physicist	Dermatology	Massachusetts General Hospital
2012	Pathologist	Pathology	Massachusetts General Hospital

Other Professional Positions

1987-1991	Vice-president	Vanguard Imaging, Ltd.
1993-1994	Consultant	Signal Analytics
2000-2003	Consultant	Infraredx, Inc.
2005-2010	Consultant	Prescient Medical, Inc.
2005-2010	Consultant	Cambridge Research and Instrumentation
2007-	Consultant	Merck Research Laboratories
2009-	Consultant	NinePoint Medical
2010-	Consultant	Samsung Advanced Institute of Technology

Major Administrative Leadership Positions*Local*

2007-2008	Interim Director	Wellman Center Photopathology Laboratory
2008-	Co-director of HST .035	Harvard-MIT Division of Health Sciences and Technology
2009-2013	Associate Director	Wellman Center for Photomedicine

Regional

2007-	Program Leader of Optical Diagnostics	Center for Integration of Medicine and Innovative Technology (CIMIT)
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Committee Service*Local*

2003-2004	Intellectual Property Committee Chairman	Wellman Center for Photomedicine, MGH
2003-2004	Search Committee for Director Member	Wellman Center for Photomedicine, MGH
2003-	Faculty Executive Committee Member	Wellman Center for Photomedicine, MGH
2007-	Faculty Search Committee Chairman	Wellman Center for Photomedicine, MGH, and HST
2013-	MGH Pathology Research Strategic Planning Committee Member	MGH Pathology

National

2008-	Program Committee Technical Session Chairman	Gordon Research Conference
2009-	Vulnerable Plaque Working Group Member	National Heart Lung and Blood Institute (NHLBI)

2010-2012	Transformation M4 Emerging Technology Team Leader	College of American Pathologists
2012-	IVM Working Group Vice Chair	College of American Pathologists
<i>International</i>		
2007	International Conference on Advances in Optics and Biotechnology Co-Chairman	Engineering Conferences International
2008-	International Working Group on Intracoronary OCT Standardization and Validation Founder and co-chairman	International Committee on Intracoronary OCT Standardization and Validation

Professional Societies

1995-	SPIE – International Society for Optical Engineering Member	
1995-	Optical Society of America Member	
1998-2001	American Medical Association Member	
1998-2001	Massachusetts Medical Association Member	
2000-	Association for Eradication of Heart Attack Member	
2000-	American Heart Association Member	
2006-	SPIE – International Society for Optical Engineering, Cardiovascular Photonics Program Committee Co-Chairman	
2006-	SPIE – International Society for Optical Engineering, Endoscopic Microscopy Program Committee Co-Chairman	
2011-	American Collage of Cardiology Fellow	
2012 -	College of American Pathologists Fellow	

Grant Review Activities

2003	NIDDK Study Section Ad hoc member	National Institutes of Health
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2005-2009 Microscopic Imaging Study Section National Institutes of Health
Standing member

Editorial Activities

Ad hoc reviewer

1993- Applied Optics
1998- Optics Communications
1998- Journal of the Optical Society of America
1993- Optics Letters
2000- Journal of Biomedical Optics
2001- Optics Express
2001- Applied Physics Letters
2003- Circulation
2003- Journal of the American College of Cardiology
2005- Arteriosclerosis, Thrombosis, and Vascular Biology
2007- Nature

Other Editorial Roles

2001	Editor	<i>The Handbook of Optical Coherence Tomography</i> , Marcel Dekker
2005	Guest Editor	Journal of Biomedical Optics
2010	Editor	<i>Atlas of Intracoronary Optical Coherence Tomography</i> , Springer

Honors and Prizes

1991-1996	NIH Fellowship	National Institute of General Medical Sciences (NIH)	Academic
1991-1998	MD/Ph.D. Fellowship	Harvard Medical School	Academic
1994	General Telephone & Electronics Engineering Fellowship	General Telephone & Electronics	Research
1995	Young investigator runner-up	American Heart Association	Research
1996	Student abstract prize runner-up	American Gastroenterology Association	Research
1996	MIT Research Laboratory of Electronics Award	Massachusetts Institute of Technology	Research
2000	Partners in Excellence Group Leader	Partners	Research
2004	Edward M. Kennedy Award for Health Care Innovation	Center for Integration of Medicine and Innovative Technology	Research
2007	International Academy of Science Technology of the Year Finalist	International Academy of Science	Research
2012-2017	Mike and Sue Hazard Family MGH Research Scholar	Massachusetts General Hospital	Research

Report of Funded and Unfunded Projects

Funding Information

Past

2000-2003	PI	National Science Foundation (NSF) Research BES-0086709	\$270,000
Endoscopic Confocal Microscopy by Spectral Encoding The goal of this work is to develop an endoscope compatible confocal microscope for identifying sub-cellular features diagnostic of early cancer and dysplasia.			
2001-2003	Co-PI	Advanced Cardiovascular Systems Research	
Characterization of Coronary Plaques with OCT with Patient Event Follow-up The goal of this project is to build and analyze an OCT database of human coronary plaques and demonstrate the clinical potential of intracoronary OCT in patients.			
2002-2003	PI	Center for Innovative Minimally Invasive Technology Research	\$75,000
Speckle Imaging for Plaque Characterization The goal of this project is to investigate a new method for characterizing atherosclerotic plaque structure and composition. The method is based on the temporal decorrelation of multiply scattered coherent light.			
2002-2005	PI	The Whitaker Foundation Research	\$236,289
Spectrally Encoded Miniature Endoscopy The goal of this project is to investigate a new imaging technology for ultraminiature endoscopy and laparoscopy, permitting the diagnosis of disease in previously inaccessible areas of the body.			
2002-2006	Investigator	National Institutes of Health Research R01HL70039	
In-situ Measurement of Plaque Biomechanical Properties (Bouma) This goal of this project is to validate and apply an optical coherence tomography (OCT) imaging method for assessing stress, strain and compliance in coronary vessels in vivo.			
2003-2004	PI	Center for Innovative Minimally Invasive Technology Research	\$25,000
Low Coherence Interferometry System for Guidance in Lumbar Punctures The goal of this project is to investigate the use of low coherence interferometry to provide interactive guidance of the lumbar puncture needle in real-time and identify adjacent tissue types before they are penetrated.			
2003-2004	PI	Center for Innovative Minimally Invasive Technology Research	\$75,000
Polarization Sensitive OCT (PS-OCT) Assessment of Collagen in Atherosclerotic Plaques The objective of this study is to investigate the measurement of collagen by quantifying birefringence in atherosclerotic plaques using PS-OCT.			
2003-2008	Investigator	National Institutes of Health	

Research
R01RR19768

Fast OCT Technology for Comprehensive Diagnostic Imaging (deBoer)

The goals of this project are to develop a new, parallel detection form of OCT that provides vastly improved image acquisition rate and resolution. The new technology will be used for early detection and treatment of glaucoma, characterization of vulnerable plaques responsible for acute myocardial infarction, and for surveillance for esophageal neoplasia in patients with Barrett's esophagus.

