# Harvard Medical School Curriculum Vitae


**Date Prepared:** June 15, 2026

**Name:** David Eric Golan

**Office Address:** Dean for Research Initiatives and Global Programs
Harvard Medical School
25 Shattuck Street, Gordon Hall 101A
Boston, Massachusetts 02115

**Home Address:** 106 Sumner Road, Brookline, Massachusetts 02445

**Work Phone:** 617-432-7492

**Work Email:** david_golan@hms.harvard.edu

**Work FAX:** 617-432-7494

**Place of Birth:** Boston, Massachusetts


## Education

| | | | |
|---|---|---|---|
| 1975 | A.B. | Chemistry | Harvard University, Cambridge, MA |
| 1979 | M.D. | Medicine | Yale University School of Medicine, New Haven, CT |
| 1982 | Ph.D. | Molecular Biophysics and Biochemistry | Yale University, New Haven, CT |

## Postdoctoral Training

| | | | |
|---|---|---|---|
| 1975-1981 | Predoctoral Trainee | Medical Scientist Training Program | Yale University, New Haven, CT |
| 1979-1983 | Clinical Fellow | Medicine | Harvard Medical School, Boston, MA |
| 1979-1980 | Resident | Internal Medicine | Brigham and Women's Hospital, Boston, MA |
| 1980-1982 | Resident | Internal Medicine | Brigham and Women's Hospital |
| 1982-1983 | Resident | Internal Medicine | Brigham and Women's Hospital |
| 1983-1984 | Research Fellow | Hematology-Oncology | Brigham and Women's Hospital |
| 1984-1985 | Research/Clinical Fellow | Hematology-Oncology | Brigham and Women's Hospital |

## Faculty Academic Appointments

| | | | |
|---|---|---|---|
| 1983-1987 | Instructor | Medicine | Harvard Medical School, Boston, MA |
| 1984-1987 | Instructor | Pharmacology | Harvard Medical School |
| 1987-1994 | Assistant Professor | Medicine | Harvard Medical School |
| 1987-1994 | Assistant Professor | Biological Chemistry and Molecular Pharmacology | Harvard Medical School |
| 1994-2002 | Associate Professor | Medicine | Harvard Medical School |
| 1994-2001 | Associate Professor | Biological Chemistry and Molecular Pharmacology | Harvard Medical School |
| 2001- | Professor | Biological Chemistry and Molecular Pharmacology | Harvard Medical School |
| 2001- | Scholar and Founding Member | | The Academy at Harvard Medical School |
| 2002-2011 | Professor | Medicine | Harvard Medical School |
| 2011- | George R. Minot Professor of Medicine | | Harvard Medical School |

## Appointments at Hospitals/Affiliated Institutions

| | | | |
|---|---|---|---|
| 1985-1992 | Associate Physician | Hematology Division | Brigham and Women's Hospital, Boston, MA |
| 1985-1997 | Attending Physician | Hematology-Oncology Clinic | Brigham and Women's Hospital |
| 1985-2019 | Attending Physician | Hematology-Oncology Inpatient Service | Brigham and Women's Hospital |
| 1985-2019 | Attending Physician | Hematology-Oncology Consult Service | Brigham and Women's Hospital |
| 1992-2002 | Physician | Hematology Division | Brigham and Women's Hospital |
| 1997-2021 | Clinical Staff | Medical Oncology | Dana-Farber Cancer Institute, Boston, MA |
| 1997-2021 | Attending Physician | Hematology-Oncology Clinic | Dana-Farber Cancer Institute |
| 2002- | Senior Physician | Hematology Division | Brigham and Women's Hospital |

## Major Administrative Leadership Positions

**Local**

| | | |
|---|---|---|
| 1982-2020 | Director, Scanning Fluorescence Microscope Photometer Facility | Harvard Medical School, Boston, MA |
| 1988-1992 | Director, Fluorescence Activated Cell Sorter Facility | Bone Marrow Transplantation Program, Brigham and Women's Hospital, Boston, MA |
| 1988-1997 | Co-Director, Program in Clinical Pharmacology | Harvard Medical School |

| | | |
|---|---|---|
| 1997-2004 | Executive Director, Confocal Microscopy Facility | Brigham and Women's Hospital |
| 1997-2013 | Program Leader, Human Pharmacology | Harvard Medical School Scholars in Clinical Science Program |
| 2000-2003 | Co-Director, MD-PhD Program | Harvard Medical School |
| 2003 | Interim Director, MD-PhD Program | Harvard Medical School |
| 2008-2009 | Director, Research Education Program | Clinical and Translational Science Center, Harvard Medical School |
| 2008-2009 | Associate Director, Leder Human Biology and Translational Medicine Program | Harvard Medical School |
| 2008-2014 | Dean for Graduate Education | Harvard Medical School |
| 2008-2019 | Special Advisor for Global Programs | Harvard Medical School |
| 2008-2019 | Chair, Division of Medical Sciences | Harvard University |
| 2009-2014 | Director, Graduate and Undergraduate Education Program | Clinical and Translational Science Center, Harvard Medical School |
| 2009-2016 | Co-Director, Program in Clinical and Translational Research and Education | Harvard Medical School – Portugal Program in Translational Research and Information<br>Harvard Medical School |
| 2009-2019 | Chair, Program in Graduate Education | Harvard Medical School |
| 2012- | Director, Therapeutics Graduate Program | Harvard Medical School |
| 2012-2019 | Education Co-Director, Laboratory of Systems Pharmacology | Harvard Medical School |
| 2014-2019 | Dean for Basic Science and Graduate Education | Harvard Medical School |
| 2019-2024 | Dean for Research Operations and Global Programs | Harvard Medical School |
| 2020- | Co-Chair, Executive Committee | Massachusetts Consortium on Pathogen Readiness |
| 2024- | Dean for Research Initiatives and Global Programs | Harvard Medical School |

## Committee Service

**Local**

| | | |
|---|---|---|
| 1988-2006 | William Bosworth Castle Society<br>1988-2006<br>1990-2006 | Harvard Medical School, Boston, MA<br>Senior Fellow<br>Board of Advisors |
| 1989-1993 | Committee on Educational Evaluation | Harvard Medical School |
| 1989-1993 | Preclinical Promotion Board | Harvard Medical School |
| 1990 | Strategic Planning Consulting Group, Francis A. Countway Library of Medicine | Harvard Medical School |
| 1990-1995 | Curriculum Committee | Harvard Medical School |
| 1990-1991 | Committee for Student Health | Harvard Medical School |
| 1991 | Policy on Software and Video Committee, Office of Technology Licensing and Industry-Sponsored Research | Harvard Medical School |
| 1991-1992 | Committee on Years Three and Four | Harvard Medical School |

| | | |
|---|---|---|
| 1992-1997 | Education Task Force, Division on Addictions | Harvard Medical School<br>Advisory Board, Chair |
| 1993-1998 | Academic Societies Promotion and Review Board | Harvard Medical School<br>Vice-Chair, Executive Committee, Chair |
| 1993-1996 | Technology Subcommittee, Joint Library Committee, Francis A. Countway Library of Medicine | Harvard Medical School |
| 1994-1995 | Medical Education Program Self-Study Committee | Harvard Medical School |
| 1994-1995 | Curriculum Review Committee, Harvard-MIT Division of Health Sciences and Technology | Harvard Medical School |
| 1994-1996 | Faculty Fellowship Committee | Harvard Medical School<br>Chair, Subcommittee on Pharmacology and Therapeutics |
| 1994-2003 | Subcommittee on Admissions, MD-PhD Program | Harvard Medical School |
| 1995-2001 | Council on Student Affairs | Harvard Medical School |
| 1996-2001 | Committee on Years One and Two | Harvard Medical School |
| 1996 | University Committee on Biological Sciences | Harvard Medical School |
| 1997-1998 | Committee on Professional Development | Harvard Medical School<br>Chair, Subcommittee on Remediation |
| 1997- | Faculty Standing Committee, MD-PhD Program | Harvard Medical School |
| 1997-2001 | Research Infrastructure Committee | Brigham and Women's Hospital |
| 1998-2013 | Executive Committee, Scholars in Clinical Science Program | Harvard Medical School |
| 1998-2001 | Committee on Years Three and Four | Harvard Medical School<br>Chair, Subcommittee on Therapeutics and Evidence-Based Medicine |
| 1998 | Curriculum Planning Committee, MD-PhD Program | Harvard Medical School<br>Chair |
| 1998-1999 | Committee on Excellence in Tutoring | Harvard Medical School |
| 1998-2001 | Academic Societies Promotion and Review Board | Harvard Medical School<br>Chair, Executive Committee<br>Chair, Subcommittee on Academic Performance |
| 1998-1999 | Ad hoc Committee to Review the MD-PhD Training Program | Harvard Medical School |
| 1999-2001 | Main Committee on Admissions | Harvard Medical School |
| 1999-2008 | Physician Educator Steering Committee, Harvard Macy Institute Program for Physician Educators | Harvard Medical School |
| 1999-2008 | Curriculum Committee, Harvard Initiative for Patient-Associated Science: Training, Education, Understanding and Research (PASTEUR) | Harvard Medical School |

| | | |
|---|---|---|
| 1999-2013 | Core Planning Group, International Medical Education Alliances, Harvard Medical International | Harvard Medical School |
| 2002-2003 | Committee of Advisors, MD-PhD Program | Harvard Medical School |
| 2001-2010 | Executive Committee, The Academy at Harvard Medical School | Harvard Medical School |
| 2001-2005 | Council on Educational Policy | Harvard Medical School<br>Co-Chair, Medical Sciences Education Steering Group |
| 2001-2002 | Selection Committee, The Academy at Harvard Medical School | Harvard Medical School |
| 2001-2010 | Scientific Steering Committee, Division for Research and Education in Complementary and Integrative Medical Therapies | Harvard Medical School |
| 2001-2006 | Faculty Standing Committee on Resident Research, Department of Medicine | Brigham and Women's Hospital |
| 2001-2006 | Technology Assessment and Development Committee | Brigham and Women's Hospital |
| 2001-2003 | Medical Education Program Self-Study Committee | Harvard Medical School |
| 2001-2004 | Committee on Assessment | Harvard Medical School |
| 2001-2002 | "Blue Sky" Medical Education Task Force | Harvard Medical School |
| 2002-2004 | Scientific Advisory Board | Cantata Pharmaceuticals, Cambridge, MA<br>Member |
| 2002-2006 | Steering Committee, The Academy at Harvard Medical School | Harvard Medical School |
| 2002-2004 | Coordinating Committee for Curriculum Innovation, The Academy at Harvard Medical School | Harvard Medical School |
| 2003-2004 | Task Force for a New Curriculum | Harvard Medical School |
| 2003-2019 | International Programs Committee, Office of Enrichment Programs | Harvard Medical School |
| 2003-2008 | Standing Committee on Innovation, Department of Medicine Education Council | Brigham and Women's Hospital |
| 2003-2004 | Medical Education Reform Initiative Blueprint and Themes Committee | Harvard Medical School |
| 2003-2006 | Medical Education Reform Initiative Steering Committee | Harvard Medical School<br>Chair, Working Group on In-Depth Educational Experiences<br>Chair, Design Group on In-Depth Educational Experiences |
| 2004-2007 | Faculty Council | Harvard Medical School |
| 2004-2009 | Finance Committee, Department of Biological Chemistry and Molecular Pharmacology | Harvard Medical School |
| 2005-2006 | Curriculum Committee | Harvard Medical School |
| 2005-2010 | Advisory Committee, The Academy at Harvard Medical School | Harvard Medical School |

| | | |
|---|---|---|
| 2005-2008 | Subcommittee of Professors | Harvard Medical School |
| 2007-2008 | Steering and Curriculum Committee, Program in Human Biology and Translational Medicine | Harvard Medical School<br>Chair |
| 2007-2008 | Admissions Committee, Program in Biological and Biomedical Sciences | Harvard Medical School |
| 2007-2008 | Strategic Advisory Group on Education, Harvard Medical School Strategic Planning Initiative | Harvard Medical School<br>Chair, Subcommittee on the Continuum of Education |
| 2008-2019 | Division of Medical Sciences Program Heads Committee | Harvard Medical School<br>Chair |
| 2008- | Harvard Integrated Life Sciences Coordinating Committee | Harvard University |
| 2008-2014 | Core Operations Committee | Clinical and Translational Science Center, Harvard University |
| 2009-2019 | Dean's Senior Cabinet | Harvard Medical School |
| 2009-2019 | Education Executive Committee | Harvard Medical School |
| 2009- | Program in Graduate Education (PGE) | Harvard Medical School<br>Chair, 2009-2019 |
| 2009-2019 | Standing Committee on Governance and Oversight of Master's Degree Programs | Harvard Medical School<br>Co-Chair, Chair |
| 2009- | Harvard-MIT Health Sciences and Technology Leadership Committee | Harvard Medical School and Massachusetts Institute of Technology |
| 2009- | University Committee on International Projects and Sites | Harvard University |
| 2009-2014 | Faculty of Medicine Committee on Conflicts of Interest and Commitment | Harvard Medical School |
| 2009-2011 | Task Force on Faculty Development and Diversity | Harvard Medical School |
| 2009-2019 | PGE/Curriculum Fellows Program Leadership Committee | Harvard Medical School<br>Chair |
| 2010-2013 | Faculty Council | Harvard Medical School |
| 2010- | Committee on Global Projects and Sites | Harvard Medical School<br>Chair |
| 2010- | Nikon Imaging Center Faculty Advisory Committee | Harvard Medical School |
| 2012- | Initiatives, Programs, Centers, and Institutes Committee | Harvard Medical School |
| 2012- | Capital Management Committee | Harvard Medical School |
| 2013-2019 | Harvard Program in Therapeutic Science Executive Committee | Harvard Medical School |
| 2013-2019 | Regulatory Sciences Advisory Group | Harvard Medical School<br>Co-Chair |
| 2013-2022 | Boston Biomedical Innovation Center Steering Committee | Brigham and Women's Hospital |
| 2013-2019 | HarvardX Steering Committee | Harvard University |
| 2014- | Global and Community Health Appointments Committee | Harvard Medical School |

| | | |
|---|---|---|
| 2015-2020 | Space Committee | Harvard Medical School |
| 2015- | Warren Alpert Foundation Prize Scientific Advisory Committee | Harvard Medical School |
| 2015-2020 | Title IX Policy Review Advisory Committee | Harvard University |
| 2016- | Q-FASTR Executive Steering Committee | Harvard Medical School<br>Co-Chair |
| 2017-2018 | Comprehensive Review of Graduate Education at Harvard Medical School Steering Committee, Co-Chair | Harvard Medical School<br>Chair |
| 2018-2024 | Research Operations Working Group | Harvard Medical School<br>Co-Chair |
| 2019- | Dean's Leadership Council | Harvard Medical School |
| 2019- | Therapeutics Steering Committee | Harvard Medical School<br>Co-Chair |
| 2019-2024 | I-Hub Executive Team | Harvard Medical School |
| 2019- | Foundry Committee | Harvard Medical School<br>Co-Chair |
| 2019-2022 | Harvard Blavatnik Life Lab at Longwood Space Planning Committee | Harvard Medical School<br>Chair |
| 2019- | Data Strategy Steering Committee | Harvard Medical School |
| 2019-2024 | Center for Computational Biomedicine Faculty Committee | Harvard Medical School |
| 2019- | Research Computing Faculty Advisory Committee | Harvard Medical School |
| 2019- | Research Rigor and Reproducibility Committee | Harvard Medical School |
| 2019-2024 | Blavatnik Gift Strategy Committee | Harvard Medical School |
| 2019- | Blavatnik Therapeutics Challenge Awards Review Committee | Harvard Medical School |
| 2020- | Bertarelli Rare Cancers Fund Advisory Council | Harvard Medical School |
| 2024- | Research Technology Committee | Harvard Medical School |
| 2025- | Advisory Committee on Research Sustainability | Harvard Medical School |
| 2025- | MassCPR Biospecimens and Data Network Committee | Harvard Medical School |

