

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
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

Hospital Appointments and Major Administrative Leadership Positions:

2016-present Associate Director, Stanford Cancer Institute
2016-present Active Staff, Lucile Packard Children's Hospital
2016-present Leader, Cancer Immunology Program, Stanford Cancer Institute
2016-present Member, Immunology Program, Stanford University
2016-present Director, Parker Institute for Cancer Immunotherapy, Stanford University School of Medicine
2017-present Founding Director, Stanford Center for Cancer Cell Therapy

2020-present Co-Executive Director, Laboratory for Cell and Gene Medicine, Stanford School of Medicine

Other Professional Positions:

2017-present Scientific Founder, Lyell Immunopharma
 2020-present Scientific Founder, Syncopation Life Sciences
 2021-present Scientific Founder, Link Cell Therapies

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
 1989-2023 American Board of Pediatrics
 1992-2023 American Board of Pediatric Hematology/Oncology

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
 2006-2019 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 Leukemia
2019	Lila and Murray Gruber Memorial Cancer Research Award and Lectureship, American Academy of Dermatology
2019	FDA Distinguished Lecturer
2019	Best Postdoctoral Mentor Award, Stanford Graduate Program in Immunology
2021	AACR-St. Baldrick's Foundation Award for Outstanding Achievement in Pediatric Cancer Research
2021	AACR Team Science Award to the St. Baldrick's-StandUp2Cancer Team
2021	Richard V. Smalley Award and Lectureship, The Society for the Immunotherapy of Cancer's "most prestigious award to a clinician/scientist and luminary in the field who has significantly contributed to the advancement of cancer immunotherapy research"
2021	American Society for Clinical Oncology Pediatric Oncology Award and Lecture
2022	Fellow, American Association for Cancer Research
2022	Nobility in Science Award, Sarcoma Foundation of America

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
 Society for the Immunotherapy of Cancer

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

1997	Co-Chair, Simultaneous Session on Immunopathology American Society of Hematology
1999	Chair, Symposium on Thymic Aging, FASEB/AAI, Washington D.C.
2000	Chair, Clinical Immunology Society, Third HIV Immune-based Therapies Workshop, 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, 1st 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, 2nd 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, 3rd 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, 4th 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 Program Committee, American Association for Cancer Research Annual Meeting
- 2019 Co-Chair, Keystone Conference, Immunotherapy of Cancer
- 2020 Co-Chair, Keystone Symposia, Cell Therapy: Cancer and Beyond

National/International Advisory Boards, Committees, Grant Reviews (non-profit, selected):

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 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 ASH Committee on Scientific Affairs
 2018-present Foundation for NIH Trailblazer Prize Jury
 2019 AACR Cancer Progress Report 2019 Steering Committee
 2019-present Scientific Committee, Cancer Research UK, Grand Challenges
 2019-present External Advisory Board, Human Oncology and Pathogenesis Program, Memorial Sloan Kettering Cancer Center
 2019-2022 External Advisory Board, University of Colorado Comprehensive Cancer Center
 2019-present Szent-Gyorgyi Prize Selection Committee
 2020 SPORE Study Section, National Cancer Institute
 2020-present External Advisory Board, Dana Farber Cancer Institute
 2020-present American Cancer Society Brightedge Fund, Advisory Council
 2020-present AACR Oncology Development Fund Investment Advisory Committee

Local Advisory Boards, Committees (non-profit, 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
2018-present	Academic Review and Promotion Committee, Department of Pediatrics, Stanford School of Medicine
2018	Chair, Search Committee, Department of Neurosurgery, Stanford School of Medicine
2019-present	Dean's Executive Committee, Stanford School of Medicine
2020-2021	Diversity, Equity and Inclusion Committee, Stanford Program in Immunology
2020-present	Search Committee, Bone Marrow Transplantation and Cell Therapy Division, Stanford School of Medicine
2021	Search Committee, Pediatric Hematology/Oncology/SCT Division, Stanford School of Medicine

