

CURRICULUM VITAE

Personal:

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Place of Birth: Pratapgarh, India

Citizenship: US Citizen

Education:

Year Graduated	Degree	Area	Conferring Institution
1966	B.S	Chemistry	University of Karachi, Pakistan
1968	M.S.	Organic Chemistry	University of Karachi, Pakistan
1970	M. Phil.	Physical Chemistry	Quaid-i-Azam University (Formerly known as University of Islamabad), Pakistan
1980	Ph.D.	Physical Organic Chemistry	University of Arkansas, USA
2000	M.A.	(Honorary) Artium Magister	Harvard University, USA

Postdoctoral Training:

1980-1982 Research Fellow, Department of Chemistry, University of Pennsylvania

Professional Appointments and Positions:

Faculty Academic Appointments:

Years	Position	Department	Institution
1982-1987	Research Associate	Dermatology	Harvard Medical School
1987-1991	Assistant Professor (Biochemistry)	Dermatology	Harvard Medical School
1990-1991	Assistant Professor	Division of Health Sciences and Technology	Harvard-MIT
1991-2000	Associate Professor (Biochemistry)	Dermatology	Harvard Medical School
1991-2000	Associate Professor	Division of Health Sciences and Technology	Harvard-MIT
2005	Affiliated Faculty (Member)	Division of Health Sciences and Technology	Harvard-MIT
2000- current	Professor (Biochemistry)	Dermatology	Harvard Medical School
2009- current	Professor	Division of Health Sciences and Technology	Harvard-MIT

Hospital and Institution Appointments

Years	Position	Department	Institution
1982-1989	Assistant Biochemist	Dermatology	Massachusetts General Hospital
1989-1994	Associate Biochemist	Dermatology	Massachusetts General Hospital
1994- current	Biochemist	Dermatology	Massachusetts General Hospital
2005- current	Faculty	Division of Health Sciences and Technology (HST)	Harvard-MIT
2005-2011	Founding Director	Office of Research Career Development	Massachusetts General Hospital

Other Professional Positions:

1990 Visiting Professor Ulm University Clinic Ulm, Germany

Major Administrative Leadership Positions:

Years	Position	Department	Institution
1988-98	Team Leader	Wellman Laboratories of Photomedicine	Massachusetts General Hospital
1991-93	Chair	Wellman Laboratories Team Leaders	Massachusetts General Hospital

1997-98	Chair, Strategic Planning Committee	Wellman Laboratories of Photomedicine	Massachusetts General Hospital
1999-2004	Associate Director	Wellman Center for Photomedicine	Massachusetts General Hospital
1999-2004	Executive Council	Wellman Laboratories of Photomedicine	Massachusetts General Hospital
1999-2004	Faculty Council	Wellman Laboratories of Photomedicine	Massachusetts General Hospital
2002-2003	Chair	Joint Committee on the Status of Women,	Harvard Medical School
2004- current	Committee of Professors	Wellman Center for Photomedicine	Massachusetts General Hospital
2004- current	Faculty Executive Council	Wellman Center for Photomedicine	Massachusetts General Hospital
2004-2005	Member	Committee on New Criteria for Promotions	Harvard Medical School
2005-2011	Director	Office of Research Career Development	Massachusetts General Hospital
2005- current	Member	Committee of Professors	Harvard Medical School
2008- 2013	Member	Standing Committee on Promotions, Reappointments and Appointments (P&R)	Harvard Medical School
2009	President-Elect		American Society for Photobiology (ASP)
2009-2014	Treasurer		International Photodynamic Association (IPA)
2010-2012	President		American Society for Photobiology (ASP)
2013	Vice President of Science	1st Scientific Meeting of the PAPDT	The Pan-American Photodynamic Association (PAPDT)
2013-2019	President		International Photodynamic Association
2017-2020	Chair		International Photodynamic Association

Committee and Consultancy Service
Local Committee Service:

Years of Membership	Position , Committee Name	Institution
1986-1988	Co-Chair, Education Committee	Wellman Laboratories, Massachusetts General Hospital and Harrison Spectroscopy Laboratories, MIT
1989-1990	Member, Committee on Research	Massachusetts General Hospital
1990-1998	Member, Subcommittee on Research Animal Care	Massachusetts General Hospital
1992-1998	Member, Subcommittee on Review of Research Proposals (SRRP)	Massachusetts General Hospital
1992- current	Member, Research Council	Massachusetts General Hospital
1993-1994	Member, Steering Committee	Wellman Laboratories of Photomedicine, Massachusetts General Hospital
1994-1998	Member, Applications Committee	Wellman Laboratories of Photomedicine, Massachusetts General Hospital
1994-1998	Member, Basic Science Committee	Wellman Laboratories of Photomedicine, Massachusetts General Hospital
1996-2005	Member, Affirmative Action Committee	Massachusetts General Hospital
1997	Member, Cancer Center Search Committee	Massachusetts General Hospital/Massachusetts Eye & Ear Infirmary
1997- current	Member, Fellowship Selection Committee in Gynecology-Oncology	Massachusetts General Hospital
1997-1998	Chair, Executive Director Search Committee	Wellman Laboratories of Photomedicine, Massachusetts General Hospital
1998-2002	Member, Harvard Skin Disease Research Center	Harvard Institutes of Medicine, Brigham and Women's Hospital
1998- current	Member, Joint Committee on the Status of Women at HMS	Harvard Medical School

1998	Member, Research Operations Improvement Committee on Faculty Development,	Massachusetts General Hospital
1998	Member, Strategic Planning Committee, Subcommittee on Review of Research Proposals (SRRP),	Massachusetts General Hospital
1999- current	Chair, Appointments and Promotion Committee, Wellman Center for Photomedicine	Massachusetts General Hospital
1999-2004	Member, Executive Committee, Wellman Laboratories of Photomedicine	Massachusetts General Hospital
2000-2001	Chair, Executive Committee, Wellman Laboratories of Photomedicine	Massachusetts General Hospital
2000-2001	Chair, Faculty Council	Wellman Laboratories of Photomedicine, Massachusetts General Hospital
2001-2002	Vice-Chair, Joint Committee on the Status of Women	Harvard Medical School
2002	SIC Working Group for Genetics\Genomics	Massachusetts General Hospital
2002-2003	Chair, Joint Committee on the Status of Women	Harvard Medical School
2002-2005	Member, Women in Academic Medicine Leadership Committee	Harvard Medical School
2002-2005	Member, Standing Deans Committee on Promotion, Reappointments, and Appointments	Harvard Medical School
2003-2005	Member, ECOR Career Development Office Task Force	Massachusetts General Hospital
2003-2005	Chair, Dean's Award Committee, Joint Committee on the Status of Women	Harvard Medical School
2004- current	Member, Space Committee	Wellman Center for Photomedicine, Massachusetts General Hospital
2005	Member, Gynecologic Oncology Research Committee	Harvard Medical School
2005-2008	Member, Subcommittee of Professors	Harvard Medical School
2005-2008	Member, Faculty Council	Harvard Medical School
2005- current	Member, Standing Search Committee	Harvard-MIT Division of Health Sciences and Technology (HST)
2005- current	Member, Career Conference Committee	Harvard Medical School

2005-current	Member, Executive Committee on Research (ECOR)	Massachusetts General Hospital
2005- current	Research Administration Management Project (RAMP),	Massachusetts General Hospital
2005- current	Member, Partners Research Council	Massachusetts General Hospital
2007- current	Member, Personnel Committee	Harvard-MIT Division of Health Sciences and Technology (HST)
2008-2014	Member, Standing Committee on Promotions, Reappointments and Appointments	Harvard Medical School
2008-2015	Voting Member, Harvard Medical School Promotion and Review Board (PRB)	Harvard Medical School
2008- current	Member, Milton Committee	Harvard Medical School
2008- current	Member, Authorship Dispute	Brigham & Women's Hospital, Harvard Medical School
2008- current	Member, Student Review Board	Harvard Medical School
2008- current	Member, MGH Dermatology Promotions Committee	Massachusetts General Hospital
2008- current	Advisor, Biomedical Science Careers Student Conference sponsored by Biomedical Science Careers Program, Diversity Inclusion and Community Partnership (DCP),	Harvard Medical School (Saturdays)
2009	Member, Ad Hoc Committee to Search for a Professor of Surgery, Full Time, to Serve as Director of the Center for Quality and Safety and Associate Director of the Codman Center for Clinical Effectiveness in Surgery at Massachusetts General Hospital,	Harvard Medical School
2009- current	Member, Council of Mentors, HMS Office for Diversity and Community Partnership	Harvard Medical School
2009- current	Member of the HMS/HSDM Excellence in Mentoring Awards Selection Committee	Harvard School of Dental Medicine
2009- current	Member, Task Force on Research Activities in the Department of Anesthesia and Critical Care	Massachusetts General Hospital
2009- current	Member, Finance Committee	Wellman Center for Photomedicine,

2009	Member, Search Committee for Young Investigators	Massachusetts General Hospital Harvard-MIT HST & MIT EECS (Electrical Engineering and Computer Science)
2010	Member, Partners Responsible Conduct of Research Program	Massachusetts General Hospital
2010	Member, Shore Fellowship Fundraising Committee, Eleanor and Miles Shore 50th Anniversary Scholars Awards	Harvard Medical School
2010	Member, Mentoring Committee for Melissa Suter	Wellman Center for Photomedicine, Massachusetts General Hospital
2010- current	Member, Strategic Space Planning Committee	Wellman Center for Photomedicine, Massachusetts General Hospital
2011	Member, Visiting Committee	Harvard-MIT Division of Health Sciences and Technology (HST)
2011- current	Member, Partners Biorepository Implementation Committee	Massachusetts General Hospital
2012- current	Chair, Affirmative Action Committee	Wellman Center for Photomedicine, Massachusetts General Hospital
2012- current	Member, Ad hoc Administration Task Force Committee	Wellman Center for Photomedicine, Massachusetts General Hospital
2012- current	Member, Review Committee on Student Misconduct	Harvard School of Dental Medicine
2001 -current	Chair, Career Development and Promotions Committee (CDAP)	Wellman Center for Photomedicine, Massachusetts General Hospital
2014	Member, Ad hoc Evaluation Committee, Office for Faculty Affairs	Harvard Medical School
2014	Member, Ad hoc Evaluation Committee, Department of Medicine/BWH and Professorial Promotions Committee	Brigham & Women's Hospital
2014	Member, Search Committee, Instructor/Assistant Professor in the	Brigham & Women's Hospital

2014	Division of Biomedical Engineering at Brigham & Women's Hospital Panelist, Career Pathways Panel Discussion: The Academic Job Search, Office for Research Career Development	Massachusetts General Hospital
2015	Co-leader, New Investigator Advancement Initiative (NAI), "expanding your research program through collaborations", Office for Research Career Development	Massachusetts General Hospital
2015	Member, Shore Fellowship Selection Committee, Office for Faculty Affairs	Harvard Medical School
2015	Panelist, Academic Jobs Panel, Office for Research Career Development	Massachusetts General Hospital
2016	Member, Ad hoc Committee to evaluate Dr. F. Stephen Hodi, for appointment as Professor of Medicine to serve at the Dana-Farber Cancer Institute	Harvard Medical School
2017	Member, Ad hoc Committee to evaluate Dr. Seok Hyun Yun, Ph.D. for appointment as Professor of Dermatology	Harvard Medical School
2017	Member, Committee on Fundamental Research (CFR)	Massachusetts General Hospital
2018	Mentor, 6th Boston Children's Hospital Postdoctoral Association (PDA) Annual All-Star Mentoring Event	Boston Children's Hospital
2018- current	Faculty Advisor and Mentor, The Wellman Outreach Committee bringing STEM programs based on biomedical optics to URM high schools	Wellman Center for Photomedicine, Massachusetts General Hospital
2019- current	Member, MGB Subcommittee for NAI (National Academy of Inventors)	Massachusetts General Hospital
2021- current	Member, Standing Committee on Rights and Responsibilities (SCRR)	Harvard Medical School
2023- current	Member, Dean's committee for external review of the MGH Department of Dermatology	Harvard Medical School and Massachusetts General Hospital

National Committee Service (including Consultancies):

Total current number of Advisory Boards/Consultancies : 28

* National grant review committee and activity under the heading Grant Reviews below

Years of Membership	Position , Committee Name	Institution
1979- current	Member, Miscellaneous committees (Search, space committees)	
1991- 2004	Member, Scientific Advisory Committee, Photodynamic Therapy Program	Case Western Reserve University, Cleveland, OH
1993-1998	Member, 1998 Conference Organizing Committee (SPIE)	Society for Photoinstrumentation and Electronics SPIE, San Jose, CA
1994-1996	Member, Scientific Advisory Board	MediSpectra Inc., Cambridge, MA
1996-2002	Member, Technical Advisory Board	OPOTEK Inc., Carlsbad, CA
1997-1998	Member, Scientific Advisory Board	Light Medicine, Inc., Leverett, MA
1997-2000	Consultant	Peridontix, Inc., Watertown, MA
1998-2002	Consultant	Miravant Medical Technologies, Santa Barbara, CA
1998	Member, Organizing Committee, 1998 Therapeutic Laser Applications Conference	Optical Society of America, Orlando, FL
1999	Member, Publications Committee,	American Society for Laser Medicine and Surgery, Inc., Wausau, WI
1988	Chair, Advances in Photochemotherapy	Society for Photoinstrumentation and Electronics (SPIE), Boston, MA
1990	Co-Chair, Fundamentals of Photodynamic Therapy	Society for Photoinstrumentation and Electronics (SPIE), Los Angeles, CA
1990	Co-Chair, Photochemical Effects in Laser-Tissue Interactions	Society for Photoinstrumentation and Electronics (SPIE), Los Angeles, CA
1990	Chair	International Photodynamic Association,

1991	Chair, Photochemical Effected Laser-Tissue Interactions	Buffalo, NY Society for Photoinstrumentation and Electronics (SPIE), Los Angeles, CA
1991	Chair, Future Directions in Photodynamic Therapy	Engineering Foundation Conference on Lasers in Medicine, Palm Coast, FL
1992	Chair, Photochemical Effects in Laser-Tissue Interactions	Society for Photoinstrumentation and Electronics (SPIE), Los Angeles, CA
1993	Laser-Tissue Interactions, Chair	Society for Photoinstrumentation and Electronics (SPIE), Los Angeles, CA
1994	Chair, Laser-Tissue Interactions	Society for Photoinstrumentation and Electronics (SPIE), Los Angeles, CA
1995	Chair, Laser-Tissue Interactions	Society for Photoinstrumentation and Electronics (SPIE), Los Angeles, CA
1996	Chair, Laser-Tissue Interactions	Society for Photoinstrumentation and Electronics (SPIE), San Jose, CA
1996	Co-Chair, Cardiovascular Photobiology and Photomedicine	American Society for Photobiology, Atlanta, GA
1997	Co-Chair, Laser-Tissue Interactions	Society for Photoinstrumentation and electronics (SPIE), San Jose, CA
1998	Co-Chair, Laser-Tissue Interactions	Society for Photoinstrumentation and Electronics (SPIE), San Jose, CA
1998	Co-Chair, Therapeutic Laser Applications	Optical Society of America, Orlando, FL
1998	Co-Chair, Photodynamic Therapy Session	Gordon Research Conference, Laser Tissue Interactions, Meriden, NH

1999	Co-Chair, Optical Techniques for Treatment of Tumors	Society for Photoinstrumentation and Electronics (SPIE), San Jose, CA
1999	Co-Chair	Advances in Optics for Biotechnology, Medicine and Surgery Conference, Kona, HI
1999-2001	Board Member	League of Women Voters
1999- current	Member	League of Women Voters
2002- current	Consultant	Physical Sciences Inc, Andover MA
2003-2015	Member, Scientific Advisory Board	Rasiris Technologies, Bozeman, MT
2004-2010	Consultant	Medtronic Vascular, Santa Rosa, CA
2004-2009	Co-Chair, Optical Methods for Tumor Treatment and Detection (SPIE)	Society for Photoinstrumentation and Electronics (SPIE), renamed in 2007 to The International Society for Optics and Photonics (SPIE), San Jose, CA
2009	Member, Coordinating and Governance Committee (CGC)	National Cancer Institute, Bethesda, MD
2009	Co-Chair	International Photodynamic Association, Seattle, WA
2009	Member, Network for Translational Research (NTR): Optical Imaging in Multimodal Platforms (NTR U54) Advisory Committee	St. Louis, MO
2009	President-Elect	American Society for Photobiology (ASP)
2009-2011	Member, National Initiative on Gender, Culture and Leadership in Medicine: C - Change	Brandeis University, Women's Studies Research Center, Brandeis University, Stoneham, MA
2010	Member, National Institute of Biomedical Imaging and Bioengineering (NIBIB) Scientific Advisory Board	through an initiative by the Center for Molecular Imaging and Innovation Technology (CMIIT) of the Society for Nuclear Imaging, St. Louis, MO

2010-2012	President	American Society for Photobiology (ASP)
2010- current	Member, External Advisory Board, Department of Biomedical Engineering	Tufts University, Medford, MA
2011-2016	Member, External Scientific Advisory Committee	Dartmouth Center for Cancer Nanotechnology Excellence (DCCNE), Dartmouth, NH
2012	Mentor, AACR Science Education Committee, AACR Special Program for High School Students: The Conquest of Cancer and the Next Generation of Cancer Researchers	American Association for Cancer Research (AACR), Chicago, IL
2012	Discussion Leader-Molecular Probes	Gordon Research Conferences-Lasers in Medicine and Biology, Holderness, NH
2012	Consultant	Galderma Research & Development, Inc , Cranbury NJ
2013	Session Chair, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXII (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2013	Member, Molecular Imaging Program's Scientific Advisory Board	National Institutes of Health, Bethesda MD
2013	Co-Chair	1st Scientific Meeting of the Pan-American Photodynamic Association (PAPDT), Boston, MA
2014	Member, Scientific Advisory Board-Molecular Imaging Program	Washington, DC
2014	Co-Chair, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXIII (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2014	Conference Chair, Photonic Therapeutics and Diagnostics (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2014	Member, A BIOS Student Networking Event, (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA

2014	Co-Chair	Pan-American Photodynamic Association (PAPDT), Phoenix, AZ
2014	Conference Chair	American Society for Photobiology, San Diego, CA
2015- current	Founding Member, (OSA) Thomas F. Deutsch Fellowship Committee	The Optical Society (OSA), Boston MA, now known as Optica
2015	Conference Chair, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXIV, (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2016	Member, UH2/UH3 Steering Committee (NCI)	National Cancer Institute (NCI) Affordable Cancer Technology, Bethesda MD
2016	Session Chair, Photodynamic Therapy II (SPIE),	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2016	Conference Chair, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXV, (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2016-2019	Inaugural Member, External Advisory Committee	Center for Multiple Myeloma Nanotherapy (CMMN) at Washington University School of Medicine, St. Louis, MO
2016-2019	Member, External Advisory Board for the Breast Cancer Specialized Program of Research Excellence (SPORE) Program at the developing WUSM	the developing Siteman Cancer Center/ Washington University School of Medicine (WUSM)
2016	Member, PDT Pancreatic Cancer Advisory Board	Pinnacle Biologics, Inc., Denver, CO
2016	Member, Photofrin® Virtual Advisory Board	Pinnacle Biologics, Inc., Denver, CO
2017	Session Chair, Photodynamic Therapy I (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2017	Conference Chair, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXVI, (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA

2017	Member, External Advisory Board	Molecular Imaging Program, Center for Cancer Research, National Cancer Institute, Bethesda, MD
2018-2019	Session Chair, Photodynamic Therapy I (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2018	Conference Chair, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXVII, (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2018	Conference Program Committee, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXVII, (SPIE OPTO)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2018	Conference Chair, Advances in Photonics of Quantum Computing, Memory, and Communication XI, (SPIE BIOS)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2019- current	Member	Journal of Biomedical Optics (JBO) editorial board
2019- current	Consultant	QLEDCures, LLC , Orlando, FL
2019	Consultant	Simphotek, Inc , Newark, NJ
2019	Conference Program Committee, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXVIII, (SPIE OPTO),	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2019	Conference Chair, Advances in Photonics of Quantum Computing, Memory, and Communication XII, (SPIE BIOS)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2020	Conference Chair, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXIX, (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2020- current	Member, External Scientific Advisory Board	Rakuten Medical Inc, San Mateo CA
2020- 2022	Consultant	Incando Therapeutics Inc, Belmont CA

2021- current	Consultant	Nira BioSciences Inc, Burlington MA
2021	Conference Chair, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXX, (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2022	Conference Chair, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic and Photobiomodulation Therapy XXX, (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2022	Co-Chair, "PDT in Imaging and Cancer Therapy", 41 st American Society for Photobiology Biennial Meeting	American Society for Photobiology(ASP), Albuquerque NM
2023	Conference Chair, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXXI, (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2023	ISelect Advisory Board	By zoom
2023- current	Consultant	Light Research Inc (LRI), Tucson AZ
2024	Conference Chair, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXXII, (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA
2024-current	Consultant	QLEDCures, Inc Orlando FL
2025	Conference Chair, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXXIII, (SPIE)	The International Society for Optics and Photonics (SPIE), San Francisco, CA

International Committee Service

(not including International Grant reviews, which are below under Grant activities):

Years of Membership	Position , Committee Name	Institution, location
1992	NCI Radiation Medicine Study Section	National Cancer Institute, Toronto, Canada
1993	Medical Research Council of Canada	Canada
1993	Chair	Laser Society of Japan Tokyo, Japan
1993	Chair	Multiphoton Photochemistry in Biological Systems, Vancouver, Canada
1994	Medical Research Council of Canada	Canada

1996	Chair, 6th Biennial Meeting of the IPA	International Photodynamic Association (IPA), Melbourne, Australia
1996	Co-Chair, Photodynamic Sensitization in the Treatment of Non-Tumor Diseases	International Congress on Photobiology, Vienna, Austria
1996	Co-Chair, Biomedical Applications of Lasers, Society for Photoinstrumentation and Electronics (SPIE)	Society for Photoinstrumentation and Electronics (SPIE) Beijing, China
1998	Co-Chair, 7th Biennial Congress of the IPA	International Photodynamic Association (IPA), Nantes, France
1998	Member	Austrian National Research Council, Austria
1999	Member	Swiss National Research Foundation, Switzerland
2003	Member	National Medical Research Council, Singapore
2003	Member	VolkswagenStiftung, Hannover, Germany
2004	Member	VolkswagenStiftung, Hannover, Germany
2004-2007	Scientific Advisory Board	QLT Inc, Vancouver, BC
2005	Member	Medical Research Council Grant, United Kingdom
2005-2011	Director	International Photodynamic Association Board of Directors
2006-2009	Co-Chair	International Photodynamic Association
2008	Cancer Campaign Member	Medical Research Council, United Kingdom
2009	Member, Advisory Board to Planning Committee (ESP)	European Society for Photobiology (ESP)
2009-2014	Treasurer	International Photodynamic Association
2009	Member, Search Committee	Translational Health Science and Technology Institute (THSTI),

