

**Florida International University/Harvard University
Curriculum Vitae**

Date Prepared: February 28, 2024
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Academic Title: Senior Vice-President for Global Medical Affairs, Florida International University (FIU)
Professor, Herbert Wertheim College of Medicine (HWCOM)

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Other Current Faculty/Academic Appointments

Academic Title: Professor *Emeritus*, Harvard Medical School/Harvard University
Director, Harvard Career Development Program in Translational Glycobiology (Harvard ProTG)
Office: Harvard Institutes of Medicine
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Boston, MA 02115
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Place of Birth: Havana, Cuba

Education

1977	A.B. <i>Summa Cum Laude</i>	Biology	Harvard College, Cambridge, MA
1985	M.D., Ph.D.	Ph.D. in Immunology	Harvard Medical School, Boston MA

Postdoctoral Training

Internships and Residencies

1985-1986	Internship	Internal Medicine	University of Miami/Jackson Memorial Hospital, Miami, FL
1986-1988	Residency	Internal Medicine	University of Miami/Jackson Memorial Hospital, Miami, FL

Clinical and Research Fellowships

1987-1989	Postdoctoral Fellowship	Immunology	University of Miami/Jackson Memorial Hospital, Miami, FL
1989-1991	Clinical Fellowship	Hematology	University of Miami/Jackson Memorial Hospital, Miami, FL

Previous Faculty/Academic Appointments

1988-1989	Instructor	Medicine	University of Miami School of Medicine, Miami, FL
1989-1993	Assistant Professor	Medicine, Microbiology and Immunology	University of Miami School of Medicine, Miami, FL
1993-1996	Assistant Professor	Internal Medicine, Pathology and Laboratory Medicine	University of South Florida College of Medicine, Tampa, FL
1997-1999	Assistant Professor	Surgery	Harvard Medical School, Boston, MA
1997-2003	Assistant Professor	Medicine	Harvard Medical School, Boston, MA
2002-2003	Assistant Professor	Dermatology	Harvard Medical School, Boston, MA
2003-2011	Associate Professor	Medicine and Dermatology	Harvard Medical School, Boston, MA
2012-2018	Professor	Dermatology and Medicine	Harvard Medical School, Boston, MA
2019-2021	Dean	Herbert Wertheim College of Medicine	Florida International University, Miami, FL

Appointments at Hospitals/Affiliated Institutions

1988-1989	Chief Resident	Medicine	Jackson Memorial Hospital, Miami, FL
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1988-1993	Attending Physician	Emergency Room and Medical Services	Jackson Memorial Hospital, Miami, FL
1989-1993	Attending Physician	Medical Service	Miami Veterans Affairs Medical Center, Miami, FL
1991-1993	Attending Hematologist	Hematology	Jackson Memorial Hospital, Miami FL and Miami Veterans Affairs Medical Center, Miami, FL
1993-1996	Attending Physician	Bone Marrow Transplant Service	Moffitt Cancer Center and Research Institute, University of South Florida College of Medicine, Tampa, FL
1997-2004	Physician	Bone Marrow Transplant Unit	Massachusetts General Hospital, Boston, MA
1997-1998	Senior Investigator	Transplantation Biology Research Center	Massachusetts General Hospital, Boston, MA
1999-2002	Associate Physician	Medicine	Brigham and Women's Hospital, Boston, MA
2002-2022	Physician	Dermatology and Medicine	Brigham and Women's Hospital/Dana-Farber Cancer Institute, Boston, MA
2022-	Physician	Dermatology and Medicine	Mass General Brigham Health System, & Dana-Farber Cancer Institute, Boston, MA

Other Professional Positions

1988-1989	Staff Physician		Metro-Dade County, Florida Human Resources Health Center
1997	Visiting Scientist		Genetics Institute, Cambridge, MA

Major Administrative Leadership Positions

1988-1990	Volunteer Medical Director		Brothers of the Good Shepherd/Camillus House Health Concern
1990-1992	Founding member and Associate Scientific Director for the Bone Marrow Transplant Program		University of Miami School of Medicine
1990-1993	Faculty Director and Chairperson		Eastern Student Research Forum (an international program to promote research by medical students)
1991-1993	Medical Director		Lymphoma Cutis Program, University of Miami,

		NCI Comprehensive Cancer Center
1993-1996	Director, Jenkins Foundation Transplant Immunology Research Laboratory	Moffitt Cancer Center and Research Institute, University of South Florida College of Medicine, Tampa, FL
1997-2008	Director, Translational Research Program, Bone Marrow Transplantation Unit Hematology-Oncology, Department of Medicine	Massachusetts General Hospital, Boston, MA
2007-2011	Co-Director of MIT-HST Graduate Medical Education in Medical Sciences (GEMS) Training Program	Massachusetts Institute of Technology
2008-2011	President	Harvard Club in Concord (MA)
2008-2011	Board of Directors; Regional Director, Northeastern Massachusetts	Harvard Alumni Association
2009-2015	International Taskforce Member, "Harvard Serves" (global call for public service by Harvard Alumni)	Harvard Alumni Association
2011-present	Director, Program of Excellence in Glycosciences	Brigham & Women's Hospital Harvard Medical School
2014-2015	Committee Member, BWH Department of Dermatology Promotions Committee	Brigham & Women's Hospital
2016-2019	Committee Chair, BWH Department of Dermatology Promotions Committee	Brigham & Women's Hospital
2016- 2019	Co-Director, Harvard University Glycoscience Center	Harvard Medical School
2019-2021	Dean, Herbert Wertheim College of Medicine	Florida International University, Miami, FL
2021-present	Senior Vice-President for Global Medical Affairs	Florida International University Miami, FL

Committee Service

Local

1985-1993	Harvard Club of Miami, Schools and Scholarships Committee	Harvard College
1987-1988	Executive Housestaff Committee	Jackson Memorial Hospital, Miami, FL
1987-1993	Admissions Committee for the School of Medicine Latin American Training Program	University of Miami
1989-1993	Subcommittees for the Research and Development Committee: Equipment Subcommittee; Human Subjects Studies Subcommittee	Miami VA Medical Center, University of Miami
1989-1993	Chair person, Animal Experimentation Subcommittee	Miami VA Medical Center, University of Miami
1995-1996	Invasive Procedure and Blood Utilization Review Committee	H. Lee Moffitt Cancer Center and Research Institute
1996	Medical Staff By-Laws, Rules and Regulations Committee	H. Lee Moffitt Cancer Center and Research Institute
1997-present	Bone Marrow Transplant Protocol Review Committee	Massachusetts General Hospital, Brigham and Women's Hospital, Dana-Farber Cancer Institute
1998-2008	Project Success Advisory Committee	Harvard Medical School
2000-present	Memorial Minutes Committee	Harvard Medical School
2001-present	Schools and Scholarships Committee, Harvard Club in Concord	Harvard College
2002	Commencement Aid, Harvard College 25 th Reunion Symposium Organizing Committee	Harvard University
2002-2005	Public Services Committee at The Countway Library of Medicine	Harvard Medical School
2003-2005	Library Operations Subcommittee, The Countway Library of Medicine	Harvard Medical School
2004-2009	Steering Committee, Clinical Unit for Research Trials in Skin	Massachusetts General Hospital, Brigham and Women's Hospital, Department of Dermatology
2004-present	Steering Committee for Stem Cell Therapy/Tissue Engineering	Biomedical Research Institute, Brigham and Women's Hospital
2006	Chairperson, 25 th Reunion Committee, Class of 1981	Harvard Medical School
2006-2018	Chairperson, HMS Department of Dermatology Collaborative and Translational Research Initiatives Committee	Harvard Medical School
2006-2018	Director, Harvard Club in Concord	Harvard University

2007	Organizing Committee, Class of 1977 Reunion and Marshall, Harvard University Commencement	Harvard University
2010-2018	Clinical Investigation Committee	Brigham and Women's Hospital Harvard Medical School
2011	Reunion Committee, 30 th Reunion, Harvard Medical School Class of 1981	Harvard Medical School
2011-2013	Reunion Committee, 35 th Reunion, Harvard College Class of 1977	Harvard College
2011-2018	Admissions Committee	Harvard Medical School
2019-present	Vice President of the FIU Research Foundation	Florida International University, Modesto A. Maidique Campus
2020-2021	Organizing Committee Harvard Medical School Class of 1981 40 th Reunion	Harvard Medical School

Regional

1985-1993	Board of Directors	Miami Civic Music Association
1987-1993	Advisory Board to County Homeless Health Care Project	Metro-Dade County, FL
1988-1989	Governor's Council, Florida Chapter	American College of Physicians
1991-1993	Chairperson, Planning Committee for Medicine and Allied Health Magnet School	Dade County School Board, FL
1991-1993	Chairperson, Subcommittees for Middle School Science Curriculum Review and for Community Outreach.	Dade County School Board, FL
1994-1997	Board of Directors	Museum of Science and Industry, Tampa, FL
1997-2015	Education Advisory Board	Discovery Museum, Acton, MA
2005-2018	Board of Overseers	Boston Museum of Science
2007-2010	Board of Directors	Whizkids Foundation
2020- present	Medical Advisor to Arscht Performing Arts Center COVID-19 Repopulation Task Force	Arscht Center, FL
2020-present	Member, Miami-Dade County Mayor Panel of COVID-19 Medical Experts	Miami-Dade County Mayor Daniella Levine Cava

National

1977-1985	National Schools and Scholarship Committee and National Recent Graduate's Committee	Harvard Alumni Association
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1990-1993	University of Miami Representative	National Council of American Federation for Clinical Research
1993-1997	University of South Florida Representative	National Council of American Federation for Medical Research
1996-2000	Question Author, Certification Examination, Subspecialty of Hematology	American Board of Internal Medicine
1997-2018	National Board of Directors	Museum of Science and Industry, Tampa, FL
2000-2002	Coordinating Reviewer, Review Committee Category "Hematopoiesis: Stem and Progenitor Cell Biology."	American Society of Hematology (Annual Meeting)
2001	Working Group on Glycobiology	National Institutes of Health/NHLBI
2007	Coordinating Reviewer, Review Committee Category "Hematopoiesis: Microenvironment, Cell Adhesion and Mesenchymal Stem Cells."	American Society of Hematology Annual Meeting
2008-2014	Board of Directors; Regional Director, Northeastern Massachusetts; Member, National Schools and Scholarship Committee	Harvard Alumni Association
2009-2015	External Advisory Board, NIH/NCRR, Integrated Technology Resource for Biomedical Glycomics	NCRR/University of Georgia
2013	Advisory Committee, NIH Glycomics Working Group	National Institute of Health, Bethesda, MD
2013-2014	National Chairperson, the NHLBI Program of Excellence in Glycosciences	National Institutes of Health/NHLBI
2019-2021	Council of Florida Medical School Deans	State of Florida
2019-present	National Chairperson, NCI Alliance of Glycobiologists for Cancer Research	National Cancer Institute Bethesda, MD
2022	NIH Study Section (CSR ZRG1 CCHI-E)	National Institutes of Health, Bethesda, MD

International

1993-present	Scientific Advisory Committee to the Board of Trustees	Jose Carreras International Leukemia Foundation/ Jose Carreras Research Institute, Barcelona, Spain
2005-present	Society of Glycobiology	Scientific Program Committee
2006-2010	Membership Committee	International Society of Experimental Hematology
2006-2010	Society of Experimental Hematology	Editorial Board for <i>Experimental Hematology</i> ,

2006-present	Society of Glycobiology	the official journal of the International Society of Experimental Hematology Editorial Board for <i>Glycobiology</i> , the official journal for the Society of Glycobiology
2007-2009	American Society of Hematology	Annual Meeting Coordinating Reviewer (Category: "Hematopoiesis: Microenvironment, Cell Adhesion and Mesenchymal Stem Cells.")
2009-present	Member, International Scientific Advisory Committee of the Carreras Research Institute	Jose Carreras Leukemia Research Institute, Barcelona, Spain
2009-present	Course Director, "Cell Therapy from the Bench to the Bedside and Return"	Universidad Internacional del Mar and Universidad de Murcia, Murcia, Spain
		2014-Present Editorial Board Member
2015-2022	International Advisory Board to Swedish Government/Lund University Wallenberg Center for Molecular Medicine initiative in Stem Cell Therapeutics	Journal of Biological Chemistry Lund University, Sweden
2016-present	Scientific Advisory Committee Instituto de Investigacion Biomedica de Bellvitge (IDIBELL)	Barcelona, Spain
2023	Grant Review Committee, Hypatia Research Line, RadboudUMC	The Netherlands

