

AMY C. FAN

EDUCATION

- 9/2016 - 08/2023 **Stanford University**, Stanford, CA
Ph.D. Candidate, Immunology Graduate Program
- 9/2011 - 2/2015 **Massachusetts Institute of Technology (MIT)**, Cambridge, MA
Major: Biology
Minor: Asia and Asian Diaspora Studies

RESEARCH EXPERIENCE

- 6/2017 - 08/2023 **PhD Candidate, Immunology Graduate Program**, Stanford University, Stanford, CA
Advisor: Dr. Ravindra Majeti, Department of Medicine
Dissertation: Characterizing Cell-autonomous and Non-autonomous Contributions of RUNX1 Loss in Hematopoiesis and Leukemogenesis using Genetically Engineered Primary Human Cells
Committee: Drs. Charles Chan, Hiromitsu Nakauchi, Irving Weissman (Chair), Joy Wu
- 1/2015 - 6/2016 **Academic Research Technician, Broad Institute of MIT & Harvard**, Harvard University, Cambridge, MA
Advisor: Dr. Deborah Hung, Department of Molecular and Cellular Biology
Projects:
 - Developed low-input and single-cell RNA-Seq methods to simultaneously probe host and intracellular pathogen transcripts.
 - Investigated how PmrAB/PhoPQ activity in *S. Typhimurium* modulates Type I IFN response in macrophages.
- 1/2013 - 12/2014 **Undergraduate Research Assistant, Whitehead Institute for Biomedical Research**, MIT, Cambridge, MA
Advisor: Dr. Robert Weinberg, Department of Biology
Projects:
 - Characterized the role of phospholipase A2 and its downstream effectors to regulate fatty acid metabolism in the epithelial mesenchymal transition.
 - Probed T cell and mesenchymal cancer cell interactions.
- 6/2012 - 8/2012 **Intern, Institute for Immunology**, Tsinghua University, Beijing, China
Advisor: Dr. Li Wu, Institute for Immunology
Project: Investigated effects of cytokines on differentiation of common dendritic progenitors.
- 1/2012 - 5/2012 **Undergraduate Research Assistant, MIT Department of Biology**, MIT, Cambridge, MA
Advisor: Dr. Michael Laub, Department of Biology
Project: Identified DnaA regulators to elucidate control of asymmetric DNA replication in asymmetrically dividing *C. crescentus*.

AWARDS AND HONORS

- 8/2021 International Society of Experimental Hematology Travel Grant
5/2021 James W. Lyons Award, Stanford University
5/2021 Gerald J. Lieberman Fellowship, Stanford University
11/2020 ASH Abstract Achievement Award, American Society of Hematology
11/2020 Best Graduate Student Talk, Stanford Immunology
8/2019 Stanford Biosciences Travel Grant
6/2019 Excellence in Service to Graduate Students, Stanford Biosciences
5/2019 Community Impact Award, Stanford Alumni Association
5/2019 Excellence in Advocacy, Stanford Diversity and Advocacy Committee
8/2018 Stanford Biosciences Travel Grant

3/2017 National Science Foundation Graduate Research Fellowship
9/2016 Stanford Graduate Fellowship
6/2015 Gene Brown Prize, MIT Department of Biology
6/2014 MIT Amgen Scholar Program, Amgen Foundation

PUBLICATIONS

Karigane, D., * **Fan, A.C.**, * Nishimura, T., Kayamori, K., Nakauchi, Y., Köhnke, T., Rangavahula, A., Thomas, R., Ediriwickrema, A., Zhao, F., Stafford, M., Nuno, K.A., Suchy, F., Fowler, J.L., Chao, M., Loh, K.M., Nakauchi, H., and Majeti, R. (*In review*). Intra-leukemic IFN γ suppresses cell cycle progression and mediates chemoresistance.