2012	Mentor	India Biophotonics and Imaging Graduate Summer School, Galway, Ireland
2013	Vice President of Science, 1st Scientific Meeting of the PAPDT	The Pan-American Photodynamic Association (PAPDT)
2013	Chair, Fundamental Research (combination Treatment), The 14 th World Congress of IPA	The International Photodynamic Association (IPA), Seoul, Korea
2013	Chair, Plenary 12-Targeting the tumor micro-environment to improve PDT effectiveness, The 14 th World Congress of IPA	The International Photodynamic Association (IPA), Seoul, Korea
2013	Chair	IV International Symposium, Topical Problems of Biophotonics, Nizhny Novgorod - the Volga River, Russia
2016	Chair	Photodynamic Therapy and Photodiagnosis update Conference (Other Aspects of PDT), Nancy France
2017	Member, International Review Committee - The Terry Fox Research Institute Program Project Grants Application Competition	The Terry Fox Research Institute March 28, 2017 Toronto, Canada
2017	Member, Scientific Advisory Board	VI International Symposium-Topical Problems of Biophotonics, Nizhny Novgorod, Russia
2019	President	International Photodynamic Association Board of Directors
2019	Chair, 17 th IPA World Congress	The International Photodynamic Association (IPA) 2019 Boston, MA
2020	Session Chair (Antimicrobial PDT II), Photodynamic Therapy and Photodiagnosis Update e-Congress	Kochel, Germany
2023- 2024	Member, Organizing Committee	18 th International Congress of Photobiology IUPB-

		MEPSA, August 25-30 2024 Perth, Australia
2023	Co-Chair, ESP-ASP joint symposium on Human Amicrobial PDT	20 th Congress of the European Society for Photobiology, August 27-31, 2023 Lyon France
2024	Member, International Review Committee - The Terry Fox Research Institute Program Project Grants Application Competition	The Terry Fox Research Institute March 28, 2024 Toronto, Canada
2024-current	Member, Photo Terminology Standardization Task Force #2024-008-2-700	International Union of Pure and Applied Chemistry (IUPAC) Remote, July 9 2024
2023-current	Member, organizing committee , 18 th IPA World Congress in China	The International Photodynamic Association (IPA) Shanghai, MA
2023-current	Member, IPA board Naming and Branding committee	The International Photodynamic Association (IPA) Boston, Ma (remote)

Professional Societies

Year of Membership	Society Name
1976-current	American Chemical Society (ACS)
1982- current	American Society for Photobiology (ASP)
1988- current	European Society for Photobiology (ESP)
1990- current	American Association for Cancer Research (AACR)
1990- current	International Photodynamic Association (IPA)
2000- current	American Society for Lasers in Medicine and Surgery (ASLMS)
2014- current	American Society for Microbiology (ASM)
2018- current	SPIE (formerly the International Society for Optics and Photonics and previously the Society of Photo-Optical Instrumentation Engineers)
2018- current	The New York Academy of Sciences (NYAS)
2018- current	Optica, formerly the Optical Society of America (OSA)
2019- current	National Academy of Inventors (NAI)

Grant Review Activities

(US National):

Year	Committee Review Name	Organization, Location
1993	Whitaker Foundation	Rosslyn, VA
1993	NIH Special Study Section on Technology	National Institutes of Health (NIH), Bethesda, MD
1993	NIH Radiation Medicine Study Section	National Institutes of Health (NIH), Bethesda, MD
1994	Air Force Office of Scientific Research	Bolling Air Force Base, Washington D.C
1994	various	American Cancer Society
1994	various	National Science Foundation
1995	NIH Special Study Section on Technology	National Institutes of Health (NIH), Bethesda, MD
1995	NIH Radiation Oncology Study Section	National Institutes of Health (NIH), Bethesda, MD
1996	NIH Diagnostic and Imaging Study Section	National Institutes of Health (NIH), Bethesda, MD
1996-2000	NIH Radiation Medicine Study Section	National Institutes of Health (NIH), Bethesda, MD
2002	NIH Special Study Section on Small Business: Radiation Biology and Medical Physics	National Institutes of Health (NIH), Bethesda, MD
2002	Roswell Park Cancer Institute, Site visit for the Program Project, PDT Mechanisms and Strategies of Optimization Study Section	National Institutes of Health, Buffalo, NY
2003	DoD Breast Cancer Research Program	Department of Defense, (DoD) Reston, VA
2004	NIH Center for Scientific Review, Medical Imaging Technologies Study Section	National Institutes of Health (NIH), Bethesda, MD
2004	NIH Center for Scientific Review, National Institute of Arthritis and Musculoskeletal and Skin Diseases	National Institutes of Health (NIH), Bethesda, MD
2004	DoD Breast Cancer Research Program	Department of Defense, (DoD) Reston, VA
2005	DoD Breast Cancer Research Program	Department of Defense, (DoD) Reston, VA
2005	DoD Ovarian Cancer Research Program	Department of Defense, (DoD) Reston, VA
2006	NIH Radiation Therapeutics and Biology Study Section	National Institutes of Health (NIH), Bethesda, MD
2007	NIH Radiation Therapeutics and Biology Study Section	National Institutes of Health (NIH), Bethesda, MD

2008	NIH Radiation Oncology Study Section	National Institutes of Health (NIH), Bethesda, MD
2008	Member, NIH Special Emphasis Panel on Small Business Innovation Research (SBIR)	National Institutes of Health (NIH), Bethesda, MD
2009	NIH Challenge Grant Study Section Meeting	National Institutes of Health (NIH), Bethesda, MD
2009	Member, NIH Review Panel to Review the New ARRA R15 Academic Research Enhancement Award (AREA)	National Institutes of Health (NIH), Bethesda, MD
2010	NCI Centers of Cancer Nanotechnology Excellence (CCNE) Review	National Cancer Institute (NCI) , Gaithersburg, Maryland
2010	NCI Workshop: Image-Guided and Tumor Targeted Delivery in Cancer	National Cancer Institute (NCI), Bethesda, MD
2011	NIH Special Emphasis Panel, Member Conflict: Bioengineering Sciences and Technology	National Institutes of Health (NIH), Center for Scientific Review Bethesda, MD
2011	Nanotechnology Study Section Meeting	Seattle, WA
2011	CDMRP BCRP TRN-CET Panel Scientist Reviewer Invitation- Teleconference; Breast Cancer Research Program (BCRP) for the Department of Defense Congressionally Directed Medical Research Programs (CDMRP)	Remote/virtual
2012-2017	NIH Federal Advisory Committee, Bioengineering Sciences and Technology Sciences Integrated Review Group, Nanotechnology Study Section (NANO),	National Institutes of Health (NIH), Bethesda, MD
2012-2018	Member, NIH NANO panel, Nanotechnology Study Section	National Institutes of Health (NIH), Center for Scientific Review Bethesda, MD
2013	Special Emphasis Panel/Scientific Review Group 2013/05 NANO meeting	San Francisco, CA
2016	Member, NIH Radiation Therapeutic Member Conflict Special Emphasis Panel – Telephone Review	Remote/virtual
2017	NIGMS Support of Competitive Research (SCORE) Program - Telephone review	Remote/virtual

2019	Chair, Innovative Research in Cancer Nanotechnology (IRCN) (R01)	Bethesda, MD
2019	Reviewer, UMass Boston Dana Farber Compre Partnership. Grant title: "Curative Ultrasound-mediated Radiotherapy Enhancement (CuRE) for Pancreatic Cancer"	Boston, remote/virtual
2022	Member, NIH Special Emphasis Panel: Maximizing Investigator's Research Award (MIRA) for Early Stage Investigators (R35)	National Institutes of Health (NIH), Center for Scientific Review Bethesda, MD

Grant Review Activities

(International):

A selection of recent ones only

Year	Position, Committee/Grant Review Name	Organization, Location
2019	Reviewer, grant title : "Light-activated iron capture in photodynamic therapy"	The Academy of Medical Sciences, London UK , remote
2022	Reviewer, grant title: "Enhancing Neoantigen Vaccine Efficacy with Photodynamic Therapy" (original) 14796	Dutch Cancer Society (KWF), Netherlands, remote
2023	Reviewer, grant title: "Enhancing Neoantigen Vaccine Efficacy with Photodynamic Therapy" (resub) 15677	Dutch Cancer Society (KWF), Netherlands, remote
2023	Reviewer, grant title "Towards Perivascular Photodynamic Therapy to Downstage Locally Advanced Pancreatic Cancer - A Phase I Safety study" 15955	Dutch Cancer Society (KWF), Netherlands, remote
2024	The Terry Fox New Frontiers Program Project Grant (PPG) in Porphysome Nanoparticle-Enabled Image-Guided Cancer Interventions.	Terry Fox Research Institute 3/28/24 onsite in Toronto Canada

Editorial Activities

Ad hoc Reviewer

List of Journals Since 1987 (selected listing):

- American Journal of Obstetrics and Gynecology
- BBA - Biomembranes
- Bioconjugate Chemistry
- Biomedical Optics
- Biomedical Central Microbiology (BMC)
- British Journal of Cancer
- Clinical Cancer Research
- Cancer Research
- Chemical-Biological Interactions
- Experimental Dermatology
- Gastroenterology
- Gynecology Oncology
- International Journal of Cancer
- Journal of the American Chemical Society
- Journal of Biological Chemistry
- Journal of Biomedical Optics
- Journal of Clinical Oncology
- Journal of Medicinal Chemistry
- Journal of the National Cancer Institute
- Journal of Photochemistry and Photobiology (European)
- International Journal of Cancer
- Lasers in Surgery and Medicine
- Nature
- Nature Biotechnology
- Nature Medicine
- Nature Protocols
- Oncogene
- Photochemistry & Photobiology
- The Journal of the North American Menopause Society
- The Lancet
- *And many others*

Other Editorial Roles

Year	Role	Journal Name
1991-2001	Editorial Board	Lasers in Surgery and Medicine
1997-2001	Associate Editor	Journal of Photochemistry and Photobiology (European)
2001-2002	Associate Editor	Photochemical and Photobiological Sciences
2008-2018	Associate Editor	Journal of Cancer Nanotechnology: Basic, Translational & Clinical Research
2012-2019	Editorial Board	Nanomedicine, Nanotechnology, Biology, and Medicine (Elsevier)
2013-2019	Editorial Board	Austin Journal of Nanomedicine & Nanotechnology

Honors and Prizes:

Year	Name of Honor/Prize	Awarding Organization
1964-1966	National Merit Scholarship	Punjab Board of Education, Pakistan
1966-1968	National Merit Scholarship	Punjab University, Pakistan
1968-1970	National Merit Fellowship	University of Islamabad, Pakistan
2000	Honorary Master of Arts, <i>Artium Magistrum</i>	Harvard University
2001	Partners in Excellence Award	Partners HealthCare System, Inc (now MGB) Boston, MA
2007	Partners in Excellence Award	Partners HealthCare System, Inc (now MGB) Boston, MA
2009	William Silen Lifetime Achievement in Mentoring Award	Harvard Medical School, Boston, MA
2009	Pioneer Award in Biomedical Optics, Bench to Bedside Translation (Lifetime Achievement Award)	National Institutes of Health, Bethesda MD
2010	Catalyst Award Honoree for Dedication to equity in Science, Engineering and Technology	Science Club for Girls, Cambridge, MA
2012	10 th Anniversary Mentor Award, in recognition of exceptional mentoring of postdoctoral scholars and unwavering commitment to training well-prepared scientists for the future	National Postdoctoral Association San Francisco, CA
2014	Special Directors Award for Service to HST community	Harvard-MIT Division of Health Sciences & Technology (HST), Harvard Medical School
2015	Lifetime Achievement Award in PDT Research, for Research Excellence in the field of Photodynamic Therapy	15 th World Conference of the International Photodynamic Association, Rio de Janeiro, Brazil
2017	Award for significant advancement of Photodynamic Therapy, for research excellence in the field of Photodynamic therapy	16 th World Congress of the International Photodynamic Association, Coimbra, Portugal
2018	Britton Chance Biomedical Optics Award in recognition of trailblazing contributions to the field of Photodynamic Therapy and its clinical translation, leadership and	SPIE Photonics West, San Francisco, CA

2018	service to the photonics community (Lifetime Achievement Award) Outstanding Achievement Award for seminal contributions in the field of cancer research. (Lifetime Achievement Award)	Society of American Asian Scientists in Cancer Research (SAASCR), AACR meeting, Chicago, IL
2018	Inducted as a Fellow Member for pioneering advances in the broader field of photobiology, in particular for innovations in the application of photophysical and photochemical tools for bench to bedside translation in photodynamic therapy and imaging, incorporation of photodynamic therapy for global health applications and spearheading and establishing the field of targeted photodynamic therapy and serving with distinction in the advancement of optics and photonics	The Optical Society of America, now Optica (OSA)
2018	Inducted as a Fellow Member for her significant contributions to the field of science and technology as a distinction for her innovative work. This award highlights academic inventors who have demonstrated a prolific spirit of innovation in creating or facilitating outstanding inventions that have made a tangible impact on quality of life, economic development, and the welfare of society.	National Academy of Inventors, Houston, TX
2019	Lifetime Achievement Award, which Recognizes the illustrious career of a Senior researcher whose work has significantly advanced the research areas of the ASP	American Society for Photobiology, Biennial Congress, Tampa FL
2019	“Tayyaba Hasan ImPAct Award”, a recognition for excellence in the field , named in her honor, awarded biennially at each IPA World Congress.	17th International Photodynamic Association World Congress Cambridge, MA
2021	Thomas Dougherty Award for Excellence in PDT (Lifetime Achievement Award)	International Conference on Porphyrins and Phthalocyanines, ICPP-11, Remote/Virtual

2021	Gold Medal Award for Excellence in Photobiological Research for internationally acknowledged and outstanding scientists who have given crucial contributions to the ESP (Lifetime Achievement Award)	European Society for Photobiology (ESP) Remote/Virtual
2022	Gold Medal, recognizing significant mentoring and career contributions which greatly advanced the field of photodynamic therapy (PDT). (Lifetime Achievement Award)	International Photodynamic Association
2023	Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM), recognizing both her mentoring and her scientific achievements.	The White House Office of Science and Technology Policy (OSTP) jointly with the National Science Foundation (NSF)

Recognitions:

Year	Recognition	Institution
2012	Annual Meeting named after her as “the Dr. T. Hasan’s Massachusetts General Postdoctoral Association (MGPA) Meeting”	Massachusetts General Postdoctoral Association (MGPA)
2012	The posters of excellence awards at the MGH Office for Research Career Development’s (ORCD) Research Fellow Poster Celebration were named “ The Tayyaba Hasan ORCD Posters of Prestige ”, given annually to honor Dr. Hasan’s contributions as the founding director of the ORCD	MGH Office for Research Career Development’s (ORCD)
2018	A conference room at the Partners Innovation Office in Cambridge named “ Hasan Huddle Room ”, in honor of her many patents and contributions to patent development	Partners HealthCare System, Inc (now MGB) Boston, MA
2019	An inaugural award named after her: “the Tayyaba Hasan ImPAct Award” at the 17 th International Photodynamic Association World Congress	International Photodynamic Association

Report of Funded and Unfunded Projects:

Past Funding Information:

Government Funded Projects (completed):

- 1986-1995 Department of Defense. Program Director: J.A. Parrish (Project Leader)
The Use of High Intensity Short-Pulse Irradiation in Photodynamic Activation
- 1987-1988 Foundation for Cancer Treatment Research (P.I.)
Antibody-Mediated Photochemotherapy *In Vivo* Studies
- 1988-1989 American Cancer Society Institutional Grant (P.I.)
Selective Photodestruction of Bladder Carcinoma Cells *In Vivo* using Rhodamine and Benzophenothiazinium Dyes
- 1989-1990 Ford Foundation (P.I.)
"Cellular, Immunological and Photophysical Studies on Conventional and Antibody-Conjugate Photosensitizers"
- 1990-1992 Whitaker Foundation (P.I.)
Focal Photorelease of Second Messengers and Antibody-Mediated Photoinactivation of Proteins in Single Cells
- 1990-1992 Cutaneous Biology Research Center Grant (P.I.)
Metallothionein and Resistance to UV-Induced Cutaneous Injury
- 1991-2001 Department of Energy. Program Director: J.A. Parrish (Project Leader)
Center for Excellence in Laser Medicine
- 1991-1992 NIH R43 (Academic P.I.)
Effect of Pulsed Irradiation in Cellular Phototoxicity
- 1991-1992 Milton Fund (P.I.)
Experimental Photochemotherapy of Ovarian Cancer Using Antibody-Chromophore Conjugates
- 1991-1992 Fight for Sight, Inc. (P.I.)
Carrier Systems for Improved Selectivity of PDT in Vascular Occlusion
- 1991-1996 NIH R29 (P.I.)
Tetracycline Phototoxicity: Photobiology and Photophysics
- 1992-2002 NIH R01 (P.I.)
Experimental Photoimmunotherapy of Ovarian Cancer
- 1995 ARPA (P.I.)
Dual Wavelength Red/Infrared Laser for PDT
- 1996-1998 Department of Defense (Program Director: J.A. Parrish) (Project Leader: T. Hasan)
Macrophage Targeted Photodynamic Regulation Of Wound Healing
- 1996-1998 Department of Defense (Program Director: J.A. Parrish) (Project Leader: T. Hasan)
Photoimmunotherapy for the Local Control of Sepsis
- 1997-1998 Center for Innovative Minimally Invasive Therapy (Co-P.I.)

Fluorescence Detection and Laser Treatment of Female Lower Genital Tract Dysplasias Utilizing 5 Aminolevulinic Acid (ALA)-Induced Protoporphyrin IX

1997-2000 NIH R43 (Academic P.I.)
Functionalized Benzochlorins for PDT

1997-2007 NIH/NCI Training Grant (B. Chabner) (Mentor)
Training Program in Cancer Biology

1998-2004 P30 Training Grant
Skin Disease Research Center

1999-2001 DOD (P.I.)
Surgical Laser Application from MFEL studies

2000-2004 DOD/AFOSR
Research to Develop Biomedical Applications of Free Electron Laser Technology

2001 MDPH (P.I.)
Her-2/Neu based Photochemical Destruction of Breast Cancer Cells

2001-2008 NIH P01 (Program Director)
Physical and Biological Determinants for Optimal PDT

2002-2008 NIH R01 (Co-I)
In Vivo Immunofluorescence Microscopy and Cytometry

2003-2006 NIH R01 (Co-I)
Photodynamic Therapy of Localized Infections

2003-2005 NIH/SBIR (G. Burke)
Investigating the Tissue Response Dosimetry for PDT in Barrett's Esophagus

2003-2008 T32 Training Grant (R. Jain)
Training in Integrative Pathophysiology of Tumors

2003-2009 NIH R01 (Hasan)
Experimental Photoimmunotherapy of Ovarian Cancer

2004-2006 NIH/SBIR (S. Davis)
Real-Time Singlet Oxygen Detector for Photodynamic Therapy

2004-2008 Air Force/MFEL
Photochemistry Based Approach to the Destruction of Leishmaniasis

2004-2008 Air Force/MFEL
PDT for Mycobacterium Tuberculosis

2004-2009 DOD/AFOSR: FA9550-04-1-0079 (Anderson)
Research to Develop Biomedical Applications of Free Electron Laser Technology

2005-2010 NIH T32-CA-115305 (M. Seiden)
Training Grant "Mentored Research in Ovarian Cancer"

2006-2008 Air Force/MFEL
Targeted PDT for Leishmaniasis

2008-2009 Bill and Melinda Gates Foundation
GP63-Targeted Conjugate for Photodynamic Therapy of Visceral Leishmaniasis

2008-2010 Japan Science & Technology Agency

- Controlling cell function with light technology
- 2011-2016 NIH/NCI R01 CA156177 (Hasan)
 Targeted Photoactivable Nanocells: Image-based Drug Delivery and Dosimetry in GBM
 The major goal of this research was to develop a combination of drug delivery nanoconstructs with magnetic resonance guided optical imaging (MROQ) for the treatment of glioblastoma multiforme (GBM). The major goals were all met.
- 2011-2017 NIH/NCI R01CA158415 (Hasan)
 Heterocellular 3D ovarian tumor arrays for imaging and mechanistic combinations
 The long-term goal of this research was to develop, integrate, and validate key platform technologies to screen mechanism-based combination regimens with photodynamic therapy (PDT) for residual and recurrent Ovarian Cancer (OvCa). Heterocellular 3D printed tumor arrays that incorporate critical determinants of OvCa biology (endothelial and mesothelial cells with macrophages and fibroblasts) along with hyperspectral microscopy for simultaneous quantitative imaging of multiple biomarkers provided exceptional insight into OvCa growth and treatment response on a high throughput platform. Major goals were all met.
- 2011-2017 NIH/NCI R01CA160998 (Hasan)
 Ovarian Cancer PDT: Multi-intracellular targeting and Image-guided dosimetry
 The long term goal was to develop, integrate, and validate key platform technologies to combine quantitative fluorescence imaging for drug delivery monitoring and customized dosimetry with "Targeted Phototoxic Multi-Inhibitor Liposomes" (TPMILs) that selectively target and simultaneously block interconnected survival pathways associated with aggressive ovarian cancer. Major goals were all met.
- 2012-2013 NIH/NIBIB U54 EB015408 (Parrish)
 Point of Care Technology Research Center in Primary Care (through CIMIT)
 The goals of this cooperative agreement were to create and facilitate clinically-driven point-of-care solutions that address critical areas of unmet need in primary care, including funding, testing and evaluating prototype performance in simulated clinical environments and clinical living laboratories, transitioning prototypes into commercially licensable or start-up company opportunities, and disseminating lessons learned and best practices in innovation methodology in collaboration with other NIBIB Point of Care Technology Research Centers. Dr. Hasan's project was entitled "Rapid Fluorescence-Based Determination of Antibiotic Susceptibility".
- 2013-2017 DOD/AFOSR: FA9550-13-1-0068 (Anderson)
 Research to Develop and Apply Biophotonics to Military Medicine Needs