Professional Societies

1985-1995	American Association for the Advancement of Science	Member
1985-1997	American Federation for Clinical/Medical Research	Member
1992-present	American Society of Hematology	Member
1993-1997	International Society for Analytical Cytology	Member
1993-2011	International Society for Experimental Hematology	Member
1993-1997	New York Academy of Sciences	Member
2000-2010	American Society of Clinical Oncology	Member
2009-present	American Association of Physicians	Member

Grant Review Activities

1992-1997	Scientific Review Committees Fellowship Review Committee Career Development Award Committee Established Investigator Award Committee	American Heart Association
1994-2014	Scientific Review Committee for Jose Carreras Research Fellowship	Jose Carreras International Leukemia Foundation
1999-2003	Ad Hoc Reviewer, Immunobiology Study Section, Immunological Sciences Initial Review Group	National Institutes of Health
2000-2002	Review Committee Category “Hematopoiesis: Stem and Progenitor Cell Biology.”	American Society of Hematology Annual Meeting
2003	Ad Hoc Reviewer, Career Enhancement Award Study Section	National Institutes of Health/NHLBI
2004-2008	Standing Member, Hematopoiesis (HP) Study Section	National Institutes of Health/NHLBI
2006	Ad Hoc Reviewer, Heart, Lung and Blood Program, (HLBP) Project Review Committee	National Institutes of Health/NHLBI
2006	Scientific Review Committee, Research Fellowship Review Committee	The Medical Foundation
2008-2012	Ad Hoc Reviewer, NHLBI Special Emphasis Panel, Hematopoietic Stem Cell Regulation	National Institutes of Health/NHLBI
2009-2015	Ad Hoc Reviewer, Heart, Lung and Blood Program, (HLBP) Project Review Committee	National Institutes of Health/NHLBI
2016-present	Reviewer, NHLBI Conference Grant Application (R13) Review Committee	National Institutes of Health/NHLBI
2022	NIH Study Section (CSR ZRG1 CCHI-E)	National Institutes of Health, Bethesda, MD

Editorial Activities

Other Editorial Roles

2006-2010	Editorial Board	Experimental Hematology
2006-present	Editorial Board	Glycobiology
2010-present	Editorial Board Member	Peer-eMed
2014-present	Editorial Board Member	The Journal of Biological Chemistry

Ad hoc Reviewer (most frequent)

American Journal of Pathology
Blood
Cancer Research
Cell Stem Cell
Experimental Hematology
Glycobiology
Journal of Biological Chemistry
Journal of Clinical Investigation
Journal of Immunology
Journal of Experimental Medicine

Nature
 Nature Chemical Biology
 Proceedings of the National Academy of Sciences

Honors and Prizes

1973-1977	John Harvard Scholarship	Harvard College	Distinction awarded yearly for academic excellence Distinction for academic excellence as a freshman Academic Honor Academic Honor
1974	Whittaker-Edwards Prize	Harvard College	
1976 1977	<i>Phi Beta Kappa</i> Dr. Donald McKee Memorial Scholarship	Harvard College	
1985	James Tolbert Shipley Prize	Harvard Medical School	Award for best research by a graduating student
1988-1989 1989-1993	Chief Medical Resident Veterans Affairs Research Career Development Award	Jackson Memorial Hospital US Department of Veterans Affairs	Competitive award for career development Recipient for medical community service Given for excellence in teaching Given for outstanding research productivity and achievement
1990	Kelly's Heroes Award	WTVJ-TV (CBS), Miami, FL	
1993	George Paff Award	University of Miami School of Medicine	Recipient for medical community service Mayo-Luther Forum on Stem Cells Excellence in the field of hematology Charles Warren Memorial Symposium on Structural Glycomics First Pan-Asian Pacific Summit on Emerging Healthcare Strategies Recognition for advancement of medical knowledge Harvard Business School, Cambridge, MA
1993	Stanley J. Glaser Foundation Award	University of Miami School of Medicine	
1993	Peace and Unity Award	Archdiocese of Miami, FL	Recognition for advancement of medical knowledge Harvard Business School, Cambridge, MA
1996	Inaugural Speaker	Mayo Clinic, Rochester, MN	
1996	New Investigator Award	International Society for Experimental Hematology	Recognition for advancement of medical knowledge Harvard Business School, Cambridge, MA
2006	Inaugural Keynote Speaker	University of New Hampshire	
2007	Inaugural Plenary Session Speaker	Beijing, China	Recognition for advancement of medical knowledge Harvard Business School, Cambridge, MA
2009	Elected member	Association of American Physicians	
2009-2010	Leadership Training	Brigham & Women's Hospital Leadership Program	Recognition for pioneering work in the fields of cell therapy and glycoscience
2019	Honorary Doctorate (Doctorado, Honoris Causa)	University of Murcia, Spain	
2022	Hall of Fame Inductee	Miami-Dade County Public Schools, Miami-Dade County, FL	Recognition for contributions to the field medicine

Report of Funded and Unfunded Projects

Funding Information (listing DIRECT COSTS FUNDING ONLY)

PAST FUNDING (only reporting “PAST FUNDING” AS PI WITHIN THE LAST 25 YEARS):

- 1997-2002 Co-Principal Investigator \$240,000/yr
Title: “Compatibility of Swine Cells and Human Stroma”
Goal: Molecular analysis of adhesion molecules on swine and human hematopoietic cells, with goal to “humanize” relevant pig cell molecules
- 1997-2002 Principal Investigator \$175,000/yr
Title: “Molecular Analysis of Hematopoietic Cell L-selectin Ligand”
Goal: To identify a novel selectin ligand expressed on human hematopoietic stem cells (which is now known as “HCELL”)
- 2000-2005 Principal Investigator \$250,000/yr
Title: “Adhesion Molecules Mediating Skin Tropism in Acute GVHD”
Goal: To elucidate the adhesion molecules that regulate skin tropism of alloreactive lymphocytes in acute GVHD
- 2003-2007 Principal Investigator NIH/NHLBI, R01 HL60528 \$250,000/yr
Title: (renewal R01) “Structure and Biology of Hematopoietic Cell E-/L- selectin Ligand”
Goal: To determine the structure of Hematopoietic E-/L-Selectin Ligand (HCELL) on human hematopoietic stem cells and characterize its function in hematopoiesis.
- 2003-2007 Principal Investigator NIH/NHLB1, R01 HL073714-01 \$350,000/yr
Title: “Analysis of Homing Receptors on Human Adult Stem Cells” (Competitively renewed in 2007)
Goal: To define the expression of adhesion molecules on adult stem cells that mediate migration of these cells into sites of inflammation
- 2003-2008 Co -Investigator NIH/NIADDK, R01 AI56084
Title: “Structure-Functions Analysis of T Cell E-Selectin Ligands”
Goal: To characterize the individual E-selectin ligands expressed on T cells
- 2003-2009 Co-Investigator NIH/NHLBI P01 HL070149
Title: “Mechanisms of Graft Versus Host Disease”
Goal: To elucidate the molecular basis of GVHD and design novel therapies and prophylactic regimens to prevent this complication
- 2004-2009 Co-Principal Investigator NIH/NHLBI, P01 HL075847 \$200,000/yr
Title: “Minority K-12 Initiative for Teachers and Students”
Goal: To increase science literacy, aptitude and interest in science careers among Boston middle and high school students, particularly underrepresented minority and disadvantaged students.

2007-2009 Principal Investigator NIH/NIDDK, R21 DK075012 \$175,000/yr
Title: "Characterization of a Novel 65kDa E-selectin Ligand on G-CSF Mobilized Leukocytes"
Goal: To identify an E-selectin ligand induced on human myeloid cells by G-CSF administration

2008 - 2010 Co-Investigator NIH/NCCR, COBRE RR018757
Title: "Innovative Approaches to Tissue Repair"
Goal: COBRE Program Project, dedicated to creating center for regenerative medicine at Roger Williams Hospital, Providence, Rhode Island

2007 - 2011 Principal Investigator NIH/NHLBI, R01 (renewal R01) R01 HL073714 \$250,000/yr
Title: "Optimizing Osteotropism of Human Mesenchymal Stem Cells"
Goal: The objective of this project is to manipulate the expression of membrane molecules on mesenchymal stem cells that mediate migration of these cells into bone.

2007 - 2012 Principal Investigator NIH/NCI, R01 CA121335 \$195,000/yr
Title: "Molecular Analysis of CD44 in Colon Cancer Cells"
Goal: To characterize the structural biology of CD44 on colon cancer cells and to define how expression of CD44 glycoforms mediates growth and metastasis of colon cancer.

2011-2019 Principal Investigator NIH/NHLBI, 1P01HL107146-02 1,800,000/yr
Title: "Program of Excellence in Glycosciences: Biosynthesis and Function of Lactosaminyl Glycans in Hematopoiesis"
Goal: To characterize the structure and function of lactosaminyl glycans in hematopoiesis; to promote growth and education in the discipline of glycobiology both regionally and nationally, and to create the field of "translational glycobiology."

CURRENT FUNDING (Direct Cost Funding):

2018-2024 Principal Investigator NIH/NHLBI, K12HL141953 \$1,000,000/yr
Title: "Forging Translational Glycobiologists: Intermeshing Glycoscience Training and Clinical Education"
Goal: Career development/training for the next generation of "Translational Glycobiologists"

2019-2024 Principal Investigator NIH/NCI, U01 CA225730-01A1 \$ 500,000/ yr
Title: "Analysis of E-selectin Ligands of Human Acute Leukemia Cells and their Biology in Leukemogenesis"
Goal: Identification of the role(s) of E-selectin ligands in human acute leukemias

2019-2024 Co-Investigator NIH/ 2P01CA148600-07A1 \$ 100,000/ yr
Title: "Cord Blood Graft Engineering to Improve Engraftment and Reduce GVHD"
Goal: To assess how glycan engineering could improve outcomes in core blood transplants

Report of Local Teaching and Training

Teaching of Students in Courses:

Florida International University

2019-present Course Lecturer, Integrated Functions of the Human Body (HWC0M BMS 6500)

Harvard College

1975-1977 Undergraduates	Science, Harvard University Bureau of Study Council Tutor, 6 hours/week
1976-1977 20 Biology Majors	Natural Sciences 5 Teaching Assistant, 6 hours/week for 2 terms (Fall & Spring)
1997 Undergraduates	Senior Common Room Winthrop House and Currier House Member, 1 hour/month
1997-present Undergraduates	Biology and Biochemistry, Winthrop House Non-resident Tutor, 1 hour/week
2004-2007 2 students	91r (Independent Research/Study) for Harvard College Students Preceptor, 8 hours/week
2011-present 1 student	91r (Independent Research/Study) for Harvard College Students Preceptor, 8 hours/week
2012-2013 2 students	91r (Independent Research/Study) for Carlos Rodriguez-Russo (Harvard College) Senior Honors Thesis Supervisor/Preceptor, 8 hours/week
2013-2014 2 students	91r (Independent Research/Study) for Ritika Walia (Brandeis University) Senior Honors Thesis Supervisor/Preceptor, 8 hours/week
2010-2019 12 students	Harvard Freshmen Seminar 23E: The Scientific Method: Roadmap to Knowledge Professor, 18 hours/week, one Semester

Harvard Medical School

1979 110 students	Physiology and Biophysics 700.0 Teaching Assistant, 5 hours/week for 4 weeks
1999-2008 25 students	HST Hematology (HST – 080) Course Lecturer, 2 hour lecture - 20 hours/year
2001-2006 2 students	Introduction to Clinical Medicine, HST Program (at BWH) Full time Preceptor, 100 hours/year (spring term, 2 nd year)
2005-2007 10 Students	GSAS Transplantation Biology – 300 level course Course Lecturer, 2 hour lecture – 20 hours/year
2005-2007 15 high school students	Mentoring for Science Program (a Harvard Medical School program to provide science education to high school students in the Boston Public School System) Course Lecturer and Case Author, 10 hours lecture, 390 hours of case authorship – 400 hours/year
2007-2010	HST 240 - Translational Medicine Preceptorship

20 MIT Graduate Students	Course Director, 12 hours/month (144 hours/year)
2008-2012 20 MIT Graduate Students	HST 594 - Translational Medicine Seminar Course Director, 5 hours/month, fall-spring terms (40 hours/year)
2014-2015 2 students	Patient-Doctor II (HMS Physical Diagnosis Course) Full time Preceptor, 50 hours/year (spring term, 2 nd year)
2015-2019 3 students	HST200 (HMS/MIT Physical Diagnosis Course) Full time Preceptor, 50 hours/year (spring term, 2 nd year)

University of South Florida College of Medicine

1993-1995 2 students	Physical Diagnosis Instructor, 5 hours/week, one term/year
1993-1996 130 medical students	Medical Microbiology and Immunology Course (1993 – 1996) and Hematology Course (1996) Course lecturer, 2 lectures in each course, 20 hours/year