Patents/Provisional and Patents Pending:

2005	A Peptide Epitope and Improvement Thereof Inducing 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 Compositions and Methods for Treatment of Cancers Harboring an H3K27M Mutation. Provisional 61/531,872; 62/651,406; PCT/US2018/041839, Filed 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 Inhibiting Modulating T Cell Receptor Signaling, PCT/US2018/025459, Filed 03/30/2018
- 2017 Methods of Treating T Cell Exhaustion by Inhibiting Modulating T Cell Receptor Signaling, PCT/US2018/025394, 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; PCT/US2018/065801 Filed 12/14/18.
- 2018 Chimeric Antigen Receptor Polypeptides and Methods of Using Same, Provisional 62/694,830, Filed 7/6/2018
- 2018 SMASH_h 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
- 2018 SNIP: A "drug on" chemogenetic system for regulating of CAR T-cell therapy PCT/US2019/064722. Filed 12/6/2019
- 2019 Therapeutic Antigen Binding Proteins Specific For CD93 and Methods of Use Thereof, Provisional 62/813,009, Filed 03/02/19
- 2019 Regulatable Cell Surface Receptors and Related Compositions and Methods, Provisional 62/776,250, Filed 12/06/2018
- 2019 Enhancement of Polypeptides and Chimeric Antigen Receptor (car) via Hinge Domains, Provisional 62/844,683. Filed 05/07/2019
- 2019 Chimeric Antigen Receptors Targeting Glycipan-2, Provisional 62/844,695, Filed 05/07/2019
- 2019 Paratope Chimeric Antigen Receptors (CARS) for Improving CAR T Cell Functionality, Provisional 62/812,2015, Filed 02/28/2019
- 2019 STASH Tag: A chemigenetic system for control of protein localization, PCT/US2020/055057
- 2020 Optimized CAR T cell hinge regions enhance CAR functionality, PCT/US2020/031728, Filed 05/06/20

- 2020 CARs Engineered to Overcome Loss of CD58, Filed 2/14/20, 63/109,831
 2020 Immune cells with increased glycolytic flux, Filed 7/9/2020, 63/049,946
 2020 Novel T-Cell Specificities and Uses Thereof, Filed 4/4/20, 63/014,960
 2020 Materials for Improving Adoptive Cell Therapy and Uses Thereof, Filed 10/20/20, 63/094,243.
 2021 A Method to Enhance CAR T Efficacy through Adenosine Deaminase Overexpression 63/238,756, Filed 8/20/21
 2021 NOT-gated CAR T Cells to Ameliorate On-target, Off-tumor Toxicity of CAR T Therapy, Filed, 63/244,636, Filed 9/15/21
 2022 Ectopic FOXO1 expression promotes a memory-like phenotype and enhances CAR-T cell anti-tumor functionality, 63/334,462. Filed 4/25/22.

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
 2020-present *Principal Investigator*, Sponsored Research Award, Engineering Enhanced Potency CAR T cells, Lyell Immunopharma

