

on the cell surface, resulting in the eradication of diseased cells. In one example, the target cell population or target tissue is tumor cells or tumor tissue.

In a further aspect, the present disclosure provides a pharmaceutical composition comprising the recombinant T cell as described herein; and a pharmaceutically acceptable carrier for use as a medicament. In one example, the present disclosure relates to a pharmaceutical composition comprising the antigen receptor of the disclosure, the recombinant cell of the disclosure, or the nucleic acid of the disclosure; and a pharmaceutically acceptable carrier. The pharmaceutical composition of the disclosure may be used as a medicament, in particular in the treatment of a disease such as cancer characterized by expression of one or more antigens which are bound by the antigen receptor of the disclosure such as one or more tumor antigens.

In a further aspect, the present disclosure provides use of the pharmaceutical composition as described herein in the manufacture of a medicament for treating a disease characterized by expression of at least one antigen which is bound by the antigen receptor, wherein the antigen is preferably a tumor antigen. In one example, the present disclosure relates to a method of treating a disease such as cancer comprising administering to a subject a therapeutically effective amount of the pharmaceutical composition of the disclosure, wherein the disease is characterized by expression of at least one antigen such as a tumor antigen which is bound by the antigen receptor.

In a further aspect, the present disclosure provides use of the recombinant T cell as described herein in the manufacture of a medicament for treating a disease, wherein the disease is characterized by expression of at least one antigen which is bound by the antigen receptor and wherein the disease is preferably cancer. In one example, the present disclosure relates to a method of treating a subject having a disease, disorder or condition associated with expression or elevated expression of at least one antigen, the method comprising administering to the subject T cells genetically modified to express an antigen receptor of the disclosure targeted to the at least one antigen. In one example, the disease, disorder or condition is cancer. In one example, the T cells may be autologous, allogeneic or syngeneic to the subject.

In one example of the disclosure, the antigen receptor binds to only one antigen (e.g. by being monospecific and recognizing the same epitope or by being bispecific or multispecific and

CLAIMS

1. An antigen receptor, which receptor comprises a first peptide chain and a second peptide chain,

wherein

the first peptide chain comprises a first domain, a second domain, a variable region of a T cell receptor chain, and an immunoreceptor signal transmission domain;

the second peptide chain comprises a first domain, a second domain, a variable region of a T cell receptor chain, and an immunoreceptor signal transmission domain;

wherein the first domain from the first peptide chain forms together with one of the domains from the second peptide chain a first antigen binding site, and

wherein the second domain from the first peptide chain forms together with the other domain from the second peptide chain a second antigen binding site, wherein

(i) the first peptide chain comprises a variable region of a T cell receptor alpha chain and a constant region of a T cell receptor alpha chain and the second peptide chain comprises a variable region of a T cell receptor beta chain and a constant region of a T cell receptor beta chain, or

(ii) the first peptide chain comprises a variable region of a T cell receptor beta chain and a constant region of a T cell receptor beta chain and the second peptide chain comprises a variable region of a T cell receptor alpha chain and a constant region of a T cell receptor alpha chain.

2. The receptor of claim 1, wherein the first and/or second peptide chains further comprise a linker between the first and second domains and/or between the first and second domains and the variable region of a T cell receptor chain, wherein the linker is preferably an arbitrary amino acid sequence.

3. The receptor of claim 1 or 2, wherein the first and/or second domains each comprise a variable region of an immunoglobulin chain or a variable region of a T cell receptor chain.

4. The receptor of any one of claims 1 to 3, wherein the first domain from the first peptide chain comprises a variable region of a heavy chain of an immunoglobulin with a specificity for an antigen and the domain from the second peptide chain forming an antigen

binding site with the first domain from the first peptide chain comprises a variable region of a light chain of an immunoglobulin with a specificity for the antigen.

5. The receptor of any one of claims 1 to 4, wherein the second domain from the first peptide chain comprises a variable region of a heavy chain of an immunoglobulin with a specificity for an antigen and the domain from the second peptide chain forming an antigen binding site with the second domain from the first peptide chain comprises a variable region of a light chain of an immunoglobulin with a specificity for the antigen.

6. The receptor of any one of claims 1 to 5, wherein
the first and the second domains from the first peptide chain each comprise a variable region of a heavy chain of an immunoglobulin; and
the first and the second domains from the second peptide chain each comprise a variable region of a light chain of an immunoglobulin.

7. The receptor of any one of claims 1 to 6, wherein
the N-terminal domain from the first peptide chain forms together with the N-terminal domain from the second peptide chain an antigen binding site; and
the C-terminal domain from the first peptide chain forms together with the C-terminal domain from the second peptide chain an antigen binding site.

8. A recombinant cell expressing the first peptide chain, the second peptide chain or both the first and second peptide chains defined in any one of claims 1 to 7.

9. The recombinant cell of claim 8, wherein the recombinant cell is a T cell.

10. A method for producing a cell expressing an antigen receptor which receptor comprises a first peptide chain and a second peptide chain, the method comprising:

(a) providing a cell;

(b) providing a first genetic construct encoding the first peptide chain comprising at least a first domain, a second domain, a variable region of a T cell receptor chain, and an immunoreceptor signal transmission domain;

(c) providing a second genetic construct encoding the second peptide chain comprising at least a first domain, a second domain, a variable region of a T cell receptor chain, and an immunoreceptor signal transmission domain;

(d) introducing the first and second genetic constructs into the cell; and

(e) allowing the constructs to be expressed in the cell;

wherein the first domain from the first peptide chain is able to form together with one of the domains from the second peptide chain a first antigen binding site, and

wherein the second domain from the first peptide chain is able to form together with the other domain from the second peptide chain a second antigen binding site;

wherein

(i) the first peptide chain comprises a variable region of a T cell receptor alpha chain and a constant region of a T cell receptor alpha chain and the second peptide chain comprises a variable region of a T cell receptor beta chain and a constant region of a T cell receptor beta chain, or

(ii) the first peptide chain comprises a variable region of a T cell receptor beta chain and a constant region of a T cell receptor beta chain and the second peptide chain comprises a variable region of a T cell receptor alpha chain and a constant region of a T cell receptor alpha chain.

11. The method of claim 10, wherein the first peptide chain and the second peptide chain are provided on a single genetic construct.

12. The method of claim 10 or 11, wherein the cell is a human cell, preferably a T cell.

13. A recombinant cell produced by the method of any one of claims 10 to 12, wherein said cell is preferably a human cell.

14. The recombinant cell of claim 13, wherein said recombinant cell is a T cell.

15. A nucleic acid encoding the first peptide chain, the second peptide chain or both the first and second peptide chains defined in any one of claims 1 to 7, which is preferably DNA or RNA.

16. A pharmaceutical composition comprising the recombinant T cell of claim 9 or 14; and a pharmaceutically acceptable carrier for use as a medicament.

17. Use of the pharmaceutical composition of claim 16 in the manufacture of a medicament for treating a disease characterized by expression of at least one antigen which is bound by the antigen receptor, wherein the antigen is preferably a tumor antigen.

18. The use of claim 17, wherein the disease is cancer.

19. Use of the recombinant T cell of claim 9 or 14 in the manufacture of a medicament for treating a disease, wherein the disease is characterized by expression of at least one antigen which is bound by the antigen receptor and wherein the disease is preferably cancer.