

Stanford



Yueh-hsiu Chien

Professor of Microbiology & Immunology

Bio

ACADEMIC APPOINTMENTS

- Professor, Microbiology & Immunology
- Member, Bio-X
- Member, Stanford Cancer Institute

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

One of our main research focuses is to define **TH1** T cell function so that we can better understand host immune defense. **TH1** T cells, together with B cells and **TH2** 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, **TH1** T cells respond earlier than **TH2** 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 **TH1** T cells and **TH2** 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 **TH1** T cells to occupy unique temporal and functional niches in host immune defense. We are following up on these studies to determine how **TH1** T cell function affect the development and the termination of the inflammatory response and to study **TH1** T cells function in infections and autoimmune diseases. These include a mouse model of *Toxoplasma gondii* infection (in collaboration with Dr. John Boothroyd) 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

- **NK-like CD8+ **TH1** 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*
Yin, Q., Luo, W., Mallajosyula, V., Bo, Y., Guo, J., Xie, J., Sun, M., Verma, R., Li, C., Constantz, C. M., Wagar, L. E., Li, J., Sola, et al
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
2022: eabi9591
- **Nanoparticle-enabled innate immune stimulation activates endogenous tumor-infiltrating T cells with broad antigen specificities.** *Proceedings of the National Academy of Sciences of the United States of America*
Yin, Q., Yu, W., Grzeskowiak, C. L., Li, J., Huang, H., Guo, J., Chen, L., Wang, F., Zhao, F., von Boehmer, L., Metzner, T. J., Leppert, J. T., Chien, et al
2021; 118 (21)
- **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*
Huang, H., Sikora, M. J., Islam, S., Chowdhury, R. R., Chien, Y., Scriba, T. J., Davis, M. M., Steinmetz, L. M.
2019
- **Casting a wider net: Immunosurveillance by nonclassical MHC molecules.** *PLoS pathogens*
D'Souza, M. P., Adams, E., Altman, J. D., Birnbaum, M. E., Boggiano, C., Casorati, G., Chien, Y., Conley, A., Eckle, S. B., Fruh, K., Gondre-Lewis, T., Hassan, N., Huang, et al
2019; 15 (2): e1007567
- **Opposing T cell responses in experimental autoimmune encephalomyelitis.** *Nature*
Saligrama, N. n., Zhao, F. n., Sikora, M. J., Serratelli, W. S., Fernandes, R. A., Louis, D. M., Yao, W. n., Ji, X. n., Idoyaga, J. n., Mahajan, V. B., Steinmetz, L. M., Chien, Y. H., Hauser, et al
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
2018
- **A multi-cohort study of the immune factors associated with M. tuberculosis infection outcomes** *NATURE*
Chowdhury, R., Vallania, F., Yang, Q., Angel, C., Darboe, F., Penn-Nicholson, A., Rozot, V., Nemes, E., Malherbe, S. T., Ronacher, K., Walzl, G., Hanekom, W., Davis, et al
2018; 560 (7720): 644+
- **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
2018
- **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. 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**

