

## CURRICULUM VITAE

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**Citizenship:** United States

### **Education:**

1980 B.S. (Natural Sciences, summa cum laude), University of Akron, Akron, Ohio  
1984 M.D., Northeastern Ohio Universities College of Medicine, Rootstown, Ohio

### **Brief Chronology of Employment:**

1984 - 1988 Residency, Combined Pediatrics/Internal Medicine; Children's Hospital Medical Center of Akron/Akron General Medical Center, Akron, Ohio  
1989 – 1992 Fellowship Pediatric Hematology/Oncology; Pediatric Branch, NCI, NIH, Bethesda, MD  
1992-1996 Investigator, Experimental Immunology Branch, NCI, NIH  
1996-1998 Investigator, Pediatric Oncology Branch, NCI, NIH  
1998-2003 Principal Investigator, Tenure Track, Pediatric Oncology Branch, NCI, NIH  
2003-2015 Tenured Principal Investigator and Head, Immunology Section, Pediatric Oncology Branch, NCI, NIH  
2005 Deputy Branch Chief, Pediatric Oncology Branch, NCI, NIH  
2005-2008 Acting Branch Chief, Pediatric Oncology Branch, NCI, NIH  
2008-2015 Chief, Pediatric Oncology Branch, NCI, NIH  
2016-2018 Endowed Professor of Pediatrics and Medicine, Stanford University  
2016-present Associate Director, Stanford Cancer Institute  
2016-present Leader, Cancer Immunology and Immunotherapy Program, Stanford Cancer Institute  
2016-present Director, Parker Institute for Cancer Immunotherapy, Stanford University School of Medicine  
2017-present Founding Director, Stanford Center for Cancer Cell Therapy  
2018-present Ernest and Amelia Gallo Family Professor of Pediatrics and Medicine, Stanford University

### **Military Service:**

1980-2010 United States Public Health Service, Captain 0-6, retired

### **Medical License and Board Certification:**

1984-2017	Ohio
1994-2017	Maryland
1994-2005	District of Columbia
2015-present	California
1989-present	American Board of Internal Medicine, Unlimited Certification
1989-2000	American Board of Pediatrics
2000-2006	American Board of Pediatrics, Recertification
2006-2018	American Board of Pediatrics, Recertification
2018-2023	American Board of Pediatrics, Recertification
1992-1998	American Board of Pediatric Hematology/Oncology
1998-2006	American Board of Pediatric Hematology/Oncology, Recertification
2006-2018	American Board of Pediatric Hematology/Oncology, Recertification
2018-2023	American Board of Pediatric Hematology/Oncology, Recertification

### **Societies:**

American Association of Immunologists  
 American Society of Clinical Investigation  
 Alpha Omega Alpha Honorary Medical Society  
 American Association for Cancer Research  
 American Society of Hematology  
 American Society for Pediatric Hematology/Oncology  
 American Society for Clinical Oncology  
 Henry Kunkel Society  
 Association of American Physicians

### **Editorial Responsibilities:**

2001-2006	Editorial Board, Clinical Immunology
2002-2008	Editorial Board, BLOOD
2002-2005	Editorial Board, Medical Immunology
2003-2010	Editorial Board, Biology of Blood and Marrow Transplantation
2004-2010	Editorial Board, Molecular Cancer Therapeutics
2004-2009	Editorial Board, Pediatric Blood and Cancer
2004-2010	Editorial Board, Pediatric Hematology/Oncology
2004-2010	Editorial Board, Electronic Sarcoma Update Newsletter, Liddy Shriver Sarcoma Initiative
2007-2011	Associate Editor, Journal of Pediatric Hematology/Oncology
2008-2014	Associate Editor, BLOOD
2009	Editor, Pediatric Clinics of North American, Bone Marrow Transplantation
2011-2015	Founding Editor-in-Chief, Frontiers in Pediatric Oncology
2016-present	Cancer Today, Editorial Advisory Board

**Ad hoc reviews:** New England Journal of Medicine, Nature, Science, Nature Medicine, Nature Biotechnology, Nature Reviews Immunology, PNAS, Immunity, Journal of the National Cancer

Institute, Journal of Clinical Investigation, Journal of Experimental Medicine, Journal of Immunology, Cancer, Cancer Research, Journal of Clinical Oncology, European Journal of Immunology, Journal of Leukocyte Biology, International Journal of Pediatric Hematology/Oncology, Bone Marrow Transplantation, Immunology Today, American Journal of Pediatric Hematology/Oncology, Journal of Infectious Diseases, Cell Death and Differentiation, AIDS

**Honors and Other Special Recognition:**

1980	Summa Cum Laude, University of Akron
1984	Alpha Omega Alpha Honorary Medical Society
1988	Chief Resident, Internal Medicine, Akron General Medical Center
1997	Intramural Research Award, National Cancer Institute
1999	Intramural Research Award, National Cancer Institute
2000	Distinguished Clinical Teacher Award, NIH
2000	Intramural Research Award, National Cancer Institute
2001	Bench-to-Bedside Research Award, Co-Principal Investigator, NIH
2003	Mentor of Merit, NIH Fellows Committee, NIH
2003	PHS Commendation Medal
2003	NCI Director's Award
2004	Distinguished Alumni Award, NEOUCOM
2004	NIH Technology Transfer Award
2005	Bench-to-Bedside Research Award, Principal Investigator, NIH
2005	American Society of Clinical Investigation
2006-present	Best Doctors in America
2007	NIH Merit Award
2009	Alex Koufos Memorial Lectureship, Akron Children's Hosp, Akron, OH
2010	NCI Director's Award
2011	The Vineberg Lectureship, Montreal Children's Hospital Grand Rounds, Montreal, Quebec
2012	How! How! Award, Special Love, Inc.
2012	Great Teacher Lecture Awardee, National Institutes of Health
2013	NIH Director's Award
2013	Alexandra Scott Lectureship in Pediatric Oncology, Children's Hospital of Philadelphia
2015	NIH G. Burroughs Mider Lecture, (Honoring Distinguished NIH Intramural Research Scientist)
2015, 2016	Chair-Elect, Pediatric Cancer Working Group, AACR
2015	Association of American Physicians
2015	William Hathaway Visiting Professor Award, University of Colorado
2016	Nitschke-Kaskake Visiting Professorship, Oklahoma City Children's Hospital
2017	Stephen Max Memorial Lecture, University of Maryland
2017, 2018	Chair, Pediatric Cancer Working Group, AACR
2017	Warren Sutow Distinguished Lecture, MD Anderson Cancer Center
2018	BJ Kennedy Keynote Lecturer, Masonic Cancer Center, Minneapolis, MN
2018	Top 10 Clinical Research Award for New CAR-T Cell Therapy for Relapsed

- 2019 Leukemia  
Lila and Murray Gruber Memorial Cancer Research Award and Lectureship,  
American Academy of Dermatology

**National and International Conference Organizer/Session Chair (selected)**

- 2000 Chair, Clinical Immunology Society, Third HIV Immune-based Therapies  
Workshop, Washington, D.C.
- 1997 Co-Chair, Simultaneous Session on Immunopathology American Society of  
Hematology
- 1999 Chair, Symposium on Thymic Aging, FASEB/AAI, Washington D.C.
- 2001 Co-Chair, Simultaneous Session on Experimental Transplantation  
American Society of Hematology
- 2002 Co-Chair, Session on Clinical Immunology/Rheumatology/Cytokine Signaling,  
Pediatric Academic Societies Annual Meeting
- 2002 Chair, Plenary Session, Symposia on Cytokines in Cancer, Combined NCI/EORTC  
Congress, Frankfurt, Germany
- 2007 Chair, Educational Session on Ewing's Sarcoma, American Society of Clinical  
Oncology
- 2007 Conference Organizer, Nobel Mini-Symposium, IL-7 In Health and Disease,  
Stockholm, Sweden
- 2007 Co-Chair, Cytokine Session, International Society for the Biologic Therapy of  
Cancer National Meeting, Boston, MA
- 2007 Program Committee, NCI Symposium on Cancer and Inflammation, Bethesda, MD
- 2007, 08 Chair, Session on Lymphocyte Biology, American Society of Hematology
- 2007 Advisory Committee, NCI Immunotherapy Workshop
- 2008 Conference Organizer, 1<sup>st</sup> International Conference on Immunotherapy in Pediatric  
Oncology, Bethesda, MD
- 2008 Program Committee, NCI Symposium on Immunotherapy
- 2010 Program Committee, NCI Symposium on Inflammation and Cancer
- 2010 Conference Organizer, 2<sup>nd</sup> International Conference on Immunotherapy in Pediatric  
Oncology, Houston Texas
- 2011 Member, American Society of Hematology Scientific Committee on Immunology  
and Host Defense
- 2012 Vice-Chair, American Society of Hematology Scientific Committee on  
Immunology and Host Defense
- 2012 Conference Organizer, 3<sup>rd</sup> International Conference on Immunotherapy in Pediatric  
Oncology, Frankfurt, Germany
- 2013 Chair, American Society of Hematology Scientific Committee on Immunology and  
Host Defense
- 2014 Scientific Program Committee: American Association for Cancer Research meeting  
on Hematologic Malignancies, 2014
- 2015 Chair, Immunology Scientific Program Committee, AACR Annual Meeting
- 2015 Conference Organizer, 4<sup>th</sup> International Conference on Immunotherapy in Pediatric  
Oncology, Seattle, WA
- 2016-2017 Co-Chair, Program Committee, AACR Annual Meeting