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 Antibody HGS-ETR2 in Patients with Refractory Pediatric Solid Tumors".
- 2007-2015 *Principal Investigator*, 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 *IND Sponsor*, Tumor Purged/CD25+ Depleted Lymphocytes with Tumor Lysate/KLH Pulsed Dendritic Cell Vaccine
- 2010-2015 *IND Sponsor*, KT64.4-1BBL aAPC + rhIL15 Expanded Allogeneic NK Cells after T Cell Depleted Allogeneic PBSCT
- 2011-2015 *IND Sponsor*, Anti-CD19 CAR T Cells for Refractory B Cell Malignancies
- 2007-2010 *Principal Investigator*, NCI Protocol 08-C-0007, "A Phase I Trial of Ipilimumab in Patients with Refractory Pediatric Cancer"
- 2011-2015 *Principal Investigator*, 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 *IND Sponsor*, Autologous NK Cells Plus rhIL15 for Refractory Pediatric Solid Tumors
- 2013-2015 *IND Sponsor*, 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 *Principal Investigator*, 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 *Study Chair*, 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 *IND Sponsor*, Autologous T Cells Transduced with Bivalent Lentiviral Vector (CD19/22.BB.z) Chimeric Antigen Receptor (CAR)
- 2017-Present *Principal Investigator*, 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
- 2020-Present *IND Sponsor*, Autologous T-Cells transduced with retroviral vector (14g2a-GD8.BB.z.iCasp9) expressing GD2 chimeric antigen receptor; and chemotherapy
- 2022-Present *IND Sponsor*, Autologous T-cells Transduced with Lentiviral Vector Expressing B7-H3 Targeting Chimeric Antigen Receptor (Efla-CAR276.CD8.BB.z); Administered via Locoregional Infusion into CNS (Intracerebroventricular and/or Intratumoral)

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, 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
2016-2018	Cancer Today, Editorial Advisory Board
2019	Associate Editor, Cancer Immunology Research
2020-present	Editorial Board, <i>Cell</i>

Ad hoc reviews: New England Journal of Medicine, Nature, Science, Nature Medicine, Nature Bioengineering, 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

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	Product Reviewer, US Food and Drug Administration
Hua Zhang	1999-2004	Vice President, VP and Chief Scientific Officer at SPH Biotherapeutics (HK) Hong Kong
Fraia Melchionda	2001-2004	Assoc Professor, University of Bologna, Italy
Melinda Merchant	1999-2004	Vice President, Epizyme Inc
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	Product Reviewer, US Food and Drug Administration
Yongzhi Cui	2006-2010	Study Physician, Astra Zeneca
Christian Capitini	2006-11	Associate Professor, Pediatric Hematology/Oncology, University of Wisconsin
Najat Boujkouj	2008-10	Product Reviewer, US Food and Drug Administration
Jeremy Edwards	2008-10	Attending Physician, Tripler Army Base, Honolulu, HI
Steven Highfill	2010-2014	Director, Process Dev, Center for Cell Engineering, 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, Asst. Professor, University of Virginia
Robbie Majzner	2014-2019	Asst. Professor, Stanford University

Samuel Haile	2014-2017	Scientist, Cell Design Labs, San Francisco
Sabine Heitzeneder	2014-present	Instructor, Stanford University
Rachel Lynn	2016-2018	Assoc Director Research, Lyell Immunopharma
Evan Weber	2016-2021	Asst. Professor, University of Pennsylvania
Dorota Klysz	2017-2021	Staff Scientist, Stanford University
Johanna Theruvath	2017-2022	Resident, Texas Children's Hospital
Meena Kadapakkum	2017-2020	Asst. Professor, Pediatric Hematology/Oncology, UCLA
Diane Tseng	2017-2020	Asst. Professor, Medical Oncology, University of Washington
Zinaida Good	2018-present	Postdoctoral Fellow, Stanford University
Sneha Ramakrishna	2018-present	Instructor, Stanford University
Hima Abunathan	2018-2021	Scientist, Personalis
Rebecca Richards	2018-2022	Asst. Professor, Univ of Wisconsin
Valentine Barsan	2019-2022	Adjunct Professor, UCSF
Matt Frank	2019-present	Asst. Professor, Stanford University
Amaury Leruste	2018-2021	Institut Curie
Cecilia Romello	2020-present	Postdoctoral Fellow, Stanford University
Naiara Martinez-Velez	2020-present	Postdoctoral Fellow, Stanford University
Sean Hunter	2020-present	Postdoctoral Fellow, Stanford University
Louai Labanieh	2022-present	Postdoctoral Fellow, Stanford University

