

## 10 Reference List

In alphabetical order.

Agrawal,A., Eastman,Q.M., and Schatz,D.G. (1998). Transposition mediated by RAG1 and RAG2 and its implications for the evolution of the immune system. *Nature* 394, 744-751.

Alam,S.M. and Gascoigne,N.R. (1998). Posttranslational regulation of TCR Valpha allelic exclusion during T cell differentiation. *J. Immunol.* 160, 3883-3890.

Anderson,K.V., Jurgens,G., and Nusslein-Volhard,C. (1985). Establishment of dorsal-ventral polarity in the *Drosophila* embryo: genetic studies on the role of the Toll gene product. *Cell* 42, 779-789.

Arden,B., Clark,S.P., Kabelitz,D., and Mak,T.W. (1995). Mouse T-cell receptor variable gene segment families. *Immunogenetics* 42, 501-530.

Ashton-Rickardt,P.G., Bandeira,A., Delaney,J.R., Van Kaer,L., Pircher,H.P., Zinkernagel,R.M., and Tonegawa,S. (1994). Evidence for a differential avidity model of T cell selection in the thymus. *Cell* 76, 651-663.

Banchereau,J. and Steinman,R.M. (1998). Dendritic cells and the control of immunity. *Nature* 392, 245-252.

Barber,D.F., Passoni,L., Wen,L., Geng,L., and Hayday,A.C. (1998). The expression in vivo of a second isoform of pT alpha: implications for the mechanism of pT alpha action. *J. Immunol.* 161, 11-16.

Basu,D., Horvath,S., Matsumoto,I., Fremont,D.H., and Allen,P.M. (2000). Molecular basis for recognition of an arthritic peptide and a foreign epitope on distinct MHC molecules by a single TCR. *J. Immunol.* 164, 5788-5796.

- Basu,S., Binder,R.J., Ramalingam,T., and Srivastava,P.K. (2001). CD91 is a common receptor for heat shock proteins gp96, hsp90, hsp70, and calreticulin. *Immunity*. *14*, 303-313.
- Belvin,M.P. and Anderson,K.V. (1996). A conserved signaling pathway: the *Drosophila* toll-dorsal pathway. *Annu. Rev. Cell Dev. Biol.* *12*, 393-416.
- Bendelac,A., Bonneville,M., and Kearney,J.F. (2001). Autoreactivity by design: innate B and T lymphocytes. *Nature Rev. Immunol.* *1*, 177-186.
- Bendelac,A., Hunziker,R.D., and Lantz,O. (1996). Increased interleukin 4 and immunoglobulin E production in transgenic mice overexpressing NK1 T cells. *J. Exp. Med.* *184*, 1285-1293.
- Bennett,M.J., Van Leeuwen,J.E., and Kearse,K.P. (1998). Calnexin association is not sufficient to protect T cell receptor alpha proteins from rapid degradation in CD4+CD8+ thymocytes. *J. Biol. Chem.* *273*, 23674-23680.
- Benoist,C. and Mathis,D. (2001). Autoimmunity provoked by infection: how good is the case for T cell epitope mimicry? *Nat. Immunol.* *2*, 797-801.
- Bhan,A.K., Mizoguchi,E., Smith,R.N., and Mizoguchi,A. (2000). Spontaneous chronic colitis in TCR alpha-mutant mice; an experimental model of human ulcerative colitis. *Int. Rev. Immunol.* *19*, 123-138.
- Binder,R.J., Anderson,K.M., Basu,S., and Srivastava,P.K. (2000a). Cutting edge: heat shock protein gp96 induces maturation and migration of CD11c+ cells in vivo. *J. Immunol.* *165*, 6029-6035.
- Binder,R.J., Han,D.K., and Srivastava,P.K. (2000b). CD91: a receptor for heat shock protein gp96. *Nat. Immunol.* *1*, 151-155.
- Biro,J., Wurch,A., Potocnik,A.J., Falk,I., Mossmann,H., and Eichmann,K. (1999). Regulation of T cell receptor (TCR) beta gene expression by CD3 complex signaling in immature thymocytes: implications for TCRbeta allelic exclusion. *Proc. Natl. Acad. Sci. U. S. A* *96*, 3882-3887.

Blank,U., Boitel,B., Mege,D., Ermonval,M., and Acuto,O. (1993). Analysis of tetanus toxin peptide/DR recognition by human T cell receptors reconstituted into a murine T cell hybridoma. *Eur. J. Immunol.* 23 , 3057-3065.

Bonneville,M., Ishida,I., Mombaerts,P., Katsuki,M., Verbeek,S., Berns,A., and Tonegawa,S. (1989). Blockage of alpha beta T-cell development by TCR gamma delta transgenes. *Nature* 342, 931-934.

Borgulya,P., Kishi,H., Uematsu,Y., and von Boehmer,H. (1992). Exclusion and inclusion of alpha and beta T cell receptor alleles. *Cell* 69, 529-537.

Brandle,D., Brduscha-Riem,K., Hayday,A.C., Owen,M.J., Hengartner,H., and Pircher,H. (1995). T cell development and repertoire of mice expressing a single T cell receptor alpha chain. *Eur. J. Immunol.* 25, 2650-2655.

Bretscher,P. (1992). The two-signal model of lymphocyte activation twenty-one years later. *Immunol. Today* 13, 74-76.

Bretscher,P.A. (1975). The two signal model for B cell induction. *Transplant. Rev.* 23, 37-48.

Brinster,R.L., Chen,H.Y., Trumbauer,M., Senear,A.W., Warren,R., and Palmiter,R.D. (1981). Somatic expression of herpes thymidine kinase in mice following injection of a fusion gene into eggs. *Cell* 27, 223-231.