**National and International**

| | | |
|---|---|---|
| 1994-2000 | Medical/Scientific Advisory Board | Alza Corporation, Palo Alto, California<br>Member |
| 1995-2015 | United States Pharmacopoeia | Member |
| 1996-1998 | Applied Pharmacology Task Force and United States Medical Licensing Examination (USMLE) Step 1 Applied Pharmacology Test Material Development Committee | National Board of Medical Examiners<br>Member |

| | | |
|---|---|---|
| 1996 | Consultant on Teaching of the Basic Medical Sciences, Faculty of Medical Sciences | National University of Cuyo, Mendoza, Argentina |
| 1997 | Allergy, Immunology, and Transplantation Research Committee, National Institute of Allergy and Infectious Diseases | National Institutes of Health, Washington, D.C.<br>Special Reviewer |
| 1997 | Biophysical Chemistry Study Section, Division of Research Grants | National Institutes of Health<br>Special Reviewer |
| 1998 | Source Selection Evaluation Panel, Tissue Based Biosensors Program | Defense Advanced Research Projects Agency |
| 1998-1999 | Biophysical Chemistry Study Section, Center for Scientific Review | National Institutes of Health<br>Special Reviewer and ad hoc Initial Review Group Member |
| 1998-2001 | Pharmacology Test Committee and USMLE Step 1 Pharmacology Test Material Development Committee | National Board of Medical Examiners<br>Member |
| 1999 | Interdisciplinary Review Committee, USMLE Step 1 Computer-Based Test | National Board of Medical Examiners<br>Member |
| 1999 | Consultant on a New Medical Curriculum | China Medical University, Shenyang, China |
| 2000-2010 | Consultant on a New Medical Curriculum | Carl Gustav Carus Medical Faculty of the Technical University of Dresden, Dresden, Germany |
| 2000 | United States Civilian Research and Development Foundation for the Independent States of the Former Soviet Union | United States Department of State<br>Special Reviewer, Science Centers Program |
| 2001 | Invited Speaker, Workshop on Functional Integration of Cells and Materials, Defense Sciences Research Council | Defense Advanced Research Projects Agency |
| 2001-2004 | Ad hoc Initial Review Group Member, Hematology Study Section, Center for Scientific Review | National Institutes of Health |
| 2002 | Reviewer, Ohio Biomedical Research and Technology Transfer Partnership Awards Program | |
| 2002-2003 | Consultant on a New Medical Curriculum | Xinjiang Medical University, Urumqi, China |
| 2002-2008 | Consultant on a New Medical Curriculum | Cleveland Clinic Lerner College of Medicine at Case Western Reserve University, Cleveland, Ohio |
| 2003-2006 | Leukemia, Immunology and Blood Cell Development Committee | American Cancer Society<br>Member |
| 2005-2006 | Consultant on a New Medical Curriculum | Catholic University of Portugal, Lisbon, Portugal |
| 2006 | National Center for Complementary and Alternative Medicine | National Institutes of Health<br>Invited Participant, Working Group on Biofield Energy Medicine |

| | | |
|---|---|---|
| 2008- | Karin Grunebaum Cancer Research Foundation | Trustee |
| 2009- | Dubai Harvard Foundation for Medical Research | Harvard University<br>Trustee |
| 2009-2016 | Harvard Medical School – Portugal Program in Translational Research and Information | Harvard Medical School and the Foundation for Science and Technology of the Government of Portugal<br>Governing Board |
| 2013-2020 | Oversight Committee, Rwanda Human Resources for Health Program | Harvard Medical School and Brigham and Women's Hospital<br>Co-Chair |
| 2013- | Oversight Committee, Osher Center for Integrative Medicine at Harvard Medical School and Brigham and Women's Hospital | Harvard Medical School and Brigham and Women's Hospital<br>Co-Chair |
| 2013-2024 | Executive Committee, National Centers for Accelerated Innovation | National Heart, Lung, and Blood Institute |
| 2014-2024 | Steering Committee, Harvard Medical School Center for Global Health Delivery – Dubai | Harvard Medical School and Dubai Healthcare City Authority<br>Chair |
| 2014- | Steering Committee, Partnership for Health Advancement in Vietnam | Harvard Medical School, Brigham and Women's Hospital, Beth Israel Deaconess Medical Center<br>Chair |
| 2024- | Steering Committee, Harvard Medical School-Seoul National University Hospital-Seoul National University College of Medicine Collaboration in Research and Education | Harvard Medical School, Seoul National University Hospital, Seoul National University College of Medicine<br>Co-Chair |
| 2025- | DRIVE Acceleration Team | Commonwealth of Massachusetts<br>Co-Chair, Saving Lives Through Research Working Group |

**Professional Societies**

| | |
|---|---|
| 1980- | Biophysical Society |
| 1980- | Red Cell Club |
| 1983- | Massachusetts Medical Society |
| 1984- | American College of Physicians |
| 1986- | New York Academy of Sciences |
| 1986- | The Protein Society |
| 1987- | American Chemical Society |
| 1988- | American Society of Cell Biology |
| 1989- | American Association for the Advancement of Science |
| 1989- | Society of Analytical Cytology |
| 1990- | American Medical Association |

| | | |
|---|---|---|
| 1992- | American Society of Hematology (2000, National Meeting Abstract Review Committee) | |
| 1995- | Molecular Medicine Society | Fellow |
| 1996- | American Society for Clinical Investigation | Elected Member |

## Editorial Activities

**Ad hoc Reviewer**
American Journal of Pathology
American Journal of Physiology
Biochimica et Biophysica Acta
Biochemistry
Biophysical Journal
Blood
Experimental Pathology
European Biophysical Journal
European Journal of Biochemistry
European Journal of Hematology
FASEB Journal
FEBS Letters
Immunity
Journal of Biological Chemistry
Journal of Cell Biology
Journal of Cellular Physiology
Journal of Immunology
Journal of Theoretical Biology
Nature
Nature Methods
New England Journal of Medicine
Photochemistry and Photobiology

## Honors and Prizes

| | | |
|---|---|---|
| 1971 | Harvard National Scholar | Harvard University |
| 1971 | National Merit Scholar | |
| 1975 | Detur Prize | Harvard University |
| 1975 | Phi Beta Kappa | Harvard University |
| 1975 | A.B. summa cum laude | Harvard University |
| 1985-1987 | Research Fellow | The Medical Foundation, Inc. |
| 1994-1995 | Funds for Discovery Award | Harvard Medical School |
| 1996 | Elected Member | American Society for Clinical Investigation |
| 1996 | Faculty Prize for Excellence in Teaching | Harvard Medical School |

| | | | |
|---|---|---|---|
| 1997 | Elected Member | Aesculapian Club, Harvard Medical School | |
| 1997-2008 | Method to Extend Research in Time (MERIT) Award | National Heart, Lung and Blood Institute, National Institutes of Health | |
| 1998-2000 | Interdisciplinary Seed Grant Award | Brigham and Women's Hospital Research Organization | |
| 1998-2000 | Dual-Mentored Fellowship Program Award | Brigham and Women's Hospital Research Organization | |
| 1997 | Student Award for Excellence in Teaching | Harvard Medical School | Course Director |
| 1998 | Student Award for Excellence in Teaching | Harvard Medical School | Tutor |
| 1999 | Student Award for Excellence in Teaching | Harvard Medical School | Course Guide, Lecture Notes, Conference |
| 2000 | Student Award for Excellence in Teaching | Harvard Medical School | Problems, Tutorial Cases, and PharmAid Manual |
| 2001 | Student Award for Excellence in Teaching | Harvard Medical School | Lecturer |
| 2002 | Student Award for Excellence in Teaching | Harvard Medical School | Lecturer |
| 2003 | Student Award for Excellence in Teaching | Harvard Medical School | Lecturer |
| 2004 | Student Award for Excellence in Teaching | Harvard Medical School | Lecturer |
| 2004 | Student Award for Excellence in Teaching | Harvard Medical School | Course Guide |
| 2005 | Alpha Omega Alpha Robert J. Glaser Distinguished Teacher Award | Association of American Medical Colleges | This national award "recognizes the significant contributions to medical education made by gifted teachers." It was accompanied by a $10,000 grant from Alpha Omega Alpha and the Association of American Medical Colleges. |
| 2010 | Master Mentor Award | Harvard University | |
| 2012 | First Prize in Pharmacology | British Medical Association Medical Book Award | This international medical book award was for *Principles of Pharmacology* (3rd edition), a textbook for which Dr. Golan was the editor-in-chief. |
| 2017 | Highly Commended in Medicine | British Medical Association Medical Book Award | This international medical book award was for *Principles of* Pharmacology (4th edition), a textbook for which Dr. Golan was the editor-in-chief. |

# Report of Funded and Unfunded Projects

## Funding Information

**Past**

1984-1993 Membrane dynamics in normal and abnormal red blood cells
NIH/R01 HL 32854
PI

1988-1993 Mobility and distribution of sickle membrane components
NIH/P60 HL 15157
Section Head (Project PI) and Co-PI of Parent Center Grant

1988-1992 Fluorescence activated cell sorter facility; Cellular and molecular studies of bone marrow transplantation
NIH/P01 CA 39542
Co-PI (Core Director)

1988-1989 Interactive laser cytometer/cell sorter
NIH Shared Instrumentation Grant/S10 RR 05006
PI

1988-1989 Significance of transductive electrokinetic processes in cell surface glycoprotein movement
Whitaker Health Sciences Fund, Massachusetts Institute of Technology
PI

1992-1993 Mechanism of cellular responses to ac electric fields
William F. Milton Fund, Harvard University
PI

1993-1997 Membrane dynamics in normal and abnormal erythroid cells
NIH/R01 HL 32854
PI

1993-1998 Mobility and adhesion of sickle membrane components; Comprehensive sickle cell center
NIH/P60 HL 15157
Section Head (Project PI) and Co-PI of Parent Center Grant

1994-1995 Use of NADH laser fluorimetry for the assessment of oocyte and embryo quality
Funds for Discovery, Harvard Medical School
PI

1996-2000 Prediction of optimal parameters for electrotherapy of wound healing
The Whitaker Foundation/Biomedical Engineering Research Grant
Co-Investigator

1998-2000 Use of computer-enhanced laser and video microscopy techniques to elucidate the physical properties of individual cell surface receptors, channels, and adhesion molecules
Northeastern University Engineering Research Center for Subsurface Sensing and Imaging Systems/Interdisciplinary Seed Grant
PI

1997-2008 Molecular interactions in erythroid cell membranes
NIH/R37 HL 32854
PI

1998-2000 Quantitative analysis of the two-dimensional binding between lipopolysaccharide from *Pseudomonas aeruginosa* and the cystic fibrosis transmembrane conductance regulator (CFTR)
Brigham and Women's Hospital Research Organization/Interdisciplinary Seed Grant
Co-PI

1998-2000 Cellular imaging of protein-protein interactions: Visualizing the dynamic regulation of eNOS and caveolin in $Ca^{2+}$-dependent signal transduction
Brigham and Women's Hospital Research Organization/Interdisciplinary Seed Grant
Co-PI

1998-2003 Lymphocyte-erythrocyte adhesion in sickle cell disease. Parent Center Grant: Comprehensive sickle cell center
NIH/P60 HL 15157
Section Head (Project PI) and Co-PI of Parent Center Grant

2000-2002 Use of computer-enhanced laser and video microscopy techniques to elucidate the physical properties of individual cell surface receptor, channels, and adhesion molecules. Parent Center Grant: Engineering research center for subsurface sensing and imaging systems
NSF/EEC-9986821
Section Head (Project PI) and Co-PI of Parent Center Grant

2003-2008 Single molecule analysis of sickle erythrocyte adhesion. Parent Center Grant: Comprehensive sickle cell center
NIH/U54 HL 70819
Section Head (Project PI) and Co-PI of Parent Center Grant

2008-2012 Molecular regulation of adhesive integrin interactions in erythroblastic islands
NIH/R01 HL 32854
PI

2008-2013 Education, training, and career development. Parent Center Grant: Harvard Clinical and Translational Science Center
NIH/UL1 RR 25758
Section head (Project PI)