Doctoral Students

Melissa Hazen	2000-2001	Asst. Professor of Pediatrics, Boston Children's Hospital
Sarah Taylor Tasian	2001-2002	Asst. Professor of Pediatrics, Children's Hospital of Philadelphia
Achiamah Osei-Tutu	2002-2003	Dermatologist, Private Practice, New York City
Jessica Karl Shand	2003-04	Asst. Professor of Pediatrics, Univ. of Rochester
Tom Krupica	2004-06	Gastroenterologist, Georgetown University
Eunice Rhee	2006-07	Neonatology, Children's Hospital of Colorado
Haven Garber	2007-08	Asst. Member, MDACC
Natasha Fewkes	2008-12	Asst. Professor of Dermatology, UCSD
Wangko Lundstrom	2009-2012	Head of Analytics, Octopharma, Sweden
Sneha Ramakrishna	2010-11	Instructor, Stanford University
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	Fellow, Pediatric Hematology/Oncology, Stanford University
Nick Tschernia	2013-14	Fellow, Medical Oncology, University of North Carolina
Justin Arredondo-Guerrero	2017-present	Doctoral Student, Immunology, Stanford
Louai Labanieh	2017-2022	Postdoctoral Fellow, Stanford University
Victor Tieu	2019-present	Doctoral Student, Immunology, Stanford
Katherine Murphy	2019-present	Doctoral Student, Immunology, Stanford
Vandon Duong	2019-present	Doctoral Student, Bioengineering, Stanford
Tara Murty	2019-present	MSTP Student, Biophysics, Stanford
Jeremy Bjelajac	2021-present	Doctoral Student, Stem Cell Biology, Stanford
Kylie Burdsall	2021-present	MSTP Student Cancer Biology, Stanford
Quenton Bubb	2021-present	MSTP Student Stem Cell Biology, Stanford

Pre- & Post-baccalaureates

Matthew Milliron, MD	2003-04	Anesthesiologist, Charleston, SC
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Varun Khanna, MD	2004-05	Asst. Professor of Cardiology, Univ of Oklahoma
Sarah G. Mitchell, MD	2004-05	Asst. Professor Pediatrics, Winship Cancer Institute Emory College of Medicine
Dave Grindler MD	2005-06	Otolaryngologist, Kaiser Permanente, Colorado
Rachelle Veenstra PhD	2006-07	PRA Health Sciences, Raleigh-Durham
Jeff Leong, MD/PhD	2007-08	Resident in Internal Medicine, Univ of California, Irvine,
Ryan Murphy	2008-08	Medical Student, University of California, San Diego
Joanna Meadors Hales MD	2008-10	Pediatrics, Asheville, NC
Janna Minehart MD	2012	Residency, Internal Medicine, Univ of Pennsylvania
Waleed Haso MD	2011-2014	Senior Scientist, Kite Pharma
Alec Walker	2013-2015	Doctoral Candidate, Immunology, Harvard Medical School
Jillian Smith MD	2013-2015	Pediatrics Resident, Children's National Medical Center
Skylar Reitburg	2017-2019	Biologist, Lyell Immunopharma
Jake Lattin	2018-2019	Medical Student, St. Louis University
Brooke Vittemberga	2016-2019	Undergraduate, Stanford University
Panos Vandris	2018-2021	Masters Student, Stanford University
Alex Doan	2020-present	Undergraduate, Stanford University

Thesis Committees:

2002	Outside Expert, Thesis Committee, Rockefeller University
2002	Outside Expert, Thesis Committee, Rush University
2016-2020	Surya Murty, Stanford Bioengineering Graduate Program
2017-2020	Benson George, Stanford Stem Cell Program
2017-2020	Chris Mount, Stanford Cancer Biology Program
2017-2018	Salil Bhate, Stanford Immunology Program
2017-2019	Phoebe Yi, Stanford Stem Cell Program
2016-2021	David Gennert, Genetics Program
2018-present	Tim Keyes, Stanford Cancer Biology Program
2020-present	Nishant Mehta, Stanford Bioengineering Program
2022-present	Sarah Sackey, Stanford Immunology Program

