
Yuan Tian, Ph.D.

Bioinformatics Scientist

Division of Vaccine Discovery

La Jolla Institute for Immunology, La Jolla, CA, USA

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Summary of Qualifications

- In-depth knowledge of immunology with extensive research experience in T cell biology.
- Proficient in using Python, R and various software to analyze next-generation sequencing data, high-dimensional single-cell data, and T cell receptor (TCR) repertoires.
- Advanced skills in cellular immunology assays including flow cytometry, CyTOF, and cell culture.
- Demonstrated ability to use Python and various Python libraries for web development, data analysis, machine learning, and deep learning.
- Strong public speaking and communication skills, as evidenced by numerous presentations at international conferences and a first prize for poster presentation.

Technical Skills

- **Immunology:** flow cytometry, cytometry by time-of-flight (CyTOF), cell culture, ELISA, ELISPOT, handling human blood samples, murine viral infection models
- **Programming and Bioinformatics:** Python, R, Unix, DESeq2, MiXCR, VDJtools, Gene Set Enrichment Analysis (GSEA), Ingenuity Pathway Analysis (IPA), Pandas, Numpy, PyTorch, Fastai, Keras, scikit-learn, Django, Javascript/jQuery, HTML, and CSS

Research Experience

May 2019–present Bioinformatics Scientist

Feb 2019–present AAI Intersect Fellow

Jun 2016–May 2019 Postdoctoral Fellow

Division of Vaccine Discovery, La Jolla Institute for Immunology

- 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.
- Introduced CyTOF to the laboratory and conducted high-dimensional single-cell analysis
- Mentored Life Sciences Summer Institute (LSSI) intern and laboratory technician.

Aug 2011–May 2016 Graduate Research Assistant

Department of Microbiology, University of Alabama at Birmingham

- 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

- 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.

Education

2016 Ph.D. in Microbiology and Immunology

University of Alabama at Birmingham (UAB), Birmingham, AL, USA

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

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*, *Aging*, *Scientific Reports*, *Clinical & Experimental Immunology*, *Journal of Biomolecular Structure & Dynamic*, *Virus Research*, *BMC Immunology*, *Medicine*, *Viral Immunology*, *Computational Biology and Chemistry*, and *Research Square*
- Review Editor for *Frontiers in Bioinformatics and Computational Biology*
- Editorial Board Member for *Journal of Cellular Immunology*

Publications

1. **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* Under review. (*designates corresponding author)
2. Grifoni A, **Tian Y**, Sette A and Weiskopf D. 2019. "Human Immuno-Profiles of Flavivirus-Specific T Cell Responses." *Immunology* Under review.
3. **Tian Y**, Grifoni A, Sette A and Weiskopf D. 2019. "Human T Cell Response to Dengue Virus Infection." *Frontiers in Immunology* 10:2125.
4. **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, Sette A. 2019. "Dengue-Specific CD8⁺ T Cell Subsets Display Specialized Transcriptomic and TCR Profiles." *The Journal of Clinical Investigation* 130:1727-1741.
5. 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, 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* doi: 10.1002/cyto.a.23866.
6. 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.
7. **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.
 8. 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.
 9. **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.
 10. **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.
 11. **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.
 12. **Tian Y** and Zajac AJ. 2016. "IL-21 and T Cell Differentiation: Consider the Context." *Trends in Immunology* 37(8): 557-68.
 13. **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.