- Sub Project: Rapid, Portable, Fluorescence Based Determination of Antibiotic Susceptibility (PI:Hasan)
 The specific aim of this project was to develop a rapid diagnostic platform which provides point of care treatment guidance via novel enzyme activated chemistries and microfluidics. The major goals were all met.
- 2013-2017 DOD/AFOSR: FA9550-11-1-0331 (Anderson)
 Research to Develop and Apply Biophotonics to Military Medicine Needs
 The major goals of this project were to further research in areas of military medicine.
 Dr. Hasan's project was "Rapid Fluorescence Based Antibiotic Susceptibility Assay".
- 2014-2021 NIH/NCI UH3 CA189901 (Hasan/Celli)
 Low-cost Enabling Technology for Image-guided Photodynamic Therapy (PDT) of Oral Cancers
 The goal was to introduce a low-cost enabling technology for photodynamic therapy (PDT)-based treatment of oral cancer and to conduct clinical trials in a low- and middle-income country (LMIC) setting. The proposal was divided into two major phases: A largely pre-clinical and engineering design phase in the U.S. with a minor clinical component was performed at the foreign site (UH2); then a primarily clinical phase with the performance site in India (UH3).
 The technological adaptation and validation led to a sustainable cancer technology in an intermediate regional clinic in India with the potential for dissemination to neighboring rural villages. This quest for lowering healthcare costs also has potential significance in the U.S. where oral cancer is the 8th leading cause of cancer deaths amongst men. Major goals were all met.
- 2015-2016 NIH/NIBIB U54 EB015403 (Klapperich)
 Image-Guided Phototherapy to Prevent Ovarian Cancer Recurrence (through Boston University)
 This proposal was to reduce the high rate of ovarian cancer (OvCa) recurrence and mortality by monitoring and selectively destroying residual, microscopic tumors using a "theranostic" platform that integrates fluorescence microendoscopy and near infrared phototherapy.
- 2015-2021 NIH/NCI R01 CA192878-01A1 (Yun)
 Bioluminescence-activated photodynamic therapy of breast cancer
 The research developed and tested novel photodynamic therapy (PDT) for killing cancer cells in the tumor margin and regional lymph nodes with minimal damage to normal tissues. Major goals were all met.
- 2015-2021 NIH/NCI P01 5P01CA084203-16 (Hasan/Pogue)
 Molecular Response and Imaging-based Combination Strategies for Optimal PDT

- This project tested new photodynamic therapy (PDT)-based combination treatments for pancreato-biliary and non-melanoma skin cancers. Major goals were all met.
- 2016-2019 DOD/MMPP: FA9550-16-1-0479 (Anderson)
 Military Medicine Photonics Program
 Dr. Hasan's project (Project 5) :“A Preliminary System for Rapid Susceptibility Identification of Carbapenem Antibiotics” .Major goals were all met.
- 2016-2020 NIH/FIC R21 TW010202 (Hasan/Palanisami)
 Fogarty International Center
 Rapid Treatment Guidance for Antibiotic-Resistant Disease at the Point of Care
 This study tested a recently developed platform for characterizing bacterial infection at the POC to allow clinicians to more effectively prescribe antibiotic therapies and to chart the spread of antibiotic resistance e.g., extended spectrum beta-lactamase (ESBL). This platform was validated on clinical specimens in Chiang Mai, Thailand. Major goals were all met.
- 2017-2020 NIH/NCI R21 CA220143-01 (Hasan)
 Optical Imaging Guided Resection and Photodynamic Therapy of Glioma with Targeted Photoactivable Agents.
 This application proposed to build an advanced nanoparticle for treatment of glioblastoma (GBM) that combined diagnostic capabilities using fluorescence and photoacoustic (PA) imaging and therapeutic capabilities with photodynamic therapy (PDT) and simultaneous delivery of a receptor tyrosine kinase inhibitor known to interact synergistically with PDT. Major goals were all met.
- 2017-2020 AFOSR FA9550-17-1-0277 (Anderson)
 Combating drug resistant malaria by exploiting photosensitizer synthesis via parasite dependent nutrient acquisition pathways.
 This project utilized a unique facet of the malarial parasite metabolism to sterilize patient blood with photodynamic therapy in resource-limited environments. Major goals were all met.
- 2017-2022 DOD/MMPP: FA9550-17-1-0277 (Anderson)
 Research to Develop and Apply Biophotonics to Military Medicine Needs/ Airforce Office of Scientific Research
 Subprojects: Project 6: Combating drug resistant malaria by exploiting photosensitizer synthesis via parasite dependent nutrient acquisition pathways.
 Project 2: Identification of trauma-induced biomarkers using a smartphone-based microfluidic platform. Major goals were all met.
- 2019-2023 NIH - (through Singlet 02 Therapeutics LLC) R44 DE026083
 (Xu and Hasan Co-Principal Investigator)
 Title: 3D-Printed Superhydrophobic-Tipped Optical Fiber for Targeted Periodontal Photodynamic Therapy

A superhydrophobic (SH) device was validated in vitro in a multispecies biofilm and in vivo in a rat ligature model. The project utilized the potential of Antimicrobial Photodynamic Therapy (aPDT) which has emerged as a promising method for biofilm control and eradication of bacteria involved in periodontal disease. Major goals were all met.

2019-2023 DoD - STTR 80318-ST-ST1 Award: W911NF22P0018

(Raymond Lanzafame)

Title: Portable quantum dot electroluminescent (QDEL) light sources for point of care photodynamic treatment of deep wound MDR infections

The goal of this project was to develop a flexible and wearable QDEL light source that could enable antimicrobial photodynamic therapy (aPDT) of deep wound infections caused by multi-drug resistant (MDR) ESKAPE (Enterococcus faecium, Staphylococcus pneumoniae, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa and Enterobacter species) pathogens at the point of care. The proposed research could possibly minimize the probability of bacterial infections in deep wounds in military hospitals. Major goals were all met.

2020-2024 DOD/MMPP: FA9550-20-1-0063

(Anderson, Evans) (Hasan: Subproject leader)

Department of Defense/Airforce Office of Scientific Research Military Medical Photonics Program

Title: 2020 Military Medical Photonics Project,

Subproject title : QLED activated tools for infection control/Ambulatory Photodynamic Therapy Blankets

This project (**Project 9**) aimed to develop a flexible and portable light-emitting quilt system to prevent wound colonizing bacteria (including multidrug-resistant bacteria) from progressing to infection and limit concomitant patient disability. Major goals were all met.

Industry Funded Projects (completed):

1993-1995 QLT PhotoTherapeutics, Inc. (P.I.)

Photodynamic Therapy for Rheumatoid Arthritis

1993-1998 Binary Therapeutics, Inc. (P.I.)

Tumorigenicity and Metastasis Assays for Ovarian Cancer

1993-1995 DUSA Pharmaceuticals, Inc. (P.I.)

Mechanisms of ALA-induced PDT

1994-1995 Scotgen (P.I.)

Selective Photodestruction of Cells and Tissue with Antibody-Photosensitizer Conjugates

1996-2000 QLT PhotoTherapeutics, Inc. (P.I.)

- 1996-2000 Mechanistic Studies of Photodynamic Therapy of Arthritis
PDT Systems, Inc. (P.I.)
Photophysics and Photochemistry of Tin Etiopurpurins
- 1996-1997 Periodontix, Inc. (P.I.)
Photodynamic Therapy of Periodontitis
- 1997-1999 Periodontix, Inc. (P.I.)
Photodynamic Therapy of Periodontitis, Phase 2
- 2000-current Royalty Stream, Novartis/QLT
- 2008-2012 Covidien Ltd. (P.I.)
Research gift for Photodynamic Therapy
- 2008 Photopharmica Ltd
Research gift for Photodynamic Therapy
- 2010-2016 Covidien A206704
Continued Studies on the Effect of Combining Quaternary Alkaloids and Chemotherapeutic(s) in a Orthotropic Pancreatic Cancer Mouse Model
In this continuation phase of the project, the inhibitory synergism of the optical isomers of morphinan alkaloids in combination with other agents in the pancreatic cancer model was elaborated.
- 2012-2023 Canon U.S.A. (P.I.)
- 2012-2015 Canon Inc. A210162.06
Image Guided PDT for Glioma Using Photoactivatable Nanocarriers
The first goal of this project was to develop new nano-compositions, including targeting entities that show preferential accumulation in Glioblastoma multiforme. The second objective of the project was to test these compositions in imaging and therapy to reinforce image-guided platforms for treatment of cancer. Major goals were all met.
- 2016-2018 Bristol-Myers Squibb (Hasan)
Establishment of a 3D bioprinting platform to screen immuno-oncology agents, in combination with photodynamic therapy, to boost antigen specific T-cell mediated tumor killing. This platform, in conjunction with quantitative fluorescence imaging and analysis, enabled antibody drug conjugates and biologics to be screened for their capacity to enhance tumor killing by lymphocytes in a highly reproducible 3D setting that better represents the heterogeneity and complexity of the tumor microenvironment. This collaborative agreement with Bristol-Myers Squibb formed the basis for bioprinting and imaging-based 3D assay development to improve preclinical prediction of single and combination immuno-oncology agents, ultimately with goal of identifying patient-specific regimens. Major goals were all met.
- 2020-2023 Rakuten Medical (consultant – PI:Toraishi)
Dr Hasan provided advice on in-licensing or partnering on company molecules, such as novel targets, CTLA-4, non—EFGR cancer targets already conjugated with light-excitabile dyes
- 2020-2023 Physical Sciences Inc (consultant – PI Zhao, Youbo)
Dr. Hasan provided advice on the in-vivo testing and attended reviews of the program both at PSI and collaborating institutes including

Dartmouth and Cleveland Clinic. She also assisted PSI in identifying potential early adopters of the dosimeter.

2021-current Light Research Inc (consultant – PI Rongguang Liang)

Dr. Hasan provides consultations and assistance with study designs, data analysis and interpretation of results. Project: Mobile oral cancer screening and treatment (MOST) system for low resource settings

Mentorship for Research Funding (completed):

- 7/1/89-6/30/91 German Research Council
R. Bachor, M.D.
“Carrier-mediated Photodestruction of Bladder Cancer Cells”
- 7/1/90-6/30/92 German Research Council
M. Scholz, Ph.D.
“Cellular and Subcellular Localization and Kinetics of Photosensitizers by Confocal Laser Scanning Microscopy”
- 7/1/90-6/30/92 German Research Council
U. Schmidt, M.D.
“Photosensitizer Conjugates for Closure of Neovasculature in Ophthalmologic Disorders”
- 9/1/90-8/31/93 NIH NRSA
W.G. Roberts, Ph.D.
“Biochemistry and Photochemistry of Conjugated Sensitizers”
- 6/1/91-5/31/92 American College of Obstetrics and Gynecology
B. Goff, M.D.
“Applications of Photodynamic Therapy to the Treatment of Ovarian Cancer”
- 7/1/92-6/1/93 Department of Energy
C. Sekar, M.D.
“Photodynamic Inhibition of Restenosis in a Rat Model”
- 7/1/93-6/30/94 Swiss National Science Foundation
G. Wagnieres, Ph.D.
“Fluorescence Diagnostics of Early Bladder Cancer using Metachromatic Dyes”
- 7/1/93-6/30/94 Department of Energy
D. Kato, M.D.
“Immuno-photodiagnosis of Ovarian Carcinoma”
- 7/1/93-6/30/94 Department of Energy
S. Iinuma, M.D.
“Photodynamic Treatment of Solid Tumors in Combination with Anti-Angiogenesis Therapy”
- 7/1/94-6/30/95 Department of Energy
D. Kato, M.D.
“Photodynamic Therapy of Advanced Ovarian Cancer in a Murine Model”
- 7/1/95-6/30/96 Department of Energy
T. Momma, M.D.

7/1/95-6/30/97 Department of Energy
 K. Trauner, M.D.
 "Experimental Photodynamic Therapy in a Metastatic Rat Prostate Cancer Model"

7/1/95-6/30/96 Department of Energy
 K. Molpus, M.D.
 "Transcutaneous Photodynamic Treatment of Rheumatoid Arthritis"

7/1/96-6/30/97 Department of Energy
 N. Soukos, D.D.S.
 "Photodynamic Therapy of Ovarian Carcinoma"

7/1/97-6/30/98 Department of Energy
 L. Duska, M.D.
 "Epidermal Growth Factor Receptor Targeted Immunophotodiagnosis of Oral Cancer and Precancer"

7/1/97-6/30/98 Department of Energy
 M. Lein, M.D.
 "Photoimmunotherapy in Combination with Cisplatin in the Treatment of Advanced Epithelial Ovarian Cancer"

7/1/97-6/30/98 Department of Energy
 N. Soukos, D.D.S.
 "Laser-induced Hyperthermia and Metalloproteinases in a Rat Prostate Cancer Model"

9/1/97-8/31/98 Center for Innovative Minimally Invasive Therapy
 L. Duska, M.D.
 "Epidermal Growth Factor Receptor as a Target for Photoimmunotherapy and Immuno-photodiagnosis of Oral Cancer"

5/1/98-4/30/00 NIH NRSA
 K. Rajagopalan, Ph.D.
 "Fluorescence Detection and Laser Treatment of Female Lower Genital Tract Dysplasias Utilizing 5 Aminolevulinic Acid (ALA)-Induced Protoporphyrin IX"

7/1/00-6/30/01 Department of Energy
 Marcella Del Carmen, M.D.
 "Photo-modified Antibodies for Photodynamic Therapy"

9/1/00-8/31/01 Department of Energy
 Boleslav Kosharsky, M.D.
 "PDT using anti-epidermal growth factor receptor antibody C225 in the treatment of advanced epithelial ovarian cancer"

7/1/01-6/30/02 Department of Energy
 Tri Dinh, M.D.
 "Anti-angiogenesis with PDT: A new combination treatment for prostate cancer"

7/1/01-6/30/02 Department of Energy
 Tri Dinh, M.D.
 "The use of PDT to Enhance N-(4-Hydroxyphenyl) Retinamide based Differentiation Therapy for the Treatment of Advanced Epithelial Ovarian Cancer"

- 7/1/04-6/30/06 National Cancer Institute of Canada
Nicolas Solban, Ph.D.
“Optical strategies for studying metastatic mechanisms, tumor cell detection, and for monitoring the treatment of prostate cancer.”
- 9/15/04-9/14/06 Department of Defense
Nicolas Solban, Ph.D.
“Optical Strategies for Studying Metastatic Mechanisms, Tumor Cell Detection and Treatment of Prostate Cancer”
- 10/1/08-9/30/11 NIH NRSA
Daniel Neuman, Ph.D.
“Targeted Photoactivated Nanoparticles for the Treatment of Ovarian Cancer”
- 4/1/09-3/31/12 NIH NRSA
Conor Evans, Ph.D.
“Multimodality Microendoscope for Metastatic Ovarian Cancer Detection & Treatment”
- 4/1/10-3/31/13 NIH NRSA
Bryan Q. Spring, Ph.D.
“Hyperspectral Microendoscopy to Monitor VEGF during Pancreatic Cancer Therapy”
- 9/20/10-7/31/12 NIH K99
Prakash R. Rai, Ph.D.
“Theranostic Nanomedicine for Breast Cancer Prevention and Image-guided Therapy”
- 8/1/11-7/31/16 NIH K99/R00
Jonathan Celli, Ph.D.
“Mechanism-based therapies for pancreatic cancer informed by stromal micro-rheology.”
- 9/1/12-8/31/15 NIH F32
Srivalleesha Mallidi, Ph.D.
“Glioblastoma PDT Design: Nanoagent Uptake and Tumor Oxygenation Based Dosimetry”
- 5/1/14-4/30/19 NIH K99/R00
Imran Rizvi, Ph.D.
“Targeting Determinants of OvCa Metastases in Engineered 3D Microfluidic Platforms”
- 1/1/14-12/31/14 Bullock Fellowship (Harvard/MGH)
Girgis Obaid Ph.D.
“A multifunctional liposomal delivery system for image-guided PDT-based combination treatments and anti-angiogenic response in an *in vivo* glioblastoma model”
- 9/1/14-8/31/14 Tosteson Fellowship (Harvard/MGH)
Huang-Chiao Huang, Ph. D
“Tumor-activatable Nanoconstructs for Image-guided Photochemotherapy of Glioblastoma *in vivo*”
- 1/1/17-8/14/17 Bullock Fellowship (Harvard/MGH)

Anne-Laure Bulin, Ph.D.

“Application of a nanoscintillator-photosensitizer conjugate that allows simultaneous deep tissue photodynamic therapy and radiation therapy for pancreatic cancer.”

2/1/18-2/1/23

NIH K99/R00

Girgis Obaid, Ph.D.

“Molecular imaging-directed bioengineering of nanoconjugates as adaptable tumor targeting platforms.”

Current Funded Projects:

Years Funded	Role on Project	Funding Source- Grant Type and Number	PI
2019-2026	Principal Investigator	NIH/NCI - R01 CA231606	(Hasan)
Title:	Dual function theranostic constructs for photoacoustic image-guided surgery and photo-dynamic therapy.		
	Major Goals: The major goal of this project is to reduce morbidity and enhance survival rates in patients with oral cavity tumors using a targeted Dual Function Antibody Conjugate (DFAC) amenable to online deep tissue photoacoustic imaging (PAI) guided surgery followed with targeted photodynamic therapy (PDT) in one intraoperative setting.		
2020-2025	Sub Project Principal Investigator	NIH/NCI -5R01CA226855-03 (subproject through Northeastern University)	(Spring BQ)
Title:	Multiplexed and dynamically targeted photoimmunotherapy of heterogenous, chemo resistant micrometastases guided by online in-vivo optical imaging of cell-surface biomarkers.		
	Subproject: the Hasan laboratory at the Wellman Center for Photomedicine (Massachusetts General Hospital and Harvard Medical School) provides conceptual input on the development of multiplexed and dynamic tumor-targeted, activatable photoimmunotherapy (MD-taPIT).		
2021-2025	Consultant for Light Research Inc	NIH - 75N91022C00019	(Rongguang Liang Light Research Inc)
	Dr. Hasan provides consultations and assistance with study designs, data analysis and interpretation of results. Project: Mobile oral cancer screening and treatment (MOST) system for low resource settings		
2021-2026	Co- Investigator	NIH -5R01CA260340-02 (Univ MD prime site)	(Huang)
Title:	Addressing Chemoresistance in Pancreatic and Ovarian Cancers: Photodynamic Priming and Repurposing of Tetracyclines using Targeted Photo-Activable Multi-Inhibitor Liposomes.		
	This project explores clinically relevant, photo-chemistry-based modality, PDP and advanced nanotechnology-based, imaging guided customized platform that combines the diagnostic expertise of Dr. Hasan's lab, employing non-invasive multiplexed hyperspectral fluorescence, microendoscope imaging and therapeutic capabilities with light activation of photosensitizers to modulate nearby tissues to potential chemotherapy in patient derived xenograft models. The specific aim of this project is to develop a comprehensive platform that integrates multi-wavelength imaging for therapy guidance and monitoring to uniquely enhance treatment outcomes.		

Years Funded	Role on Project	Funding Source- Grant Type and Number	PI
2022-2027	Co-Principal Investigator	NCI- 2P01CA084203-17A1	(Hasan, Maytin)
Title:	Photodynamic Priming of Cancer and Image-guidance for Optimal Immune Response		
	<p>The overall goal of this project is to develop a new platform for cancer therapeutics with a focus on Pancreatic Ductal Adenocarcinoma (PDAC) and Non-Melanoma Skin Cancer (NMSC). Project 3 and Core B will help establish the optimal PDP/ ICI therapy for BCC and SCC skin cancers. This project aims to improve therapy for pancreatic cancer, using visible light activation to not only destroy the cancer itself, but also to increase the efficacy of other treatments such as chemotherapy and immunotherapy while minimizing the toxicity associated with the latter.</p>		
	<p>Project 1: Vitamin D, Immune Checkpoint Inhibition and Photodynamic Priming (PDP) for Enhanced Therapy of Skin Cancer. Clinically, will investigate Vitamin D and PDT mediated induction of ICI molecules, and recruitment/activation of T cell subsets in tumors.</p>		
	<p>Project 2: Intratumoral PDT Induces PDP-based Enhancement of PD-1 Inhibition in Pancreatic Carcinoma. Advanced PDAC patients no longer responsive to chemotherapy, will receive verteporfin-PDT via ultrasound-guided endoscopy (EUS) to prime the tumor and sensitize it to the ICI agent (anti-PD1; pembrolizumab).</p>		
	<p>Project 3: Immune checkpoint inhibition therapy enhanced by integrated photodynamic treatment and image guidance in preclinical models of pancreatic cancer. Imaging-based monitoring of the immune landscape will be used to inform the optimal timing of ICI administration, in order to achieve enhanced outcomes in an orthotopic immunocompetent murine PDAC tumor model and in PDIOs.</p>		
2023-2026	Project leader	DOD/MMPP: FA9550-23-1-0656	(Evans)
	Department of Defense/Airforce Office of Scientific Research Military Medical Photonics Program		
Title:	2023 Military Medical Photonics Project, Sub Project Title: Project 6: Early prediction of sepsis bacterial metabolism		
	<p>The goal of this project is to exploit metabolism -based biomarkers for early sepsis prediction using optical methods.</p>		

Years Funded	Role on Project	Funding Source- Grant Type and Number	PI
2023-2028	Co-Principal Investigator	NIH - U01CA279862-01	(Hasan, Celli)
Title:	A comprehensive platform for low-cost screening and image-guided photodynamic therapy (PDT) treatment of pre-malignant and malignant oral lesions in low resource settings.		
	The goal of this project is to develop and produce a low cost, simple to use, handheld device that can screen patients for high-risk oral cancers, image the location of these cancers, and treat it using this same device at point of care.		
2024-2026	Co-Principal Investigator	U01CA279862-S1 (NIH)	(Hasan, Celli)
Title:	A comprehensive platform for low-cost screening and image-guided photodynamic therapy (PDT) of pre-malignant and malignant oral lesions in low resource settings (supplement)		
	Major Goals: This is a <u>diversity supplement</u> to promote the career development of undergraduate student Sergio Farias. Mr. Farias works under the mentorship of Dr. Jonathan P. Celli, at UMass Boston. This supplement enables him to investigate photobleaching as a quantitative and real-time reporter of photodynamic therapy (PDT) dose response.		
2024-2025	Co-Investigator	1R41AI183969-01 (NIH/SingletO2 Therapeutics)	(Xu)
Title:	A compliant superhydrophobic antimicrobial photodynamic therapy bandage for the prevention of multidrug resistant wound infections (Burns)		
	Major Goals: The goal of this project is to develop a singlet oxygen-generating bandage, manage its ex vivo and in vivo efficacy test, and make efforts for its successful clinical translation.		
2024-2028	Principal Investigator	R01 EB034360-01A1 (NIH/NIBIB University of Texas)	(Obaid)
Title:	Molecular Imaging Guidance for Potentially Chemoimmunotherapy in Pancreatic Cancer using Photodynamic Priming		
	Major Goals: The aim of this project is to investigate the immune checkpoint silencing activity of targeted nano-constructs developed and provided by UT Dallas and will explore their role in facilitating PDP-enhanced T cell attack of tumor nodules.		