- Saligrama, N., Zhao, F., Fernandes, R. A., Serratelli, W. S., Louis, D. M., Chien, Y., Garcia, C. K., Oksenberg, J., Davis, M. M.
SAGE PUBLICATIONS LTD.2018: 5
- **A Macrophage Colony-Stimulating-Factor-Producing ## 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
2018; 48 (2): 350–63.e7
 - **Concerted T cell response in experimental autoimmune encephalomyelitis and multiple sclerosis**
Saligrama, N., Zhao, F., Fernandes, R., Serratelli, W. S., Louis, D. M., Chien, Y. C., Garcia, C. K., Oksenberg, J., Davis, M. M.
SAGE PUBLICATIONS LTD.2017: 201
 - **Microbiota-activated CD103(+) DCs stemming from microbiota adaptation specifically drive gamma delta T17 proliferation and activation** *MICROBIOME*
Fleming, C., Cai, Y., Sun, X., Jala, V. R., Xue, F., Morrissey, S., Wei, Y., Chien, Y., Zhang, H., Haribabu, B., Huang, J., Yan, J.
2017; 5
 - **DCs stemming from microbiota adaptation specifically drive ?dT17 proliferation and activation.** *Microbiome*
Fleming, C., Cai, Y., Sun, X., Jala, V. R., Xue, F., Morrissey, S., Wei, Y., Chien, Y., Zhang, H., Haribabu, B., Huang, J., Yan, J.
2017; 5 (1): 46-?
 - **Defective Signaling in the JAK-STAT Pathway Tracks with Chronic Inflammation and Cardiovascular Risk in Aging Humans.** *Cell systems*
Shen-Orr, S. S., Furman, D., Kidd, B. A., Hadad, F., Lovelace, P., Huang, Y., Rosenberg-Hasson, Y., Mackey, S., Grisar, F. A., Pickman, Y., Maecker, H. T., Chien, Y., Dekker, et al
2016; 3 (4): 374-384 e4
 - **Changes in Brain Activation Associated with Spontaneous Improvization and Figural Creativity After Design-Thinking-Based Training: A Longitudinal fMRI Study.** *Cerebral cortex*
Saggar, M., Quintin, E., Bott, N. T., Kienitz, E., Chien, Y., Hong, D. W., Liu, N., Royalty, A., Hawthorne, G., Reiss, A. L.
2016
 - **Detection, phenotyping, and quantification of antigen-specific T cells using a peptide-MHC dodecamer** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Huang, J., Zeng, X., Sigal, N., Lund, P. J., Su, L. F., Huang, H., Chien, Y., Davis, M. M.
2016; 113 (13): E1890-E1897
 - **Thermoelectric Power in Bilayer Graphene Device with Ionic Liquid Gating** *SCIENTIFIC REPORTS*
Chien, Y., Yuan, H., Wang, C., Lee, W.
2016; 6: 20402
 - **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*
Wei, Y., Han, A., Glanville, J., Fang, F., Zunige, L. A., Lee, J. S., Cue, D. J., Chien, Y.
2015; 6: 1-6
 - **Pictionary-based fMRI paradigm to study the neural correlates of spontaneous improvisation and figural creativity.** *Scientific reports*
Saggar, M., Quintin, E., Kienitz, E., Bott, N. T., Sun, Z., Hong, W., Chien, Y., Liu, N., Dougherty, R. F., Royalty, A., Hawthorne, G., Reiss, A. L.
2015; 5: 10894-?
 - **The Split Virus Influenza Vaccine rapidly activates immune cells through Fc gamma receptors** *VACCINE*
O'Gorman, W. E., Huang, H., Wei, Y., Davis, K. L., Leipold, M. D., Bendall, S. C., Kidd, B. A., Dekker, C. L., Maecker, H. T., Chien, Y., Davis, M. M.
2014; 32 (45): 5989-5997
 - **The Split Virus Influenza Vaccine rapidly activates immune cells through Fc? receptors.** *Vaccine*
O'Gorman, W. E., Huang, H., Wei, Y., Davis, K. L., Leipold, M. D., Bendall, S. C., Kidd, B. A., Dekker, C. L., Maecker, H. T., Chien, Y., Davis, M. M.
2014; 32 (45): 5989-5997
 - **Gamma delta T cells recognize haptens and mount a hapten-specific response** *ELIFE*
Zeng, X., Meyer, C., Huang, J., Newell, E. W., Kidd, B. A., Wei, Y., Chien, Y.
2014; 3
 - **## T cells: first line of defense and beyond** *Annu Rev Immunol*