Bruno,L., Rocha,B., Rolink,A., von Boehmer,H., and Rodewald,H.R. (1995). Intra- and extra-thymic expression of the pre-T cell receptor alpha gene. *Eur. J. Immunol.* 25, 1877-1882.

Busch,D.H., Pilip,I.M., Vijn,S., and Pamer,E.G. (1998). Coordinate regulation of complex T cell populations responding to bacterial infection. *Immunity.* 8, 353-362.

Calmette,A. and Guérin,C. (1909). Sur quelques propriétés du bacilles tuberculeux d'origine bovine cultivé sur la bile de boef glycérine. *Compt. R. Acad. Sci.* 716.

Carvalho,L.H., Sano,G.G., Hafalla,J.C., Morrot,A., de Lafaille,M.A., and Zavala,F. (2002). IL-4-secreting CD4+ T cells are crucial to the development of CD8+ T-cell responses against malaria liver stages. *Nat. Med.* 8, 166-170.

Chui,D., Sellakumar,G., Green,R., Sutton-Smith,M., McQuistan,T., Marek,K., Morris,H., Dell,A., and Marth,J. (2001). Genetic remodeling of protein glycosylation in vivo induces autoimmune disease. *Proc. Natl. Acad. Sci. U. S. A* 98, 1142-1147.

Clevers,H.C. and Owen,M.J. (1991). Towards a molecular understanding of T-cell differentiation. *Immunol. Today* 12, 86-92.

Corthay,A., Nandakumar,K.S., and Holmdahl,R. (2001). Evaluation of the Percentage of Peripheral T Cells with Two Different T Cell Receptor alpha-Chains and of their Potential Role in Autoimmunity. *J. Autoimmun.* 16, 423-429.

Couez,D., Malissen,M., Buferne,M., Schmitt-Verhulst,A.M., and Malissen,B. (1991). Each of the two productive T cell receptor alpha-gene rearrangements found in both the A10 and BM 3.3 T cell clones give rise to an alpha chain which can contribute to the constitution of a surface-expressed alpha beta dimer. *Int. Immunol.* 3, 719-729.

Danilczyk,U.G., Cohen-Doyle,M.F., and Williams,D.B. (2000). Functional relationship between calreticulin, calnexin, and the endoplasmic reticulum luminal domain of calnexin. *J. Biol. Chem.* 275, 13089-13097.

Demetriou,M., Granovsky,M., Quaggin,S., and Dennis,J.W. (2001). Negative regulation of T-cell activation and autoimmunity by Mgat5 N-glycosylation. *Nature* 409, 733-739.

Derbinski,J., Schulte,A., Kyewski,B., and Klein,L. (2001). Promiscuous gene expression in medullary thymic epithelial cells mirrors the peripheral self. *Nat. Immunol.* 2, 1032-1039.

Dustin,M.L. and Chan,A.C. (2000). Signaling takes shape in the immune system. *Cell* 103, 283-294.

Ehl,S., Aichele,P., Ramseier,H., Barchet,W., Hombach,J., Pircher,H., Hengartner,H., and Zinkernagel,R.M. (1998). Antigen persistence and time of T-cell tolerization determine the efficacy of tolerization protocols for prevention of skin graft rejection. *Nat. Med.* *4*, 1015-1019.

Ehl,S., Barchet,W., Oehen,S., Aichele,P., Hombach,J., Hengartner,H., and Zinkernagel,R.M. (2000). Donor cell persistence and activation-induced unresponsiveness of peripheral CD8<sup>+</sup> T cells. *Eur. J. Immunol.* *30*, 883-891.

Ehl,S., Hombach,J., Aichele,P., Hengartner,H., and Zinkernagel,R.M. (1997). Bystander activation of cytotoxic T cells: studies on the mechanism and evaluation of in vivo significance in a transgenic mouse model. *J. Exp. Med.* *185*, 1241-1251.

Elliott,J.I. (1998). Selection of dual Valpha T cells. *Eur. J. Immunol.* *28*, 2115-2123.

Elliott,J.I. (1999). Dual Valpha T cells. *Cell Mol. Life Sci.* *56*, 143-154.

Elliott,J.I. and Altmann,D.M. (1995). Dual T cell receptor alpha chain T cells in autoimmunity. *J. Exp. Med.* *182*, 953-959.

Elliott,J.I. and Altmann,D.M. (1996). Non-obese diabetic mice hemizygous at the T cell receptor alpha locus are susceptible to diabetes and sialitis. *Eur. J. Immunol.* *26*, 953-956.

Emmrich,F., Thole,J., van Embden,J., and Kaufmann,S.H. (1986). A recombinant 64 kilodalton protein of *Mycobacterium bovis* bacillus Calmette-Guerin specifically stimulates human T4 clones reactive to mycobacterial antigens. *J. Exp. Med.* *163*, 1024-1029.

Evavold,B.D., Sloan-Lancaster,J., Wilson,K.J., Rothbard,J.B., and Allen,P.M. (1995). Specific T cell recognition of minimally homologous peptides: evidence for multiple endogenous ligands. *Immunity.* *2*, 655-663.

Fearon,D.T. and Locksley,R.M. (1996). The instructive role of innate immunity in the acquired immune response. *Science* *272*, 50-53.

