Acquisition of Specific Immunity and Dynamics in the Generation of Memory T Cells in Children

1993 Fiscal Year Final Research Report Summary

Acquisition of Specific Immunity and Dynamics in the Generation of Memory T Cells in Children

Research Project

Project/Area Number

03404034

Research Category

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

Allocation Type

Single-year Grants

Research Field

Pediatrics

Research Institution

Kanazawa University

Principal Investigator

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Keywords

Infectious mononucleosis / Memory T lymphocyte / IMN 3.1 antibody / Fas antigen / Bc1-2 protein / Apoptosis

Research Abstract

Immune stimulation of T cells resulted in the conversion CD45 antigen expression form CD45RA 'naive' to CD45RO 'primed' phenotype. It has been suggested that memory T cells reside within CD45RO 'primed' T CELL POOL.As T cells response during EBV-induced infectious mononucleosis is particularly intense. dynamics in the acquisition and generation of T cell memory was evauated largely in this disease model.
1. Monoclonal antibody IMN3.1, prodced with T cells in the acute phase of infectious mononucleosis as imunogen, identified a novel T cell activatin antigen, which was expressed preferentially on apoptosis-prone T cells, such as mononucleosis T cels, thymocytes, and anti-Fas-sensitive T cell lines, but not on resting circulating T cellls.
2. Atypical lymphocytes in infectious mononuchlosis are activated CD45RO^+ T cells. The majority of these stimulated T cells seemed to be eliminated in vivo by apoptotic cel death.
3. CD45RO^+ T cells in infectious mononucleosis expressed Fas as well as IMN3.1 antigen and were sensitive to apoptotsis. In contrast, CD45RO^+ T cells from healthy individuals expressed Fas, but not IMN3.1, antigen, and were resistant to apoptosis. CD45RO^+ blastoid T cells in mononucleosis expressed no detectable leels of bc1-2 protein, whereas CD45RO^+ T cells in healthy subjects were seemingly a quiescent state and expressed considerable levels of bc1-2. The reduced expression of bc1-2 on the majority of stimulated Tcells might render these cells rone to apoptosis. Onyly a few of stimulated T cells

expressing both Fas and bcl by unclear mechanisms, however, might be rescued from cell death and might re-enter to a quiescent state as specified functional memory T cells
4. Apoptotic tendency in vitro aging of lymhocytes, monocytes, and neutrohils was in increasing order of sensitivity and seeed to be inversely correlaed with their expression levels of bc1-2.

Research Products (15 results)

All | Other

All | Publications (15 results)

[Publications] Takao TSUJI: "Efficient induction of immunoglobulin production in neonatal naive B cells by memory CD4^+ T cell subset expressing L-selectin" Journal of Immunology. (in press). (1994)

[Publications] Masaki HASUI: "Mature T cell requirement for immunoglobulin production by naive B cells injected intraperitoneally into SCID mice" Clinical Experimental Immunology. 95. 357-361 (1994)

[Publications] Takahiro UEHARA: "A novel T cell activation antigen identified by an MoAb IMN3・1 and expressed preferentially on human T cells susceptible to apoptosis" Journal of Immunology. 150. 3243-3253 (1993)

[Publications] Yoichi TAMARU: "Absence of bcl-2 expression by activated CD45RO^+T lymphocytes in infectious mononuc-leosis supporting their susceptibility to PCD" Blood. 82. 521-427 (1993)

[Publications] Takahiro UEHARA: "Apoptotic cell death of primed CD45RO^+T lymphocytes in Epstein-Barr virus-induced infectious mononucleosis" Blood. 80. 452-458 (1992)

[Publications] Toshio MIYAWAKI: "Differential expression of apoptosis-related Fas antigen on lymphocyte populations in human peripheral blood" Journal of Immunology. 149. 3753-3758 (1992)

[Publications] Takao TSUJI et al.: "Efficient induction of immunoglobulin production in neonaal naie B cells by memory CD4+ T cell subset expressing homing receptro L-selectin." J Immunol. (in press).

[Publications] Masaki HASUI et al.: "Mature T cell requirement for immunoglobulin production by neonatal naive B cells injected intraperitoneally intoSCID mice" Clin Exp. 95. 357-61 (1994)

[Publications] Takahiro UEHARA et al.: "A nove T cell activation antigen identified by monoclona TMN3.1 antibody and expressed preferentially on T cells susceptible to apoptosis" J Immunol. 150. 3243-53 (1993)

[Publications] Yoichi TAMARU et al.: "Absence of bc1-2 expression by activated CD45RO+ T lymphcytes in acue infectious mononucleosis supporting their ssceptibility to apoptosis" Blood. 82. 521-27 (1993)

[Publications] Takahiro UEHARA et al.: "Apoptotic cell deathof primed CD45RO+ T lymphocytes in Epstein-Barr virus-induced infectin monomucleosis" Blood. 80. 452-58 (1992)

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[Publications] Akihiro YACHIE et al.: "Defective roduction of IL-6 in very small prematre infants in response to bacterial pathogens" Infect Immun. 60. 749-53 (1992)

[Publications] Yoshiki UENO et al.: "T cell-dependent production of IgG in human cord blood B cells in reconstituted SCID mice" Scand J Immunol. 35. 415-19 (1992)

[Publications] Hirokazu KANEGANE et al.: "A novel subpopulation of CD45+CD4+ T cells expressing IL-2 receptor alpha-chain(CD25) and having a functinally transitional nature into memory cells" Int Immunol. 12. 1349-56 (1991)

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