- Chien, Y., Meyer, C., Bonneville, M.
2014
- **Gamma delta T cells recognize haptens and mount a hapten-specific response.** *eLife*
Zeng, X., Meyer, C., Huang, J., Newell, E. W., Kidd, B. A., Wei, Y., Chien, Y.
2014; 3
 - **gamma delta T Cells: First Line of Defense and Beyond** *ANNUAL REVIEW OF IMMUNOLOGY, VOL 32*
Chien, Y., Meyer, C., Bonneville, M.
2014; 32: 121-155
 - **A Single Peptide-Major Histocompatibility Complex Ligand Triggers Digital Cytokine Secretion in CD4(+) T Cells.** *Immunity*
Huang, J., Brameshuber, M., Zeng, X., Xie, J., Li, Q., Chien, Y., Valitutti, S., Davis, M. M.
2013; 39 (5): 846-857
 - **Dietary gluten triggers concomitant activation of CD4(+) and CD8(+) alpha beta T cells and gamma delta T cells in celiac disease** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Han, A., Newell, E. W., Glanville, J., Fernandez-Becker, N., Khosla, C., Chien, Y., Davis, M. M.
2013; 110 (32): 13073-13078
 - **Dietary gluten triggers concomitant activation of CD4+ and CD8+ αβ T cells and γδ T cells in celiac disease.** *Proceedings of the National Academy of Sciences of the United States of America*
Han, A., Newell, E. W., Glanville, J., Fernandez-Becker, N., Khosla, C., Chien, Y., Davis, M. M.
2013; 110 (32): 13073-13078
 - **Correlation of Gene Expression and Genome Mutation in Single B-Cells** *PLOS ONE*
Weinstein, J. A., Zeng, X., Chien, Y., Quake, S. R.
2013; 8 (6)
 - **The natural and the inducible: interleukin (IL)-17-producing γδ T cells.** *Trends in immunology*
Chien, Y., Zeng, X., Prinz, I.
2013; 34 (4): 151-154
 - **Correlation of gene expression and genome mutation in single B-cells.** *PloS one*
Weinstein, J. A., Zeng, X., Chien, Y., Quake, S. R.
2013; 8 (6)
 - **gamma delta T Cells Recognize a Microbial Encoded B Cell Antigen to Initiate a Rapid Antigen-Specific Interleukin-17 Response** *IMMUNITY*
Zeng, X., Wei, Y., Huang, J., Newell, E. W., Yu, H., Kidd, B. A., Kuhns, M. S., Waters, R. W., Davis, M. M., Weaver, C. T., Chien, Y.
2012; 37 (3): 524-534
 - **Toxoplasma Polymorphic Effectors Determine Macrophage Polarization and Intestinal Inflammation** *CELL HOST & MICROBE*
Jensen, K. D., Wang, Y., Wojno, E. D., Shastri, A. J., Hu, K., Cornel, L., Boedec, E., Ong, Y., Chien, Y., Hunter, C. A., Boothroyd, J. C., Saeij, J. P.
2011; 9 (6): 472-483
 - **Ligand recognition during thymic development and gamma delta T cell function specification** *SEMINARS IN IMMUNOLOGY*
Meyer, C., Zeng, X., Chien, Y.
2010; 22 (4): 207-213
 - **Evidence for a functional sidedness to the alpha beta TCR** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Kuhns, M. S., Girvin, A. T., Klein, L. O., Chen, R., Jensen, K. D., Newell, E. W., Huppa, J. B., Lillemeier, B. F., Huse, M., Chien, Y., Garcia, K. C., Davis, M. M.
2010; 107 (11): 5094-5099
 - **The Salmonella SPI2 Effector Ssel Mediates Long-Term Systemic Infection by Modulating Host Cell Migration** *PLOS PATHOGENS*
McLaughlin, L. M., Govoni, G. R., Gerke, C., Gopinath, S., Peng, K., Laidlaw, G., Chien, Y., Jeong, H., Li, Z., Brown, M. D., Sacks, D. B., Monack, D.
2009; 5 (11)
 - **Cutting Edge: gamma delta Intraepithelial Lymphocytes of the Small Intestine Are Not Biased toward Thymic Antigens** *JOURNAL OF IMMUNOLOGY*
Jensen, K. D., Shin, S., Chien, Y.
2009; 182 (12): 7348-7351