- Fowell,D. and Mason,D. (1993). Evidence that the T cell repertoire of normal rats contains cells with the potential to cause diabetes. Characterization of the CD4+ T cell subset that inhibits this autoimmune potential. *J. Exp. Med.* *177*, 627-636.
- Frohman,M.A., Dush,M.K., and Martin,G.R. (1988). Rapid production of full-length cDNAs from rare transcripts: amplification using a single gene-specific oligonucleotide primer. *Proc. Natl. Acad. Sci. U. S. A* *85*, 8998-9002.
- Furutani,M., Yanagi,Y., Fujisawa,I., Nakayama,T., Kishimoto,H., Kuida,K., Asano,Y., and Tada,T. (1989). Post-transcriptional allelic exclusion of two functionally rearranged T cell receptor alpha genes. *Int. Immunol.* *1*, 281-288.
- Fuss,I.J., Neurath,M., Boirivant,M., Klein,J.S., de la,M.C., Strong,S.A., Fiocchi,C., and Strober,W. (1996). Disparate CD4+ lamina propria (LP) lymphokine secretion profiles in inflammatory bowel disease. Crohn's disease LP cells manifest increased secretion of IFN-gamma, whereas ulcerative colitis LP cells manifest increased secretion of IL-5. *J. Immunol.* *157*, 1261-1270.
- Garcia,K.C., Degano,M., Stanfield,R.L., Brunmark,A., Jackson,M.R., Peterson,P.A., Teyton,L., and Wilson,I.A. (1996). An alphabeta T cell receptor structure at 2.5 A and its orientation in the TCR-MHC complex. *Science* *274*, 209-219.
- Gonzalez,A., Katz,J.D., Mattei,M.G., Kikutani,H., Benoist,C., and Mathis,D. (1997). Genetic control of diabetes progression. *Immunity.* *7*, 873-883.
- Graeff-Meeder,E.R., van der,Z.R., Rijkers,G.T., Schuurman,H.J., Kuis,W., Bijlsma,J.W., Zegers,B.J., and van Eden,W. (1991). Recognition of human 60 kD heat shock protein by mononuclear cells from patients with juvenile chronic arthritis. *Lancet* *337*, 1368-1372.
- Grode,L., Kursar,M., Fensterle,J., Kaufmann,S.H., and Hess,J. (2002). Cell-mediated immunity induced by recombinant *Mycobacterium bovis* Bacille Calmette-Guerin strains against an intracellular bacterial pathogen: importance of antigen secretion or membrane-targeted antigen display as lipoprotein for vaccine efficacy. *J. Immunol.* *168*, 1869-1876.

- Groettrup,M., Baron,A., Griffiths,G., Palacios,R., and von Boehmer,H. (1992). T cell receptor (TCR) beta chain homodimers on the surface of immature but not mature alpha, gamma, delta chain deficient T cell lines. *EMBO J.* *11*, 2735-2745.
- Groettrup,M. and von Boehmer,H. (1993). T cell receptor beta chain dimers on immature thymocytes from normal mice. *Eur. J. Immunol.* *23*, 1393-1396.
- Gundlach,B.R., Wiesmuller,K.H., Junt,T., Kienle,S., Jung,G., and Walden,P. (1996). Specificity and degeneracy of minor histocompatibility antigen-specific MHC-restricted CTL. *J. Immunol.* *156*, 3645-3651.
- Habich,C., Baumgart,K., Kolb,H., and Burkart,V. (2002). The receptor for heat shock protein 60 on macrophages is saturable, specific, and distinct from receptors for other heat shock proteins. *J. Immunol.* *168*, 569-576.
- Haines,J.L., Ter Minassian,M., Bazyk,A., Gusella,J.F., Kim,D.J., Terwedow,H., Pericak-Vance,M.A., Rimmler,J.B., Haynes,C.S., Roses,A.D., Lee,A., Shaner,B., Menold,M., Seboun,E., Fitoussi,R.P., Gartioux,C., Reyes,C., Ribierre,F., Gyapay,G., Weissenbach,J., Hauser,S.L., Goodkin,D.E., Lincoln,R., Usuku,K., Oksenberg,J.R., and . (1996). A complete genomic screen for multiple sclerosis underscores a role for the major histocompatibility complex. The Multiple Sclerosis Genetics Group. *Nat. Genet.* *13*, 469-471.
- Hardardottir,F., Baron,J.L., and Janeway,C.A., Jr. (1995). T cells with two functional antigen-specific receptors. *Proc. Natl. Acad. Sci. U. S. A* *92*, 354-358.
- Harder,T. (2001). Raft membrane domains and immunoreceptor functions. *Adv. Immunol.* *77*, 45-92.
- Hashimoto,C., Hudson,K.L., and Anderson,K.V. (1988). The Toll gene of *Drosophila*, required for dorsal-ventral embryonic polarity, appears to encode a transmembrane protein. *Cell* *52*, 269-279.
- Hayashi,F., Smith,K.D., Ozinsky,A., Hawn,T.R., Yi,E.C., Goodlett,D.R., Eng,J.K., Akira,S., Underhill,D.M., and Aderem,A. (2001). The innate immune response to bacterial flagellin is mediated by Toll-like receptor 5. *Nature* *410*, 1099-1103.