University of Miami School of Medicine

1985-1992 150 students	Core Immunology Course, Laboratory/Conference Instructor, 4 hours/week for 3 weeks
1988-1992 3 second year students	Physical Diagnosis Course Instructor, 5 hours/week, one term/year
1990 M.D., Ph.D. students in tutorial	“Life Cycle” Module, Physician-Scientist Program Tutor, 10 hours/week for 8 weeks
1992 5 graduate students	“Autoimmune Disease” Course Director, 15 hours/week for 5 weeks

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

1988-1989	Chief Medical Resident Jackson Memorial Hospital, Miami, FL	Full Time-60 hrs/week
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Clinical Supervisory and Training Responsibilities

Year(s)	Responsibility	Institution	Level of Effort
1988-1993	Medical Attending	Miami VA Medical Center, Jackson Memorial Hospital	Full time-4 mos/year
1993-1996	Attending, BMT Service	H. Lee Moffitt Cancer Center and Research Institute	Full time-4 mos/year

1997-2002	Attending, BMT Service	Massachusetts General Hospital	Full time-4 mos/year
2002-2018	Attending, BMT Service	BWH/DFCI	Full time- 2 mo/year

Laboratory and Other Research Supervisory and Training Responsibilities

1989-1993	Lab supervisor/advisor to high school students in the Secondary School Laboratory Research Program in Dade County, FL, and mentor to three college students and one post doc.	Daily mentorship for four years
1990-present	Supervision of post-doctoral fellows (University of Miami, University of South Florida, Harvard Medical School, Florida International University)	Daily mentorship (see below)
1993-1996	Lab supervisor /advisor to two college students, three graduate students and three post docs, University of South Florida	Daily mentorship for four years
1997-present	Laboratory research mentor to college students (>30 students since 1997)	Daily mentorship - 3mos/year (during summer)

Formally Supervised Trainees (>1 year of mentoring):

1990-1993	Lou Meng, M.D. Accomplishments: Now CEO of biotech company; previously served as Assistant Professor of Pathology at the University of Miami School of Medicine	Post-doctoral fellow
1993-1995	Jane Messina, M.D. Accomplishments: Professor of Pathology and Cell Biology, Dermatology and Cutaneous Surgery, and Oncologic Services, University of South Florida College of Medicine	Post-doctoral fellow
1993-1996	Katrina Allen, Ph.D. Accomplishments: Current position is unknown	Post-doctoral fellow
1994-1996	Xhizuang Shu, M.D., Ph.D. Accomplishments: Senior scientist working in biotech industry in China	Post-doctoral fellow
1997-1999	Han Chong Toh, M.D.; Ph.D. Accomplishments: Deputy Director, National Cancer Center Singapore	Post-doctoral fellow
1997-1999	Pierre Theodore, M.D. Accomplishments: Associate Professor of Surgery, University of California San Francisco; Vice-president, Scientific Innovation, Thoracic Surgical Oncology, Johnson & Johnson Medical Devices Company.	Post-doctoral fellow
1999-2003	Charles J. Dimitroff, Ph.D. Accomplishments: Professor of Translational Medicine, and Executive Vice-president for Research, Herbert Wertheim College of Medicine, Florida International University, Miami, FL	Post-doctoral fellow
2001-2003	Mirjana Milinkovic, M.D. Accomplishments: Associate Professor of Dermatology, University of Belgrade, Serbia	Post-doctoral fellow

2002-2004 Min Xu, M.D. Post-doctoral fellow
Accomplishments: Academic Urologist, Tufts Medical Center

2003-2007 Monica Burdick, Ph.D. Post-doctoral fellow
Accomplishments: Associate Professor of Chemical and Biomolecular Engineering, Ohio University

2004-2007 Nilesh Dagia, Ph.D. Post-doctoral fellow
Accomplishments: Head of Biology and Pharmacology, Opal Oncology

2004-2006 Vicente Resto, M.D., Ph.D. Post-doctoral fellow
Accomplishments: Professor of Surgery and Biochemistry, and Chair of Department of Otolaryngology, University of Texas, Galveston

2004-2010 Zeineb Gadhoun, Ph.D. Post-doctoral fellow
Accomplishments: Senior Research Scientist, King Abdullah University of Science and Technology, Jeddah, Saudia Arabia

2005-2009 Jasmeen Merzaban, Ph.D. Post-doctoral fellow
Accomplishments: Associate Professor of Bioscience, King Abdullah University of Science and Technology, Jeddah, Saudia Arabia

2007-2010 Sai Thankamony, Ph.D. Post-doctoral fellow
Accomplishments: Senior Scientist, Biogen

2007-2009 Tomas Navarro, M.D. Post-doctoral fellow
Accomplishments: Associate Professor, Hospital Universitari German Trias i Pujol (Barcelona, Spain)

2007-2009 Yakov Peter, Ph.D. Post-doctoral fellow
Accomplishments: Assistant Professor of Biology, Albert Einstein School of Medicine, NY

2008-2011 Shwan Tawfiq, M.D. Post-doctoral fellow
Accomplishments: Chief of Bone Marrow Transplant at the University of Kurdistan, Iraq

2008-2012 Pieter Jacobs, Ph.D. Post-doctoral fellow
Accomplishments: Managing Scientist: Head of Cell Culture, Manufacturing Sciences and Technology Department, Genzyme Corporation (Geel, Belgium)

2009-2011 Shinobu Sakai, Ph.D. Visiting Scientist, Japan Society for the Promotion of Science
Accomplishments: Senior Research Scientist, National Institute of Health Sciences, Japan

2006-2014 Cristina Silvescu, Ph.D. Post-doctoral fellow
Accomplishments: Scientist, Bruker Inc.

2012-2014 Catalina Ruiz-Cañada, Ph.D. Post-doctoral fellow
Accomplishments: Instructor, University of Massachusetts Medical School, Worcester, MA

2014-2015 Victor C. Wang, M.D. Post-doctoral fellow
Accomplishments: Academic hospital private practice, Children's Hospital Orange County

2012-2016	Brad Dykstra, Ph.D. Accomplishments: Research Scientist, Platelet Biogenesis, Boston, MA	Post-doctoral fellow
2012-2018	Olga Gisela Pachón-Peña, Ph.D. Accomplishments: Staff Scientist, Maine Medical Center	Post-doctoral fellow
2014-2019	Nandini Mondal, Ph.D. Accomplishments: Senior Scientist, Beam Therapeutics	Post-doctoral fellow
2016-2018	Mariana Silva, Ph.D. Accomplishments: Senior Scientist, Vor Biopharma	Post-doctoral fellow
2018-2022	Winston Elliott, Ph.D. Accomplishments: Biotech Consultant	Post-doctoral fellow
2020-present	Evan Ales	MD,PhD (PhD student in the Biomedical Sciences Program at HWCOR)
2020- 2023	Kevin Chandler, PhD	Scholar trainee (K12; FIU)
2021- present	Ryan Jajosky, MD	Scholar trainee (K12; MassGenBrigham, HMS)
2021- present	Elizabeth Calle, MD,PhD	Scholar trainee (K12; MassGenBrigham, HMS)
2022- present	Mark Murakami, MD	Scholar trainee (K12; Dana-Farber Cancer Inst, HMS)

Formal Teaching of Peers (CME and other continuing education courses):

2009, 2011	Immunology and Skin Disease: Frontiers in Cutaneous Immunology; presentation entitled “Mesenchymal Stem Cells” Harvard Medical School	Speaker
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Local Invited Presentations:

1984	“Effector Functions of the Macrophage” Harvard Medical Society Symposium (Boston, MA) Harvard Medical School	Lecture
1985	“The Complement Genes of the Major Histocompatibility Complex” Harvard Medical School (Boston, MA) Department of Pathology	Lecture

1986	“The Class III Genes of the MHC” University of Miami School of Medicine, FL Department of Immunology and Microbiology	Seminar
1990	“Lymphocyte Migration” University of Miami School of Medicine (Miami, FL) Department of Immunology and Microbiology	Seminar
1991	“Chronic Lymphocytic Leukemia” University of Miami School of Medicine (Miami, FL)	Grand Rounds
1992	“The Effects of Steroids on Lymphocyte Migration” University of Miami School of Medicine (Miami, FL) Department of Immunology and Microbiology	Seminar
1994	“Lymphocyte Migration in Health and Disease” University of South Florida, Department of Medicine	Grand Rounds
1994	“Regulation of L-Selectin Gene Expression” University of South Florida Department of Biochemistry and Molecular Biology	Seminar
1998	“Pathobiology of Cutaneous GVHD” Harvard Skin Disease Research Center Seminar Series (Boston, MA) Sponsor/Source Compensation	Seminar
1998	“The Selectins” Massachusetts General Hospital (Boston, MA) Pathology Research Seminar Series	Lecture
1999	“The Structural Biology of the L-selectin Ligands” Harvard Institutes of Medicine (Boston, MA) Immunology Seminar Series	Lecture
1999	“GI Complications of Bone Marrow Transplantation” Massachusetts General Hospital (Boston, MA) Gastroenterology	Grand Rounds
1999	“Site-specific Migration of Lymphocytes in Graft-versus-Host Disease” Dana-Farber Cancer Institute (Boston, MA) Bone Marrow Transplant Conference	Lecture
2001	“The Science and Politics of Embryonic and Adult Stem Cell Research” Brigham and Women’s Hospital (Boston, MA) Chief Medical Resident’s Teaching Conference	Lecture
2001	“Hermes, HCELL and Hematopoiesis: Homing in on CD44”	Lecture

	Harvard Medical School (Boston, MA) Vascular Biology Seminar Series	
2002	“The ‘Roll’ of Selectins: How Stem Cells Migrate” Massachusetts General Hospital (Boston, MA) Cancer Seminar Series	Seminar
2002	“The Pathobiology of Acute GVHD: A Double-edged Sword” Dana-Farber Cancer Institute (Boston, MA) Bone Marrow Transplant Conference	Lecture
2003	“Human Hematopoiesis: New ‘Roll’ for CD44” Harvard Medical School (Boston, MA) Center for Blood Research Seminar Series	Seminar
2003	“Optimizing Homing of Hematopoietic Stem Cells for Regenerative Therapies” Dana-Farber Cancer Institute (Boston, MA) Bone Marrow Transplant Conference	Lecture
2003	“The Peripatetic Adult Stem Cell” Harvard Medical School (Boston, MA) New England Regional Primate Center	Lecture
2005	“Strategies to Enhance Lymphocyte Migration to Sites of Relapse Following Hematopoietic Stem Cell Transplantation” Dana-Farber Cancer Institute (Boston, MA) Bone Marrow Transplant Conference	Lecture
2005	“The Lymphocyte Homing Receptors” Dana-Farber Cancer Institute (Boston, MA) Bone Marrow Transplant Conference	Lecture
2006	“Molecular Basis of Hematopoietic Stem Cell Trafficking In Utero” Children’s Hospital Medical Center (Boston, MA) Fetal Medicine/Fetal Care Center Grand Rounds	Lecture
2007	“Regulation of Stem Cell Trafficking by Glycan Engineering” Brigham and Women’s Hospital (Boston, MA) Division of Hematology	Seminar
2007	“Applications of Mesenchymal Stem Cell-based Regenerative Therapeutics” Dana-Farber Cancer Institute (Boston, MA) Bone Marrow Transplant Conference	Lecture
2008	“Chemical Engineering of Cell Migration” Massachusetts General Hospital (Boston, MA) Steele Laboratory Seminar Series	Seminar
2009	“Home Sweet Home: Steering Cell Migration in the Vasculature via	Seminar

	Glycoengineering” Children’s Hospital (Boston, MA) Harvard-wide Vascular Biology Seminar Series	
2011	“Enabling Stem Cell Therapeutics through GPS” Shriners’ Hospital (Boston, MA)	Invited Speaker
2019	“Paving the Road to Safe and Efficient Cell Therapeutics” Keynote Speaker, Biomedical Sciences Institute Advisory Board Meeting and Symposium Florida International University, (Miami, FL)	Speaker
2019	“Where are we going?” Annual General Medical Staff Meeting West Kendall Baptist Hospital (Miami, FL)	Keynote Speaker
2019	“Immune Response against transplants and tumors” Florida International University Herbert Wertheim College of Medicine (Miami, FL)	Lecture
2019	Ehrlich’s “Magic Bullet” Realized: Immunotherapy with BiTES and CAR T-cells Florida International University Herbert Wertheim College of Medicine (Miami, FL)	Lecture
2019	“Realizing the promise of translational glycobiology In clinical medicine Torrey Pines Institute for Molecular Studies Port St. Lucie, FL	Speaker
2020	“Glycans as Targets for Cancer Therapeutics” Harvard ProTG K12 Didactic Lecture Series/ Virtual	Lecture
2021	“The Glycoscience of Schizophrenia” FIU HWCOC Citrus Health Grand Rounds Herbert Wertheim College of Medicine (Miami, FL)	Grand Rounds