2009-2016 Program in Clinical and Translational Research and Education. Harvard Medical School – Portugal Program in Translational Research and Information
Program Head and Co-PI of Parent Center Grant
Ministry of Science, Technology and Higher Education, Government of Portugal
Co-Director

2012-2017 Integrin-based mechanisms in terminal erythroid maturation
NIH/R01 HL 116327
PI

2014-2019 Training in Pharmacological Sciences
NIH/T32 GM 007306
PI

2014-2019 Center of Excellence in Systems Pharmacology
NIH/P50 GM 107618
Co-PI

2018-2020 Inhibition of malaria parasite invasion of erythrocytes by ibudilast and ibudilast-like small molecules
Harvard Medical School Dean's Initiative Award Program for Innovation Grants in the Basic and Social Sciences
PI

2020-2021 Massachusetts Consortium on Pathogen Readiness
Massachusetts Life Sciences Center
PI (multiple PI's)

**Current**

2002- Web curriculum in pharmacology
Harvard University Provost's Fund for Innovation in Instructional Technology
PI

2013-2022 Boston Biomedical Innovation Center (B-BIC)
NIH/U54 HL 119145
PI (multiple PI's)

2019-2029 Training in Pharmacological Sciences
NIH/T32 GM 132089
PI (multiple PI's)

2020-2027 Massachusetts Consortium on Pathogen Readiness
China Evergrande Group
PI (multiple PI's)

2020-2031 Management Plan for Blavatnik Therapeutics Challenge Awards
Blavatnik Family Foundation
PI

2021-2022 Massachusetts Consortium on Pathogen Readiness / SARS-CoV-2 Variants Program
Anonymous
PI (multiple PI's)

2022-2025 Massachusetts Consortium on Pathogen Readiness / Biospecimens Program
Anonymous Foundation
PI (multiple PI's)

2022-2027 New England Pathogen Genomics Center of Excellence
CDC/Massachusetts Department of Public Health/NU50CK000629-01-00
PI for National Lead Center for Education (multiple PI's)

2023-2027 Massachusetts Consortium on Pathogen Readiness / Research Infrastructure
Warren Alpert Foundation
PI

2023-2027 Massachusetts Consortium on Pathogen Readiness / MassCPR-Strengthening Biorepository-Linked Bioinformatics Capabilities
Anonymous Foundation
PI

2024-2027 HMS-SNUH Research and Education Collaboration
Seoul National University Hospital
PI

2025-2027 Lurie Marks Postdoctoral Fellowships
Nancy Lurie Marks Foundation
PI

2026-2028 Harvard Medical School – Heidelberg University Medical School Strategic Partnership
Heidelberg University / State of Baden-Württemberg
PI (multiple PI's)

# Report of Local Teaching and Training

## Teaching of Students in Courses

| | | |
|---|---|---|
| 1984-1989 | Introduction to Pharmacology (Traditional Pathway)<br>Medical Students | Harvard Medical School<br>28 hours/year as Section Leader; 6 hours/year as Lecturer |

| | | |
|---|---|---|
| 1986-1987 | Introduction to Clinical Medicine (Traditional Pathway) | Harvard Medical School |
| | Medical Students | 45 hours/year |
| 1989-2006 | Principles of Pharmacology | Harvard Medical School |
| | Medical and Dental Students | 20 hours/year as Lecturer and Tutor<br>Founder and Course Director |
| 1990-1994 | Conduct of Science (Division of Medical Sciences) | Harvard Medical School |
| | Graduate Students | 18 hours/year |
| 1993-2006 | Human Systems (New Pathway) | Harvard Medical School |
| | Medical and Dental Students | 24 hours/year |
| 1993-2021 | Summer Honors Undergraduate Research Program for Under-Represented Minority Students (SHURP) | Harvard Medical School |
| | Undergraduate Students | 16 hours/year as Preceptor |
| 1994-2013 | Molecular Approaches to Drug Action and Design (Division of Medical Sciences) | Harvard Medical School |
| | Graduate and Postgraduate Students | 10 hours/year |
| 1994-1998 | Critical Thinking and Research Proposal Writing (Division of Medical Sciences) | Harvard Medical School |
| | Graduate Students | 20 hours/year |
| 1996- | Molecular and Cellular Toxicology | Harvard School of Public Health |
| | Graduate Students | 4 hours/year |
| 2002- | Principles of Pharmacology for the Investigator/Translational Pharmacology (Scholars in Clinical Science Program, Master of Medical Sciences in Clinical Investigation Program, Leder Human Biology and Translational Medicine Program, Therapeutics Graduate Program, Program in Medical Education) | Harvard Medical School |
| | Graduate Students, Master's Students, and Medical Students | 10 hours/year as Lecturer<br>Co-Founder and Co-Course Director |
| 2004-2005 | Mentored Clinical Casebook Project (New Pathway) | Harvard Medical School |
| | Medical Students | 12 hours/year |
| 2007-2012 | Cellular Metabolism and Human Disease (Division of Medical Sciences and Faculty of Arts and Sciences) | Harvard Medical School |
| | Graduate and Undergraduate Students | 8 hours/year |
| 2008-2011 | Principles of Human Disease: Physiology and Pharmacology (Division of Medical Sciences and Faculty of Arts and Sciences) | Harvard Medical School |
| | Graduate and Undergraduate Students | 12 hours/year as Lecturer and Tutor<br>Course Director |

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

| | | |
|---|---|---|
| 1985-2018 | Hematology-Oncology Consult Service and inpatient Unit Attending | Brigham and Women's Hospital, Boston, MA |
| | Medical Students, Residents, Fellows | 1-2 months/year |
| 1999 | Ambulatory Care Subspecialty Case Discussions | Brigham and Women's Hospital |
| | Residents | 2 hours |

## Clinical Supervisory and Training Responsibilities

| | |
|---|---|
| 1979-1983 | Supervision of medical students on Medicine rotation |
| 1984-2019 | Supervision of medical students, interns, residents, and hematology-oncology fellows on Hematology-Oncology Clinic, Consult Service, and Inpatient Unit rotations |

## Laboratory and Other Research Supervisory and Training Responsibilities

| | | |
|---|---|---|
| 1978-2021 | Supervision of 1-3 research assistants in laboratory | per year |
| 1982-2021 | Supervision of 1-3 medical and/or graduate students in laboratory | per year |
| 1988-2021 | Supervision of 2-5 postdoctoral fellows in laboratory | per year |

## Formally Supervised Trainees and Faculty

**Postdoctoral Trainees and Mentored Visiting Professors**

| | |
|---|---|
| 1988-1992 | James D. Corbett, Ph.D., Research Associate, Department of Laboratory Medicine, University of California, San Francisco, CA.<br>6 publications including 2 in J Clin Invest, 1 in Blood, 3 in Biophys J. |
| 1988-1992, 1993-2000 | Hemant S. Thatte, Ph.D., Associate Professor, Department of Surgery, Harvard Medical School and West Roxbury Veterans Administration Medical Center, Boston, MA<br>16 publications including 3 in Proc Natl Acad Sci USA, 3 in FASEB J, 1 U.S. Patent |
| 1989-1990 | Laura M. Ferguson, Ph.D., Chief Scientific Officer, Delphine Diagnostics, Bordentown, NJ.<br>3 publications including 2 in J Cell Biol, 1 in J Biol Chem. |

| | |
|---|---|
| 1990-2000 | Michael R. Cho, Ph.D., Professor, Department of Biomedical Engineering, University of Illinois, Chicago, IL.<br>17 publications including multiple publications in Blood, FASEB J, J Clin Invest, J Biol Chem, Biophys J, and Proc Natl Acad Sci USA. |
| 1990-1991 | Margaret R. Kasschau, Ph.D., Chair emeritus, Department of Biological Sciences, Associate Provost emeritus, University of Sciences in Philadelphia, Philadelphia, PA.<br>2 publications including 1 in Blood. |
| 1990-1994 | Si-qiong J. Liu, M.D., Ph.D., Professor, Department of Cell Biology and Anatomy, Louisiana State University School of Medicine, New Orleans, LA.<br>2 publications in Biophys J. |
| 1990-1992 | Gilda A. Barabino, Ph.D., President, Professor of Biomedical and Chemical Engineering, Franklin W. Olin College of Engineering, Needham, MA.<br>3 publications including 1 in Blood and 1 in Am J Hematol. |
| 1991-1996 | Katalin Polgar, Ph.D., Chief Scientific Officer, CheckPoint Health, New York, NY.<br>2 publications. |
| 1993-1994 | Kenneth D. Brady, Ph.D., Consultant, Software Engineering, Staten Island, NY.<br>3 publications including 1 in Biochem J, 1 in Biophys J. |
| 1995-1997 | De-Min Zhu, Ph.D., President and CEO, Cureport, Inc., Boston, MA.<br>3 publications including 1 each in J Biol Chem, ACS Chem Biol, and Biophys J. |
| 1997-2000 | Prakash Prabhakar, Ph.D., Vice President, Clinical Operations & Translational Early Clinical Development, Obsidian Therapeutics, Cambridge, MA.<br>3 publications including 2 in Proc Natl Acad Sci USA, 1 in J Biol Chem. |
| 1998-1999 | A. Alev Gerçeker, Ph.D., Assistant Professor, Department of Pharmaceutical Microbiology, Faculty of Pharmacy, Istanbul University, Istanbul, Turkey.<br>2 publications including 1 in Proc Natl Acad Sci USA, 1 in Infect Immun. |
| 1998-2000 | Torsten H. Schroeder, M.D., Fellow, Department of Anesthesiology and Critical Care Medicine, Tübingen University Hospital, Tübingen, Germany.<br>1 publication in Proc Natl Acad Sci USA |
| 1998-2021 | Rossen Mirchev, Ph.D., Research Associate in Biological Chemistry and Molecular Pharmacology, Harvard Medical School, Boston, MA.<br>8 publications including 1 each in Immunity, Proc Natl Acad Sci USA, J Clin Invest, Blood, Br J Haematol, J Cell Sci, Blood Cells Mol Dis, J Cell Biol. |
| 1999-2003 | Martin M. Lee, Ph.D., Research Fellow in Medicine, Harvard Medical School, Boston, MA.<br>2 publications including 1 in Proc Natl Acad Sci USA. |
| 2001-2012 | Alison J. Lin, Ph.D., Lead, Training, Workforce Development and Community Engagement, Office of Data Science Strategy, National Institutes of Health, Rockville, MD.<br>11 publications including 1 in Chemistry & Biology, 1 in Proc Natl Acad Sci USA, 4 in J Biol Chem, 1 in Biochemistry, 1 in ACS Chem Biol, 1 in PLoS Pathog. |
| 2002-2006 | Aslihan Turhan, Ph.D., Senior Manager, Thermo Fisher Scientific, Waltham, MA.<br>1 publication in Am J Hematol. |

2002-2006 Christopher W. Cairo, Ph.D., Professor and Associate Chair, Faculty of Science – Chemistry, University of Alberta, Edmonton, Alberta, Canada.
6 publications including 1 in Immunity, 2 in Biophys J, 1 in J Biol Chem, 1 in ACS Chem Biol.

2008-2009 Marina Marinkovic, Ph.D., Senior Principal Scientific Project Manager, Novartis Institutes for BioMedical Research, Cambridge, MA.

2009-2013 Francis Alenghat, M.D., Ph.D., Associate Professor of Medicine, University of Chicago Medical School, Chicago, IL.
2 publications including 1 in J Cell Sci.

2009-2013 Marcie R. Williams, Ph.D., Assistant Professor of Engineering, Lee University, Cleveland, TN.

2010-2012 Benjamin Jin, Ph.D., Scientist, Proteomics Expert Group, National Institute on Aging, National Institutes of Health, Bethesda, MD.
1 publication in Proc Natl Acad Sci USA.

2014-2017 Nidhi Gera, Ph.D., Program Officer, National Heart, Lung, and Blood Institute, National Institutes of Health, Bethesda, MD.

2021-2024 Nuru G. Stracey, Ph.D., Scientific Training Manager, National Centre for Atmospheric Science, University of York, York, England, UK.

2024- Irene Wong, Ph.D., Curriculum Fellow, Therapeutics Graduate Program, Harvard University.

**Graduate Student Trainees**

1982-1988 Alan H. Stolpen, M.D., Ph.D., Associate Professor Emeritus, Department of Radiology, University of Iowa College of Medicine, Iowa City, IA.
3 publications including 1 each in J Cell Biol, Proc Natl Acad Sci USA.

1988-1994 Kimberly A. Wagner, Ph.D., Managing Partner, TBGD Partners LLC, Marlboro, NY.
3 publications including 1 in Biophys J, 2 in Biochem J.

1989-1992 Kimberly A. Birch, Ph.D., Regulatory Consultant, Eli Lilly and Company, Indianapolis, IN.
1 publication in J Cell Physiol.

1993 Kerry M. Wong, M.D., Dermatologist, Needham Heights, MA.

1995-1997 Alexandru C. Bageac, M.D., Radiology Associates of North Texas, Fort Worth, TX.
1 U.S. Patent.

1997-1998 Mary T. Silvia, M.D., Associate Professor of Neurology, Wake Forest University School of Medicine, Winston-Salem, NC.
1 publication in FASEB J.

1997-2007 Milan Bajmoczi, M.D., Ph.D., Vascular Surgeon, Porter Heart & Vascular Center, Fairbanks, AK.
4 publications including 1 each in Science, J Immunol, Am J Physiol Cell Physiol.

2000-2001 Joshua M. Galanter, M.D., Senior Medical Director, Genentech, South San Francisco, CA.
Editor and author, *Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy*, 1st edition. Author, *Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy*, 2nd edition.

2000-2001 Tanya Korobeinikova, Ph.D., Senior Vice President, Ceded Reinsurance, MS Transverse, Insurance Group, Warren, NJ.
1 publication in Proc ASMDA-10.

2001-2005 Pasit Pakawatpanurut, Ph.D., (formerly Pallop Karnchanaphanurach), Associate Professor, Department of Chemistry, Deputy Dean for Research and Innovation, Faculty of Science, Mahidol University, Bangkok, Thailand.
1 publication in J Clin Invest.