- He,X., Janeway,C.A., Jr., Levine,M., Robinson,E., Preston-Hurlburt,P., Viret,C., and Bottomly,K. (2002). Dual receptor T cells extend the immune repertoire for foreign antigens. *Nat. Immunol.* *3*, 127-134.
- Heath,W.R., Carbone,F.R., Bertolino,P., Kelly,J., Cose,S., and Miller,J.F. (1995). Expression of two T cell receptor alpha chains on the surface of normal murine T cells. *Eur. J. Immunol.* *25*, 1617-1623.
- Heath,W.R. and Miller,J.F. (1993). Expression of two alpha chains on the surface of T cells in T cell receptor transgenic mice. *J. Exp. Med.* *178*, 1807-1811.
- Hemmer,B., Vergelli,M., Gran,B., Ling,N., Conlon,P., Pinilla,C., Houghten,R., McFarland,H.F., and Martin,R. (1998a). Predictable TCR antigen recognition based on peptide scans leads to the identification of agonist ligands with no sequence homology. *J. Immunol.* *160*, 3631-3636.
- Hemmer,B., Vergelli,M., Pinilla,C., Houghten,R., and Martin,R. (1998b). Probing degeneracy in T-cell recognition using peptide combinatorial libraries. *Immunol. Today* *19*, 163-168.
- Hemmi,H., Takeuchi,O., Kawai,T., Kaisho,T., Sato,S., Sanjo,H., Matsumoto,M., Hoshino,K., Wagner,H., Takeda,K., and Akira,S. (2000). A Toll-like receptor recognizes bacterial DNA. *Nature* *408*, 740-745.
- Hennecke,J. and Wiley,D.C. (2001). T cell receptor-MHC interactions up close. *Cell* *104*, 1-4.
- Hiom,K., Melek,M., and Gellert,M. (1998). DNA transposition by the RAG1 and RAG2 proteins: a possible source of oncogenic translocations. *Cell* *94*, 463-470.
- Hogan,B., Constantini,F., and Lacy,E. (1986). *Manipulating the mouse embryo: A laboratory manual*. Cold Spring Harbor Press, Cold Spring Harbor, NY.
- Hogquist,K.A., Jameson,S.C., Heath,W.R., Howard,J.L., Bevan,M.J., and Carbone,F.R. (1994). T cell receptor antagonist peptides induce positive selection. *Cell* *76*, 17-27.



- Iijima,H., Takahashi,I., Kishi,D., Kim,J.K., Kawano,S., Hori,M., and Kiyono,H. (1999). Alteration of interleukin 4 production results in the inhibition of T helper type 2 cell-dominated inflammatory bowel disease in T cell receptor alpha chain-deficient mice. *J. Exp. Med.* *190*, 607-615.
- Iqbal,N., Oliver,J.R., Wagner,F.H., Lazenby,A.S., Elson,C.O., and Weaver,C.T. (2002). T helper 1 and T helper 2 cells are pathogenic in an antigen-specific model of colitis. *J. Exp. Med.* *195*, 71-84.
- Jameson,S.C. and Bevan,M.J. (1998). T-cell selection. *Curr. Opin. Immunol.* *10*, 214-219.
- Janeway,C.A., Jr. and Medzhitov,R. (2002). Innate immune recognition. *Annu. Rev. Immunol.* *20*, 197-216.
- Janeway,C.A., Travers,P., and Walport,M. (1999). *Immuno Biology. The Immune System in Health and Disease*. Elsevier Science Ltd/Garland Publishing.
- Kappler,J.W., Roehm,N., and Marrack,P. (1987). T cell tolerance by clonal elimination in the thymus. *Cell* *49*, 273-280.
- Kaufmann,S.H. (1990). Heat shock proteins and the immune response. *Immunol. Today* *11*, 129-136.
- Kaufmann,S.H., Vath,U., Thole,J.E., Van Embden,J.D., and Emmrich,F. (1987). Enumeration of T cells reactive with Mycobacterium tuberculosis organisms and specific for the recombinant mycobacterial 64-kDa protein. *Eur. J. Immunol.* *17*, 351-357.
- Kinsella,T.M. and Nolan,G.P. (1996). Episomal vectors rapidly and stably produce high-titer recombinant retrovirus. *Hum. Gene Ther.* *7*, 1405-1413.
- Kishi,H., Borgulya,P., Scott,B., Karjalainen,K., Traunecker,A., Kaufman,J., and von Boehmer,H. (1991). Surface expression of the beta T cell receptor (TCR) chain in the absence of other TCR or CD3 proteins on immature T cells. *EMBO J.* *10*, 93-100.

- Kisielow, P., Bluthmann, H., Staerz, U.D., Steinmetz, M., and von Boehmer, H. (1988a). Tolerance in T-cell-receptor transgenic mice involves deletion of nonmature CD4+8+ thymocytes. *Nature* 333, 742-746.
- Kisielow, P., Teh, H.S., Bluthmann, H., and von Boehmer, H. (1988b). Positive selection of antigen-specific T cells in thymus by restricting MHC molecules. *Nature* 335, 730-733.
- Koch, U., Lacombe, T.A., Holland, D., Bowman, J.L., Cohen, B.L., Egan, S.E., and Giddens, C.J. (2001). Subversion of the T/B lineage decision in the thymus by lunatic fringe-mediated inhibition of Notch-1. *Immunity* 15, 225-236.
- Koga, T., Wand-Wurtenberger, A., DeBruyn, J., Munk, M.E., Schoel, B., and Kaufmann, S.H. (1989). T cells against a bacterial heat shock protein recognize stressed macrophages. *Science* 245, 1112-1115.
- Kondo, M., Weissman, I.L., and Akashi, K. (1997). Identification of clonogenic common lymphoid progenitors in mouse bone marrow. *Cell* 91, 661-672.
- Koning, F., Lew, A.M., Maloy, W.L., Valas, R., and Coligan, J.E. (1988). The biosynthesis and assembly of T cell receptor alpha- and beta-chains with the CD3 complex. *J. Immunol.* 140, 3126-3134.
- Kouskoff, V., Korganow, A.S., Duchatelle, V., Degott, C., Benoist, C., and Mathis, D. (1996). Organ-specific disease provoked by systemic autoimmunity. *Cell* 87, 811-822.
- Kuckelkorn, U., Ruppert, T., Strehl, B., Jungblut, P.R., Zimny-Arndt, U., Lamer, S., Prinz, I., Drung, I., Kloetzel, P.M., Kaufmann, S.H., and Steinhoff, U. (2002). Link between Organ-specific Antigen Processing by 20S Proteasomes and CD8(+) T Cell-mediated Autoimmunity. *J. Exp. Med.* 195, 983-990.
- Kuida, K., Furutani-Seiki, M., Saito, T., Kishimoto, H., Sano, K., and Tada, T. (1991). Post-translational attainment of allelic exclusion of the T cell receptor alpha chain in a T cell clone. *Int. Immunol.* 3, 75-82.