Report of Regional, National and International Invited Teaching and Presentations

Regional

No presentations below were sponsored by outside entities:

1986	“Acquired Immunodeficiency Disease” Greater Miami Interdenominational Faith Conference, Miami, FL	Lecture
1986	“The Current Truth About AIDS” Temple Israel Miami Health Symposium, Miami, FL	Lecture

1987	“AIDS: The Facts” Dade County Family Services Center, Miami, FL	Lecture
1988	“Health Care and the Homeless” Florida Division of American College of Physicians, Annual Meeting (Jacksonville, FL)	Lecture
1992	“Immunobiology of Chronic Lymphocytic Leukemia” Leukemia Society of South Florida, Miami, FL	Lecture
1993	“Pathophysiology of Lymphocyte Migration” University of South Florida, Tampa, FL Department of Pathology and Laboratory Medicine	Grand Rounds
1999	“The Glycobiology of the Selectin Ligands” Boston Glycobiology Discussion Group (Boston, MA)	Lecture
2001	“How is a Scientist ‘Made’?” Southern New England Junior Science and Humanities Symposium	Lecture
2002	“Stem Cell Therapies: Do We Need Embryonic Stem Cells to Treat Disease?” Harvard University (Boston, MA) Harvard College Class of 1977 (25 th Reunion) Reunion Symposia, Symposium on Biotechnology	Moderator and Lecture
2005	“The Role of Glycans in Stem Cell Migration” Boston Glycobiology Discussion Group	Lecture
2008	“Stem Cells” Harvard Club in Concord (Concord, MA)	Seminar
2008	“GPS for Stem Cells” Boston Museum of Science (Boston, MA) Current Science and Technology Seminar Series	Lecture
2008	“Glycosyltransferase-Programmed Stereosubstitution (GPS) of CD44: Steering Stem Cells to Treat Osteoporosis” CIMIT Forum (Boston, MA)	Lecture
2008	“Stem Cells” Harvard Club in Concord (Concord, MA)	Seminar
2009	“The Bioethics of Stem Cells” Temple Shir Tikva (Wayland, MA)	Lecture
2010	“The Biology and Bioethics of Stem cell-based Therapeutics” Leonard Morse Hospital (Natick, MA)	Grand Rounds
2010	“Optimizing Cellular Therapeutics by Glycan Engineering of the	Speaker

	Cell Surface” The Medical Exchange Club (Boston, MA)	
2011	“The Promise of Stem Cell-based Therapies” Harvard Club of Cape Cod (Yarmouth Port, MA)	Speaker
2012	“Desperately Seeking Cures: The Politics of Stem cell Therapeutics” Harvard Club of the North Shore (Salem, MA)	Speaker
2012	“Latino Leadership in Medicine” Latino Leadership Initiative, Harvard Kennedy School of Government, Harvard University (Cambridge, MA)	Speaker
2013	“The Dark Side of G-CSF” Hematology Grand Rounds, Brigham and Women’s Hospital/Dana-Farber Cancer Institute (Boston, MA)	Speaker
2013	“Latino Leadership in Medicine” Latino Leadership Initiative, Harvard Kennedy School of Government, Harvard University (Cambridge, MA)	Speaker
2013	“Stem Cell Therapeutics and the Future of Medicine” Brandeis Global Youth Summit on the Future of Medicine	Speaker
2013	“Trousseau: The Man, The Syndrome, and The Pathobiology” Hematology Grand Rounds Brigham and Women’s Hospital/Dana-Farber Institute (Boston, MA)	Speaker
2014	“The Scientific Method” The Medical Exchange Club (Boston, MA)	Speaker
2014	“G-CSF Toxicity: Innate Immunity Gone Wild” Immunology Seminar Series, Brigham and Women’s Hospital/Dana-Farber Cancer Institute (Boston, MA)	Speaker
2014	“Translational Research: The Making of a Clinician-Scientist” Brandeis Global Youth Summit on the Future of Medicine Brandeis University (Waltham, MA)	Speaker
2014	“Homing in on CD44: Steering Cell Migration” Hematology Grand Rounds (Boston, MA) Brigham and Women’s Hospital	Speaker
2014	“What Can be Bad About G-CSF Administration?” Harvard Medical School Transfusion Medicine Grand Rounds (Boston, MA)	Speaker
2015	“The Pathobiology of G-CSF-induced Angiototoxicity”	Speaker

Vascular Biology Seminar Series
Harvard Medical School/Boston Children's Hospital (Boston, MA)

2016	“The Scientific Method: An Unbiased Assessment” Hematology Grand Rounds Brigham and Women's Hospital (Boston, MA)	Speaker
2016	“Exploiting E-selectin Expression to Cure Skin Disease” CBRC Seminar Series Massachusetts General Hospital/Harvard Cutaneous Biology Research Center (Boston, MA)	Seminar
2016	“Celebrating the Latino Spirit” Latino Heritage Celebration Day Boston Children's Hospital (Boston, MA)	Keynote Speaker
2016	“Applying Lessons from Transfusion Medicine to Cure Osteoporosis” Harvard Medical School Transfusion Medicine Grand Rounds (Boston, MA)	Speaker
2016	“GPS for Curing Osteoporosis” Endocrine Unit Seminar Series Massachusetts General Hospital (Boston, MA)	Seminar
2016	“Enabling Translational Glycobiology” Human Glycome Project Radcliffe Institute for Advanced Study Harvard University (Boston, MA)	Seminar
2017	“Reversing Osteoporosis via Hematology” Department of Hematology Brigham and Women's Hospital (Boston, MA)	Grand Rounds
2018	“Applying the Brakes on CAR T-Cells via Glycoengineering” Harvard Medical School Center for Glycoscience Inaugural Symposium Joseph B. Martin Conference Center – HMS (Boston, MA)	Speaker
2019	“Paving the Road to Safe and Efficient CAR T-cell Therapeutics” Hematology Grand Rounds Brigham and Women's Hospital (Boston, MA)	Grand Rounds
2019	“Stem Cell Therapy: The Social Science and the Medical Science” Fisher Island (Miami, FL)	Speaker
2019	“The Path to Cure” Omar Pasalodos, M.D., Memorial Lecture Baptist Health South Florida, Miami, FL	Speaker
2019	“Optimizing Adoptive Immunotherapeutic via GPS” Hematology/Oncology Grand Rounds	Grand Rounds

Miami Cancer Institute, (Miami, FL)

2019	“Driving the CAR T-cells to Sites Where Needed” University of Miami, Miller School of Medicine Department of Microbiology and Immunology (Miami, FL)	Invited Speaker
2019	“Curing Osteoporosis Using Sugar-coated Stem Cells” Leon Medical Centers Conference (Key Biscayne, FL)	Speaker
2020	“The Power of Sugar-Coated Stem Cells” South Miami Hospital Grand Rounds South Miami Hospital, Miami, FL	Grand Rounds
2020	“Diagnostic & Prognostic Utility of Measurements of Blood Lymphocyte Subsets in Patients with Covid-19 Infection” Florida Medical Schools Covid-19 Research Symposium	Co-Coordinator/Speaker
2021	“Improving the Efficacy of CAR T-cell Therapy Hematology/Medical Oncology Educational Conference UM Sylvester Grand Rounds (Miami, FL)	Grand Rounds
2022	“The Role of the Scientific Method in Clinical Medicine” Medical Grand Rounds Miami Veterans Affairs Medical Center (Miami, FL)	Grand Rounds

National

No presentations below were sponsored by outside entities:

1992	“Lymphocyte Homing Receptors” H. Lee Moffitt Cancer Center, University of South Florida (Tampa, FL)	Grand Rounds
1994	“Lymphocyte Migration: The Biology of L-Selectin” NIH/NHLBI Hematology Branch	Seminar
1994	“The Physiology of Lymphocyte Migration Following Bone Marrow Transplantation” University of Washington (Seattle, WA) Fred Hutchinson Cancer Center	Seminar
1995	“Lymphocyte Migration Following Bone Marrow Transplantation” New York Academy of Sciences Conference (Orlando, FL)	Lecture
1995	“Expression of an L-Selectin Ligand on Hematopoietic Progenitor Cells” Gibco-BRL/Life Technologies (Bethesda, MD)	Lecture
1995	“The Biology of L-Selectin Ligands” Monsanto/Searle Visiting Scientist Seminar Series (St. Louis, MO)	Seminar
1995	“Pathophysiology of Lymphocyte Migration following Bone	Grand Rounds

	<p>Marrow Transplantation" University of South Carolina School of Medicine (Columbia, SC) Hematology/Oncology Grand Rounds</p>	
1995	<p>“The Biology of Selectins: Mediators of the Inflammatory Response” University of South Florida Department of Pathology and Laboratory Medicine Grand Rounds</p>	Grand Rounds
1995	<p>“Structural Biology of L-selecting Ligands” Genetics Institute (Cambridge, MA) Visiting Scientist Lecture Series</p>	Lecture
1995	<p>“Adhesion Molecules and Hematopoiesis: Is CD34 and L-Selectin Ligand?” Harvard Medical School (Boston, MA) Hematology/Oncology Grand Rounds, Brigham and Women's Hospital/Beth Israel Hospital</p>	Grand Rounds
1995	<p>“Tissue-Specific Lymphocyte Migration Following Bone Marrow Transplantation” Harvard Medical School/Beth Israel Hospital (Boston, MA) Department of Pathology</p>	Lecture
1996	<p>“The Biology of L-Selectin and its Ligands in Hematopoiesis”, and “The Pathophysiology of Lymphocyte Migration in GVHD” City of Hope National Cancer Center (Duarte, CA)</p>	Lecture
1996	<p>“L-Selectin Ligand as a Target for Gene Therapy” University of Southern California (Los Angeles, CA) Gene Therapy Laboratories Seminar Series</p>	Lecture
1996	<p>“The Biology of L-Selectin in Hematolymphopoiesis” Mayo Clinic (Rochester, MN) Mayo-Luther Forum on Stem Cells</p>	Lecture
1996	<p>“Adhesion Molecules and Hematopoiesis” University of Virginia School of Medicine (Charlottesville, VA) Hematology/Oncology</p>	Grand Rounds
1996	<p>“The Selectins and Their Ligands” Duke University (Durham, NC) Hematology/Bone Marrow Transplant Service</p>	Grand Rounds
1997	<p>“Selectins and the Hematopoietic Microenvironment” University of Pittsburgh Hematology/Bone Marrow Transplant Service</p>	Grand Rounds
1997	<p>“Graft-versus-Host Disease” Case Western Reserve University Cancer Center (Cleveland, OH) Hematology/Oncology Division Seminar Series</p>	Lecture

1998	“Characterization of a Novel L-selectin Ligand Expressed on Hematopoietic Progenitor Cells” NIH/NHLBI (Bethesda, MD) Hematopoietic Stem Cell Biology Meeting	Lecture
1999	“The Making of a Translationalist” University of Miami (Miami, FL) Eastern Student Research Forum	Keynote Address
2000	“Characterization and Structural Biology of HCELL, A Novel L-selectin Ligand” Roswell Park Cancer Institute (Buffalo, NY) Department of Pharmacology and Developmental Therapeutics Seminar Series	Lecture
2000	“Biology and Pathobiology of Lymphocyte Migration” Roswell Park Cancer Institute (Buffalo, NY)	Medical Grand Rounds
2000	“Leukocytes and the Mississippi: Rollin’ Along” Tulane University Cancer Center (New Orleans, LA)	Lecture
2000	“The Molecular Basis of Tissue-specific Lymphocyte Migration” Hennepin County Medical Center/University of Minnesota (Minneapolis, MN) Nephrology/Renal Transplant Program Seminar Series	Lecture
2000	“Pathobiology of Lymphocyte Migration in Acute GVHD” University of Minnesota Cancer Center (Minneapolis, MN) Bone Marrow Transplant Service	Grand Rounds
2001	“The Intern Asked the Question: So, How is it that Blood Cells Migrate into the Bone Marrow?” University of Miami (Miami, FL) Eastern Student Research Forum	Keynote Address
2001	“Shear Madness: How Hematopoietic Cells Home to Bone Marrow” University of Washington School of Medicine (Seattle, WA) Hematology/Oncology Division	Grand Rounds
2001	“Development and Use of the ‘Blot Rolling Assay’ to Identify a Novel Selectin Ligand Expressed on Hematopoietic Progenitor Cells” NIH/NHLBI Hematopoietic Stem Cell Biology Meeting (Bethesda, MD)	Lecture
2001	“Novel Methods to Improve the Clinical Diagnosis and Management of Acute Graft-versus-Host Disease” Oregon Health Science University Cancer Center (Portland, OR) Hematology/Oncology Division	Grand Rounds
2001	“Adult Stem Cells: Politics, Plasticity and Promise for the Future” University of Miami School of Medicine (Miami, FL) Dr. Larry M. Fishman Symposium	Lecture