- 2017 Co-Chair, Program Committee, AACR-NCI-EORTC Molecular Targets Meeting
- 2017 Co-Chair, Program Committee, Society for Immunotherapy of Cancer
- 2018 Co-Chair, Program Committee, AACR Annual Meeting
- 2018 Co-Chair, Program Committee, Society for Immunotherapy of Cancer
- 2018 Program Committee, CRI-CIMT-EATI-AACR
- 2019 Meeting Co-Chair, Special Conference Pediatric Cancer, AACR
- 2019 Meeting Co-Chair, Cell Therapies for Cancer, AACR
- 2019 Co-Chair, Keystone Conference, Immunotherapy of Cancer
- 2020 Co-Chair, Keystone Symposia, Cell and Gene Therapy

**Patents/Provisional and Patents Pending:**

- 2005 A Peptide Epitope and Improvement Thereof Inducting T Cell Immunity to Alveolar Rhabdomyosarcoma in HLA-B7 positive Individuals. Patent issued: 7,867,977 (US, 2011). Patents pending: 12/966,341 (US application); PCT/US2006/041462 (PC Application); E-312-2005/0
- 2008 Immunogenic Peptides And Methods Of Use For Treating And Preventing Cancer, Berzofsky et al, U.S. Patent Application No. 12/092,449 filed May 2, 2008
- 2008 Survivin Specific T Cell Receptors For Immunotherapy of Cancer, U.S. Patent Application No. 61/140,338 filed 2008.
- 2011 Anti-CD22 Chimeric Antigen Receptors, Patent pending: 61/549,516 US Application, International Patent Application No. PCT/US2012/061025; E265-2011/0-PCT-02
- 2012 M971 Chimeric Antigen Receptors, US Patent Application No. 61/717,960 filed Oct 24, 2012, Patent Pending: 61/717,960; E291-2012/0
- 2013 Anti-CD276 polypeptides, proteins and chimeric antigen receptors. Patent pending: 61/805001 (US application); E-104-2013/0
- 2014 ALK Antibodies, Conjugates and Chimeric Antigen Receptors, US Patent Application No. 61/900,806 filed November 6, 2013, Patent pending 61/900,906; E-007-2014/0
- 2015 Dual Specific Anti-CD22-Anti-CD19-Chimeric Antigen Receptors, US Patent Application No 62/135,442 filed March 29, 2015
- 2015 Anti-CD276 Chimeric Antigen Receptors, US Patent Application No 62/216,447 filed September 10, 2015
- 2017 CAR T cell therapy to treat H3K27M midline gliomas, Provisional 61/531,872; 62/651,406; PCT/US2018/041839, 7/12/18
- 2017 Methods to prevent T-cell exhaustion and improve CAR-T cell immunotherapy with small molecules, Provisional 62/479,930; PCT/US2018/025394, Filed 03/30/2018
- 2017 Methods of Treating T Cell Exhaustion by Modulating T Cell Receptor Signaling, Provisional 62/479,930; PCT/US2018/025459, Filed 03/30/2018
- 2017 Compositions and Methods for Inhibiting T Cell Exhaustion, Provisional 62/599,299, Filed 12/15/2017; 62/738,687, 9/28/2018;
- 2018 Chimeric Antigen Receptor Polypeptides and Methods of Using Same, Provisional 62/694,830, Filed 7/6/2018

- 2018 SMASh\_CARs: A "drug off" chemogenetic system for regulating CAR T-cell therapy, Provisional 62/694,830, Filed 7/6/2018
- 2018 Small Molecule Modulators of chimeric antigen receptor (CAR) T cells, Provisional 62/752,401 Filed 10/30/2018

**Cooperative Research and Development Awards/Clinical Trial Agreements/Sponsored Research Awards**

- 2003-2007 *Principal Investigator*, Preclinical and Clinical Study of Anti-TR1 (TRAIL-R1) and Anti-TR2 (TRAIL-R2) in Ewing's Sarcoma, Human Genome Sciences, Inc.
- 2004-2010 *Principal Investigator*, NIH CRADA, Phase I Study of r-hIL-7 (CYT 99 007) for Treatment of Refractory Solid Tumors with Cytheris, LLC.
- 2012-2016 *Principal Investigator*, NIH CRADA, Development of New Lentiviral-Based Chimeric Antigen Receptors (CARs) Targeting Cell Surface Proteins for the Treatment of B-Cell Malignancies, Opus Inc.
- 2013-2016 *Principal Investigator*, M-CRADA, Study of AP1903 as a Dimerizing Agent to induce Apoptosis of T cells Expressing a GD2.z.28.OX40.1CD9 Chimeric Antigen Receptor, Bellicum Pharmaceuticals
- 2016-2018 *Principal Investigator*, Sponsored Research Award, Enhancing CAR Responses to Solid Tumors by Modulating Immunosuppression and Exhaustion, Bluebird Bio
- 2017-2019 *Principal Investigator*, Sponsored Research Award, Assessment of in vitro and in vivo Activity of hDHFR/PDE5-Regulated CARs, Obsidian Therapeutics

**Clinical Protocol Leadership/IND Sponsorship:**

- 1997-2002 *Principal Investigator*, NCI Protocol 97-C-0050, A Pilot Study of Tumor Specific Peptide Vaccination with IL2, with or without Autologous T Cell Transplantation in Patients with Recurrent Pediatric Sarcomas
- 1997-2005 *Principal Investigator*, NCI Protocol 97-C-0052, A Pilot Study of Autologous T Cell Transplantation with a Vaccine Driven Expansion of Anti-Tumor Effectors After Cytoreductive Therapy in Metastatic Pediatric Sarcomas
- 2001-2004 *Principal Investigator*, NCI Protocol 01-C-0037, Late Effects of Treatment in Survivors of Pediatric Sarcomas
- 2007-2009 *Principal Investigator*, NCI Protocol 02-C-0259, Pilot Study of Allogeneic Blood Stem Cell Transplantation in Patients with High Risk and Recurrent Pediatric Sarcomas.
- 2003-2009 *Protocol Chairperson*, NCI Protocol 03-C-0152, A Phase I Trial of Subcutaneous rhIL7 (Cyt-99-007) in Refractory Non-hematologic Malignancies.
- 2004-2015 *Principal Investigator*, NCI Protocol 04-CN-135, Prospective Evaluation of the Prognostic Relevance of PCR Positivity in Blood and Bone Marrow in Non-Metastatic Ewings Sarcoma. A Companion Biology Study to COG AEWS0031.
- 2007-2011 *Principal Investigator*, NCI Protocol 07-C-0040, "A Phase I Trial of Monoclonal