2003-2008	PI	Department of Defense, MFEL Program Research FA9550-04-1-0079	\$299,488
		Low Coherence Interferometry Guided Fine Needle Aspiration	
		The goal of this project is to develop an optically guided needle for fine needle aspiration of palpable masses.	
2003-2008	PI	Department of Defense, MFEL Program Research FA9550-04-1-0079	\$301,932
		Simultaneous Fluorescence Lifetime, Excitation, and Emission Spectral Measurement	
		The goal of this research is to develop a novel Fourier transform fluorescence spectroscopy technique for simultaneously detecting silicon quantum dots with unique excitation, emission, and lifetime properties.	
2004-2006	PI	Center for Innovative Minimally Invasive Technology Research	\$75,000
		Endoscopic Full-field Optical Coherence Microscopy System for Clinical Diagnostics	
		The goal of this research is to develop a novel imaging technology that will enable endoscopic imaging of human tissue at resolution sufficient to visualize cellular substructure, thereby providing clinicians with a tool that will bring endoscopic optical biopsy closer to realization.	
2006-2008	PI	National Institutes of Health Research R21CA122161	\$208,644
		Comprehensive Architectural and Cellular Endoscopic Microscopy	
		The goal of this work is to develop an endoscopic confocal microscope for identifying sub-cellular features diagnostic of early cancer and dysplasia.	
2006-2008	PI	Prescient Medical Incorporated Research	\$973,852
		Raman Spectroscopy of Coronary Atherosclerosis	
		The goal of this study is to develop a state-of-the-art Raman spectroscopy system and 3.0 F intracoronary catheter for the chemical characterization of coronary plaque in the presence of intraluminal blood.	
2006-2008	PI	Center for Innovative Minimally Invasive Technology Research 2006A014969	\$79,814

Optical Frequency Domain Imaging for the determination of cerebral aneurysm rupture risk

The goal of this research is to develop a high-resolution structural imaging method for imaging cerebral artery walls that is capable of discriminating rupture-prone from benign aneurysms.

2007-2009	PI	Department Bridge Funding MFEL Transition Research	\$120,000
		Portable Smart Needle Device	
		The goal of this research is to construct a miniature, battery-powered optical frequency domain imaging system for guidance of needle placement during vascular access.	
2007-2009	PI	Department Bridge Funding MFEL Transition Research	\$120,000
		Laser Speckle Imaging for Tissue Perfusion	
		The goal of this project is to develop a laser speckle hand-held imaging system for determining depth-resolved tissue perfusion.	
2007-2009	PI	Department Bridge Funding MFEL Transition Research	\$120,000
		Simultaneous Fluorescence Lifetime, Excitation, and Emission Imaging	
		The goal of this research is to develop a novel Fourier fluorescent technique for determining excitation, emission, and lifetime properties of biological samples.	
2007-2009	PI	Department Bridge Funding MFEL Transition Research	\$120,000
		Laser Speckle Imaging for Evaluating Compartment Syndrome	
		The goal of this project is to create a portable imaging device for diagnosing the early stages of compartment syndrome, prior to the occurrence of irreversible ischemia.	
2008-2009	PI	Center for Innovative Minimally Invasive Technology	\$35,861
		Micromirror Based 3D-Endoscopy	
		The goal of this project is to investigate the clinical utility of a newly developed MEMS scanning mirror for three-dimensional microscopic imaging inside the body	
2008-2009	PI	MGH ECOR Formulaic Bridge Support Research	\$50,000
		Chemical Analysis of Coronary Atherosclerosis in Patients	
		Development of an Intracoronary Raman Catheter System. This study will develop a state-of-the-art Raman spectroscopy system and 3.0 F intracoronary catheter for the detection of lipid beneath blood.	
2008-2010	PI	Olympus Medical Research, Clinical Study	\$1,360,000
		Optical Frequency Domain Imaging of Gastrointestinal and Pulmonary Tracts	
		The goal of this project is to determine the applications of endoscopic optical frequency domain imaging in the gastrointestinal and pulmonary tracts. Clinical feasibility studies will be conducted in the esophagus, bile duct, pancreas, duodenum, liver, and colon.	
2008-2010	Mentor	National Institutes of Health	\$284,310

Research

K99 CA134920 (Suter)

Optical Imaging of the Pulmonary Airways in the Assessment of Lung Cancer

The research is to develop an accurate screening and assessment tool, based on optical frequency domain imaging, for the detection and diagnosis of dysplastic changes and early squamous cell carcinoma within the bronchial mucosa.

Current

2004-2014	PI	National Institutes of Health (NHLBI) Research, Clinical Study R01HL076398	\$2,212,849
		Natural History of Vulnerable Coronary Plaques The goal of this project is to expand the current diagnostic capabilities of OCT to investigate the incidence, prevalence, and natural history of vulnerable plaques and determine the morphologic predictors of acute myocardial infarction	
2007-2012	PI	National Institutes of Health Research R21EB007718-03	\$1,177,316
		Miniature Laser Therapy Endoscope The goal of this project is to further research on effective ablation therapy through the development of an integrated miniature imaging/laser-ablation probe.	
2008-2012	PI	National Institutes of Health Research R01HL093717-01	\$1,903,396
		Chemical Analysis of Coronary Atherosclerosis in Patients The goal of this proposal is to develop an intracoronary catheter for measuring the chemical and molecular composition of atherosclerotic plaques in living human patients.	
2008-2010	Mentor	National Institutes of Health Research K99 EB008737 (Peng)	\$180,000
		Densely Multiplexed Fluorescence Imaging by Fourier Transform Fluorometry The research is to develop a novel Fourier transform fluorescence technique for simultaneously detecting different fluorescent markers with unique excitation, emission, and lifetime properties.	
2008-2013	PI	American Air Liquide Inc. Research	\$1,250,000
		Optical Imaging for Pulmonary Microstructure, Function, and Gas Delivery The goal of this research is to determine the three-dimensional structure and function of mammalian alveoli.	
2009-2011	PI	National Institutes of Health Research R21CA141884-01	\$799,298
		Comprehensive Confocal Microscopy for Image Guided Biopsy The goal of this research is to develop and test a novel method for imaging entire epithelial tissue surfaces to diagnose cancer and subsequently mark these locations so that they may be	

biopsied.

2003-2015	PI	National Institutes of Health Research, Clinical Study R01CA103769-08	\$1,508,848
<p>Improving Screening and Surveillance in Barrett's Patients The goal of this project is to expand the current diagnostic capabilities of OCT, develop a standalone imaging method for systematically evaluating the distal esophagus, and test these new methods for screening and surveillance in patients.</p>			
2007-2010	PI	National Institutes of Health STTR w/ Physical Sciences Inc. Research 1R43CA114896	\$38,117
<p>Smart Optical Probe for guidance of fine needle biopsy Validation of an optical method for improving the diagnostic yield of fine needle biopsy.</p>			
2007-2010	PI	Center for Innovative Minimally Invasive Technology Research 200A052999	\$25,000
<p>Program Leadership Award for Optical Diagnostics This fund supports Dr. Tearney's efforts to manage CIMIT's Optical Diagnostics Program.</p>			
2008-2013	PI	Cystic Fibrosis Foundation Research 2007A052878	\$430,066
<p>Development of Optical Coherence Tomography for Measuring of Mucociliary Clearance The goal of this project is to develop a high-resolution imaging modality for assessing respiratory epithelia cilia and the periciliary layer in Cystic Fibrosis patients in vivo.</p>			
2008-2010	PI	Wellman Center for Photomedicine Internal Funding	\$449,684
<p>Photopathology / Microscopy Core Dr. Tearney is the director of Wellman Center's Photopathology and Microscopy core laboratory. The core laboratory provides histopathology and advanced microscopy services to Wellman Center investigators.</p>			
2010-2011	PI	MGH ECOR Formulaic Bridge Support Research, Clinical Study	\$50,000
<p>Transnasal Probe for Diagnosing Eosinophilic Esophagitis The goal of this project is to develop a transnasal probe to investigate the clinical utility of using SECM for diagnosing Eosinophilic Esophagitis (EE) in patients.</p>			
2009-2010	PI	MGH ECOR Interim Support Funds Research, Clinical Study	\$50,000
<p>Improving Screening & Surveillance in Barrett's Patients The goal of this project is to utilize probe based Optical Frequency Domain Imaging as a tool for screening and surveillance of patients with Barrett's Esophagus (BE).</p>			
2012-2014	PI	iLumen	\$270,000

		Research	
		Endoscopic Imaging System	
		The goal of this project is to develop an endoscope attachment that enables visualization of the the luminal organ with a 360-degree angle field of view.	
2012-2015	PI	Canon	\$422,932
		Research	
		Ultraminiature Endoscope	
		The goal of this project is to develop the world's smallest endoscopes for a variety of clinical applications.	
2012-2015	PI	Canon	\$430,463
		Research	
		Next Generation Molecular-microstructural Arterial Imaging System and Catheter	
		The goal of this project is to design, fabricate and test a multimodality imaging for microstructural and molecular imaging of the coronary artery wall in vivo.	
2012-2017	PI	Brigham and Woman's Hospital	\$87,124
		Research	
		1R01HL114805-01	
		Murine Aortic Valve Microcalcification Imaging Ex Vivo with 1- μ m Resolution	
		The goal of this project is to image aortic valve calcifications in situ using μ OCT.	
2012-2014	PI	Merck Research Laboratories	\$91,872
		Research	
		Intravascular Imaging of Atheroma of Inflammation and Structure	
		The goal of this project is to conduct microstructural and molecular imaging of rabbit atheroma and evaluate the inflammatory content in response to statin therapy.	