- **Thymic maturation determines gamma delta T cell function, but not their antigen specificities** *CURRENT OPINION IN IMMUNOLOGY*
Jensen, K. D., Chien, Y.
2009; 21 (2): 140-145
- **Thymic selection determines gamma delta T cell effector fate: Antigen-naive cells make interleukin-17 and antigen-experienced cells make interferon gamma** *IMMUNITY*
Jensen, K. D., Su, X., Shin, S., Li, L., Youssef, S., Yarnasaki, S., Steinman, L., Saito, T., Locksley, R. M., Davis, M. M., Baumgarth, N., Chien, Y.
2008; 29 (1): 90-100
- **An autonomous CDR3 delta is sufficient for recognition of the nonclassical MHC class I molecules T10 and T22 by gamma delta T cells** *NATURE IMMUNOLOGY*
Adams, E. J., Strop, P., Shin, S., Chien, Y., Garcia, K. C.
2008; 9 (7): 777-784
- **Antigen recognition by gamma delta T cells** *IMMUNOLOGICAL REVIEWS*
Chien, Y., Konigshofer, Y.
2007; 215: 46-58
- **gamma delta T cells - innate immune lymphocytes?** *CURRENT OPINION IN IMMUNOLOGY*
Konigshofer, Y., Chien, Y.
2006; 18 (5): 527-533
- **Nonobese diabetic mice express aspects of both type 1 and type 2 diabetes** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Chaparro, R. J., Konigshofer, Y., Beilhack, G. F., Shizuru, J. A., McDevitt, H. O., Chien, Y.
2006; 103 (33): 12475-12480
- **The shaping of the gamma delta T cell receptor repertoire** *Annual Meeting of the American-Association-of-Immunologists*
Jensen, K., Shin, S., Konigshofer, Y., Li, L., Chien, Y.
AMER ASSOC IMMUNOLOGISTS.2006: S320-S320
- **Structure of a gamma delta T cell receptor in complex with the nonclassical MHC T22** *SCIENCE*
Adams, E. J., Chien, Y. H., Garcia, K. C.
2005; 308 (5719): 227-231
- **Antigen recognition determinants of gamma delta T cell receptors** *SCIENCE*
Shin, S., El-Diwany, R., Schaffert, S., Adams, E. J., Garcia, K. C., Pereira, P., Chien, Y. H.
2005; 308 (5719): 252-255
- **The adaptor molecules LAT and SLP-76 are specifically targeted by Yersinia to inhibit T cell activation** *JOURNAL OF EXPERIMENTAL MEDICINE*
Gerke, C., FALKOW, S., Chien, Y. H.
2005; 201 (3): 361-371
- **Autoimmune destruction in the CNS triggered by non-classical MHC class I-specific gamma delta T cells** *9th Annual Meeting of Americas-Committee-for-Treatment-and-Research-in-Multiple-Sclerosis*
Yeh, J. H., Youssef, S., Chan, J. R., Cosgaya, J. M., Steinman, L., Chien, Y. H.
SAGE PUBLICATIONS LTD.2005: 110-11
- **Attributes of gamma delta intraepithelial lymphocytes as suggested by their transcriptional profile** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Fahrer, A. M., Konigshofer, Y., Kerr, E. M., Ghandour, G., Mack, D. H., DAVIS, M. M., Chien, Y. H.
2001; 98 (18): 10261-10266
- **Differential roles of cytokine receptors in the development of epidermal gamma delta T cells** *JOURNAL OF IMMUNOLOGY*
Ye, S. K., Maki, K., Lee, H. C., Ito, A., Kawai, K., Suzuki, H., Mak, T. W., Chien, Y. H., Honjo, T., Ikuta, K.
2001; 167 (4): 1929-1934
- **Antigen-recognition properties of murine gamma delta T cells** *SPRINGER SEMINARS IN IMMUNOPATHOLOGY*
Chien, Y. H., Hampl, J.
2000; 22 (3): 239-250