2007-2015	Antibody HGS-ETR2 in Patients with Refractory Pediatric Solid Tumors". <i>Principal Investigator</i> , NCI Protocol 07-C-0206, "A Pilot Study Of Tumor Vaccination In Patients With Neuroblastoma And Pediatric Sarcomas And Altered T Cell Homeostasis".
2007-2015	<i>IND Sponsor</i> , Tumor Purged/CD25+ Depleted Lymphocytes with Tumor Lysate/KLH Pulsed Dendritic Cell Vaccine
2010-2015	<i>IND Sponsor</i> , KT64.4-1BBL aAPC + rhIL15 Expanded Allogeneic NK Cells after T Cell Depleted Allogeneic PBSCT
2011-2015	<i>IND Sponsor</i> , Anti-CD19 CAR T Cells for Refractory B Cell Malignancies
2007-2010	<i>Principal Investigator</i> , NCI Protocol 08-C-0007, "A Phase I Trial of Ipilimumab in Patients with Refractory Pediatric Cancer"
2011-2015	<i>Principal Investigator</i> , NCI Protocol 11-C-0113, A Pilot Study of Genetically Engineered NY-ESO-1 Specific T Cells in HLA-A2+ Patients with Synovial Cell Sarcoma
2013-2015	<i>IND Sponsor</i> , Autologous NK Cells Plus rhIL15 for Refractory Pediatric Solid Tumors
2013-2015	<i>IND Sponsor</i> , Anti-GD2.28.z.OX40.ICD9 (anti-GD2 CAR) retroviral transduced autologous peripheral blood lymphocytes, AP1903 dimerizing agent for the treatment of GD2+ Pediatric Sarcomas
2013-2015	<i>Principal Investigator</i> , A Phase I Trial of T Cells Expressing an anti-GD2 Chimeric Antigen Receptor in Children and Young Adults with Non-neuroblastoma, GD2+ Solid Tumors
2014-Present	<i>Study Chair</i> , A Phase 1/2 Study Of Nivolumab In Children And Adolescents With Recurrent Or Refractory Solid Tumors As A Single Agent And In Combination With Ipilimumab, Translational Children's Oncology Group Trial
2017-Present	<i>IND Sponsor</i> , Autologous T Cells Transduced with Bivalent Lentiviral Vector (CD19/22.BB.z) Chimeric Antigen Receptor (CAR)
2017-Present	<i>Principal Investigator</i> , Phase 1 Dose Escalation Study of CD19/CD22 Chimeric Antigen Receptor (CAR) T Cells in Children and Young Adults with Recurrent or Refractory B Cell Malignancies, Stanford University

### Teaching and Mentoring (selected):

<u>Postdoctoral Fellows</u>	<u>Years</u>	<u>Current Position</u>
Theresa Goletz	1997-1999	Global Head, NBE Drug Disposition, EMD Serono
Manoj Sinha	1999-2001	Biologist, New York University
Philomena Medeiros	1999-2000	Attending Pathologist, University of Lisbon, Portugal
H. Udo Kontny	1996-1999	Director, Section on Pediatric Hematology/Oncology, Aachen Germany
Margret Merino	1998-2001	US Food and Drug Administration
Hua Zhang	1999-2004	Senior Research Associate, Pediatric Oncology Branch, NCI
Fraia Melchionda	2001-2004	Assoc Professor, University of Bologna, Italy
Melinda Merchant	1999-2004	Senior Medical Director, Astra Zeneca
Terry Fry	1997-2002	Professor of Pediatrics, Univ of Colorado School of Medicine
Martin Guimond	2003-2008	Asst. Professor, University of Montreal, Canada
Kristen Snyder	2003-2007	Asst. Professor, Pediatric Hematology/Oncology, Vanderbilt
Aviva Krauss	2005-08	US Food and Drug Administration

Yongzhi Cui	2006-2010	Study Physician, Astra Zeneca
Christian Capitini	2006-11	Asst. Professor, Pediatric Hematology/Oncology, University of Wisconsin
Najat Boujkouj	2008-10	US Food and Drug Administration
Jeremy Edwards	2008-10	Attending Physician, Tripler Army Base, Honolulu, HI
Steven Highfill	2010-2014	Staff Scientist, National Institutes of Health
M. Eric Kohler	2013-2014	Asst. Professor of Pediatrics, Univ of Colorado School of Medicine
Daniel Trey Lee	2009-2015	Director of Pediatric BMT, University of Virginia
Robbie Majzner	2014-present	Instructor, Stanford University
Samuel Haile	2014-2017	Scientist, Cell Design Labs, San Francisco
Sabine Heitzeneder	2014-present	Postdoctoral Fellow, Stanford University
Rachel Lynn	2016-present	Postdoctoral Fellow, Stanford University
Evan Weber	2016-present	Postdoctoral Fellow, Stanford University
Dorota Klysz	2017-present	Postdoctoral Fellow, Stanford University
Johanna Theruvath	2017-present	Postdoctoral Fellow, Stanford University
Zinaida Good	2018-present	Postdoctoral Fellow, Stanford University
Diane Tseng	2017-present	Instructor, Stanford University

#### Doctoral Students

Melissa Hazen	2000-1	Asst. Attending, Boston Children's Hospital
Sarah Taylor Tasian	2001-2002	Asst. Professor, Children's Hospital of Philadelphia
Achiamah Osei-Tutu	2002-2003	Dermatologist, Private Practice, New York City
Jessica Karl Shand	2003-04	Asst. Professor, Univ. of Rochester
Tom Krupica	2004-06	Gastroenterologist, Georgetown University
Eunice Rhee	2006-07	Neonatology, Children's Hospital of Colorado
Haven Garber	2007-08	Fellow, MDACC
Natasha Fewkes	2008-12	Fellow, Academic Dermatology, UCSD
Wangko Lundstrom	2009-2012	Head of Analytics, Octopharma, Sweden
Sneha Ramakrishna	2010-11	Pediatric Oncology Fellow, NIH/Johns Hopkins
Martha Amoako	2010-11	Pediatric Anesthesia, Johns Hopkins
Will Babbitt	2011-12	General Pediatrics
Tasha Lin	2011-12	Fellow, Medical Oncology, UCLA
Adrienne Long	2011-15	Fast Track Pediatric Residency, Boston Childrens
Nick Tschernia	2013-14	Fellow, Medical Oncology, University of North Carolina
Justin Arredondo-Guerrero	2017-present	Doctoral Student, Microbiology and Immunology, Stanford
Louai Labanieh	2017-present	Doctoral Student, Bioengineering, Stanford

#### Pre- & Post-baccalaureates

Matthew Milliron	2003-04	Anesthesiologist, Charleston, SC
Varun Khanna	2004-05	Cardiology, Oklahoma Heart Hospital
Sarah Herby	2004-05	Attending Physician, Emory University, Pediatric Hematology/Oncology
Dave Grindler	2005-06	Otolaryngologist, Colorado
Rachelle Veenstra	2006-07	PhD Student, University of Minnesota
Jeff Leong	2007-08	MD/PhD Student, Washington Univ. St. Louis
Ryan Murphy	2008-08	Medical Student, University of California, San Diego
Joanna Meadors	2008-10	Medical Student, Florida State University
Janna Minehart	2012	Research technician, Memorial Sloan Kettering



Waleed Haso	2011-2014	Lentigen Technology Incorporated
Alec Walker	2013-2015	Graduate Student, Harvard Medical School
Jillian Smith	2013-2015	Medical Student, New York Medical College
Skylar Reitburg	2017-present	Postdoctoral Biologist, Stanford University
Jake Lattin	2018-present	Postdoctoral Biologist, Stanford University
Brooke Vittemberga	2016-present	Undergraduate, Stanford University
Panos Vandris	2018-present	Undergraduate, Stanford University

### Thesis Committees

Surya Mitra, Stanford Bioengineering Graduate Program  
 Benson George, Stanford Stem Cell Program  
 Chris Mount, Stanford Cancer Biology Program  
 Salil Bhate, Stanford Immunology Program  
 Phoebe Yi, Stanford Stem Cell Program  
 Tim Keyes, Stanford Cancer Biology Program

### Stanford Lectures

2016 Stanford Undergraduate Human Biology  
 2017 Stanford Advanced Immunology (Immunol 202)  
 2017 Stanford Tumor Immunology and Immunotherapy (CBIO 275/Immuno275)  
 2018 Stanford Advanced Immunology (Immunol 202)  
 2018 Stanford Bioengineering Lecture