Current Unfunded Projects

2007-	PI	Endoscopic confocal microscopy (bench research)	
		The goal of this work is to develop a hand-held confocal microscope for identifying sub-cellular features diagnostic of early cancer and dysplasia.	
2006-	PI	Miniature endoscopy (bench research)	
		This project will develop a new imaging technology for ultraminiature endoscopy and laparoscopy, permitting the diagnosis of disease in previously inaccessible areas of the body through a novel 250 μ m-diameter endoscope.	
2006-	PI	Endoscopic optical coherence microscopy (bench research)	
		This research will develop a new form of endoscopic microscopy termed, endoscopic full field optical coherence microscopy (EFFOCM). EFFOCM permits submicron resolution imaging along all three spatial dimensions (x, y, and z).	
2007-	PI	Photoactivatable amniotic membrane coronary stent (bench research)	
		This project will develop a novel device for coronary stenting, comprising a photoactivatable amniotic membrane that is bonded to the artery wall using light.	
2006-	PI	Differential near field scanning optical microscopy (DNSOM) (bench research)	
		The goal of this research is to develop a new paradigm for nm-scale imaging using edge apertures in the near-field.	

- 2006- PI Self-interference fluorescence coherence tomography (bench research)
The goal of this work is to develop a new type of cross-sectional fluorescence imaging using the phenomena of fluorescence self-interference.
- 2008- PI Mid-infrared optical tomography
The goal of this research is to investigate the use of mid-infrared electromagnetic radiation for human disease diagnosis.
- 2009- PI Stimulated emission depletion microscopy for deep tissue superresolution microscopy
In this project we are developing a new way of performing STED superresolution microscopy that can be implemented over large fields and in human tissue in vivo.
- 2010- PI Device for accurate placement of devices within the trachea
The goal of this research is to develop an optical device for determining when a bougie or tracheostomy tube has been correctly inserted in the trachea in the trauma setting.

Report of Local Teaching and Training

Teaching of Students in Courses

Harvard-MIT Health Sciences and Technology (HST)

- 2002- HST .569, Biomedical Optics
10 (graduate students) Instructor 80 hours per semester
- 2003- Wellman Biomedical Optics Summer Institute
12 (undergraduate students) Lecturer 20 hours
- 2003- HST .035, Principles and Practice of Human Pathology
20 (graduate students) Instructor 40 hours per semester
- 2005 HST .864 Evaluating a Biomedical Business Concept
20 (graduate students) Lecturer 4 hours
- 2006 HST .186 Frontiers in Biomedical Engineering and Physics
20 (graduate students) Lecturer 4 hours
- 2011- Clinical Applications of Optical Coherence Tomography
Lecturer 1 Hour
- 2012 Introduction to Clinical/Translational Research: Device Development
Lecturer 3 Hours
- 2012 HMS Molecular Imaging
20 (graduate students) Lecturer 1 hours

Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs)

Wellman Center for Photomedicine, Massachusetts General Hospital, Harvard Medical School

- 1997- Wellman Tutorial Lecture Series
50 (graduate students, postdoctoral, clinical fellows) Lecturer 10 hours
- 2001- Wellman Photomedicine Lecture Series

50 (graduate students, postdoctoral, clinical fellows) Lecturer 10 hours

2002-50 (graduate students, postdoctoral, clinical fellows) Optical Diagnostics Tutorial Series Lecturer 10 hours

Laboratory and Other Research Supervisory and Training Responsibilities

Wellman Center for Photomedicine, Massachusetts General Hospital, Harvard Medical School

1997- Supervision of undergraduate, graduate, post-doctoral research fellows Daily mentorship since 2001

Formally Supervised Trainees

1997-1999 Stefan Brand, M.D. Staff gastroenterologist, University of Munich

Co-author on three manuscripts, one as first author (Endoscopy).

1998-2000 John Ponerros, M.D. Assistant Professor, Harvard Medical School, staff gastroenterologist, Brigham and Women's Hospital

Co-author on four manuscripts, two as first author (Gastroenterology and Gastrointestinal Endoscopy).

1998-2000 Kelly Schlendorf Medical Student, Emory Medical School

Co-author on four manuscripts.

1998-2003 George Asimellis, Ph.D. Scientist, Philips Electronics North America

As first employee of Tearney lab, assisted in developing first imaging probes.

1999-2001 Dong-Heon Kang, M.D., Ph.D. Staff cardiologist, Saint Mary's Medical Center, Seoul, Korea

Co-author on three manuscripts.

1999- Milen Shishkov, Ph.D. Instructor, Harvard Medical School
Co-author on twenty-two manuscripts. He has become one of the leading experts on developing optical imaging probes.

2000-2002 Chris Kauffman Medical Student, University of Indiana Medical School

Co-author on four manuscripts.

2000-2002 Hiroshi Yabushita, M.D. Staff cardiologist, Kinki University School of Medicine, Osaka, Japan

Co-author on four manuscripts, one as first author (Circulation).

2000-2005 Nicusor Iftimia, Ph.D. Instructor, Harvard Medical School
Co-author on thirteen manuscripts, three as first author (JBO, Optics Express, Rev. Sci. Instr.).

2001-2002 Costas Pitris, M.D., Ph.D. Assistant Professor, EECS, Cyprus University

First author on one manuscript (Optics Express), graduated with honors from HMS.

2001-2002 Tina Helg, Ph.D. Post-doctoral Associate, University of Texas, Austin

Co-author on one manuscript.

2001-2003 Masamichi Takano, M.D. Staff cardiologist, Nippon Medical School, Tokyo, Japan

Co-author on five manuscripts. First author on a book chapter (Handbook of Vulnerable Plaque).

2002-2007 Caroline Boudoux, Ph.D. Assistant Professor

Co-author on seven manuscripts, three as first author (Optics Express, J. Voice, Arch. Otolaryngol. Head Neck Surg.).

2002-2007 Dvir Yelin, Ph.D. Assistant Professor, Technion

Co-author on fourteen manuscripts, nine as first author, one publication in Nature.

2002- Alyx Chau, B.S. Graduate Student, EECS, MIT

Co-author on four manuscripts, two as first author (JBO, Annals of Biomedical Engineering).

2002- Briain MacNeill, M.D. Cardiology Fellow, Massachusetts General Hospital

Co-author on five manuscripts, two as first author (JACC and J. Nuclear Cardiology).

2003-2005 Andy Yun, Ph.D. Assistant Professor, Harvard Medical School

Co-author on twenty-seven manuscripts, eight as first author, one publication in Nature Medicine.

2003-2006 Raymond Chan, Ph.D. Research Scientist, Philips Medical

Co-author on five manuscripts, one as first author (Optics Express).

2003-2007 Ronit Yelin, Ph.D. Research Scientist, Technion

Co-author on three manuscripts, one as first author (JBO).

2003-2008 Jason Motz, Ph.D. Research Scientist, Physical Sciences, Inc.

Co-author on six manuscripts, one as first author (Optics Letters).

2003-2008 Seemantini Nadkarni, Ph.D. Assistant Professor, Harvard Medical School

Co-author on six manuscripts, five as first author, including Circulation and JACC.

2003- Brian Goldberg, B.S. Graduate Student, EECS, MIT

Co-author on two manuscripts, one as first author (JBO).