Stanford Didactic Teaching:

2016, 2018-20	Stanford Undergraduate Human Biology
2017-19	Stanford Advanced Immunology (Immunol 202)
2017-21	Stanford Tumor Immunology and Immunotherapy (CBIO 275/Immuno275)
2018-20	Stanford Advanced Immunology (Immunol 202)
2018	Stanford Bioengineering

Consulting:

2016-2018	Scientific Advisory Board, Glaxo-Smith-Kline Cell and Gene Therapy
2016	Scientific Advisory Board, Glaxo-Smith-Kline Cancer Cell Therapy
2016-2018	Chair, Scientific Advisory Board, Adaptimmune LLC
2016	Scientific Advisory Board, Servier, Pfizer
2016-2019	Scientific Advisory Board, Unum Therapeutics
2016	Scientific Advisory Board, NKarta Therapeutics
2016, 2019	Scientific Advisory Board, Roche

2016-2018 Scientific Advisory Board, Vor Pharmaceuticals
 2018-present Scientific Advisory Board, Apricity Health
 2018 Consultant, TPG
 2018 Scientific Advisory Board, Allogene
 2018 Scientific Advisory Board, Bryologyx
 2018 Scientific Advisory Board, PACT Pharma
 2018-2020 Scientific Advisory Board, Nektar
 2019, 2021 Bristol Myers Squibb
 2019-present Lyell Immunopharma
 2019-2022 Scientific Advisory Board, Neomune Tech
 2020-present Scientific Advisory Board, Immatix
 2021-present Co-Chair, Scientific Advisory Board, Glaxo-Smith-Kline Cell and Gene Therapy
 2021-present Scientific Advisory Board, Ensoma
 2021-present Scientific Advisory Board, Mammoth Biosciences
 2021-present Syncopation Life Sciences
 2022-present Link Cell Therapies

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 *Plenary Session*, 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 *Plenary Session*, 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 *Plenary Session*, 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, Kinderspass, 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 3rd 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 4th 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 4th 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 2nd 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 2nd Berlin Symposium on Adoptive T Cell Therapy, Berlin, Germany
- 2012 Canadian Society of Immunology, St. Johns, Newfoundland

- 2012 3rd 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 17th 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 4th 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
- 2019 UCLA Clinical and Translational Science Institute, *Distinguished Speaker Series*, Los Angeles, CA
- 2019 ACDRS-NIH Workshop: Cell Based Immunotherapy: From Bench to Bedside and Beyond, Bethesda, MD
- 2019 7th *ACCELERATE* Pediatric Oncology Conference, Brussels Belgium
- 2019 Roche iPODD Cancer Immunotherapy Advisory Board, Zurich, Switzerland
- 2019 American Association of Cancer Research, *Opening Plenary Session*
- 2019 *Lila and Murray Gruber Cancer Research Award Lecture*, American Academy of Dermatology, Washington DC
- 2019 Keystone Conference Cancer Immunotherapy: Mechanistic Insights to Improve Clinical Benefit, Whistler, Canada
- 2019 Greehey Children's Cancer Research Institute, San Antonio, Texas
- 2019 *The Neerhout Lecture*, Oregon Health and Science University, Portland, Oregon
- 2019 Stanford Drug Discovery Symposium, Stanford, CA
- 2019 Stanford Founding Grant Society, Stanford, CA
- 2019 US Food and Drug Administration, Distinguished Lecturer
- 2019 Pediatric Oncology Drug Advisory Committee, US Food and Drug Administration,
- 2019 University of Wisconsin Carbone Cancer Center Retreat, Madison, Wisconsin