### Advisory Boards, Committees, Grant Reviews, non-NIH:

1995 Swiss National Science Foundation  
 1996 Study Section, R21 Program in Human Immunology, Office of AIDS Research  
 2001-2002 American Society of Hematology, Abstract Reviewer  
 2001-02 Executive Board/Steering Committee, Federation of Clinical Immunology Societies (FOCIS)  
 2001-02 Chair, Tumor Immunology Subcommittee, Clinical Immunology Society  
 2002 Ad hoc Member, Biologic Response Modifiers Advisory Committee, Food and Drug Administration  
 2002 Outside Expert, Thesis Committee, Rockefeller University  
 2002 Outside Expert, Thesis Committee, Rush University  
 2002 Comitato Telethon Fondazione Onlus, Italy  
 2002 Dutch Cancer Society, The Netherlands  
 2003 Member, Biologic Response Modifiers Advisory Committee, Food and Drug Administration  
 2003 American Society of Hematology, Abstract Reviewer  
 2005 Genome Institute of Canada  
 2005 Centre National de la Recherche Scientifique, Paris, France  
 2006,07 Grant Review, University of Minnesota

2006-09 American Society of Oncology Cancer Education Committee  
 2006 Leader, Pediatric Oncology Education Track, American Society of Clinical Oncology  
 2007 American Society of Hematology, Abstract Reviewer  
 2007 La Fondation des Gouverneurs de l'espoir for Ewing Family Tumors Research  
 2007 European Research Council, Grant Review  
 2007-2010 Scientific Advisory Board, MidWest Athletes Against Cancer  
 2008 Alex's Lemonade Stand  
 2009 Alex's Lemonade Stand  
 2008 Israel Science Foundation  
 2008 FDA DNA Advisory Committee  
 2008 Coordinating Reviewer, Lymphocyte Section, American Society of Hematology  
 2009-2014 Chair, Medical Advisory Board, Children's Cancer Foundation  
 2010-2012 External Advisory Board, Program Project Grant, University of Minnesota  
 2010-2012 External Advisory Board, Program Project Grant, Baylor College of Medicine  
 2011 Vice Chair, American Society of Hematology, Scientific Committee on Immunology and Host Defense  
 2012 Ad hoc Advisory Board, St. Baldrick's  
 2012 AACR Career Development Award, Pediatrics  
 2012 Chair, Scientific Advisory Board, MidWest Athletes Against Cancer  
 2012-13 Chair, Scientific Committee on Immunology and Host Defense, American Society of Hematology,  
 2012 Genome Quebec, Genome Canada, Advisory Board  
 2012-14 St. Baldrick's  
 2012 American Society of Hematology: Career Development Awards  
 2013 Chair, Scientific Advisory Board, Midwest Athletes Against Cancer  
 2014 External Advisory Board, St. Anna Kinderspital, Vienna Austria  
 2013-14 Immunology Steering Committee, American Association for Cancer Research  
 2014, 15 Alex's Lemonade Stand  
 2014 Solving Kids Cancer  
 2014-15 Chair, Program Committee on Immunology, AACR Program Committee  
 2014, 15 AACR Lloyd Old Award in Cancer Immunology, Selection Committee  
 2015-present Hyundai Hope on Wheels Medical Advisory Board  
 2016-present Scientific Advisory Board, Unum Therapeutics  
 2016 Scientific Advisory Board, NCarta Therapeutics  
 2016 ASH Committee on Scientific Affairs  
 2016-present Scientific Advisory Board, Glaxo-Smith-Kline Cell and Gene Therapy  
 2016 Scientific Advisory Board, Glaxo-Smith-Kline Cancer Cell Therapy  
 2016-present Chair, Scientific Advisory Board, Adaptimmune LLC  
 2016 Scientific Advisory Board, Servier, Pfizer  
 2016 Scientific Advisory Board, Roche  
 2016-present Scientific Advisory Board, Vor Pharmaceuticals  
 2018-present Scientific Advisory Board, Apricity Health  
 2018-present Consultant, TPG  
 2018 Scientific Advisory Board, Allogene  
 2018-present Scientific Advisory Board, Bryologyx

2018-present Scientific Advisory Board, PACT Pharma  
 2018 Scientific Advisory Board, Nektar

**Advisory Boards, Committees, NIH (selected):**

1999-2001 Intramural Advisory Board, National Cancer Institute  
 1997 Search Committee, Vaccine Research Center, NIAID  
 1998-2000 NCI Intramural Advisory Board  
 2000 NIH Study Section, Program Project Grants NHLBI, Transplantation  
 Biology  
 2002-03 Steering Committee, NIH Immunology Interest Group  
 2002-present Steering Committee, NCI Immunology Faculty  
 2002-07 Data Safety and Monitoring Board, Adolescent Medicine Trials Network,  
 National Institute of Child Health  
 2003-2012 Preceptor, NIH Clinical Research Training Program  
 2001 Progress Review Group on Sarcomas, National Cancer Institute  
 2004 NIH Representative, NIH Director's Advisory Board for Open Access Policy to  
 Scientific Literature  
 2004-present Steering Committee, NCI Center of Excellence in Immunology  
 2004-08 NIH Central Tenure Committee  
 2005-present NCI Clinical Review Panel  
 2005 NCI Center for Cancer Research, Advisory Board  
 2005-06 Clinical Executive Committee, NIH NCI  
 2005, 2006 Reviewer, NCI Director's Award  
 2006 Search Committee, Chief of Medical Oncology Branch, National Cancer Institute  
 2006, 2007 Reviewer, Sallie Rosen Kaplan Award  
 2006 Search Committee, Chief of Laboratory of Pathology, National Cancer Institute  
 2006 Co-Chair, Work Group, Trans-NIH Research Initiative  
 2006 Advisory Board, Trans-NIH Translational Initiative in Immunology  
 2007 Search Committee, Tenure Track in Pediatric Rheumatology, NIAMS  
 2007 Search Committee, Head, Cell Processing Section, Department of Transfusion  
 Medicine, NIH Clinical Center  
 2007 Operational Review Team, Department of Laboratory Medicine, NIH Clinical  
 Center  
 2007 Search Committee, Tenure Track in Surgery, NCI  
 2007 Search Committee, Tenure Track in Cancer and Inflammation, NCI  
 2007 Search Committee, Tenure Track in National Human Genome Research Institute  
 2008-12 Advisory Board for Clinical Research, NIH Clinical Center  
 2007-10 Advisor to Deputy Director on Intramural Research, Trans-NIH Intramural  
 Research Initiatives  
 2010 Search Committee, Tenure Track in Laboratory of Tumor Immunology and  
 Biology, NCI  
 2010-12 Steering Committee, NIH Immunology Interest Group  
 2010-13 Bench-to-Bedside Review Team, NIH  
 2011 Chair, Search Committee, Tenure Track in Experimental Transplantation and  
 Immunology Branch, NCI

2012	Search Committee, Tenure Track in Dermatology, NCI
2011-12	Advisor to Deputy NCI Director, National Cancer Institute, Provocative Questions
2012-14	Executive Committee, Medical Research Scholars Program, NIH
2012-13	Executive Committee, Provocative Questions, NCI
2014-present	Center for Cancer Research Science Board
2014	Long-term Visioning Committee, National Cancer Institute
2014	Pediatric Visioning Committee, NIH Clinical Center
2015	Long-term Visioning Committee, National Institutes of Health

Invited Lectures (selected):

1995	SPIRAT/NCDDG HIV Conference on Novel HIV Therapies: From Discovery to Clinical Proof-of-Concept, Bethesda, MD
1996	Keystone Symposia on Blood and Bone Marrow Transplantation, Keystone, CO
1996	NIH Grand Rounds
1996	Second Annual NIH Immunology Retreat, Airlie, VA
1997	Third Annual NIH Immunology Retreat, Immune Tolerance Session, Airlie, VA
1997	<i>Plenary Session</i> , Intl. Workshop on HIV Drug Resistance, St. Petersburg, FLA
1997	Fourth International Symposium, Biologic Therapy of Cancer-From Basic Research to Clinical Application, Munich, Germany
1997	Aaron Diamond AIDS Research Center, Seminar Series, New York, NY
1997	Karmanos Cancer Institute Oncology Grand Rounds, Detroit, MI
1997	NIH Immunology Interest Group, Bethesda, MD
1998	Fourth Annual Translational Research Symposia, Antiretroviral Therapy, San Francisco, CA
1998	Pediatric Oncology Group, Biologic Response Modifiers Section, St. Petersburg, FLA
1998	Pediatric AIDS Clinical Trials Group, Leadership Retreat, San Diego, CA
1998	AIDS Clinical Trials Group, Leadership Retreat, San Diego, CA
1998	American Association of Immunologists, Aging Symposia, FASEB, San Francisco, CA
1998	Clinical Immunology Society, HIV Workshop, FASEB, San Francisco, CA
1998	<i>Plenary Session</i> , Fifth Conference on Retroviruses and Opportunistic Infections, Chicago, IL
1999	Infectious Disease Society of America, Philadelphia, PA, Symposia on Immune Reconstitution,
1999	Plenary Session on Targeted Therapy, Intl. Society of Pediatric Oncology/American Society of Pediatric Hematology Oncology, Montreal, Canada
1999	Institute of Virology, Immune Reconstitution in HIV Symposia, Bethesda, MD
1999	Children's Hospital of Philadelphia, Philadelphia, PA, Leukemia Interest Group,
1999	<i>Plenary Session</i> , Experimental Biology, Clinical Immunology Society, Immune Reconstitution, Washington DC
1999	Immunology Grand Rounds, Cornell University Medical Center, New York City
1999	Johns Hopkins University School of Medicine, Hematopoiesis Society
2000	Immunology Lecture Series, Dept. of Pathology, Case Western Reserve University, Cleveland, OH
2000	Dept of BMT and Pediatric Oncology, University of Bologna, Bologna Italy,