2003- W. Matthew White, M.D. ENT Fellow, Massachusetts Eye and Ear Infirmary

Co-author on four manuscripts.

2003- John Evans, M.D. Gastroenterology Fellow, Massachusetts General Hospital

Co-author on four manuscripts, two as first author (Gastrointestinal Endoscopy and Clin. Gastro. Hep.).

2004-2008 Benjamin Vakoc, Ph.D. Assistant Professor, Harvard Medical School

Co-author on nineteen manuscripts, four as first author.

- 2004- William Oh, Ph.D. Instructor, Harvard Medical School
Co-author on fifteen manuscripts, seven as first author.
- 2005-2007 Adrien Desjardins, B.S. Graduate Student, Biophysics, HMS
Co-author on thirteen manuscripts, four as first author.
- 2005- Alberto Bilenca, Ph.D. Instructor, École Polytechnique
Fédérale de Lausanne
Co-author on ten manuscripts, five as first author.
- 2005- Melissa Suter, Ph.D. Instructor, Harvard Medical School
Co-author on five manuscripts, two as first author (Gastrointestinal Endoscopy). Recipient of NIH K99/R00 award.
- 2005- Leilei Peng, Ph.D. Instructor, Harvard Medical School
First author on two manuscripts (Optics Express and Optics Letters). Recipient of NIH K99/R00 award.
- 2006-2007 Aydogan Ozcan, Ph.D. Assistant Professor, UC Los Angeles
Co-author on six manuscripts, three as first author, including Nano Letters.
- 2006- Patrick Yachinski, M.D. Gastroenterology Fellow,
Massachusetts General Hospital
Co-author on one manuscript.
- 2006- Lida P. Hariri, M.S. Graduate Student, EECS, University of
Arizona
First author on one manuscript submitted to IEEE Trans. Med. Im.
- 2007- Priyanka Jillela Undergraduate Student, University of
Texas
Two manuscripts in preparation.
- 2007 Amneet Gulati Undergraduate Student, Rice
University
Demonstrated feasibility of respiratory FFOCM (results are currently unpublished).
- 2007-2008 Max Colice, Ph.D. Technology Specialist, Hamilton,
Brook, Smith and Reynolds
Co-author on one manuscript.
- 2007-2009 Lisa Bartlett Graduate Student, Tufts University
Co-author on one manuscript.
- 2007- Dong-Kyun Kang, Ph.D. Post-doctoral Associate, Harvard
Medical School
First author on one manuscript accepted to Optics Express. First author on a second manuscript for
Gastrointestinal Endoscopy/
- 2007-2008 Michael Choma, M.D., Ph.D. Pediatric Fellow, Children's Hospital
First author on one manuscript submitted to Nature.
- 2008-2008 Kendall Bate Undergraduate Student, New York
University
Established SOP's for intracoronary OCT core lab.

2008-2010	Jing Yuan, Ph.D.	Post-doctoral Associate, Huazhong University of Sci. & Tech. (HUST)
	First author on one manuscript	
2008-2012	Hongki Yoo, Ph.D.	Assistant Professor Biomedical Optics and Photomedicine Dept. of Biomedical Engineering, Hanyang University, Korea
	Co-author eight manuscripts, two as first author	
2008-2012	Linbo Liu, Ph.D.	Assistant Professor Nanyang Technological University School of Electrical and Electronic Engineering, Singapore
	Co-author on seven manuscripts, one as first author	
2009-2010	Eman Namati, Ph.D.	Director, Systems Engineering NinePoint Medical
	Co-author on five manuscripts	
2009-2011	Jacqueline Namati, Ph.D.	Post-doctoral Associate, Harvard Medical School
2009-2012	Parama Pal, Ph.D.	Robert Bosch Centre for Cyber Physical Systems
	Member of lab	
2009-	Atsushi Tanaka, M.D.	Assistant Professor, Wakayama Medical University
	Co-author on seven manuscripts, two as first author	
2009-	Hao Wang, M.S.	
	Member of lab.	
2009-2012	William Warger, Ph.D.	Thor Labs
	Co-author on four manuscripts	
2010-2012	Christine Fleming, Ph.D.	Assistant Professor Columbia University
2010-	Emmanuel Coron, M.D. Ph.D.	Post-doctoral Associate, University Hospital Nantes
	Co-author on two manuscripts, one as first author	
2010-2012	Simon Schlachter, Ph. D.	NinePoint Medical
2010-	Paulino Vacas Jacques, Ph. D.	
	Member of lab	
2010-	Michalina Gora, Ph. D.	
	Co-author on two manuscripts, both as first author	

2011- Li Li
New member of lab

2011- Ehsan Hamidi
New member of lab

2011-2012 Yaron Bromberg
Department of Applied Physics
Yale University

Co-author on two manuscripts

2012- Tzahi Grunzweig
New member of lab

2012- Ali Fard
New member of lab

2012- Dora Juan Juan Hu
New member of lab

2012- Nima Tabatabaei
New member of lab

2012- Kengyeh (Ken) Chu
Co-author on one publication

2012- Huan Ma
New member of lab

2012- Tao Wu
New member of lab

Formal Teaching of Peers (e.g., CME and other continuing education courses)

2000-2001	Endoscopic Management of Tumors of the Upper Aerodigestive Tract	12 hours
Clinical Applications of Optical Coherence Tomography	Boston, MA	Partners Health Care
2003	Thrombosis and Thromboembolism: New Strategies for Improved Patient Care	12 hours
Imaging the Vulnerable Plaque	Boston, MA	Partners Health Care

Local Invited Presentations

1999	Optical Coherence Tomography in the Cardiovascular System	Lecture
Wellman Center for Photomedicine, MGH		
1999	Clinical Applications of Optical Coherence Tomography	Lecture
Center for Integration of Medicine and Innovative Technology		

2002	Optical Diagnostics Center for Integration of Medicine and Innovative Technology	Lecture
2002	Optical Techniques for Minimally Invasive Imaging Wellman Center for Photomedicine	Lecture
2002	In Vivo Optical Microscopy: A New Field Department of Pathology, MGH	Grand Rounds
2003	Endoscopic Confocal Microscopy Center for Integration of Medicine and Innovative Technology	Lecture
2003	Optical Imaging of Coronary Plaque Macrophages in Human Patients Wellman Center for Photomedicine, MGH	Lecture
2004	Cardiovascular Optical Coherence Tomography at MGH Center for Integration of Medicine and Innovative Technology	Lecture
2005	OFDI for Assessing Cerebral Aneurysm Risk Center for Integration of Medicine and Innovative Technology	Lecture
2006	Optical Diagnosis: An Overview Wellman Center for Photomedicine, MGH	Lecture
2007	Optical Diagnosis: An Overview Center for Integration of Medicine and Innovative Technology	Lecture
2008	Seeing Inside the Body: Microendoscopy and Endoscopic Microscopy Department of Pathology, MGH	Lecture
2008	Seeing Inside: OFDI and Ultraminiature Endoscopy Center for Integration of Medicine and Innovative Technology	Lecture
2010	Endoscopic Microscopy for Gastrointestinal Applications Department of Gastrointestinal Medicine, MGH	Grand Rounds
2010	Endoscopic Microscopy Department of Pulmonary Medicine, MGH	Grand Rounds
2012	Future of Coronary OCT Department of Rheumatology, BWH	Grand Rounds
2012	Grant Writing Office of Research Career Development, MGH	Lecture
2012	Seeing the Unseen in Patients: Advancing Disease Prevention and Treatment Through Micro-Imaging Research Advisory Council, MGH	Lecture

Report of Regional, National and International Invited Teaching and Presentations

Local

2009	Imaging Human Coronary Arteries with Light Brigham and Women's Hospital	Grand Rounds None
2011	Intravascular OCT a Translational Story French American Innovation Day, Boston, MA	Lecture Embassy of France in the United States Office for Science and Technology
2012	R-Level Grant Writing Workshop Office for Research Career Development Grant Writing Workshop, Boston, MA	Lecture Massachusetts General Hospital
2012	Seeing the Unseen in Patients: Advancing Disease Prevention and Treatment Through Micro-Imaging Department of Cardiology, BWH	Grand Rounds