Current Submitted Projects (pending support):

Years Funded	Role on Project	Funding Source- Grant Type and Number	PI
2025-2030 expected Title:	Project leader	1 Ro1 CA288498-01 (NIH/University of Maryland)	(Huang)
<p>Fluorescence-guided photodynamic therapy using targeted nanotechnology and ML7710 to manage peritoneal carcinomatosis</p> <p>Major Goals: Exploring the ability of targeted photochemotherapy platform to induce ICD, Hasan Lab will evaluate the expression kinetics of DAMPs that are considered as hallmarks of ICD (Hsp60, Hsp70, CRT, and HMGB), in patient derived immune organoid in a light dose dependent manner and will analyze the expression patterns at different time points post therapy. Hasan Lab will also demonstrate an acute treatment response study to assess the benefit of photochemotherapy for the enhancement of antitumor immunity, employing immunocompetent orthotopic advanced-stage tumor model, hypothesizing that the proposed solution (PDT+ platinum therapy) will provide consistent reduction in local tumor burden, reduce metastasis and improve survival.</p>			
2025-2030 expected Title:	Investigator	1RM1DE034236 (NIH/UMass, Boston) USISTEF/AI/033/2023	(Celli, Hasan, and Liang)
<p>AI-enabled technology for real-time, imaging-guided therapy of oral lesions</p> <p>Major Goals: This proposal develops new technology for image-guided treatment of pre-malignant and malignant lesions. The proposed technology uses machine learning in conjunction with simultaneous intraoral imaging to monitor treatment progress in real time.</p> <p>In this project, leveraging the success of our lab's previous efforts using vitamin D as a differentiation promoter for non-melanoma skin cancers, we will develop strategies for pretreatment with vitamin D analogs for enhanced ALA photosensitization of oral lesions. This approach will be investigated in animal models guided by machine learning using imaging of PpIX fluorescence as a training set. Differentiation promoter dosage and schedule will be systematically evaluated. Our lab will identify the biological strategies for enhancing photosensitization of oral lesions. We will do this in animal models, which will be immunocompetent MOC models. We will establish and validate that approach using the Deep-PDT-Net (DPN). We will work with teams at the University of Arizona and the University of Massachusetts, Boston, to validate the DPN and AI-enabled intraoral PDT planning and therapy monitoring based on fluorescence imaging on the MOC oral cancer models. The specificity and sensitivity of DPN and AI-enabled approaches for treatment planning and monitoring will be correlated with the treatment outcomes. The treatment outcomes we will analyze will monitor acute responses and immune-score, post-PDT, and tumor growth and survival percentage of animals after Day 90 (Post-PDT). This work's significance lies in PDT's ability to transform immunosuppressive tumors into responsive states.</p>			

Years Funded	Role on Project	Funding Source- Grant Type and Number	PI
2025-2027 expected Title:	Principal Investigator Targeted photoactivated chemotherapy to combat metastatic ovarian cancer	R21 CA296053-01 (NIH/Texas State University)	(Kornienko) <p>Major Goals: The major goal of this project is to develop dual-targeting moieties to treat tumor spheroids developed from ovarian cancer lines.</p> <p>In this project, leveraging the success of our lab's previous efforts, we will assist Dr. Kornienko in developing dual-targeting PACT agents with tumor-targeting moieties to treat tumor spheroids developed from ovarian cancer lines. I will lead the studies proposed in Aim 2 to evaluate the activity and specificity of the dual-targeting PACT agents on ovarian cancer spheroids. Selective destruction of spheroids in vitro using targeted PACT agents compared with their non-targeted counterparts will successfully demonstrate this novel concept. It will set the foundation for subsequent in vivo studies in the future.</p>
2026-2030 expected Title:	Principal Investigator VisualSonics Vevo F2 LAZR-X Photoacoustic and Ultrasound Imaging System	S10OD036232-01 NIH S10 - High-End Instrumentation (HEI) Grant	(Hasan) <p>Major Goals: The aim of this project is purchase of a specific instrument. The Vevo F2 LAZR-X is a highly versatile imaging system specifically designed for non-invasive pre-clinical small animal research. This newer generation ultrasound/photoacoustic imager will replace our old generation Vevo 2100 LAZR system that has been phased out by Fujifilm VisualSonics. The new equipment will enable high resolution longitudinal investigation of anatomical and functional changes associated with disease progression and enable monitoring of therapeutic responses in a non-invasive manner. The instrument will support 12 major users and 6 minor users at the Massachusetts General Hospital's Wellman Center for Photomedicine (Dermatology and Pathology), Neurosurgery, Cardiovascular Research Center (Medicine), and Athinoula A. Martinos Center for Biomedical Imaging. The diverse research applications of these researchers are focused on using imaging technology to understand the pathophysiology of an array of high impact diseases such as cancer, cardiovascular disease, abnormal brain function, neurological pathologies/injury, and antibiotic resistant infections. Collectively, these scientists have experience using the most sophisticated optical imaging technologies currently available to biomedical research, each of which has its own intrinsic strengths and weaknesses</p>

of scientific knowledge of cancer and emerging technologies; Development of communication skills; Individualized career preparation.

2017 – current Mentor YES for CURE
The **Young Empowered Scientists for Continued Research Engagement** (YES for CURE) Program is a *three-year* training initiative for highly motivated high school and undergraduate students interested in pursuing a career in scientific research. Through engagement in mentored summer research projects, participation in an advanced scientific curriculum during the academic year, and year-round professional skills training, students will acquire scientific knowledge and technical skills, and increase their understanding of how to conduct biomedical research. This initiative is funded through an R25 grant from the National Cancer Institute (NCI CA221738)

2014-current Mentor REU (Research Experiences for Undergraduates| NSF - National Science Foundation)
The Research Experiences for Undergraduates (REU) program supports active research participation by undergraduate students in any of the areas of research funded by the National Science Foundation. REU projects involve students in meaningful ways in ongoing research programs or in research projects specifically designed for the REU program.

2009-current Mentor KAIST (Korea Advanced Institute of Science and Technology)

2010-current Mentor Pakistan Institute of Engineering and Applied Sciences (PIEAS)
Pakistan Institute of Engineering and Applied Sciences (PIEAS), Islamabad, is recognized as a preeminent federal public university devoted to higher education in specific disciplines of engineering, natural sciences and formal sciences. Although PIEAS offers BS, MS, MPhil and PhD degree programs, yet the postgraduate degree programs dominate.

2018 Mentor Harvard-Amgen Scholars Program
The Amgen Scholars Program at Harvard is a 10-week faculty-mentored residential summer research program for undergraduates in biotechnology.

2012 Mentor The Brazil Scientific Mobility Program (BSMP)
This program offered Brazilian students the opportunity to study abroad in the United States. BSMP was part of the Brazilian government's larger initiative to grant 100,000 Brazilian university students the opportunity to study abroad at the world's best colleges and universities.

Report of Academic Teaching and Training:

Local Teaching of Students in Courses

Medical School/School of Dental Medicine courses:

- 1989 Photomedicine Lecture Series, Health Sciences and Technology (HMS/MIT)
- 1990 Introduction to Photomedicine, Health Sciences and Technology (HMS/MIT), 5 students (undergraduate/graduate)
- 1991 Harvard University Continuing Education Course "Update and Advances in Head and Neck Cancer," 20-25 students (Residents and Fellows)
- 1993 "Biology of Cancer" Harvard University (Coordinator: Osma Kandil, Ph.D.), approx. 60 students (undergraduate/graduate)
- 1993 "Pathophysiology of Tumors" HST Course (Coordinator: R. Jain, Ph.D. MIT-Harvard Joint Program), 15-20 students (undergraduate/graduate)
- 1995 "Pathophysiology of Tumors" HST Course (Coordinator: R. Jain, Ph.D. MIT-Harvard Joint Program), 15-20 students (undergraduate/graduate)
- 1997 "Pathophysiology of Tumors" HST Course (Coordinator: R. Jain, Ph.D. MIT-Harvard Joint Program), 15-20 students (undergraduate/graduate)
- 1999 "Pathophysiology of Tumors" HST Course (Coordinator: R. Jain, Ph.D. MIT-Harvard Joint Program), 15-20 students (undergraduate/graduate)
- 2000 "Medical Applications of PDT: Present and Future," Harvard University Continuing Medical Education Course (Coordinator: Raphael Bueno, M.D.)
- 2001 "Medical Applications of PDT: Present and Future," Harvard University Continuing Medical Education Course (Coordinator: Raphael Bueno, M.D.)
- 2002 "Photodynamic Therapy," Molecular, Cellular and Tissue Radiation Biology, Harvard Medical School (Coordinator: Kathryn Held, Ph.D.)
- 2002 Photochemical approaches in biomedical applications," Cutaneous Biology Research Center Course, Harvard Medical School (Coordinator: Jerome Gross, Ph.D.)
- 2002 "Photodynamic Therapy," BioOptics IAP, Harvard Medical School (Coordinator: Thomas Deutsch, Ph.D.)
- 2002 "Medical Applications of PDT: Present and Future," Harvard University Continuing Medical Education Course (Coordinator: Raphael Bueno, M.D.)
- 2005 "Photodynamic Therapy," Molecular, Cellular and Tissue Radiation Biology, Harvard Medical School (Coordinator: Kathryn Held, Ph.D.)
- 2006 "Photodynamic Therapy," Molecular, Cellular and Tissue Radiation Biology, Harvard Medical School (Coordinator: Kathryn Held, Ph.D.)
- 2008 "9th biennial Biomedical Science Careers Student Conference" The Biomedical Science Careers Program (Coordinator: J. Reede, MD HMS - Dean for Diversity and Community Partnership), 2-4 students (high school-postdoctoral level)

International Teaching of Students in Courses

International Medical School Courses:

- 2007- Pakistan Institute of Engineering and Applied Sciences (PIEAS)
Islamabad, Pakistan
- 2012- The Catholic University of Korea-Harvard Wellman Center for
Photomedicine
Core Technology Development Center
- 2012- Wellman Center for Photomedicine, Massachusetts General Hospital,
Harvard Medical School-Shanghai Dermatology Hospital, Shanghai Tongji
University School of Medicine
- 2017 16th International Photodynamic Association World Congress,
“Mechanism and optimization of PDT outcomes”, June 7-14, Coimbra,
Portugal

Graduate courses, seminars:

- 1995 Lecture Series, Grand Rounds, Hematology-Oncology, Brigham &
Women’s Hospital, Boston, MA
- 1997 Lecture Series, Grand Rounds, Joint Center for Head and Neck Surgery,
Brigham and Women’s Hospital, Boston, MA
- 1997 Lecture Series, Photons in Biomedical Applications, Photonics Center,
Boston University, Boston, MA
- 1998 Photodynamic Therapy: Molecular Basis and Clinical Applications,
Collaborative Course on Biology of the Skin, Dept. of Dermatology, Boston
University School of Medicine, Boston, MA
- 2003 Photodynamic Therapy, Biomedical Optics, Tufts University, Boston, MA
- 2004 Photodynamic Therapy, Biomedical Optics, Tufts University, Boston, MA
- 2005 Photodynamic Therapy, Biomedical Optics, Tufts University, Boston, MA
- 2006 Photodynamic Therapy, Biomedical Optics, Tufts University, Boston, MA
- 2007 Photodynamic Therapy, Biomedical Optics, Tufts University, Boston, MA
- 2008 Photodynamic Therapy, Biomedical Optics, Tufts University, Boston, MA
- 2009 Photodynamic Therapy, Biomedical Optics, Tufts University, Boston, MA
- 2010 “Frontiers in Biomedical Engineering and Physics” HST 500, Health
Sciences and Technology/Massachusetts Institute of Technology
(Coordinator: Sangeeta N. Bhatia, M.D., Ph.D.). Title of Talk
“Photodynamic Therapy: Basic Principles and Imaging Applications” - 15
graduate students, March 11
- 2010 “Biophysics 242r”, Harvard Medical School (Coordinators: Guillermo J.
Tearney, M.D., Ph.D. and Brett Bouma, Ph.D.). Title of Talk
“Photodynamic Therapy: A Bridge between Medicine and Technology -
15 graduate students, March 23
- 2010 “Clinical Experience” HST 212, Massachusetts General Hospital
(Coordinators: R. Rox Anderson, M.D. and Warren M. Zapol, M.D.). Title
of Talk “Photodynamic
Therapy: a bridge between science and medicine” - 9 graduate students,
March 29

2013 Photodynamic Therapy, Biomedical Optics, Tufts University, Boston, MA

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

2003- Radiation Oncology Course for residents and clinical fellows
Role in course: Lecturer

Laboratory and Other Research Supervisory and Training Responsibilities

04/ 2008 Advisor at 9th Annual Biomedical Science Careers Student Conference
Assigned two to four students of different academic levels. Served as a source of information and inspiration for the students. Had opportunity to dialogue with the students throughout the day.

Formally Supervised Trainees

1982-84 Dorina Abdulah, M.D. (Staff)
Department of Geriatrics, Spaulding Rehabilitation Center
Harvard Medical School,
Boston, MA

1984-86 Annette Thompson, Ph.D. (Editor)
Nature,
London, United Kingdom

1986-88 Mark Latina, M.D. (Associate Clinical Professor)
Tufts-New England Medical Center, Mass Eye & Ear, and MGH,
Harvard Medical School,
Boston, MA

1986-89 Kenneth Linden, Ph.D., M.D.
Dermatology/Dermatologic Oncology, UCI Medical Center,
Irvine, CA

1986-89 Christopher Shea, M.D. (Professor, Chief, Section of Dermatology)
The University of Chicago Medicine,
Chicago, IL

1987 Alice Tserozoglu, M.D. (Faculty)
Dept. of Gynecology, Athens Hospital,
Athens, Greece

1987-94 Anthony Cincotta, Ph.D. (President and CEO)
Gematria Sciences, LLC.,
Tiverton, RI

1988-90 Katsumi Hanada, M.D. (Professor and Chairman)
Dept. of Dermatology, Hirosaki University School of Medicine,
Hirosaki, Japan

1989-91 Manfred Scholz, Ph.D. (Senior Scientist)
Bioconsulting Lafaire & Partner,
Cambridge, MA

1989-91 Rüdiger Bachor, M.D. (*deceased*)

1989-92 W. Gregory Roberts, Ph.D. (Research Scientist)
University of California San Diego Cancer Center,

1989-92 San Diego, CA
 Paolo Ortu, M.D. (Staff)
 Dept. of Vascular Surgery, General Hospital,
 Sardinia, Italy

1990-92- Barbara Goff, M.D. (Professor)
 Dept. of Obstetrics & Gynecology, University of Washington
 Medical Center,
 Seattle, WA

1999-93 Ursula Schmidt-Erfurth, M.D. (Professor and Chair)
 Medical University of Vienna, Department of Ophthalmology,
 Vienna, Austria

1991-92 Amitava Chatterjee, Ph.D. (Head)
 Dept. of Biochemistry, Chittaranjan National Cancer Institute,
 Calcutta, India

1991-92 Dani Vooijs (Research Scientist)
 Industry,
 The Netherlands

1991-92 Ulrich Hermanto, M.D.
 Ph.D. Program, New York University,
 New York, NY

1991-93 Chandra Sekar, M.D. (Resident)
 Boston University Medical School,
 Boston, MA

1991-94 Seiichi Iinuma, M.D. (Staff)
 Saiseikai Chuoh Hospital, Dept. of Urology,
 Tokyo, Japan

1992 Fernando E. Kaffe, M.D., F.A.C.S.
 Sacred Heart Hospital and Baptist Hospital, Peripheral Vascular
 and Endovascular Care,
 Pensacola, Florida

1992-94 Daniel Kato, M.D. (Assistant Professor)
 University of California San Francisco Medical Center,
 San Francisco, CA

1993-94 Benedicte van den Bergh, (Ph.D. Candidate)
 Dept. of Medicinal Photochemistry, Leiden University,
 Leiden, Netherlands

1993-94 George Wagnieres, Ph.D. (Associate Professor)
 LPAS, Batiment di Chemie, EPFL,
 Lausanne, Switzerland

1993-94 Beatrice Aveline, Ph.D. (Instructor)
 Wellman Laboratories of Photomedicine, Massachusetts General
 Hospital, Harvard Medical School,
 Boston, MA

1993-95 Elisabeth Jeremiasse (Industrial Scientist)
 The Netherlands

1994-95 Marco Del Governatore, M.D. (Staff)

- Dept. of Surgery, University Hospital,
Bologna, Italy
- 1994-95 Giampaolo Ugolini, M.D. (Staff)
Dept. of Surgery, University Hospital,
Bologna, Italy
- 1994-96 Tetsuo Momma, M.D. (Staff)
The 2nd National Hospital,
Tokyo, Japan
- 1994-96 Kelly Molpus, M.D. (Associate Professor and Chief)
Dept. of Obstetrics & Gynecology, Vanderbilt University Medical
Center,
Nashville, TN
- 1994-96 Bernhard Ortel, M.D. (Associate Professor of Medicine)
University of Chicago Medical Center,
Chicago, IL
- 1995-96 Brian Pogue, Ph.D. (Professor & Chair)
Department of Medical Physics, University of Wisconsin-Madison,
WI and Professor of Engineering , Thayer School of Engineering,
Dartmouth, Hanover, NH
- 1995-96 Linda Duska, M.D. (Assistant Professor)
Dept. of Gynecologic Oncology, Harvard Medical School,
Massachusetts General Hospital,
Boston, MA
- 1995-96 Martijn van Duijn (Ph.D. Program)
Dept. of Medical Biochemistry, State University Leiden,
Leiden, Netherlands
- 1995-97 Kenneth Trauner, M.D. (Surgeon)
Kaiser Oakland Dept. of Orthopedic Surgery,
Oakland, CA
- 1995-97 JoAnn Buczek-Thomas, Ph.D. (Instructor)
Dept. of Biochemistry, Boston University School of Medicine,
Boston, MA
- 1995-98 Nikos Soukos, D.D.S. (Founder and Director)
Applied Molecular Photomedicine Laboratory, Forsyth Institute,
Boston, MA
- 1997 Nedret Altıok, M.D. (Associate Professor)
Pharmacology & Institute of Medical Sciences, Istanbul Science
University,
Istanbul, Turkey
- 1997 Michael Lein, M.D. (Professor Doctor)
Dept. of Urology, University Hospital Charitè, Humboldt University,
Berlin, Germany
- 1997-98 Akira Ito, M.D., Ph.D. (Staff)
Department of Dermatology, Kobe University School of Medicine,
Kobe, Japan
- 1998-99 Hans Guenther Loew, M.Sc. (Graduate Student)

University of Vienna,
Vienna, Austria

1998-99 Laurence Booth, (Postdoctoral Fellow)
UK (current location unknown)

1998-99 Krishnan Rajagopalan, Ph.D. (Managing Partner-Industry)
Tysons Corner, McLean, VA

1998-99 Máire Doyle, Ph.D. (Research Associate)
National Institutes of Health,
Bethesda, Maryland

1998-99 Claudia Alge, M.D. (Resident)
Dept of Ophthalmology, Ludwig-Maximilians University,
Munich, Germany

1998-00 Mark Savellano (Manager)
Fluroescent Imaging Laboratory, Norris Cotton Cancer Center,
Lebanon, NH

1999-01 Anne Moor, Ph.D. (Industry)
The Netherlands (exact location unknown)

1999-00 Boleslav Kosharskyy, Ph.D. (Assistant Professor)
Dept of Anesthesiology, Mount Sinai School of Medicine,
New York, NY

1999-02 Marcela del Carmen, M.D., MPH (Executive Vice President)
Mass General Brigham,
Boston, MA

2000-02 David Sharlin, Ph.D. (Professor, MS Program Coordinator)
College of Science, Engineering, & Technology, Department of
Biological Sciences at Minnesota State University,
Mankato, MN

2000-02 Mabubur Bhuiyan, MBBS, Ph.D. (Research Fellow)
Wayne State University,
Detroit, Michigan

2000-03 Tri A. Dinh, M.D. (Physician)
Gynecologic Oncology, The Methodist Hospital,
Houston, TX

2000-05 Alok Sinha, MD (Resident Physician)
Saint Joseph Hospital,
Nashua NH

2000-18 Imran Rizvi, Ph.D. (Assistant Professor)
Joint Department of Biomedical Engineering, University of North
Carolina at Chapel Hill, North Carolina State University,
Raleigh, NC

2001-03 Lisa Goel, MS (Company Founder)
Nanobiosym, Inc.
Medford, MA

2001-03 Marietta S. Ambrose, MD, MPH FACC (Associate Professor of
Clinical Medicine)

Div of Cardiovascular Medicine, Dept of Medicine, University of Pennsylvania and Perelman School of Medicine, Philadelphia, PA

2001-03 Edward Maytin, MD, PhD (Section Head of Molecular Dermatology, Staff Member and Assistant Professor)
Dept of Dermatology and Dept of Biomedical Engineering, Cleveland Clinic and Cleveland State Univ, and Cleveland Clinic Lerner College of Medicine of Case Western Reserve University, Cleveland, OH

2001-03 Pål Selbo, PhD (Scientist)
Institute for Cancer Research, The Norwegian Radium Hospital, Oslo, Norway

2002-07 Nicolas Solban, PhD (Associate Principal Scientist)
Merck Research Laboratories, Boston, MA

2003-2004 Juan Benavides, MS (Research Engineer)

2003-05 Ralph Peteranderl, PhD (Research Fellow, Science Teacher)
Archbishop Williams High School, South Hamilton MA

2003-06 Sachiko Kosaka, MD, PhD (Senior Assistant Professor)
Nippon Medical School, Tokyo, Japan

2004 Brett Johnson, PhD (Research Scientist)
Novartis, Cambridge, MA

2004-06 Kathleen (Katie) O’Riordan, PhD (Director of Regulatory Affairs)
Curadel Surgical Innovations, Natick MA