2002-2004 Alexander Lam, M.D., Emergency Medicine Physician, Kaiser Permanente Santa Rosa Medical Center, Santa Rosa, CA.
1 publication in Br J Haematol.

2005-2010 Quentin J. Baca, M.D., Ph.D., Clinical Assistant Professor, Department of Anesthesiology, Perioperative and Pain Medicine, Stanford University School of Medicine, Palo Alto, CA.
4 publications including 1 each in Nat Rev Drug Discov, J Biol Chem, J Cell Sci, J Cell Biol.

**Research Assistants and Undergraduate Students**

1982-1987 Carl D. Brown, Ph.D., Senior Principal Engineer, Bruker, Seattle, WA.
6 publications including 2 in J Cell Biol, 1 in Proc Natl Acad Sci USA.

1985-1986 Adam Abroms, M.D., Ophthalmologist and Eye Surgeon, ADV Vision, Paso Robles, CA.

1986-1987 John Jin Han, M.D., Interventional Pain Physician, Geisinger, Danville, PA.

1987-2017 Patrick W. Yacono, Researcher, Silk Therapeutics, Medford, MA.
13 publications including 2 in Proc Natl Acad Sci USA, 2 in J Cell Biol, 1 in J Clin Invest.

1997 Stephanie K. Sharps, M.D., Clinical Associate Professor of Medicine and Assistant Dean of Student Affairs, Regional Medical Campus, George Washington University School of Medicine and Health Sciences, Baltimore, MD.

1997-1998 M. Zelime Ward, M.D., Child Neurologist, Fort Worth, TX.

1998-1999 Joan Marler, Ph.D., Associate Professor, Department of Physics and Astronomy, Clemson University, Clemson, SC.
1 publication in Frontiers Biosci.

1998-1999 Vivian Gonzalez Mitchell, M.D., Instructor in Medicine, Harvard Medical School and Brigham and Women's Hospital, Boston, MA.

1999 Timothy Harris, M.D., Ph.D., Associate Professor of Radiation Oncology, Virginia Commonwealth University School of Medicine, Richmond, VA.

2000-2001 Charles M. Jobin, M.D., Louis U. Bigliani, M.D. Associate Professor of Orthopedic Surgery, Columbia University Medical Center, New York, NY.
1 publication in J Biol Chem.

2001 Divya Errabelli, M.P.H., Vice President, Virgin Pulse, Boston, MA.

2001 Shiv Sudhakar, M.D., Assistant Professor of Internal Medicine, California Northstate University College of Medicine, Elk Grove, CA.

2002 Yolanda Tseng, M.D., M.Phil., Associate Professor of Radiation Oncology and TBI Lead, University of Washington, Seattle, WA

2003 Jordan Amadio, M.D., M.B.A., Chief of Spinal Neurosurgery, Olympia Neurological Institute, Director of Neurosurgery, Neuralink, Austin, TX.

2004 Theodore Nyame, M.D., Plastic Surgeon, Charlotte Plastic Surgery, Charlotte, NC.

| | |
|---|---|
| 2007 | Andre K. Johnson, M.D., Ph.D., Pulmonary/Critical Care Medicine, Banner-University Medical Center South, Riverside, CA. |
| 2009 | Jennifer E. Yeh, M.D., Ph.D., Clinical Assistant Professor of Dermatology, Stanford University School of Medicine, Redwood City, CA. |
| 2010 | Maria Inês Pereira, M.D., Faculty of Medicine, University of Lisbon, Lisbon, Portugal. |
| 2011-2013 | Megumi Sasaki, B.S.N., R.N., Registered Nurse, Oakland, CA. |
| 2012 | João Luís Vaz Silva, M.D., Ph.D., Resident in Pathology, Portuguese Institute of Oncology of Porto FG (IPO-Porto), Porto, Portugal. |
| 2015-2018 | Adheshwari Ramesh, B.S., M.S., Senior Associate Scientist, FogPharma, Cambridge, MA. |
| 2018-2020 | Catherine Phelan, B.S., Research Assistant, Department of Biological Chemistry and Molecular Pharmacology, Harvard Medical School, Boston, MA. |

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

| | | |
|---|---|---|
| 1986-1998 | Intensive Review of Hematology-Oncology<br>Hematology-Oncology Division | 10 hours/every other year<br>Boston, MA |
| 1990-1991 | New Pathways in General Medical Education<br>Harvard Medical School | 4 hours/year<br>Boston, MA |
| 1991 | Clinical Pharmacology<br>Brigham-Beth Israel Postgraduate Medical Series | 6 hours<br>Boston, MA |
| 1997-2011 | Harvard Macy Program for Physician Educators<br>Harvard Medical School | 2 hours/year<br>Boston, MA |
| 2000-2008 | Harvard Medical International Program in Advanced Medical Education and Harvard Medical International Leadership Program<br>Harvard Medical School | 25 hours/year<br>Boston, MA |
| 2010 | Medical Education Workshop<br>Harvard Medical School – Portugal Program in Translational Research and Information | 20 hours<br>Coimbra, Portugal |
| 2011 | Medical Education Workshop<br>Harvard Medical School – Portugal Program in Translational Research and Information | 20 hours<br>Curia, Portugal |
| 2014-2024 | Hematology Board Review Course<br>Hematology Division | 10 hours/every other year<br>Boston, MA |

**Local Invited Presentations**

| | |
|---|---|
| 1983-2021 | Introduction to Laboratory Research in Biophysics<br>Harvard University |
| 1988 | Transductive Coupling in Living Cells<br>Massachusetts Institute of Technology |
| 1999- | Principles of Toxicology<br>Harvard School of Public Health |

1999-2021 Biotechnology and Engineering
Massachusetts Institute of Technology

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

## Invited Presentations and Courses

**Regional**

| | |
|---|---|
| 1980 | Department of Biomedical Research, St. Elizabeth's Hospital, Boston, MA |
| 1982 | Boston Blood Club |
| 1985 | Boston Blood Club |
| 1989 | Committee on Cell and Developmental Biology, Harvard University |
| 1989 | Center for Blood Research, Boston, MA |
| 1990 | Pulmonary Division, New England Deaconess Hospital, Boston, MA |
| 1990 | Division of Pediatric Oncology, Dana-Farber Cancer Institute, Boston, MA |
| 1991 | Department of Biology, Harvard University |
| 1992 | Department of Pharmacology, Boston University |
| 1994 | Laboratory for Cell and Molecular Biology, Deaconess Hospital, Boston, MA |
| 1995 | Department of Molecular and Cellular Biology, Harvard University |
| 1995 | Symposium on EMF Bioeffects<br>Harvard School of Public Health |
| 1996 | Symposium to Honor Jiri Palek<br>St. Elizabeth's Medical Center, Boston, MA |
| 1997 | Career Panel, MD/PhD Program Annual Retreat<br>Harvard Medical School |
| 1998 | Engineering Research Center, Northeastern University, Boston, MA |
| 1999 | Department of Biology, Northeastern University |
| 1999 | Division of Bioengineering and Environmental Health, MIT, Cambridge |

**National**

| | |
|---|---|
| 1980 | Red Cell Club Spring Meeting |
| 1982 | Biophysical Society Annual Meeting |
| 1983 | Gordon Conference on Red Cells |
| 1987 | Gordon Conference on Red Cells |
| 1989 | Department of Medicinal Chemistry, School of Pharmacy, University of California, San Francisco |
| 1990 | American Society of Hematology Annual Meeting |
| 1991 | Departments of Surgery and Organismal Biology, University of Chicago |
| 1991 | Teaching Institute, American Society of Pharmacology and Experimental Therapeutics Annual Meeting |
| 1992 | Department of Biophysics, University of Rochester, Rochester, New York |
| 1993 | Biophysical Society Annual Meeting |
| 1993 | Red Cell Club Spring Meeting |
| 1993 | Gordon Conference on Biorheology of Cell Division |
| 1993 | Teaching Clinic, American College of Clinical Pharmacology Annual Meeting |
| 1995 | Gordon Conference on Red Cells |
| 1996 | American Society of Hematology Annual Meeting |
| 1997 | Gordon Conference on Red Cells |
| 2001 | Workshop on Functional Integration of Cells and Materials<br>Defense Sciences Research Council, Defense Advanced Research Projects Agency |

2002 Visiting Professor
Cleveland Clinic Lerner College of Medicine at Case Western Reserve University, Cleveland, Ohio

2006 Working Group on Biofield Energy Medicine
National Center for Complementary and Alternative Medicine, National Institutes of Health

2017 Teaching Institute, American Society of Pharmacology and Experimental Therapeutics Annual Meeting

2019 Balancing Content, Critical Thinking, and Creativity in Graduate Education; Symposium at American Society of Pharmacology and Experimental Therapeutics Annual Meeting

**International**

1981 International Workshop on Biological Applications of Photobleaching Techniques
Weizmann Institute of Science, Rehovot, Israel and Sackler School of Medicine, Tel Aviv, Israel

1996 Visiting Professor
National University of Cuyo, Mendoza, Argentina

1999 Visiting Professor
China Medical University, Shenyang, China

2000 Visiting Professor
Carl Gustav Carus Medical Faculty of the Technical University of Dresden, Dresden, Germany

2002 Visiting Professor
Xinjiang Medical University, Urumqi, China

2005 Visiting Professor
Catholic University of Portugal, Lisbon, Portugal

2007 Gordon Conference on Red Cells
Aussois, France

2008 Visiting Professor
University of Lisbon, Lisbon, Portugal

2010 Invited Lecturer
PMPH-Beijing International Medical Deans Forum, Beijing, China

2011 Workshop Lecturer and Co-Director, Leadership in Healthcare
Dubai-Harvard Foundation for Medical Research, Dubai, UAE

2022 Keynote Address, Symposium on Medical Education, University of Medicine and Pharmacy at Ho Chi Minh City, Ho Chi Minh City, Vietnam

2022 Keynote Address, Vietnam National Medical Education Conference,
Ho Chi Minh City, Vietnam

2024 Jeffrey Cheah Distinguished Speakers Series, Sunway University, Kuala Lumpur, Malaysia

2024 Keynote Address, National Strategic Technology Research Institute, Seoul National University Hospital, Seoul, Republic of Korea

2025 Keynote Address, Annual Meeting, Praboromarajchanok Institute, Bangkok, Thailand

# Report of Clinical Activities and Innovations

## Current Licensure and Certification

| | |
|---|---|
| 1981 | Massachusetts License |
| 1983 | Diplomate, American Board of Internal Medicine |
| 1986 | Diplomate, Subspecialty of Hematology, American Board of Internal Medicine |

## Practice Activities

| | | | |
|---|---|---|---|
| 1985-2019 | Consult Service and Inpatient Unit Attending | Hematology-Oncology, Brigham and Women's Hospital | 1-2 months per year; 5-20 inpatients and 1-5 new consults per day |
| 1985-2021 | Clinic Attending Physician | Hematology-Oncology, Brigham and Women's Hospital/Dana-Farber Cancer Center | 2-8 patients per ½-day session per week |

# Report of Technological and Other Scientific Innovations

| | |
|---|---|
| 07/30/1996 | Hardy RI, Golan DE, Biggers JD, inventors; President and Fellows of Harvard College and Brigham and Women's Hospital, Inc., assignees. A process for assessing oocyte and embryo quality. US patent 5,541,081. Issued 7/30/96. |
| 09/23/1997 | Golan DE, Thatte HS, Bageac AC, inventors; President and Fellows of Harvard College, assignee. Methods of detecting and treating vaso-occlusive crisis in sickle cell disease. US patent 5,669,396. Issued 9/23/97. |

# Report of Scholarship

## Peer reviewed publications in print or other media

- **Research investigations**


1. Wilson T, Golan DE, Harris MS, Baumstark AL. Thermolysis of tetramethoxy- and p-dioxenedioxetanes. Kinetic parameters, chemiluminescence, and yields of excited products. J Am Chem Soc. 1976; 98:1086-1091.

2. Golan DE, Veatch W. Lateral mobility of band 3 in the human erythrocyte membrane studied by fluorescence photobleaching recovery: Evidence for control by cytoskeletal interactions. Proc Natl Acad Sci USA. 1980; 77:2537-2541.

3. Alecio MR, Golan DE, Veatch WR, Rando RR. Use of a fluorescent cholesterol derivative to measure lateral mobility of cholesterol in membranes. Proc Natl Acad Sci USA. 1982; 79:5171-5174.

4. Golan DE, Alecio MR, Veatch WR, Rando RR. Lateral mobility of phospholipid and cholesterol in the human erythrocyte membrane: Effect of protein-lipid interactions. Biochemistry. 1984; 23:332-339.

5. Golan DE, Brown CS, Cianci CML, Furlong ST, Caulfield JP. Schistosomula of *Schistosoma mansoni* use lysophosphatidylcholine to lyse adherent human red blood cells and immobilize red cell membrane components. J Cell Biol. 1986; 103:819-828.

6. Bierer BE, Herrmann SH, Brown CS, Burakoff SJ, Golan DE. Lateral mobility of class I histocompatibility antigens in B lymphoblastoid cell membranes: Modulation by cross-linking and effect of cell density. J Cell Biol. 1987; 105:1147-1152.

7. Stolpen AH, Pober JS, Brown CS, Golan DE. Class I major histocompatibility complex proteins diffuse isotropically on immune interferon-activated endothelial cells despite anisotropic cell shape and cytoskeletal organization: Application of fluorescence photobleaching recovery with an elliptical beam. Proc Natl Acad Sci USA. 1988; 85:1844-1848.

8. Golan DE, Furlong ST, Brown CS, Caulfield JP. Monopalmitoyl phosphatidylcholine incorporation into human erythrocyte ghost membranes causes protein and lipid immobilization and cholesterol depletion. Biochemistry. 1988; 27:2661-2667.

9. Griffith IJ, Ghogawala Z, Nabavi N, Golan DE, Myer A, McKean DJ, Glimcher LH. Cytoplasmic domain affects membrane expression and function of an Ia molecule. Proc Natl Acad Sci USA. 1988; 85:4847-4851.

