
Yuan Tian, Ph.D.

Staff Scientist

Translational Data Science Integrated Research Center

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Summary of Qualifications

- In-depth knowledge of immunology with extensive research experience in T cell biology.
- Proficient in using Python and R to analyze high-dimensional single-cell data.
- Demonstrated ability to use Python for web development, machine learning, and deep learning.
- Advanced skills in cellular immunology assays including flow cytometry and mass cytometry.

Education

2011–2016 Ph.D. in Microbiology and Immunology

University of Alabama at Birmingham (UAB), Birmingham, AL, United States

2007–2011 B.E. in Bioengineering, Tianjin University, Tianjin, China

Research Experience

Nov 2019–present Staff Scientist

TDS-IRC, Fred Hutchinson Cancer Research Center, Seattle, WA

- Spearheaded collaborative efforts to review key insights obtained from single-cell immune profiling of COVID-19 patients and build a [visualization portal](#) for visualizing, analyzing, and downloading standardized single-cell sequencing data of over 3.2 million cells.
- Analyzed single-cell RNA-seq data from sorted HIV-specific CD4 T cells and helped identify a Th2 transcriptional signature that is correlated with reduced risk of HIV infection.

Feb 2019–Nov 2019 AAI Intersect Fellow and Bioinformatics Scientist

Jun 2016–Feb 2019 Postdoctoral Fellow

Division of Vaccine Discovery, La Jolla Institute for Immunology, La Jolla, CA

- Characterized antigen-specific IL-10+IFN- γ + double positive (DP) CD4 T cells in acute dengue patients and their association with dengue disease.
- Characterized the transcriptomic profiles and TCR repertoires of human dengue virus-specific CD8 T cell subsets.
- Discovered the unique phenotypes and heterogeneity of human CD4 effector memory T cells re-expressing CD45RA (termed Temra cells) via systems biology approaches.
- Mentored Life Sciences Summer Institute (LSSI) intern and laboratory technician.

Aug 2011–May 2016 Graduate Research Assistant

Department of Microbiology, UAB, Birmingham, AL

- Elucidated the roles of interleukin 21 (IL-21) in CD8 T cell differentiation under homeostatic conditions and following viral infections.
- Discovered the function of IL-10 in the development of memory T cells and the differentiation of antiviral CD4 T cell subsets during an acute viral infection.
- Published 3 first-author papers and delivered 12 oral/poster presentations.

Sep 2009–Jul 2011 Undergraduate Researcher

Department of Bioengineering, Tianjin University, Tianjin, China

- Isolated and characterized anti-digoxin llama single-domain antibodies (VHHs) by phage display.
- Obtained funding for the project through a competitive proposal process.
- Managed the project budget and a research team consisting of three undergraduate students.

Honors

2019	The American Association of Immunologists (AAI) Intersect Fellowship for Computational Scientists and Immunologists
2015, 2016	AAI Trainee Abstract Award
2015	Raymond N. Hiramoto Travel Award
2014	Gail H. Cassell Award for Best Graduate Student Poster
2013	UAB Spring Immunology Symposium Award
2010, 2011	Tianjiu Innovation Research Scholarship
2010	Shanghai Pudong Development Bank Scholarship

Selected Presentations

2019	AAI Annual Meeting, San Diego, CA
2019	Cold Spring Harbor Meeting: Systems Immunology, Cold Spring Harbor, NY
2019	Human Immunology Project Consortium (HIPC) 2019 Annual Meeting, Rockville, MD
2018	Network of Immunology Frontier (NIF) Winter School on Advanced Immunology, Awaji, Island and Osaka, Japan
2018	6th Pan-American Dengue Research Network Meeting, Galveston, TX
2018	AAI Annual Meeting, Austin, TX
2017	AAI Annual Meeting, Washington, D.C.
2016	AAI Annual Meeting, Seattle, WA
2015	AAI Annual Meeting, New Orleans, LA
2014	Southeastern Immunology Symposium, Atlanta, GA
2013	Spring Immunology Symposium, Birmingham, AL

Peer Reviewer

- *Ad Hoc* reviewer for *Frontiers in Immunology*, *Emerging Microbes & Infections*, *Bioinformatics*, *Aging*, *Clinical Immunology*, *Frontiers in Bioengineering and Biotechnology*, *Scientific Reports*, *Frontiers in Genetics*, *Clinical & Experimental Immunology*, *Journal of Biomolecular Structure & Dynamics*, *Virus Research*, *BMC Immunology*, *Medicine*, *Viral Immunology*, *Computational Biology and Chemistry*, and *Research Square*
- Editorial Board Member for *BMC Immunology*, *Medicine*, and *Journal of Cellular Immunology*
- Review Editor for *Frontiers in Immunology*, *Frontiers in Bioinformatics*, *Frontiers in Bioengineering and Biotechnology*, *Frontiers in Genetics*, and *Frontiers in Plant Science*

