Claims

1. A method for making a T cell population for use in altering the immunodominance hierarchy of a patient, the method comprising the steps of:

a. identifying at least one subdominant antigen or subdominant epitope in a sample obtained from the patient;

b. providing one or more patient samples obtained from a patient(s) each comprising antigen presenting cells (APCs) and/or T cells;

c. exposing the APCs from the patient sample to one or more subdominant antigens or epitopes;

d. cultivating from the patient sample a T cell population comprising T cells capable of recognizing said subdominant antigen or epitope by

(i) exposing the T cells to the APCs from step (c) in media comprising one or more of IL-7, IL-12, IL-15, and IL-21;

(ii) expanding the T cells in media; and

(iii) optionally restimulating the T cells by exposing to the APCs from step (c).

2. The method of claim 1, wherein the patient sample comprises peripheral blood mononuclear cells (PBMCs).

3. The method of claim 1, further comprising the step of isolating the APCs.

4. The method of claim 1, wherein the antigen presenting cells are dendritic cells.

5. The method of claim 4, wherein step (c) comprises exposing multiple aliquots of dendritic cells with each exposed to a different subdominant antigen.

6. The method of claim 1, wherein the step of exposing the T cells to the APCs from step (c) comprises exposing the T cells to the APCs from step (c) in media that further comprises a cytokine selected from the group consisting of IL-2, IL-4 and IL-6.

7. The method of claim 1, wherein the step of exposing the T cells to the APCs from step (c) comprises exposing the T cells to the APCs from step (c) in media comprising IL-15.

8. The method of claim 1, wherein the step of exposing the T cells to the APCs from step (c) comprises exposing the T cells to the APCs from step (c) in media comprising IL-15 and IL-21.

9. The method of claim 20, wherein the step of exposing the T cells to the APCs from step (c) comprises exposing the T cells to the APCs from step (c) in media comprising IL-4 and IL-15.

10. The method of claim 1, wherein the step of expanding the T cells in media comprises using media comprising one or more of IL-2, IL-4, IL-6, IL-7, IL-12, IL-15, and IL-21.

11. The method of claim 1, wherein the step of expanding the T cells in media comprises using media comprising one or more of IL-7 and IL-15.

12. The method of claim 1, wherein the subdominant antigen or epitope comprises a viral antigen, a fungal antigen, a bacterial antigen, a parasitic antigen, a prion antigen, or a tumor antigen.

13. The method of claim 12, wherein the subdominant antigen or epitope is presented to the APCs as one or more peptides or as a plasmid or vector that expresses the subdominant antigen or epitope .

14. The method of claim 1, wherein the step of expanding the T cells in media comprises culturing the T cells in a gas permeable bioreactor.

15. A T cell population obtained by the method of claim 1.

16. The T cell population of claim 15, wherein the at least one subdominant antigen or epitope is an antigen or epitope to which a cellular or humoral immune response is not detectable in the patient sample or is only detectable at a low level.