10. Stolpen AH, Golan DE, Pober JS. Tumor necrosis factor and immune interferon act in concert to slow the lateral diffusion of proteins and lipids in human endothelial cell membranes. J Cell Biol. 1988; 107:781-789.

11. Stolpen AH, Brown CS, Golan DE. Characterization of microscopic laser beams by two-dimensional scanning of fluorescence emission. Appl Optics. 1988; 27:4414-4422.

12. Bierer BE, Herrmann SH, Brown CS, Golan DE, Burakoff SJ. A monoclonal antibody to LFA-3, the CD-2 ligand, specifically immobilizes major histocompatibility complex proteins. Eur J Immunol. 1989; 19:661-665.

13. Greenberg SM, Chandrasekhar C, Golan DE, Handin RI. Transforming growth factor beta inhibits endomitosis in the Dami human megakaryocytic cell line. Blood. 1990; 76:533-537.

14. Liu SC, Sen Z, Palek J, Golan DE, Amato D, Hassan K, Nurse GT, Babona D, Coetzer T, Jarolim P, Zaik M, Borwein S. Molecular defect of the band 3 protein in Southeast Asian ovalocytosis. N Engl J Med. 1990; 323:1530-1538.

15. Caulfield JP, Chiang CP, Yacono PW, Smith LA, Golan DE. Low density lipoproteins bound to *Schistosoma mansoni* do not alter the rapid lateral diffusion or shedding of lipids in the outer surface membrane. J Cell Sci. 1991; 99:167-173.

16. Antin JH, Bierer BE, Smith BR, Ferrara J, Guinan EC, Sieff C, Golan DE, Macklis RM, Tarbell NJ, Lynch E, Reichert TA, Blythman H, Bouloux C, Rappeport JM, Burakoff SJ, Weinstein HJ. Selective depletion of bone marrow T lymphocytes with anti-CD5 monoclonal antibodies: Effective prophylaxis for graft-versus-host disease in patients with hematologic malignancies. Blood. 1991; 78:2139-2149.

17. Chan PY, Lawrence MB, Dustin ML, Ferguson LM, Golan DE, Springer TA. Influence of receptor lateral mobility on adhesion strengthening between membranes containing LFA-3 and CD2. J Cell Biol. 1991; 115:245-255.

18. Sakamoto H, Michaelson J, Jones WK, Bhan AK, Abhyankar S, Silverstein M, Golan DE, Burakoff SJ, Ferrara JLM. Lymphocytes with a novel $CD4^{+}CD8^{-}CD3^{-}$ phenotype are effectors of experimental cutaneous graft versus host disease. Proc Natl Acad Sci USA. 1991; 88:10890-10894.

19. Goldman SJ, Uniyal S, Ferguson LM, Golan DE, Burakoff SJ, Kiener PA. Differential activation of phosphotyrosine phosphatase activity in a murine T cell hybridoma by monoclonal antibodies to CD45. J Biol Chem. 1992; 267:6197-6204.

20. Corbett JD, Golan DE. Band 3 and glycophorin are progressively aggregated in density fractionated sickle and normal red blood cells: Evidence from rotational and lateral mobility studies. J Clin Invest. 1993; 91:208-217.

21. Lee RC, Gowrishankar TR, Basch RM, Patel PK, Golan DE. Cell shape dependent rectification of surface receptor transport in a sinusoidal electric field. Biophys J. 1993; 64:44-57.

22. Thatte HS, Kasschau MR, Furlong ST, Byam-Smith MP, Williams DF, Golan DE. *Schistosoma mansoni*: membranes from adult worms reversibly perturb shape, volume, and membrane organization of intact human red blood cells. Exp Parasitol. 1993; 76:13-22.

23. Wagner KA, Yacono PW, Golan DE, Tashjian AH Jr. Mechanism of spontaneous intracellular calcium fluctuations in single $GH_4C_1$ rat pituitary cells. Biochem J. 1993; 292:175-182.

24. Goncalves E, Yamada K, Thatte HS, Backer JM, Golan DE, Kahn CR, Shoelson SE. Optimizing transmembrane domain helicity accelerates insulin receptor internalization and lateral mobility. Proc Natl Acad Sci USA. 1993; 90:5762-5766.

25. LaSalle JM, Toneguzzo F, Saadeh M, Golan DE, Taber R, Hafler DA. T cell presentation of antigen requires cell-to-cell contact for proliferation and anergy induction: Differential MHC requirements for superantigen and autoantigen. J Immunol. 1993; 151:649-657.

26. Su MWC, Walden PR, Golan DE, Eisen HN. Cognate peptide-induced destruction of $CD8^+$ cytotoxic T lymphocytes is due to fratricide. J Immunol. 1993; 151:658-667. [Published erratum in: J Immunol. 1995; 154:4223]

27. Corbett JD, Cho MR, Golan DE. Deoxygenation affects fluorescence photobleaching recovery measurements of red cell membrane protein lateral mobility. Biophys J. 1994; 66:25-30.

28. Jarolim P, Rubin HL, Liu SC, Cho MR, Brabec V, Derick LH, Yi S, Saad STO, Alper S, Brugnara C, Golan DE, Palek J. Duplication of 10 nucleotides in the erythroid band 3 (AE1) gene in a kindred with hereditary spherocytosis and band 3 protein deficiency (Band $3^{PRAGUE}$). J Clin Invest. 1994; 93:121-130.

29. Polgar K, Yacono PW, Hill JA, Anderson DJ, Lee CYG, Golan DE. Use of the translational mobility of a plasma membrane protein to assess fertilization of mouse oocytes and viability of mouse zygotes and two-cell embryos. Biol Reprod. 1994; 50:474-480.

30. Brady KD, Wagner KA, Tashjian AH Jr, Golan DE. Relationships between amplitudes and kinetics of rapid cytosolic free calcium fluctuations in $GH_4C_1$ rat pituitary cells: Roles for diffusion and calcium-induced calcium release. Biophys J. 1994; 66:1697-1705.

31. Thatte HS, Bridges KR, Golan DE. Microtubule inhibitors differentially affect translational movement, cell surface expression and endocytosis of transferrin receptors in K562 cells. J Cell Physiol. 1994; 160:345-357.

32. Birch KA, Ewenstein BM, Golan DE, Pober JS. Prolonged peak elevations in cytoplasmic free calcium ions, derived from intracellular stores, correlate with the extent of thrombin-stimulated exocytosis in single human umbilical vein endothelial cells. J Cell Physiol. 1994; 160:545-554.

33. Cho MR, Thatte HS, Lee RC, Golan DE. Induced redistribution of cell surface receptors by alternating current electric fields. FASEB J. 1994; 8:771-776.

34. Corbett JD, Agre P, Palek J, Golan DE. Differential control of band 3 lateral and rotational mobility in intact red cells. J Clin Invest. 1994; 94:683-688.

35. Brady KD, Wagner KA, Tashjian AH Jr, Golan DE. Alterations in the frequency and shape of $Ca^{2+}$ fluctuations in $GH_4C_1$ cells induced by thyrotropin-releasing hormone and Bay K 8644. Biochem J. 1995; 306:399-406.

36. Liu SJ, Hahn WC, Bierer BE, Golan DE. Intracellular mediators regulate CD2 lateral diffusion and cytoplasmic $Ca^{2+}$ mobilization upon CD2-mediated T cell activation. Biophys J. 1995; 68:459-470.

37. Prausnitz MR, Corbett JD, Gimm JA, Golan DE, Langer R, Weaver JC. Millisecond measurement of transport during and after an electroporation pulse. Biophys J. 1995; 68:1864-1870.

38. Liu SC, Palek J, Yi SJ, Nichols PE, Derick LH, Chiou SS, Amato D, Corbett JD, Cho MR, Golan DE. Molecular basis of altered red blood cell membrane properties in Southeast Asian ovalocytosis: Role of the mutant band 3 protein in band 3 oligomerization and retention by the membrane skeleton. Blood. 1995; 86:349-358.

39. Morita CT, Beckman EM, Bukowski JF, Tanaka Y, Band H, Bloom BR, Golan DE, Brenner MB. Direct presentation of nonpeptide prenyl pyrophosphate antigens to human γδ T cells. Immunity. 1995; 3:495-507.

40. Datta YH, Romano M, Jacobson BC, Golan DE, Serhan CN, Ewenstein BM. Peptido-leukotrienes are potent agonists of von Willebrand factor secretion and P-selectin surface expression in human umbilical vein endothelial cells. Circulation. 1995; 92:3304-3311.

41. Polgar K, Yacono PW, Golan DE, Hill JA. Immune interferon gamma inhibits translational mobility of a plasma membrane protein in preimplantation stage mouse embryos: A T-helper-1 mechanism for immunologic reproductive failure. Am J Obstet Gynecol. 1996; 174:282-287.

42. Kasschau MR, Barabino GA, Bridges KR, Golan DE. Adhesion of sickle neutrophils and erythrocytes to fibronectin. Blood. 1996; 87:771-780.

43. Thatte HS, Bridges KR, Golan DE. ATP depletion induces translational immobilization of cell surface transferrin receptors in K562 cells. J Cell Physiol. 1996; 166:446-452.

44. Liu SC, Yi SJ, Mehta JR, Nichols PE, Ballas SK, Yacono PW, Golan DE, Palek J. Red cell membrane remodeling in sickle cell anemia: Sequestration of membrane lipids and proteins in Heinz bodies. J Clin Invest. 1996; 97:29-36.

45. Dustin ML, Ferguson LM, Chan PY, Springer TA, Golan DE. Visualization of CD2 interaction with LFA-3 and determination of the two-dimensional dissociation constant for adhesion receptors in a contact area. J Cell Biol. 1996; 132:465-474.

46. Golan DE, Corbett JD, Korsgren C, Thatte HS, Hayette S, Yawata Y, Cohen CM. Control of band 3 lateral and rotational mobility by band 4.2 in intact erythrocytes: Release of band 3 oligomers from low-affinity binding sites. Biophys J. 1996; 70:1534-1542.

47. Cho MR, Thatte HS, Lee RC, Golan DE. Reorganization of microfilament structure induced by ac electric fields. FASEB J. 1996; 10:1552-1558.

48. Johnson ME, Berk DA, Blankschtein D, Golan DE, Jain RK, Langer R. Lateral diffusion of small compounds in human stratum corneum and model lipid bilayer systems. Biophys J. 1996; 71:2656-2668.

49. Bridges KR, Barabino GD, Brugnara C, Cho MR, Christoph GW, Dover G, Ewenstein BM, Golan DE, Guttmann CRG, Hofrichter J, Mulkern RV, Zhang B, Eaton WA. A multiparameter analysis of sickle erythrocytes in patients undergoing hydroxyurea therapy. Blood. 1996; 88:4701-4710.

50. Yi SJ, Liu SC, Derick LH, Murray J, Barker JE, Cho MR, Palek J, Golan DE. Red cell membranes of ankyrin-deficient *nb/nb* mice lack band 3 tetramers but contain normal membrane skeletons. Biochemistry. 1997; 36:9596-9604.

51. Dustin ML, Golan DE, Zhu DM, Miller JM, Meier W, Davies EA, van der Merwe PA. Low affinity interaction of human or rat T cell adhesion molecule CD2 with its ligand aligns adhering membranes to achieve high physiological affinity. J Biol Chem. 1997; 272:30889-30898.

52. Holländer GA, Zuklys S, Morel C, Mizoguchi E, Mobisson K, Simpson S, Terhorst C, Wishart W, Golan DE, Bhan AK, Burakoff SJ. Monoallelic expression of the interleukin-2 locus. Science. 1998; 279:2118-2121.

53. Hanspal M, Golan DE, Smockova Y, Yi SJ, Cho MR, Liu SC, Palek J. Temporal synthesis of band 3 oligomers during terminal maturation of mouse erythroblasts: Dimers and tetramers exist in the membrane as preformed stable species. Blood. 1998; 92:329-338.

54. Querfurth HW, Haughey NJ, Greenway SC, Yacono PW, Golan DE, Geiger JD. Expression of ryanodine receptors in HEK293 and other human epithelioid cell lines. Biochem J. 1998; 334:79-86.

55. Prabhakar P, Thatte HS, Goetz RM, Cho MR, Golan DE, Michel T. Receptor-regulated translocation of endothelial nitric oxide synthase. J Biol Chem. 1998; 273:27383-27388.

56. Cho MR, Eber SW, Liu SC, Lux SE, Golan DE. Regulation of band 3 rotational mobility by ankyrin in intact human red cells. Biochemistry. 1998; 37:17828-17835.

57. Shen H, Cheng T, Preffer FI, Dombkowski D, Tomasson MH, Golan DE, Yang O, Hofmann W, Sodroski JG, Luster AD, Scadden DT. Intrinsic human immunodeficiency virus type 1 resistance of hematopoietic stem cells despite coreceptor expression. J Virol. 1999; 73:728-737.

58. Cho MR, Knowles DW, Smith BL, Moulds JJ, Agre P, Mohandas N, Golan DE. Membrane dynamics of the water transport protein aquaporin-1 in intact human red cells. Biophys J. 1999; 76:1136-1144.

59. Liu SJ, Golan DE. T cell stimulation through the T cell receptor/CD3 complex regulates CD2 lateral mobility by a calcium/calmodulin dependent mechanism. Biophys J. 1999; 76:1679-1692.

60. Goetz RM, Thatte HS, Prabhakar P, Cho MR, Michel T, Golan DE. Estrogen induces the calcium-dependent translocation of endothelial nitric oxide synthase. Proc Natl Acad Sci USA. 1999; 96:2788-2793.

61. Cho MR, Thatte HS, Silvia MT, Golan DE. Transmembrane calcium influx induced by ac electric fields. FASEB J. 1999; 13:677-683.

62. Leiter LM, Thatte HS, Okafor C, Marks PW, Golan DE, Bridges KR. Chloramphenicol-induced mitochondrial dysfunction is associated with decreased transferrin receptor expression and ferritin synthesis in K562 cells and is unrelated to IRE-IRP interactions. J Cell Physiol. 1999; 180:334-344.

