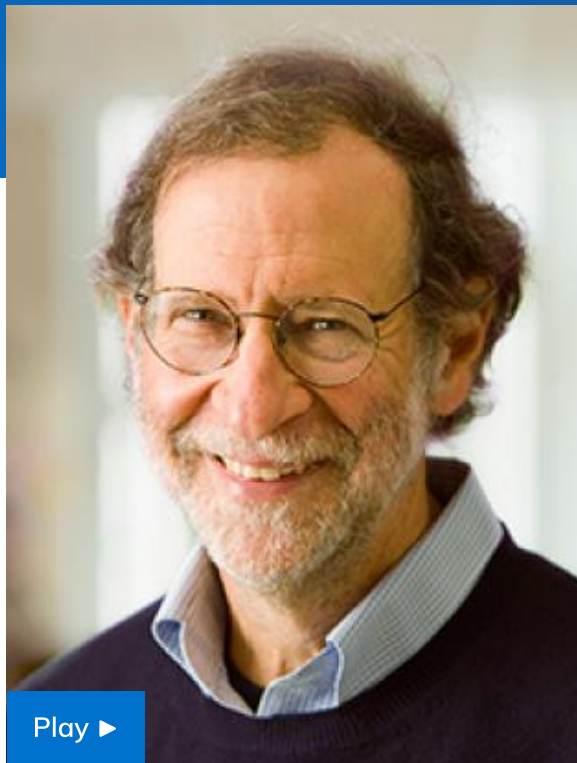


Stephen J. Forman, M.D.

877-375-1937



Hematologist-Oncologist

5 (223 RATINGS)

CLINICAL EXPERTISE

Bone Marrow and Stem Cell Transplantation

Hematologic Malignancies

Leukemia

Lymphoma

RESEARCH AREA

T Cell Immunotherapy

APPOINTMENTS

Director, Hematologic Malignancies Research Institute

Professor, Department of Hematology & Hematopoietic Cell Transplantation

<https://www.cityofhope.org/stephen-forman>

1/14

Principal Investigator, Lymphoma SPORE

Director, T Cell Therapeutics Research Laboratory

Co-director, Hematologic Malignancies Program, Comprehensive Cancer Center

CLINICAL TEAMS

[Bone Marrow and Stem Cell Transplantation](#)

[Hematology & Hematopoietic Cell Transplantation](#)

[Leukemia](#)

[Lymphoma](#)

[Myeloma and Multiple Myeloma](#)

RESEARCH TEAMS

[CAR T Immunotherapy](#)

[Cellular Immunotherapy](#)

[Hematology & Hematopoietic Cell Transplantation](#)

[T Cell Therapeutics Research](#)

"It remains a privilege, after 45 years of doing this, to be allowed to take care of somebody who has these diseases."

Stephen J. Forman, M.D., is an international expert in [leukemia](#), [lymphoma](#) and [bone marrow transplantation](#). Dr. Forman is also co-editor of "Thomas' Hematopoietic Cell Transplantation," a definitive textbook for clinicians, scientists and health care professionals.

Dr. Forman exudes the special blend of zealous determination and compassion typical of City of Hope team members, illustrated by his own words: "We come to work every day thinking 'cure ...' Once we've extended our hand and grabbed yours, we don't let it go."

In 45 years at City of Hope, Dr. Forman has been instrumental in dramatically advancing survival rates for blood disorders. He is deeply involved with the translational and clinical research at City of Hope's [Toni Stephenson Lymphoma Center](#), [Cellular Immunotherapy Center](#), [Judy and Bernard Briskin Center for Multiple Myeloma Research](#) and the [Gehr Family Center for Leukemia Research](#).

His current projects are focused on immunotherapy — using the body's own immune system to attack cancer. Much of his current work centers on [T cells and their cancer-fighting potential](#).

