

Claims

1. A method for treating a subject comprising:
 - (i) providing sub-therapeutic amounts of immune effector cells genetically modified to express an antigen receptor to the subject, and
 - (ii) administering to the subject an antigen targeted by the antigen receptor, a polynucleotide encoding the antigen, or a host cell genetically modified to express the antigen.
2. The method of claim 1 which is a method of inducing an immune response in said subject.
3. The method of claim 2, wherein the immune response is a T cell-mediated immune response.
4. The method of claim 2 or 3, wherein the immune response is an immune response to a target cell population or target tissue expressing an antigen.
5. The method of claim 4, wherein the target cell population or target tissue is cancer cells or cancer tissue.
6. The method of claim 4, wherein the cancer cells or cancer tissue is solid cancer.
7. A method for treating a subject having a disease, disorder or condition associated with expression or elevated expression of an antigen comprising:
 - (i) providing sub-therapeutic amounts of immune effector cells genetically modified to express an antigen receptor, the antigen receptor being targeted to the antigen associated with the disease, disorder or condition or cells expressing the antigen associated with the disease, disorder or condition, to the subject, and
 - (ii) administering to the subject an antigen targeted by the antigen receptor, a polynucleotide encoding the antigen, or a host cell genetically modified to express the antigen.
8. The method of claim 7, wherein the disease, disorder or condition is cancer and the antigen associated with the disease, disorder or condition is a tumor antigen.
9. The method of claim 7 or 8, wherein the disease, disorder or condition is solid cancer.

10. A method for treating a subject having a solid cancer associated with expression or elevated expression of a tumor antigen comprising:
- (i) providing immune effector cells genetically modified to express an antigen receptor, the antigen receptor being targeted to the tumor antigen or cells expressing the tumor antigen, to the subject, and
 - (ii) administering to the subject an antigen targeted by the antigen receptor, a polynucleotide encoding the antigen, or a host cell genetically modified to express the antigen.
11. The method of claim 10, wherein the immune effector cells genetically modified to express an antigen receptor are provided to the subject in sub-therapeutic amounts.
12. The method of any one of claims 1 to 11, wherein the immune effector cells genetically modified to express an antigen receptor are provided to the subject by administering the immune effector cells genetically modified to express an antigen receptor or by generating the immune effector cells genetically modified to express an antigen receptor in the subject.
13. A method for treating a subject comprising:
- (i) generating immune effector cells genetically modified to express an antigen receptor in the subject, and
 - (ii) administering to the subject an antigen targeted by the antigen receptor, a polynucleotide encoding the antigen, or a host cell genetically modified to express the antigen.
14. The method of claim 13 which is a method of inducing an immune response in said subject.
15. The method of claim 14, wherein the immune response is a T cell-mediated immune response.
16. The method of claim 14 or 15, wherein the immune response is an immune response to a target cell population or target tissue expressing an antigen.
17. The method of claim 16, wherein the target cell population or target tissue is cancer cells or cancer tissue.
18. The method of claim 17, wherein the cancer cells or cancer tissue is solid cancer.

19. A method for treating a subject having a disease, disorder or condition associated with expression or elevated expression of an antigen comprising:

- (i) generating immune effector cells genetically modified to express an antigen receptor, the antigen receptor being targeted to the antigen associated with the disease, disorder or condition or cells expressing the antigen associated with the disease, disorder or condition, in the subject, and
- (ii) administering to the subject an antigen targeted by the antigen receptor, a polynucleotide encoding the antigen, or a host cell genetically modified to express the antigen.

20. The method of claim 19, wherein the disease, disorder or condition is cancer and the antigen associated with the disease, disorder or condition is a tumor antigen.

21. The method of claim 19 or 20, wherein the disease, disorder or condition is solid cancer.

22. A method for treating a subject having a solid cancer associated with expression or elevated expression of a tumor antigen comprising:

- (i) generating immune effector cells genetically modified to express an antigen receptor, the antigen receptor being targeted to the tumor antigen or cells expressing the tumor antigen, in the subject, and
- (ii) administering to the subject an antigen targeted by the antigen receptor, a polynucleotide encoding the antigen, or a host cell genetically modified to express the antigen.

23. The method of any one of claims 13 to 22, wherein the immune effector cells genetically modified to express an antigen receptor are generated in the subject in sub-therapeutic amounts.

24. The method of any one of claims 1 to 23, which is a method for treating or preventing cancer in a subject.

25. The method of claim 24, wherein the cancer is solid cancer.

26. The method of claim 24 or 25, wherein the cancer is associated with expression or elevated expression of a tumor antigen targeted by the antigen receptor.

27. The method of any one of claims 1 to 26, wherein the antigen receptor is a chimeric antigen receptor (CAR) or T cell receptor (TCR).

28. The method of any one of claims 1 to 27, wherein the polynucleotide encoding the antigen is RNA.
29. The method of any one of claims 1 to 27, wherein the host cell genetically modified to express the antigen comprises a polynucleotide encoding the antigen.
30. The method of any one of claims 1 to 29, wherein the immune effector cells genetically modified to express an antigen receptor comprise a polynucleotide encoding the antigen receptor.
31. The method of any one of claims 1 to 30, wherein the immune effector cells are T cells.
32. A kit comprising:
- (i) immune effector cells genetically modified to express an antigen receptor or a polynucleotide encoding an antigen receptor, and
 - (ii) an antigen targeted by the antigen receptor, a polynucleotide encoding the antigen, or a host cell genetically modified to express the antigen.
33. The kit of claim 32, wherein the polynucleotide encoding an antigen receptor is useful for genetic modification of immune effector cells to express an antigen receptor.
34. The kit of claim 32 or 33, further comprising instructional material for use of the kit in the method of any one of claims 1 to 31.