63. Peters LL, Jindel HK, Gwynn B, Korsgren C, John KM, Lux SE, Mohandas N, Cohen CM, Cho MR, Golan DE, Brugnara C. Mild spherocytosis and altered red cell ion transport in protein 4.2-null mice. J Clin Invest. 1999; 103:1527-1537.

64. Igarashi J, Thatte HS, Prabhakar P, Golan DE, Michel T. Calcium-independent activation of endothelial nitric oxide synthase by ceramide. Proc Natl Acad Sci USA. 1999; 96:12583-12588.

65. Gerçeker AA, Zaidi T, Marks P, Golan DE, Pier GB. Impact of heterogeneity within cultured cells on bacterial invasion: Analysis of *Pseudomonas aeruginosa* and *Salmonella typhi* entry into MDCK cells using a green-fluorescent protein labelled cystic fibrosis transmembrane conductance regulator receptor. Infection & Immunity. 2000; 68:861-870.

66. Cho MR, Thatte HS, Lee RC, Golan DE. Integrin-dependent human macrophage migration induced by oscillatory electrical stimulation. Ann Biomed Eng. 2000; 28:234-243.

67. Kedersha N, Cho MR, Li W, Yacono PW, Chen S, Golan DE, Anderson P. Accumulation of untranslated mRNA at stress granules is a dynamic process that regulates translation during stress. J Cell Biol. 2000; 151:1257-1268.

68. Mirchev R, Golan DE. Single particle tracking and laser optical tweezers studies of the dynamics of individual protein molecules in membranes of intact human and mouse red cells. Blood Cells Molecules Diseases. 2001; 27:143-147.

69. Cho MR, Marler JP, Thatte HS, Golan DE. Control of calcium entry in human fibroblasts by frequency-dependent electrical stimulation. Frontiers Biosci. 2002; 7:a1-8.

70. Schroeder TH, Lee MM, Yacono PW, Cannon CL, Gerçeker AA, Golan DE, Pier GB. CFTR is a pattern recognition molecule that extracts *Pseudomonas aeruginosa* LPS from the outer membrane into epithelial cells and activates NF-kB translocation. Proc Natl Acad Sci USA. 2002; 99:6907-6912.

71. Gonzalez E, Kou R, Lin AJ, Golan DE, Michel T. Subcellular targeting and agonist-induced site-specific phosphorylation of eNOS. J Biol Chem. 2002; 277:39554-39560.

72. Duan L, Gan H, Golan DE, Remold HG. Critical role of mitochondrial damage in determining outcome of macrophage infection with *Mycobacterium tuberculosis*. J Immunol. 2002; 169:5181-5187.

73. Jobin CM, Chen H, Lin AJ, Yacono PW, Igarashi J, Michel T, Golan DE. Receptor-regulated dynamic interaction between endothelial nitric oxide synthase and calmodulin revealed by fluorescence resonance energy transfer in living cells. Biochemistry. 2003; 42:11716-11725.

74. Venkatesh N, Feng Y, DeDecker B, Yacono P, Golan D, Mitchison T, and McKeon F. Chemical genetics to identify NFAT inhibitors: Potential of targeting calcium mobilization in immunosuppression. Proc Natl Acad Sci USA. 2004; 101:8969-8974.

75. Gonzalez E, Nagiel A, Lin AJ, Golan DE, Michel T. siRNA-mediated down-regulation of caveolin-1 differentially modulates signaling pathways in endothelial cells. J Biol Chem. 2004; 279:40659-40669.

76. Khatib L, Golan DE, Cho M. Physiologic electrical stimulation provokes intracellular calcium increase mediated by phospholipase C activation in human osteoblasts. FASEB J. 2004; 18:1903-1905.

77. Erwin PA, Lin AJ, Golan DE, Michel T. Receptor-regulated dynamic *S*-nitrosylation of endothelial nitric-oxide synthase in vascular endothelial cells. J Biol Chem. 2005; 280:19888-19894.

78. Kedersha N, Stoecklin G, Ayodele M, Yacono P, Lykke-Andersen J, Fitzler MJ, Scheuner D, Kaufman RJ, Golan DE, Anderson P. Stress granules and processing bodies are dynamically linked sites of mRNP remodeling. J Cell Biol. 2005; 169:871-884.

79. Yin J, Lin AJ, Buckett PD, Wessling-Resnick M, Golan DE, Walsh CT. Single-cell FRET imaging of transferrin receptor trafficking dynamics by Sfp-catalyzed, site-specific protein labeling. Chemistry & Biology. 2005; 12:999-1006.

80. Yin J, Straight PD, McLaughlin SM, Zhou Z, Lin AJ, Golan DE, Kelleher NL, Kolter R, Walsh CT. Genetically encoded short peptide tag for versatile protein labeling by Sfp phosphopantetheinyl transferase. Proc Natl Acad Sci USA. 2005; 102:15815-15820.

81. Yin J, Lin AJ, Golan DE, Walsh CT. Site-specific protein labeling by Sfp phosphopantetheinyl transferase. Nature Protocols. 2006; 1:280-285.

82. Cairo CW, Mirchev R, Golan DE. Cytoskeletal regulation couples LFA-1 conformational changes to receptor lateral mobility and clustering. Immunity. 2006; 25:297-308.

83. Yang L, Kowalski JR, Yacono P, Bajmoczi M, Shaw SK, Froio RM, Golan DE, Thomas SM, Luscinskas FW. Endothelial cell cortactin coordinates intercellular adhesion molecule-1 clustering and actin cytoskeleton remodeling during polymorphonuclear leukocyte adhesion and transmigration. J Immunol. 2006; 177:6440-6449.

84. Zhu DM, Dustin ML, Cairo CW, Thatte HS, Golan DE. Mechanisms of cellular avidity regulation in CD2-CD58 mediated T cell adhesion. ACS Chem Biol. 2006; 1:649-658.

85. Finnegan EM, Turhan A, Golan DE, Barabino GA. Adherent leukocytes capture sickle erythrocytes in an in vitro flow model of vaso-occlusion. Am J Hematol. 2007; 82:266-275.

86. Zhu DM, Dustin ML, Cairo CW, Golan DE. Analysis of two-dimensional dissociation constant of laterally mobile cell adhesion molecules. Biophys J. 2007; 92:1022-1034.

87. Reiniger N, Lee MM, Coleman MT, Ray C, Golan DE, Pier GB. Resistance to *Pseudomonas aeruginosa* chronic lung infection requires cystic fibrosis transmembrane conductance regulator-modulated interleukin-1 (IL-1) release and signaling through the IL-1 receptor. Infect Immun. 2007; 75:1598-1608.

88. Zhou Z, Cironi P, Lin AJ, Xu Y, Hrvatin S, Golan DE, Silver PA, Walsh CT, Yin J. Genetically encoded short peptide tags for orthogonal protein labeling by Sfp and AcpS phosphopantetheinyl transferases. ACS Chem Biol. 2007; 2:337-346.

89. Kowalski MP, Dubouix-Bourandy A, Bajmoczi M, Golan DE, Zaidi T, Coutinho-Sledge YS, Gygi MP, Gygi SP, Wiemer EAC, Pier GB. Host resistance to lung infection mediated by major vault protein in epithelial cells. Science. 2007; 317:130-132.

90. Zaidi T, Bajmoczi M, Zaidi T, Golan DE, Pier GB. Disruption of CFTR-dependent lipid rafts reduces bacterial levels and corneal disease in a murine model of *Pseudomonas aeruginosa* keratitis. Invest Ophthalmol Vis Sci. 2008; 49:1000-1009.

91. Chen H, Levine YC, Golan DE, Michel T, Lin AJ. Atrial natriuretic peptide-initiated cGMP pathways regulate vasodilator-stimulated phosphoprotein phosphorylation and angiogenesis in vascular endothelium. J Biol Chem. 2008; 283:4439-4447.

92. Komazin-Meredith G, Mirchev R, Golan DE, Van Oijen AM, Coen DM. Hopping of a processivity factor on DNA revealed by single-molecule assays of diffusion. Proc Natl Acad Sci USA. 2008; 105:10721-10726.

93. Alcaide P, Newton G, Auerbach S, Sehrawat S, Mayadas TN, Golan DE, Yacono P, Vincent P, Kowalczyk A, Luscinskas FW. p120-Catenin regulates leukocyte transmigration through an effect on VE-cadherin phosphorylation. Blood. 2008; 112:2770-2779.

94. Karnchanaphanurach P, Mirchev R, Ghiran I, Asara JM, Papahadjopoulos-Sternberg B, Nicholson-Weller A, Golan DE. C3b deposition on human erythrocytes induces the formation of a membrane skeleton-linked protein complex. J Clin Invest. 2009; 119:788-801.

95. Hamirally S, Kamil JP, Ndassa-Colday YM, Lin AJ, Jahng WJ, Baek MC, Noton S, Silva LA, Simpson-Holley M, Knipe DM, Golan DE, Marto JA, Coen DM. Viral mimicry of Cdc2/cyclin-dependent kinase 1 mediates disruption of nuclear lamina during human cytomegalovirus nuclear egress. PLoS Pathog. 2009; 5(1):e1000275. Epub 2009 Jan 23.

96. Bajmoczi M, Gadjeva M, Alper SL, Pier G, Golan DE. Cystic fibrosis transmembrane conductance regulator and caveolin-1 regulate epithelial cell internalization of *Pseudomonas aeruginosa*. Am J Physiol Cell Physiol. 2009; 297:C263-277. Epub 2009 Apr 22.

97. Cairo CW, Das R, Albohy A, Baca QJ, Pradhan D, Morrow JS, Coombs D, Golan DE. Dynamic regulation of CD45 lateral mobility by the spectrin-ankyrin cytoskeleton of T cells. J Biol Chem. 2010; 285:11392-11401. Epub 2010 Feb 17.

98. Glodek AM, Mirchev R, Golan DE, Khoory JA, Burns JM, Shevkoplyas SS, Nicholson-Weller A, Ghiran IC. Ligation of complement receptor 1 increases erythrocyte membrane deformability. Blood. 2010; 116:6063-6071. Epub 2010 Sep 22.

99. Rajani V, Carrero G, Golan DE, de Vries G, Cairo CW. Analysis of molecular diffusion by first-passage time variance identifies the size of confinement zones. Biophys J. 2011; 100:1463-1472.

100. Mirchev R, Lam A, Golan DE. Membrane compartmentalization in Southeast Asian ovalocytosis red blood cells. Br J Haematol. 2011; 155:111-121. Epub 2011 Jul 27.

101. Yang XH, Mirchev R, Deng X, Yacono P, Yang HL, Golan DE, Hemler ME. CD151 restricts the α6 integrin diffusion mode. J Cell Sci. 2012; 125:1478-1487. Epub 2012 Feb 10.

102. Jin BY, Lin AJ, Golan DE, Michel T. MARCKS protein mediates hydrogen peroxide regulation of endothelial permeability. Proc Natl Acad Sci USA. 2012; 109:14864-14869. Epub 2012 Aug 27.

103. Alenghat FJ, Baca QJ, Rubin NT, Pao LI, Matozaki T, Lowell CA, Golan DE, Neel BG, Swanson KD. Macrophages require Skap2 and Sirpa for integrin-stimulated cytoskeletal rearrangement. J Cell Sci. 2012; 125:5535-5545. Epub 2012 Sep 12.

104. Reim NI, Kamil JP, Wang D, Lin A, Sharma M, Ericsson M, Pesola JM, Golan DE, Coen DM. Inactivation of retinoblastoma protein does not overcome the requirement for human cytomegalovirus UL97 in lamina disruption and nuclear egress. J Virol. 2013; 87:5019-5027. Epub 2013 Feb 20.

105. Alenghat FJ, Golan DE. Membrane protein dynamics and functional implications in mammalian cells. Curr Top Membr. 2013; 72:89-120.

106. Chiasson-MacKenzie C, Morris ZS, Baca Q, Morris B, Coker JK, Mirchev R, Jensen AE, Carey T, Stott SL, Golan DE, McClatchey AI. NF2/Merlin mediates contact-dependent inhibition of EGFR mobility and internalization via cortical actomyosin. J Cell Biol. 2015; 211:391-405. Epub 2015 Oct 19.

107. Cancedda C, Riviello R, Wilson K, Scott KW, Tuteja M, Barrow JR, Hedt-Gauthier B, Bukhman G, Scott J, Milner D, Raviola G, Weissman B, Smith S, Nuthulaganti T, McClain CD, Bierer BE, Farmer PE, Becker AE, Binagwaho A, Rhatigan J, Golan DE. Building workforce capacity abroad while strengthening global health programs at home: Participation of seven Harvard-affiliated institutions in a health professional training initiative in Rwanda. Acad Med. 2017; 92:649-658.

108. Antman EM, Di Corleto PE, Freeman MW, Ganz T, Golan DE, Kitterman R, Loscalzo J, Low M, McKenna E, O'Connor AC, Palazzolo M, Parrish J, Reizes O, Ross RS, Vaughan C, Vince DG, Watts L; NIH Centers for Accelerated Innovations. NIH Centers for Accelerated Innovations Program: Principles, practices, successes and challenges. Nat Rev Drug Discov. 2017; 16:663-664. Epub 2017 Aug 4.

109. Fajnzylber J, Regan J, Coxen K, Corry H, Wong C, Rosenthal A, Worrall D, Giguel F, Piechocka-Trocha A, Atyeo C, Fischinger S, Chan A, Flaherty KT, Hall K, Dougan M, Ryan ET, Gillespie E, Chishti R, Li Y, Jilg N, Hanidziar D, Baron RM, Baden L, Tsibris AM, Armstrong KA, Kuritzkes DR, Alter G, Walker BD, Yu X, Li JZ; Massachusetts Consortium for Pathogen Readiness.* SARS-CoV-2 viral load is associated with increased disease severity and mortality. Nat Commun. 2020; 11:5493. doi: 10.1038/s41467-020-19057-5.
*Golan D is an author in the Massachusetts Consortium for Pathogen Readiness.