- **A population of murine gamma delta T cells that recognize an inducible MHC class Ib molecule** *SCIENCE*
Crowley, M. P., Fahrner, A. M., Baumgarth, N., Hampl, J., Gutgemann, I., Teyton, L., Chien, Y. H.
2000; 287 (5451): 314-316
- **Crystal structure of a gamma delta T cell receptor ligand T22: A truncated MHC-like fold** *SCIENCE*
Wingren, C., Crowley, M. P., Degano, M., Chien, Y. H., Wilson, I. A.
2000; 287 (5451): 310-314
- **Suppression of T and B lymphocyte activation by a Yersinia pseudotuberculosis virulence factor, YopH** *JOURNAL OF EXPERIMENTAL MEDICINE*
Yao, T., Meccas, J., Healy, J. I., FALKOW, S., Chien, Y. H.
1999; 190 (9): 1343-1350
- **The specificity of a weak gamma delta TCR interaction can be modulated by the glycosylation of the ligand** *JOURNAL OF IMMUNOLOGY*
Hampl, J., SCHILD, H., Litzenberger, C., Baron, M., Crowley, M. P., Chien, Y. H.
1999; 163 (1): 288-294
- **Visualizing lymphocyte recognition** *IMMUNOLOGY AND CELL BIOLOGY*
Wulfing, C., Chien, Y. H., DAVIS, M. M.
1999; 77 (2): 186-187
- **Visualizing T-cell recognition** *64th Symposia: Signaling and Gene Expression in the Immune System*
DAVIS, M. M., Wulfing, C., Krummel, M. F., Savage, P. A., Xu, J., Sumen, C., Dustin, M. L., Chien, Y. H.
COLD SPRING HARBOR LAB PRESS, PUBLICATIONS DEPT.1999: 243-251
- **Differential effect of B lymphocyte-induced maturation protein (Blimp-1) expression on cell fate during B cell development** *JOURNAL OF EXPERIMENTAL MEDICINE*
Messika, E. J., Lu, P. S., Sung, Y. J., Yao, T., Chi, J. T., Chien, Y. H., DAVIS, M. M.
1998; 188 (3): 515-525
- **Induction of rapid T cell activation and tolerance by systemic presentation of an orally administered antigen** *IMMUNITY*
Gutgemann, I., Fahrner, A. M., Altman, J. D., DAVIS, M. M., Chien, Y. H.
1998; 8 (6): 667-673
- **Ligand recognition by alpha beta T cell receptors** *ANNUAL REVIEW OF IMMUNOLOGY*
Davis, M. M., BONIFACE, J. J., Reich, Z., Lyons, D., Hampl, J., Arden, B., Chien, Y. H.
1998; 16: 523-?
- **CD4 augments the response of a T cell to agonist but not to antagonist ligands** *IMMUNITY*
Hampl, J., Chien, Y. H., DAVIS, M. M.
1997; 7 (3): 379-385
- **The recognition of the nonclassical major histocompatibility complex (MHC) class I molecule, T10, by the gamma delta T cell, G8** *JOURNAL OF EXPERIMENTAL MEDICINE*
Crowley, M. P., Reich, Z., Mavaddat, N., Altman, J. D., Chien, Y. H.
1997; 185 (7): 1223-1230
- **T cell receptor biochemistry, repertoire selection and general features of TCR and Ig structure** *Symposium on the Molecular Basis of Cellular Defence Mechanisms*
DAVIS, M. M., Lyons, D. S., Altman, J. D., MCHYZERWILLIAMS, M., Hampl, J., BONIFACE, J. J., Chien, Y., Nossal, Zinkernagel, Miller, Paul, Kirberg, MELCHERS, Mosmann, Goodnow
JOHN WILEY & SONS LTD.1997: 94-104
- **Biological and chemical aspects of T-cell receptor-mediated recognition** *40th Symposium of the Alfred-Benzon-Foundation on HLA and Disease - the Molecular Basis*
DAVIS, M. M., Lyons, D. S., Altman, J. D., Hampl, J., BONIFACE, J. J., Arden, B., Chien, Y.
MUNKSGAARD.1997: 193-203
- **Ligand recognition by gamma delta T cells** *40th Symposium of the Alfred-Benzon-Foundation on HLA and Disease - the Molecular Basis*
Chien, Y. H., SCHILD, H., Mavadatt, N., Rock, E., Davis, M.
MUNKSGAARD.1997: 179-192

