

CLAIMS

1. A cell in which an HLA-A allele and an HLA-B allele are disrupted and at least one kind of HLA-C protein can be expressed,

5 wherein the HLA-C protein is a protein encoded by one kind of allele selected from the group consisting of an HLA-C*01:02 allele, an HLA-C*02:02 allele, an HLA-C*03:03 allele, an HLA-C*03:04 allele, an HLA-C*04:01 allele, an HLA-C*05:01 allele, an HLA-C*06:02 allele, an HLA-C*07:01 allele, an HLA-C*07:02 allele, an HLA-C*08:01 allele, an HLA-C*12:02 allele, and an HLA-C*16:01 allele.

10

2. The cell according to claim 1, wherein at least one kind of HLA allele of the HLA-A allele, the HLA-B allele, or the HLA-C allele is homozygous.

3. The cell according to claims 1 or 2, which is a low-antigenic cell in which a rejection
15 reaction is reduced in a case where the cell is allogeneically transplanted into a recipient, and in which the disrupted HLA allele is an HLA allele that is not present in the recipient.

4. The cell according to any one of claims 1 to 3, which is a pluripotent stem cell.

20 5. The cell according to any one of claims 1 to 4, wherein at least one allele of a class II major histocompatibility complex transactivator (CIITA) allele, a regulatory factor X5 (RFX5) allele, a regulatory factor X associated protein (RFXAP) allele, or a regulatory factor X associated ankyrin containing protein (RFXANK) allele is further disrupted or modified.

25

6. A method for producing the cell according to any one of claims 1 to 5, comprising a step of disrupting or modifying an HLA allele of a donor cell by genome editing.

7. The method for producing according to claim 6, wherein the genome editing is performed by introducing a sequence-specific DNA-cleaving enzyme into the donor cell.

8. The method for producing according to claim 7, wherein the sequence-specific DNA-cleaving enzyme is CRISPR-Cas and the genome editing is performed by introducing a gRNA and the CRISPR-Cas into the donor cell.

10

9. The method for producing according to any one of claims 6 to 8, wherein the donor cell is a pluripotent stem cell.

10. The method for producing according to claim 8,

15

wherein the gRNA is a gRNA targeting, as a target base sequence, a base sequence that is mapped to only one target HLA haplotype in a case where the base sequence is mapped to base sequence data of genomic DNA of all HLA haplotypes, but that is not mapped in a case where the base sequence is mapped to base sequence data of all genomic DNA except for HLA alleles.

20

11. The method for producing according to claim 10,

wherein the target base sequence consists of

a base sequence set forth in any of SEQ ID NOs: 3, 4, 7, 45 to 52, and

72 to 2459, or

25

a base sequence in which one or several bases are deleted, substituted,

or added at a 5' end of a base sequence set forth in any of SEQ ID NOs: 3, 4, 7, 45 to 52, and 72 to 2459.

12. The method for producing according to claim 10 or 11,

5 wherein the target base sequence consists of

a base sequence set forth in any of SEQ ID NOs: 3, 4, 7, and 45 to 52,

or

a base sequence in which one or several bases are deleted, substituted,

or added at a 5' end of a base sequence set forth in any of SEQ ID NOs: 3, 4, 7, and 45 to

10 52.

13. The method for producing according to any one of claims 10 to 12, wherein the target base sequence is mapped to an exon 2 or 3 of an HLA gene.

15 14. The method for producing according to claim 8,

wherein the gRNA is a gRNA targeting, as a target base sequence, a base

sequence that is mapped to two or more target HLA haplotypes in a case where the base

sequence is mapped to base sequence data of genomic DNA of all HLA haplotypes, but

that is not mapped in a case where the base sequence is mapped to base sequence data of

20 all genomic DNA except for HLA alleles.

15. The method for producing according to claim 14,

wherein the target base sequence consists of

a base sequence set forth in any of SEQ ID NOs: 53 to 55 and 2460 to

25 8013, or

a base sequence in which one or several bases are deleted, substituted, or added at a 5' end of a base sequence set forth in any of SEQ ID NOs: 53 to 55 and 2460 to 8013.

5 16. The method for producing according to claim 14 or 15,

wherein the target base sequence consists of

a base sequence set forth in any of SEQ ID NOs: 53 to 55, or

a base sequence in which one or several bases are deleted, substituted, or added at a 5' end of a base sequence set forth in any of SEQ ID NOs: 53 to 55.

10

17. The method for producing according to any one of claims 14 to 16, wherein the target base sequence is mapped to an exon 2 or 3 of an HLA gene.