

新生児NaiveT細胞の機能的特異性とMemoryT細胞への分化・成熟

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1991 Fiscal Year Final Research Report Summary

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

Research Project

Project/Area Number

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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1990 – 1991

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 alpha-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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