*Co-first authors

Suchy, F.P.*, Karigane, D.*, Nakauchi, Y., Higuchi, M., Zhang, J., Pekrun, K., Hsu, I., **Fan, A.C.**, Nishimura, T., Charlesworth, C.T., Bhadury, J., Nishimura, T., Wilkinson, A.C., Kay, M.A., Majeti, R., Nakauchi, H. (*In review*). Frequent hidden genetic errors with Cas9/AAV-mediated knockins: Detection and prevention. *Co-first authors

Köhnke, T., Nuno, K.A., Alder, C.C., Gars, E., Phan, P., **Fan, A.C.**, Majeti, R. (*In revision*). Human HSPCs engineered with truncated ASXL1 spontaneously progress to myeloid malignancy and can be targeted by PRC1 inhibition.

Fan, A.C., Nakauchi, Y., Bai, L., Azizi, A., Nuno, K.A., Zhao, F., Karigane, D., Cruz-Hernandez, D., Reinisch, A., Khatri, P., Majeti, R. (2023). RUNX1 loss renders hematopoietic and leukemic cells dependent on interleukin-3 and sensitive to JAK inhibition. *J Clin Invest*.

Linde, M.H., **Fan, A.C.**, Köhnke, T., Trotman-Grant, A.C., Gurev, S.F., Phan, P., Zhao, F., Haddock, N.L., Nuno, K.A., Gars, E.J., Stafford, M., Marshall, P.L., Dove, C.G., Linde, I.L., Landberg, N., Miller, L.P., Majzner, R.G., Zhang, T.Y., Majeti, R. (2023). Reprogramming Cancer into Antigen Presenting Cells as a Novel Immunotherapy. *Cancer Discov*.

Nakauchi, Y.,* Azizi, A.,* Thomas, D., Corces, M.R., Reinisch, A., Sharma, R., Cruz Hernandez D., Köhnke, T., Karigane, D., **Fan, A.**, Martinez-Krams, D., Stafford, M., Kaur, S., Dutta, R., Phan, P., Ediriwickrema, A., McCarthy, E., Ning, Y., Phillips, T., Ellison, C., Guler, G.D., Bergamaschi, A., Ku, C-J., Levy, S., Majeti, R. (2022). The Cell Type-Specific 5hmC Landscape and Dynamics of Healthy Human Hematopoiesis and TET2-Mutant Preleukemia. *Blood Cancer Discov*.

Babdor, J., **Fan, A.C.**, Wane, M., Mbiribindi, B., Mobley, A.S., Noel, J.C., Kouame, E. (2021). Black In Immuno: using social media and digital platforms to connect the dots. *Nat Rev Immunol*.

Kouame, E., Noel, J.C., Wane, M., Babdor, J., Caslin, H.L., **Fan, A.**, Mbiribindi, B., Sattler, S., Mobley, A.S. (2021). Black In Immuno Week: Who We Are, What We Did, and Why It Matters. *J Immunol*.

Richards, R., Zhao, F., Freitas, K., Parker, K., Xu, P., **Fan, A.**, Sotillo, E., Daugaard, M., Oo, H.Z., Liu, J., Hong, W-J., Sorenson, P., Chang, H., Satpathy, A., Majzner, R., Majeti, R., Mackall, C. (2021). NOT-Gated CD93 CAR T Cells Effectively Target AML with Minimized Endothelial Cross-Reactivity. *Blood Cancer Discov*.

Patel, S.A., Dalela, D, **Fan, A.C.**, Lloyd, M.R., Zhang, T. (2021). Niche-Directed Therapy in Acute Myeloid Leukemia: Optimization of Stem Cell Competition for Niche Occupancy. *Leuk. Lymphoma*.