Regional

2006	Endoscopic Microscopy Yale School of Medicine, New Haven, CT	Grand Rounds None
2007	Seeing Inside the Body with Microendoscopy and Endoscopic Microscopy Tufts School of Bioengineering, Medford, MA	Invited Lecture None
2007	The Future of Optical Medicine: Seeing Inside the Body Boston University Biomedical Engineering, Boston, MA	Invited Lecture None
2012	Seeing the Unseen in Patients: Advancing Disease Prevention and Treatment Through Micro-Imaging Lincoln Labs, MIT	Lecture
2012	Endoscopic Microscopy: Bridging the Radiology-Pathology Divide Fall Colloquia, University of Massachusetts Lowell	Lecture
2012	Future of Coronary OCT Whitaker Cardiovascular Institute, Boston University	Lecture

National

1995	Optical Biopsy in Human Tissue Using Optical Coherence Tomography and Microscopy Optical Society of America Annual Meeting, Baltimore, MD	Invited Lecture Optical Society of America
1996	Optical Biopsy using Optical Coherence	Invited Lecture

	Tomography	
	Gordon Research Conference, Meriden, NH	None
1996	Endoscopic Optical Coherence Tomography Lasers and Electro-Optics Society Annual Meeting, Boston, MA	Invited Lecture IEEE
2000	Clinical Applications of Optical Coherence Tomography	Invited Lecture
	Gordon Research Conference, New London, CT	None
2001	OCT Imaging of Coronary Lesions: Investigating the Vulnerable Plaque Model	Invited Lecture
	Optical Society of America Annual Meeting, Long Beach, CA	Optical Society of America
2002	Cardiovascular Optical Coherence Tomography	Grand Rounds
	Mount Sinai Medical Center, New York, NY	None
2003	Endoscopic Microscopy: Emerging Techniques for Clinical Medicine	Invited Lecture
	Montefiore Medical Center, New York, NY	None
2004	Cellular Imaging in Coronary Atherosclerotic Plaques using Optical Coherence Tomography	Invited Lecture
	Cardiovascular Medical Imaging Symposium, Baltimore, MD	American Society of Nuclear Cardiology
2004	Intracoronary Optical Coherence Tomography: Emerging Techniques and Clinical Application	Invited Lecture
	Frontiers in Optics, Rochester, NY	Optical Society of America
2004	Intravascular Optical Coherence Tomography Imaging	Invited Lecture
	National Institutes of Health: Optical Diagnostic Imaging from Bench to Bedside, Bethesda, MD	Optical Society of America
2004	Cellular Imaging in Coronary Atherosclerotic Plaques using Optical Coherence Tomography	Invited Lecture
	Photonic Applications, Systems and Technologies (PhAST) Conference, San Francisco, CA	Optical Society of America
2004	Pathology and Imaging of the Esophagus	CME
	American College of Gastroenterology, Orlando, FL	American College of Gastroenterology
2005	Wellman-MGH Intracoronary Optical Diagnostics Program	Invited Lecture
	Transcatheter Cardiovascular Therapeutics Conference, Washington, DC	Cardiovascular Research Foundation
2005	Low-coherence Interferometry for Guidance of Lumbar Punctures	Invited Lecture
	Telemedicine and Advanced Technology Research Center, Fort Detrick, MD	Department of Defense

2005	Optical Coherence Tomography Digestive Disease Week, Chicago, IL	Invited Lecture American Gastroenterological Association
2006	Endoscopic Microscopy: Bridging the Radiology-Pathology Divide Photonics West, San Jose, CA	Plenary Lecture SPIE
2006	Optical Coherence Tomography for Detection of Atherosclerotic Plaque Food and Drug Administration (FDA) Science Forum, Washington, DC	Invited Lecture FDA
2006	Beyond OFDI: Laser Speckle Imaging, Raman Spectroscopy, and More Transcatheter Cardiovascular Therapeutics Conference, Washington, DC	Invited Lecture Cardiovascular Research Foundation
2006	Optical Imaging of the Vulnerable Plaque Vulnerable Plaque Summit, Houston, TX	Invited Lecture None
2006	Optical Imaging Diagnostics Institute for Surgical Research, Houston, TX	Grand Rounds Department of Defense
2006-	Optical coherence tomography/Raman spectroscopy: Cellular imaging and composition ViP – A Vulnerable Plaque Summit, Houston, TX	CME The Methodist Hospital
2006-	Intracoronary OCT High Risk Plaques: Detection and Management, Boston, MA	CME CIMIT
2007	Pathology for Endoscopic Microscopists Photonics West, San Francisco, CA	Invited Lecture SPIE
2007	Imaging Barrett's Esophagus with Optical Coherence Tomography University of Alabama Medical Center, Birmingham, AL	Grand Rounds None
2007	Cardiovascular Optical Reflectance Microscopy Center for Biophotonics Science & Technology, Lake Tahoe, CA	Invited Lecture None
2007	Optical Coherence Tomography/Raman Spectroscopy: Cellular Imaging and Composition Vulnerable Plaque Summit, Houston, TX	Invited Lecture None
2007	Raman Spectroscopy for Plaque Characterization: Advantages, Drawbacks, and Development of an Endovascular Catheter Transcatheter Cardiovascular Therapeutics Conference, Washington, DC	Invited Lecture Cardiovascular Research Foundation

2008	The Technology II: Polarization Sensitive OCT, Laser Speckle And Beyond Transcatheter Cardiovascular Therapeutics Conference, Washington, DC	Invited Lecture Cardiovascular Research Foundation
2008	New Generation Fourier-Domain OCT: Advantages and Limitations Transcatheter Cardiovascular Therapeutics Conference, Washington, DC	Invited Lecture Cardiovascular Research Foundation
2008	Preclinical Assessment of Coverage: Experience with OCT/OFDI Transcatheter Cardiovascular Therapeutics Conference, Washington, DC	Invited Lecture Cardiovascular Research Foundation
2008	Seeing Inside the Body: Microendoscopy and Endoscopic Microscopy NIDDK Technology in Urology and Nephrology, Boston, MA	Invited Lecture NIH
2008	OCT and OFDI for Dermatology American Academy of Dermatology Annual Meeting, San Antonio, TX	Invited Lecture AAD
2008	Seeing Inside the Body with Microendoscopy and Endoscopic Microscopy BIOMED, St. Petersburg, FL	Seminar Optical Society of America
2009	Contrast in Endoscopic Microscopy Photonics West, San Francisco, CA	Invited Lecture SPIE
2009	Optical Imaging of Human Coronary Arteries UC Davis, Davis, CA	Invited Lecture None
2009	Basics of OCT/OFDI Image Interpretation i2 Summit, ACC Annual Meeting, Orlando, FL	Invited Lecture ACC
2009	Translating Intracoronary OCT National Heart Lung and Blood Institute, Bethesda, MD	Seminar NIH
2010	Vulnerable Plaque Criteria and Standards 22nd Annual Scientific Symposium of Transcatheter Cardiovascular Therapeutics	Invited Lecture None
2010	Immunostains, Infra-red Microscopy, FTIR and Beyond 22nd Annual Scientific Symposium of Transcatheter Cardiovascular Therapeutics	Invited Lecture None
2010	Imaging Technologies for Tumor Identification and Diagnosis Association of Pathology Chairs Annual Meeting	Invited Lecture None
2010	Spectra-encoded and OCT Endoscopy Gordon Research Conference, Holderness, NH	Invited Lecture None