- Kuwabara,I., Ohno,H., Punt,J.A., Hashimoto,Y., and Saito,T. (1994). Transition from TCR-beta dimer to TCR-alpha beta-expressing cells by introduction of an alpha-chain in an immature thymocyte cell line. *J. Immunol.* *152*, 2148-2156.
- Lafaille,J.J., Keere,F.V., Hsu,A.L., Baron,J.L., Haas,W., Raine,C.S., and Tonegawa,S. (1997). Myelin basic protein-specific T helper 2 (Th2) cells cause experimental autoimmune encephalomyelitis in immunodeficient hosts rather than protect them from the disease. *J. Exp. Med.* *186*, 307-312.
- Lambolez,F., Azogui,O., Joret,A.M., Garcia,C., von Boehmer,H., Di Santo,J., Ezine,S., and Rocha,B. (2002). Characterization of T cell differentiation in the murine gut. *J. Exp. Med.* *195*, 437-449.
- Lantz,O. and Bendelac,A. (1994). An invariant T cell receptor alpha chain is used by a unique subset of major histocompatibility complex class I-specific CD4+ and CD4-8- T cells in mice and humans. *J. Exp. Med.* *180*, 1097-1106.
- Li,S.G., Quayle,A.J., Shen,Y., Kjeldsen-Kragh,J., Oftung,F., Gupta,R.S., Natvig,J.B., and Forre,O.T. (1992). Mycobacteria and human heat shock protein-specific cytotoxic T lymphocytes in rheumatoid synovial inflammation. *Arthritis Rheum.* *35*, 270-281.
- Li,Z., Menoret,A., and Srivastava,P. (2002). Roles of heat-shock proteins in antigen presentation and cross-presentation. *Curr. Opin. Immunol.* *14*, 45-51.
- Lopez-Cubero,S.O., Sullivan,K.M., and McDonald,G.B. (1998). Course of Crohn's disease after allogeneic marrow transplantation. *Gastroenterology* *114*, 433-440.
- Lowe,J.B. (2001). Glycosylation, immunity, and autoimmunity. *Cell* *104*, 809-812.
- Maier,B., Molinger,M., Cope,A.P., Fugger,L., Schneider-Mergener,J., Sonderstrup,G., Kamradt,T., and Kramer,A. (2000). Multiple cross-reactive self-ligands for *Borrelia burgdorferi*-specific HLA-DR4-restricted T cells. *Eur. J. Immunol.* *30*, 448-457.

- Malissen,M., Trucy,J., Jouvin-Marche,E., Cazenave,P.A., Scollay,R., and Malissen,B. (1992). Regulation of TCR alpha and beta gene allelic exclusion during T-cell development. *Immunol. Today* *13*, 315-322.
- Malissen,M., Trucy,J., Letourneur,F., Rebai,N., Dunn,D.E., Fitch,F.W., Hood,L., and Malissen,B. (1988). A T cell clone expresses two T cell receptor alpha genes but uses one alpha beta heterodimer for allorecognition and self MHC-restricted antigen recognition. *Cell* *55*, 49-59.
- Martin,R., Gran,B., Zhao,Y., Markovic-Plese,S., Bielekova,B., Marques,A., Sung,M.H., Hemmer,B., Simon,R., McFarland,H.F., and Pinilla,C. (2001). Molecular mimicry and antigen-specific T cell responses in multiple sclerosis and chronic CNS Lyme disease. *J. Autoimmun.* *16*, 187-192.
- Matsumoto,I., Staub,A., Benoist,C., and Mathis,D. (1999). Arthritis provoked by linked T and B cell recognition of a glycolytic enzyme. *Science* *286*, 1732-1735.
- Matzinger,P. (2002). The danger model: a renewed sense of self. *Science* *296*, 301-305.
- Maverakis,E., van den,E.P., and Sercarz,E.E. (2001). Self-reactive T cells and degeneracy of T cell recognition: evolving concepts-from sequence homology to shape mimicry and TCR flexibility. *J. Autoimmun.* *16*, 201-209.
- Medzhitov,R., Preston-Hurlburt,P., and Janeway,C.A., Jr. (1997). A human homologue of the *Drosophila* Toll protein signals activation of adaptive immunity. *Nature* *388*, 394-397.
- Metcalf,K.A., Hitman,G.A., Rowe,R.E., Hawa,M., Huang,X., Stewart,T., and Leslie,R.D. (2001). Concordance for type 1 diabetes in identical twins is affected by insulin genotype. *Diabetes Care* *24*, 838-842.
- Mizoguchi,A., Mizoguchi,E., and Bhan,A.K. (1999). The critical role of interleukin 4 but not interferon gamma in the pathogenesis of colitis in T-cell receptor alpha mutant mice. *Gastroenterology* *116*, 320-326.

Mizoguchi,A., Mizoguchi,E., Chiba,C., Spiekermann,G.M., Tonegawa,S., Nagler-Anderson,C., and Bhan,A.K. (1996). Cytokine imbalance and autoantibody production in T cell receptor-alpha mutant mice with inflammatory bowel disease. *J. Exp. Med.* *183*, 847-856.

Mizoguchi,A., Mizoguchi,E., Smith,R.N., Preffer,F.I., and Bhan,A.K. (1997a). Suppressive role of B cells in chronic colitis of T cell receptor alpha mutant mice. *J. Exp. Med.* *186*, 1749-1756.

Mizoguchi,E., Mizoguchi,A., and Bhan,A.K. (1997b). Role of cytokines in the early stages of chronic colitis in TCR alpha-mutant mice. *Lab Invest* *76*, 385-397.