- 2000 Department of Pediatric Oncology, Kinderspasse, Vienna Austria,  
 2000 Allogeneic BMT, Forbeck Foundation, Hilton Head, SC,  
 2000 First International Ewings Sarcoma Symposia, Warrenton, VA  
 2000 New York Society of Physicians and Surgeons, Tumor Immunology, New York, NY  
 2000 National Institute of Arthritis and Musculoskeletal Diseases, Stem Cell Research:  
 Potential and Promise, Bethesda, MD  
 2000 American Academy of Immunology, Clinical Immunology Society Symposium, Seattle,  
 WA  
 2000 *Plenary Session*, Immune Reconstitution, American Society for BMT Annual Meeting,  
 Anaheim, CA  
 2000 Grand Rounds, Dept. of Pediatrics, Memorial Sloan Kettering Cancer Center, New York,  
 NY  
 2001 Immunology Faculty Seminar Series, NCI,  
 2001 Immunology Interest Group Seminar Series, NIH,  
 2001 *Plenary Session*, Scientific Subcommittee on Pediatric Hematology, American Society of  
 Hematology, Orlando, FLA  
 2001 Pre-meeting Symposium on HIV Immunotherapy Federation of Clinical Immunology  
 Societies (FOCIS), Boston, MA  
 2001 Office of AIDS Research Advisory Board, National Institutes of Health  
 2001 *Plenary Session*, Keystone Symposia on HIV Pathogenesis; Keystone CO  
 2001 Dept. of Immunology Lecture Series, Mayo Clinic, Rochester, Minnesota,  
 2001 Department of Bone Marrow Transplantation Lecture Series, University of Minnesota,  
 Minneapolis, Minnesota  
 2002 Immunology Faculty Seminar Series, NCI  
 2002 National Childhood Cancer Foundation, Gold Ribbon Days, “New Therapeutic Strategies  
 for Pediatric Cancer”, Washington DC  
 2002 *Plenary Session*, Cytokines and Cancer, NCI-EORTC, Frankfurt Germany  
 2002 Department of Pediatrics, University of Rochester, Rochester, NY  
 2002 Oncology Grand Rounds, Immune Based Therapies in Pediatric Oncology  
 Baylor College of Medicine, Texas Children’s Hospital, Houston TX  
 2002 Immunology Seminar Series, IL-7 Based Therapeutic Strategies  
 St. Jude Children’s Research Hospital, Memphis, Tennessee  
 2002 Cytokine Modulation of Immune Reconstitution, NHLBI Conference on Immune  
 Reconstitution post-Allogeneic BMT, Bethesda, MD  
 2002 Second International Conference on Ewings Sarcoma, Hanover, NH  
 2002 CFAR Conference, Case Western Reserve University, Cleveland, OH  
 2003 *Plenary Session* on Hematopoietic Stem Cell Transplantation, International Society of  
 Cell Therapy, Phoenix, AZ  
 2003 Symposium for Practicing Physicians, Focus on Immunotherapy, National Cancer  
 Institute, Bethesda, MD  
 2003 Topic Symposium on Immune Reconstitution, Pediatric Academic Society/American  
 Society of Pediatric Hematology/Oncology, Seattle, WA,  
 2003 Symposium, Immunology and Immunotherapy of Pediatric Malignancies, American  
 Society of Pediatric Hematology/Oncology, Seattle, WA  
 2003 *Plenary Session*, Keystone Symposia on HIV Immunopathology, Banff, Canada  
 2003 *Keynote Speaker*, Regional Cancer Consortium, Ohio State University, Columbus, OH

- 2003 Virology Faculty Retreat, Gamma C Cytokines as Vaccine Adjuvants, Bethesda, MD
- 2003 NIH Cytokine Interest Group Symposia on Lymphocyte Homeostasis, Frederick, MD
- 2004 Session Chair on Bone Marrow Transplantation, International Congress of Immunology, Montreal Quebec
- 2004 Immune Reconstitution after BMT, Summer Immunology Conference, FASEB, Snowmass, CO
- 2004 *Keynote Speaker*, European Society of Pediatric Bone Marrow Transplantation, Immune Reconstitution: Current Concepts, Holland
- 2004 NIH Director's Series, T Cell Homeostasis
- 2004 NIH Recombinant DNA Advisory Board, External Expert, The Immune Response to Lymphopenia
- 2005 IL7 in Tumor Immunotherapy, Keystone Symposia on Tumor Immunology, Keystone, CO
- 2005 Major Symposia on Lymphocyte Homeostasis, American Academy of Immunology, San Diego, CA
- 2005 3<sup>rd</sup> International Conference on Ewing's Sarcoma, Dallas, TX
- 2005 NCI Center for Cancer Research Grand Rounds, Bethesda, MD
- 2005 NCI Translational Immunology Related to Cancer, Bethesda, MD
- 2005 Nobel Forum, Maintenance of Long-Term Immunity in Man, Karolinska Institute, Stockholm, Sweden
- 2005 Department of Pediatric Oncology, Karolinska Institute, Stockholm Sweden
- 2005 International Society for the Biologic Therapy of Cancer, Alexandria Virginia
- 2006 International Tumor Vaccine Symposium, Hasumi Foundation, Bethesda, MD
- 2006 American Society of Bone Marrow Transplantation, Honolulu, Hawaii
- 2006 Children's Oncology Group, Educational Session, Immunotherapy in Pediatric Oncology
- 2006 American Society of Gene Therapy, Symposia on Regulatory T cells, Baltimore, MD
- 2006 American Society of Clinical Oncology, Discussant, Scientific Session
- 2006 American Society for Veterinary Clinical Oncology, Tucson, Arizona
- 2007 NCI Science Writer's Series, Second Malignant Neoplasms
- 2007 4<sup>th</sup> Annual Cellular Therapy Symposium, Regensburg Germany
- 2007 NCI Executive Committee, Scientific Presentation
- 2007 Dana Farber Cancer Institute, Transplantation Grand Rounds, Boston, MA
- 2007 American Society for Pediatric Hematology/Oncology, Pediatric Academic Society, Toronto, Canada
- 2007 Rolduc, Conference in Basic Immunology, The Netherlands
- 2007 American Society of Clinical Oncology, Session Chair, Chicago, IL
- 2007 American Society of Clinical Oncology, Meet-the-Professor, Chicago, IL
- 2007 Cytokine Interest Group, National Institutes of Health
- 2007 *Keynote Speaker*, Midwest Athletes Against Cancer Scientific Symposium, University of Wisconsin, Milwaukee
- 2007 Nobel Mini-Symposium, IL-7 in Health and Disease, Stockholm Sweden
- 2007 NIH Research Festival
- 2007 NHLBI Grand Rounds, Bethesda, MD
- 2007 International Society for Biologic Therapy of Cancer, Boston, MA
- 2007 Ethics Grand Rounds, NIH Clinical Center
- 2007 Howard Hughes Cloister Program Seminar Series, Bethesda, MD

