CLAIMS

1. A method for expanding a T cell population for use in treatment of cancer in a subject wherein the expanded T cell population targets a neo-antigen, the method comprising the steps of:

a) providing a sample comprising a T cell population which is capable of specifically recognising said neo-antigen; and

b) co-culturing the T cell population with a composition comprising the neo-antigen, or neo-antigen peptide, and an antigen presenting cell;

wherein the neo-antigen has been identified in a sample of a tumour from said subject as being a clonal neo-antigen.

2. A method according to claim 1 wherein said T cells are selectively expanded using a plurality of clonal neo-antigens or clonal neo-antigen peptides, wherein each of said peptides comprises a different clonal mutation.

3. A method according to any preceding claim wherein said antigen presenting cell has been loaded or pulsed with a peptide derived from said clonal neo-antigen.

4. A method according to any preceding claim wherein said antigen presenting cell is a dendritic cell.

5. A method according to any preceding claim wherein the T cell population is cultured with IL-2 or anti-CD3 and/or CD28 antibodies.

6. A method according to any preceding claim wherein the T cell population is isolated from a sample of the tumour of the patient to be treated.

7. A method according to any preceding claim wherein the population of T cells comprises CD8+ T cells, CD4+ T cells or CD8+ and CD4+ T cells.

8. A method according to any preceding claim wherein at least a first and a second T cell is provided, wherein the first T cell targets a first clonal neo-antigen generated by a first clonal mutation and the second T cell targets a second truncal neo-antigen generated by a second truncal mutation.

9. A method according to any preceding claim wherein said expanded T cell population is enriched with T cells which target clonal neo-antigens relative to the starting sample.

10. A T cell composition which comprises T cells selectively expanded to target one or more clonal neo-antigens.

11. A T cell composition useful for the treatment of a cancer in a subject which comprises T cells selectively expanded to target clonal neo-antigens characteristic of the subject's cancer.

12. A T cell composition according to claim 10 or 11 wherein said expanded T cell population is enriched with T cells which are specific to clonal neo-antigens.

13. A T cell composition according to any of claims 10 to 12 wherein the expanded population of clonal neo-antigen-reactive T cells has a higher activity than the population of T cells which have not been expanded, as measured by the response of the T cell population to restimulation with a clonal neo-antigen peptide.

14. A T cell composition comprising a T cell population which is obtained or obtainable by a method according to any one of claims 1 to 9.

15. A T cell composition according to any of claims 10 to 14 for use in treating cancer.

16. A T cell composition for use according to claim 15 wherein the T cell composition is used in combination with a checkpoint inhibitor.

17. A method according to claim 2 wherein said plurality of peptides comprises between 2 and 100 peptides.

18. A method according to claim 6, wherein the T cell population comprises tumour infiltrating lymphocytes (TILs).

19. A method according to claim 13 wherein the activity is measured by cytokine production, and wherein a higher activity is a 5-10-fold or greater increase in activity.

20. A T cell composition according to claim 15 wherein the cancer is non small-cell lung cancer (NSCLC) or melanoma.