Stanford



Yueh-hsiu Chien

Professor of Microbiology & Immunology

Microbiology and Immunology

Bio

ACADEMIC APPOINTMENTS

- Professor, Microbiology and Immunology
- Member, Bio-X
- Member, Stanford Cancer Institute
- Member, Wu Tsai Neurosciences Institute

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

One of our main research focuses is to define γδ T cell function so that we can better understand host immune defense. γδ T cells, together with B cells and αβ T cells, are the only cells that use somatic V, D, J gene rearrangement to generate diverse antigen receptors. All three types of cells are present together in all but the most primitive vertebrates, suggesting that each population contributes to host immune competence uniquely and that all three are necessary for maintaining immune competence. Functional analysis indicates that in infections, γδ T cells respond earlier than αβ T cells do; and also emerge late after pathogen numbers start to decline. Thus, these cells may be involved in both establishing and resolving the inflammatory response. Our past studies indicate that γδ T cells and αβ T cells are clearly distinct in their antigen recognition and activation requirements and also in antigen-specific repertoire and effector-function development. These aspects allow γδ T cells to occupy unique temporal and functional niches in host immune defense. We are following up on these studies to determine how γδ T cell function affect the development and the termination of the inflammatory response and to study γδ T cells function in infections and autoimmune diseases. These include a mouse model of Toxoplasma gondii infection (in collaboration with Dr. John Boothryod) and celiac patients in response to gluten challenge (in collaboration with Dr. Mark Davis). We will expand the analysis to TB patients.

Teaching

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Cancer Biology (PhD Program)
- Immunology (PhD Program)
- Microbiology and Immunology (PhD Program)

Publications

PUBLICATIONS

- **Human vaccine responses regulated by parallel cytokine pathways.** *Nature immunology*
  Chen, G., Guo, J., Heath, J., Prestwood, T. R., Kwon, W. J., Smith, A. R., Nguyen, T. T., Kathuria, K. R., Sola, E., Sangare, A., Mallajosyula, V., Furuichi Fong, R., Mohsin, et al
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- **Engineered mucus-tethering bispecific nanobodies enhance mucosal immunity against respiratory pathogens.** *Nature nanotechnology*
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- **Neuroendocrine cells orchestrate regeneration through Desert hedgehog signaling.** *Cell*
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- **γδ T cell antigen receptor polyspecificity enables T cell responses to a broad range of immune challenges.** *Proceedings of the National Academy of Sciences of the United States of America*
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- **NK-like CD8+ γδ T cells are expanded in persistent Mycobacterium tuberculosis infection.** *Science immunology*
  Roy Chowdhury, R., Valainis, J. R., Dubey, M., von Boehmer, L., Sola, E., Wilhelmy, J., Guo, J., Kask, O., Ohanyan, M., Sun, M., Huang, H., Huang, X., Nguyen, et al
  2023; 8 (81): eade3525

- **A TLR7-nanoparticle adjuvant promotes a broad immune response against heterologous strains of influenza and SARS-CoV-2.** *Nature materials*
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  2023

- **Human Coronary Plaque T Cells Are Clonal and Cross-React to Virus and Self.** *Circulation research*
  Roy Chowdhury, R., D'Addabbo, J., Huang, X., Veizades, S., Sasagawa, K., Louis, D. M., Cheng, P., Sokol, J., Jensen, A., Tso, A., Shankar, V., Wendel, B. S., Bakerman, et al
  2022: 101161CIRCRESAHA121320090

- **KIR+CD8+ T cells suppress pathogenic T cells and are active in autoimmune diseases and COVID-19.** *Science (New York, N.Y.)*
  Li, J., Zaslavsky, M., Su, Y., Guo, J., Sikora, M. J., van Unen, V., Christophersen, A., Chiou, S., Chen, L., Li, J., Ji, X., Wilhelmy, J., McSween, et al
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- **Select sequencing of clonally expanded CD8+ T cells reveals limits to clonal expansion.** *Proceedings of the National Academy of Sciences of the United States of America*
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2019; 15 (2): e1007567

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  2019

- **Author Correction: A multi-cohort study of the immune factors associated with M. tuberculosis infection outcomes.** *Nature*

  Roy Chowdhury, R., Vallania, F., Yang, Q., Lopez Angel, C. J., Darboe, F., Penn-Nicholson, A., Rozot, V., Nemes, E., Malherbe, S. T., Ronacher, K., Walzl, G., Hanekom, W., Davis, et al

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- **A multi-cohort study of the immune factors associated with M. tuberculosis infection outcomes.** *Nature*

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- **Novel M-CSF-producing gamma delta T cells protect against recurrent malaria**

  Mamedov, M. R., Scholzen, A., Nair, R. V., Cumnock, K., Kenkel, J. A., Oliveira, J. H. M., Trujillo, D. L., Saligrama, N., Zhang, Y., Rubelt, F., Schneider, D. S., Chien, Y., Sauerwein, et al

  AMER ASSOC IMMUNOLOGISTS.2018

- **Does selecting ligand shape gamma delta-TCR repertoire?** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*

  Chien, Y.

  2018; 115 (16): E3606

- **From T Cell Receptor to Antigen, Systems Approach to Discovering T Cell Antigen(s) in Multiple Sclerosis and Experimental Autoimmune Encephalomyelitis**

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- **A Macrophage Colony-Stimulating-Factor-Producing γδ T Cell Subset Prevents Malarial Parasitemic Recurrence.** *Immunity*

  Mamedov, M. R., Scholzen, A. n., Nair, R. V., Cumnock, K. n., Kenkel, J. A., Oliveira, J. H., Trujillo, D. L., Saligrama, N. n., Zhang, Y. n., Rubelt, F. n., Schneider, D. S., Chien, Y. H., Sauerwein, et al

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- **DCs stemming from microbiota adaptation specifically drive ?dT17 proliferation and activation.** *Microbiome*

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- **A highly focused antigen receptor repertoire characterizes gamma delta T cells that are poised to make IL-17 rapidly in naive animals** *FRONTIERS IN IMMUNOLOGY*
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- **Pictionary-based fMRI paradigm to study the neural correlates of spontaneous improvisation and figural creativity.** *Scientific reports*
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- **The Split Virus Influenza Vaccine rapidly activates immune cells through Fc? receptors.** *Vaccine*
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