2002	“How Stem Cells Learn to ‘Crawl’” Roger Williams Hospital Cancer Center (Providence, RI) Seminar Series	Lecture
2003	“The Trafficking of Adult Stem Cells” 52 nd Annual Montagna Symposium on the Biology of Skin (Snowmass, CO)	Lecture
2003	“The Discovery of ‘HCELL’, the Bone Marrow ‘Homing Receptor’” Johns Hopkins School of Medicine (Baltimore, MD) Department of Pharmacology Seminar Series	Lecture
2003	“Recent Advances in Our Understanding of Acute Cutaneous GVHD” Connecticut Society of Dermatology and Dermatologic Surgery Annual Meeting (Hartford, CT)	Lecture
2003	“The Molecular Basis of Acute GVHD” All-Children’s Hospital (St. Petersburg, FL), Univ. of South Florida College of Medicine Immunology Seminar Series	Lecture
2003	“New ‘Avenues’ in Medicine: Hematopoietic Stem Cells and Regenerative Therapies” All-Children’s Hospital (St. Petersburg, FL), Univ. of South Florida College of Medicine	Grand Rounds
2004	“Regenerative Medicine: Implications for Future Clinical Management” University of Miami School of Medicine (Miami, FL) Medical Grand Rounds	Grand Rounds
2004	“T Cell Depletion and Leukocyte-Endothelial Interactions in Hematopoietic Stem Cell Transplantation” Satellite Symposium, Annual Meeting of the American Society of Blood Marrow Transplantation (Orlando, FL)	Lecture
2004	“Subverting the Inflammatory Response for Regenerative Medicine” Cleveland Clinic Foundation (Cleveland, OH) Cleveland Clinic Immunology Seminar Series	Lecture
2005	“Stem Cell Migration: Homing in on CD44” NIH/NHLBI (Bethesda, MD) Bone Marrow Transplant Unit, Hematology Branch, Invited Seminar Series	Lecture
2006	“Homing Receptors, Chemokines, and the Biology of Cellular Trafficking” American Society of Blood and Marrow Transplantation Annual Meeting (Honolulu, HI)	Lecture
2006	“Steering Stem Cells: Optimizing the Vascular Route for Regenerative Medicine”	Grand Rounds

Tulane University Health Science Center (New Orleans, LA)
Center for Gene Therapy

2006	<p>“Convergence on Glycans: The Molecular Basis of Stem Cell Trafficking and Cancer Metastasis” University of New Hampshire (Durham, NH) Charles Warren Memorial Symposium on Structural Glycomics</p>	Keynote Address
2006	<p>“Engineering Stem Cell Trafficking and Regenerative Therapeutics” Fred Hutchinson Cancer Research Center (Seattle, WA) Clinical Research Division</p>	Grand Rounds
2006	<p>“Optimizing Homing of Mesenchymal Stem Cells for Regenerative Medicine” Annual NIH Gene Therapy Symposium (Sonoma, CA)</p>	Lecture
2006	<p>“The ‘Rolls’ of Homing Receptors and Chemokines in Stem Cell Trafficking to Bone Marrow” Weill Medical College-Cornell University/New York Presbyterian Hospital (New York, NY) Hematology/Oncology Division</p>	Grand Rounds
2007	<p>“‘Braking’ the Barrier Towards Use of Adult Stem Cells in Regenerative Medicine” City of Hope Cancer Center (Duarte, CA) Stem Cell Biology Seminar Series</p>	Lecture
2007	<p>“Enabling Mesenchymal Stem Cell-based Therapy for Osteogenesis Imperfecta” Baylor College of Medicine (Houston, TX) Feigen Center Pediatric Research</p>	Lecture
2007	<p>“Ex Vivo Glycan Engineering of Cell Migration: Implications for Immunity and Stem Cell Therapeutics” University of California (Los Angeles, CA) ImmunoForum Lecture Series</p>	Lecture
2007	<p>“The Discovery of HCELL” NIH/NHLBI (Bethesda, MD) Hematology Seminar Series</p>	Lecture
2008	<p>“The Role of Cancer Cell Surface Glycans in Metastasis” NCI Conference on the Biology of Brain Metastasis (Bethesda, MD)</p>	Speaker
2008	<p>“GPS for Stem Cells: The Roadmap for Regenerative Therapeutics” Rhode Island Science and Technology Advisory Council Symposium (Providence, RI)</p>	Keynote Address
2008	<p>“Eradicating the Leukemia Stem Cell” 10th International Conference on Chronic Myeloid Leukemia (Boston, MA)</p>	Lecture

2008	“Stem Cell Therapeutics” Bentley College (Waltham, MA) Congressional Student Leadership Conference on Medicine and Healthcare	Lecture
2009	“Stem Cell-based Therapies: Balancing Medical Need and Bioethics” Baskin Memorial Lecture, Temple Judea (Coral Gables, FL)	Lecture
2010	“Glycosyltransferase-Programmed Stereosubstitution (GPS): Directing Cell Trafficking in vivo” Consortium for Functional Glycomics, National Workshop Meeting (Bethesda, MD)	Speaker
2010	“Fulfilling the Promise of Stem Cell Therapeutics” Indiana Life Sciences Summit (Indianapolis, IN)	Keynote Address
2011	“The Past, Present, and Future of Stem Cells: At the Interface of Medical Necessity and Bioethics” Harvard Club of Maryland: The Johns Hopkins Club (Baltimore, MD)	Speaker
2011	“Unveiling the Devils in the Details: Optimizing Ex Vivo Glycan Engineering of Live Cell Surfaces” Complex Carbohydrate Research Center, University of Georgia (Athens, GA) Georgia Glycoscience Symposium/ Consortium for Functional Glycomics Workshop	Keynote Address
2011	“Stem Cells: What is Happening... Today?” Harvard Club of Princeton (Princeton, NJ)	Speaker
2011	“Desperately Seeking Cures: Stem Cell Therapeutics, Translational Glycobiology, and the USPTO” Sanford-Burnham Medical Research Institute (La Jolla, CA) Translational Research Seminar Series	Lecture
2011	“Optimizing Stem Cell Therapeutics for Cardiovascular Diseases” South Miami Heart Center Comprehensive Cardiovascular Symposium	Speaker
2011	“Enabling Stem Cell Therapeutics for Neurologic Diseases” University of Maryland, Center for Neurologic Diseases (Baltimore, MD)	Invited Speaker
2011	“Practical and Bioethical Aspects of Stem Cell Therapeutics” Department of Biology, Yeshiva University (New York, New York)	Visiting Professor
2011	“GPS for Regenerative Medicine: Optimizing Stem Cells Therapeutics” Department of Medicine, University of Massachusetts (Worcester, MA)	Medical Grand Rounds Speaker
2012	“Fulfilling the Promise of Translational Biology” National Academy of Sciences, Workshop on the Future of Glycoscience	Plenary Speaker

(Washington, DC)

2012	“Glycosyltransferase-Programmed Sterosubstitution (GPS): Sweetening The Applicability of Cellular Therapeutics” National Institutes of Health, Glycoscience Symposium: Interfacing Glycoscience with Disease and Clinical Practice (Bethesda, MD)	Plenary Speaker
2012	“Stem Cell Therapeutics: Separating Hype from Facts” Harvard Club of Miami (Miami, FL)	Annual Keynote Speaker
2012	“Latino Leadership in Medicine: Desperately Seeking Cures” Miami Dade College, 305 Rise Conference (Miami, FL)	Annual Keynote Speaker
2012	“Stem Cell Therapeutics: Political Controversy and Clinical Applications” Doctor’s Hospital at Renaissance, Edinburg, TX	Grand Rounds
2012	“Desperately Seeking Cures” Texas A&M International University, Laredo, TX	Visiting Professor Lecture
2012	“Leading with Your Passion” Texas A&M International University, Laredo, TX (Leadership Students’ Meeting)	Annual Keynote Speaker
2012	“Finding Paradise” Texas A&M International University, Laredo, TX, Laredo High School District	Speaker
2012	“The Biology of Lymphocyte Migration: Implications for Neurologic Diseases” Neurosciences Grand Rounds, University of California San Francisco, Dept. of Neurology	Visiting Professor Lecture
2013	“The Vascular Route to Stem Cell Therapeutics” Mount Sinai Medical Center, Miami, FL, Division of Cardiology	Visiting Professor Grand Rounds
2013	“The Future of Stem Cell Therapy” Harvard Club of Houston, Houston, TX	Annual Keynote Speaker
2013	“Optimizing Cellular Therapy via Cell Surface Glycan Engineering” Glycoimmunology Symposium, Harvard Medical School, Boston, MA	Speaker
2013	“Steering Stem Cells to Cure Osteoporosis” Department of Medicine University of Florida College of Medicine, Gainesville, FL	Visiting Professor, Medical Grand Rounds
2013	“The Scientific Process” NHLBI Lung Regeneration and Repair Consortium Meeting, University of Pennsylvania School of Medicine, Philadelphia, PA	Keynote Speaker

2014	“HCELL: The Bone Marrow Homing Receptor” Bone Marrow Transplant Program Grand Rounds MD Anderson Cancer Center, Houston	Grand Rounds Speaker
2015	“The E Selectin Ligands: The Good, the Bad and the (Extremely) Ugly” Department of Biological Chemistry Johns Hopkins University, Baltimore, MD	Visiting Professor Invited Lecture
2015	“Stem Cell Therapeutics” Harvard Club of West Coast of Florida Tampa, FL	Annual Keynote Speaker
2015	“Reversing Degenerative Discourse: The Promise of Stem Cell Therapeutics” Harvard Club of Central Florida Orlando, FL	Annual Keynote Speaker
2015	“Glycoscience Innovation Inspired by Medical Necessity: The Impact of Translational Glycobiology” NHLBI Biomedicine Lecture Series Bethesda, MD	Invited Speaker
2015	“Achieving the Promise of Regenerative Therapeutics” UF Health Cancer Center – Orlando Health Orlando, FL	Oncology Grand Rounds Speaker
2016	“Stem Cell Therapeutics: The Politics, the Hype, and the Curative Deliverables” The Harvard Club of Broward County Boca Raton, FL	Annual Keynote Speaker
2016	“The Curative Power of Sugar-coated Stem Cells” Gates Stem Cell Center Seminar Series Denver, CO	Invited Speaker
2016	“GPS: Guiding a path to cure a disease by sugar coating stem cells” Biotechne/R & D Systems Minneapolis, MN	Invited Speaker
2017	“GPS for CAR-T cells: Navigating Cell-based Therapeutics to Cure Cancer” Memorial Sloan Kettering Cancer Center New York, NY	Medical Grand Rounds
2018	“GPS: Glycoengineering Cell Trafficking for Clinical Indications” Duke University School of Medicine, Department of Biochemistry Seminar Series Durham, North Carolina	Invited Speaker
2021	“Enabling the Roadmap for CAR T-Cell Therapy”	Invited Speaker

MCI BHSF Summit of the Americas on Immunotherapies for Hematologic Malignancies
Miami, FL

2021	“Saving Sight via Site-directed Cell Trafficking” Frontiers in Vision Science Lecture Bascom Palmer Eye Institute Miami, FL	Invited Speaker
2023	“Realizing the Dream of the ‘Fountain of Youth’” Medical Exchange Club Boston, MA	Invited Speaker
2023	“The Impact of AI on Glycoscience” NHLBI K12 Meeting, Society for Glycobiology Kona, Hawaii	Invited Speaker

International

No presentations below were sponsored by outside entities:

1983	"Phylogenetic Conservation of the MHC Protein Factor B" International Complement Workshop (Mainz, Germany)	Speaker
1992	“Immunobiology of Lymphoma and Leukemia” International Congress of Cuban Physicians (Miami, FL)	Speaker
1995	“The Hematopoietic Microenvironment: The Biology of L-Selectin” Keystone Symposium on the Hematopoietic Microenvironment (Taos, NM)	Speaker
1996	“L-Selectin Adhesive Interactions in Hematolymphopoiesis” Jose Carreras International Leukemia Foundation Scientific Symposium (Barcelona, Spain)	Speaker
1996	“A Novel L-selectin Ligand is Expressed on Normal Human Hematopoietic Cells” 25th Anniversary Meeting of the International Society for Experimental Hematology (NY, NY)	Speaker
1996	“Lymphocyte Migration to Target Tissues in GVHD” University of Murcia School of Medicine (Murcia, Spain) Hematology/Oncology Division	Speaker
2002	“Novel Methods of Diagnosing Graft-versus-Host Disease” 3 rd International Workshop on Non-myeloablative Stem Cell Transplantation (Captiva Island, FL)	Speaker
2003	“The ‘Roll’ of Hyaluronic Acid in Acute Cutaneous Graft-versus-	Speaker