Location

DUARTE - MAIN CAMPUS

1500 East Duarte Road
Duarte, CA 91010
[\(626\) 256-4673](tel:(626)256-4673)

Education & Experience

Degrees



- 1974, M.D., Medicine, University of Southern California, Los Angeles, CA
- 1970, B.A., Philosophy, cum laude, St. John's College, Annapolis, MD

Fellowship



- 1979-1980, Fellow, Medical Oncology, City of Hope, Duarte, CA
- 1978-1979, Research Associate, Hematology Division, Department of Pharmacology, Los Angeles County+USC Medical Center, Los Angeles, CA
- 1976-1978, Fellow, Hematology Division, LAC+USC Medical Center, Los Angeles, CA

Residency



- 1974-1975, Harbor UCLA Hospital, Torrance, CA

Internship



- 1974-1976, Intern and Resident, Internal Medicine, Harbor UCLA Hospital, Torrance, CA

Professional Experience



- 2014-present, Director, Hematologic Malignancies Research Institute, City of Hope, Duarte, CA
- 2014-present, Associate Director for Clinical Sciences, City of Hope, Duarte, CA
- 2004-present, Director, T Cell Therapeutics Research Laboratory, Beckman Research Institute of City of Hope, Duarte, CA
- 1987-present, Co-Leader, Hematologic Malignancies Program, City of Hope, Duarte, CA
- 1987-2019, Chair, Department of Hematology & Hematopoietic Cell Transplantation, City of Hope, Duarte, CA
- 1980-present, Staff Physician, Department of Medical Oncology & Therapeutics Research, City of Hope, Duarte, CA
- 1979-present, Staff Physician, Department of Hematology & Hematopoietic Cell Transplantation, City of Hope, Duarte, CA
- 1978-1979, Research Associate, Hematology Division, Department of Pharmacology, Los Angeles County+USC Medical Center, Los Angeles, CA

Research

Laboratory

Advances in surgery, radiation therapy, and chemotherapy over the last decade have increased the cure rates of a variety of malignancies. For patients whose tumors are not eradicated, however, the impediment most frequently encountered is the inability to fully eliminate the minimal residual disease that frequently has acquired resistance to conventional treatment modalities.

A conceptually attractive strategy for targeting minimal residual disease is the manipulation of immunologic effector cells to specifically recognize tumor targets. Animal models and an increasing number of clinical trials have implicated the T lymphocyte as a pivotal immunologic effector cell in antitumor immunity. Technologies are now available for identifying T cell target epitopes expressed by human tumors, isolating T cells for genetic modification to recognize these tumor targets, and then expanding these cells ex vivo to large numbers for reinfusion. Initial clinical trials for lymphoma, leukemia, and malignant glioma employing adoptive transfer of tumor-specific T cells have commenced at City of Hope.

Specific research projects at the Forman lab include:

Adoptive Immunotherapy

Advances in surgery, radiation therapy, and chemotherapy over the last decade have increased the cure rates of a variety of malignancies. For patients whose tumors are not eradicated, however, the impediment most frequently encountered is the inability to fully eliminate the minimal residual disease that often has acquired resistance to conventional treatment modalities. An attractive strategy for targeting minimal residual disease is the manipulation of immunologic effector cells to specifically recognize tumor targets. Animal models and an increasing number of clinical trials have implicated the T lymphocyte as a pivotal immunologic effector cell in anti-tumor immunity. This has led to our overall interest in using adoptive immunotherapy of T cells to target cancer, specifically leukemia/lymphoma, brain tumors, and neuroblastoma. Areas of focus in our research program are outlined below.

Glioma Tumor Cells Are Killed by Therapeutic T Cells

Scanning of zetakine redirected cytolytic T cell lysis of a glioma tumor cell

Genetic Modification of T Cells for Redirected Tumor Recognition

Technologies are now available for identifying immunogenic T cell target epitopes expressed by human tumors, isolating antigen-specific T cells, and expanding them ex vivo to large numbers for reinfusion. However, to overcome the difficulties of isolating tumor-reactive T cells from cancer patients, we have developed technology to take T cells from a cancer patient and reprogram them to target a patient's cancer through genetic engineering strategies using

DNA electroporation and/or lentiviral transduction. Previous studies by our laboratory have provided proof of the principle that CTL can be engineered to specifically target lymphoma, neuroblastoma, and glioma tumors via expression of tumor-specific chimeric immunoreceptors resulting in MHC-independent killing of target tumor cells (Cooper et al, Blood 2003; Park et al, Mol Therapy 2007; Kahlon et al, Cancer Res 2004). More recently, we have completed pre-clinical studies of cytotoxic T cells (CTLs) genetically modified to express an IL13-zetakine chimeric immunoreceptor to target cell-surface IL13Ra2 on medulloblastoma/primitive neuroectodermal tumors, the most common type of brain tumor in children (Stastny et al, J Ped Hematol Oncol 2007). Overall, we are currently involved in studying the potential clinical utility of adoptively transferring T-cells that have been genetically redirected to recognize CD19 (on leukemia and lymphoma); IL13Ra2 (on glioblastoma and medulloblastoma); L1-CAM (on neuroblastoma, lung cancer, and renal cell carcinoma); HER2 (on breast cancer, brain metastases, and medulloblastoma); or alpha-3 integrin (on medulloblastoma).