2004-08 Sung K. Chang, PhD (Principal Systems Engineer)
Amgen, Thousand Oaks, CA

2004-05 Amor Khachemoune, MD, CWS (Dermatologist, Clinical Instructor)
SUNY Downstate Medical Center, Brooklyn, NY

2004-09 Oleg E. Akilov, MD, PhD (Assistant Professor in Dermatology at UPMC), University of Pittsburgh, Pittsburgh, PA

2004- 2024 Zhiming Mai, PhD (Instructor)
Wellman Center for Photomedicine, Massachusetts General Hospital, Boston, MA

2005-2007 Wei Zhong, PhD (Research Navigator)
Harvard Catalyst, The Harvard Clinical and Translational Science Center, Boston, MA

2005-07 Thomas Stepinac, PhD (Statistician)

Novartis Pharma Productions, GmbH, Technical Operations,
Wehr, Germany

2006-07 Gregory M. Watt, PhD (Senior Research Scientist)
Carbosynth,
South Oxfordshire, England

2006-08 Arshi Malik, PhD (Assistant Professor)
College of Medicine, King Khalid University,
Kingdom of Saudi Arabia

2006-09 Humra Athar, PhD (Senior Research Scientist and Adjunct Faculty)
University of Massachusetts,
Lowell MA

2006-13 Sarika Verma, PhD (Clinical Manager)
Healthcare Optics Research Laboratory, Canon ,
Boston, MA

2007-09 Daniel Neuman, PhD (Associate Director of Licensing)
Mass General Brigham,
Boston, MA

2007-11 Ulysses Sallum, PhD (Director of Business Development)
Technology and Innovation Dept at Boston Children's Hospital,
Boston, MA

2007-11 Xiang Zheng, PhD (Senior Staff Scientist)
Regeneron Pharmaceuticals, Inc.,
Pearl River, NY

2007-12 Jonathan Celli, PhD (Associate Professor)
University of Massachusetts, College of Science and Mathematics,
Boston, MA

2007-10 & Lei Z. Zheng, PhD (Director Business Development)
2011-13 Fortress Biotech, New York, NY

2008-09 Conor L. Evans, PhD (Associate Professor)
Wellman Center for Photomedicine, Massachusetts General
Hospital,
Boston, MA

2008-10 Prakash R. Rai, PhD (Assistant Professor)
University of Massachusetts Lowell, Department of Chemical
Engineering,
Lowell, MA

2008-10 Ramtin Rahmanzadeh, PhD (Research Group Leader)
University of Lübeck,
Lübeck, Germany

2008-09 Yupeng Tu (Biotech, Healthcare)

2008-10 & Toshihiro Kushibiki, PhD (Associate Professor)
2009/2011 National Defense Medical College,
Japan

2008-11 Adnan Abu Yousif, PhD (Cancer Pharmacology Scientist)
Takeda Oncology,
Cambridge, MA

2008-15 Bryan Quilty Spring, PhD (Assistant Professor)
Department of Physics, College of Science,
Northeastern University,
Boston, MA

2009-11 Stefan Elrington (Consultant)
The Boston Consulting Group (BCG)
Boston, MA

2009-11 Youssef Mir, PhD (Research Fellow)
Centre de biochimie Structurale, CNRS UMR 5048 - UM 1 -
INSERM UMR 1054 ,
Montpellier Cedex- France

2010-12 Iqbal Massodi, PhD (Pharmacy Manager)
Rite Aid,
Williamsburg, VA

2010-13 Shifalika Tangutoori, PhD (Senior Scientist)
SalioGen Therapeutics, Drug Delivery,
Lexington MA

2010-19 Srivalleesha Mallidi, PhD (Assistant Professor)
Department of Biomedical Engineering, Tufts University,
Medford, MA

2011 Wael Al-Daraji, MD, PhD (Professor, Division Chief of Global
Health)
Department of Family Medicine and Public Health,
University of California at San Diego
San Diego, CA

2011-12 R. Bryan Sears, PhD (Faculty)
Boston College High School,
Boston, MA

2011-12 Stanley Kimani, MSc, PhD, MBA (Field Application Scientist)
MilliporeSigma, NJ

2011-13 Lawrence B. Mensah, D.Phil (PhD) (Postdoctoral Research
Associate,
Founder CEO and President)
Dept of Chemical Engineering, MIT , The Pathway Initiative and
Gateway Institute of Medicine,
Boston MA

2011-14 Shazia Khan, PhD (Scientific Editor/Scientist, life Sciences
Journals)
Elsevier,
Cambridge MA

2011-13 &
2015-17 Sriram Anbil (Internal Medicine Resident Physician)
UCLA Health, University of California,
Los Angeles, CA

2011-20 Akilan Palanisami, PhD (Consultant)
Cambridge, MA

2012-13 Ruth Goldschmidt, PhD (Research Scientist)

The Weizmann Institute of Science
Rehovot, Israel

2012-13 Ashwini Ghogare, PhD (CEO and head of AI-enabled Drug
Discovery)
MilliporeSigma,
Burlington, MA

2012-14 Sultan Sibel Erdem, PhD (Assistant Professor)
Istanbul Medipol University,
Kavşağı-Beykoz, İstanbul

2012-14 Chun-Te (Patrick) Chiang, PhD (Research Scientist) Lawrence J.
Ellison Institute for Transformative Medicine,
Los Angeles CA

2012-15 Kohei Watanabe, PhD (Senior Scientist, Group Manager)
Canon Medical Systems Corp
Utsunomiya, Tochigi, Japan

2012-18 Huang Chiao Huang, PhD (Assistant Professor)
Fischell Dept of Bioengineering, University of Maryland,
College Park, MD

2013-14 Heather Gudejko, PhD (Product Scientist)
Cell Signaling Technology (CST),
Danvers, MA

2013-14 Rehab Amin, PhD (Assistant Professor)
National Institute of Laser Enhanced Science (NILES)
Cairo University, Egypt

2013-16 Emma Briars PhD (Research Scientist, Computational Biology)
Day Zero Diagnostics Inc,
Boston, MA

2013-19 Girgis Obaid, PhD (Assistant Professor, Erik Jonsson School of
Engineering and Computer Science, Department of
Bioengineering), The University of Texas
Dallas, TX

2014 Nan Xu, MD, PhD (Associate Professor/Administrative Director of
Dermatology)
Shanghai East Hospital, Tongji University,
Shanghai, China

2014 Jia Chen, MD, PhD (Attending Physician)
Shanghai Skin Disease Hospital,
Shanghai, China

2014-16 Joyce Liu (MD/PhD Candidate)
Department of Cancer Biology, Biochemistry and Molecular Physics
Wellen Lab, University of Pennsylvania,
Philadelphia, PA

2014-17 Anne-Laure Bulin, PhD (Principal Investigator, Cancer Targets and
Experimental Therapeutics), INSERM (French National Institute of
Health and Medical Research),
Grenoble, France

2014-16 Daniela Vecchio, PhD (Senior Clinical Research Scientist)
 Erasca, Inc,
 Petaluma CA

2015-16 Yujiro Tsujita, MD (Visiting Scientist)
 Department of Urology, National Defense Medical College,
 Tokorozawa,
 Saitama, Japan

2015-17 Ahmed Alkhateeb, PhD (Director)
 Oncology External Innovation, Sanofi,
 Cambridge, MA

2015-17 Mans Broekgaarden, PhD (Research Fellow)
 Team Cancer Targets and Experimental Therapeutics
 Institute for Advanced Biosciences, Université de Grenoble-Alpes
 Grenoble, France

2015-17 Megumi Ichikawa, MD (Visiting Scientist)
 Department of Neurosurgery, Tokyo Medical University,
 Tokyo, Japan

2015-18 Yan Baglo, PhD (Postdoctoral Researcher)
 Fischell Dept of Bioengineering, University of Maryland,
 College Park, MD

2015-18 Jerrin Kuriakose, PhD (Scientific Advisor)
 Cognition IP Legal Services
 San Francisco, CA

2015-19 Amjad Pervez Khan, PhD (Research Scientist)
 Wellman Center for Photomedicine, Massachusetts General
 Hospital,
 Boston, MA

2016-17 & Shazia Bano, PhD (R&D Scientist, Formulation and Drug Delivery)
 2017-23 Frederick, MD

2016-19 Michael Pigula, PhD (Research Technician)
 Scripps Research Institute,
 La Jolla, CA

2016-18 Shubhankar Nath, PhD (Senior Scientist)
 Quanterix,
 Billerica, MA

2017-19 Rei Haraoka, MD (Visiting Scientist)
 Department of Neurosurgery, Tokyo Medical University,
 Tokyo, Japan

2017-2019 Wendong Jin, PhD, MD (staff)
 Shandong University (SDU), State key Laboratory for Crystal
 Materials,
 Shandong, China

2017-current Yanfang Feng, PhD (Instructor)
 Wellman Center for Photomedicine, Massachusetts General
 Hospital, Harvard Medical School
 Boston, MA

2017-21 Shoab Ashraf, DVM, PhD (Senior Postdoc)
Pillai Lab, Cumming School of Medicine, University of Calgary,
Canada

2017-18 Xiaobing Wang, PhD (Visiting Scholar)
Key Laboratory of Medicinal resources and Natural Pharmaceutical
Chemistry, Ministry of Education, College of Life Sciences, Shaanxi
Normal University,
Xi'an, China

2018 Mustafa Kemal Ruhi , PhD (Assistant Professor)
Institute of Biomedical Engineering, Bogazici University,
Istanbul Turkey

2018 Frances (Fan) Yang, DDS, PhD, DMSc (Periodontist)
Nashua, NH

2018-19 Marvin Xavierselvan (PhD Candidate)
Tufts University,
Boston, MA

2018-20 Joseph Swain (Researcher, PhD Candidate)
Rice University, Chemistry program,
Houston, TX

2018-current Mohammad Ahsan Saad, PhD (Instructor)
Wellman Center for Photomedicine, Massachusetts General
Hospital, Harvard Medical School,
Boston, MA

2018-20 Xiaodong Ding, MD, PhD (Visiting Scientist)
Department of Gastroenterology, Xin Hua Hospital Affiliated to
Shanghai Jiao Tong University School of Medicine,
Shanghai, China

2018-19 Alessandra Nara de Souza Rastelli (Visiting Scientist)
Sao Paulo State University (UNESP) School of Dentistry of
Araraquara,
Araraquara Brazil

2019 Qura Tul Ain (PhD Candidate)
The Islamia University of Bahawalpur,
Punjab, Pakistan

2019 Susan Callaghan, PhD (Scientist)
Pfizer,
County Dublin, Ireland

2019-21 Pushpamali De Silva, PhD (Senior Fellow in Tumor Immunology)
Dept of Medical Oncology, Dana-Farber Cancer Institute, Harvard
Medical School, Broad Institute of MIT and Harvard,
Boston, MA

2019 Shalin Shetty (Project Specialist)
Syneos Health Clinical Solutions,
Cambridge MA

2019-20 Hanna Camille Thomsen, PhD (3D Image Specialist)
ZEISS Microscopy,

Seattle WA
2019-21 Zhaohui Sunny Zhou, PhD (Visiting Scientist)
Department of Chemistry and Chemical Biology, Northeastern
University,
Boston, MA

2020- 21, & Jose Quilez Alburquerque, PhD (Research Fellow)
2022-2024 Wellman Center for Photomedicine, Massachusetts General
Hospital,
Boston, MA

2020-23 Caroline Coradi Tonon, PhD DDS (Senior Scientist)
American Dental Association Research Institute,
Chicago, IL

2021-23 Shakir Khan, PhD (Research Fellow)
Celli Lab, Department of Physics, University of Massachusetts
Boston,
Boston, MA

2022 Demi Wekking (Masters Candidate)
The University of Amsterdam,
Amsterdam, Netherlands

2022 Jimena Nicolas Morala (PhD Candidate)
Universidad Autonoma de Madrid,
Madrid, Spain

2022-2023 Chathuna Sri Anjuna Bodahandi (PhD Candidate)
The Graduate Center, The City University of NY,
New York NY

2022-2023 Isabella (Bella) Feng (CanCure student) sophomore then junior
Undergrad Northeastern University, expected Bachelor of Science
in Cell and Molecular Biology 2024)
Boston MA

2022-2024 Ani Seppelin (student) Senior Oakmont Regional High
School, then freshman undergrad Northeastern University,
expected Bachelor of Science in Biochemistry with a Minor in
Public Health 2027)
Boston MA

2022-2024 Harrison James Roberts (Medical Practice Assistant)
BWH Orthopedics Patriot Place,
Foxboro MA

2023 Tessa Van Bergen (PhD Candidate)
The University of Amsterdam,
Amsterdam, Netherlands

2023-current Natalie Eidenschink (Research Technician)
Wellman Center for Photomedicine, Massachusetts General
Hospital,
Boston, MA

2023-2025 Fernanda Cabral (Research Fellow, Deutsch Fellow)

Wellman Center for Photomedicine, Massachusetts General Hospital,
Boston, MA

2023-current Derek Allen (Research Technician)
Wellman Center for Photomedicine, Massachusetts General Hospital,
Boston, MA

2023-2024 Madeline Szoo (CanCure student) sophomore Undergrad
Northeastern University, expected Bachelor of Science in
Chemical Engineering and Biochemistry with a Minor in Women's,
Gender, and Sexuality Studies 2025)
Boston, MA

2024-2025 Nayab Tahir (Research Fellow-Fulbright Fellow US Educational
Foundation Pakistan)
Wellman Center for Photomedicine, Massachusetts General
Hospital,
Boston, MA

2024 Jeonghyun (Jay) Oh (CanCure student) sophomore Undergrad
Northeastern University, expected Bachelor of Science in
Biomedical Physics with a Minor in Mathematics 2026)
Boston, MA

2024-current Shivendran Vytheswaran (Research Technician)
Wellman Center for Photomedicine, Massachusetts General
Hospital,
Boston, MA

2024 Alessandra Nara de Souza Rastelli (visiting Scientist)
Assoc Professor Department of Restorative Dentistry, School of
Dentistry, São Paulo State University – UNESP,
Araraquara, São Paulo, Brazil

2024 Yuanpei (Jeremy) Zhao (CanCure student) Junior Undergrad
Boston University, expected Bachelor of Science in Biology

2024 Atticus Conn (Co-Op student) Senior Undergrad
Northeastern University, expected Bachelor of Science²³⁵ in
Biochemistry 2025)
Boston, MA

2024-2025 Edynara Morales (PhD Candidate – joint program)
Wellman Center for Photomedicine, Massachusetts General
Hospital,
Boston, MA and Federal University of Goiás,
Goiás Brazil

2024-2025 Jianhua Huang (Research Fellow)
Wellman Center for Photomedicine, Massachusetts General
Hospital,
Boston, MA

2025- Badri Parshad (Research Fellow)

Wellman Center for Photomedicine, Massachusetts General
Hospital,
Boston, MA

Formal Teaching of Peers (e.g., CME and other continuing education courses)
2000- Gynecology Oncology basic Translational Seminar Series,
Massachusetts General Hospital and Dana-Faber Cancer Institute.

Doctoral Thesis Reviews:

- 1996 Thesis Committee, Modestus O.K. Obochi, "Prevention of murine skin allograft rejection by Photodynamic Therapy (PDT) using benzoporphyrin derivative monoacid ring A (BPD)," University of British Columbia
- 1996 Thesis Committee, R.B. Veenhuizen, "Photodynamic therapy for minimal residual cancer in the peritoneal cavity," Frije Universiteit, Amsterdam
- 1997 Thesis Co-Advisor, Mark Savellano, "Photo-immuno-targeting with Benzoporphyrins," University of Michigan
- 1998 Thesis Committee, Stephen Yip, "Ex vivo bone marrow purging using BPD-mediated photodynamic therapy," University of British Columbia.
- 1999 Thesis Committee, Pål Selbo, "Prostate Cancer Metastasis/Physical and Biological Determinants for Optimal PDT," University of Oslo, Oslo, Norway.
- 2004 Thesis Committee, Mark Niedre, "Development and Validation of Singlet Oxygen Luminescence-based Photodynamic Therapy Dosimetry," University of Toronto, Canada
- 2006 Thesis Committee, Xiaodong Zhou, "Designing Treatment Individualization in Photodynamic Therapy to Compensate for Pharmacokinetic Variability," Dartmouth College, New Hampshire
- 2006 Thesis Committee, Chao Sheng, "Dosimetry for ALA-PpIX Photodynamic Therapy of Barrett's Esophagus," Dartmouth College, New Hampshire
- 2006 Thesis Committee, Summer Gibbs, "Noninvasive Fluorescence Imaging for Functional Monitoring of Murine Glioma Treatment Strategies," Dartmouth College, New Hampshire
- 2008 Thesis Committee, Chu Shihng Meir, "Photodynamic Therapy (PDT) in Human Epithelial and Myometrial Multidrug Resistant Tumor Cell Models," The Hong Kong Polytechnic University, Hong Kong
- 2010 Thesis Co-Advisor, Imran Rizvi, "Microenvironment-specific 3D Models to Reliably Evaluate Novel Treatment Strategies for Human Tumors," Thayer School of Engineering, Dartmouth College, New Hampshire
- 2010 Proposal Catalyst, Leah Acker, "Flexible optical array for delivering light to the cochlea," Harvard-MIT Division of Health Sciences and Technology (HST), Medical Engineering and Medical Physics, HST's IDEA² program.
- 2011 Thesis Committee, Juweli Wendy Wu, "Near-Infrared Emitting Quantum Dots for Cellular and Vascular Fluorescent Labeling in In Vivo Multiplexed Imaging Studies", Massachusetts Institute of Technology, Boston

- 2011 Thesis Committee (External Examiner), Jonathan Franklin Lovell, “New Porphyrin Architectures for Biomedical Applications”, University of Toronto, Canada
- 2012 Thesis Preparation Committee (External Examiner), Michael Jermyn, “Advancing the Clinical Use of Nirfast: A Computational Tool for Modeling Near-Infrared Light Transport in Tissue”, Thayer School of Engineering, Dartmouth College, New Hampshire
- 2013 Thesis Committee (External Examiner), Michael Jermyn, “Clinical Implementation of Image-Guided Optical Modeling Tools for Dosimetry in Pancreatic Cancer Photodynamic Therapy”, Thayer School of Engineering, Dartmouth College, New Hampshire
- 2016 Thesis Committee (External Examiner), Luis Gabriel Borges Rocha, “Development of a Novel Photosensitizer for Photodynamic Therapy of Cancer”, Universidad De Coimbra, Portugal
- 2021 Thesis Committee (External Examiner), Vincent Phuong, “Evaluating Tumor Heterogeneity Effects on Transports and Acute Therapeutic Outcomes of Photodynamic Therapy in Pancreatic Adenocarcinoma”, Thayer School of Engineering, Dartmouth College, New Hampshire
- 2021 Thesis Committee (External Examiner), Jessica Devilla, “A Platform for Image-Guided Photodynamic Therapy for Detection and Treatment of Early-Stage Oral Cancer in Low Resource Settings”, Harvard School of Engineering and Applied Sciences, Boston

Master’s Thesis Reviews:

- 1998 Thesis Advisor, Hans Guenther Lowe, “Intracellular aggregation-dynamics of photodynamic sensitizers for PDD specific damage of mitochondria by selective resonance absorption during CW and femtosecond-pulse-fractionated PDT using ALA,” University of Vienna, Vienna, Austria
- 1999 Thesis Advisor, Lisa Goel, “Effect of photodynamic therapy on metastasis-related properties: viscoelasticity and E-cadherin-based adhesion in tumor cells using optical tweezer,” Tufts University, Boston, MA
- 2004 Thesis Committee, Chao Sheng, “Dosimetry for ALA-PpIX/Photofrin Based Photodynamic Therapy of Barrett’s Esophagus,” Dartmouth College, New Hampshire
- 2004 Thesis Committee, Xiaodong Zhou, “Dynamics of Photosensitizer Distribution in Photodynamic Therapy of Prostate Tumors: Experimental and Theoretical Analysis with Verteporfin,” Dartmouth College, New Hampshire
- 2008 Thesis Committee, Johannes Wittmann, “Phase 1 Animal Safety Study of New Second Generation Porphyrin based Photosensitizer in the Syrian Golden Hamster,” University of New South Whales, Sydney, Australia
- 2013 Thesis Advisor, Albert S. Chiou, “Combination-based Photodynamic Therapy to Disrupt Compensatory VEGF Signaling in Pancreatic Cancer”, Harvard-M.I.T. Division of Health Sciences and Technology, Boston

- 2015 Thesis Referee, Hossam Zakaria Hussein Mohamed, “Tissue-Simulating Phantom for Photothermal Interaction Mediated by Nanoparticles, National Institute of Laser Enhanced Science, Cairo University, Egypt
- 2016 Thesis Advisor, Dmitriy Timerman, “Improving Photodynamic Therapy Response in a Subcutaneous Glioblastoma Model”, Harvard-M.I.T. Division of Health Sciences and Technology, Boston
- 2022 Thesis Committee (External Examiner and Masters Project Host), Demi Wekking, “Photodynamic Priming of the pancreatic cancer tumor microenvironment, enabling immunotherapy and of multidrug resistant bacteria enhancing antibiotic treatment”, Department of Medical Biochemistry and Biotechnology, University of Amsterdam, Netherlands

Other Reviews:

Miscellaneous graduate and undergraduate theses and research

Presentation and Lecture Activities:

Local Invited Presentations:

- 1988 Invited Lecture, “Selective Phototoxicity Using Monoclonal Antibody-Photosensitizer Conjugates”, SPIE, Boston, MA
- 1988 Invited Lecture, “Selective Phototoxicity Using Monoclonal Antibody-Photosensitizer Conjugates”, SPIE, Boston, MA
- 1991 Invited Lecture, “The Society for Minimally Invasive Therapy”, Boston, MA
- 1997 Plenary Lecture, Laser/Tissue Interaction and Wound Healing Session. 1997 Cornea Research Conference, Boston, MA
- 2003 Invited Lecture, “Leadership Development for Physicians and Scientists,” Harvard Medical School, Boston, MA
- 2008 Invited Lecture, 'The Landsdowne Seminar Series', MIT, “Photodynamic Therapy: A bridge between photochemical technology and medicine”, April 24, Cambridge, MA.
- 2008 Invited Lectures, Radiation Research Society (RRS) in Connection with American Society for Therapeutic Radiology and Oncology (ASTRO), (i) “Photodynamic Activation: A Platform for Optical Imaging and Therapeutics”; (ii) “Photo-nanotechnology: An Emerging Platform for Targeted Imaging and Treatment”, September 21-24, Boston, MA
- 2009 Invited Lecture, “Leadership Development for Physicians and Scientists”, Harvard Medical School, March 31-April 3, Boston, MA
- 2009 Invited Lecture, Merrimack Pharmaceuticals, “Light-triggered Nanoconstructs as Combinatorial Therapeutics for Cancer”, December 7, Cambridge, MA
- 2010 Invited Lecture, Joint IEEE-Photonics Society & Boston University Biomedical Optics Workshop, “Photodynamic Therapy: A Bridge between Medicine and Technology”, March 30, Boston, MA