	Host Disease” Hyaluronan 2003 International Conference (Cleveland, OH)	
2003	“Strategies to Enhance Lymphocyte Migration to Sites of Relapse Following Non-myeloablative Stem Cell Transplantation” 4 th International Workshop on Non-myeloablative Stem Cell Transplantation (Bermuda)	Speaker
2004	“From Graft Failure to Graft-versus-Host Disease: The Central Role of Glycans in Allogeneic Bone Marrow Transplantation” International Meeting of the Society of Glycobiology (combined with Japanese Society of Carbohydrate Research (Honolulu, HI)	Speaker
2005	“Physiology and Pathobiology of Lymphocyte and Stem Cell Migration” 5 th International Workshop on Non-myeloablative Stem Cell Transplantation (Cancun, Mexico)	Speaker
2006	“Cellular Trafficking: Homing in on Glycosyltransferases” Annual Meeting of the Society for Glycobiology (Los Angeles, CA)	Speaker
2006	“Chemical Engineering of Stem Cell and Lymphocyte Trafficking” University of Barcelona, Institute of Hematology and Oncology (Barcelona, Spain)	Lecture
2007	“Reversing Degenerative Diseases: The Promise of Regenerative Medicine” First Pan-Asian Pacific Summit on Emerging Healthcare Strategies (Beijing, China)	Plenary Session Speaker
2007	“The Biology of Stem Cell Migration” Peking Union Medical College (Beijing, China) National Chinese Center for Tissue Engineering	Lecture
2007	“Homing Receptors, Chemokines and Cellular Trafficking” and “Biology and Pathobiology of Lymphocyte Migration after Bone Marrow Transplant” 11 th Meeting of the Brazilian Society of Bone Marrow Transplantation (Gramado, Brazil)	Plenary Session Speaker (2 presentations)
2007	“The Naor Legacy: Defining the ‘Roll’ of CD44 in Cancer Metastasis” Hadassah Medical Center (Jerusalem, Israel) International Symposium Honoring Prof. David Naor	Plenary Session Speaker
2007	“‘Braking’ in on CD44: Optimizing Homing of Mesenchymal Stem Cells for Regenerative Medicine” International Conference on Hyaluronan (Charleston, SC)	Plenary Session Speaker
2008	“Programming Stem Cell Migration” Society for Glycobiology Annual Conference (Dallas, TX)	Plenary Speaker

2009	“Biology of Cell Migration” Universidad Internacional Del Mar/Universidad De Murcia (Mazarron, Spain)	Lecture
2009	“Pathobiology of GVHD” Universidad Internacional Del mar/Universidad De Murcia (Mazarron, Spain)	Lecture
2009	“Mesenchymal Stem Cell Transplantation” Universidad Internacional Del Mar/Universidad De Murcia (Mazarron, Spain)	Lecture
2009	“Moving Stem Cells via GPS” Hospital Universitari German Trias i Pujol (Barcelona, Spain)	Lecture
2009	“Glycosyltransferase-programmed stereosubstitution (GPS) of CD44: Using GPS to Steer MSC Trafficking” MSC2009: Regenerative Medicine and Adult Stem Cell Therapy (Cleveland, OH)	Lecture
2009	“Mesenchymal Stem Cells” Harvard Medical School (Boston, MA) Immunology and Skin Disease: Frontiers in Cutaneous Immunology (International Conference)	Lecture
2010	“The Biology of Lymphocyte Trafficking” and “Creating a Roadmap for Stem Cell Therapeutics” Visiting Professor, Weizmann Institute of Science, (Rehovot, Israel)	Visiting Professor and “Highlights in Immunology” Institute Lecturer
2010	“Optimizing Stem Cell-based Therapeutics” Curso Internacional Red Terce: Nuevas Tecnologías de implante y modulación celular (Madrid, Spain)	Speaker
2011	“Functional Pleiotropisms of E-selectin Ligands” Glycobiology Gordon Research Conference (Lucca, Italy)	Speaker
2011	“Glycan Engineering and Stem Cells” (Discussion Session) Glycobiology Gordon Research Conference (Lucca, Italy)	Chairperson
2011	“Mesenchymal Stem Cells (MSC): Hitting the Sweet Spot for Immunomodulation” Harvard Medical School (Boston, MA) Immunology and Skin Disease 2011 (International Conference)	Lecture
2011	“Role of the E-Selectin Ligand HCELL in Hematopoiesis and Leukemogenesis” American Society of Hematology (San Diego, CA), Myeloid Cell Workshop	Invited Presentation
2012	“Guiding Stem Cells to Cure Osteoporosis” Hospital Universitario, “Virgen de la Arrixaca” University of Murcia (Murcia, Spain)	Medical Grand Rounds
2012	“Immunotherapy of Hematopoietic Stem Cell Transplantation” Universidad Internacional del Mar (Aguilas, Spain)	Lecture

2012	“Glycosyltransferase – Programmed Stereosubstitution: A New Paradigm in Stem Cell Therapeutics” Universidad Internacional del Mar (Aguilas, Spain)	Lecture
2013	“Programming Stem cell Migration” Hospital Virgen de la Arrixaca Clinical University Hospital (Murcia, Spain)	Lecture
2013	“Stem Cell Trafficking; Biology and Manipulation via GPS” Universidad Internacional del Mar (Los Alcazares, Spain)	Lecture
2013	“The Future of Medicine: Regenerative Therapeutics” Centro Unico de Ablacion e Implante de la Provincia de Buenos Aires (La Plata, Argentina)	Lecture
2013	“GPS: Navigating the future of Medicine” Annual Glycoscience Ireland Meeting (County Mayo, Galway, Ireland)	Keynote Speaker
2014	“Stem Cell Trafficking: Biology and Manipulation via GPS” Universidad Internacional del Mar (Los Alcazares, Spain)	Lecture
2014	“The Scientific Method: Theory and Practice” Jose Carreras Research Institute (Barcelona, Spain)	Invited Lecture
2014	Glyconavigating Cell Migration 2014 Annual Meeting, American Association of Blood Banks (Philadelphia, PA)	Plenary Speaker
2015	“GPS: Creating GPS for Cell Migration” Universidad Internacional del Mar (Los Alcazares, Spain)	Lecture
2015	“Glycoengineering Cell Migration: Achieving the Promise of Cellular Therapeutics” 23 rd International Symposium on Glycoconjugates (Split, Croatia)	Plenary Lecture
2016	“Use of GPS to Optimize Tissue Delivery of Stem Cells” The Wallenberg Centre for Molecular Medicine (Lund, Sweden)	Lecture
2016	“Translational Glycobiology: Making Post-translational TRANSLATIONAL” University of Nova, Faculty of Sciences and Technology (Lisbon, Portugal)	Lecture
2016	“Glycosyltransferases: the cornerstones of cellular immunotherapy” 10 th International Symposium on Glycosyltransferases (Toronto, Canada)	Plenary Speaker
2016	“Terapia de células madre: la promesa de curación” University of Leon/University of Vigo	Plenary Lecture

(Villafranca del Bierzo, Spain)

2016	“Stem cell trafficking: Optimizing MSC therapeutics” Universidad Internacional del Mar (Los Alcazares, Spain)	Lecture
2016	“Sialyl Lewis X and E-Selectin: the drivers of cell therapeutics” Sialoglyco 2016 Conference (Toronto, Canada)	Speaker
2017	“Using the Inflammatory Response to Cure Disease” Graduate School Invited Seminar Series Nova University (Lisbon, Portugal)	Speaker
2017	“GPS for Stem Cells: Creating a Pathway to Cure” Inaugural Regenerative Medicine Symposium, University of Buffalo, Roswell Park Cancer Institute (Buffalo, NY)	Keynote Speaker
2017	“Glycosyltransferases as Tools to Identify Cell Surface Lactosaminyl Glycans” <i>Gordon Research Conference: Chemical and Biochemical Approaches to Deciphering Glycan Function</i> (West Dover, VT)	Speaker
2017	“Innovaciones Para Mejorar el Tráfico Celular: GPS” University of Murcia/Universidad Internacional del Mar (Los Alcazares, Spain)	Lecture
2017	“Driving skin-specific stem cell migration via GPS” International Pigment Center Conference (IPCC) (Denver, CO)	Invited Speaker
2017	“GPS: La Ruta Glicocientífica de la Terapia Celular” 4th Latin American Glycobiology Meeting (Mexico City, Mexico)	Keynote Lecture
2017	“GPS: Navigating the pathway for regenerative therapy” Ernst Klenk Symposium 2017 (Cologne, Germany)	Lecture
2018	“Enabling Cell Therapeutics: GPS for the Road Ahead” University of Murcia/Universidad Internacional del Mar (Los Alcazares, Spain)	Lecture
2018	“GPS: Navigating Cell Therapeutics via Glycoengineering” Benzon Foundation Symposium on Glycotherapeutics (Copenhagen, Denmark)	Plenary Speaker
2018	“GPS for Cell Therapy: Optimizing Treatment Efficacy and Safety via Enforced Cell Navigation” BioProcess International Conference on Cell & Gene Therapy Bioprocessing & Commercialization (Boston, MA)	Plenary Speaker

2018	The Translational Glycobiology of Human Regenerative Therapeutics 5th Latin American Glycobiology Meeting (Mexico City, Mexico)	Keynote Lecture
2019	“Driving Stem Cell Trafficking via GPS” University of Cambridge Stem Cell Institute Cambridge, United Kingdom	Visiting Professor
2019	“E-Selectin Ligands in Human Leukemogenesis” Society for Glycobiology 2019 Annual Meeting Phoenix, AZ	Speaker
2019	“Cell Surface Glycoengineering: Applying GPS to CAR T-cells 30 th Joint European Glycobiology Meeting Lille, France	Keynote Speaker
2020	“Optimizing Adoptive Cell Immunotherapeutics via GPS” Summit of the Americas on Immunotherapies for Hematologic Malignancies Miami, FL	Keynote Speaker
2020	“Glycan Determinants in Cancer as Targets for CAR-T-cell-based Therapeutics” INNOGLY WG1 and WG3 Joint Virtual Meeting Porto, Portugal	Keynote Lecture
2020	“Lymphocyte numbers matter: The Immunobiology of COVID-19 Lymphopenia.” COVID-19 Disease Virtual Course Universidad de Murcia, Spain	Speaker
2021	“Saving Sight via Site-directed Cell Trafficking” Bascom-Palmer Eye Institute Grand Rounds (“Frontiers in Vision” Lecturer) University of Miami, Miami, FL	Lecture
2022	“Optimizing CAR cell-based Immunotherapy by Targeting the Cancer Cell ‘Sugar Coat’” Summit of the Americas on Immunotherapies for Hematologic Malignancies Miami, FL	Keynote Speaker
2022	“Medicina Regenerativa: Terapias Germinadas en Leon” Simposio: Avances en Terapia Celular University of Leon, Leon, Spain	Keynote Speaker
2022	“Una Nueva Definición Operativa de la Célula Madre Hematopoyética Humana” University of Murcia/Universidad Internacional del Mar Los Alcazares, Spain	Lecture
2022	“GPS para Optimizar el Tráfico de Células Madres Mesenquimales (CMMs)” University of Murcia/Universidad Internacional del Mar Los Alcazares, Spain	Lecture

2022	“Sialylated Lewis X (sLeX: CD15s): The ‘Sweetener’ of Leukemogenesis” NCI Symposium on “Post-translational Modifications in Tumor Biology” National Cancer Institute, Bethesda, MD (Teleconference)	Lecture
2022	“Terapia Celular en Reparacion del Sistema Nervioso Central del Hecho” International Congress of Latin American Neurosurgeons Miami, FL	Plenary Lecture
2022	“Aesculapius, Hermes, and Regenerative Medicine” University of Paris/Paris Center for Cardiovascular Research (PARCC) Seminar Series Paris, France	Visiting Speaker
2023	“The Translational Glycobiology of Human Hematopoiesis” MassGenBrigham Hospital/Harvard Medical School Hematology Grand Rounds Boston, MA	Grand Rounds
2023	“Gerrymandering Tissue-Resident Cells in Acute GVHD” Dana-Farber Cancer Inst./Harvard Medical School Bone Marrow Transplant Grand Rounds Boston, MA	Grand Rounds
2023	“Unveiling the Glycobiology of Human Hematopoietic Development” 15 th Jenner Glycobiology and Medicine Symposium Porto, Portugal	Plenary Speaker
2023	“Chemo-enzymatic Modification of Cell Surface Glycans to Optimize CAR T-cell Immunotherapy” Symposium on New Advances in Therapeutic Applications of Glycans American Chemical Society Annual Meeting San Francisco, CA	Speaker

Report of Clinical Activities and Innovations

Current License and Certification:

- 1986 - Florida Physician License
- 1989 - Diplomate, American Board of Internal Medicine (certified indefinitely)
- 1994 - Diplomate, Subspecialty of Hematology (certified until 2018)
- 1997 - Massachusetts Physician License

Practice Activities:

<i>Activity</i>	<i>Setting of Practice</i>	<i>Name and Location of Practice</i>	<i>Level of Activity</i>
Bone Marrow transplantation	Teaching Hospital	Brigham & Women’s Hospital/Dana-Farber Cancer Institute	Patient care 10%, Teaching 20 %,
Hematology	Teaching Hospital	Brigham & Women’s Hospital	Administration 20%, Research 50%.