Betin, V.,* Penaranda, C.,* Bandyopadhyay, N., Yang, R., Abitua, A., Bhattacharyya, R., **Fan, A.**, Avraham, R., Livny, J., Shores, N., Hung, D.T. (2018). Hybridization-based targeted capture of pathogen mRNA enables paired host-pathogen transcriptional analysis. *Sci Rep*. 9:19244. *Co-first authors

Avital, G.,* Avraham, R.,* **Fan, A.**, Hashimshony, T., Hung, D.T., and Yanai, I. (2017). scDual-Seq: mapping the gene regulatory program of Salmonella infection by host and pathogen single-cell RNA-sequencing. *Genome Biol*. 18, 200. *Co-first authors

Avraham, R., Haseley, N., **Fan, A.**, Bloom-Ackermann, Z., Livny, J., and Hung, D.T. (2016). A highly multiplexed and sensitive RNA-seq protocol for simultaneous analysis of host and pathogen transcriptomes. *Nat. Protoc*. 11, 1477–1491.

INVITED PRESENTATIONS

Fan, A.C., Nakauchi, Y., Bai, L., Azizi, A., Nuno, K.A., Zhao, F., Karigane, D., Cruz-Hernandez, D., Reinisch, A., Khatri, P., Majeti, R. (Sep 2022). Interleukin-3 selectively rescues RUNX1-deficient human HSPCs with hyposensitivity to JAK/STAT signaling. ***International Society of Experimental Hematology Annual Scientific Meeting***. Edinburgh, Scotland. (Poster Presentation)

Fan, A., Azizi, A., Nuno, K., Nakauchi Y., Zhao, F., Reinisch, A., Cruz-Hernandez, D., Majeti, R. (Aug 2021). Hypersensitivity to IL-3 Rescues Inflammatory RUNX1-Deficient Human HSPCs. ***International Society of Experimental Hematology Annual Scientific Meeting***. Virtual. (Oral and Poster Presentations)

Fan, A., Azizi, A., Nuno, K., Nakauchi Y., Zhao, F., Reinisch, A., Cruz-Hernandez, D., Majeti, R. (Dec 2020). Cytokine Rescue and Targeting of Inflammation-Sensitive RUNX1 Deficient Human CD34+ Hematopoietic Stem and Progenitor Cells. ***American Society of Hematology Annual Meeting and Exposition***. Virtual. (Oral Presentation)

Fan, A., Azizi, A., Dutta, R., Nakauchi, Y., Nuno, K., Zhao, F., Reinisch, A., Majeti, R. (Aug 2020). IL-3 rescues proliferative defects in inflammation-sensitive RUNX1 deficient human hematopoietic stem and progenitor cells. ***International Society of Hematology Annual Scientific Meeting***. Virtual. (Poster Presentation)

Fan, A., Nuno, K., Nakauchi, Y., Köhnke, T., Kim, S., Reinisch, A., Cruz-Hernandez, D., Majeti, R. (Aug 2019). Modeling the pathogenesis of RUNX1 deficiency in inherited AML predisposition syndromes in primary cells. ***International Society of Experimental Hematology Annual Scientific Meeting***. Brisbane, Australia. (Poster Presentation)

Fan, A., Reinisch, A., & Majeti, R. Modeling the Effects of RUNX1 Deficiency in Inherited AML Predisposition Syndromes in Primary Cells. (Aug 2018). ***International Society of Experimental Hematology Annual Scientific Meeting***. Los Angeles, CA. (Poster Presentation)

Fan, A., Avital, G., Avraham, R., Hashimshony, T., Hung, D., Yanai, I. Studying host-pathogen interactions using single-cell RNA-Seq. (Sep 2015). ***CSHL Meeting: Microbial Pathogenesis and Host Response***. Cold Spring Harbor, NY. (Poster Presentation).

