

What is claimed is:

1. A method for producing a modified immune cell, or a population of modified immune cells, with reduced immunogenicity and/or increased anti-neoplasia activity by multiplexed editing, the method comprising:

modifying in at least three genes at a single target nucleobase in each gene thereof in an immune cell, or in the population of immune cells, thereby generating the modified immune cell or the population of modified immune cells with reduced immunogenicity and/or increased anti-neoplasia activity,

wherein the modifying comprises contacting the immune cell with a base editor comprising a deaminase,

wherein at least a first gene of the at least three genes is selected from the group consisting of: CD2, CD3, CD4, CD5, CD7, CD30, CD33, CD52, CD70, and CIITA.

2. The method of claim 1, wherein at least one of the at least three genes is a checkpoint inhibitor gene, or an immune response regulation gene.

3. The method of any one of claims 1 to 2, wherein at least one of the at least three genes encodes polypeptides that form a TCR complex.

4. The method of claim 1, wherein a second gene of the at least three genes is independently selected from the group consisting of: CD2, CD5, CD7, CD52, TRAC, a check point inhibitor, PDCD1, CIITA, a T cell marker, CD3 epsilon, CD3 gamma, CD3 delta, TRBC1, TRBC2, and B2M, and the second gene is different from the first gene.

5. The method of any one of claims 1 to 4, wherein the modifying comprises deaminating the single target nucleobase.

6. The method of claim 5, wherein the deaminating is performed by a polypeptide comprising a deaminase.

7. The method of claim 6, wherein the deaminase is associated with a nucleic acid programmable DNA binding protein (napDNAbp) to form a base editor.
8. The method of claim 7, wherein the deaminase is fused to the nucleic acid programmable DNA binding protein (napDNAbp).
9. The method of claim 8, wherein the napDNAbp comprises a Cas9 nickase or nuclease dead Cas9.
10. The method of any one of claims 6-9, wherein the deaminase is a cytidine deaminase that converts a cytosine (C) to a thymine (T) or an adenosine deaminase that converts an adenosine (A) to a guanine (G).
11. The method of claim 10, wherein the deaminase is a cytidine deaminase and the base editor further comprises a uracil glycosylase inhibitor.
12. The method of any one of claims 1 to 11, wherein the modifying comprises contacting the immune cell or the population of immune cells with a base editor and a guide nucleic acid sequence.
13. The method of claim 12, wherein the guide nucleic acid sequence comprises a sequence selected from the group consisting of UUCGUAUCUGUAAAACCAAG, CCUACCUGUCACCAGGACCA, CUCUUACCUGUACCAUAACC, CACCUACCUAAGAACCAUCC, ACUCACGCUGGAUAGCCUCC, ACUCACCCAGCAUCCCCAGC, CACUCACCUUAGCCUGAGCA, and CACGCACCUGGACAGCUGAC.
14. The method of any one of claims 1 to 13, wherein the target nucleobase is in an exon, a splice donor site, or a splice acceptor site.
15. The method of claim 1, wherein the target nucleobase is in a splice acceptor site or a splice donor site of a gene of the at least three genes, and wherein each of the remaining genes of the at

least three genes is different from the first gene and is independently selected from the group consisting of: TRAC, PDCD1, CD52, CD7, B2M, CD2, CD5, and CIITA.

16. The method of any one of claims 1 to 15, wherein the immune cell is a human cell, a cytotoxic T cell, a regulatory T cell, a T helper cell, a dendritic cell, a B cell, or a NK cell, or a population thereof.

17. The method of any one of claims 1 to 16,
a) wherein the modifying is *ex vivo*, and/or,
b) wherein the immune cell or the population of immune cells is derived from a single human donor.

18. The method of any one of claims 1 to 17, further comprising contacting the immune cell or the population of immune cells with a polynucleotide that encodes an exogenous functional chimeric antigen receptor (CAR) or a functional fragment thereof; or a lentivirus comprising a polynucleotide that encodes an exogenous CAR or a functional fragment thereof.

19. The method of claim 18, wherein the CAR or the functional fragment thereof specifically binds a marker associated with neoplasia.

20. The method of claim 19, wherein the neoplasia is a T cell cancer, a B cell cancer, a lymphoma, a leukemia, or a multiple myeloma.

21. The method of claim 20, wherein the CAR or the functional fragment thereof specifically binds CD7 or BCMA.

22. The method of any one of claims 1-21, wherein the at least three genes are CD7, TRAC, and PDCD1.

23. The method of claim 22, wherein the base editor comprising a deaminase is BE4.

24. The method of one of claims 22 or 23, wherein the at least three genes further comprise CD52.
25. A modified immune cell with reduced immunogenicity or increased anti-neoplasia activity produced according to the method of any one of claims 1 to 24,
wherein the modified immune cell comprises a single target nucleobase modification in each of at least three genes,
wherein the at least three genes are: CD7, PDCD1, and TRAC.
26. A modified immune cell with reduced immunogenicity or increased anti-neoplasia activity, wherein the modified immune cell comprises a single target nucleobase modification in each one of at least three gene sequences,
wherein a first of the at least three genes is selected from the group consisting of CD2, CD3, CD4, CD5, CD7, CD30, CD33, CD52, CD70 and CIITA;
and
wherein the immune cell is a human immune cell selected from the group consisting of a cytotoxic T cell, a regulatory T cell, a T helper cell, a dendritic cell, a B cell, and a NK cell, optionally wherein the immune cell is in an *ex vivo* culture and further optionally wherein the immune cell is derived from a single human donor.
27. The modified immune cell of claim 26, wherein the immune cell further comprises a polynucleotide that encodes an exogenous functional chimeric antigen receptor (CAR) or a functional fragment thereof; wherein
the CAR specifically binds a marker associated with a neoplasia;
the CAR specifically binds a marker associated with a neoplasia selected from a T cell cancer, a B cell cancer, a lymphoma, a leukemia, or a multiple myeloma; and/or
the CAR specifically binds CD7 or BCMA.