

Name & Degree: Willi K. Born, PhD.

Title(s): Professor

Primary Department: Immunology

Education: Diplom in Biologie (MS) 1977, Dr. rer. nat. (Ph.D.) 1982, at the MPI and Albert Ludwigs University, Freiburg, Germany. Postdoctoral fellow at UTHSCD (Dallas, TX) 1982-4 and at NJMRC (Denver, CO) 1984-6.

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Research Program:

We are studying the biology of $\gamma\delta$ T cells. Problems of specific interest include ligands of the $\gamma\delta$ TCR, functional development of $\gamma\delta$ T cells, organization of the $\gamma\delta$ T cell system and interactions of $\gamma\delta$ T cells with other cells and systems in the vertebrate body. We are also interested in the role of $\gamma\delta$ T cells in diseases, and in possible therapeutic uses of $\gamma\delta$ T cell function.

Key Publications:

Born, W., Yagüe, J., Palmer, E., Kappler, J. and Marrack, P. Rearrangement of T cell receptor β chain genes during T cell development. Proc. Natl. Acad. Sci. USA 82: 2925-2929, 1985.

Born, W., Rathbun, G., Tucker, P., Marrack, P. and Kappler, J. Synchronized rearrangements of T cell γ and β chain genes in fetal thymocyte development. Science 234: 479-482, 1986.

Born, W., Miles, C., White, J., O'Brien, R., Freed, J. H., Marrack, P., Kappler, J. and Kubo, R.T. Peptide sequences of T cell receptor δ and γ chains are identical to predicted X and γ proteins. Nature, 330: 572-574, 1987.

Chien, Y., Iwashima, M. Wettstein, D., Kaplan, K., Elliott, J. F., **Born, W.**, and Davis, M. M. T cell receptor δ gene rearrangement in early thymocytes. Nature, 330: 722-727, 1987.

O'Brien, R. L., Happ, M. P., Dallas, A., Palmer, E., Kubo, R. and **Born, W.** Stimulation of a major subset of lymphocytes expressing T cell receptor $\gamma\delta$ by an antigen derived from *Mycobacterium tuberculosis*. Cell 57: 667-674, 1989.

White, J., Blackman, M., Bill, J., Kappler, J., Marrack, P. and **Born, W.** Two better cell lines for making hybridomas expressing specific T cell receptors. J. Immunol. 143: 1822-1825, 1989.

Finkel, T. H., Cambier, J. C., Kubo, R. T., **Born, W.K.**, Marrack, P. and Kappler, J. The thymus has two functionally distinct populations of immature $\alpha\beta^+$ T cells: one population is deleted by ligation of $\alpha\beta$ TCR. Cell 58: 1047-1054, 1989.

Happ, M.P., Kubo, R.T., Palmer, E., **Born, W.K.** and O'Brien, R.L. Limited receptor repertoire in a mycobacteria-reactive subset of $\gamma\delta$ T lymphocytes. Nature 342: 696-698, 1989

Born, W., Hall, L., Dallas, A., Boymel, J., Shinnick, T., Young, D., Brennan, P., and O'Brien, R. Recognition of a peptide antigen by heat shock reactive $\gamma\delta$ T lymphocytes. Science 249: 67-69, 1990.

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O'Brien, R.L., Fu, Y.-X., Cranfill, R., Dallas, A., Reardon, C., Lang, J., Carding, S., Kubo, R., and **Born, W.** HSP-60 reactive $\gamma\delta$ T cells: a large, diversified T lymphocyte subset with highly focused specificity. Proc. Natl. Acad. Sci. USA 89:4348-4352, 1992.

Fu, Y.-X., Cranfill, R., Vollmer, M., van der Zee, R., O'Brien, R.L., and **Born, W.** *In vivo* response of murine $\gamma\delta$ T cells to an HSP-60 derived peptide. Proc. Natl. Acad. Sci. (USA) 90:322-326, 1993.

Fu, Y.-X., Ellis-Roark, C., Kelly, K., Drevets, D., Campbell, P., O'Brien, R. and **Born, W.** Immune protection and control of inflammatory tissue necrosis by $\gamma\delta$ T cells. J. Immunol. 153:3101-3115, 1994.

Heyborne, K., Fu, Y.-X., Nelson, A., Farr, A., O'Brien, R. and **Born, W.** Recognition of trophoblasts by $\gamma\delta$ T cells. J. Immunol. 153:2918-2926, 1994.

Lahn, M., Kalataradi, H., Mittelstadt, P., Pflum, E., Vollmer, M., Cady, C., Mukasa, A., Vella, A., Ikle, D., Harbeck, R., O'Brien, R., and **Born, W.** Early preferential stimulation of $\gamma\delta$ T cells by tumor necrosis factor alpha. J. Immunol. 160:5221-5230, 1998.

Lahn, M., Kanehiro, A., Takeda, K., Joetham, A., Schwarze, J., Kohler, G., O'Brien, R., Gelfand, E.W., **Born, W.** Negative regulation of airway responsiveness that is dependent on $\gamma\delta$ T cells and independent of $\alpha\beta$ T cells. Nature Medicine 5: 1150-1156, 1999.

Cady, C.T., Lahn, M., Vollmer, M., Tsuji, M., Seo, S.J., Reardon, C.L., O'Brien, R.L., and **Born, W.K.** Response of murine $\gamma\delta$ T cells to the synthetic polypeptide polu-Glu⁵⁰Tyr⁵⁰. J. Immunol. 165:1790-1798, 2000.

Huber, S.A., Graveline, D., Newell, M.K., **Born, W.K.**, and O'Brien, R.L. $V\gamma 1^+$ T cells suppress and $V\gamma 4^+$ T cell promote susceptibility to coxsackievirus B3-induced myocarditis in mice. J. Immunol. 165:4174-4181, 2000.

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Lahn, M., Kanehiro, A., Takeda, K., Terry, J., Hahn, Y.-S., Aydintug, M.K., Konowal, A., Ikuta, K., O'Brien, R.L., Gelfand, E.W., and **Born, W.K.** MHC class I-dependent V γ 4⁺ pulmonary T cells regulate $\alpha\beta$ T cell-independent airway responsiveness. Proc.Natl.Acad.Sci. (USA), 99:8850-8855, 2002.

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Hahn, Y.-S., Taube, C., Jin, N., Sharp, L., Wands, J.M., Aydintug, M.K., Lahn, M., Huber, S., O'Brien, R.L., Gelfand, E.W., and **Born, W.K.** Different Potentials of $\gamma\delta$ T Cell Subsets in Regulating Airway Responsiveness: V γ 1⁺ Cells, but not V γ 4⁺ Cells, Promote Airway Hyperreactivity, Th-2 Cytokines and Airway Inflammation. J.Immunol. 172: 2894-2902, 2004

Aydintug, M.K., Roark, C.L., Saffrey, M., Yin, X., Wands, J.M., **Born, W.K.**, O'Brien, R.L. Detection of Cell Surface Ligands for the $\gamma\delta$ TCR using soluble TCRs. J.Immunol., 172: 4167-4175, 2004.

Lahn, M., Kanehiro, A., Hahn, Y.-S., Wands, J.M., Aydintug, M.K., O'Brien, R.L., Gelfand, E.W., **Born, W.K.** Aerosolized anti-T cell receptor antibodies are effective against airway inflammation and hyperreactivity in allergic mice. Int. Arch. Allergy and Immunology, 134: 49-55, 2004.

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Reardon, C.L., **Born, W.K.**, and O'Brien, R.L. A unique V γ 5-T-Cell population in the murine mammary gland. Molecular Immunology, 43: 1057-61, 2006

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