## BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Shiraz, Parveen

eRA COMMONS USERNAME (credential, e.g., agency login): PSHIRAZ

POSITION TITLE: Instructor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

| INSTITUTION AND LOCATION | DEGREE *(if applicable)* | Completion Date MM/YYYY | FIELD OF STUDY |
|---|---|---|---|
| Kilpauk Medical College, India | MBBS | 01/1995 | Bachelor of Medicine, Bachelor of Surgery |
| Cedars-Sinai Med Center/UCLA, Los Angeles, CA | Internship | 06/1998 | Internal Medicine |
| St. Mary's Medical Center, San Francisco, CA | Residency | 06/2000 | Internal Medicine |
| Loma Linda University, Loma Linda, CA | Fellowship | 06/2015 | Hematology/Medical Oncology |
| Stanford University, Stanford, CA | Fellowship | 06/2016 | Blood and Marrow Transplantation |

**A. Personal Statement**

I am a physician-scientist in the Division of Blood and Marrow Transplantation-Cell Therapy (BMT-CT) at Stanford University. The focus of my translational and laboratory research is the exploration of safe and more accessible forms of cell therapy for myeloid malignancies. I joined the laboratory of Dr. Judith Shizuru and produced multi-antigen targeting antibodies to recruit Natural Killer (NK) cells and macrophages to eliminate myeloid leukemic clones. Preclinical studies in xenograft models of myelodysplastic syndrome and acute myeloid leukemia are showing promising results. Additionally, I have engineered NK cells using their cytokine receptors to potentiate their leukemia cytotoxicity. Preclinical studies with these engineered NK cells for Myelodysplastic syndrome and Acute Myeloid Leukemia are ongoing. My translational research also involves evaluating Thymic Stromal Lymphopoietin (TSLP) as a novel biomarker for Acute Graft Versus Host Disease (GVHD) which is a common and significant complication of hematopoietic stem cell transplant.

**Awarded projects:**

Sponsor: TRAM Scholar Program Award, Stanford University (08/2022 – 08/2024)
**Role: Principal Investigator**
Title: Evaluating Thymic Stromal Lymphopoietin (TSLP) as a Biomarker for Acute Graft Versus Host Disease
Goal: TSLP isoforms play a key role in mucosal homeostasis and inflammation, and our preliminary data demonstrate association of elevated plasma levels of TSLP isoforms with non-relapse mortality in acute GVHD (aGVHD). TSLP can therefore be a potential prognostic and predictive biomarker in aGVHD.

Sponsor: California Institute of Regenerative Medicine (DISC2-13400) (09/2022 – 08/2024)
Role: **Chief Scientist**
Title: Targeted Immunotherapy-based Blood Stem Cell Transplantation

Sponsor: EvansMDS Discovery Research Grant 2022 (09/2022 – 08/2025)
Role: **Chief Scientist**
Title: Blood Stem Cell Transplantation with Targeted Eradication of MDS Clones

Sponsor: Department of Medicine DEI Award, Stanford University (09/2024 – 08/2025)
**Role: Principal Investigator**
Title: Receptor Engineered and Activated Natural Killer Cells to Eliminate Health Care Disparity in Myeloid Malignancies

Sponsor: Aplastic Anemia Myelodysplastic Syndrome International Foundation Award (01/2025 – 12/2025)
**Role: Principal Investigator**
Evaluating Thymic Stromal Lymphopoietin (TSLP) as a Biomarker for Acute Graft Versus Host Disease. We have extended our study to a large sample set from the Mount Sinai Acute GVHD International Consortium (MAGIC) biorepository.

