Functional Characteristics of Neonatal Naive T cell and Their Maturation into Memory T cell

1991 Fiscal Year Final Research Report Summary

Functional Characteristics of Neonatal Naive T cell and Their Maturation into Memory T cell

Research Project

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02454268

Research Category

Grant-in-Aid for General Scientific Research (B)

Allocation Type

Single-year Grants

Research Field

Pediatrics

Research Institution

Kanazawa University

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Keywords

Neonatal T cells / Naive T cells / Memory T cells / CD45 isoforms / Tgammadelta^+ cells / Interleukin-6 / Cytokines / T cell activation

Research Abstract

Naive and memory T cell populations can be discriminated by differential expression of CD45 isoforms. These studies were undertaken to elucidate some functional characteristics of neonatal inherently naive T cells and their maturation steps into memory T cells following increased antigenic exposure after birth. Obtained results are follow as.
1) Although neonatal T cells share with adult naive T cells in terms to CD45RA expression, they have strong suppressor activity and less helper activity for B cell differentiation even after memory cells-like phenotypic changes by activation.
2) BB3^+ subsets within T-gamma/delta^+ T cells, but not deltaTCS-1^+ cells, express CD45RO and have the ability to respond to the antigen.
3) Naive CD4^+ T cells, unlike memory ones, are hyporesponsive to anti-CD2 stimulation, based on their inability to produce IL-6.

4) Both CD4^+ and CD8^+ T cell populations express CD45RO as well as HLA-DR antigens, indicating strong stimulation with Epstein-Barr infection.
5) Memory T cells express IL-2 receptor subunits (alpha or chains) and respond well to exogenous IL-2.
6) A novel population of CD4^+ T cells with naive (CD45RA^+, CD45RO^-) phenotype expressing IL-2R alpha-chain, which express memory-like functions, are identifiable in the blood of newborns and young children. This population represents the cells at the transitional stage from naive to memory T cells.
7) Full-term newborns can produce IL-6 in response to bacterial pathogens, but IL-6-producing capabilities of preterm babies are still immature.

Research Products (12 results)

All | Other

All | Publications (12 results)

[Publications] Miyawaki,T.et al.: "Differential expression of CD45RO (UCHL1) and its functional relevance in two subpopulations of circulating TCR-g/d^+ lymphocytes" Journal of Experimental Medicine. 171. 1833-1838 (1990)

[Publications] Kasahara,Y.et al.: "Role of interleukin 6 for differential responsiveness of naive and memory CD4^+ T cells in CD2-mediated activation" Journal of Experimental Medicine. 172. 1419-1424 (1990)

[Publications] Miyawaki,T.et.al.: "Expression of CD45RO (UCHL1) by CD4^+ and CD8^+ T cells as a sign of in vivo activation in infectious mononucleosis" Clinical Experimental Immunology. 83. 447-451 (1991)

[Publications] Taga,K.et al.: "Preferential expression of IL-2 receptor subunits on memory populations within CD4^+ and CD8^+ T cells" Immunology. 72. 15-19 (1991)

[Publications] Kanegane,H.et al.: "A novel subpopulation of CD45RA^+ CD4^+ T cells expressing IL-2 receptor α-chain (CD25) and having a functionally transitional nature into memory cells" International Immunology. 3. 1349-1356 (1991)

[Publications] Uehara,T.et al.: "Apoptotic cell death of primed CD45RO^+ T lymphocytes in Epstein-Barr virus-induced infectious mononucleosis" Blood.

[Publications] Miyawaki, T. et al.: "Differential expression of CD45RO (UCHL1) and its functional relevance in two subpopulations of circulating TCR-gamma/delta^+ lymphocytes." J. Exp. Med.171. 1833-1838 (1990)

[Publications] Kasahara, T. et al.: "Role of interleukin 6 for differential responsiveness of naive and memory CD4^+ T cells in CD2-mediated activation." J. Exp. Med.172. 1419-1424 (1990)

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[Publications] Uehara, T. et al.: "Apoptotic cell death of primed CD45RO^+ T lymphocytes in Epstein-Barr virus-induced infectious mononucleosis." Blood.

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