Mizoguchi,E., Mizoguchi,A., Preffer,F.I., and Bhan,A.K. (2000). Regulatory role of mature B cells in a murine model of inflammatory bowel disease. *Int. Immunol.* *12*, 597-605.

Mombaerts,P., Clarke,A.R., Rudnicki,M.A., Iacomini,J., Itohara,S., Lafaille,J.J., Wang,L., Ichikawa,Y., Jaenisch,R., Hooper,M.L., and . (1992). Mutations in T-cell antigen receptor genes alpha and beta block thymocyte development at different stages. *Nature* *360*, 225-231.

Mombaerts,P., Mizoguchi,E., Grusby,M.J., Glimcher,L.H., Bhan,A.K., and Tonegawa,S. (1993). Spontaneous development of inflammatory bowel disease in T cell receptor mutant mice. *Cell* *75*, 274-282.

Mowat,A.M. and Viney,J.L. (1997). The anatomical basis of intestinal immunity. *Immunol. Rev.* *156*, 145-166.

Munk,M.E., Schoel,B., Modrow,S., Karr,R.W., Young,R.A., and Kaufmann,S.H. (1989). T lymphocytes from healthy individuals with specificity to self-epitopes shared by the mycobacterial and human 65-kilodalton heat shock protein. *J. Immunol.* *143*, 2844-2849.

NIH, NATIONAL INSTITUTES OF HEALTH, 2000. REPORT OF THE AUTOIMMUNE DISEASES COORDINATING COMMITTEE.

<http://www.niaid.nih.gov/dait/pdf/adccrev.pdf>

- Nolan,G.P. (2002). Retroviral systems. Nolan Lab  
[http://www.stanford.edu/group/nolan/retroviral\\_systems/phx.html](http://www.stanford.edu/group/nolan/retroviral_systems/phx.html).
- Ohashi,K., Burkart,V., Flohe,S., and Kolb,H. (2000). Cutting edge: heat shock protein 60 is a putative endogenous ligand of the toll-like receptor-4 complex. *J. Immunol.* *164*, 558-561.
- Ohashi,P.S., Oehen,S., Buerki,K., Pircher,H., Ohashi,C.T., Odermatt,B., Malissen,B., Zinkernagel,R.M., and Hengartner,H. (1991). Ablation of "tolerance" and induction of diabetes by virus infection in viral antigen transgenic mice. *Cell* *65*, 305-317.
- Ohashi,P.S., Pircher,H., Burki,K., Zinkernagel,R.M., and Hengartner,H. (1990). Distinct sequence of negative or positive selection implied by thymocyte T-cell receptor densities. *Nature* *346*, 861-863.
- Okazaki,K. and Sakano,H. (1988). Thymocyte circular DNA excised from T cell receptor alpha-delta gene complex. *EMBO J.* *7*, 1669-1674.
- Padovan,E., Casorati,G., Dellabona,P., Meyer,S., Brockhaus,M., and Lanzavecchia,A. (1993). Expression of two T cell receptor alpha chains: dual receptor T cells. *Science* *262*, 422-424.
- Parronchi,P., Romagnani,P., Annunziato,F., Sampognaro,S., Becchio,A., Giannarini,L., Maggi,E., Pupilli,C., Tonelli,F., and Romagnani,S. (1997). Type 1 T-helper cell predominance and interleukin-12 expression in the gut of patients with Crohn's disease. *Am. J. Pathol.* *150*, 823-832.
- Pecorari,F., Tissot,A.C., and Pluckthun,A. (1999). Folding, heterodimeric association and specific peptide recognition of a murine alphabeta T-cell receptor expressed in *Escherichia coli*. *J. Mol. Biol.* *285*, 1831-1843.
- Pervin,K., Childerstone,A., Shinnick,T., Mizushima,Y., van der,Z.R., Hasan,A., Vaughan,R., and Lehner,T. (1993). T cell epitope expression of mycobacterial and homologous human 65-kilodalton heat shock protein peptides in short term cell lines from patients with Behcet's disease. *J. Immunol.* *151*, 2273-2282.

- Pircher,H., Burki,K., Lang,R., Hengartner,H., and Zinkernagel,R.M. (1989). Tolerance induction in double specific T-cell receptor transgenic mice varies with antigen. *Nature* *342*, 559-561.
- Pircher,H., Moskophidis,D., Rohrer,U., Burki,K., Hengartner,H., and Zinkernagel,R.M. (1990). Viral escape by selection of cytotoxic T cell-resistant virus variants in vivo. *Nature* *346*, 629-633.
- Proujansky,R. (1999). Fixing the intestinal mucosa in the bone marrow transplant patient: lessons from other intestinal immunodeficiencies and inflammatory disorders. *Pediatr. Transplant.* *3 Suppl 1*, 9-13.
- Rammensee,H.G., Falk,K., and Rotzschke,O. (1993). Peptides naturally presented by MHC class I molecules. *Annu. Rev. Immunol.* *11*, 213-244.
- Redondo,M.J., Yu,L., Hawa,M., Mackenzie,T., Pyke,D.A., Eisenbarth,G.S., and Leslie,R.D. (2001). Heterogeneity of type I diabetes: analysis of monozygotic twins in Great Britain and the United States. *Diabetologia* *44*, 354-362.
- Ridgway,W.M. and Fathman,C.G. (1998). The association of MHC with autoimmune diseases: understanding the pathogenesis of autoimmune diabetes. *Clin. Immunol. Immunopathol.* *86*, 3-10.
- Robey,E. and Fowlkes,B.J. (1994). Selective events in T cell development. *Annu. Rev. Immunol.* *12*, 675-705.
- Rocha,B. and von Boehmer,H. (1991). Peripheral selection of the T cell repertoire. *Science* *251*, 1225-1228.
- Ronin,C., Bouchilloux,S., Granier,C., and van Rietschoten,J. (1978). Enzymatic N-glycosylation of synthetic Asn--X--Thr containing peptides. *FEBS Lett.* *96*, 179-182.
- Rudd,P.M., Wormald,M.R., Stanfield,R.L., Huang,M., Mattsson,N., Speir,J.A., DiGennaro,J.A., Fetrow,J.S., Dwek,R.A., and Wilson,I.A. (1999). Roles for glycosylation of cell surface receptors involved in cellular immune recognition. *J. Mol. Biol.* *293*, 351-366.