2011	Endoscopic Microscopy: Bridging the Radiology- Pathology Divide Pathology Grand Rounds, Bronx, New York	Lecture Montefiore Medical Center
2011	Cath Case Conference Hahnemann University Hospital- Heart Failure Conference, Philadelphia, Pennsylvania	Sheldon Goldberg Cardiovascular Institute of Philadelphia
2011	Endoscopic Microscopy: Bridging the Radiology- Pathology Divide Annual Layton/Finley Lectureship Series, Tucson, Arizona	Lecture University of Arizona
2011	Endoscopic Microscopy: Bridging the Radiology- Pathology Divide United States and Canadian Academy of Pathology Annual Lecture, San Antonio, Texas	Lecture United States and Canadian Academy of Pathology
2011	Endoscopic Microscopy: Bridging the Radiology- Pathology Divide Gregory Derringer Grand Rounds, Indianapolis, Indiana	Lecture Indiana University of Pathology and Laboratory
2011	Scanning the Depths: Enabling Targeted Intervention in Esophageal Disorders American Society for Gastrointestinal Endoscopy Digestive Disease Week, Chicago Illinois	Invited Presentation NinePoint Medical
2011	The Future of Superhuman Vision: Boldly Going Where No Man's Gone Before/ OFDI Image Interpretation Clinical Advisory Board Meeting, Chicago, Illinois	Lecture NinePoint Medical
2011	Advances in Endoscopy and Intravascular OCT Stanford Photonics Research Center 2011 Annual Symposium, Stanford, California	Lecture Stanford University: Stanford Photonics Research Center
2011	Endoscopic Microscopy: Bridging the Radiology- Pathology Divide National Institute of Health Inter-Institute Workshop 2011, Bethesda, Maryland	Lecture National Institution of Biomedical Imaging and Bioengineering
2011	Kornel L. Terplan Lecture 12 th Annual Kornel Terplan Memorial Lecture Day, Buffalo, New York	Invited Speaker The Department of Pathology and Anatomical Sciences: University at Buffalo
2011	Intravascular Imaging Developments; OCT Merck Non-Human Atherosclerosis Imaging Scientific Input Engagement 2011, Whitehouse Station, New Jersey	Lecture Merck Research Laboratories
2011	Optical Coherence Tomography National Cancer Institute Workshop , Washington, DC	Lecture The Catholic University of America
2011	Introduction to OCT Image Interpretation	Lecture

Transcatheter Cardiovascular Therapeutics 2011 Program, San Francisco, California	Transcatheter Cardiovascular Therapeutics
2012 Academic Industrial Partnerships for Translation of in vivo Imaging Systems for Cancer	Lecture
National Institute of Health: Industrial Partnership Meeting	Department of Health and Human Services
2012 In Vivo Microscopy: An Educational Forum for Pathologists	Lecture
American Society for Clinical Pathologists	
2012 Cardiovascular Pathology	Lecture
SPIE Photonics West	SPIE
2012 Standards in Endoscopic Microscopy	Lecture
SPIE Photonics West	SPIE
2012 Advances in OCT Researching: Clinical Applications	Lecture
GE Global Headquarters Albany, NY	GE Global Research
2012 New Intravascular Imaging Technique	Lecture
3 rd Multimodality Cardiovascular Molecular Imaging Symposium	NIH
2012 Endoscopic Microscopy: Bridging the Radiology-Pathology Divide	Lecture
Innovative Tissue-Based Diagnostics	Cambridge Healthcare Institute
2012 Seeing the Unseen in Patients: Advancing Disease Prevention and Treatment Through Micro-Imaging	Lecture
Association of Pathology Chairs	Association of Pathology Chairs
2012 The Future of Endoscopic Microscopy	State of the Art Lecture
Corning Labs, NY	Corning
2012 The Future of Intravascular Imaging	Lecture
Cardiovascular Institute State of the Art	Cardiovascular Institute
2012 Endoscopic Microscopy: Bridging the Radiology-Pathology Divide	Radiology Grand Rounds
Department of Radiology	Stanford University
<i>International</i>	
2004 Intracoronary Optical Coherence Tomography	Invited Lecture
XIIIth International Vascular Biology Meeting, Ontario Canada	None
2005 Endoscopic Confocal Microscopy	Invited Lecture
Biomedical Optics Meeting, St. Andrews, Scotland	None
2006 Imaging the Vulnerable Plaque Pt 1: Beyond	Invited Lecture

	Optical Coherence Tomography Vulnerable Plaque Meeting 2006, Capri, Italy	Cardialysis
2006	Intracoronary Optical Coherence Tomography and Optical Frequency Domain Imaging Erasmus Medical Center, Rotterdam, Netherlands	Seminar None
2007	Optical Frequency Domain Imaging (OFDI) Vulnerable Plaque Meeting 2007, Santorini, Greece	Invited Lecture Cardialysis
2007	Intracoronary Optical Frequency Domain Imaging Bergamo Hospital Grand Rounds, Bergamo, Italy	Grand Rounds None
2008	Intracoronary OCT and OFDI EuroPCR, Barcelona, Spain	Invited Lecture Euro PCR
2008	Intracoronary OCT and OFDI Vulnerable Plaque Meeting 2008, Athens, Greece	Invited Lecture Cardialysis
2008	Optical Imaging of Coronary Atherosclerosis University Hospital of Muenster, Muenster, Germany	Invited Lecture None
2009	Intracoronary OCT: Principles, Second Generation and Beyond EuroPCR, Barcelona, Spain	Invited Lecture None
2010	3D Intracoronary Microscopy with Optical Frequency Domain Imaging CCT, Kobe, Japan	Invited Lecture None
2010	Standardization in Endoscopic Microscopy ICCU, Paris, France	Plenary Talk Mauna Kea Technologies
2010	Future of Coronary OCT The 8th Conference of Advanced Cardiovascular Ultrasound, Osaka, Japan	Invited Lecture Daiichi – Sankyo
2010	International Working Group Update Vulnerable Plaque Meeting, Lisbon, Portugal	Invited Lecture Cardialysis
2010	Endoscopic Microscopy: Bridging the Radiology-Pathology Divide Lecia Scientific Forum, Cambridge, Liverpool, and London, England	Invited Lecture Leica
2010	Intravascular Imaging: is there light at the end of the tunnel? Euro PCR, Paris, France	Invited Lecture None
2011	New Generation Optical Biopsy Technology Including Endoscopic Imaging and Preclinical/Clinical Challenges The 75 th Annual Scientific Meeting of the Japanese Circulation Society, Yokohama, Tokyo	Lecture The Japanese Circulation Society

2011	OCT Tissue Characterization – Boston Approach	Lecture
9 th International	Vulnerable Patient Meeting, Cascais, Portugal	Cadialysis Clinical Trial Management- Core Laboratories
2011	Endoscopic Microscopy: Bridging the Radiology- Pathology Divide	Lecture
Italian Physical Society:	Microscopy Applied to Biophotonics, Varenna, Italy	The International School of Physics
2011	Endoscopic Microscopy: Bridging the Radiology- Pathology Divide	Lecture
1 st Congress of the International Academy of Digital Pathology,	Quebec City, Canada	International Academy of Digital Pathology
2011	Raman Spectroscopy/ OCT Image Interpretation	Lecture
Optics in Cardiology 2011,	Rotterdam, Netherlands	Optics in Cardiology
2012	Micro-OCT Tissue Characterization	Lecture
Vulnerable Patient Meeting,	Madrid	Cardialysis
2012	The Future of Endoscopic Microscopy	Lecture
Vulnerable Patient Meeting,	Madrid	Cardialysis
2012	Advances in Plaque Characterization by OCT	Lecture
EuroPCR,	Paris	EuroPCR
2012	The Future of Coronary OCT	Lecture
Vascular Inflammation, Aging and Imaging,	Portugal	CNIC
2012	The Future of Coronary OCT	Lecture
Photonics North,	Canada	Bio-Medical-Infection Conference
2012	Endoscopic Microscopy: Bridging the Radiology- Pathology Divide	Lecture
Annual Residents’ Research Day,	McMaster University, Canada	McMaster University
2012	Seeing the Unseen in Patients: Advancing Disease Prevention and Treatment Through Micro-Imaging	Lecture
Dr. John Macgregor Lecture,	University of Alberta, Canada	University of Alberta
2012	Seeing the Unseen in Patients: Advancing Disease Prevention and Treatment Through Micro-Imaging	Lecture
Department of Biomedical Engineering,	Hanyang University, Korea	Hanyang University
2012	Seeing the Unseen in Patients: Advancing Disease Prevention and Treatment Through Micro-Imaging	Lecture

Department of Biomedical Engineering, KAIST University, Korea		KAIST University
2012	Seeing the Unseen in Patients: Advancing Disease Prevention and Treatment Through Micro-Imaging	Lecture
Samsung Corporate Headquarters, Korea		Samsung

Report of Clinical Activities and Innovations

Current Licensure and Certification

2001- Board Certification, Anatomic Pathology

Practice Activities

Since completion of his residency in 2001, Dr. Tearney has devoted 100% effort to research.