TEACHING EXPERIENCE

- 09/2021 – 04/2023 **Immunology Tutor**
Use textbooks, primary literature, and problem sets to introduce students to concepts of immunology and how they contribute to disease pathogenesis and therapeutic design.
- 03/2021 - 02/2022,
7/2015 - 10/2017 **Writer: Secret of Life (secretoflife.org)**, Broad Institute of MIT & Harvard
Created content for immunology chapter and designed practice problems for online multimedia textbook for MIT/EdX Intro Biology courses.
- 4/2019 - 4/2020 **Course Coordinator, IMMUNOL 223: Biology and Disease of Hematopoiesis**, Stanford University
Proposed and designed new 3-unit graduate-level elective focused on historic perspective of hematopoiesis and hematopoietic diseases.
- 4/2019 - 12/2019 **Instructor, BIOS 284: Diversifying Graduate Admissions**, Stanford University
Propose, design, and teach new 1-unit course to teach strategies and knowledge for advocating and negotiating for improved admissions processes.
- 5/2018 - 8/2018 **Course Coordinator: Immunology Graduate Program StartUp**, Stanford University
Design weeklong boot-camp to expose incoming Immunology graduate students to faculty, resources, and core immunology wet-lab techniques.
- 4/2017 - 8/2017 **Co-Instructor, Stanford ADVANCE Institute Science Writing Course**, Stanford University
Developed and taught 8 week writing workshop for incoming graduate students
- 9/2014 - 12/2014 **Teaching Assistant: 7.012: Introduction to Biology**, MIT Department of Biology
Created learning and review materials. Lead recitation sections, office hours, and review sessions. Graded problem sets and exams. 7.0/7.0 evaluation by students.

1/2012 - 5/2012 **Teaching Assistant: 7.02: Intro to Experimental Biology & Communication**, MIT
Department of Biology
Lead biweekly lab sections and exam review sessions. Graded pre-labs and lab reports.
6.0/7.0 evaluation by students.

MENTORING EXPERIENCE

12/2021 - Present **Lab Mentor**, Majeti lab, Physician Scientist Training Program, (PSTP) Stanford University
Train medical student in experimental techniques and data analysis. Guide student through grant application processes.

4/2020 – 06/2022 **Mentor**, ADVANCE Undergraduate Institute, Stanford University
Advise college students from diverse backgrounds on applying to graduate school.

9/2019 - 06/2022 **Mentor**, Enhancing Diversity in Graduate Education Program, Stanford University
Advise mechanical engineering graduate students from diverse backgrounds on transitioning to and navigating graduate school.

9/2017 - 10/2020 **Mentor**, Stanford Biosciences Student Association NSF Mentorship Program
Guide and provide feedback to graduate students applying to the NSF GRFP.

10/2017 - 2/2020 **Volunteer**, Stanford Science Penpals
Exchange letters with underserved middle and high school student populations.

3/2020 - 8/2020 **Mentor**, Immunology Graduate Peer Mentorship Program, Stanford University
Hold office hours and allow drop-in mentoring for all graduate students to help navigate transitioning to graduate school, personal life, science, professional development, and experience as a historically underrepresented group (broadly defined).

3/2019 - 8/2019 **Lab Co-Mentor**, Majeti lab, California Institute for Regenerative Medicine (CIRM), Stanford University
Trained Master's student in experimental design, data analysis, and science communication: oral, poster, and thesis.

6/2018 - 8/2019 **Lab Mentor**, Majeti lab, Stanford Institutes of Medicine Summer Research Program (SIMR)
Trained first-generation high school student in experimental techniques, data analysis, and science communication: oral and poster. Guided student through the college application process.

10/2017 **Mentor**, Stanford Graduate Pathways to STEM
Guided students from underrepresented minorities, first generation, and low-income families through graduate school application process.

4/2017 - 10/2017 **Program Leader**, Stanford ADVANCE Institute
Developed 8 week writing workshop for incoming graduate students from diverse backgrounds. Individually mentored students on transitioning to graduate school.

6/2017 - 8/2017 **Mentor**, Stanford Medical Youth Science Program
Mentored high school seniors from underrepresented groups regarding the college application process and biomedical career path.

3/2012 - 4/2013 **Mentorship Program Chair**, MIT China Care
Planned biweekly events to connect American-raised, adopted Chinese orphans to Chinese culture and student mentors.