110. Kaneko N, Kuo HH, Boucau J, Farmer JR, Allard-Chamard H, Mahajan VS, Piechocka-Trocha A, Lefteri K, Osborn M, Bals J, Bartsch YC, Bonheur N, Caradonna TM, Chevalier J, Chowdhury F, Diefenbach TJ, Einkauf K, Fallon J, Feldman J, Finn KK, Garcia-Broncano P, Hartana CA, Hauser BM, Jiang C, Kaplonek P, Karpell M, Koscher EC, Lian X, Liu H, Liu J, Ly NL, Michell AR, Rassadkina Y, Seiger K, Sessa L, Shin S, Singh N, Sun W, Sun X, Ticheli HJ, Waring MT, Zhu AL, Alter G, Li JZ, Lingwood D, Schmidt AG, Lichterfeld M, Walker BD, Yu XG, Padera RF Jr, Pillai S; Massachusetts Consortium on Pathogen Readiness Specimen Working Group.* Loss of Bcl-6-Expressing T Follicular Helper Cells and Germinal Centers in COVID-19. Cell. 2020; 183:143-157.e13. doi:10.1016/j.cell.2020.08.025. Epub 2020 Aug 19.
*Golan D is an author in the Massachusetts Consortium on Pathogen Readiness Specimen Working Group.

111. Shrock E, Fujimura E, Kula T, Timms RT, Lee IH, Leng Y, Robinson ML, Sie BM, Li MZ, Chen Y, Logue J, Zuiani A, McCulloch D, Lelis FJN, Henson S, Monaco DR, Travers M, Habibi S, Clarke WA, Caturegli P, Laeyendecker O, Piechocka-Trocha A, Li JZ, Khatri A, Chu HY; MGH COVID-19 Collection & Processing Team,* Villani AC, Kays K, Goldberg MB, Hacohen N, Filbin MR, Yu XG, Walker BD, Wesemann DR, Larman HB, Lederer JA, Elledge SJ. Viral epitope profiling of COVID-19 patients reveals cross-reactivity and correlates of severity. Science. 2020; 370:eabd4250. doi: 10.1126/science.abd4250. Epub 2020 Sep 29.
*Golan D is an author in the MGH COVID-19 Collection & Processing Team.

112. Weingarten-Gabbay S, Klaeger S, Sarkizova S, Pearlman LR, Chen DY, Gallagher KME, Bauer MR, Taylor HB, Dunn WA, Tarr C, Sidney J, Rachimi S, Conway HL, Katsis K, Wang Y, Leistritz-Edwards D, Durkin MR, Tomkins-Tinch CH, Finkel Y, Nachshon A, Gentili M, Rivera KD, Carulli IP, Chea VA, Chandrashekar A, Bozkus CC, Carrington M; MGH COVID-19 Collection & Processing Team,* Bhardwaj N, Barouch DH, Sette A, Maus MV, Rice CM, Clauser KR, Keskin DB, Pregibon DC, Hacohen N, Carr SA, Abelin JG, Saeed M, Sabeti PC. Profiling SARS-CoV-2 HLA-I peptidome reveals T cell epitopes from out-of-frame ORFs. Cell. 2021; 184:3962-3980.e17. doi: 10.1016/j.cell.2021.05.046. Epub 2021 Jun 3.
*Golan D is an author in the MGH COVID-19 Collection & Processing Team.

113. Galván-Peña S, Leon J, Chowdhary K, Michelson DA, Vijaykumar B, Yang L, Magnuson AM, Chen F, Manickas-Hill Z, Piechocka-Trocha A, Worrall DP, Hall KE, Ghebremichael M, Walker BD, Li JZ, Yu XG; MGH COVID-19 Collection & Processing Team,* Mathis D, Benoist C. Profound Treg perturbations correlate with COVID-19 severity. Proc Natl Acad Sci U S A. 2021; 118:e2111315118. doi: 10.1073/pnas.2111315118.
*Golan D is an author in the MGH COVID-19 Collection & Processing Team.

114. Kim MH, Salloum S, Wang JY, Wong LP, Regan J, Lefteri K, Manickas-Hill Z, Gao C, Li JZ, Sadreyev RI, Yu XG, Chung RT; MGH COVID-19 Collection & Processing Team.* Type I, II, and III Interferon Signatures Correspond to Coronavirus Disease 2019 Severity. J Infect Dis. 2021; 224:777-782. doi: 10.1093/infdis/jiab288.
*Golan D is an author in the MGH COVID-19 Collection & Processing Team.

115. Schmaier AA, Pajares Hurtado GM, Manickas-Hill ZJ, Sack KD, Chen SM, Bhambhani V, Quadir J, Nath AK, Collier AY, Ngo D, Barouch DH, Shapiro NI, Gerszten RE, Yu XG; MGH COVID-19 Collection and Processing Team,* Peters KG, Flaumenhaft R, Parikh SM. Tie2 activation protects against prothrombotic endothelial dysfunction in COVID-19. JCI Insight. 2021; 6:e151527. doi: 10.1172/jci.insight.151527.
*Golan D is an author in the MGH COVID-19 Collection & Processing Team.

116. Fenyves BG, Mehta A; MGH COVID-19 Collection & Processing Team,* Kays KR, Beakes C, Margolin J, Goldberg MB, Hacohen N, Filbin MR. Plasma P-selectin is an early marker of thromboembolism in COVID-19. Am J Hematol. 2021; 96:E468-E471. doi: 10.1002/ajh.26372. Epub 2021 Oct 16.
*Golan D is an author in the MGH COVID-19 Collection & Processing Team.

117. Antman EM, Freeman MW, Golan DE, Kitterman R, McKenna E, Parrish J, Vaughan C, Watts L, Loscalzo J. An overview of the process, progress, and outcomes of a National Center for Accelerated Innovation: The Boston Biomedical Innovation Center Experience. J Clin Transl Sci. 2021; 5:e137. doi: 10.1017/cts.2021.791. eCollection 2021.

118. Regan J, Flynn JP, Rosenthal A, Jordan H, Li Y, Chishti R, Giguel F, Corry H, Coxen K, Fajnzylber J, Gillespie E, Kuritzkes DR, Hacohen N, Goldberg MB, Filbin MR, Yu XG, Baden L, Ribeiro RM, Perelson AS, Conway JM, Li JZ; MGH COVID-19 Collection & Processing Teams. Viral load kinetics of severe acute respiratory syndrome coronavirus 2 in hospitalized individuals with coronavirus disease 2019. Open Forum Infect Dis. 2021; 8:ofab153. doi: 10.1093/ofid/ofab153. eCollection 2021 Aug. PMID: 34430669.
*Golan D is an author in the MGH COVID-19 Collection & Processing Team.

119. Francis JM, Leistritz-Edwards D, Dunn A, Tarr C, Lehman J, Dempsey C, Hamel A, Rayon V, Liu G, Wang Y, Wille M, Durkin M, Hadley K, Sheena A, Roscoe B, Ng M, Rockwell G, Manto M, Gienger E, Nickerson J; MGH COVID-19 Collection and Processing Team,* Moarefi A, Noble M, Malia T, Bardwell PD, Gordon W, Swain J, Skoberne M, Sauer K, Harris T, Goldrath AW, Shalek AK, Coyle AJ, Benoist C, Pregibon DC. Allelic variation in class I HLA determines CD8+ T cell repertoire shape and cross-reactive memory responses to SARS-CoV-2. Sci Immunol. 2022; 7:eabk3070. doi: 10.1126/sciimmunol.abk3070. Epub 2022 Jan 21.
*Golan D is an author in the MGH COVID-19 Collection & Processing Team.

120. Silverstein NJ, Wang Y, Manickas-Hill Z, Carbone C, Dauphin A, Boribong BP, Loiselle M, Davis J, Leonard MM, Kuri-Cervantes L; MGH COVID-19 Collection & Processing Team,* Meyer NJ, Betts MR, Li JZ, Walker BD, Yu XG, Yonker LM, Luban J. Innate lymphoid cells and COVID-19 severity in SARS-CoV-2 infection. Elife. 2022; 11:e74681. doi: 10.7554/eLife.74681.
*Golan D is an author in the MGH COVID-19 Collection & Processing Team.

121. Nelson RW, Chen Y, Venezia OL, Majerus RM, Shin DS; MGH COVID-19 Collection & Processing Team,* Carrington MN, Yu XG, Wesemann DR, Moon JJ, Luster AD. SARS-CoV-2 epitope-specific CD4+ memory T cell responses across COVID-19 disease severity and antibody durability. Sci Immunol. 2022; 7:eabl9464. doi: 10.1126/sciimmunol.abl9464. Epub 2022 Jul 22.
*Golan D is an author in the MGH COVID-19 Collection & Processing Team.

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

**Proceedings of Meetings:**

1. Malyutov MB, Bayborodin O, Mirchev R, Golan DE. Fitting diffusion and trend in noise via Mercer expansion. Proc 12th Eur Simulation Symp; 2000 Sep 28-30; Hamburg, Germany. Delft: Soc Computer Simulation; 2000. pp. 646-650.

2. Korobeinikova T, Mirchev R, Malyutov MB, Golan DE. Modeling the dynamics of individual protein molecules in the red blood cell membrane. Proc ASMDA-10 (Applied Stochastic Modeling and Data Analysis) Conf; 2001 Jun 12-15; Compiegne, France.

**Reviews, Chapters, and Editorials:**

1. Golan DE. Red cell membrane protein and lipid diffusion. In: Parker JC, Agre PC, editors. Red blood cell membranes: Structure, function and clinical implications. New York: Marcel Dekker; 1989. pp. 367-400.

2. Golan DE, Rubin RH, Walsh CT. Integration of pharmacology teaching into the "New Pathway" curriculum at Harvard Medical School. The Pharmacologist. 1992; 34:95-96.

3. Green LC, Waldman RH, Golan DE. Comment on the interpretation of lymphocyte phenotyping [Letter]. Cancer Immunol Immunother. 1992; 35:218-222.

4. Golan DE, Agre P. Action at a distance: Another lesson from the red cell [New and Notable]. Biophys J. 1994; 66:1271-1272.

5. Golan DE. Principles of pharmacology: A foundation for life-long learning in pharmacology and therapeutics. MedEd News. Boston: Harvard Medical School, 1999; 4(2):1-10.

6. Golan DE. Hemolytic anemias: Red cell membrane and metabolic defects. In: Goldman L, Bennett JC, editors. Cecil Textbook of Medicine, 21st edition. Philadelphia: WB Saunders; 2000. pp. 867-876.

7. Golan DE. Hemolytic anemias: Red cell membrane and metabolic defects. In: Goldman L, Ausiello D, editors. Cecil Textbook of Medicine, 22nd edition. Philadelphia: WB Saunders; 2004. pp. 1021-1030.

8. Simon J, Golan DE. Drug-receptor interactions. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Galanter JM, Armstrong AW, Arnaout RA, Rose HS, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy. Philadelphia: Lippincott Williams & Wilkins; 2004. pp. 3-16.

9. Rose HS, Golan DE. Pharmacodynamics. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Galanter JM, Armstrong AW, Arnaout RA, Rose HS, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy. Philadelphia: Lippincott Williams & Wilkins; 2004. pp. 17-26.

10. LaMattina J, Golan DE. Pharmacokinetics. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Galanter JM, Armstrong AW, Arnaout RA, Rose HS, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy. Philadelphia: Lippincott Williams & Wilkins; 2004. pp. 27-43.

11. Armstrong AW, Golan DE. Pharmacology of hemostasis and thrombosis. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Galanter JM, Armstrong AW, Arnaout RA, Rose HS, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy. Philadelphia: Lippincott Williams & Wilkins; 2004. pp. 335-356.

12. Harbison H, Coen DM, Golan DE. Principles of antimicrobial and antineoplastic pharmacology. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Galanter JM, Armstrong AW, Arnaout RA, Rose HS, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy. Philadelphia: Lippincott Williams & Wilkins; 2004. pp. 493-504.

13. Albritton R, Coen DM, Golan DE. Principles of combination chemotherapy. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Galanter JM, Armstrong AW, Arnaout RA, Rose HS, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy. Philadelphia: Lippincott Williams & Wilkins; 2004. pp. 603-613.

14. Leader B, Ulm JW, Breakefield X, Golan DE. Protein-based and gene therapies. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Galanter JM, Armstrong AW, Arnaout RA, Rose HS, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy. Philadelphia: Lippincott Williams & Wilkins; 2004. pp. 757-779.

15. Ulick J, Golan D. The science of drugs: Delivering doses, hitting the target, missing the mark. Newsweek. Summer 2005 special edition: Your health in the 21st century, 4-page pullout poster.

16. Golan D. Building better medicines. Newsweek. Summer 2005 special edition: Your health in the 21st century, pp. 36-39.

17. Cairo CW, Simon J, Golan DE. Drug-receptor interactions. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 2nd Edition. Philadelphia: Lippincott Williams & Wilkins; 2007. pp. 3-18.

18. Rose HS, Golan DE. Pharmacodynamics. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 2nd Edition. Philadelphia: Lippincott Williams & Wilkins; 2007. pp. 19-29.

19. LaMattina J, Golan DE. Pharmacokinetics. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 2nd Edition. Philadelphia: Lippincott Williams & Wilkins; 2007. pp. 31-48.

20. Taniguchi C, Armstrong SA, Green LC, Golan DE, Tashjian AH Jr. Drug toxicity. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 2nd Edition. Philadelphia: Lippincott Williams & Wilkins; 2007. pp. 63-73.

21. Armstrong AW, Golan DE. Pharmacology of hemostasis and thrombosis. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 2nd Edition. Philadelphia: Lippincott Williams & Wilkins; 2007. pp. 387-415.

22. Harbison H, Coen DM, Golan DE. Principles of antimicrobial and antineoplastic pharmacology. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 2nd Edition. Philadelphia: Lippincott Williams & Wilkins; 2007. pp. 567-584.

23. Albritton R, Coen DM, Golan DE. Principles of combination chemotherapy. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 2nd Edition. Philadelphia: Lippincott Williams & Wilkins; 2007. pp. 719-731.

24. Leader B, Golan DE. Protein-based therapies. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 2nd Edition. Philadelphia: Lippincott Williams & Wilkins; 2007. pp. 917-934.