Murine Xenograft Models Surgical Suite

To monitor the therapeutic objectives of adoptive T cell transfer before entering the clinical setting, our lab has developed multiple murine xenograft models. For example, we are now routinely performing stereotactic surgeries in mice for the intracranial injection of human brain tumors to mimic the situation of our patients. In addition, we have also developed lymphoma, neuroblastoma, and medulloblastoma murine xenograft models. Bioluminescent strategies have also been developed by our group for the in vivo imaging of both T cells and tumors. Our utilization of the firefly and renilla luciferase genes (ffLuc and rLuc, respectively) along with the Xenogen system for serial imaging of anesthetized mice has been critically important for evaluating our animal studies. Specifically, these animal model systems are being used for studying the efficacy of immunotherapy, T cell trafficking from tail vein injections, contralateral homing of T-cells to tumors within the parenchyma of the brain, and studies of T cell persistence and proliferation.

Trafficking of Adoptively Transferred T Cells

To exert a therapeutic effect, adoptively transferred tumor-specific cytotoxic T cells (CTLs) must traffic to sites of tumor burden, exit the circulation, and infiltrate the tumor microenvironment. T cells are able to respond to migration-directing chemicals, called chemokines, that are produced by tumor cells. Thus our group has begun to examine the ability of adoptively transferred human CTLs to traffic to tumors. Using a combination of in vivo tumor tropism studies, and in vitro biophotonic chemotaxis assays, we observed that tumors that produce CCL2/MCP1 (>10ng/ml), such as cell lines derived from glioma and

medulloblastoma, efficiently chemoattract ex vivo expanded primary human T cells. These studies suggest that the capacity of adoptively transferred T-cells to home to tumors may be influenced in part by the species and amounts of tumor-derived chemokines, in particular MCP-1 (Brown et al, J Immunol 2007).

Targeting Tumor Progenitor Cells with Genetically Engineered Effector T-Cells

Recent hypotheses that tumors arise from cancer stem cells that appear to be resistant to radiation treatment and chemotherapy have also led us to begin to isolate and expand stem cells from human glioma to assess the vulnerability of these cells to T-cell-mediated killing in our adoptive immunotherapy models. Our initial studies demonstrate that chimeric immunoreceptor redirected IL13Ra2-specific CTL, currently being evaluated in an FDA-approved pilot phase 1 trial for the treatment of recurrent/refractory malignant glioma, can kill cancer stem/progenitor cells in vitro, and reduce the engrafted potential of the glioma stem/progenitor population in an orthotopic murine tumor model. Current models now predict that curative therapies for many cancers might require the elimination of the stem/progenitor population, and these studies lay the foundation for an immunotherapy approach to achieve this goal.

Development of Strategies to Optimize T Cell Anti-Tumor Activity in Vivo

Our group has also begun to investigate the expression of additional gene products in T cells that may serve to overcome constraints on T cell effector function and survival in vivo. For example, we are currently examining the efficacy of providing co-stimulatory signaling to T cells through the integration of costimulatory signaling domains within a tumor-targeting chimeric antigen receptor. Our recent studies in this area demonstrate that integrating costimulation with activation signaling events is important for fully activating CD4+ anti-tumor effector cells, resulting in sustained function in the tumor microenvironment.

Another strategy we are currently examining is the utility of genetically modifying T cells which have first been selected for specificity to viruses such as CMV or EBV, which would allow for endogenous stimulation of these T cells upon their transfer to patients infected with these viruses that are frequently reactivated in infected hosts. We would also predict that such a combinatorial bispecific T cell strategy would permit the selective isolation of virus-specific memory T cells as recipients of chimeric antigen receptor genes for improved in vivo persistence following adoptive transfer. In fact, studies on the unique engraftment potential of memory T cells are also being carried out in primates in collaboration with Dr. Berger at the Fred Hutchinson Cancer Research Center in Seattle. Because tumors can avoid immune-mediated elimination by the production of immunosuppressive cytokines (e.g., TGF- β), our

group is also evaluating strategies by which T cells may be rendered resistant to such immunosuppression. One project is the development of interference RNA sequences that could decrease the susceptibility of T cells to tumor-mediated suppression. In collaboration with Sangamo Biosciences in Richmond, California, we are also interested in studying the effects of genetically blocking glucocorticoid sensitivity of the tumor-specific T cells because postoperative brain cancer patients are routinely treated with immunosuppressive steroids (e.g., glucocorticoids) to reduce clinical symptoms of edema.

