CLAIMS

1. A method for culturing natural killer cells comprising a step of co-culturing transformed CD4+ T cells and seed cells, wherein the transformed CD4+ T cells express at least one gene selected from the group consisting of 4-1BBL gene, mbIL-21 gene, OX40L gene and mTNF-α gene, and wherein the seed cells are mononuclear cells derived from cord blood.

~~2. The method according to claim 1, wherein the transformed CD4+ T cells express at least one gene selected from the group consisting of the 4-1BBL, mbIL-21, OX40L, and mTNF-α genes.~~

~~3~~2. The method for culturing natural killer cells of~~according to~~ claim ~~2~~1, wherein the 4-1BBL gene is a base~~has a nucleotide~~ sequence ~~en~~coding the amino acid sequence represented by sequence No. 1~~set forth in SEQ ID NO: 1~~.

~~4~~3. The method for culturing natural killer cells of~~according to~~ claim ~~3~~2, wherein the base sequence coding the amino acid sequence represented by sequence No. 1 is a base sequence represented by sequence No. 2~~encoding nucleotide sequence is set forth in SEQ ID NO: 2~~.

~~5~~4. The method for culturing natural killer cells of ~~according to~~ claim ~~2~~1, wherein the mbIL-21 gene is a base ~~has a nucleotide~~ sequence ~~en~~coding the amino acid sequence represented by sequence No. 3~~set forth in SEQ ID NO: 3~~.

~~6~~5. The method for culturing natural killer cells of ~~according to~~ claim ~~5~~4, wherein the base sequence coding the amino acid sequence represented by sequence No. 3 is a base sequence represented by sequence No. 4~~encoding nucleotide sequence is set forth in SEQ ID NO: 4~~.

~~7~~6. The method for culturing natural killer cells of~~according to~~ claim ~~2~~1, wherein the OX40L gene is a base sequence coding the amino acid sequence represented by sequence No. 5~~has a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO: 5~~.

~~8~~7. The method for culturing natural killer cells of ~~according to~~ claim ~~7~~6, wherein the base sequence coding the amino acid sequence represented by sequence No. 5 is a base sequence represented by sequence No. 6~~encoding nucleotide sequence is set forth in SEQ ID NO: 6~~.

~~9~~8. The method for culturing natural killer cells of ~~according to~~ claim ~~2~~1, wherein the mTNF-α gene is a base sequence coding the amino acid sequence represented by sequence No. 8~~has a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO: 8~~.

~~10~~9. The method for culturing natural killer cells of ~~according to~~ claim ~~9~~8, wherein the base sequence coding the amino acid sequence represented by sequence No. 8 is a base sequence represented by sequence No. 9~~encoding nucleotide sequence is set forth in represented by SEQ ID NO: 9~~.

~~11~~10. The method for culturing natural killer cells of ~~according to~~ claim ~~2~~1, wherein the gene is introduced~~transduced~~ through a recombinant lentivirus.

~~12~~11. The method for culturing natural killer cells of ~~according to~~ claim 1, wherein the CD4+ T cells express ~~the~~ 4-1BBL gene or mbIL-21 gene.

~~13~~12. The method for culturing natural killer cells of ~~according to~~ claim 1, wherein the CD4+ T cells express ~~the~~ 4-1BBL gene and mbIL-21 gene~~s~~.

~~14~~13. The method for culturing natural killer cells of ~~according to~~ claim 1, wherein the CD4+ T cells express ~~the~~ 4-1BBL gene, mbIL-21 gene, and mTNF-α gene~~s~~.

~~15~~14. The method for culturing natural killer cells of ~~according to~~ claim 1, wherein the CD4+ T cells express ~~the~~ 4-1BBL gene, mbIL-21 gene, OX40L gene, and mTNF-α gene~~s~~.

~~16~~15. The method for culturing natural killer cells of~~according to~~ claim 1, wherein the CD4+ T cells are any one selected from the group consisting of Hut78, H9, Jurkat, Loucy, Molt-3, Molt-13, Peer, RPMI8402, and TALL-01 cells.

~~17. The method according to claim 1, wherein the seed cells are cord blood-derived mononuclear cells.~~

~~18. The method according to claim 1, wherein the seed cells are cells from which CD3(+) cells are eliminated.~~

~~19~~16. The method for culturing natural killer cells of ~~according to~~ claim 1, wherein the cultivation is performed by mixing the transformed CD4+ T cells and seed sells at a ratio of 0.1:1 to 50:1~~transformed CD4+ T cells and the seed cells are mixed in a ratio of 0.1:1 to 50:1~~.

~~20~~17. The method for culturing natural killer cells of ~~according to~~ claim 1, wherein the seed cells are mixed once with the support cells and cultured for 5 to 60 days, or mixed with the support cells at least twice and cultured for at least 60 days~~with the feeder cells only once for 5 to 60 days or twice or more for at least 60 days~~.

~~21~~18. The method for culturing natural killer cells of ~~according to~~ claim 1, wherein the cultivation is performed in a medium containing~~natural killer cells are cultured in a~~

~~medium supplemented with~~ an anti-CD3 antibody and ~~an~~ interleukin protein.

~~22~~19. The method for culturing natural killer cells of ~~according to~~ claim ~~21~~18, wherein the anti-CD3 antibody comprises any one ~~is~~ selected from the group consisting of OKT-3, UCHT1, and HIT3a.

~~23~~20. The method for culturing natural killer cells of ~~according to~~ claim ~~21~~18, wherein the interleukin protein comprises any one~~is~~ selected from the group consisting of IL-2, IL-12, IL-15, IL-18, and IL-21.

~~24. Natural killer cells produced by the method according to claim 1.~~

~~25~~21. A composition for culturing natural killer cells from mononuclear cells derived from cord blood as seed cells, comprising transformed CD4+ T cells which express at least one gene selected from the group consisting of 4-1BBL gene, mbIL-21 gene, OX40L gene and mTNF-α gene, as active ingredients~~comprising transformed CD4+ T cells as active ingredients~~.

~~26. The composition according to claim 25, wherein the transformed CD4+ T cells express at least one gene selected from the group consisting of the 4-1BBL, mbIL-21, OX40L, and mTNF-α genes.~~