25. Golan DE. Hemolytic anemias: Red cell membrane and metabolic defects. In: Goldman L, Ausiello D, editors. Cecil Textbook of Medicine, 23rd edition. Philadelphia: WB Saunders; 2007. pp. 1203-1212.

26. Leader B, Baca QJ, Golan DE. Protein therapeutics: A summary and pharmacological classification. Nature Rev Drug Discov. 2008; 7:21-39.

27. Cairo CW, Golan DE. T cell adhesion mechanisms revealed by receptor lateral mobility. Biopolymers. 2008; 89:409-419.

28. Morris ZS, Golan DE. Drug-receptor interactions. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 3rd Edition. Philadelphia: Lippincott Williams & Wilkins; 2011. pp. 2-16.

29. Baca QJ, Golan DE. Pharmacodynamics. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 3rd Edition. Philadelphia: Lippincott Williams & Wilkins; 2011. pp. 17-26.

30. Baca QJ, Golan DE. Pharmacokinetics. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 3rd Edition. Philadelphia: Lippincott Williams & Wilkins; 2011. pp. 27-42.

31. Conner MW, Dorian-Conner C, Green LC, Armstrong SR, Taniguchi C, Tashjian AH Jr, Golan DE. Drug toxicity. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 3rd Edition. Philadelphia: Lippincott Williams & Wilkins; 2011. pp. 56-70.

32. Armstrong AW, Golan DE. Pharmacology of hemostasis and thrombosis. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 3rd Edition. Philadelphia: Lippincott Williams & Wilkins; 2011. pp. 372-400.

33. Baca QJ, Coen DM, Golan DE. Principles of antimicrobial and antineoplastic pharmacology. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 2nd Edition. Philadelphia: Lippincott Williams & Wilkins; 2011. pp. 563-580.

34. Baca QJ, Coen DM, Golan DE. Principles of combination chemotherapy. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 3rd Edition. Philadelphia: Lippincott Williams & Wilkins; 2011. pp. 716-727.

35. Baca QJ, Leader B, Golan DE. Protein therapeutics. In: Golan DE, Tashjian AH Jr, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 3rd Edition. Philadelphia: Lippincott Williams & Wilkins; 2011. pp. 895-916.

36. Alenghat FJ, Golan DE. Drug-receptor interactions. In: Golan DE, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 4th Edition. Philadelphia: Wolters Kluwer; 2016. pp. 2-16.

37. Baca QJ, Golan DE. Pharmacodynamics. In: Golan DE, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 4th Edition. Philadelphia: Wolters Kluwer; 2016. pp. 17-26.

38. Baca QJ, Golan DE. Pharmacokinetics. In: Golan DE, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 4th Edition. Philadelphia: Wolters Kluwer; 2016. pp. 27-42.

39. Conner MW, Dorian-Conner C, Vaidya VS, Green LC, Golan DE. Drug toxicity. In: Golan DE, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 4th Edition. Philadelphia: Wolters Kluwer; 2016. pp. 70-86.

40. Gera N, Armstrong EJ, Golan DE. Adrenergic pharmacology. In: Golan DE, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 4th Edition. Philadelphia: Wolters Kluwer; 2016. pp. 150-166.

41. Armstrong EJ, Golan DE. Pharmacology of hemostasis and thrombosis. In: Golan DE, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 4th Edition. Philadelphia: Wolters Kluwer; 2016. pp. 403-432.

42. Coen DM, Koduri V, Golan DE. Principles of antimicrobial and antineoplastic pharmacology. In: Golan DE, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 4th Edition. Philadelphia: Wolters Kluwer; 2016. pp. 603-621.

43. Coen DM, Golan DE. Principles of combination chemotherapy. In: Golan DE, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 4th Edition. Philadelphia: Wolters Kluwer; 2016. pp. 770-781.

44. Baca QJ, Leader B, Golan DE. Protein therapeutics. In: Golan DE, Armstrong EJ, Armstrong AW, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 4th Edition. Philadelphia: Wolters Kluwer; 2016. pp. 955-978.

45. Alenghat FJ, Golan DE. Drug-receptor interactions. In: Golan DE, Loscalzo J, Namchuk MN, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 5th Edition. Philadelphia: Wolters Kluwer; 2025. pp. 2-16.

46. Baca QJ, Golan DE. Pharmacodynamics. In: Golan DE, Loscalzo J, Namchuk MN, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 5th Edition. Philadelphia: Wolters Kluwer; 2025. pp. 17-27.

47. Baca QJ, Golan DE. Pharmacokinetics. In: Golan DE, Loscalzo J, Namchuk MN, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 5th Edition. Philadelphia: Wolters Kluwer; 2025. pp. 28-43.

48. Conner MW, Dorian-Conner C, Golan DE. Drug toxicity. In: Golan DE, Loscalzo J, Namchuk MN, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 5th Edition. Philadelphia: Wolters Kluwer; 2025. pp. 80-97.

49. Elgart V, Crouch EAC, Golan DE, Namchuk MN, Loscalzo J. Combination drug therapies. In: Golan DE, Loscalzo J, Namchuk MN, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 5th Edition. Philadelphia: Wolters Kluwer; 2025. pp. 98-106.

50. Golan DE, Namchuk MN, Coen DM. Principles of antimicrobial pharmacology. In: Golan DE, Loscalzo J, Namchuk MN, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 5th Edition. Philadelphia: Wolters Kluwer; 2025. pp. 692-706.

51. Brea EJ, Namchuk MN, Golan DE. Principles of cancer pharmacology. In: Golan DE, Loscalzo J, Namchuk MN, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 5th Edition. Philadelphia: Wolters Kluwer; 2025. pp. 833-844.

52. Kumar P, Golan DE, Battinelli EM. Pharmacology of hemostasis and thrombosis. In: Golan DE, Loscalzo J, Namchuk MN, editors. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 5th Edition. Philadelphia: Wolters Kluwer; 2025. pp. 969-999.

**Books and Monographs:**

1. Golan DE. Lateral mobility of band 3 in the human erythrocyte ghost membrane [M.D. dissertation]. New Haven, Connecticut: Yale University, 1979. 156 pp.

2. Golan DE. Dynamic interactions in the human erythrocyte membrane: Studies on the lateral mobility of band 3, phospholipid, and cholesterol [Ph.D. dissertation]. New Haven, Connecticut: Yale University, 1982. 282 pp.

3. Golan DE (editor-in-chief), Tashjian AH Jr (deputy editor), Armstrong EJ, Galanter JM, Armstrong AW, Arnaout RA, Rose HS (associate editors). Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy. Philadelphia, Pennsylvania: Lippincott Williams & Wilkins, 2004. 856 pp.

4. Golan DE (editor-in-chief), Tashjian AH Jr (deputy editor), Armstrong EJ, Armstrong AW (associate editors). Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 2nd Edition. Philadelphia, Pennsylvania: Lippincott Williams & Wilkins, 2007. 985 pp.

5. Farrell SE, Golan DE (editor). Principles of Pharmacology Workbook. Philadelphia, Pennsylvania: Lippincott Williams & Wilkins, 2007. 320 pp.

6. Golan DE (editor-in-chief), Tashjian AH Jr (deputy editor), Armstrong EJ, Armstrong AW (associate editors). Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 3rd Edition. Philadelphia, Pennsylvania: Lippincott Williams & Wilkins, 2011. 954 pp.

7. Golan DE (editor-in-chief), Armstrong EJ, Armstrong AW (associate editors). Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 4th Edition. Philadelphia: Wolters Kluwer; 2016. 1,024 pp.

8. Golan DE (editor-in-chief), Loscalzo J, Namchuk MN (deputy editors). Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 5th Edition. Philadelphia: Wolters Kluwer; 2025. 1,232 pp.

**Professional educational materials or reports, in print or other media**

**Educational Materials:**

1. Golan DE, and associates. Faculty and Student Guides for Principles of Pharmacology. 1989-2006. Approximately 1100 pp.

**Nonprint Educational Materials:**

1. Joseph JT, Golan DE. PharmAid®: A computer learning program for pharmacology. ©1991-present. 573 text, diagram, and pharmacokinetics cards.

2. Aster JC, Golan DE, Mitus J, von Kapff C. Hematology and hematologic oncology teaching slide collection. Brigham and Women's Hospital and Harvard Medical School, 1996. 118 slides and accompanying text.

# Narrative Report

**Narrative Summary of Research Contributions:**

My laboratory has concentrated on two scientific areas within the field of cell surface protein and lipid dynamics: (1) the molecular dynamics of membrane proteins and lipids in red cell structure, function, and pathophysiology; and (2) the molecular dynamics of cell surface adhesion receptors in lymphocyte adhesion and activation. Our primary research area used the human red cell membrane as a model system to elucidate, in molecular detail, the mechanisms controlling the lateral and rotational mobility of transmembrane proteins and lipids. We used biophysical and other methods to elucidate the biological implications of these protein and lipid mobility control mechanisms for red cell physiology, and for the molecular pathophysiology of hereditary spherocytosis, hereditary elliptocytosis, Southeast Asian ovalocytosis, and sickle cell anemia. We also provided evidence for a molecular mechanism by which schistosomula of *Schistosoma mansoni* gain access to host red cell proteins and lipids. We extended these studies to the molecular dynamics and signaling of membrane proteins in erythroblasts undergoing terminal maturation in the bone marrow, and to host and parasite factors responsible for *Plasmodium falciparum* invasion of human red cells. Our group also had a deep interest in using the human lymphocyte as a model of an adhesive and activatable cell that is capable of fundamental changes in cellular physiology (e.g., cell motility, cell adhesion, cell shape, and molecular secretion) depending on adhesion and activation interactions involving specific cell surface receptors. We studied, in molecular detail, mechanisms controlling the lateral mobility, surface distribution, and two-dimensional (membrane) affinity of cell surface receptors in lymphocyte membranes, and biological implications of

these control mechanisms for lymphocyte adhesion and activation. In the course of all these studies, my group made contributions to biophysical theories and methodologies important in the study of cell surface protein and lipid dynamics.

Over the past 10 years, I have co-directed a large consortium devoted to accelerating innovation in biomedical research (the Boston Biomedical Innovation Center, a National Center for Accelerated Innovation), and I have co-chaired a second large consortium devoted to combating infectious disease outbreaks (the Massachusetts Consortium on Pathogen Readiness, or MassCPR). MassCPR brings together hundreds of basic and translational scientists, clinicians, and public health professionals from more than two dozen universities, medical schools, research institutes, teaching hospitals, government agencies, and biopharmaceutical companies in Massachusetts. MassCPR investigators are experts in the fields of virology, immunology, microbiology, structural biology, epidemiology, pathology, diagnostics and therapeutics development, computational biology, and clinical medicine. Our investigators have published more than 1,000 research articles on the biology and disease manifestations caused by SARS-CoV-2 and other pathogens, and our working groups are preparing for a coordinated local, regional, and national response to emerging infectious disease threats and to the next outbreak with pandemic potential.

**Narrative Summary of Teaching Contributions:**

From 1989 to 2006 I served as the founding course director of Principles of Pharmacology, the core course in pharmacology taken by Harvard medical and dental students in the New Pathway curriculum. An important adjunct to the Principles of Pharmacology course was PharmAid®, a computer-based pharmacology learning program that I developed in collaboration with Jeffrey Joseph. I also worked with course planners in the second-year Human Systems (pathophysiology) modules to develop a pharmacology "paracurriculum" that extended the concepts introduced in the first-year course to examples of specific therapeutic agents used in the second-year course's tutorial cases. Since 2000 I have led a major effort to write a mechanism-based textbook of pharmacology with Armen Tashjian (deceased in 2009) and a dedicated group of Harvard medical students. The textbook, *Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy*, has just been published in its fifth edition and is a leading pharmacology text worldwide. In 2012 the third edition of this textbook was awarded First Prize in the Pharmacology category at the British Medical Association (BMA) Medical Book Awards, and in 2017 the fourth edition received the honor of Highly Commended in the category of Medicine at the BMA Medical Book Awards. From 2001 to 2006 I served in leadership roles in medical education reform at HMS, including the development of proposals for in-depth scholarly project experiences as a required component of the MD curriculum. I have served as co-director for two of the five required core courses in the Leder Human Biology and Translational Medicine (LHB) graduate program curriculum. I am the founding and current director of an interdisciplinary Therapeutics Graduate Program (TGP) at Harvard University to which PhD students in any of the thirteen Harvard Integrated Life Sciences programs may apply. The TGP has a steady-state enrollment of approximately 140 students, and it has been the recipient of an NIH T32 predoctoral training grant since its founding in 2012. The TGP is the only graduate program at Harvard to require a 2–4-month internship experience outside the dissertation laboratory; most students select internships in biopharmaceutical companies, and others choose to work in clinical research, regulatory science, science policy, consulting, business development, or venture capital. In 2018 I chaired a comprehensive review of graduate (PhD and Master's) education at HMS that subsequently led to major reforms in the organization, governance, coordination, and programming of the life-science graduate programs at HMS and Harvard University. Since 2008 I have served on the executive leadership committee of the Harvard-MIT Health Sciences and Technology Program, the leading training program in the world for physician-scientists, physician-engineers, and physician-leaders.

**Narrative Summary of Administrative Contributions:**

From 2001 to 2006 I served in leadership roles in medical education reform at HMS, including the development of proposals for in-depth scholarly project experiences as a required component of the MD curriculum. From 2008 to 2014 I served as Dean for Graduate Education at HMS. From 2014 to 2019 I served as Dean for Basic Science and Graduate Education, with responsibility for advising the Dean of the Faculty on matters involving the HMS basic science departments and responsibility for all PhD and Master's programs at HMS. I currently serve as Dean for Research Operations and Global Programs (recently renamed Dean for Research Initiatives and Global Programs), with responsibility for implementing interdepartmental, inter-institutional, and interdisciplinary research initiatives as well as global programs at HMS. Since 2020 I have co-chaired the Executive Committee of the Massachusetts Consortium on Pathogen Readiness, a scientific and clinical consortium of more than two dozen different institutions and almost 1,000 investigators across Massachusetts devoted to research on the global COVID-19 pandemic and preparing for future pandemics.