- 2011 Invited Lecture, 20th Annual R. William Gange Lecture, "Exploiting cellular molecular responses for enhanced Photodynamic Treatments", December 1, MGH, Boston, MA
- 2012 Invited Lecture, Massachusetts General Postdoctoral Association Annual Meeting, "Career Development at MGH", January 30, MGH, Boston, MA
- 2012 Invited Lecture, Tufts University School of Engineering, Department of Biomedical Engineering, "Photodynamic Therapy: A Bridge between Science, Technology and Medicine", February 5, Medford, MA
- 2012 Invited Lecture, Wellman Noon Tutorial, "The Cancer Cell and its Evil Ways", November 27, MGH, Boston, MA
- 2013 Invited Lecture, New England Biolabs, "Photodynamic Therapy a photochemistry-based bridge between technology, science and medicine", March 28, Ipswich, MA
- 2013 Invited Lecture, PanAmerican Photodynamic Association (PAPDT), Sheraton Boston Hotel/Hynes Convention Center, "Optimizing PDT: Are Molecular Targets the way to go?", April 6, Boston, MA
- 2014 Invited Lecture, Optics and Spectroscopy Seminar Series, "Photodynamic Therapy: A Bridge between Science, Technology and Medicine", March 11, Laser Biomedical Research Center, MIT, Cambridge, MA
- 2014 Invited Lecture, MGH–University of Tokyo Symposium: Frontiers in Biomedical Engineering, "Photodynamic Therapy: a bridge between science, technology and medicine", September 24, Boston, MA
- 2015 Invited Lecture, Vincent Center for Reproductive Biology Seminar Series (VCRB) "Targeting resistance in ovarian cancer with photochemistry-based processes", March 16, Boston, MA
- 2017 Invited Lecture, Applied Pharmaceutical Nanotech meeting, "Infrared light-activated nanoconstructs in biomedical applications", October 4, Cambridge, MA
- 2017 Invited Lecture, University of Massachusetts Medical School, Biochemistry and Molecular Pharmacology Seminar Series, "Photodynamic Activation: A Bridge between Science, Technology and Medicine", November 8, Worcester, MA
- 2018 Invited Speaker, Gordon Research Conference on Lasers in Medicine and Biology, "Cancer Therapeutics: what do photochemical strategies bring to the table?", July 8-13, Lewiston, ME
- 2018 Invited Speaker, Quarterly Business Review (QBR), "Photochemically-based molecular medicines", August 22, Somerville, MA
- 2019 Invited Speaker, Advances in Addressing Oral Cancer: Cells to Society "Challenges and Benefits of a Light-Activated, Simple Approach for the Treatment of Early Oral Cancer in LMICs", April 30, Joseph B. Martin Conference Center, Boston, MA
- 2020 Invited Speaker, Distinguished Seminar Series, Department of Chemical Engineering, "Optically Activated Nanomedicines: Photochemistry as a Tool for imaging, Priming and Therapy", February 19, Northeastern University, Boston, MA

- 2021 Invited Speaker, “Photodynamic Therapy: applications and limitations. Can these be overcome by using ionizing radiation as an adjuvant excitation source?” MGH Physics Dept, Boston, October 12, virtual
- 2022 Invited Speaker, “A photochemistry-based Approach to Cancer Therapeutics” , Mass General Hospital Cancer Forum Series, September 12, virtual
- 2022 Invited Speaker, “why Biophotonics Optics?”, MGH Wellman Center for Photomedicine Outreach event, October 19
- 2022 Invited Speaker, Harvard Medical School, Office for Diversity Inclusion & Community Partnership dinner for Muslim Students, Trainees, Faculty and Staff
- 2023 Invited Speaker, “A comprehensive platform for low-cost screening and image-guided photodynamic therapy (PDT) of pre-malignant and malignant oral lesions in low resource settings”, NCI U01 Virtual meeting, September 21
- 2023 Invited Speaker, “How critical a player can the photon be in cancer therapeutics?” Wellman Education Committee seminar, Boston MA, October 3
- 2023 Invited Speaker, “Photodynamic Therapy: A bridge between Science, Engineering and Medicine”, UMASS Lowell - Departments of Physics and Biomedical Engineering at UMass Lowell Fall 2023 Colloquium series, Lowell MA October 25
- 2023 Invited Interviewee, “Photodynamic therapy for drug resistant pathogens” PNAS interview, for The-Scientist.com, November 7
- 2023 NCI podcast interview with Dr Oliver Bogler, “Inside Cancer Careers”, Virtual, December 15, broadcast January 2024

Report of Regional and National Graduate Courses and Seminars:

- 1998 Strategies for Selective Phototargeting, Grand Rounds, Dept. of Radiation Oncology, University of Pennsylvania, Philadelphia, PA
- 1999 Biomedical Chemistry and Photodynamic Sciences, Fulbright College of Arts & Sciences, University of Arkansas, Fayetteville, AK
- 2000 Strategies for Selective Photodynamic Therapy, Roswell Park Memorial Cancer Institute, Buffalo, NY
- 2006 Molecular Mechanism-Based Strategies for Enhanced Photodynamic Therapy , Wayne State University School of Medicine, Detroit, MI

Report of International Graduate Courses and Seminars:

- 1992 Grand Rounds, Hamilton Regional Cancer Center, Ontario, Canada
- 1993 Seminar, Photoimmunotherapy: Principles and Applications, Department of Dermatology, Hirosaki University, Japan
- 1993 Invited Teaching, Introduction to Photodynamic Therapy, Department of Tumor Biology, Sendai University, Japan
- 2006 EGFR/VEGF in Photodynamic Therapy, Institute of Hepatology, University London College, London, UK

Invited presentations (Report of National and International Invited Teaching and Presentations):

- 1987 Invited Lecture, Targeting of Drugs. NATO ASI, Cape Sunio Beach, Greece
- 1988 Invited Lecture, Photochemical Targeting of Cancer Cells. Gordon Conference on Lasers in Medicine, New Hampshire
- 1989 Invited Lecture, Immunologic Targeting of Cancer Cells. SPIE, Los Angeles, CA
- 1990 Invited Lecture, Photochemical Effects in Laser-Tissue Interactions. SPIE Conference on Progress in Biomedical Optics, Los Angeles, CA
- 1990 Invited Lecture, Tissue Targeting of Photosensitizers. SPIE Conference on Progress in Biomedical Optics, Los Angeles, CA
- 1990 Invited Lecture, Selective Photosensitization, Conference on Photodynamic Treatments: Virus Eradication and Tumor Therapy. University of Muenster, Germany
- 1990 Invited Lecture, Approaches to Tumor Targeting. Workshop on Photodynamic Therapy, Ulm, Germany
- 1990 Invited Lecture, Targeted Photosensitization Using Carrier Systems. Institute of Biochemistry, Swiss Institute for Experimental Cancer Research, Lausanne, Switzerland
- 1990 Invited Lecture, Intensity Dependent Photosensitization. National Laser Center, London University, London, England
- 1992 Plenary Lecture, International Lithuanian-Italian Workshop on Photosensitized Therapy, Lithuania
- 1992 Plenary Lecture, Laser Induced Selective Destruction of Ovarian Cancer Cells. International Conference on Monoclonal Antibody Immunoconjugates for Cancer, San Diego, CA
- 1992 Invited Lecture, Multiphoton Photobiologic Effects. SPIE, Los Angeles, CA
- 1992 Invited Lecture, 11th International Congress on Photobiology, Kyoto, Japan
- 1993 Seminar, Strategies to Selective Phototargeting. Beckman Laser Institute, Irvine, CA
- 1993 Invited Lecture, Role of Carrier Molecules in PDT. EEC Workshop, Lubeck, Germany
- 1993 Invited Lecture, American Society for Photobiology, Chicago, IL
- 1994 Invited Lecture, Lasers & Applications, Advances in Science, Medicine and Technology. National Institute of Laser Enhanced Sciences, Cairo, Egypt
- 1994 Invited Lecture, Gordon Research Conference on the Chemistry and Biology of Tetrapyrroles. Wolfeboro, NH
- 1994 Invited Lecture, Gordon Conference on Lasers in Medicine and Biology, Meriden, NH
- 1994 Seminar, Photochemical Destruction of Cancer Cells. Rush Cancer Institute, Chicago, IL
- 1994 Plenary Lecture, International Conference on Monoclonal Antibody Immunoconjugates for Cancer, San Diego, CA

- 1995 Invited Lecture, Experimental Photodynamic Therapy of Intraabdominal Cancers. University of Bologna, Italy
- 1995 Invited Lecture, The European Biomedical Optics Symposium Week, Barcelona, Spain
- 1995 Plenary Lecture, Photodynamic Therapy: An Overview. Conference on Lasers and Electro-Optics, Baltimore, MD
- 1997 Invited Lecture, Photodynamic Treatment of Antigen-Induced Arthritis with BPD-MA, Future Directions in Photodynamic Therapy. European Society for Photobiology, Stresa, Italy
- 1997 Invited Lecture, BiOS Europe '97, San Remo, Italy
- 1997 Invited Lecture, Engineering Foundation Conference on Lasers in Medicine and Biology, Snowbird, UT
- 1998 Invited Lecture, New Advances in Photodynamic Therapy Targeted Photodynamic Therapy. Annual Meeting of the Radiation Research Society, Louisville, KY
- 1998 Invited Lecture, Therapeutic Laser Applications Topical Meeting, Optical Society of America, Orlando, FL
- 1998 Invited Lecture, First World Congress of Photomedicine in Gynecology, Zurich, Switzerland
- 1998 Seminar, Oregon Medical Laser Center Lecture Series, St. Vincent Hospital and Medical Center, Portland, OR
- 1998 Invited Lecture, Overview of Current Status of Photodynamic Therapy. Gordon Research Conference, Meriden, NH
- 2000 Invited Lecture, New Directions in Photodynamic Therapy. Symposium of New Technologies sponsored by Johnson & Johnson, San Jose, CA
- 1999 Invited Lecture, Advances in Optics for Biotechnology, Medicine and Surgery Conference, Kailua-Kona, Hawaii
- 1999 Invited Lecture, Selective Photosensitizer Localization in PDT. Symposium on Photosensitization (ESP), European Society for Photobiology, Granada, Spain.
- 1999 Invited Lecture, Principles of Photodynamic Therapy and Preclinical Studies, New Aspects in Indocyanine-Green-Angiography. 4th International Symposium on ICG-Angiography, Baden-Baden, Germany
- 1999 Invited Lecture, PDD/PDT in Clinical Practice. 3rd International Symposium on Photodynamic Diagnosis and Therapy in Clinical Practice, Innsbruck, Austria.
- 2000 Invited Lecture, Fundamentals of Photochemistry and Photodynamic Therapy. SPIE Photonics West 2000, San Francisco, CA
- 2000 Invited Lecture, Progress and Novelties in Photodynamic Therapy: Basic Research Aspects. Workshop on Photodynamic Therapy, Marrakech, Morocco
- 2000 Invited Lecture, Recent Advances in Photodynamic Therapy. First International Conference on Porphyrins and Phthalocyanines, Dijon, France
- 2001 Invited Lecture, Fundamentals of Photochemistry and Photodynamic Therapy. SPIE Photonics West 2001, San Jose, CA

- 2001 Invited Lecture, Mechanisms of Cellular Response to PDT. 13th International Congress on Photobiology, San Francisco, CA
- 2001 Invited Lecture, Photodynamic Therapy for Cancer. International Conference on Technology in Cancer Research and Treatment in the New Millennium, Albany, NY
- 2001 Invited Lecture, Photochemically Targeted Destruction of Bacteria *in vivo*. 9th Congress, European Society for Photobiology, Lillehammer, Norway
- 2001 Invited Lecture, Photodynamic Activation in the Possible Treatments of Arthritis. 4th International Symposium on Photodynamic Diagnosis and Therapy in Clinical Practice, Bressanone, Italy
- 2001 Invited Lecture, Therapeutic and Diagnostic Approaches using Light Activatable Chemicals. Van Andel Research Institute, Grand Rapids, MI
- 2001 Invited Lecture, EGFR: A Molecular Target for PDT of Cancer. Hong Kong International PDT Conference, Hong Kong, China
- 2002 Invited Lecture, Photochemistry based Strategies in Cancer Treatment and Diagnosis with EGFR as a Molecular Target, IGERT Seminars, Austin, TX
- 2002 Invited Lecture, Photochemistry Based Approaches to Cancer Treatment and Diagnosis, Mount Sinai School of Medicine, Derald H. Rottenberg Cancer Center, New York, NY
- 2002 Invited Lecture, Photodynamic Therapy, University of Pennsylvania, Philadelphia, PA
- 2003 Invited Lecture, PDT and Growth Factors, SPIE Photonics West 2003, San Jose, CA
- 2003 Invited Lecture, Angiogenetic Effects in Photodynamic Therapy, 9th World Congress of The International Photodynamic Association, Miyazaki, Japan
- 2003 Invited Lecture, Modulation to Achieve Targeted Photodynamic Action affects the Mode of Cell Death, American Society for Photobiology, Baltimore, MD
- 2003 Invited Lecture, Molecular Responses and Modulation in PDT, 5th International Symposium on Photodynamic Diagnosis and Therapy in Clinical Practice, Brixen/Bressanone, Italy
- 2003 Invited Lecture, Targeted Optical Imaging and Photodynamic Therapy, Ernst Schering Foundation's Molecular Imaging Symposium, Berlin, Germany
- 2004 Invited Lecture, Photochemical Effects in Laser-Tissue Interactions: Photodynamic Therapy, An Overview, SPIE Photonics West 2004, San Jose, CA
- 2004 Keynote Invited Lecture, Optical Imaging in the Mechanistic Understanding of Photodynamic Therapy, SPIE Photonics West 2004, San Jose, CA
- 2004 Invited Lecture, Tumor Metastasis, Cell Type, Animal Species, and Tumor Cell Monitoring In Vivo, SPIE Photonics West 2004, San Jose, CA
- 2004 Invited Lecture, Great Lakes Symposium, Cleveland, OH
- 2004 Invited Lecture, ICPP-3, Medical Applications of Porphyrin-based compounds, New Orleans, LA

- 2004 Invited Lecture, Biophotonics 2004, Directing Photodynamic Therapy toward Specific Molecular Targets, Stockholm, Sweden
- 2004 Invited Lecture, ASP, Erb BI Mediated Targeting of Ovarian Cancer: Immunoconjugate Processing and Cytotoxic Efficacy, Seattle, WA
- 2004 Invited Lecture, SPIE, Combination Photodynamic and Differentiation Therapy: Preclinical and Clinical Studies, San Jose, CA
- 2005 Invited Lecture, SPIE, The Need for Optical Imaging in the Understanding and Optimization of Photodynamic Therapy, San Jose, CA.
- 2005 Invited Lecture, FDA, Photodynamic Therapy: Mechanisms, Applications and Imaging, Washington, DC
- 2005 Invited Lecture, IPA, Molecular Targets in Photodynamic Therapy. 10th World Congress, Munich, Germany
- 2005 Invited Lecture, Molecular Responses of PDT on Prostate Tumors and Implications, Deutsche Gesellschaft für Lasermedizin, Ulm, Germany
- 2006 Invited Lecture, Molecular Target Modulation: A Strategy for Optimization of Photodynamic Therapy, Dept. of Gastroenterology, University College of London Institute of Hepatology, London
- 2006 Invited Lecture, Strategies for Optimizing Photodynamic Treatments in Dermatology, Nippon Medical School, Tokyo, Japan
- 2006 Invited Lecture, Strategies for Optimizing Photodynamic Treatments in Dermatology, 57th Annual meeting of the Central Division of the Japanese Dermatological Association, Nagoya, Japan
- 2006 Invited Lecture, Molecular Mechanism-Based Strategies for Enhanced Photodynamic Therapy, Wayne State University School of Medicine, Detroit, MI
- 2006 Invited Lecture, SPIE, Molecular Imaging of Photodynamic Therapy Efficacy, San Jose, CA
- 2007 Invited Lecture, Photochemical and Photophysical Strategies for the Treatment and Diagnosis of Disease. PIEAS, Islamabad, Pakistan
- 2007 Invited Lecture, Molecular Response and Imaging-based Combination Treatments for Pancreatic Cancer, IPA, Shanghai, China
- 2007 Invited Presentation, Advances in Optics for Biotechnology, Medicine, and Surgery, Naples, FL
- 2007 Invited Lecture, European Conference in Biomedical Optics, Munich, Germany
- 2007 Invited Lecture, European Society for Photobiology, Bath, UK
- 2007 Invited Lecture, Frontiers in Optics 2007 (Optical Society of America), "Molecular Response and Imaging-based Combination Strategies for Optimal PDT", San Jose, CA
- 2008 Invited Lecture, SPIE, Photonics-West, "Mechanisms of synergy between epidermal growth factor receptor targeted immunotherapy and photodynamic treatment of ovarian cancer", January 19-24, San Jose, CA
- 2008 Invited Lecture, Wayne State University School of Medicine, "Photodynamic Therapy: A Bridge between Technology and Medicine", May 16, Detroit, MI

- 2008 Invited Lecture, Washington University School of Medicine, "Photodynamic Therapy: A Platform for Bridging Photochemistry, Photobiology and Medicine", June 4, St. Louis, MO
- 2008 Invited Lectures, International Conference on Porphyrins and Phthalocyanines (ICCP-5), "Strategies for targeted Photodynamic Therapy", July 7-11, Moscow, Russia
- 2008 Invited Lectures, Korean Photodynamic Association, The Catholic University of Korea, (i) "Photodynamic Therapy: A Platform Bridging Chemistry, Biology and Medicine"; (ii) "Strategies for Targeted Photodynamic Therapy", August 23, Seoul, Korea
- 2008 Invited Lecture, 3rd Annual NCI Alliance for Nanotechnology in Cancer Investigators Meeting, "Targeted nanomaterials for photodynamic therapy and imaging in ovarian cancer models", September 8-10, Chicago, IL
- 2008 Invited Lectures, 7th International Symposium on Photodynamic therapy and Photodiagnosis in Clinical Practice, (i) "Getting optimal PDT response via molecular target identification"; (ii) "Approaches to selectivity in PDT", October 7-11, Brixen, Italy
- 2009 Invited Lectures, SPIE, Photonics-West, (i) "Photodynamic agents and imaging: applications in therapy monitoring"; (ii) "Molecular imaging and therapy strategies"; (iii) "Optimization of combinatorial therapy using EGFR inhibition and photodynamic therapy in novel ovarian cancer models", January 24-29, San Jose, CA
- 2009 Invited Lecture. World Leish 4, 4th World Congress on Leishmaniasis, "Photodynamic Therapy for Cutaneous Leishmaniasis", February 3-7, Lucknow, India
- 2009 Invited Lectures, 12th World Congress of the International Photodynamic Association, (i) "Molecular Target- based Combinations with PDT for Enhanced Treatment Outcomes"; (ii) "Photodynamic Therapy for Cutaneous Leishmaniasis", June 11-15, Seattle, WA
- 2009 Invited Lectures, 15th International Congress on Photobiology, (i) "Delivery of photosensitizers and other therapeutic agents using nanocells"; (ii) "Mechanism based enhancement of PDT response", June 18-23, Dusseldorf, Germany
- 2009 Invited Lectures, 13th Congress of the European Society for Photobiology, (i) "Targeted Photodynamic Therapy: the photoimmunoconjugate approach"; (ii) "Molecular Targets in Antimicrobial PDT"; (iii) "Molecular response-based PDT combinations: the importance of models", September 3-11, Wroclaw, Poland
- 2009 Invited Lecture, 4th Annual NCI Alliance Investigators Meeting, "Targeted nanomaterials for imaging and photodynamic therapy in orthotopic cancer models", October 20-22, Manhattan Beach, CA
- 2009 Invited Lecture, NCI Translational Science Meeting (TSM 2), "Molecular Response and Imaging-based Combination Strategies for Optimal PDT", November 4-7, Vienna, VA

- 2009 Invited lecture, Frontiers in Optics 2009/Laser Science XXV, “Photodynamic Therapy: A Bridge between Technology and Medicine”, October 14-19, San Jose, CA
- 2010 Invited Lectures, SPIE Photonics West, (i) “Combination treatments with PDT are enhanced by co-encapsulation of PDT agents and biologics in targeted nanoconstructs”; (ii) “Targeted Theranostic Nanoparticles for Biomedical Applications”, January 23-29, San Francisco, CA
- 2010 Invited Lecture, University of Pennsylvania School of Medicine- Department of Radiation Oncology, “Mechanism and Imaging-Based Therapeutic Strategies for Metastatic Ovarian Cancer in 3D and in vivo models”, April 15, Philadelphia, PA
- 2010 Invited Lecture, H Foundation Basic Science Symposium: Bioengineering and Cancer, Robert H. Lurie Comprehensive Cancer Center of Northwestern University, “Molecular Response and Imaging-based Combination Strategies for Optimal Photodynamic Therapy (PDT)”, April 23, Chicago, IL
- 2010 Invited Lecture, Wayne State University School of Medicine, “Photodynamic Therapy: A Translational Bridge between Chemistry and Medicine”, May 21, Detroit, MI
- 2010 Invited Lecture, The University of Missouri, Ellis Fischel Cancer Center and School of Medicine Oncology Grand Rounds, “Photodynamic Therapy: A Translational Bridge Between Technology and Medicine”, September 21, Columbia, MO
- 2010 Invited Lectures, 8th International Symposium on Photodynamic Therapy and Photodiagnosis in Clinical Practice, (i) “PDT for intracellular pathogens”; (ii) “Selective tumor targeting in PDT”, Brixen/Bressanone (South Tyrol, Italy), October 6-9, 2010.
- 2011 Invited Lectures, SPIE Photonics West, (i) “PDT simultaneously with inhibition of EGFR and c-Met pathways enhances treatment outcomes in experimental pancreatic cancer”; (ii) “Imaging enabled platforms for development of therapeutics”, January 22-27, San Francisco, CA
- 2011 Invited Lecture, Florida International University, Herbert Wertheim College of Medicine, “Photodynamic Therapy: A Bridge between Science, Technology and Medicine”, February 25, Miami, FL
- 2011 Invited Lectures, 13th World Congress International Photodynamic Association, (i) “Targeted PDT and its clinical relevance”; (ii) “Nanoconstructs for simultaneous delivery of PDT and oncogenic inhibitors”; (iii) “PDT School-Fundamental Principles of Photodynamic Therapy and Strategies for Optimization”, May 10-14, Innsbruck, Austria
- 2011 Invited Lecture, Advances in Optics for Biotechnology, Medicine and Surgery XII An ECI Conference Series (Engineering Conferences International), “Imaging enabled platforms for development of therapeutics”, June 5-8, Naples, FL
- 2011 Invited Lecture, 21st Annual Meeting of the Japan Photodynamic Association, “Photodynamic Therapy: A Bridge between Science, Technology and Medicine”, July 2-3, Osaka, Japan