Clinical Innovations:

- **Member of team that developed treatment plan - and was the bone marrow harvest physician and the assigned in-patient attending - for the first patient to undergo combined bone marrow-living related donor kidney transplant (patient with multiple myeloma and end-stage renal disease). Massachusetts General Hospital (September-October, 1998).**
- **Inventor of the cell surface glycoengineering technology known as “Glycosyltransferase-programmed Stereosubstitution” (GPS). The GPS technology enforces trafficking of intravenously administered cells to bone marrow, to skin, and to all sites of tissue injury. GPS technology is being applied in two clinical trials at present: (1) Use of Mesenchymal Stem Cells to Reverse Osteoporosis (at the Virgen de la Arrixaca Hospital/University of Murcia, Murcia, Spain); (2) Enhancing Engraftment of Cord Blood-derived Hematopoietic Stem Cells in Hematopoietic Stem Cell Transplantation (MD Anderson Cancer Center, Houston, Texas).**

Report of Technological and Other Scientific Innovations

Innovation/Patent: Fluorinated Glucosamine Analogs Useful for Modulating Post-translational Glycosylations on Cells

U.S. Patent 7,098,195, issued August 29, 2006

Description: Creation of chemical agent to inhibit cell membrane glycosylations that regulate cellular trafficking

Innovation/Patent: Hematopoietic Cell E-Selectin/L-Selectin Ligand Polypeptides and Methods of Use Thereof

Japanese Patent 4198990, issued October, 2008

Description: Composition of matter for the molecule HCELL, and methods of use of HCELL for treating hematopoietic disorders, inflammatory conditions, and cancer, and for providing stem cell therapy in a mammal

Innovation/Patent: Hematopoietic Cell E-Selectin/L-Selectin Ligand Polypeptides and Methods of Use Thereof

European Patent EP 1421174, issued December, 2009

Description: Composition of matter for the molecule HCELL, and methods of use of HCELL for treating hematopoietic disorders, inflammatory conditions, and cancer, and for providing stem cell therapy.

Innovation/Patent: Antibody SACK-1 that binds CD44 glycoforms

United States Patent 7,816,500, issued October 19, 2010

Description: Composition of matter for an HCELL-specific mAb and methods of use in treating hematopoietic disorders, inflammatory conditions, and cancer, and for providing stem cell therapy in a mammal

Innovation/Patent: Hematopoietic Cell E-Selectin/L-Selectin Ligand Polypeptides and Methods of Use Thereof

United States Patent 7,875,585, issued January 25, 2011

Description: Composition of matter for the molecule HCELL, and methods of use of HCELL for treating hematopoietic disorders, inflammatory conditions, and cancer, and for providing stem cell therapy in a mammal

Innovation/Patent: Cytokine Induction of Selectin Ligands on Cells

United States Patent 7,998,740, issued August 16, 2011

Description: Methods for inducing expression of HCELL and other E-selectin ligands on myeloid cells using the cytokine G-CSF

Innovation/Patent: Composition and Methods for Modifying Cell Surface Glycans

United States Patent 8,084,236, issued December 27, 2011

Description: Methods and compositions for modifying cell surface glycans (e.g., glycans expressed on the surface of live cells or cell particles)

Innovation/Patent: Hematopoietic Cell E-Selectin/L-Selectin Ligand Polypeptides and Methods of Use Thereof

Canadian Patent CA 2429625, issued May 1, 2012

Description: Composition of matter for the molecule HCELL, and methods of use of HCELL for treating hematopoietic disorders, inflammatory conditions, and cancer, and for providing stem cell therapy in a mammal

Innovation/Patent: Composition and Methods for Modifying Cell Surface Glycans

Japanese Patent 5368976, issued August 20, 2013

Description: Methods and compositions for modifying cell surface glycans (e.g., glycans expressed on the surface of live cells or cell particles).

Innovation/Patent: Composition and Methods for Modifying Cell Surface Glycans

Australian Patent 2007254777, issued February, 2014

Description: Methods and compositions for modifying cell surface glycans (e.g., glycans expressed on the surface of live cells or cell particles).

Innovation/Patent: Cytokine Induction of Selectin Ligands on Cells

United States Patent 8,633,026, issued January 21, 2014

Description: Method of enhancing expression of E-selectin ligands on myeloid cells by use of G-CSF

Innovation/Patent: Methods to Improve Cell Therapy

United States Patent 8,728,810, issued May 20, 2014

Description: Methods and compositions for modifying cell surface glycans (e.g., glycans expressed on the surface of live cells or cell particles) using glycosyltransferases without need for input divalent cation cofactors.

Innovation/Patent: Methods of Treating Complications and Disorders Associated with G-CSF Administration

United States Patent 8,765,126, issued July 1, 2014

Description: Use of inhibitors of myeloperoxidase and E-selectin ligands to treat inflammatory conditions associated with G-CSF expression/administration.

Innovation/Patent: Composition and Methods for Modifying Cell Surface Glycans

United States Patent 8,852,935, issued October 7, 2014

Description: The composition of matter of mesenchymal stem cells expressing E-selectin ligands created by exofucosylation.

Innovation/Patent: Method for Increasing the E-selectin Binding Activity of a Population of Cells Expressing a CD44 Polypeptide

United States Patent 9,523,078, issued December 20, 2016

Description: An in vitro method for increasing the E- and/or L-selectin binding affinity of a population of cells expressing the CD44 Polypeptide.

Innovation/Patent: Platelet Additive Solution Having a beta-Galactosidase Inhibitor

United States Patent 9,609,861, issued April 4, 2017

Description: Use of beta-galactosidase inhibitors to prolong platelet storage in vitro, and to prolong platelet survival in vivo.

Innovation/Patent: Platelet Storage and Reduced Bacterial Proliferation in Platelet Products Using a Sialidase Inhibitor

United States Patent 9,788,539, issued October 17, 2017

Description: Composition of storage solutions that inhibit bacterial growth and prolong platelet function in collected platelets for transfusion, via use of combination sialidase inhibitors and beta-galactosidase inhibitors to prolong platelet storage in vitro, and to prolong platelet survival in vivo.

Innovation/Patent: Composition and Methods for Modifying Cell Surface Glycans

European Patent 2035546, issued January 5, 2018

Description: Methods and compositions for modifying cell surface glycans (e.g., glycans expressed on the surface of live cells or cell particles).

Innovation/Patent: Compositions and Methods for Modifying Cell Surface Glycans

United States Patent 9,914,913, issued March 13, 2018

Description: Methods and compositions for modifying glycans (e.g., glycans expressed on the surface of live cells or cell particles).

Innovation/Patent: Platelet Protection Solution Having Beta-Galactosidase and Sialidase Inhibitors

United States Patent 10,271,541, April 30, 2019

Description: Compositions of platelet storage solutions that contain beta-galactosidase and sialidase inhibitors inhibit bacterial growth in collected platelets for transfusion.

Innovation/Patent: Hematopoietic Progenitor Cell Populations having Affinity for E-selectin/L-selectin

United States Patent 10,370,642, issued August 6, 2019)

Description: The invention comprises methods and compositions for treating hematopoietic disorders, inflammatory conditions, and cancer and providing stem cell therapy in a mammal.

Innovation/Patent: Methods to Improve Cell Therapy

United States Patent 10,471,103, issued November 12, 2019

Description: Methods of cellular treatment via administration of a population of cells modified to enforce expression of an E-selectin and/or an L-selectin ligand, the modified cell population having a cell viability of at least 70% after a treatment to enforce such expression.

Innovation/Patent: Fucosyltransferase-Specific Inhibition using Fucose Mimetics

United States Patent 11,517,580, issued December 6, 2022)

Description: Compositions and methods for specific fucosyltransferase inhibition for treatment for a variety of diseases. The compositions of the invention comprise a glycomimetic of L-Fucose that

selectively inhibits the generation of sialyl Lewis X by FTVI and FTVII but has no effect on the generation of Lewis X by FTIX.

Innovation/Patent: Compositions and Methods for Modifying Cell Surface Glycans
 United States Patent 11,535,831, issued December 27, 2022)

Description: Methods and compositions for modifying glycans expressed on the surface of live stem cells or leukocytes.

Report of Education of Patients and Service to the Community

Activities

1985-1993	Board of Directors	Miami Civic Music Association
1987-1993	Advisory Board to County Homeless Health Care Project	Metro-Dade County, FL
1987-1993	Volunteer Physician Brief Description – Ran free health care clinic 3 times a week during evening hours	Dade County Homeless Health Care Project
1988-1989	Governor’s Council, Florida Chapter	American College of Physicians
1988-1990	Volunteer Medical Director Medical Director for free homeless healthcare clinic which I helped to establish	Brothers of the Good Shepherd/Camillus House Health Concern
1990-1993	Mentor Mentor in program for high school student lab research at regional universities	Laboratory Research Program, Dade County, FL School System
1991-1993	Chairperson, Planning Committee for medicine and Allied Health Magnet School	Dade County School Board, FL
1991-1993	Chairperson, Subcommittees for Middle School Science Curriculum Review and for Community Outreach	Dade County School Board, FL
1992	Lead Judge Secondary School science fair, Lead judge	Dade County, FL
1992	Lead Judge Science category, Lead judge	Miami Herald Silver Knight Award

1994-1997	Board of Directors	Museum of Science and Industry, Tampa, FL
1997	Non-resident tutor Tutored in Biology, Biochemistry, and Pre- Medical studies	John Winthrop House, Harvard College
1997-present	Education Advisory Board	Discovery Museum, Acton, MA
2001	Volunteer Physician Van physician; manned the traveling volunteer van	Pine Street Inn, Boston, MA
2001-present	Schools and Scholarships Committee, Harvard Club in Concord	Harvard College
2002	Organizer for Class of 1977 25 th Reunion Symposium on Biotechnology	Harvard College
2002	Commencement Aid Served as honorary Marshall	Harvard University
2002	Judge and organizer, Science fair	Peter Noyes Elementary School, Sudbury, MA
2006-present	Director	Harvard Club in Concord, MA
2005-present	Board of Overseers	Museum of Science, Boston, MA
2007-2010	Board of Directors	Whizkids Foundation
2008-2011	President	Harvard Club in Concord, MA
2008-2014	Board of Directors; Regional Director, Northeastern Massachusetts	Harvard Alumni Association
2009-2018	International Taskforce Member, "Harvard Serves" (global call for public service by Harvard Alumni)	Harvard Alumni Association

Community Service Recognitions

<i>Year</i>	<i>Name of Award</i>	<i>Organization</i>	<i>Recognition</i>
1990	Kelly's Heroes Award	WTVJ-TV (CBS), Miami, FL	Recipient for medical community service
1993	George Paff Award	University of Miami School of Medicine	Given for excellence in teaching
1993	Peace and Unity Award	Archdiocese of Miami, FL	Recipient for medical community service

Report of Scholarship

Publications:

Peer-Reviewed Publications in print or other media (MEETING ABSTRACTS ARE NOT LISTED)