Report of Technological and Other Scientific Innovations

Greater than 150 disclosures submitted to Massachusetts General Hospital, 75 patents pending, and 64 US patents issued.

Report of Scholarship

Peer-Reviewed Publications in print or other media

Research investigations

1. Kenet RO, Herrold EM, Hill JP, Wong KK, **Tearney GJ**, Borer JS. Coronary luminal morphology: Reconstruction from digital angiograms. *American Journal Cardiac Imaging* 1990;4:11-19.
2. Bouma BE, **Tearney GJ**, Boppart SA, Hee MR, Brezinski ME, Fujimoto JG. High resolution optical coherence tomographic imaging using a mode locked Ti:Al₂O₃ laser. *Optics Letters* 1995;20:1486-88.
3. Fujimoto JG, Brezinski ME, **Tearney GJ**, Boppart SA, Bouma BE, Hee MR, Southern JF, Swanson EA. Biomedical imaging and optical biopsy using optical coherence tomography. *Nature Medicine* 1995;1:970-72.
4. **Tearney GJ**, Brezinski ME, Southern JF, Bouma BE, Hee MR, Fujimoto JG. Determination of the refractive index of highly scattering human tissue by optical coherence tomography. *Optics Letters* 1995;20:2258-60.
5. Boppart SA, Brezinski ME, Bouma BE, **Tearney GJ**, Fujimoto JG. Investigation of developing embryonic morphology using optical coherence tomography. *Developmental Biology* 1996;177:54-63.
6. Boppart SA, Bouma BE, Brezinski ME, **Tearney GJ**, Fujimoto JG. Imaging developing neural morphology using optical coherence tomography. *Journal of Neuroscience Methods* 1996;70:65-72.

7. Bouma BE, **Tearney GJ**, Bilinsky IP, Golubovic B, Fujimoto JG. A self-phase-modulated Kerr-lens-modelocked Cr:forsterite laser source for optical coherence tomography. *Optics Letters* 1996;21:1839-41.
8. Brezinski ME, **Tearney GJ**, Bouma BE, Izatt JA, Hee MR, Swanson EA, Southern JF, Fujimoto JG. Optical coherence tomography for optical biopsy: properties and demonstration of vascular pathology. *Circulation* 1996;93:1206-13.
9. Brezinski ME, **Tearney GJ**, Boppart SA, Bouma BE, Hee MR, Swanson EA, Southern JF, Fujimoto JG. High-resolution vascular imaging with optical coherence tomography. *Journal of the American College of Cardiology* 1996;27:29.
10. Brezinski ME, **Tearney GJ**, Bouma BE, Boppart SA, Hee MR, Swanson EA, Southern JF, Fujimoto JG. Imaging of coronary artery microstructure with optical coherence tomography. *The American Journal of Cardiology* 1996;77:92-93.
11. Sadhwani A, Schomacker KT, **Tearney GJ**, Nishioka NS. Determination of Teflon thickness with laser speckle. I. Potential for burn depth diagnosis. *Applied Optics* 1996;35:5727-35.
12. **Tearney GJ**, Boppart SA, Bouma BE, Brezinski ME, Weissman NJ, Southern JF, Fujimoto JG. Scanning single-mode fiber optic catheter-endoscope for optical coherence tomography. *Optics Letters* 1996;21:1-3.
13. **Tearney GJ**, Bouma BE, Boppart SA, Golubovic B, Swanson EA, Fujimoto JG. Rapid acquisition of in vivo biological images by use of optical coherence tomography. *Optics Letters* 1996;21:1408-10.
14. **Tearney GJ**, Brezinski ME, Boppart SA, Bouma BE, Weissman NJ, Southern JF, Swanson EA, Fujimoto JG. Catheter-based optical imaging of a human coronary artery. *Circulation* 1996;94:3013.
15. Boppart SA, Bouma BE, Pitris C, **Tearney GJ**, Fujimoto JG. Forward-scanning instruments for optical coherence tomographic imaging. *Optics Letters* 1997;22:1618-20.
16. Bouma BE, Nelson LE, **Tearney GJ**, Jones DJ, Brezinski ME, Fujimoto JG. Optical coherence tomographic imaging at 1.55 μm and 1.8 μm using Er- and Tm-doped fiber sources. *Journal of Biomedical Optics* 1997;3:76-79.
17. Brezinski ME, **Tearney GJ**, Boppart SA, Swanson EA, Southern JF, Fujimoto JG. Optical biopsy with optical coherence tomography, feasibility for surgical diagnostics. *Journal of Surgical Research* 1997;71:32-40.
18. Brezinski ME, **Tearney GJ**, Weissman NJ, Boppart SA, Bouma BE, Hee MR, Weyman AE, Swanson EA, Southern JF, Fujimoto JG. Assessing atherosclerotic plaque morphology: comparison of optical coherence tomography and high frequency intravascular ultrasound. *Heart* 1997;77:397-403.

19. Golubovic B, Bouma BE, **Tearney GJ**, Fujimoto JG. Optical frequency domain reflectometry using rapid wavelength tuning of Cr⁴⁺ forsterite laser. *Optics Letters* 1997;22:1704-06.
20. Boppart SA, **Tearney GJ**, Bouma BE, Southern JF, Brezinski ME, Fujimoto JG. Noninvasive assessment of the developing xenopus cardiovascular system using optical coherence tomography. *Proceedings of the National Academy of Sciences* 1997;94:4256-61.
21. **Tearney GJ**, Bouma BE, Fujimoto JG. Phase and group delay relationships for the phase control rapid-scanning optical delay line. *Optics Letters* 1997;22:1811-13.
22. **Tearney GJ**, Brezinski ME, Bouma BE, Boppart SA, Southern JF, Fujimoto JG. Optical biopsy in human gastrointestinal tissue using optical coherence tomography. *American Journal of Gastroenterology* 1997;92:1800-1804.
23. **Tearney GJ**, Brezinski ME, Bouma BE, Boppart SA, Pitris C, Southern JF, Fujimoto JG. In vivo endoscopic optical biopsy with optical coherence tomography. *Science* 1997;276:2037-9.
24. **Tearney GJ**, Brezinski ME, Bouma BE, Boppart SA, Southern JF, Fujimoto JG. Optical Biopsy in human urologic tissue using optical coherence tomography. *Journal of Urology* 1997;157:1913.
25. Boppart SA, Bouma BE, Pitris C, **Tearney GJ**, Southern JF, Brezinski ME, Fujimoto JG. Intraoperative assessment of microsurgery with three-dimensional optical coherence tomography. *Radiology* 1998;208:81-86.
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27. Fujimoto JG, Bouma BE, **Tearney GJ**, Boppart SA, Pitris C, Southern JF, Brezinski ME. New technology for high-speed and high-resolution optical coherence tomography. *Annals of the New York Academy of Sciences* 1998;838:95-107.
28. Pitris C, Brezinski ME, Bouma BE, **Tearney GJ**, Fujimoto JG. High resolution imaging of the upper respiratory tract with optical coherence tomography. *American Journal of Respiratory and Critical Care Medicine* 1998;157:1640-44.
29. **Tearney GJ**, Webb RH, Bouma BE. Spectrally encoded confocal microscopy. *Optics Letters* 1998;23:1152-54.
30. **Tearney GJ**, Brezinski ME, Southern JF, Bouma BE, Boppart SA, Fujimoto JG. Optical biopsy in human pancreatobiliary tissue using optical coherence tomography. *Digestive Diseases and Sciences* 1998;43:1193-9.
31. Bouma BE, **Tearney GJ**. Power efficient, non-reciprocal interferometer and linear scanning fiber-optic catheter for optical coherence tomography. *Optics Letters* 1999;24:531-33.
32. Fujimoto JG, Boppart SA, **Tearney GJ**, Bouma BE, Pitris C, Brezinski ME. High resolution in vivo intra-arterial imaging with optical coherence tomography. *Heart* 1999;82:128-33.