- 2008 International Society for Biologic Therapy of Cancer, Rockville, MD
- 2008 Oncology Grand Rounds, Washington Hospital Center, Washington DC
- 2008 Ewing's Sarcoma 4<sup>th</sup> International Symposium, Dartmouth College
- 2008 American Society of Pediatric Hematology/Oncology, Cincinnati, OH
- 2008 Rita Zaizov Honorary Symposium, Schneider Children's Hospital, Tel Aviv, Israel
- 2008 Oncology Congress, San Francisco, CA
- 2008 Knight's Fellows Presentation, NIH
- 2008 NCI Center for Excellence in Immunology Immunotherapy: Realizing the Promise
- 2008 Walter Reed Army Research Institute
- 2009 Food and Drug Administration, CBER, Seminar Series
- 2009 MD Anderson Cancer Center, Pediatric Grand Rounds, Houston, TX
- 2009 Visiting Professor, Institute of Molecular Medicine, University of Lisbon, Portugal
- 2009 *Plenary Session* on GVHD, Tandem Meetings for ASBMT/ISBMT, Tampa Florida
- 2009 Discussant, American Society of Clinical Oncology
- 2009 University of Minnesota, Grand Rounds, Minneapolis, MN
- 2009 Targeted Therapies for Childhood Cancer, Georgetown University, Washington DC
- 2009 University of Montreal, Hospital Massoneuve-Rosemont Scientific Advisory Board
- 2009 Memorial Sloan Kettering Cancer Center, National Conference on Desmoplastic Small Round Cell Tumor, New York, NY
- 2009 *Alex Koufos Memorial Lecture*, Akron Children's Hospital, Akron, OH
- 2009 Frontiers in Immunology, National Institutes of Health, Bethesda, MD
- 2009 Ethical and Regulatory Aspects of Clinical Research, NIH Clinical Center, Investigator Panel
- 2010 Children's Hospital, University of Cincinnati
- 2010 American Society for Pediatric Hematology/Oncology, Major Symposium, Montreal Canada
- 2010 Federation of Clinical Immunology Societies, Boston, MA
- 2010 Cell and Gene Therapy Group, Baylor College of Medicine/Texas Children's Hospital
- 2010 ATTACK Conference, Montpellier, France
- 2010 2<sup>nd</sup> International Conference on Immunotherapy in Pediatric Oncology, Houston, TX
- 2011 *The Vineberg Lecture*, Montreal Children's Hospital Grand Rounds, Montreal, Quebec
- 2011 American Society of Clinical Oncology
- 2011 Advances in Immunotherapy for Cancer, Center for Cancer Research, Bethesda MD
- 2011 Cooperative Immunotherapy Network (CITN), IL-7 Overview, Bethesda, MD
- 2012 Howard Hughes Research Institute Cloister Program, Bethesda MD
- 2012 *Keynote Speaker*, Texas Children's Hospital Cancer Center, Houston, TX
- 2012 Sarcoma Foundation of America, New York, NY
- 2012 NCI Center of Excellence in Immunology, Bethesda, MD
- 2012 2<sup>nd</sup> Berlin Symposium on Adoptive T Cell Therapy, Berlin, Germany
- 2012 Canadian Society of Immunology, St. Johns, Newfoundland
- 2012 3<sup>rd</sup> International Conference on Immunotherapy in Pediatric Oncology, Frankfurt Germany
- 2012 University of Birmingham, Birmingham England
- 2012 San Raffaele Institute, Milan, Italy
- 2012 *NIH Great Teachers Lecture*, Bethesda, MD
- 2012 Washington Academy of Sciences, Washington DC

- 2013 American Society for Bone Marrow Transplantation, Salt Lake City, Utah
- 2013 NIH Translational Research Interest Group
- 2013 Van Andel Research Institute, Grand Rapids, MI
- 2013 Meet-the-Expert, American Association for Cancer Research
- 2013 Cleveland Clinic Foundation, Immunology Research Seminar, Cleveland, OH
- 2013 Dana Farber Cancer Institute, Pediatric Hematology/Oncology Grand Rounds
- 2013 American Association of Immunologists, Major Symposium, Honolulu, HI
- 2013 American Society of Clinical Oncology, Chicago, IL
- 2013 Children's Oncology Group, Minneapolis, MI
- 2013 FDA-RAC T Cell Immunotherapies, Bethesda, MD
- 2013 Hyundai Childhood Cancer Advocacy Event, US Capitol, Washington DC
- 2013 Childhood Congressional Caucus, US Capitol, Washington DC
- 2013 CureSearch Symposium, Washington DC
- 2013 Human Immunology Symposium, Blood Research Institute, Milwaukee, WI
- 2013 International Sarcoma Conference, New York, NY
- 2013 American Assoc for Cancer Research, Pediatric Cancer at the Crossroads, San Diego, CA
- 2013 Educational Session, American Society of Hematology, New Orleans, LA
- 2013 Alexandra Scott Lectureship, Children's Hospital of Philadelphia
- 2014 StandUp2Cancer Scientific Summit, Pasadena, CA
- 2014 Grand Rounds, National Heart, Lung and Blood Institute, Bethesda MD
- 2014 Roswell Park Cancer Institute, Buffalo, NY
- 2014 17<sup>th</sup> US-Japan Meeting on Chimeric Antigen Receptor T cells for Cancer Therapy, Bethesda, MD
- 2014 St. Jude Research Hospital, Memphis, TN
- 2014 American Association for Cancer Research, Meet-the-Expert, San Diego, CA
- 2014 American Association for Cancer Research, Educational Session, San Diego, CA
- 2014 Congressional Briefing, Rayburn Office Building, Washington DC, "Making Research Count For Patients: A Continual Pursuit"
- 2014 Four Diamonds Pediatric Cancer Center, Hershey, PA
- 2014 Advances in Neuroblastoma *Keynote Address*, Cologne, Germany
- 2014 Aspen Cancer Conference, Aspen, CO
- 2014 Children's National Medical Center, Center for Cancer and Immunology Research, Washington DC
- 2014 Pediatric Bone Marrow Transplant Consortium, Dallas, TX
- 2014 Immunohematology Symposium, National Institutes of Health
- 2014 Cancer Immunotherapy: Delivering the Promise; National Institutes of Health
- 2014 Walter Reed Army Medical Center, Dept of Medicine, Research Seminar
- 2014 NCI Council of Research Advocates, Bethesda, MD
- 2014 Hyundai Hope-on-Wheels, Thought Leaders Summit, Washington DC
- 2014 Second Military Medical School, Shanghai, China
- 2014 Lucille Packard Hospital at Stanford, Palo Alto, CA
- 2015 Google-X Immunology Summit, Mountain View CA
- 2015 SU2C Scientific Summit, Santa Monica, CA
- 2015 G. Burroughs Mider Lecture, Bethesda MD
- 2015 Adaptimmune Inc., Oxford, England
- 2015 University of California San Francisco, Breakthroughs in Cancer Immunotherapy