Publications

1. **Tian Y**, Carpp LN, Miller HER, Zager M, Newell EW, and Gottardo R. "Singular insights into the immunology of SARS-CoV-2 infection." *Nature Biotechnology* In revision.
2. da Silva Antunes R, Soldevila F, Pomaznoy M, Babor M, Bennett J, **Tian Y**, Khalil NN, Qian Y, Mandava A, Scheuermann RH, Cortese M, Pulendran B, Petro CD, Gilkes A, Purcell LA, Sette A, and Peters B. 2021. "Systems view of Bordetella pertussis booster vaccination in adults primed with whole-cell vs. acellular vaccine." *JCI Insight* Mar 9;141023.
3. Grifoni A, **Tian Y**, Sette A, and Weiskopf D. 2020. "Transcriptomic immune profiles of human flavivirus-specific T-cell responses." *Immunology* 160(1):3-9.
4. **Tian Y**^{*}, Seumois G, De-Oliveira-Pinto LM, Herrera-de la Mata S, Kim C, Hinz D, Goonawardhana NDS, De Silva AD, Premawansa S, Premawansa G, Wijewickrama A, Balmaseda A, Grifoni A, Vijayanand P, Harris E, Peters B, Sette A, and Weiskopf D. 2019. "Molecular Signatures of Dengue Virus-Specific IL-10/IFN- γ Co-Producing CD4 T Cells and Their Association with Severe Dengue Disease." *Cell Reports* 29(13):4482-4495.e4. (*designates corresponding author)
5. **Tian Y**, Grifoni A, Sette A, and Weiskopf D. 2019. "Human T Cell Response to Dengue Virus Infection." *Frontiers in Immunology* 10:2125.
6. **Tian Y**, Babor M, Lane J, Seumois G, Liang S, Goonawardhana NDS, De Silva AD, Phillips EJ, Mallal SA, da Silva Antunes R, Grifoni A, Vijayanand P, Weiskopf D, Peters B, and Sette A. 2019.

- "Dengue-Specific CD8⁺ T Cell Subsets Display Specialized Transcriptomic and TCR Profiles." *The Journal of Clinical Investigation* 130:1727-1741.
7. Lee BH, Kelly G, Bradford S, Davila M, Guo XV, Amir ED, Thrash EM, Solga M, Lannigan J, Sellers B, Candia J, Tsang J, Montgomery R, Tamaki S, Sigdel T, Sarwal M, Lanier L, **Tian Y**, Kim C, Hinz D, Peters B, Sette A, and Rahman A. 2019. "A Modified Injector and Sample Acquisition Protocol Can Improve Data Quality and Reduce Inter-Instrument Variability of the Helios Mass Cytometer." *Cytometry Part A* 95(9):1019-1030.
 8. Swaminathan K, Olsson N, Lund PJ, Marceau CD, Wagar LE, **Tian Y**, Sidney J, Weiskopf D, Majzoub K, De Silva AD, Harris E, Davis MM, Sette A, Carette JE, and Elias JE. 2018. "Immuno-Proteomic Interrogation of Dengue Infection Reveals Novel HLA Haplotype-1 Specific MHC-I Antigens." *bioRxiv* 471821.
 9. **Tian Y**, da Silva Antunes R, Sidney J, Lindestam Arlehamn CS, Grifoni A, Dhanda SK, Paul S, Peters B, Weiskopf D, and Sette A. 2018. "A Review on T Cell Epitopes Identified Using Prediction and Cell-Mediated Immune Models for *Mycobacterium tuberculosis* and *Bordetella pertussis*." *Frontiers in Immunology* 9:2778.
 10. Grifoni A, Costa-Ramos P, Pham J, **Tian Y**, Seumois G, Sidney J, De Silva AD, Lakshmanane P, Collins MH, Stone M, Norris PJ, Romero CME, Durbin A, Watkins DI, De Silva AM, Busch M, Peters B, Vijayanand P, Harris E, Falconar A, Kallas E, Weiskopf D, and Sette A. 2018. "Cutting Edge: Transcriptional Profiling Reveals Multifunctional and Cytotoxic Antiviral Responses of Zika Virus-Specific CD8⁺ T Cells." *The Journal of Immunology* 201(12):3487-3491.
 11. **Tian Y**, Babor M, Lane J, Schulten V, Patil VS, Seumois G, Rosales S, Fu Z, Burel J, Zapardiel-Gonzalo J, Tennekoon R, De Silva AD, Premawansa S, Premawansa G, Wijewickrama A, Greenbaum J, Vijayanand P, Weiskopf D, Sette A, and Peters B. 2017. "Unique Phenotypes and Clonal Expansions of a Human CD4 Memory T Cell Subset Termed TEMRA." *Nature Communications* 8:1473.
 12. **Tian Y**, Sette A, and Weiskopf D. 2016. "Cytotoxic CD4 T Cells: Differentiation, Function, and Application to Dengue Virus Infection." *Frontiers in Immunology* 7:531.
 13. **Tian Y**, Mollo SB, Harrington LE, and Zajac AJ. 2016. "IL-10 Regulates Memory T Cell Development and the Balance between Th1 and Follicular Th Cell Responses during an Acute Viral Infection." *The Journal of Immunology* 197(4):1308-21.
 14. **Tian Y** and Zajac AJ. 2016. "IL-21 and T Cell Differentiation: Consider the Context." *Trends in Immunology* 37(8):557-68.
 15. **Tian Y**, Cox MA, Kahan SM, Ingram JT, Bakshi RK, and Zajac AJ. 2016. "A Context-Dependent Role for IL-21 in Modulating the Differentiation, Distribution, and Abundance of Effector and Memory CD8 T Cell Subsets." *The Journal of Immunology* 196(5):2153-66.