

## WHAT IS CLAIMED IS

1. A method for producing effector cells which express a desired protein, comprising the steps of:
  - 5 (1) providing material cells that have a cassette deck structure with a cassette tape gene comprising a gene encoding a marker protein in their genome, wherein the material cells can be differentiated into the effector cells, and wherein the marker protein can be expressed in the effector cells or progenitor cells thereof when the material cells are differentiated into the effector cells or  
10 progenitor cells thereof;
  - (2) proliferating the material cells,
  - (3) differentiating the material cells into the effector cells or progenitor cells thereof; and
  - (4) replacing the gene encoding the marker protein in the effector cells or  
15 progenitor cells thereof with a gene encoding the desired protein.
2. The method according to claim 1, wherein the upstream and downstream of the gene encoding the marker protein in the material cell in step (1) are flanked by a pair of recombina-  
20 se target sequences, and wherein the step (4) is the step of culturing the effector cells or progenitor cells thereof with a cassette tape exchange vector comprising the gene encoding the desired protein flanked by the same recombina-  
se target sequences in the presence of the recombina-  
se so that the gene encoding the marker protein is exchanged with the gene encoding the desired protein.
- 25 3. The method according to claim 1, wherein the step (4) is the step of introducing the gene encoding the desired protein into the effector cells or progenitor cells thereof by means of genome editing so that the desired protein is expressed in the effector cells or the progenitor cells thereof instead of the marker protein.
- 30 4. The method according to any one of claims 1 to 3, further comprising the step of

selecting the effector cells or progenitor cells thereof that are negative for the marker protein so that the effector cells or progenitor cells expressing the desired protein are selected.

5     5.       The method according to any one of claims 1 to 4, wherein the marker protein is a known ligand or receptor that is expressed on the surface of the effector cells or the progenitor cells thereof.

6.       The method according to claim 5, wherein the gene encoding the marker protein  
10 is a gene encoding a known rearranged T cell receptor (TCR) or a chimeric antigen receptor (CAR).

7.       The method according to any one of claims 1-4, wherein the marker protein is a fluorescent protein.

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8.       The method according to any one of claims 1 to 7, wherein the material cells having the cassette deck structure provided in step (1) comprise only one cassette deck structure in the genome per one material cell.

20     9.       The method according to claim 8, wherein in step (4), the cassette tape gene in the cassette deck structure contained in the clonal effector cells or progenitor cells thereof is exchanged with multiple cassette tape genes each comprising a gene encoding different desired protein so that effector cells expressing different proteins are produced at the same time.

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10.      The method according to claim 9, wherein the cassette tape gene comprises a pair of recombinase target sequences in its upstream and downstream, and wherein in step (4), the effector cells or progenitor cells thereof are cultured with multiple cassette tape exchange vectors at the same time in the presence of the recombinase.

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11. The method according to claim 9, wherein in step (4), the cassette tape gene in the effector cells or progenitor cells thereof is exchanged with multiple cassette tape genes each comprising a gene encoding different desired protein by means of genome editing.

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12. The method according to any one of claims 1 to 11, wherein the material cell is a pluripotent stem cell.

13. The method according to claim 12, wherein the pluripotent stem cell is an ES cell or an iPS cell.

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14. A method for producing multiple types of effector cells each expressing different protein, comprising the steps of:

15 providing clonal effector cells or progenitor cells thereof which comprises in its genome one cassette deck structure per one cell, wherein the cassette deck structure comprises a cassette tape gene comprising a gene encoding a marker protein in the manner the marker protein can be expressed in the cells and does not comprise exogenous drug resistant gene, and

20 exchanging the gene encoding the marker protein in the effector cells or progenitor cells thereof with genes encoding multiple proteins to produce multiple types of effector cells each expressing different protein at the same time.

15. The method according to claim 14, wherein the cassette tape gene comprises a pair of recombinase target sequences in its upstream and downstream, and the effector cells or progenitor cells thereof comprise the cassette deck structure with a cassette tape gene comprising the gene encoding the marker protein are cultured with multiple cassette tape exchange vectors each comprising a gene encoding different protein under the presence of the recombinase to produce multiple types of effector cells each expressing different protein at the same time.

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16. The method according to claim 14, wherein the step of exchanging the gene encoding the marker protein in the effector cells or progenitor cells thereof with genes encoding multiple desired proteins is carried by means of genome editing.
- 5 17. The method according to any one of claims 1 to 16, wherein the effector cell is an immune cell.
18. The method according to claim 17, wherein the effector cell is NK cell or T cell.
- 10 19. The method according to claim 17 or 18, wherein the, wherein the gene encoding the marker protein is a gene encoding a known rearranged T cell receptor (TCR) or a chimeric antigen receptor.
- 15 20. The method according to any one of claims 17 to 19, wherein the desired protein is TCR or CAR.
21. A composition comprising the effector cells obtained by the method of claim 20, wherein the composition is for use in the treatment of an immune relating disease in a subject.
- 20 22. Use of a composition comprising the effector cells obtained by the method of claim 20 in the manufacture of a medicament for the treatment of an immune relating disease in a subject.