- **Early biochemical signals arise from low affinity TCR-ligand reactions at the cell-cell interface** *JOURNAL OF EXPERIMENTAL MEDICINE*
Beeson, C., Rabinowitz, J., Tate, K., Gutgemann, I., Chien, Y. H., Jones, P. P., DAVIS, M. M., McConnell, H. M.
1996; 184 (2): 777-782
- **A TCR binds to antagonist ligands with lower affinities and faster dissociation rates than to agonists** *IMMUNITY*
Lyons, D. S., Lieberman, S. A., Hampl, J., BONIFACE, J. J., Chien, Y. H., Berg, L. J., DAVIS, M. M.
1996; 5 (1): 53-61
- **Recognition by gamma/delta T cells** *ANNUAL REVIEW OF IMMUNOLOGY*
Chien, Y. H., Jores, R., Crowley, M. P.
1996; 14: 511-532
- **Ligand recognition by gamma delta T cells** *8th International Congress of Mucosal Immunology*
Chien, Y. H.
ACADEMIC PRESS INC.1996: 169-182
- **GAMMA-DELTA T-CELLS - T-CELLS WITH B-CELL-LIKE RECOGNITION PROPERTIES** *CURRENT BIOLOGY*
Chien, Y. H., Jores, R.
1995; 5 (10): 1116-1118
- **FUNCTIONAL EXPRESSION AND RECOGNITION OF NONCLASSICAL MHC CLASS-I T10(B) IS NOT PEPTIDE-DEPENDENT** *JOURNAL OF IMMUNOLOGY*
Kaliyaperumal, A., Falchetto, R., Cox, A., Dick, R., Shabanowitz, J., Chien, Y. H., Matis, L., Hunt, D. F., Bluestone, J. A.
1995; 155 (5): 2379-2386
- **ISSUES CONCERNING THE NATURE OF ANTIGEN RECOGNITION BY ALPHA-BETA AND GAMMA-DELTA T-CELL RECEPTORS** *9th International Congress of Immunology*
DAVIS, M. M., Chien, Y. H.
ELSEVIER SCI LTD.1995: 316-18
- **T-CELL RECEPTOR V-REGION USAGE AND ANTIGEN-SPECIFICITY - THE CYTOCHROME-C MODEL SYSTEM** *Conference on T-Cell Receptor Use in Human Autoimmune Diseases*
DAVIS, M. M., MCHYZERWILLIAMS, M., Chien, Y. H.
NEW YORK ACAD SCIENCES.1995: 1-11
- **The recognition of MHC molecules by gamma delta T cells.** *Behring Institute Mitteilungen*
SCHILD, H., Chien, Y. H.
1994: 113-123
- **THE NATURE OF MAJOR HISTOCOMPATIBILITY COMPLEX RECOGNITION BY GAMMA-DELTA-T-CELLS** *CELL*
SCHILD, H., Mavaddat, N., Litzenberger, C., Ehrlich, E. W., DAVIS, M. M., Bluestone, J. A., Matis, L., Draper, R. K., Chien, Y. H.
1994; 76 (1): 29-37
- **CDR3 LENGTH IN ANTIGEN-SPECIFIC IMMUNE RECEPTORS** *JOURNAL OF EXPERIMENTAL MEDICINE*
ROCK, E. P., SIBBALD, P. R., DAVIS, M. M., Chien, Y. H.
1994; 179 (1): 323-328
- **HOW ALPHA-BETA-T-CELL RECEPTORS SEE PEPTIDE MHC COMPLEXES** *IMMUNOLOGY TODAY*
Chien, Y. H., DAVIS, M. M.
1993; 14 (12): 597-602
- **T-CELL RECEPTOR INTERACTION WITH PEPTIDE MAJOR HISTOCOMPATIBILITY COMPLEX (MHC) AND SUPERANTIGEN MHC LIGANDS IS DOMINATED BY ANTIGEN** *JOURNAL OF EXPERIMENTAL MEDICINE*
Ehrlich, E. W., DEVAUX, B., ROCK, E. P., JORGENSEN, J. L., DAVIS, M. M., Chien, Y. H.
1993; 178 (2): 713-722
- **TOPOLOGY AND AFFINITY OF T-CELL RECEPTOR MEDIATED RECOGNITION OF PEPTIDE MHC COMPLEXES** *CURRENT OPINION IN IMMUNOLOGY*
DAVIS, M. M., Chien, Y. H.
1993; 5 (1): 45-49