Reports of Original Research investigations

1. **Sackstein R**, Colten HR, Woods DE. Phylogenetic conservation of a class III major histocompatibility complex antigen, factor B: isolation and nucleotide sequencing of mouse factor B cDNA clones. *J. Biol. Chem.* 1983; 258:14693-14697.
2. **Sackstein R**, Colten HR. Molecular regulation of MHC class III (C4 and factor B) gene expression in mouse peritoneal macrophages. *J. Immunol.* 1984; 133:1618-1626.
3. Chaplin DD, **Sackstein R**, Perlmutter DH, Weis JH, Kruse TA, Coligan J, Colten HR, Seidman JG. Expression of hemolytically active murine fourth component of complement in transfected L cells. *Cell* 1984; 37:569-576.
4. **Sackstein R**, Roos MH, Demant P, Colten HR. Subdivision of the mouse major histocompatibility complex by identification of genomic polymorphisms of the class III genes. *Immunogenetics* 1984; 20:321-330.
5. **Sackstein R**, Falanga V, Streilein JW, Chin YH. Lymphocyte adhesion to psoriatic dermal endothelium is mediated by a tissue-specific receptor/ligand interaction. *J. Invest Dermatol.* 1988; 91:423-430.
6. Chin YH, Falanga V, Streilein JW, **Sackstein R**. Specific lymphocyte-endothelial cell interactions regulate migration into lymph nodes, peyer's patches and skin. *Regional Immunology* 1988; 1:78-83.
7. Chin YH, Falanga V, Streilein JW, **Sackstein R**. Lymphocyte recognition of psoriatic endothelium: evidence for a tissue-specific receptor/ligand interaction. *J. Invest Dermatol.* 1989; 93:82-87.
8. Oxley SM, **Sackstein R**. Detection of an L-selectin ligand on a hematopoietic progenitor cell line. *Blood* 1994; 84:3299-3306.
9. **Sackstein R**, Borenstein M. The effects of corticosteroids on lymphocyte recirculation in humans: analysis of the mechanism of impaired lymphocyte migration to lymph node following methylprednisolone administration. *J. Invest. Med.* 1995; 43:68-77.
10. **Sackstein R**, Meng, L, Xu XM, Chin YH. Evidence of post-transcriptional regulation of L-selectin gene expression in rat lymphoid cells. *Immunology* 1995; 85:198-204.
11. Wasik MA, **Sackstein R**, Novick D, Butmarc JR, Vonderheld E, Kadin MD. Cutaneous CD56+ large (T-) cell lymphoma associated with a high concentration of circulating IL-2. *Human Pathology* 1996; 27:738-744.
12. **Sackstein R**, Fu L, Allen KL. A hematopoietic cell L-selectin ligand exhibits sulfate-independent binding activity. *Blood* 1997; 89:2773-2781.
13. Ballester OF, Tummala R, Janssen WE, Fields KK, Hiemenz JW, Goldstein SC, Perkins JB, Sullivan DM, Rosen R, **Sackstein R**, Zorsky P, Saez R, Elfenbein GJ. High-dose chemotherapy and autologous

peripheral blood stem cell transplantation in patients with multiple myeloma and renal insufficiency. *Bone Marrow Transplantation* 1997, 20:653-656.

14. Sykes M, Preffer F, McAfee S, Saidman SL, Weymouth D, Andrews D, Colby C, **Sackstein R**, Sachs DH and Sykes M. Mixed lymphohematopoietic chimerism and graft-vs-lymphoma effects after non-myeloablative therapy and HLA-mismatched donor bone marrow transplantation. *Lancet* 1999; 353:1755-1759.
15. Spitzer TR, Delmonico F, Tolkoff-Rubin N, McAfee S, **Sackstein R**, Saidman S, Colby C, Sykes M, Sachs DH, Cosimi AB. Combined HLA-matched donor bone marrow and renal transplantation for multiple myeloma with end stage renal disease: The induction of allograft tolerance through mixed lymphohematopoietic chimerism. *Transplantation* 1999; 68: 480-484.
16. Toh HC, McAfee SL, **Sackstein R**, Cox BF, Colby C, Spitzer TR. Late-onset veno-occlusive disease following high dose chemotherapy and stem cell transplantation. *Bone Marrow Transplantation* 1999; 24:891-895.
17. Colby C, McAfee SL, **Sackstein R**, Finkelstein DM, Fishman JA, Spitzer TR. A prospective randomized trial comparing the toxicity and safety of atovaquone with trimethoprim/sulfamethoxazole as *Pneumocystis carinii* pneumonia prophylaxis following autologous peripheral blood stem cell transplantation. *Bone Marrow Transplantation* 1999; 24: 897-902.
18. Salgia R, Quackenbush E, Lin J, Souchkova N, Sattler M, Ewaniuk DS, Klucher KM, Daley GQ, Kraeft SK, **Sackstein R**, Alyea EP, von Adrian UH, Chen LB, Gutierrez-Ramos J-C, Pendergast A-M, Griffin JD. The BCR/ABL oncogene alters the chemotactic response to Stromal-Derived Factor-1 α . *Blood* 1999; 94:4233-4246.
19. Colby C, Chang Q, Fuchimoto Y, Ferrara V, **Sackstein R**, Spitzer TR, Scharf-White ME, Sachs DH. Cytokine-mobilized peripheral blood progenitor cells for allogeneic reconstitution of miniature swine. *Transplantation* 2000; 69:135-140.
20. Toh HC, McAfee SL, **Sackstein R**, Multani P, Cox BF, Garcia-Carbonero R, Colby C, Spitzer TR. High-dose cyclophosphamide + carboplatin and interleukin-2 (IL-2) activated autologous stem cell transplantation followed by maintenance IL-2 therapy in metastatic breast carcinoma – A phase II study. *Bone Marrow Transplantation* 2000; 25:19-24.
21. Buhler L, Awwad M, Basker M, Gojo S, Watts A, Treter S, Nash K, Oravec G, Chang Q, Thall A, Down J, Sykes M, Andrews D, **Sackstein R**, White-Scharf M, Sachs DH, Cooper DKC. High-dose porcine hematopoietic cell transplantation combined with CD40L blockade in baboons prevents an induced anti-pig humoral response. *Transplantation* 2000; 69:2296-304.
22. Spitzer TR, McAfee S, **Sackstein R**, Colby C, Toh HC, Multani P, Saidman S, Weymouth D, Preffer F, Poliquin C, Foley A, Cox B, Dombowski D, Andrews D, Sachs DH, Sykes M. The intentional induction of mixed chimerism and achievement of anti-tumor responses following non-myeloablative conditioning therapy and HLA-matched and mismatched donor bone marrow transplantation for refractory hematologic malignancies. *Biology of Blood and Marrow Transplantation* 2000; 6:309-320.
23. **Sackstein R**, Dimitroff CJ. An hematopoietic cell L-selectin ligand that is distinct from PSGL-1 and displays N-glycan-dependent binding activity. *Blood* 2000; 96:2765-2774.

24. Dimitroff CJ, Lee J, Fuhlbrigge RC, **Sackstein R**. A distinct glycoform of CD44 is an L-selectin ligand on human hematopoietic progenitor cells. *Proc. Natl. Acad. Sci. USA* 2000; 97:13841-13846.
25. Buhler L, Basker M, Alwayn IPJ, Goepfert C, Kitamura H, Kawai T, Gojo S, Kozlowski T, Ierino FL, Awwad M, Sachs DH, **Sackstein R**, Robson SC, Cooper DKC. Coagulation and thrombotic disorders associated with pig organ and hematopoietic cell transplantation in nonhuman primates. *Transplantation* 2000; 70:1323-1331.
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27. Alwayn IPJ, Buhler L, Appel JZ, Goepfert C, Csizmadia E, Correa L, Harper D, Kitamura H, Down JD, Awwad M, **Sackstein R**, Cooper DKC, Robson SC. Mechanisms of Thrombotic Microangiopathy Following Xenogeneic Hematopoietic Progenitor Cell Transplantation. *Transplantation* 2001; 71:1601-1609.
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Thesis

Analysis of the Murine Major Histocompatibility Complex Class III Genes C4 and Factor B. **Ph.D., Immunology, Harvard University (Graduate School of Arts and Sciences), 1984.**

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings:

NOT LISTED (>300 to date)

Narrative Report of Research Efforts (limited to <1000 words)

My efforts as a basic scientist and clinician are intimately intermeshed. I am a basic science immunologist/biochemist/molecular biologist with clinical expertise in internal medicine/hematology/immunology and, in particular, in hematopoietic stem cell transplantation (HSCT). Accordingly, my bench research efforts aim to elucidate biologic processes critical to improving outcomes for patients undergoing stem cell transplantation, such as: (1) hematopoiesis, and other cell and tissue regeneration from stem cell-based therapeutics; (2) tissue-specific lymphocyte migration (including the immunobiology of lymphocyte migration in host defense and in pathologic reactions such as graft-versus-host disease); and (3) pathobiology of tumor cell proliferation and tumor metastasis. *The common thread for all these efforts is to manipulate the biology of cellular trafficking, as it pertains to stem cell transplantation and tissue regeneration ('regenerative medicine'), to host defense/inflammation, and to cancer growth and metastasis.*

At the outset of my career as an HSCT physician (1980s), there were two principal obstacles to successful application of this life-saving technology: (1) Graft failure, and (2) Graft-versus-host disease (GVHD). In that era, the problem of graft failure was profound, as >20% of recipients died from lack of blood cell regeneration within certain transplant groups (e.g., aplastic anemia, T-cell depletion, unrelated donors, etc.). Though many factors contributed to graft failure, a fundamental piece of information related to solving this mystery was missing: there was essentially nothing known about the molecular basis of hematopoietic stem cell migration to the marrow. Just as the development of GVHD was clearly related to the capability of infused donor lymphocytes to preferentially migrate to certain target tissues (i.e., the skin, the gut and the liver), there was also no knowledge of the molecular effectors of such trafficking. *I thus sought to define the specialized adhesion molecules on the surface of blood-borne cells called “homing receptors” that bind to endothelial cells at target tissues under hemodynamic shear conditions, thus directing cellular migration patterns.*

Early on, most of our understanding of cell migration was derived from studies of lymphocyte trafficking to lymph nodes. It was recognized that lymphocyte homing into peripheral lymph nodes was principally regulated by a lymphocyte membrane protein operationally known as the “lymph node homing receptor” (now known as ‘L-selectin’) that adheres to its ligands expressed on lymph node high endothelial venules. Our laboratory identified that L-selectin expression is characteristic not only of lymphocytes but also of early hematopoietic progenitor cells, and this observation prompted us to examine the expression of selectin ligands among human bone marrow cells, and we also studied the expression of selectins (principally, E-selectin) on bone marrow microvessels (marrow “sinusoidal” vessels). These studies led to discovery of a novel selectin ligand present on hematopoietic progenitor cells. Our subsequent biochemical studies revealed that this selectin ligand, now known as Hematopoietic Cell E-/L-selectin Ligand (HCELL), is the most potent naturally-expressed E- and L-selectin ligand in the body. The HCELL molecule is a unique glycoform of CD44, and it is natively expressed on *human* hematopoietic stem cells. By mediating binding to marrow sinusoidal endothelium that constitutively expresses E-selectin, HCELL functions as the “bone marrow homing receptor”, directing human stem cell migration into the marrow. We are presently elucidating the role(s) of HCELL in hematopoiesis and in hematopoietic stem cell homing. We have also developed gateway technologies to glycan engineer the surface of stem cells to specifically enforce HCELL expression, thereby licensing osteotropism, and are currently examining whether HCELL+ mesenchymal stem cells (MSC) can be used to cure generalized bone diseases. Furthermore, because E-selectin expression is induced with inflammation or injury on vascular endothelium at all sites of tissue injury, we are investigating whether enforced HCELL expression will confer efficient vascular delivery of stem or tissue-specific progenitor cells for all applications of regenerative therapeutics. In related research, our studies are moving beyond normal stem/progenitor cells to the biology of the ‘cancer stem cell’: we have found that HCELL is characteristically expressed on blasts of human acute leukemia and also among certain human cancer cells, and thus we are investigating how HCELL expression is related to leukemogenesis/carcinogenesis and to metastasis.

In other studies of the molecular basis of cellular trafficking, our laboratory is investigating the physiology of lymphocyte migration following stem cell transplantation to determine how pathologic tissue-specific migration patterns develop post-transplant, such as in acute GVHD. In particular, we are examining the adhesion molecules that regulate skin-specific migration of lymphocytes in cutaneous GVHD reactions, in order to elucidate the molecular basis of this process and develop therapeutic agents to treat or prevent this condition. We thus aim to devise novel therapies to eliminate the detrimental GVHD reaction of allogeneic transplantation without disturbing beneficial immune reactions such as the graft-versus-malignancy effect. Toward this goal, we are also testing whether enforced surface HCELL expression can improve the delivery of regulatory lymphocytes to blunt GVHD and/or can augment the capacity of MSC (which are immunomodulatory) to abrogate the GVHD reaction. In other studies, we are defining how enforced HCELL expression may achieve higher efficiency of immune effector cell-based immunotherapies against

cancer (e.g., CAR T-cells, CAR NK cells, antigen-pulsed dendritic cells, tumor-infiltrating lymphocytes (TILs), etc.) and we are also investigating the structural biology of key molecules that mediate adhesive interactions that create microenvironmental “niches” for tumor cell proliferation and the adhesion molecules that allow for tumor cell dissemination. The goal in all these studies is to utilize structural information for the rational design of drugs that disrupt key adhesion molecules in tumor cell growth and metastasis, yielding development of agents/technologies that will disrupt tumor proliferation and dissemination, and, will improve immune effector cell infiltration of tumor tissue and tumoricidal activity.