Lastly, another group of projects underway in the lab is examining ways of generating gene products that influence the expression of cytokines such as IL-2 and IL-7 which help promote the survival of T cells and are critical for generating T cell memory responses. A new collaboration with Dr. Smolke in the Chemical Engineering Department at CalTech involves the development of RNA regulating systems that are inducible by drugs such as tetracycline to control the expression of cytokines in T cells which will promote their proliferation and survival.

Overall, the recent progress and current directions of Dr. Forman's research group have generated much enthusiasm and support at City of Hope. The laboratory and office space in the Arnold and Mabel Beckman Center for Cancer Immunotherapeutics & Tumor Immunology is located in the heart of City of Hope. This state-of-the-art center is dedicated to immunotherapy and facilitates collaboration between lab researchers and clinicians, and rapidly moves scientific discoveries from the lab to patients.

T Cell Therapeutics Research Laboratories

- Director: Dr. Stephen Forman, M.D.
- Deputy Director: Dr. Christine Brown, Ph.D
- Duarte – Main Campus

TCTRL Laboratories

- [Dr. Christine Brown lab](#)
- [Dr. Xiuli Wang](#)
- [Dr. Saul Priceman lab](#)

- [Dr. Elizabeth Budde](#)

Translational Team

Jinny Paul, Ph.D.
Director, TCTRL Clin Operations
jpaul@coh.org
626-218-3478

Michael Rothe, Ph.D.
Post-doctoral Fellow
mrothe@coh.org
626-218-1568

Arturo Orozco
Research Assoc II
aorozco@coh.org
626-218-0675

Andrea Matias
Research Assoc I
amatias@coh.org
626-218-0675

Regulatory Team

Jamie Wagner
Regulatory Operations Manager
jwagner@coh.org
626-218-0056

Winnie Wong
Regulatory Affs Specialist III
wiwong@coh.org
626-218-0472

Hala Karam
Regulatory Affs Specialist II
hkaram@coh.org
626-218-2818

Monica Nisis
Regulatory Affs Specialist II
mnisis@coh.org
626-218-8345

Dileshni Tilakawardane
Regulatory Affs Specialist II
dtalakawardane@coh.org
626-218-7372

Program Management/Support Team

Julie Ostberg, Ph.D.
Assistant Research Professor
jostberg@coh.org
626-218-5249

Kirsten Rood, Ph.D.
Director of TCTRL Program Dev
krOOD@coh.org
626-218-2602

Renate Starr
Director of TCTRL Laboratory Ops
rstarr@coh.org
626-218-3274

Leonor Velasco
Research lab technician
lvelasco@coh.org
626-218-4181

Diana Ronquillo
Research lab technician
dronquillo@coh.org
626-218-1947

Awards & Memberships

Awards

- 2019, E. Donnall Thomas Lecture, American Society for Blood and Marrow Transplantation
- 2019, DKMS Mechtild Harf Science Award

Memberships

- 2018, Association of American Physicians
- 2018, Parker Institute for Cancer Immunotherapy

Publications

- Alvarnas JC, Zaia JA, **Forman SJ**. How I treat patients with HIV-related hematological malignancies using hematopoietic cell transplantation. Blood. 2017 Sep 7. pii: blood-2017-04-551606. DOI: 10.1182/blood-2017-04-551606. [Epub ahead of print] PubMed PMID: 28882882.
- Mei MG, Cao TM, Chen L, Song JY, Siddiqi T, Cai JL, Farol LT, Al Malki MM, Salhotra A, Aldoss I, Palmer J, Herrera AF, Zain J, Popplewell LL, Chen RW, Rosen ST, **Forman SJ**, Kwak L, Nademanee AP, Budde LE. Long-Term Results of High-Dose Therapy and Autologous Stem Cell Transplantation for Mantle Cell Lymphoma: Effectiveness of Maintenance Rituximab. Biol Blood Marrow Transplant. 2017 Jul 18. pii: S1083-8791(17)30575-X. DOI: 10.1016/j.bbmt.2017.07.006. [Epub ahead of print] PubMed PMID: 28733266.
- Gu Y, Zhang J, Ma X, Kim BW, Wang H, Li J, Pan Y, Xu Y, Ding L, Yang L, Guo C, Wu X, Wu J, Wu K, Gan X, Li G, Li L, **Forman SJ**, Chan WC, Xu R, Huang W. Stabilization of the c-Myc Protein by CAMKII γ Promotes T Cell Lymphoma. Cancer Cell. 2017 Jul 10;32(1):115-128.e7. DOI: 10.1016/j.ccell.2017.06.001. PubMed PMID: 28697340; PubMed Central PMCID: PMC5552197.