- 2019 *Opening Keynote Lecture*, AACR Special Conference on Cellular Therapies, San Francisco, CA
- 2019 AACR Special Conference on Pediatric Oncology, Montreal Canada
- 2019 Korean Association of Immunologists, Immuno-oncology Symposium, Seoul Korea
- 2019 Nature Conference, Translating Cell and Gene Therapies, Guangzhou, China
- 2019 *Plenary Session*, AACR-NCI-EORTC, Boston, MA
- 2019 *Keynote Speaker*, Stanford University Dept of Pathology, Annual Retreat
- 2019 US House of Representatives, Immunotherapy for Cancer, Washington DC
- 2019 Cancer Moonshot Collaborative Meeting, Bethesda, MD
- 2019 *Opening Keynote*, AACR Special Conference on Tumor Immunology and Immunotherapy, Boston, MA
- 2019 Society for the Immunotherapy of Cancer, Washington DC
- 2020 Stand Up 2 Cancer, Annual Symposium
- 2020 European Hematology Association-EBMT 2nd Annual Symposium on CAR Therapies, Sitges, Spain
- 2020 *Plenary Session*, Keystone Symposia on Emerging Cell Therapies: Cancer and Beyond, Banff, Canada
- 2020 *Plenary Session*, American Society for Transplantation and Cell Therapy, Orlando, FL
- 2020 Keynote Speaker, IO360, New York, NY
- 2020 Cell Symposium, San Francisco, Ca
- 2020 New York Academy of Sciences, Virtual Symposium
- 2020 Nature, Science Asia Conference, Virtual Symposium
- 2020 Yale Center for Immunooncology, Virtual Symposium
- 2020 Beth Israel-Deaconess Cancer Center Symposium, Horizons in Targeted and Immune Based Therapies, Virtual Symposium
- 2020 St. Jude Children's Research Hospital, Science of Pediatric Cancer Series, Virtual Symposium
- 2020 International Society for Pediatric Cancer (SIOP) Annual Meeting, Virtual Symposium
- 2020 American Society of Hematology, ASH-EHA Joint Symposium, Virtual Symposium
- 2020 *Keynote Lecture*, NCI Workshop on Cell Based Therapy for Solid Tumors, Virtual Symposium
- 2021 StandUp2Cancer Virtual Gathering, *Keynote Address*
- 2021 American Society for Transplantation and Cell Therapy, Virtual
- 2021 NIH Distinguished Lecture, Virtual
- 2021 American Association for Cancer Research, St. Baldrick's Award for Achievement in Pediatric Cancer Research, Virtual
- 2021 Broad Institute, Scientific Seminar Series, Virtual
- 2021 Cleveland Clinic, Science of Pediatric Cancer, Virtual
- 2021 Mayo Clinic, Postdoctoral Fellows Invited Speaker, Virtual
- 2021 American Society for Clinical Oncology, Pediatric Oncology Award Lecture, Virtual
- 2021 Accelerate Forum on CAR-T Cells, Virtual
- 2021 New York Academy of Science, *Keynote Address*, Virtual
- 2021 Toronto Hospital for Sick Kids, Special Seminar, Virtual
- 2021 United States Patent and Trademark Office Seminar, Virtual
- 2021 Stanford Community Advisory Board, Immunotherapy for Breast Cancer, Virtual
- 2021 CureSearch Summit, Virtual

- 2021 St. Baldrick's Summit, Virtual
- 2021 Massachusetts Institute of Technology, Virtual Seminar Series
- 2021 Hope for ATRT Summit
- 2021 AACR Keynote Special Seminar on Immunotherapy
- 2021 Baylor Center for Cell and Gene Therapy, Virtual Seminar
- 2021 St. Jude Seminar on Immunotherapy, Virtual
- 2021 Washington University in St. Louis, Immunology Seminar Series, Virtual
- 2021 UCSF Immunology Seminar Series, Virtual
- 2021 Smalley Award Lecture, Society for Immunotherapy of Cancer, Washington DC
- 2021 UCSD Bioengineering Seminar Series, Virtual
- 2021 European CAR T Cell Conference, Utrecht, Netherlands, Virtual
- 2021 American Society of Hematology Workshop on Lymphomas, Virtual
- 2022 Session Chair, Major Symposium, American Association for Cancer Research, New Orleans LA