33. Bouma BE, **Tearney GJ**, Compton CC, Nishioka NS. High resolution imaging of the upper gastrointestinal tract in vivo using optical coherence tomography. *Gastrointestinal Endoscopy* 2000;51:467-74.
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35. **Tearney GJ**, Jang IK, Kang DH, Aretz HT, Houser SL, Brady TJ, Schlendorf KH, Shishkov M, Bouma BE. Porcine coronary imaging in vivo by optical coherence tomography. *Acta Cardiologica* 2000;55:233-7.
36. White WM, Baldassano M, Rajadhyaksha M, Gonzalez S, **Tearney GJ**, Anderson RR, Fabian RL. A novel, noninvasive imaging technique for intraoperative assessment of parathyroid glands: Confocal reflectance microscopy. *Surgery* 2000;128:1088-1101.
37. Jang IK, **Tearney GJ**, Bouma BE. Visualization of tissue prolapse between coronary stent struts by optical coherence tomography (OCT): Comparison with intravascular ultrasound. *Circulation* 2001;104:2754.
38. Ponerros JM, Brand S, Bouma BE, **Tearney GJ**, Compton CC, Nishioka NS. Diagnosis of specialized intestinal metaplasia by optical coherence tomography. *Gastroenterology* 2001;120:7-12.
39. Jang IK, Bouma BE, Kang DH, Park SJ, Park SW, Seung KB, Choi KB, Shishkov M, Schlendorf KH, Pomerantsev E, Houser SL, Aretz HT, **Tearney GJ**. Visualization of coronary atherosclerotic plaques in patients using optical coherence tomography. *Journal of the American College of Cardiology* 2002;39:604-09.
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41. **Tearney GJ**, Bouma BE. Atherosclerotic plaque characterization by temporal and spatial speckle pattern analysis. *Optics Letters* 2002;27:533-35.
42. **Tearney GJ**, Shishkov M, Bouma BE. Spectrally encoded miniature endoscopy. *Optics Letters* 2002;27:415-17.
43. Yabushita H, Bouma BE, Houser SL, Aretz HT, Jang IK, Schlendorf KH, Kauffman CR, Shishkov M, Kang DH, Halpern EF, **Tearney GJ**. Characterization of human atherosclerosis by optical coherence tomography. *Circulation* 2002;106:1640-5.
44. Bouma BE, **Tearney GJ**, Yabushita H, Shishkov M, Kauffman CR, DeJoseph Gauthier D, MacNeill BD, Houser SL, Aretz HT, Halpern EF, Jang IK. Evaluation of intracoronary stenting by intravascular optical coherence tomography. *Heart*. 2003;89:317-20.
45. Iftimia N, Bouma BE, **Tearney GJ**. Speckle reduction in optical coherence tomography by "path length encoded" angular compounding. *Journal of Biomedical Optics* 2003;8:260-63.

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47. **Tearney GJ**, Jang IK, Bouma BE. Evidence of cholesterol crystals in atherosclerotic plaque by optical coherence tomographic (OCT) imaging. *European Heart Journal* 2003;24:1462.
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50. Yelin D, Bouma BE, Iftimia N, **Tearney GJ**. Three-dimensional spectrally encoded imaging. *Optics Letters* 2003;28:2321-3.
51. Yun S, Boudoux C, **Tearney GJ**, Bouma BE. High-speed wavelength-swept semiconductor laser with polygon-scanner-based wavelength filter. *Optics Letters* 2003;28:1981-3.
52. Yun SH, **Tearney GJ**, de Boer JF, Iftimia N, Bouma BE. High-speed optical frequency-domain imaging. *Optics Express* 2003;11:2953-63.
53. White B, Pierce M, Nassif N, Cense B, Park B, **Tearney GJ**, Bouma BE, Chen T, de Boer JF. In vivo dynamic human retinal blood flow imaging using ultra-high-speed spectral domain optical Doppler tomography. *Optics Express* 2003;11:3490-7.
54. Yun SH, **Tearney GJ**, Bouma BE, Park BH, de Boer JF. High-speed spectral-domain optical coherence tomography at 1.3 μm wavelength. *Optics Express* 2003;11:3598-604.
55. Yun SH, Boudoux C, Pierce MC, de Boer JF, **Tearney GJ**, Bouma BE. Extended-cavity semiconductor wavelength-swept laser for biomedical imaging. *IEEE Photonics Technology Letters* 2004;16:293-5.
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62. Iftimia N, Bouma BE, de Boer JF, Park BH, Cense B, **Tearney GJ**. Adaptive ranging for optical coherence tomography. *Optics Express* 2004;12:4025-34.
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Thesis

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2. **Tearney GJ**. Optical biopsy of in vivo tissue using optical coherence tomography [Doctoral dissertation]. Cambridge (MA): Massachusetts Institute of Technology; 1997.
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Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings:

(Over 400 abstracts presented at scientific meetings)

Narrative Report

My research interests are primarily focused on the development and validation of non-invasive, high-resolution optical imaging methods for disease diagnosis. In particular, I have conducted research to develop and establish a new imaging modality, termed "optical coherence tomography" (OCT), which provides cross-sectional images of tissue architectural microstructure at a resolution of 10 μm . I was the first to perform human imaging in the coronary arteries and gastrointestinal tract with this method, and my laboratory has imaged over 500 patients to date. Additionally, I have developed an endoscopic confocal microscopy system that is capable of obtaining images at a resolution of 1.0 μm through an endoscope accessory port. Images obtained by OCT and endoscopic confocal microscopy may be used to guide biopsies during screening procedures and may potentially allow for primary diagnosis at tissue sites

where excisional biopsies are difficult to obtain. In my work, I have developed several other technologies, including an ultraminiature three-dimensional endoscope, a highly efficient form of near field scanning optical microscopy (NSOM), and novel fluorescence spectroscopy and imaging techniques. I have an active program in Raman spectroscopy and have conducted the first intracoronary Raman in vivo. I have successfully transitioned several of my inventions into the commercial sector. Examples include the rapidly scanning optical delay line (RSOD) that is utilized for ophthalmic OCT and optical frequency domain imaging (OFDI) technology that is being commercialized by multiple companies for intracoronary and gastrointestinal uses.

My training in the field of pathology has complemented my research by providing a foundation for the interpretation of images obtained by these new, non-invasive diagnostic modalities. Also, while in my Pathology Residency, I established several active collaborations within the Massachusetts General Hospital (MGH). These collaborations involve pathologists, clinicians, physicists and engineers, and also include clinical studies in the fields of Gastroenterology, Cardiology, Pulmonology, and Otolaryngology. My work extends beyond MGH, as I now direct multicenter, national, and international clinical studies to validate technologies developed in my laboratory. In addition, I have recently founded the International Working Group on Intracoronary OCT Standardization and Validation, a group that is dedicated to ensuring the widespread adoption of this imaging technology.

With respect to teaching, I have actively participated in the development of a program to increase graduate student participation at the Wellman Center for Photomedicine. Currently, I supervise the Ph.D thesis research of several MIT graduate students and have supervised M.D. honors theses conducted by Harvard Medical School students. Additionally, I helped found the graduate course on biomedical optics at MIT in the HST program (HST .569), am a co-director for the HST Human Pathology course (HST .035), and a lecturer for the Wellman Biomedical Optics Summer Program. I also teach on the national level, including CME courses, training courses for interpreting optical images, and numerous presentations to the lay public relating the benefits of our imaging technology to health care.