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- Urak R, Walter M, Lim L, Wong CW, Budde LE, Thomas S, **Forman SJ**, Wang X. Ex vivo Akt inhibition promotes the generation of potent CD19 CAR T cells for adoptive immunotherapy. *J Immunother Cancer.* 2017 Mar 21;5:26. DOI:10.1186/s40425-017-0227-4. eCollection 2017. PubMed PMID: 28331616; PubMed Central PMCID: PMC5359873.
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- Gibson CJ, Lindsley RC, Tchekmedyian V, Mar BG, Shi J, Jaiswal S, Bosworth A, Francisco L, He J, Bansal A, Morgan EA, Lacasce AS, Freedman AS, Fisher DC, Jacobsen E, Armand P, Alyea EP, Koreth J, Ho V, Soiffer RJ, Antin JH, Ritz J, Nikiforow S, **Forman SJ**, Michor F, Neuberg D, Bhatia R, Bhatia S, Ebert BL. Clonal Hematopoiesis Associated With Adverse Outcomes After Autologous Stem-Cell Transplantation for Lymphoma. *J Clin*

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- Armenian SH, Horak D, Scott JM, Mills G, Siyahian A, Berano Teh J, Douglas PS, **Forman SJ**, Bhatia S, Jones LW. Cardiovascular Function in Long-Term Hematopoietic Cell Transplantation Survivors. Biol Blood Marrow Transplant. 2017 Apr;23(4):700-705. DOI: 10.1016/j.bbmt.2017.01.006. Epub 2017 Jan 5. PubMed PMID: 28065839; PubMed Central PMCID: PMC5348114.
- Sala Torra O, Othus M, Williamson DW, Wood B, Kirsch I, Robins H, Beppu L, O'Donnell MR, **Forman SJ**, Appelbaum FR, Radich JP. Next-Generation Sequencing in Adult B Cell Acute Lymphoblastic Leukemia Patients. Biol Blood Marrow Transplant. 2017 Apr;23(4):691-696. DOI: 10.1016/j.bbmt.2016.12.639. Epub 2017 Jan 3. PubMed PMID: 28062215; PubMed Central PMCID: PMC5465962.

Ratings & Reviews

Ratings and reviews below are gathered from the Press Ganey Clinician and Group Consumer Assessment of Healthcare Providers and Systems (CG CAHPS) survey. CG CAHPS is a standardized survey that is used to measure a patient's experience in the physician office setting. Ratings are an average of all responses to questions about a provider's care, with 5 stars being the highest.

5.0	Know important info medical history
5.0	Show respect for what you say
5.0	Rate provider 0-10
5.0	Recommend this provider office
5.0	Provider listen carefully to you
4.9	Spend enough time with you

4.9 Provider explain in way you understand

01/22/23

Dr. Forman was fabulous - Verified patient

01/14/23

Dr. Forman is wonderful. He listens to my health concerns and offers excellent guidance and advice. I feel he sincerely cares about me. I am very fortunate to have him as my oncologist, and the City of Hope is fortunate to have him on staff. - Verified patient

11/23/22

Totally impressed with the attitude, kindness and professionalism of all the staff. - Verified patient

11/23/22

Dr. Forman is amazing, hope he can cure my condition. I live in [...] but after meeting him I wanted to be in his care from start to finish. He has a special aura about him that I connected with and put my complete Trust in him to my decisions about my life - Verified patient

10/25/22

I realize how fortunate I am to have Dr. Forman as my Dr. He is the best of the best, brilliant, humble and kind. Again, I'm so fortunate to be under his care. - Verified patient

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