- Rülicke, T. (2001). *Transgene, Transgenese, transgene Tiere: Methoden der nichthomologen DNA-Rekombination*. Karger, Basel.
- Sakaguchi, S., Ermak, T.H., Toda, M., Berg, L.J., Ho, W., Fazekas de St.G.B., Peterson, P.A., Sakaguchi, N., and Davis, M.M. (1994). Induction of autoimmune disease in mice by germline alteration of the T cell receptor gene expression. *J. Immunol.* *152*, 1471-1484.
- Salvetti, M., Buttinelli, C., Ristori, G., Carbonari, M., Cherchi, M., Fiorelli, M., Grasso, M.G., Toma, L., and Pozzilli, C. (1992). T-lymphocyte reactivity to the recombinant mycobacterial 65- and 70-kDa heat shock proteins in multiple sclerosis. *J. Autoimmun.* *5*, 691-702.
- Sambrook, J., Fritsch, M., and Maniatis, T. (1989). *Molecular Cloning: A Laboratory Manual*. Cold Spring Laboratory Press, Cold Spring Harbor, N. Y..
- Sano, G., Hafalla, J.C., Morrot, A., Abe, R., Lafaille, J.J., and Zavala, F. (2001). Swift development of protective effector functions in naive CD8(+) T cells against malaria liver stages. *J. Exp. Med.* *194*, 173-180.
- Sant'Angelo, D.B., Cresswell, P., Janeway, C.A., Jr., and Denzin, L.K. (2001). Maintenance of TCR clonality in T cells expressing genes for two TCR heterodimers. *Proc. Natl. Acad. Sci. U. S. A* *98*, 6824-6829.
- Sarukhan, A., Garcia, C., Lanoue, A., and von Boehmer, H. (1998). Allelic inclusion of T cell receptor alpha genes poses an autoimmune hazard due to low-level expression of autospecific receptors. *Immunity.* *8*, 563-570.
- Schatz, D.G. and Malissen, B. (2002). Lymphocyte development. *Curr. Opin. Immunol.* *14*, 183-185.
- Schoel, B., Zugel, U., Ruppert, T., and Kaufmann, S.H. (1994). Elongated peptides, not the predicted nonapeptide stimulate a major histocompatibility complex class I-restricted cytotoxic T lymphocyte clone with specificity for a bacterial heat shock protein. *Eur. J. Immunol.* *24*, 3161-3169.



- Schonrich,G., Alferink,J., Klevenz,A., Kublbeck,G., Auphan,N., Schmitt-Verhulst,A.M., Hammerling,G.J., and Arnold,B. (1994). Tolerance induction as a multi-step process. *Eur. J. Immunol.* *24*, 285-293.
- Schwartz,R.H. (1996). Models of T cell anergy: is there a common molecular mechanism? *J. Exp. Med.* *184*, 1-8.
- Sha,W.C., Nelson,C.A., Newberry,R.D., Kranz,D.M., Russell,J.H., and Loh,D.Y. (1988). Positive and negative selection of an antigen receptor on T cells in transgenic mice. *Nature* *336*, 73-76.
- Shimamura,M. and Huang,Y.Y. (2002). Presence of a novel subset of NKT cells bearing an invariant Valpha19.1-Jalpha26 TCR alpha chain. *FEBS Lett.* *516*, 97-100.
- Singh-Jasuja,H., Scherer,H.U., Hilf,N., Arnold-Schild,D., Rammensee,H.G., Toes,R.E., and Schild,H. (2000). The heat shock protein gp96 induces maturation of dendritic cells and down-regulation of its receptor. *Eur. J. Immunol.* *30*, 2211-2215.
- Sprent,J., Lo,D., Gao,E.K., and Ron,Y. (1988). T cell selection in the thymus. *Immunol. Rev.* *101*, 173-190.
- Steinhoff,U., Brinkmann,V., Klemm,U., Aichele,P., Seiler,P., Brandt,U., Bland,P.W., Prinz,I., Zugel,U., and Kaufmann,S.H. (1999). Autoimmune intestinal pathology induced by hsp60-specific CD8 T cells. *Immunity.* *11*, 349-358.
- Steinhoff,U., Schoel,B., and Kaufmann,S.H. (1990). Lysis of interferon-gamma activated Schwann cell by cross-reactive CD8+ alpha/beta T cells with specificity for the mycobacterial 65 kd heat shock protein. *Int. Immunol.* *2*, 279-284.
- Steinhoff,U., Zugel,U., Wand-Wurtenberger,A., Hengel,H., Rosch,R., Munk,M.E., and Kaufmann,S.H. (1994). Prevention of autoimmune lysis by T cells with specificity for a heat shock protein by antisense oligonucleotide treatment. *Proc. Natl. Acad. Sci. U. S. A* *91*, 5085-5088.
- Strober,W., Fuss,I.J., and Blumberg,R.S. (2002). The immunology of mucosal models of inflammation. *Annu. Rev. Immunol.* *20*, 495-549.