LEADERSHIP & SERVICE

9/2020 - Present **Co-organizer and Board Member, Black In Immuno**
Organize inaugural weeklong celebration of Black immunologists and work with academic and industrial institutions to identify how to make their environment more inclusive.

- 07/2022 – 07/2023 **Senior Program Leader, Racial Equity to Advance a Community of Health (REACH) Postbac Initiative**, Stanford Medicine
Manage team of ten program leaders to provide mentorship and plan workshops and courses to postbac cohort. Administer surveys to inform program improvement and to evaluate postbac sense of belonging, skills, and relationship with research mentors.
- 4/2021 - 06/2022 **Co-organizer, Improving Intercultural Competencies Utilizing the Intercultural Development Inventory**, Stanford University
Assess cross-cultural competency and create action plans to increase inclusivity and equity in the academic space.
Awards:
 - **Wellness Mini Grant**, Stanford Recreation and Wellness & Well-being at Stanford
 - **Teaching and Mentoring Academy Innovation Grant**, Stanford Medicine
- 3/2022 - 06/2022 **Representative to the Student Program Committee**, Stanford Immunology Graduate Program
Represented student interests.
- 9/2020 – 11/2021 **Student Representative to the Community, Diversity, and Inclusion in Immunology Committee**, Stanford Immunology Graduate Program
Represent student interests in evaluating and changing program structures, policies, and practices to create a more inclusive and diverse training environment.
- 7/2019 – 08/2021 **Student Representative to the Biosciences Diversity Advisory Council**, Stanford University
Evaluate graduate student admissions applications to assign funding for interviews and fellowships.
- 4/2021 **Science Fair Judge**, Greene Scholars Program
Evaluate elementary school science fair projects and posters performed by students of African descent in the Bay Area.
- 3/2018, 4/2021 **Group Leader**, High School to PhD Event, Stanford University
Guide URM/low income high school participants from low income through Stanford campus visit, presentations, and demonstrations. Field questions about navigating college and graduate school trajectory and application process.
- 9/2019 – 8/2020 **Student Representative to the Executive Committee, Stanford Immunology Graduate Program**
Represent student interests in determining graduate program policies, such as structuring curricula and admissions requirements.
- 9/2018 - 8/2019 **Graduate Student Representative, Diversity Cabinet**, Stanford University
Represented student interests in Stanford Medicine strategic planning.
- 9/2018 - 5/2019 **Student Representative, Committee on Graduate Admissions and Policy**, Stanford University
Represented student perspectives on graduate policies, including graduate mentorship and admissions policies and documents.
- 6/2018 - 5/2019 **President, Biomedical Association for the Interest of Minority Students (BioAIMS)**, Stanford University
Advocated for graduate students on diversity, equity, and inclusion issues. Collaborated to create cross-campus programs to address diversity in student mentorship and to improve the graduate admissions process.
Awards:
 - **2 Diversity & Inclusion Innovation Fund awards**, Vice Provost for Graduate Education
 - **Leaving a Legacy Campus Impact Award**, Student Activities and Leadership

- 6/2017 - 5/2018 **Financial Officer, Biomedical Association for the Interest of Minority Students (BioAIMS), Stanford University**
Coordinated funds to educate about and respond to national issues and events.
- 1/2014 - 12/2014 **President, MIT New House Dormitory Executive Team**
Represented interests of NH4 living group. Oversee NH4 executive team.
- 9/2013 - 6/2014 **Residential Director, MIT Medlinks**
Acted as a liaison for MIT Medical to dormitories, providing over the counter drugs, first aid, and mental and academic support for students.
- 1/2013 - 12/2013 **Judicial Chair, MIT New House Dormitory Executive Team**
Rewrote constitution to reflect dormitory organization. Mediated dorm-wide conflicts.
- 1/2012 - 12/2012 **Campus Preview Weekend (CPW) and Residential Exploration (REX) Chair, MIT New House Dormitory Executive Team**
Oversaw 40+ events and budget proposals. Coordinated 70+ volunteers. Managed \$12,500 budget.