**Citations:**

1. Gowda, C., Francis, O.L., Ding, Y., **Shiraz, P.**, Dovat, S., & Payne, K.J. (2015). Pediatric High-Risk Leukemia – Molecular Insights. DOI: 10.5772/61247.
2. **Shiraz, P.**, Payne, K.J. & Muffly, L. (2020). The Current Genomic and Molecular Landscape of Philadelphia-like Acute Lymphoblastic Leukemia. Int J Mol Sci, 21(6):2193. PMCID: PMC7139642.
3. **Shiraz, P.**, Jehangir, W. & Agrawal, V. (2021). T-Cell Acute Lymphoblastic Leukemia – Current Concepts in Molecular Biology and Management. Biomedicines, 9(11):1621. PMCID: PMC8615775.
4. Lee, C.J., **Shiraz, P.** & Muffly, L. (2016). Pharmacological Maintenance Strategies Following Allogeneic Hematopoietic Cell Transplantation for Acute Myeloid Leukemia. Leuk Lymphoma, 58(3):516-527. PMID: 27685315.

**B. Positions, Scientific Appointments, and Honors**

| | |
|---|---|
| 2021 – Present | Instructor, Division of BMT/CT, Shizuru Lab, Stanford University, CA |
| 2019 – 2021 | Clinician Educator, Division of BMT/CT, Stanford University, Stanford, CA |
| 2016 – 2019 | Hematologist, Leukemia/Lymphoma Centers of Excellence, Kaiser Permanente, CA |
| 2015 – 2016 | Fellow, Blood and Marrow Transplantation, Stanford University, Stanford, CA |
| 2012 – Present | Member, American Society of Hematology |
| 2012 – 2015 | Fellow, Hematology/Medical Oncology, Loma Linda University, Loma Linda, CA |
| 2000 – 2012 | Staff Physician, Adult Hospitalist team, Kaiser Permanente Medical Center, San Jose, CA |
| 1998 – 2000 | Resident, Dept of Internal Medicine, St. Mary's Medical Center, San Francisco, CA |
| 1997 – 1998 | Intern, Dept of Internal Medicine, Cedars-Sinai Medical Center, Los Angeles, CA |
| 1996 – 1997 | Research Assistant, Gerald Reaven Lab, Endocrinology and Metabolism, Stanford University, Stanford, CA |

**C. Contribution to Science**

My lab research training during hematology fellowship focused on describing the molecular landscape and identifying potential targets in CRLF2 B-ALL which is a high-risk B-ALL five times more common among Hispanics. As a leukemia and transplant physician, I collaborated with other investigators in clinical trials to study the utilization of pediatric regimens in young adults, measurable residual disease (MRD) assessment and CAR-T cell therapy for B-ALL and the use of engineered grafts to reduce toxicity from HCT.

1. CRLF2 overexpressing B-ALL is a high-risk leukemia characterized by poor outcomes. It is five times more common among Hispanics and is therefore a major contributor to health care disparity in leukemia outcomes. There is no FDA approved therapy targeting this subgroup of ALL. During lab research training at Loma Linda University, I studied CRLF2-TSLP ligand-receptor interaction and the downstream signaling pathways to identify potential targeted therapies.
    1. **Shiraz, P.**, Francis, O., Baez, I., Conception, K., Mayagoitia, K., Ginelli, E., Martinez, S., Coats, J., Fisher, R., Morris, C., Zhang, X., Ruijun, S., Dovat, S. & Payne, K. (2014). TSLP-induced alterations of multiple signaling pathways in primary CRLF2 B-ALL xenografts. Blood, 124(21):3783.
    2. **Shiraz P**, Francis O, Baez I, Salcedo C K, Mayagoitia K, Ginelli E, Milford TA, Coats J, Fisher R,

Morris C, Zhang X, Ruijun S, Payne K. Therapies for CRLF2 B-cell Acute Lymphoblastic Leukemia. Western Regional Meeting of the American Federation for Medical Research, Carmel, CA 2015.

3. Francis, O.L., Martinez, S.R., Milford, T.M., Baez, I., Coats, J.S., Mayagoitia, K., Conception, K.R., Ginelli, E., Benitez, A., Weldon, A.J., Arogyaswamy, K., **Shiraz, P.**, Fisher, R., Morris, C.L., Zhang, X.B., Filippov, V., Van Handel, B., Ge, Z., Song, C., Dovat, S., Su, R.J., & Payne, K.J. (2016). A novel xenograft model to study the role of TSLP-induced CRLF2 signals in normal and malignant human B lymphopoiesis. Haematologica, 101(4):417-26. PMCID: PMC5004401.