- **DEVELOPMENT OF GAMMA-DELTA T-CELL SUBSETS FROM FETAL HEMATOPOIETIC STEM-CELLS** *ANNALS OF THE NEW YORK ACADEMY OF SCIENCES*
Ikuta, K., Kina, T., MacNeil, I., Uchida, N., Peault, B., Chien, Y. H., Weissman, I. L.
1992; 651: 21-32
- **DEVELOPMENT OF GAMMA-DELTA T-CELL SUBSETS FROM FETAL HEMATOPOIETIC STEM-CELLS** *CONF ON CD5 B-CELLS IN DEVELOPMENT AND DISEASE*
Ikuta, K., Kina, T., MacNeil, I., Uchida, N., Peault, B., Chien, Y. H., Weissman, I. L.
NEW YORK ACAD SCIENCES.1992: 21-32
- **A GAMMA-DELTA T-CELL RECEPTOR HETERODIMER INDUCES THE EXPRESSION OF CD4 AND CD8 IN THYMOCYTES** *JOURNAL OF EXPERIMENTAL MEDICINE*
Iwashima, M., DAVIS, M. M., Chien, Y. H.
1991; 174 (1): 293-296
- **RECOGNITION OF SELF ANTIGENS BY SKIN-DERIVED T-CELLS WITH INVARIANT GAMMA-DELTA-ANTIGEN RECEPTORS** *SCIENCE*
Havran, W. L., Chien, Y. H., Allison, J. P.
1991; 252 (5011): 1430-1432
- **EXPRESSION OF A FETAL GAMMA-DELTA T-CELL RECEPTOR IN ADULT MICE TRIGGERS A NON-MHC-LINKED FORM OF SELECTIVE DEPLETION** *INTERNATIONAL IMMUNOLOGY*
Iwashima, M., Green, A., Bonyhadi, M., DAVIS, M. M., Allison, J. P., Chien, Y.
1991; 3 (4): 385-393
- **A DEVELOPMENTAL SWITCH IN THYMIC LYMPHOCYTE MATURATION POTENTIAL OCCURS AT THE LEVEL OF HEMATOPOIETIC STEM-CELLS** *CELL*
Ikuta, K., Kina, T., MacNeil, I., Uchida, N., Peault, B., Chien, Y. H., Weissman, I. L.
1990; 62 (5): 863-874
- **A POSSIBLE BASIS FOR MAJOR HISTOCOMPATIBILITY COMPLEX-RESTRICTED T-CELL RECOGNITION** *PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY OF LONDON SERIES B-BIOLOGICAL SCIENCES*
DAVIS, M. M., Chien, Y. H., BJORKMAN, P. J., ELLIOTT, J. F., Iwashima, M., ROCK, E. P., PATTEN, P. A.
1989; 323 (1217): 521-524
- **VARIABLE REGION (V-SIGMA) GENE SEGMENT MOST FREQUENTLY UTILIZED IN ADULT THYMOCYTES IS 3' OF THE CONSTANT (C-SIGMA) REGION** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Iwashima, M., Green, A., DAVIS, M. M., Chien, Y. H.
1988; 85 (21): 8161-8165
- **THE ADULT T-CELL RECEPTOR DELTA-CHAIN IS DIVERSE AND DISTINCT FROM THAT OF FETAL THYMOCYTES** *NATURE*
ELLIOTT, J. F., ROCK, E. P., PATTEN, P. A., DAVIS, M. M., Chien, Y. H.
1988; 331 (6157): 627-631
- **T-CELL RECEPTOR DELTA-GENE REARRANGEMENTS IN EARLY THYMOCYTES** *NATURE*
Chien, Y. H., Iwashima, M., Wettstein, D. A., Kaplan, K. B., ELLIOTT, J. F., Born, W., DAVIS, M. M.
1987; 330 (6150): 722-727
- **IDENTIFICATION AND SEQUENCE OF A 4TH HUMAN T-CELL ANTIGEN RECEPTOR CHAIN** *NATURE*
Loh, E. Y., Lanier, L. L., Turck, C. W., Littman, D. R., DAVIS, M. M., Chien, Y. H., WEISS, A.
1987; 330 (6148): 569-572
- **TRANSIENT REARRANGEMENTS OF THE T-CELL ANTIGEN RECEPTOR ALPHA-LOCUS IN EARLY THYMOCYTES** *JOURNAL OF EXPERIMENTAL MEDICINE*
LINDSTEN, T., FOWLKES, B. J., Samelson, L. E., DAVIS, M. M., Chien, Y. H.
1987; 166 (3): 761-775
- **A NEW T-CELL RECEPTOR GENE LOCATED WITHIN THE ALPHA-LOCUS AND EXPRESSED EARLY IN T-CELL DIFFERENTIATION** *NATURE*
Chien, Y. H., Iwashima, M., Kaplan, K. B., ELLIOTT, J. F., DAVIS, M. M.
1987; 327 (6124): 677-682