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>
- 2021 Emerson Collective Demo Day: <https://ecdemoday.com/>

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, KidsvCancer 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- β 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+ 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.
8. Schwartz GN, Hakim F, Zujewski J, Szabo JM, Cepeda R, Riseberg D, Warren MK, **Mackall CL**, Setzer A, Noone M, Cowan KH, O'Shaughnessy J and Gress RE. Early suppressive effects of chemotherapy and cytokine treatment on committed vs. primitive hematopoietic progenitors in patient bone marrow. *British Journal of Hematology*, 1996, 92: 537-547.
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INVITED MANUSCRIPTS AND BOOK CHAPTERS

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Research Support (Current)

1 R01 CA263500-01 (PI: Mackall) 07/01/2021 - 06/30/2026
National Institutes of Health \$517,892 (Subs: \$46,214)
Developing Safe and Effective GD2-CAR T Cell Therapy for Diffuse Midline Gliomas
Major Goals: To test GD2-CAR therapies in diffuse midline gliomas and identify biomarkers of response.

CLIN2-10846 (PI: Mackall) 06/01/2018 - 05/31/2022
California Institute for Regenerative Medicine \$11,200,000 TDC
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.
Role: PI

U54 CA232568-01 (MPI: Mackall/Maris) 07/01/2018 - 06/30/2023
NIH/NCI \$12,197,183 TDC
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.
Role: Multi-PI

Parker Institute for Cancer Immunotherapy (Institute Leader: Mackall) 09/01/2018 – 06/30/22
The goal of this project is to lead a group of investigators @ Stanford focused on enhancing understanding and developing novel immune therapeutics for cancer.
Role: Institute Lead/PI

P01CA217959-01 (PI: Maris) 09/01/2017 – 08/30/2022
NIH/NCI \$680,250 TDC
Discovering and Exploiting Mechanisms of Neuroblastoma Therapy Resistance

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

Role: Project PI

2P01 CA04960529A1 (PI: Negrin) 07/1/2018 – 06/30/2023
NIH/NCI \$1,721,380

Bone Marrow Grafting and Cellular Therapy for Leukemia and Lymphoma

The major goals of this project are to optimize CAR based therapies for B cell malignancies

Role: Project PI

SU2C-AACR-DT1113 (MPI: Mackall/Maris) 02/01/2016 – 11/30/2021
St.Baldrick's Foundation/Lucile Packard Children's \$2,000,000 TDC

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.

Role: Co-Leader

CureSearch/Parker Institute
for Cancer Immunotherapy (PI: Mackall) 07/19/2019 – 06/30/2022
\$1,200,000 TDC

A Phase I Trial of GD2-CAR for Diffuse Intrinsic Pontine Gliomas

Aim/Goal: This grant will provide funding for cell manufacturing for a Phase I trial of GD2-CAR in pediatric and young adult patients with H3.K27M Diffuse Intrinsic Pontine Gliomas

Role: PI

5P30CA124435 (PI: Artandi) 09/15/2010 – 05/31/2022
NIH/NCI \$2,117,429 TDC/yr

Stanford Cancer Institute

The major goal of this project is to build on institutional strengths in both technology development and translational research to foster interdisciplinary collaborations amongst research programs. Shared resources will support the investigations in experimental and clinical research.

Role: Program Leader, Associate Director

1U24CA22430901 (PI: Maecker) 09/01/2017– 8/31/2022
NIH/NCI \$1,600,000 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.