- Suri,A. and Katz,J.D. (1999). Dissecting the role of CD4+ T cells in autoimmune diabetes through the use of TCR transgenic mice. *Immunol. Rev.* *169*, 55-65.
- Takahashi,I., Iijima,H., Katashima,R., Itakura,M., and Kiyono,H. (1999). Clonal expansion of CD4+ TCRbetabeta+ T cells in TCR alpha-chain- deficient mice by gut-derived antigens. *J. Immunol.* *162*, 1843-1850.
- Takahashi,I., Kiyono,H., and Hamada,S. (1997). CD4+ T-cell population mediates development of inflammatory bowel disease in T-cell receptor alpha chain-deficient mice. *Gastroenterology* *112*, 1876-1886.
- Takeda,K., Clausen,B.E., Kaisho,T., Tsujimura,T., Terada,N., Forster,I., and Akira,S. (1999). Enhanced Th1 activity and development of chronic enterocolitis in mice devoid of Stat3 in macrophages and neutrophils. *Immunity.* *10*, 39-49.
- Takeuchi,O., Hoshino,K., Kawai,T., Sanjo,H., Takada,H., Ogawa,T., Takeda,K., and Akira,S. (1999). Differential roles of TLR2 and TLR4 in recognition of gram-negative and gram-positive bacterial cell wall components. *Immunity.* *11*, 443-451.
- Terrence,K., Pavlovich,C.P., Matechak,E.O., and Fowlkes,B.J. (2000). Premature expression of T cell receptor (TCR)alphabeta suppresses TCRgammadelta gene rearrangement but permits development of gammadelta lineage T cells. *J. Exp. Med.* *192*, 537-548.
- Theofilopoulos,A.N. (1995). The basis of autoimmunity: Part II. Genetic predisposition. *Immunol. Today* *16*, 150-159.
- Uematsu,Y., Ryser,S., Dembic,Z., Borgulya,P., Krimpenfort,P., Berns,A., von Boehmer,H., and Steinmetz,M. (1988). In transgenic mice the introduced functional T cell receptor beta gene prevents expression of endogenous beta genes. *Cell* *52*, 831-841.
- Vabulas,R.M., Ahmad-Nejad,P., da Costa,C., Miethke,T., Kirschning,C.J., Hacker,H., and Wagner,H. (2001). Endocytosed HSP60s use toll-like receptor 2 (TLR2) and TLR4 to activate the toll/interleukin-1 receptor signaling pathway in innate immune cells. *J. Biol. Chem.* *276*, 31332-31339.

- von Boehmer,H. (1994). Positive selection of lymphocytes. *Cell* 76, 219-228.
- Vyse,T.J. and Todd,J.A. (1996). Genetic analysis of autoimmune disease. *Cell* 85, 311-318.
- Webb,S., Morris,C., and Sprent,J. (1990). Extrathymic tolerance of mature T cells: clonal elimination as a consequence of immunity. *Cell* 63, 1249-1256.
- Williams,D.B. and Watts,T.H. (1995). Molecular chaperones in antigen presentation. *Curr. Opin. Immunol.* 7, 77-84.
- Wilson,A., MacDonald,H.R., and Radtke,F. (2001). Notch 1-deficient common lymphoid precursors adopt a B cell fate in the thymus. *J. Exp. Med.* 194, 1003-1012.
- Wirtz,S. and Neurath,M.F. (2000). Animal models of intestinal inflammation: new insights into the molecular pathogenesis and immunotherapy of inflammatory bowel disease. *Int. J. Colorectal Dis.* 15, 144-160.
- Wucherpfennig,K.W. (2001). Structural basis of molecular mimicry. *J. Autoimmun.* 16, 293-302.
- Wucherpfennig,K.W. and Strominger,J.L. (1995). Molecular mimicry in T cell-mediated autoimmunity: viral peptides activate human T cell clones specific for myelin basic protein. *Cell* 80, 695-705.
- Xavier,R., Brennan,T., Li,Q., McCormack,C., and Seed,B. (1998). Membrane compartmentation is required for efficient T cell activation. *Immunity.* 8, 723-732.
- Zal,T., Volkmann,A., and Stockinger,B. (1994). Mechanisms of tolerance induction in major histocompatibility complex class II-restricted T cells specific for a blood-borne self-antigen. *J. Exp. Med.* 180, 2089-2099.
- Zal,T., Weiss,S., Mellor,A., and Stockinger,B. (1996). Expression of a second receptor rescues self-specific T cells from thymic deletion and allows activation of autoreactive effector function. *Proc. Natl. Acad. Sci. U. S. A* 93, 9102-9107.

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Zugel,U. and Kaufmann,S.H. (1997). Activation of CD8 T cells with specificity for mycobacterial heat shock protein 60 in *Mycobacterium bovis* bacillus Calmette-Guerin-vaccinated mice. *Infect. Immun.* *65*, 3947-3950.

Zugel,U. and Kaufmann,S.H. (1999a). Immune response against heat shock proteins in infectious diseases. *Immunobiology* *201*, 22-35.

Zugel,U. and Kaufmann,S.H. (1999b). Role of heat shock proteins in protection from and pathogenesis of infectious diseases. *Clin. Microbiol. Rev.* *12*, 19-39.

Zugel,U., Schoel,B., Yamamoto,S., Hengel,H., Morein,B., and Kaufmann,S.H. (1995). Crossrecognition by CD8 T cell receptor alpha beta cytotoxic T lymphocytes of peptides in the self and the mycobacterial hsp60 which share intermediate sequence homology. *Eur. J. Immunol.* *25*, 451-458.

Zugel,U., Sponaas,A.M., Neckermann,J., Schoel,B., and Kaufmann,S.H. (2001). gp96-peptide vaccination of mice against intracellular bacteria. *Infect. Immun.* *69*, 4164-4167.