- 2011 Invited Lecture, 14th Congress of the European Society for Photobiology, "Combination of Photodynamic and Nano Technologies for Therapy and Treatment Monitoring", September 1-6, Geneva, Switzerland
- 2011 Invited Lecture, 14th Congress of the European Society for Photobiology, "Image-based anti-vascular therapy with PDT", September 1-6, Geneva, Switzerland
- 2011 Invited Lecture, 14th Congress of the European Society for Photobiology, "Enzyme Targeted Photodynamic Therapy and Rapid Optical Diagnostics", September 1-6, Geneva, Switzerland
- 2011 Invited Lecture, University of Chicago, "Photochemistry as a Tool for Diagnostics and Therapy", October 7, Chicago, IL
- 2011 Invited Lecture, Cancer Institute Forum, University of Arkansas for Medical Sciences, "A Bridge between Science, Technology and Medicine", October 24, Little Rock, Arkansas
- 2011 Invited Lecture, Translational Biomarkers in Diagnostics and Therapeutics, "Optical Strategies for Monitoring Biomarkers in vivo for Treatment Design", November 16-18, Mumbai, India
- 2012 Invited Lectures, SPIE Photonics West, (i) "Nanoconstructs for combinations based on PDT and oncogenic inhibitors"; (ii) "Targeting drug resistance mechanism for a rapid optical identification of specific antibiotic utility: Photosensitizers as multifunctional molecular probes", January 21-26, San Francisco, CA
- 2012 Invited Lecture, Washington University in St. Louis, 8th Annual Postdoctoral Scientific Symposium, "So you have a Ph.D.? What next? A personal perspective" March 28, St. Louis, MO
- 2012 Invited Lecture, Wayne State University School of Medicine, "Mechanism, imaging and model-based optimization of photodynamic therapy", April 13, Detroit, MI
- 2012 Invited Lecture, University of California, Fourth Annual Allan Oseroff Lecture, Beckman Laser Institute and Medical Clinic, "Getting the best of Photodynamic Therapy: Are molecular targets the way to go?", April 24, Irvine, CA
- 2012 Invited Lecture, Department of Pharmaceutics, College of Pharmacy, University of Minnesota "Photodynamic Therapy: A Bridge between Technology and Medicine", April 26, Minneapolis, MN
- 2012 Invited Lecture, The Optical Society (OSA), Biomedical Optics Conference "Molecular probes in Photodynamic Therapy", April 30, Miami, FL
- 2012 Invited Lecture, The Ohio State University (OSU) Comprehensive Cancer Center-James Cancer Hospital and Solove Research Institute, 1st Annual International Photodynamic Medicine Symposium, "Maximizing Photodynamic Therapy: Molecular Targets?", May 11-12, Columbus, OH
- 2012 Invited Lecture, Biophotonics and Imaging Graduate Summer School (BIGSS12), "Imaging and Photodynamic Therapy: Mechanisms, Monitoring and Optimisation", June 7-13, Galway, Ireland

- 2012 Invited Lecture, 36th Meeting of The American Society for Photobiology, "Photodynamic Therapy: A Bridge Between Photobiology, Photochemistry and Technology", June 23-27, Montréal, Canada
- 2012 Discussion Leader in Molecular Probes, Gordon Conference on Lasers in Medicine and Biology, July 22-27, Holderness, NH
- 2012 Invited Speaker, 3rd Light for Health 2012, "Photodynamic Therapy: A Bridge between Medicine and Technology", September 21, Barcelona, Spain
- 2012 Invited Lecture, 9th International Symposium on Photodynamic Therapy and Photodiagnosis in Clinical Practice, "Optimizing PDT: are molecular targets the way to go?", October 16-20, Brixen/Bressanone, (South Tyrol) Italy
- 2012 Invited Lecture, 9th International Symposium on Photodynamic Therapy and Photodiagnosis in Clinical Practice, "Image guided drug delivery and therapy in GBM", October 16-20, Brixen/Bressanone, (South Tyrol) Italy
- 2012 Invited Presentation, Pakistan Institute of Engineering and Applied Sciences (PIEAS) Colloquium, "Applying Basic Science to Developing Targeted Treatment of Disease", November 5-9, Islamabad, Pakistan
- 2012 Invited Lecture, PAEC General Hospital, "Molecular Modulation of Cancer Tissue for Enhanced Treatment Response", November 5-9, Islamabad, Pakistan
- 2012 Invited Lecture, The GRDC (Global R&D Center) Symposium, Green Science and Engineering for Health and Environment, "Photodynamic Therapy: A bridge between science, technology and medicine", November 12-13, Seoul, Korea
- 2012 Invited Lecture, Cancer Nanotechnology Mechanisms in Nanoparticle Hyperthermia "Targeted Nanoconstructs and Light Activated Treatment of Cancer", December 1, Hanover, NH
- 2013 Invited Lecture, SPIE Photonics West, "Determinants of treatment resistance in 3D cellular models of cancer", February 2-8, San Francisco, CA
- 2013 Invited Lecture, Initiative for Maximizing Student Development (IMSD) Program and Chemistry Colloquium Seminar, "Strategies for Molecular Targeting in Photodynamic Therapy", March 15, Baton Rouge, Louisiana
- 2013 Invited Lecture, Radiobiology & Imaging Retreat Program: Bioengineering in Cancer Therapy and Imaging: Illuminating New Directions in Nanoparticle Research Symposium, "Photoactivatable Multi-inhibitor Nanoconstructs in Cancer Therapy", May 9, Philadelphia, PA
- 2013 Invited Lecture, The 14th World Congress of International Photodynamic Association, "Molecular Target-Based Photodynamic Therapy Combination Therapies", May 26-31, Seoul, Korea
- 2013 Invited Lecture, 3rd Shanghai International Forum on Photodynamic Medicine, "Photodynamic Therapy: A Bridge between Science, Technology and Medicine", May 31-June 3, Shanghai, China
- 2013 Invited Lecture, Tongji University, "Optimizing Photodynamic Therapy via Molecular Targeting", June 3, Tongji, China

- 2013 Invited Lecture, Food and Drug Administration/Center for Drug Evaluation and Research (FDA/CDER), "Mechanism and Imaging-based Approach to Photodynamic Therapy of Cancer", June 10, Silver Spring, MD
- 2013 Invited Lecture, IV International Symposium, Topical Problems of Biophotonics, "Photodynamic Therapy: A slice of clinical biophotonics bridging science, technology and medicine", July 21-27, Nizhny Novgorod - the Volga River, Russia
- 2013 Invited Lecture, 15th Congress of the European Society for Photobiology, "Photodynamic therapy-based combinations made more effective with multi-inhibitor nanoconstructs", September 2-6, Liège (Belgium)
- 2013 Invited Lecture, Arizona State University, "Photodynamic Therapy: A slice of biophotonics bridging science, technology and medicine", October 17, Tempe, AZ
- 2013 Invited Lecture, University of Pittsburgh Cancer Institute, "Photodynamic Therapy: A slice of biophotonics bridging science, technology and medicine", December 10, Pittsburgh, PA
- 2014 Invited Lecture, SPIE Photonics West, "Drug resistance mechanisms, Photodynamic Therapy (PDT) and combination treatments", February 1-6, San Francisco, CA
- 2014 Invited Lecture, 25 years of Laser-Tissue Interaction at SPIE Photonics West, "PDT: Back to the future (25 years of follies and fortunes)", February 1-6, San Francisco, CA
- 2014 Keynote Invited Speaker, Annual Postdoc Boot Camp for Graduate Students in the School of Medicine at University of North Carolina at Chapel Hill, "So you have a PhD and more, now what?", April 3, Chapel Hill, NC
- 2014 Invited Lecture, PanAmerican Photodynamic Association (PAPDT), "PDT Pearls Science", April 5, Phoenix, AZ
- 2014 Invited Lecture, International Congress on Photodynamic Applications (ICPA), "Molecular Targeted Photodynamic Therapy", May 25-27, Dundee, Scotland
- 2014 Invited Lecture, Biomedical Engineering Materials and Applications (BEMA) Roundtable Committee Meeting, "Low Cost Enabling Technology for Image Guided Photodynamic Therapy of Oral Cancer", June 5-6, Woods Hole, MA
- 2014 Invited Lecture, Howard Schlossberg Retirement Symposium & Reception, "Photodynamic Therapy: A Bridging Technology for Science & Medicine", June 8, San Jose, CA
- 2014 Invited Lecture, International Conference on Porphyrins and Phthalocyanines (ICPP-8), "Targeting Porphyrins to Key Cancer Cell Molecules for Enhanced Treatment Outcome", June 22-27, Istanbul, Turkey
- 2014 Invited Lecture, Photodynamic therapy and photodiagnosis in Clinical Practice, "Targeted PDT in cancer, parasites and bacteria: An overview of promises and limitations", October 15-18, Bressanone/Brixen, (South Tyrol) Italy

- 2014 Invited Lecture, Barbara Ann Karmanos Cancer Institute Grand Rounds, "Photodynamic Therapy and Nanotechnology: A special Relationship?" Wayne State University, December 4, Detroit, MI
- 2015 Invited Lecture, 3rd International Conference of Photodynamic and Nanomedicine for Health Sciences, Luxor & Cairo, "Photodynamic Therapy: a bridge between science, technology and medicine", Egypt, January 2-7, Cairo, Egypt
- 2015 Invited Lecture, SPIE Photonics West, "Exploiting PDT effects in the Design of Mechanism-based Combination Treatments", February 7-12, San Francisco, CA
- 2015 Invited Lecture, SPIE Photonics West, "Photodynamic Therapy", February 7-12, San Francisco, CA
- 2015 Invited Lecture, AACR-SNMMMI Joint Conference on State-of-the-Art Molecular Imaging in Cancer Therapeutics, "New Frontiers: Combining molecular imaging and nanomedicine to light up and selectively destroy cancer", February 10-13, San Diego, CA
- 2015 Invited Lecture, Biochemistry Seminar, University of Oklahoma, "Combining molecular imaging and nanomedicine for selective destruction and imaging of cancer cells", April 6, Norman, Oklahoma
- 2015 Invited Lecture, Optical Molecular Probes, Imaging and Drug Delivery (OMP), "Photodynamic Therapy (PDT): A Photochemical Slice of Clinical Biophotonics", April 12-15, Vancouver, Canada
- 2015 Invited Lectures, The International Symposium of Catholic- Harvard Wellman Photomedicine Center, (i) "Photodynamic Therapy: An Overview and Future Directions", (ii) "Molecular Imaging in therapy guidance and monitoring", April 21-31, Seoul, Korea
- 2015 Invited Lecture, Frontiers of Biomedical Imaging Science V, Vanderbilt University Institute of Imaging Science, Student Life Center, "Nanotechnology in light-activated therapy and monitoring", May 13-15, Nashville, TN
- 2015 Invited Lecture, Cancer Summer Course, "Photodynamic Therapy (PDT): A photochemical slice of biophotonics for cancer treatment", September 7-11, Lausanne, Switzerland
- 2015 Invited Lecture (students' retrospective session), Cancer Summer Course, "The convoluted route from molecular vibrations and chemical kinetics to translational cancer research", September 7-11, Lausanne, Switzerland
- 2015 Invited Lecture, SPIE/NIH Biophotonics from Bench to Bedside Workshop, "Photodynamic Therapy: does it have a role in Low to Middle Income Countries", September 23-26, Bethesda, MD
- 2016 Invited Lecture, Society of Nuclear Medicine and Molecular Imaging (SNMMI) Educational Sessions focusing on "First-in-Humans Molecular Imaging Technologies," "Image-guided photodynamic therapy of pancreatic cancer: in man and mouse", January 27-29, Orlando, FL
- 2016 Invited Lecture, SPIE Photonics West, "Spatiotemporally synchronized cancer combination therapy using photo-activated nanoparticle drug delivery systems", February 13-18, San Francisco, CA

- 2016 Invited Lecture, TRI Innovation & Translation Symposium, “Combining molecular imaging with spatiotemporally synchronized cancer combination therapy using photo- activated nanoparticle drug delivery systems to light up and selectively destroy cancer”, March 1-2, Brisbane, Australia
- 2016 Invited Lecture, Department of Medicine Grand Rounds, University of Chicago, “Optically activatable nanoconstructs for image-guided therapeutics in pancreatic cancer”, March 29, Chicago, IL
- 2016 Invited Lecture, Micro- and Nanotechnology Sensors, Systems, and Applications Conference, “Multifunctional Nanoconstructs for Biomedical Applications”, April 17-21, Baltimore, MD
- 2016 Keynote Invited Speaker, Annual Scientific Retreat, Leads Discovery Optimization (LDO), (Bristol-Myers Squibb), “Optically triggered and image-guided targeted cancer therapeutics”, June 28, Princeton, NJ
- 2016 Invited Lecture, Photodynamic Therapy and Photodiagnosis update, “Exploiting cellular behavior to maximize cancer treatment outcomes”, October 24-28, Nancy, France
- 2017 Invited Lecture, SPIE Photonics West, “Image-guided therapeutics in experimental ovarian cancer, January 28-February 2, San Francisco, CA
- 2017 Invited Lecture, SPIE Photonics West, “Repurposing of photodynamic therapy (PDT) and established”, January 28-February 2, San Francisco, CA
- 2017 Invited Lecture, Photodynamic Therapy Symposium, “Beyond the barriers of light penetration: strategies, Perspectives and possibilities for photodynamic therapy”, February 25, Seoul, Korea
- 2017 Invited Lecture, ASLMS Meeting, “Photodamage in the context of neighboring cell reprogramming”, April 5-9, San Diego, CA
- 2017 Invited Lecture, ASLMS Meeting, “Translating Laboratory Science into the Clinic: Photodynamic Therapy of AMD, Skin and Pancreatic Cancers”, April 5-9, San Diego, CA
- 2017 Invited Lecture, ASP Presidential Evening Symposia, “Taking PDT from bench to bedside: case studies of AMD to Pancreatic Cancer”, April 7, San Diego, CA
- 2017 Invited Lecture, Affordable Cancer Technologies Program In-Person PI Meeting, “Low-cost enabling technology for image-guided photodynamic therapy of oral cancer”, May 18-19, Rockville, MA
- 2017 Invited Lecture, 16th International Photodynamic Association World Congress, “Photodynamic therapy as a pruner of problem cells in cancer?”, June 7-14, Coimbra, Portugal
- 2017 Invited Lecture, International Society for Photobiology, “Exploiting cellular behavior to maximize cancer treatment outcomes”, September 4-8, Pisa, Italy
- 2017 Invited Lecture, Fórum Internacional de Laserterapia (International forum of lasertherapy), “Hot topics on Photodynamic Therapy”, October 5-6, Sao Paulo, Brazil

- 2018 Invited Lecture, SPIE Photonics West, "Broadening photodynamic therapy (PDT) applications to the metastatic setting?", January 27-February 2, San Francisco, CA
- 2018 Invited Speaker, Bristol-Myers Squibb, Leads Discovery & Optimization Retreat, "Light activation of molecules: a valuable tool in the enhancement of cancer therapeutics and imaging", May 1, Princeton, NJ
- 2018 Invited Speaker, Affordable Cancer Technologies Program, Cancer Detection, Diagnosis, and Treatment Technologies for Global Health (UH2/UH3), "Low-cost enabling technology for image-guided photodynamic therapy (PDT) treatment of oral cancer in resource limited settings", May 10-11, Rockville, MD
- 2018 Invited Speaker, ASP 2018 Biennial Meeting "Photochemistry and photobiology: a bridge to science, technology and medicine", May 12-15, Tampa, FL
- 2018 Invited Speaker, Symposium in honor of Avigdor Scherz 70th Birthday, "Photodynamic therapy-overview", May 26-28, Tel-Aviv, Israel
- 2018 Invited Speaker, Medical College of Wisconsin-Cancer Center Grand Rounds speaker series, "Optical molecular activation: a valuable tool in the enhancement of cancer therapeutics and imaging", July 20, Milwaukee, WI
- 2018 Invited Lecture, Nanomedicines: From Fundamentals to Applications, ACS Fall National Meeting, "Optically Activated Nanomedicines", August 19-23, Boston, MA
- 2018 Special Lecture, Congress of Laser Week meeting, "Photodynamic activation: an enabler of cancer therapeutics", November 1-2, Tokyo, Japan
- 2018 Invited Speaker, Congress of Laser Week meeting, Luncheon Seminar, "Light activated nanoplatform", November 1-2, Tokyo, Japan
- 2018 Invited Speaker, END2CANCER: Emerging Nanotechnology and Drug Delivery Applications for Cancer Conference, "Photoactivated nanomedicines: simultaneous spatiotemporal control of drug release and cell death", December 6-7, Oklahoma City, Oklahoma
- 2018 Invited Speaker, School of Med Benning Medical Society Lecture Series, "Infrared light activation in biomedical applications", December 10, Salt Lake City, UT
- 2019 Invited Speaker, Experimental Radiation Oncology Seminar Series "Photodynamic activation: a spatiotemporally controlled enabler of cancer therapeutics", January 17, Houston, TX
- 2019 Invited Speaker, SPIE Photonics West, "Does PDT have a special niche as an affordable technology?", February 2-7, San Francisco, CA
- 2019 Invited Speaker, Visionary Seminar Series, Duke Medical, Imaging Training Program (MITP), Duke University, "Integrating molecular imaging with spatiotemporally synchronized cancer combinatorial therapy using photo-activatable nanoconstruct platforms", February 27, Durham, NC
- 2019 Invited Speaker, Joint ESP and International Photobiology Congress; Symposium PDT-3 - Combination of PDT with other treatment modalities,

- “Photodynamic Therapy (PDT)-inspired combinations: a special place in therapeutics?”, August 25-30, Barcelona, Spain
- 2019 Invited Speaker, Vancouver Nanomedicine Day, “Optically Activated Nanomedicines: Photodynamic Priming as a Tool”, September 11, Vancouver, Canada
- 2019 Invited Speaker, European Association of Nuclear Medicine (EANM), “PDT General Overview”, October 12-16, Barcelona, Spain
- 2019 Invited Speaker, International Workshop on Photomedicine for e-Healthcare, School of Electrical Engineering, KAIST, “Photodynamic Therapy: A Bridge to Science, Medicine and Technology”, November 15, Daejeon, Korea
- 2019 Invited Speaker, UC San Diego Bioengineering Department Seminar Series, “Optically Activated Nanomedicines: Photodynamic Activation as a Priming and Imaging Tool”, December 6, San Diego, CA
- 2020 Invited Lecture, “Is PDT-based metastatic reduction a consequence of local tumor control or a true abscopal effect in immunodeficient mice?”, SPIE Photonics West, February 1-6, San Francisco, CA
- 2020 Invited Speaker, “Optically Activated Nanomedicines: A Tool for imaging, Priming and Therapy”, University of Central Florida (UCF), NanoScience Technology Center (NSTC), March 6, Orlando, FL
- 2020 Invited Speaker, “Optical Nanomedicines as enablers and therapeutics”, European Biotechnology Congress, April 16, Prague Czech Republic
- 2021 Invited Speaker, “Optical molecular activation: a valuable tool in the enhancement of imaging and guided cancer therapeutics”, Cancer imaging Staff meeting (NIH), February 11, virtual.
- 2021 Invited Speaker, “Photochemistry as a Tool for imaging, Priming and Therapy”, University of Arizona Cancer Center Grand Rounds, February 19, virtual.
- 2021 Invited Speaker, “Optically Activated Nanomedicines: Photochemical Activation as a Priming and Imaging Tool in Pancreatic Cancer”, AACR Annual Meeting, April 14, virtual.
- 2021 Invited Speaker, “The many faces of Photodynamic Activation: a tool for effective nanomedicine?” Photodynamic Day, Istanbul Turkey, May 18, virtual
- 2021 Invited Speaker, “Photodynamic activation in the world of infections”, POLYTHEA, May 27, virtual.
- 2021 Invited Speaker, “Optical molecular activation: a valuable tool in the enhancement of imaging and guided cancer therapeutics” Memorial Sloan Kettering Cancer Center’s Innovation and Technology Team Meeting, June 2, virtual.
- 2021 Invited Speaker, “Dramatic Reduction of distant pancreatic metastases in immunodeficient mice using local PDT with nab-paclitaxel”, ASP 2021 Theresa Busch’s 20th Anniversary Symposium, June 8, virtual.
- 2021 Invited Speaker, “Optically Activated Nanomedicines: Photodynamic Activation as a Priming and Imaging Tool”, International Conference on Photoporphyrins and Phthalocyanines (ICPP-11), July 1, virtual.