2. Despite several publications in the early 2000's demonstrating superior outcomes with pediatric regimens in adolescents and young adults (AYA) with ALL, only a minority of AYAs with ALL received pediatric regimens in adult cancer centers until 2010. We demonstrated that high volume centers were more likely to administer pediatric regimens.
   a. Muffly, L., Lichtensztajn, D., **Shiraz, P.**, Abrahao, R., McNeer, J., Stock, W., Keegan, T. & Gomez, S.L. (2017). Adoption of Pediatric-Inspired Acute Lymphoblastic Leukemia Regimens by Adult Oncologists Treating Adolescents and Young Adults: A Population-Based Study. Cancer, 123(1):122-130. PMCID: PMC5161602.

3. Measurable residual disease (MRD) monitoring is an essential part of ALL management with a well-established prognostic value. MRD is traditionally measured in samples obtained from bone marrow biopsy which is an invasive procedure. We have demonstrated a strong correlation between MRD monitoring in the bone marrow and blood, thereby showing that NGS based monitoring from peripheral is an adequate alternative to frequent invasive bone marrow aspirations.
   a. Muffly, L., Sundaram, V., Chen, C., Yurkiewicz, I., Kuo, E., Burnash, S., Spiegel, J.Y., **Shiraz, P.**, […], Liedtke, M., Vempaty, H.T. & Miklos, D.B. (2021). Concordance of peripheral blood and bone marrow measurable residual disease in adult acute lymphoblastic leukemia. Blood Adv, 5(16):3147-3151. PMCID: PMC8405199.

4. To overcome antigen loss associated with CD19 targeting CAR-T cells, our group tested a bispecific CAR targeting CD19 and 22 in a phase 1 clinical trial of adults with relapsed/refractory B-ALL and large B cell lymphoma. Manufacturing feasibility and safety were demonstrated. Although response rates were high, relapses were significant and were associated with CD19 loss, implicating antigen loss as a major cause of CAR-T cell resistance and highlighting the challenge of engineering multi-specific CAR-T cells.
   a. Spiegel, J.Y., Patel, S., Muffly, L., Frank, M.J., Oak, J., **Shiraz, P.**, […], Feldman, S., Mackall, C. & Miklos, D.B. (2021). CAR T cells with dual targeting of CD19 and CD22 in adult patients with recurrent or refractory B cell malignancies: a phase 1 trial. Nat Med, 27(8):1419-1431. PMCID: PMC8363505.

5. Graft versus host disease (GVHD) is a frequent and serious complication of HCT despite pharmacological prophylaxis. We conducted a phase 1b/2 multicenter trial using a CD34 selected, T-reg engineered graft, and demonstrated a doubling of GVHD and relapse free survival (GRFS) compared to a contemporaneous standard of care arm. In another phase 1 study, we demonstrated that type 1 regulatory T cells are inducible, interleukin10+FOXP3- and can suppress GvHD after HCT.
   a. Meyer, E.H., Hoeg, R., Moroz, A., Miklos, D.B., **Shiraz, P.**, Muffly, L., […], McClellan, S.S. & Negrin, R.S. (2020). Orca-T, a Precision Treg-Engineered Donor Product, Prevents acute GvHD with less immunosuppression in an early multicenter experience with myeloablative HLA-matched transplants. Blood, 136(1):47-48.
   b. Chen, P.P., Agarwal-Hashmi, R., Saini, G., […], **Shiraz, P.**, Bertaina, A., Bacchetta, R., Roncarolo, M.G. (2021). Alloantigen-specific type 1 regulatory T cells suppress through CTLA-4 and PD-1 pathways and persist long-term in patients. Sci Transl Med, 13(617):eabf5264. PMCID: PMC9451143.

**Complete list of published work in MyBibliography:**
https://www.ncbi.nlm.nih.gov/pubmed/?term=shiraz+p\