# Differentiation and Lymphokine Responsiveness of Putative NK Cells in Early Human Development



# 1986 Fiscal Year Final Research Report Summary

## Differentiation and Lymphokine Responsiveness of Putative NK Cells in Early Human Development

Research Project

### Project/Area Number

60480242

### Research Category

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

### Allocation Type

Single-year Grants

### Research Field

Pediatrics

### Research Institution

Kanazawa University

### Principal Investigator

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### Project Period (FY)

**1985 – 1986**

### Keywords

NK cell activity / NK progenitor cells / Immature NK cells / Fetus / Neonates / Interferon- <gamma> (IFN- <gamma> ) / インターロイキン・2(IL-2)

### Research Abstract

1. Peripheral blood mononuclear cells(MNC) from fetuses of estimated gestational age of 20 wk lacked NK cell activity against K 562 target cells even after 18 hr-treatment with interferon- <gamma> (IFN- <gamma> ). Low, but significant levels of basal and IFN- <gamma> -inducible NK cell activity were observed in premature infants of 27-wk-gestation, with a progressive increase of these activities during the last trimester of pregnancy. Contrary to IFN- <gamma> , interleukin-2(IL-2) could induce a marked NK cell activity even in MNC from fetuses of 20-wk-gestational age and in Leu- <11^-> cell population of cord MNC, each of them lacked both basal and IFN- <gamma> -inducible NK cell activity. These ontogenic development and lymphokine responsiveness of human NK cell activity indicated that putative precursors of NK effector cells might be divided into IFN- <gamma> -responsive, more mature inactive forms of NK cells and into putative NK progenitors responding well to IL-2, but not to IFN- <gamma> , which might appear at an earlier stage of fetal development than IFN- <gamma> -responsive ones.
2. In cord blood, Leu- <11^+> cells were comparable in number with adult controls, but Leu- <7^+> cells were very meager. Preliminary studies indicated that low levels of Leu- <7^+> cells in cord MNC might be responsible for the poor ability of cord blood in their anti-CD3-inducible cytotoxicity.
3. Dissociated production of IL-2 and IFN- <gamma> , ample production of IL-2 and poor secretion of IFN- <gamma> , on PHA stimulation is a characteristic of cord MNC. In this report, some experimental data suggesting that IFN- <gamma> production by PHA-stimulated cord MNC to be down-

regulated by preferential activation of suppressor precursors against IFN- <gamma> production, were presented. These PHA-inducible suppressor precursors in cord MNC expressed in large T4 helper phenotype and were radiosensitive in nature.

## Research Products (11 results)

All | Other

All | Publications (11 results)

[Publications] UENO,Yoshiki: Journal of Immunology. 135. 180-184 (1985)

[Publications] SEKI,Hidetoshi: Journal of Immunology. 135. 2351-2356 (1985)

[Publications] SEKI,Hidetoshi: Journal of Immunology. 137. 3158-3161 (1986)

[Publications] KOIZUMI,Shoichi: Blood. 68. 1065-1073 (1986)

[Publications] SATO,Hiroshi: Journal of Biological Response Modifiers. 5. 191-201 (1986)

[Publications] TANIGUCHI,Noboru: Proceeding of Japan Medical Reproductive Immunology.

[Publications] UENO, Yoshiki: "Differential effects of recombinant human interferon- <gamma> and interleukin-2 on natural killer cell activity of peripheral blood in early human development." Journal of Immunology. 135. 180-184 (1985)

[Publications] SEKI, Hidetoshi: "Mode of in vitro augmentation of natural killer cell activity by recombinant human interleukin 2: a ccmparative study of Leu- <11^+> and Leu- <11^-> cell populations in cord blood and adult peripheral blood." Journal of Immunology. 135. 2351-2356 (1985)

[Publications] SEKI, Hidetoshi: "Phenotypic and functional characteristics of active suppressor cells against IFN- <gamma> production in PHA-stimulated cord blood lymphocytes." Journal of Immunology. 137. 3158-3161 (1986)

[Publications] KOIZUMI, Shoichi: "Malignant clonal expansion of large granular lymphocytes with a Leu- <11^+> , Leu- <7^-> surface phenotype: in vitro responsiveness of malignant cells to recombinant human interleukin 2." Blood. 68. 1065-1073 (1986)

[Publications] SATO, Hiroshi: "Monoclonal antibody which has the neutralizing activities for human IL-2." Journal of Biological Response Modifiers. 5. 191-201 (1986)

**URL:** https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-60480242/604802421986kenkyu_seika_hokoku_

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