- 2021 Invited Speaker, “Does light have a unique niche for enabling nanotechnology”, ESP Congress, Salzburg Austria, August 31, virtual.
- 2021 Invited Speaker, “Optically Activated Nanoplatfrom Creates an Immune-rich and Responsive Tumor Microenvironment?”, University of Maryland, November 19, Baltimore MD
- 2021 Invited Speaker, “Photodynamic Activation is a tool for therapy and therapy monitoring: does it have potential in diagnostics and pharmacology? “, Photopharmacology III conference, Cleveland Clinic, OH, November 29, virtual.
- 2021 Interviewed, Topic “The future of PDT”, one of a series of interviews with leaders in the IPA (promoting the cooperation between the IPA and the Chinese Association of Rehabilitation Medicine to develop the IPA China), Interviewed by Xiuli Wang, M.D., Ph.D., Director, Institute of Photomedicine, Tongji University School of Medicine, Department of Phototherapy, Shanghai Dermatology Hospital, Dec 27. 2021, virtual
- 2022 Invited Speaker, “Introduction and talk on PPIX success stories”, IPA Masterclass series, March 8, virtual.
- 2022 Invited Speaker, “Remote consequences of local Photobiological effects”, Photobiology Symposium at SID 2022, May 20, virtual.
- 2022 – Invited Speaker, “The importance of porphyrins in nanoconstructs for enabling therapeutics”, the triple symposium Porphyrinoids-based systems for Health, held at the International Conference on Porphyrins and Phthalocyanines (ICPP-12), Madrid Spain July
- 2022 Invited Speaker, “Envisioning Leadership in Molecular Therapies of the future? Impossible to predict!”, Workshop: Emerging Academic Medical Physics Faculty Leaders, Science Symposium on Diversity, Mentoring and Visionering, University of Wisconsin WI August 31
- 2022 Invited Speaker, “Light activation as a tool for addressing multidrug resistance” Cancer Multidrug Resistance and PDT Symposium, Baltimore MD Oct 24
- 2023 Invited Speaker, “Polymeric Nanocarriers and their role in Cancer Diagnostics and Treatment” Aga Khan University, Karachi Pakistan, February 16
- 2023 Invited Speaker, “Light Activation of Organic Nanomaterials Creates a Response-rich Tumor Microenvironment” COMSATS U – Pakistan, the 1st International Conference on Physics Horizons and Multidisciplinary Sciences (ICPHMS-2023), Lahore Pakistan stan, February 27
- 2023 Invited Speaker, “Polymeric Nanocarriers and their role in Cancer Diagnostics and Treatment” International Symposium on Biophotonics (ISB-23), part of UNESCO Chair “Light for Health” highlighting the role of light in our daily life, PIEAS, Islamabad, Pakistan, March 8
- 2023 Invited Speaker, “Image guided Photodynamic Treatments in Infections and Cancer”, Optica conference, Vancouver Canada, April 25
- 2023 Invited Speaker, “The Yin and Yang of PDT to fight Cancer and infectious diseases”, VI-International School on Light Sciences and Technologies (VI-ISLiST), Santander, Spain, June 22

- 2023 Invited Speaker, “The Yin and Yang of PDT to fight Cancer and infectious diseases”, IPA world congress, Tampere Finland, July 11
- 2023 Invited Speaker, ““Brand New Delivery Approaches for PDT” – Photon is not only an actuator but an integral part of the delivery system., Symposium on Human Antimicrobial PDT, 20th Congress of the European Society for Photobiology, Lyon France, Aug 27
- 2023 Invited Speaker, “Light as the Next Frontier in Cancer Therapy Augmentation?”, University of Maryland Cancer Center, Maryland, October 17
- 2024 Invited Speaker, “Optically Activated nanomedicines: Photodynamic Activation as a Priming and Imaging Tool”, University of North Carolina joint seminar at the School of Pharmacy and Center for Integrative Chemical Biology, North Carolina February 28
- 2024 Invited Speaker, “Photodynamic Activation as a Priming and Imaging Tool: A bridge between Science, Engineering and Medicine” Bioengineering Department of the University of Texas Dallas, April 5
- 2024 Invited Keynote Speaker, “Optically activated nano constructs provide microenvironment priming, imaging, and therapy” Engineering Conferences International (ECI): Nanotechnology in Medicine IV: Physical Triggers and Advanced Materials. Tomar Portugal, May 12
- 2024 Invited Speaker “Role of PDT in overcoming drug resistance in Cancers”, University of Coimbra, Coimbra Portugal, May 17
- 2024 Invited Speaker “Cell death mechanisms in Photodynamic Therapy”, International Conference on Porphyrins and Phthalocyanines ICPP-13, Niagara Falls, NY June 25
- 2024 Invited speaker “Photosensitization as a Tool for addressing Drug Resistance” , The International Union for Photobiology and the Molecular and Experimental Pathology Society of Australia IUPB World Congress, Perth Australia, August 28
- 2024 Invited Keynote speaker “A perspective on Photodynamic Activation” , The International Union for Photobiology and the Molecular and Experimental Pathology Society of Australia IUPB World Congress, Perth Australia, August 29
- 2024 Invited Keynote Speaker “A perspective on Photodynamic Activation” , Innovative Approaches for Cancer Targeting, a Tribute to Professor Kristian Berg, Oslo Norway October 30
- 2024 Invited speaker “Photodisinfection and impact on wound healing implications”, Scientific Session 5: Microbiome & Infection: Implications for Wound Healing. Innovations in Wound Healing conference, Islamorada Key, FL Dec 5

Professional leadership roles related to teaching:

- 1990 Course on Bioconjugates (American Chemical Society), 50 students (postgraduate)
- 1992 "Simple Rules in Photodynamic Therapy: Applications and Dosimetry"

- Course: The International Society for Optical Engineering (SPIE), 15 students (graduate and postgraduate; mix of physics, chemistry, engineering, biology)
- 1993- “Fundamentals of Photochemistry and Photodynamic Therapy” Course: The International Society for Optical Engineering (SPIE), 25 students (graduate and postgraduate; mix of physics, chemistry, engineering, biology)
- 1995 “Introduction to Medical Optics and Lasers” Course: Tufts/New England Eye Center (Coordinator: Thomas F. Deutsch, Ph.D.), 25 students (graduate)
- 2001 Visiting Professor, Fulbright College of Arts & Sciences, University of Arkansas, Fayetteville, AR

Report of Technological and Other Scientific Innovations:

Patents

54 patents: 43 issued, 6 active, 2 pending, 13 exclusively U.S., 12 Licensed or Optioned, 1 Commercialized

U.S. issued patents only- sorted by filed date, abandoned not included

Name	Serial No	Patent No	Filed On	Issued On	Status
Photodynamic Therapy for the Destruction of the Synovium in the Treatment of Rheumatoid Arthritis & the Inflammatory Arthritides	8/016,609	5,368,841	2/11/1993	11/29/1994	Expired 2/11/13
Angiographic Method using Green Porphyrins in Primate Eyes	08/209,473	5,707,986	23/14/1994	1/13/1998	Expired- lifetime 2015
Inhibition of Fibrosis by Photodynamic Therapy	08/741,816	5,913,884	10/31/1996	6/22/1999	Expired- lifetime 2016
Benzophenothiazine & Benzoporphyrin Dye Combination Photodynamic Therapy of Tumors	08/787,665	5,952,329	1/23/1997	9/14/1999	Expired- lifetime 2017

Photosensitizer Conjugates for Pathogen Targeting	08/812,606	6,462,070	3/6/1997	10/8/2002	Expired - 2017
Photodynamic Therapy for the Treatment of Osteoarthritis	08/948,623	5,942,534	10/10/1997	8/24/1999	Expired- 2017
Acceleration of Wound Healing by Photodynamic Therapy	09/160,528	6,107,466	9/24/1998	8/22/2000	Expired – lifetime 2016
Photosensitizer Conjugates for Targeting Intracellular Pathogens	09/418,910	6,610,298	10/15/1999	8/26/2003	Expired- 2019
Photoimmunotherapies for Cancer Using Combination Therapies	10/137,029	7,498,029	5/1/2002	3/3/2009	Expired- 2023
Photosensitizer Conjugates for Pathogen Targeting	10/143,593	7,268,155	5/9/2002	9/11/2007	Expired- 2017
Photosensitizer Conjugates for Targeting Intracellular Pathogens	10/413,179	6,977,075	4/14/2003	12/20/2005	Expired - 2019

Name	Serial No	Patent No	Filed On	Issued On	Status
Photoactivatable Antimicrobial Agents and Therapeutic and Diagnostic Methods of Using Same	12/990,997 , and 12/093,510	9,828,622	5/5/2009, and 11/15/2006	11/28/2017	Active

Methods of Treating and Imaging Tumor Micrometastases using Photoactive Immunoconjugates	15/114,881	11547300	2/2/2015	1/10/2023	Active
Prediction of Tumor Recurrence By Measuring Oxygen Saturation	15/114,906	10,426,388	2/2/2015	10/1/2019	Active
Devices and Methods for Target Analyte Detection in Liquid Samples	15/519,340	10,465,226	10/16/2015	11/5/2019	Active
β -Lactamase Targeted Photosensitizer for pesticide and pest detection	16/013,333 , also 14/410,389	10,874,107	6/20/2018 and 3/17/2016	12/29/2020	Active
Portable Wide Field Fluorimeter Systems	16/479,152	11635379	7/18/2019	4/25/23	Active
Liposomal Nanoconstructs and Methods of Making and Using the same	17/393,214 also app 15/576,583	Not yet	8/3/2021 and 5/26/2016	Not yet as of 10/30/24	Pending, published 5/12/22
System and Method for Low Cost Light Therapy	17/292,466	Not yet	11/11/2019	Not yet as of 10/30/24	Pending, published 1/20/22

Report of Scholarship and Research Publications

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Peer Reviewed Publications in print or other media

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61. **Hasan T**, Akilov O, Kosaka S, Rai P, Verma S. Photodynamic Therapy for Cutaneous Leishmaniasis. World Leish 4; 4th World Congress on Leishmaniasis, Lucknow, India, 2009.
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67. **Hasan T**. Targeted Theranostic Nanoparticles for Biomedical Applications, SPIE Photonics West, San Francisco, CA, 2010.
68. **Hasan T**. Role of Photosensitizer Delivery in Photodynamic Therapy. International Conference on Porphyrins and Phthalocyanines (ICPP-6), Santa Ana Pueblo, New Mexico, 2010.
69. **Hasan T**. PDT for intracellular pathogens. 8th International Symposium on Photodynamic Therapy and Photodiagnosis in Clinical Practice, Brixen/Bressanone, (South Tyrol) Italy, 2010.
70. **Hasan T**. Selective tumor targeting in PDT. 8th International Symposium on Photodynamic Therapy and Photodiagnosis in Clinical Practice, Brixen/Bressanone, (South Tyrol) Italy, 2010.

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75. **Hasan T**. Nanoconstructs for simultaneous delivery of PDT and oncogenic inhibitors. 13th World Congress International Photodynamic Association, Innsbruck, Austria, 2011.
76. **Hasan T**. Combination of Photodynamic and Nano Technologies for Therapy and Treatment Monitoring. 14th Congress of the European Society for Photobiology, Geneva, Switzerland, 2011.
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79. **Hasan T**. Nanoconstructs for combinations based on PDT and oncogenic inhibitors. SPIE Photonics West, San Francisco, CA, 2012.
80. **Hasan T**. Targeting drug resistance mechanism for a rapid optical identification of specific antibiotic utility: Photosensitizers as multifunctional molecular probes, SPIE Photonics West, San Francisco, CA, 2012.
81. **Hasan T**. Molecular probes in Photodynamic Therapy. The Optical Society (OSA), Biomedical Optics Conference, Miami, FL, 2012.
82. **Hasan T**. Photodynamic Therapy: A Bridge between Medicine and Technology 3rd Light for Health 2012, Barcelona, Spain, 2012.
83. **Hasan T**, Spring B, Sears B, Mai Z, Tangutoori S, Rizvi I, Pereira S, Maytin E. Optimizing PDT: are molecular targets the way to go?. 9th International Symposium on Photodynamic Therapy and Photodiagnosis in Clinical Practice, Brixen/Bressanone, (South Tyrol) Italy, 2012.
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88. **Hasan T.** Drug resistance mechanisms, Photodynamic Therapy (PDT) and combination treatments. SPIE Photonics West, San Francisco, CA, 2014.
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94. **Hasan T.** Photodynamic Therapy: a bridge between science, technology and medicine. MGH-U Tokyo Joint Symposium, Frontiers in Biomedical Engineering, Boston, MA, 2014.
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96. **Hasan T.** Photodynamic Therapy: a bridge between science, technology and medicine. 3rd International Conference of Photodynamic and Nanomedicine for Health Sciences, Cairo, Egypt, 2015.
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99. **Hasan T.** New Frontiers: Combining molecular imaging and nanomedicine to light up and selectively destroy cancer. AACR-SNMMI Joint Conference State-of-the-Art Molecular Imaging in Cancer Biology & Therapy, San Diego, CA, 2015.
100. **Hasan T.** Combining molecular imaging and nanomedicine for selective destruction and imaging of cancer cells, University of Oklahoma, Norman, OK, 2015.
101. **Hasan T.** Photodynamic Therapy (PDT): A photochemical slice of clinical biophotonics. Optical Molecular Probes, Imaging and Drug Delivery (OMP), Vancouver, Canada, 2015.

102. **Hasan T.** Photodynamic Therapy: An overview and future directions. The International Symposium of Catholic-Harvard Wellman Photomedicine Center, Seoul, Korea, 2015.
103. **Hasan T.** Molecular imaging in therapy guidance and monitoring. The International Symposium of Catholic-Harvard Wellman Photomedicine Center, Seoul, Korea, 2015.
104. **Hasan T.** Photodynamic Therapy: does it have a role in Low to Middle Income Countries? SPIE/NIH Biophotonics from Bench to Bedside Workshop, Bethesda, MD, 2015.
105. **Hasan T.** Nanotechnology in light-activated therapy and monitoring. Frontiers Imaging Science V Vanderbilt University Institute of Imaging Science, Student Life Center, Nashville, TN, 2015.
106. **Hasan T.** Photodynamic Therapy (PDT). A photochemical slice of clinical biophotonics. Cancer Therapy Course, Luasanne, Switzerland, 2015.
107. **Hasan T.** A rapid optical method of determination of β -lactam antibiotic susceptibility. Antibiotic resistance and antibiotic alternatives: Looking towards the future, United Kingdom, 2015.
108. **Hasan T.** Image-guided photodynamic therapy of pancreatic cancer: in man and mouse. Society of Nuclear Medicine and Molecular imaging (SNMMI) Educational Sessions focusing on "First-in-Humans Molecular Imaging Technologies, Conference, Orlando, FL, 2016.
109. **Hasan T.** Spatiotemporally synchronized cancer combination therapy using photo-activated nanoparticle drug delivery systems, SPIE Photonics West, San Francisco, CA, 2016.
110. **Hasan T.** Combining molecular imaging with spatiotemporally synchronized cancer combination therapy using photo-activated nanoparticle drug delivery systems to light up and selectively destroy cancer, TRI Innovation & Translation Symposium, Brisbane, Australia, 2016.
111. **Hasan T.** Multifunctional Nanoconstructs for Biomedical Applications, Micro-& Nanotech Sensors, Systems, & Applications Conference, Baltimore, MD, 2016.
112. **Hasan T.** Photodynamic Therapy as a unique enabler of spatiotemporally synchronized cancer combination therapies. Photodynamic Therapy and Photodiagnosis update, Nancy, France, 2016.
113. **Hasan T.** Image-guided therapeutics in experimental ovarian cancer. SPIE Photonics West, San Francisco, CA, 2017.
114. **Hasan T.** Repurposing of photodynamic therapy (PDT) and established drugs in cancer therapeutics. SPIE Photonics West, San Francisco, CA, 2017.
115. **Hasan T.** Beyond the barriers of light penetration: strategies, perspectives and possibilities for photodynamic therapy. Special lecture in photodynamic therapy symposium, Seoul, Korea, 2017.
116. **Hasan T.** Photodynamic therapy as a pruner of problem cells in cancer? 16th International Photodynamic Association World Congress, Coimbra, Portugal, 2017.
117. **Hasan T.** Infrared light-activated nanoconstructs in biomedical applications. Applied Pharmaceutical Nanotech Meeting, Cambridge, MA, 2017.

118. **Hasan T.** Broadening photodynamic therapy (PDT) applications to the metastatic setting? SPIE Photonics West, San Francisco, CA, 2018.
119. **Hasan T.** Low-cost enabling technology for image-guided photodynamic therapy (PDT) of oral cancers? Affordable Cancer Technologies Program, Rockville, MD, 2018.
120. **Hasan T.** Photochemistry and photobiology: a bridge to science, technology and medicine, ASP 2018 Biennial Meeting, Tampa, FL, 2018.
121. **Hasan T.** Cancer Therapeutics: what do photochemical strategies bring to the table? Gordon Research Conference on Lasers in Medicine and Biology, Lewiston, ME, 2018.
122. **Hasan T.** Optically Activated Nanomedicines, Nanomedicines: From Fundamentals to Applications, ACS Fall National Meeting, Boston, MA, 2018.
123. **Hasan T.** Photodynamic activation: an enabler of cancer therapeutics, Special Lecture, Congress of Laser Week meeting, Tokyo, Japan, 2018.
124. **Hasan T.** Light activated nanoplatfrom, Congress of Laser Week meeting, Luncheon Seminar, Tokyo, Japan, 2018.
125. **Hasan T.** Photoactivated nanomedicines: simultaneous spatiotemporal control of drug release and cell death, END2CANCER: Emerging Nanotechnology and Drug Delivery Applications for Cancer Conference, Oklahoma City, Oklahoma, 2018.
126. **Hasan T.** Does PDT have a special niche as an affordable technology?, SPIE Photonics West, San Francisco, CA, 2019.
127. **Hasan T.** Is PDT-based metastatic reduction a consequence of local tumor control or a true abscopal effect in immunodeficient mice?, SPIE Photonics West, San Francisco, CA, 2020.
128. JP Celli, **T Hasan** Photodynamic therapy as a cancer treatment for global health: insights from development of a low-cost image-guided PDT system for treatment of early oral cancer in India, Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic and Photobiomodulation Therapy XXX SPIE Photonics West, San Francisco CA 2022
129. BJ Liang, M Pigula, Y Baglo, D Najafali, **T Hasan.** Rationally designed light-activatable nanocomplex for multi-tier cancer cell targeting and photochemotherapy Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic and Photobiomodulation Therapy XXX SPIE Photonics West, San Francisco CA 2022
130. BW Pogue, P Vincent, **T Hasan,** K Wang. Radiomic signatures of photodynamic priming in clinical pancreatic cancer treatment. Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic and Photobiomodulation Therapy XXX SPIE Photonics West, San Francisco CA 2022
131. G Obaid, S Bano, KS Samkoe, I Rizvi, BW Pogue, D Kessel, **T Hasan.** Targeting photonanomedicines in cancer therapy: stromal, cellular and subcellular photomodulation Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic and Photobiomodulation Therapy XXX SPIE Photonics West, San Francisco CA 2022

132. Y Feng, S Ashraf, **T Hasan**. Guide the control and treatment of carbapenem-resistant bacterial infections with FIBA. Photonic Diagnosis, Monitoring, Prevention, and Treatment of Infections and Inflammatory Diseases SPIE Photonics West, San Francisco CA 2022
133. S Khan, B Song, S Mallidi, S Li, H Liu, MAB Hussain, M BaptistaLopes Teix, AA Siddiqui, AP Khan, K Askhar, SA Siddiqui, SA Hasan, C Hopper, SG Bown, R Liang, **T Hasan** and JP Celli. Clinical assessment of a low-cost, hand-held, smartphone-attached intraoral imaging probe for ALA PDT monitoring and guidance. Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic and Photobiomodulation Therapy XXX SPIE Photonics West, San Francisco CA 2022

Narrative Report:

Professor Tayyaba Hasan's research program in Biomedical Optics is focused on image and mechanism guided therapeutics with an emphasis on photodynamic therapy (PDT). PDT is a photochemistry-based approach that is increasingly used to treat a wide number of diseases and requires:

- (i) light of appropriate wavelength
- (ii) a light activatable chemical compound (photosensitizer or PS), and
- (iii) molecular oxygen.

PDT achieves its cytotoxic effect by producing active molecular species including oxygen radicals and singlet oxygen.

The major aspects of PDT that are currently studied in our laboratory are:

a) PDT Tumor Targeting:

We have been amongst the first to emphasize the use of targeting agents with chromophores to achieve selectivity and specificity in order to treat complex disseminated disease.

Specificity in PDT emanates from spatiotemporal control:

- (i) preferential localization of the photosensitizer in tissues of interest, and
- (ii) spatial localization of the activating light.

The laboratory is increasingly focused on Nano-construct formulations as light activation itself induces cytotoxicity and also serves as a drug release mechanism while the targeted nanoconstruct increases the specificity of drug accumulation within the tumor. The site-directed localization, combined with selective irradiation, results in a dual selectivity that minimizes normal tissue damage. Additional selectivity is achieved using targeting moieties such as antibodies and peptides.

b) Site-directed PDT of Microorganisms:

- (i) *Infectious Diseases*: The emergence of clinical isolates that are resistant to standard antimicrobial chemotherapeutics provides the necessary impetus to develop treatments that are not hindered by microbial resistant mutants. PDT has a potential to be that treatment due to its acute nature of photokilling. We

are developing microbial-specific photosensitizers for use in PDT that exploits the β -lactamase-producing phenotype of drug resistant pathogens.

(ii) *Rapid Fluorescence based assay for Antibiotic Efficacy*: A β -lactamase sensitive PS has been constructed and patented to result in a probe that, when cleaved (<30 min) produces a strong fluorescence signal.

(iii) *Cutaneous Leishmaniasis*: Our interest is in the development of selective phototherapeutic agents for improved outcome.

c) Mechanism-based PDT combination therapies:

We are interested in the biological consequences of PDT at both the cellular and molecular level. Our lab is developing mechanism-based PDT combination treatments in which one treatment will nullify the tumor survival responses resulting from the other treatment. The strategies involve nano-carriers with multiple inhibitors of oncogenic pathways. Along these lines, we have introduced the concept of priming where Photodynamic Priming alters the microenvironment to allow second interventions such as immune check point inhibitors, chemotherapy, biologics and radiation to be more effective.

d) Image-guided therapeutics:

Understanding targeting and treatment effects is a key bottleneck in the development of new drugs and PDT treatment protocols. Our projects to combat this include:

(i) *in vivo* longitudinal quantification of disease progression and drug targeting via confocal microendoscopy,

(ii) drug uptake information of individual organs and tissues using *in vivo* fluorescence imaging of whole small animals,

(iii) non-invasive monitoring of *in vivo* tumor volume, vasculature, and oxygenation, using ultrasound/photoacoustic imaging, and

(iv) on-line, non-invasive, fluorescent monitoring of cytotoxic singlet oxygen generation during PDT for personalizing PDT dose parameters in the clinic.

(v) Radiomics to extract features from tumors that indicate priming and other useful phenomena.

e) Model Development:

Biological inadequacies in the 2D cultures and slow speed in animal models are a major barrier for evaluation of a broad array of combination treatments. Our laboratory has developed heterocellular 3D models with quantitative imaging as a viable rapid platform for testing a larger variety of combination strategies, in addition to biomarker monitoring by high-throughput imaging and acoustic cell printing. This work provides a platform for evaluating therapies for a broad array of cancers.

(End)