Role: AI

SU2C-Catalyst #6148 (PI: Tabori) 06/01/2019 – 05/31/2023
 Stand Up 2 Cancer \$21,147 TDC/yr
 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.
 Role: AI

Ludwig Institute for Cancer Research (PI: Weissman) 09/01/2016 – 08/31/2021
 Rescuing T Cell Exhaustion \$231,481 TDC/yr
 The major goals of this project are to explore the biology of T cell exhausting in the setting of a tonically signaling chimeric antigen receptor.
 Role: PI

Research Support (Selected last 10 yrs, Completed)

2UM1CA154967-07 (PI: Cheever) 10/01/2017 – 09/30/2021
 NIH/NCI \$8,000,000 TDC
 Pediatric Cancer Immunotherapy Trials Network
 Aim/Goal: I lead the pediatric multi-institutional clinical trial consortium that will undertake studies of immune based therapies.
 Role: Ped-CITN Inaugural Chair

5P30CA124435 Administrative Supplement (PI: Mackall) 09/1/2019 – 08/31/2021
 NIH/NCI \$319,489
 Developing Methods for Clinical Scale A2AR Gene Editing of CAR T Cells to Enhance Efficacy Against Solid Tumors
 Aim/Goal: The goal of this proposal is to develop GMP Scale and Grade techniques to generate CAR T cells with deletions of the A2AR gene for enhanced efficacy against solid tumors.
 Role: PI

5U01FD005978-04 (PI: Altman) 09/01/2019 – 08/31/2020
 FDA/ University of California, San Francisco \$191,084 TDC/yr
 Development of New Machine Learning Algorithms to Quantify Treatment Effectiveness and Adverse Outcomes.
 Aim/Goal: Oversee the creation and deployment of the federated algorithm.
 Role: AI

U01-FP00013560_SUB80_01 (PI: Hawkins) 01/01/2016 – 07/31/2021
 NCI Children's Oncology Group \$15,000 TDC/yr
 Aim/Goal: I serve as Principal Investigator for the Phase I Clinical Trial of Nivolumab conducted via the COG Phase I Consortium.
 Role: Study Chair

The Leukemia & Lymphoma Society (PI: Majeti) 07/01/2018 – 06/30/2021
 Development of CAR T Cells Targeting AML Stem Cells \$180,018
 Aim/Goal: To generate CAR constructs targeting CD93 and assess their activity and to investigate the activity of CD93 CAR T cells against human AML in vitro and in vivo.
 Role: AI

Alliance for Cancer Gene Therapy (PI: Mackall) 09/01/16 - 09/01/19
 GD2 Chimeric Antigen Receptor Therapy for Osteosarcoma \$137,880 TDC/yr

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.
 Role: PI

Emerson Collective (PI: Mackall) 09/01/16 - 09/01/18
 \$88,785/year
 Identification of Novel Exhaustion Checkpoints in CAR Expressing T Cells Using CRISPR/Cas9 Gene Disruption

Bluebird Bio (PI: Mackall) 11/1/2016 – 10/31/2017
 Enhancing CAR Responses to Solid Tumors by Modulating Immunosuppression and Exhaustion
 Role: PI

Stand Up to Cancer (PI: Mackall) 7/1/2016 – 6/30/2018
 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.
 Role: PI

ZIA BC 011069 (PI: Mackall) 7/1/1997-12/31/2015
 NIH/NCI
 Biology and Therapy of Lymphopenia
 Role: PI

ZIA BC 011073 (PI: Mackall) 7/1/1997-12/31/2015
 NIH/NCI
 Immunobiology and Immunotherapy of Pediatric Tumors
 Role: PI

ZIA BC 011498 (PI: Mackall) 7/1/1997-12/31/2015
 NIH/NCI
 Clinical Trials of Immunotherapies for Childhood Cancer
 Role: PI

Hyundai Hope on Wheels (PI: Orentas) 9/15/12-12/15/14
Identifying Targets for Immune Based Therapies for Pediatric Solid Tumors
Role: AI