- 2015 St. Jude VIVA Forum, Singapore
- 2015 Children's Oncology Group, Genomics of Sarcoma, Philadelphia, PA
- 2015 AACR Major Symposium, Tumor Microenvironment, Philadelphia PA
- 2015 American Society of Pediatric Hematology/Oncology, Phoenix, AZ
- 2015 American Society of Clinical Oncology, CARs for Solid Tumors, Chicago, IL
- 2015 American Society of Gene Therapy, New Orleans, LA
- 2015 Children's Hospital of Cincinnati, Transplant Grand Rounds
- 2015 NCI Targeting Rhabdomyosarcoma Workshop, Rockville, MD
- 2015 American Society of Clinical Oncology, Discussant, Pediatric Oncology
- 2015 University of Wisconsin Cancer Center, Grand Rounds
- 2015 *Keynote Address*, Case Western Reserve Cancer Center/Cleveland Clinic Foundation, Annual Retreat
- 2015 *Plenary Session*, AACR-EORTC Molecular Targets Conference, Boston, MA
- 2015 Solid Tumor Grand Rounds, St. Jude Children's Research Hospital, Memphis, TN
- 2015 American Association of Cancer Institutes, Washington DC
- 2015 Coalition Against Childhood Cancer Annual Summit, Washington DC
- 2015 Medimmune Inc, Gaithersburg, MD
- 2015 4<sup>th</sup> International Conference on Immunotherapy in Pediatric Oncology, Seattle, WA
- 2015 University of Colorado, Division of Pediatric Hematology/Oncology Visiting Professorship
- 2015 AACR Special Conference on Pediatric Oncology, Ft. Lauderdale, FL
- 2015 Scientific Subcommittee Session, American Society of Hematology, Orlando, FL
- 2016 Nitschke-Kaskake Lecture, Oklahoma City Children's Hospital
- 2016 Sanford-Burnham Cancer Institute, La Jolla, CA
- 2016 AACR Sarcoma Educational Session, New Orleans, LA
- 2016 AACR Meet-the-Expert, New Orleans, LA
- 2016 NCI Cancer Center Retreat, Bethesda, MD
- 2016 *Keynote Address*, Children's Tumor Foundation, Austin, TX
- 2016 *Keynote Address*, Stanford Cancer Institute Retreat
- 2016 American Society of Hematology, San Diego, CA
- 2016 Society for Immunotherapy of Cancer, Washington DC
- 2016 New York Academy of Sciences, Frontiers in Immunotherapy, New York, NY
- 2017 Royal Academy of Physicians, London, England
- 2017 *Plenary Lecture*, American Association for Cancer Research, National Meeting
- 2017 Stephen Max Memorial Lecture, University of Maryland
- 2017 Cancer Cell Symposia, Inflammation and Immunity, San Diego, CA
- 2017 *Keynote Speaker*, Nordic Oncology Society, Stockholm, Sweden
- 2017 *Keynote Speaker*, American Radium Society, Colorado Springs, CO
- 2017 University of Michigan Cancer Center, Grand Rounds, Ann Arbor, MI
- 2017 *Warren Sutow Distinguished Lecture*, MD Anderson Cancer Center, Houston, TX
- 2017 National Cancer Institute, Cancer Immunology & Immunotherapy: From Conception to Delivery
- 2017 International Society of Pediatric Oncology, Washington DC
- 2017 *Plenary Session*, AACR Special Conference on Pediatric Oncology, Atlanta, GA
- 2017 American Society of Hematology, Scientific Subcommittee, Atlanta, GA
- 2017 American Society of Hematology, Special FDA Symposium, Atlanta, GA

- 2018 MidWinter Conference of Immunologists, Asilomar, CA
- 2018 Keystone Symposia, T Cell Dysfunction in Cancer, Breckenridge, CO
- 2018 Keystone Symposia, Emerging Cellular Therapies, Keystone, CO
- 2018 Keystone Symposia, Cancer Immunotherapy, Keystone, CO
- 2018 *BJ Kennedy Keynote Lecture in Medical Oncology, Univ of Minnesota*
- 2018 *Chair, Plenary Session, AACR National Meeting*
- 2018 Major Symposia, AACR National Meeting
- 2018 Kaiser Permanente National Oncology Conference, San Francisco
- 2018 Presidential Plenary Lecture, International Society of Cell Therapy, Montreal, CA
- 2018 Keynote Lecture, Mammalian Synthetic Biology Workshop 5.0, Harvard Medical School
- 2018 Advances in Neuroblastoma Research, Immunology Workshop, San Francisco
- 2018 Cell Biology Symposium, Toronto Hospital for Sick Kids, Toronto, CA
- 2018 Keynote Lecture, Adolescent and Young Adult Leukemia Symposium, University of Chicago
- 2018 Stanford Big Data/Precision Health Conference
- 2018 British Columbia Cancer Agency, *Discovery Talk*
- 2018 Charbonneau Cancer Institute, Calgary, Alberta
- 2018 Curious2018, Future InSight, Merck/Nature, Darmstadt Hesse Germany
- 2018 Abelson Lecture, Seattle Children's Hospital, Seattle, WA
- 2018 CRI-CIMT-EATI-AACR, New York, NY
- 2018 Keynote Lecture, UCSF Women in Immunology Symposium

#### Interviews, Broadcast and Alternative Media:

- 2007 Appearance/Interview Nancy Snyderman Show, NBC News, Childhood Cancer
- 2008 Appearance/Interview NBC Today Show, Stand Up to Cancer Kickoff
- 2010 Inside NCI Videocast: <http://www.cancer.gov/ncicancerbulletin/090710/page4>
- 2012 ABC News.com Twitter Chat on Cancer In Young Adults
- 2012 NCI Videocast: Promises and Challenges of Pediatric Cancer Research:  
<http://www.youtube.com/watch?v=p9ogazC4qzE>
- 2013 Webinar, Chimeric Antigen Receptors, NCI Pediatric and Adolescent Solid Tumor Steering Committee
- 2013 BLOOD Journal, Meet the Editors, <https://www.youtube.com/watch?v=d9n1-io0Y90>
- 2013 Q&A: Crystal Mackall, John Maris on Pediatrics, Cancer Discovery, 2013:961.
- 2016 American Society of Hematology, Passing the Checkpoint With New Approaches to Immunotherapy, <https://www.youtube.com/watch?v=E-EIcVnkvRo>
- 2016 Stanford Frontiers in Medicine, <https://www.youtube.com/watch?v=E-EIcVnkvRo>
- 2017 Podcast, Stanford Medicine, <https://med.stanford.edu/news/all-news/one-to-one/2016/new-hope-in-treating-cancer.html>
- 2017 ABC7 News: <https://www.youtube.com/watch?v=UTQEp3rZFqw>
- 2018 Cancer Immunotherapy with Crystal Mackall, Facebook Live, Stanford University Health Matters
- 2018 Top 10 Clinical Research Award Video:  
<https://www.clinicalresearchforum.org/page/NewCARTcell>
- 2018 Stanford Big Data: <https://www.youtube.com/watch?v=8vu21cCbUtE>

Community Service:

1989-1999	Medical Staff, Camp Fantastic for Children with Cancer
1990-1994	Volunteer, Dinner Program for Homeless Women Washington DC, Bd. of Directors, Dinner Program for Homeless Women, Washington, DC
1992	Team Leader, AIDS WALK, Washington D.C.
1994	Guest Lecturer, Mautner Project for Women with Cancer
2000	Executive Board, PTO, Grace Episcopal Day School
2002-2003	Science Fair Judge, Grace Episcopal Day School
2006-2008	Diversity Committee, Grace Episcopal Day School
2008-2013	Medical Staff, Camp Fantastic for Children with Cancer
2013-present	Communications Director, Walt Whitman Fighting Vikings Football
2014	Speaker, Frontiers in Biology for High School Students
2016-present	Advisory Board, Kids v Cancer Compassionate Use Navigator

**BIBLIOGRAPHY****REFEREED MANUSCRIPTS**

1. Paradise NF, Surmitis JM, **Mackall CL**. Oxygen reserve of left ventricle of isolated, saline-perfused rabbit heart. *American Journal of Physiology*, 1984, 247:H861-H868.
2. **Mackall CL**, Granger, L, Sheard MA, Cepeda R and Gress RE. T-cell regeneration after bone marrow transplantation: differential CD45 isoform expression on thymic-derived versus thymic-independent progeny. *Blood*, 1993, 82:2585-2594.
3. **Mackall CL**, Fleischer TA, Brown MA, Magrath IT, Shad AT, Horowitz ME, Wexler LH, Adde MA, McClure LL and Gress RE. Lymphocyte depletion during treatment with intensive chemotherapy for cancer. *Blood*, 1994, 84:2221-2228.
4. Christ M, McCartney-Francis NL, Kulkarni AB, Ward JM, **Mackall CL**, Gress RE, Hines KL, Tian H, Karlsson S, Wahl SM. Immune dysregulation in TGF- $\beta$ 1 deficient mice. *Journal of Immunology*, 1994, 153:1936-1946.
5. **Mackall CL**, Fleisher TA, Brown MR, Andrich MP, Chen CC, Feuerstein IM, Horowitz ME, Magrath IT, Shad AT, Steinberg SM, Wexler LH and Gress R.E. Age, thymopoiesis, and CD4<sup>+</sup> T-lymphocyte regeneration after intensive chemotherapy. *N Engl J of Medicine*, 1995, 332:143-149. Comment: Mackall CL, Steinberg SM, Gress RE. Regeneration of T cells after chemotherapy. *New England Journal of Medicine*, 1995, 332:1652.
6. Ward JM, Kulkarni AB, Yaswen L, **Mackall CL**, Bauer S, Huh C, Gress RE and Karlsson S. Pathology of TGF-beta 1 null mice. *American Journal of Pathology*, 1995, 146:1-12.
7. Ivy SP, **Mackall CL**, Gore L, Gress RE, and Hartley, AH. Demodicidosis in childhood acute lymphoblastic leukemia: An opportunistic infection occurring with immunosuppression. *The Journal of Pediatrics*, 1995, 127:751-754.