- **T-CELL RECEPTOR GENE STRUCTURE AND FUNCTION** *CELLULAR IMMUNOLOGY*
DAVIS, M. M., LINDSTEN, T., Gascoigne, N. R., Goodnow, C., Chien, Y. H.
1986; 99 (1): 24-28
- **PARADIGM REGAINED - SIMILARITIES AND DIFFERENCES BETWEEN T-CELL RECEPTOR AND IMMUNOGLOBULIN GENES** *BIOCHEMICAL SOCIETY SYMPOSIA*
DAVIS, M. M., LINDSTEN, T., Gascoigne, N. R., Goodnow, C., Chien, Y. H.
1986: 205-209
- **VARIABILITY AND REPERTOIRE SIZE OF T-CELL RECEPTOR V-ALPHA GENE SEGMENTS** *NATURE*
Becker, D. M., Patten, P., Chien, Y. H., Yokota, T., ESHHAR, Z., Giedlin, M., Gascoigne, N. R., Goodnow, C., Wolf, R., Arai, K., DAVIS, M. M.
1985; 317 (6036): 430-434
- **GENOMIC ORGANIZATION AND SEQUENCE OF T-CELL RECEPTOR BETA-CHAIN CONSTANT-REGION AND JOINING-REGION GENES** *NATURE*
Gascoigne, N. R., Chien, Y. H., Becker, D. M., Kavalier, J., DAVIS, M. M.
1984; 310 (5976): 387-391
- **A 3RD-TYPE OF MURINE T-CELL RECEPTOR GENE** *NATURE*
Chien, Y., Becker, D. M., LINDSTEN, T., Okamura, M., Cohen, D. I., DAVIS, M. M.
1984; 312 (5989): 31-35
- **A MURINE T-CELL RECEPTOR GENE-COMPLEX - ISOLATION, STRUCTURE AND REARRANGEMENT** *IMMUNOLOGICAL REVIEWS*
DAVIS, M. M., Chien, Y., Gascoigne, N. R., HEDRICK, S. M.
1984; 81: 235-258
- **LOCALIZATION OF A T-CELL RECEPTOR DIVERSITY-REGION ELEMENT** *NATURE*
Kavalier, J., DAVIS, M. M., Chien, Y. H.
1984; 310 (5976): 421-423
- **STRUCTURE, EXPRESSION AND DIVERGENCE OF T-CELL RECEPTOR BETA-CHAIN VARIABLE REGIONS** *NATURE*
Patten, P., Yokota, T., Rothbard, J., Chien, Y., Arai, K., DAVIS, M. M.
1984; 312 (5989): 40-46
- **SOMATIC RECOMBINATION IN A MURINE T-CELL RECEPTOR GENE** *NATURE*
Chien, Y. H., Gascoigne, N. R., Kavalier, J., Lee, N. E., DAVIS, M. M.
1984; 309 (5966): 322-326