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10. Letterio JJ, Geiser AG, Kulkarni AB, Dang H, Kong L, Nakabayashi T, **Mackall CL**, Gress RE and Roberts AB. Autoimmunity associated with TBFb $\square$ 1 deficiency in mice is dependent on MHC Class II antigen expression. *Journal of Clinical Investigation*, 1996, 98:2109-2119.
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15. Borkowski TA, Letterio JJ, **Mackall CL**, Saitoh A, Farr AG, Wang XJ, Roop DR, Gress RE, Udey MC, Langerhans cells in the TGF  $\beta$ 1 null mouse. *Adv Exp Med Biol* 1997;417:307-10.
16. **Mackall CL**, Hakim FT and Gress RE. T-cell regeneration: all repertoires are not created equal. In: *Immunology Today*, 1997, 18: 245-251.
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19. **Mackall CL**, Stein D, Fleisher TA, Brown MR, Hakim FT, Bare, CV, Leitman, SF, Read EJ, Carter CS, Wexler LH and Gress RE. Prolonged CD4 depletion after sequential autologous peripheral blood progenitor cell infusions in children and young adults. *Blood*, 2000, 96:754-762.

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- Somatostatin Analog OncolarÆ: Significant Reduction of IGF-1 Serum Levels, *American Journal of Pediatric Hematology/Oncology*, 2002, 24:440-446.
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#### INVITED MANUSCRIPTS AND BOOK CHAPTERS

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### **Research Support (Current)**

CLIN2-10846	(PI: Mackall)	6/1/2018-5/31/2022
California Institute for Regenerative Medicine		\$2,464,154 TDC/yr
CD19/CD22 Bispecific CAR T cells for Adults with B Cell Malignancies		
Aim/Goal: This award funds a Phase I clinical trial of the CD19/22 CAR in Adults with Relapsed/Refractory B cell malignancies.		
U54 CA232568-01 (MPI: Maris and Mackall)		7/1/2018-6/30/2023
NIH/NCI		\$12,197,183 Total Costs
Discovery and Development of Optimal Immunotherapeutic Strategies for Childhood Cancers		

This is a multi-institutional Center grant to discover new immunotherapeutic strategies for childhood cancers as part of the Pediatric Immunotherapy Discovery and Development Network.

SU2C-AACR-DT1113 (MPI: Mackall and Maris) 2/1/16 – 11/30/21

St. Baldrick's Foundation/Lucile Packard Children's \$500,000 TDC/yr

Immunogenomics to Create New Therapies for High-Risk Childhood Cancers

Aim/Goal: Dr. Mackall serves as a Dream Team Co-Leader for this multi-institutional translational research project to use the power of cancer genomics to define and exploit immunotherapeutic targets in high-risk pediatric cancers. The project focuses exclusively on clinical trials and late IND-enabling preclinical studies, and thus is distinct from the U54 Program focused on the discovery and early development of novel immunotherapeutic approaches to childhood cancer.

2UM1CA154967-07 (PI: Cheever, Ped CITN PI: Mackall) 10/1/17-9/30/21

NIH/NCI \$2,000,000 TDC/yr.

Pediatric Cancer Immunotherapy Trials Network

Aim/Goal: I lead the multi-institutional clinical trial consortium that will undertake studies of immune based therapies for pediatric cancers.

P01CA217959-01 (PI: Maris/Seeger, Mackall: Project Co-PI) 9/1/2017– 8/30/2022

NIH/NCI \$136,050 Stanford TDC/yr.

New Therapeutics for High Risk Neuroblastoma

Aim/Goal: The major goals of this project are to develop cell based immunotherapies for the treatment of neuroblastoma

1U24CA22430901(PI: Maecker) 9/1/2017– 8/31/2022

NIH/NCI \$1,600,000.00 TDC/yr.

(CIMACs) Cancer Immune Monitoring Center at Stanford

Aim/Goal: I serve as Associate Investigator on this project, which provides immune monitoring for NCI funded cooperative group immunotherapy trials within the United States for adult patients and pediatric patients.

129874 (PI: Mackall) 10/1/2017-9/30/2019

Obsidian Therapeutics \$224,451.00 TDC/yr

Assesment of in vitro and in vivo activity of hDHF

Aim/Goal: This project undertakes preclinical studies of regulatable chimeric antigen receptors that are proprietary to Obsidian therapeutics.

- Parker Institute for Cancer Immunotherapy (PI: Mackall) 9/1/2016 – 8/31/2021

Parker Institute for Cancer Immunotherapy \$1,000,000.00 TDC/yr

Aim/Goal: This project undertakes studies into the biology of human T cell exhaustion and T cell suppression and oversees the Parker Institute Cancer Correlative Science Unit at Stanford.

- Alliance for Cancer Gene Therapy (PI: Mackall) 09/01/16 - 09/01/19

\$137,880 TDC/yr

GD2 Chimeric Antigen Receptor Therapy for Osteosarcoma

Aim/Goal: The goal of this project is to conduct preclinical IND enabling studies to support a clinical trial of an optimized chimeric antigen receptor targeting GD2 in pediatric and young adult patients with osteosarcoma and neuroblastoma.

U01-FP00013560_SUB80_01 (PI: Adamson) NCI Children's Oncology Group Aim/Goal: I serve as Principal Investigator for the Phase I Clinical Trial of Nivolumab conducted via the COG Phase I Consortium.	01/01/16 - 12/31/18 \$15,000/year
5P30CA124435 (PI: Mitchell) NCI Aim/Goal: This is the core cancer support grant funding the Stanford Cancer Institute and I serve as the leader of the Cancer Immunology and Immunotherapy Program.	6/4/2007 – 5/31/2021 \$ 2,117,429 TDC/yr
- (PI: Mackall) Ludwig Institute for Cancer Research Aim/Goal: Developing Novel CAR T cells for Cancer OVERLAP: NONE	01/01/16 - 01/01/20 \$250,000 TDC/yr
SU2C-Catalyst (PI: Tabori) Stand Up 2 Cancer Aim/Goal: Clinical translation of novel immune-based combination therapies for paediatric hypermutant cancers and conduct of correlative endpoints. I will oversee correlative endpoints conducted at Stanford. OVERLAP: NONE	10/1/18-9/30/22 \$2,999,998 total costs
<b><u>Research Support (Selected last 10 yrs, Completed)</u></b>	
- (Mackall) Emerson Collective Identification of Novel Exhaustion Checkpoints in CAR Expressing T Cells Using CRISPR/Cas9 Gene Disruption	09/01/16 - 09/01/18 \$88,785/year
Bluebird Bio Enhancing CAR Responses to Solid Tumors by Modulating Immunosuppression and Exhaustion	Mackall (PI) 11/1/2016 – 10/31/2017
Emerson Collective Identification of Exhaustion Checkpoints in CAR Expressing T Cells Using CRISPR/Cas9 Gene Disruption	Mackall (PI) 9/1/2016 – 8/31/2018
Stand Up to Cancer Phil Sharpe Award for Scientific Collaboration The goal of this project is to conduct correlative science on a clinical trial of nivolumab in children with biallelic mismatch repair deficiency.	Mackall (PI) 7/1/2016 – 6/30/2018
ZIA BC 011069 (PI: Mackall)	7/1/1997-2015

NIH/NCI  
Biology and Therapy of Lymphopenia

ZIA BC 011073 (PI: Mackall) 7/1/1997-2015

NIH/NCI  
Immunobiology and Immunotherapy of Pediatric Tumors

ZIA BC 011498 (PI: Mackall) 7/1/1997-2015

NIH/NCI  
Clinical Trials of Immunotherapies for Childhood Cancer

Hyundai Hope on Wheels 9/15/12-12/15/14

PI: Rimas Orentas PhD; AI: Crystal L Mackall MD  
Identifying Targets for Immune Based Therapies for Pediatric Solid Tumors

NIH Bench-to-Bedside 7/1/2012-7/1/2014

PI: Crystal L Mackall MD  
CD22 Chimeric Antigen Receptors Targeting Acute Lymphoblastic Leukemia