CLAIMS

What is claimed is:

1. An *in vitro* method for stimulating T-cells, the method comprising stimulating T-cells with antigen presenting cells in the presence of interleukin (IL)-7 and IL-15, and in the absence of IL-6 and IL-12, wherein the antigen presenting cells were previously exposed to one or more peptides, wherein the peptides comprise sequence that corresponds to at least part of the sequence of one or more proteins of human papillomavirus (HPV).

2. An *in vitro* method of producing therapeutic T-cells for HPV-associated diseases, the method comprising the step of:

stimulating T-cells with antigen presenting cells in the presence of IL-7 and IL-15, and in the absence of IL-6 and IL-12, wherein the antigen presenting cells were previously exposed to one or more peptides, wherein the peptides comprise sequence that corresponds to at least part of the sequence of one or more proteins of HPV,

wherein the stimulating produces T-cells therapeutic for HPV-associated diseases.

3. The method of claim 1 or 2, wherein the T-cells are obtained from a prior stimulation of T-cells, optionally from within a population of PBMCs.

4. The method of claim 3, wherein the prior stimulation of T-cells comprises stimulating T-cells with antigen presenting cells in the presence of IL-7 and IL-15, and in the presence of IL-6 and/or IL-12, wherein the antigen presenting cells were previously exposed to one or more peptides, wherein the peptides comprise sequence that corresponds to at least part of the sequence of one or more proteins of HPV.

5. The method of claim 1 or 2, wherein prior to stimulating said T-cells, the method further comprises stimulating T-cells with antigen presenting cells in the presence of IL-7 and IL-15, and in the presence of IL-6 and/or IL-12, wherein the antigen presenting cells were previously exposed to one or more peptides, wherein the peptides comprise sequence that corresponds to at least part of the sequence of one or more proteins of HPV, to produce peripheral blood T-cells.

6. The method of any one of claims 1-5, wherein the antigen presenting cells are dendritic cells, B-blasts, or PBMCs.

7. The method of any one of claims 1-6, wherein the T-cells are present in a population of peripheral blood mononuclear cells (PBMCs) or are obtained or isolated therefrom, optionally wherein the PBMCs in the population are non-adherent PBMCs.

8. An *in vitro* method for stimulating T-cells specific for HPV or for an HPV antigen, the method comprising stimulating T-cells specific for HPV or for an HPV antigen with antigen presenting cells in the presence of IL-7 and IL-15, in the absence of IL-6 and IL-12, and in the presence of co-stimulatory cells, wherein the antigen presenting cells were previously exposed to one or more peptides, wherein the peptides comprise sequence that corresponds to at least part of the sequence of one or more proteins of HPV.

9. An *in vitro* method of producing therapeutic T-cells for HPV-associated diseases, the method comprising the step of stimulating T-cells specific for HPV or for an HPV antigen with antigen presenting cells in the presence of one or more of IL-7 and IL-15, in the absence of IL-6 and IL-12, and in the presence of co-stimulatory cells, wherein the antigen presenting cells were previously exposed to one or more peptides, wherein the peptides comprise sequence that corresponds to at least part of the sequence of one or more proteins of HPV, wherein the stimulating produces T-cells therapeutic for HPV-associated diseases.

10. An *in vitro* method of producing therapeutic T-cells for HPV-associated diseases, the method comprising:

(i) stimulating peripheral blood cells, wherein the method comprises stimulating peripheral blood T-cells with antigen presenting cells in the presence of IL-7 and IL-15 and optionally in the absence of IL-6 and/or IL-12, wherein the antigen presenting cells were previously exposed to one or more peptides, wherein the peptides comprise sequence that corresponds to at least part of the sequence of one or more proteins of HPV; and

(ii) stimulating T-cells obtained from (i) with antigen presenting cells in the presence of IL-7 and IL-15, in the absence of IL-6 and IL-12, and in the presence of co-stimulatory cells, wherein the antigen presenting cells were previously exposed to

one or more peptides, wherein the peptides comprise sequence that corresponds to at least part of the sequence of one or more proteins of HPV.

11. An *in vitro* method of producing therapeutic T-cells for HPV-associated diseases is provided, the method comprising:

(i) stimulating peripheral blood cells, wherein the method comprises stimulating peripheral blood T-cells with antigen presenting cells in the presence of interleukin (IL)-7 and IL-15 and optionally in the absence of IL-6 and/or IL-12, wherein the antigen presenting cells were previously exposed to one or more peptides, wherein the peptides comprise sequence that corresponds to at least part of the sequence of one or more proteins of HPV;

(ii) stimulating T-cells obtained from (i) with antigen presenting cells in the presence of interleukin (IL)-7 and IL-15, and in the absence of IL-6 and IL-12, wherein the antigen presenting cells were previously exposed to one or more peptides, wherein the peptides comprise sequence that corresponds to at least part of the sequence of one or more proteins of HPV, wherein (ii) is optionally repeated one or more times; and

(iii) stimulating T-cells obtained from (ii) with antigen presenting cells in the presence of interleukin (IL)-7 and IL-15, and in the presence of co-stimulatory cells, wherein the antigen presenting cells were previously exposed to one or more peptides, wherein the peptides comprise sequence that corresponds to at least part of the sequence of one or more proteins of HPV, wherein (iii) is optionally repeated one or more times.

12. The method of any one of claims 1-11, wherein the peptides comprise sequence that corresponds to:

a) the HPV18 E6 protein and/or the HPV18 E7 protein, and/or

b) the HPV16 E6 protein and/or the HPV16 E7 protein.

13. The method of any one of claims 1-12, wherein the one or more peptides comprises peptides of 15 amino acids in length, optionally wherein one or more peptides form a library and peptides in the library overlap in sequence with other peptides by 11 amino acids.

14. Use of T-cells obtained by, obtainable by, or which are the product of, a method for stimulating peripheral blood or T-cells or a method of producing therapeutic T-cells according to any one of claims 1 to 13 in the manufacture of a medicament for use in a method of adoptive cellular immunotherapy, wherein the T-cells are to be administered to a subject.

15. The use according to claim 14, wherein the subject has been exposed to HPV, or has HPV-associated disease.

16. The use according to claim 15, wherein the subject has been exposed to HPV16, HPV18 or both, or has HPV16-associated disease and/or HPV18-associated disease.

17. The use according to claim 15 or claim 16, wherein the disease is a cancer, optionally wherein the cancer is cervical cancer, anal cancer, vulvar cancer, vaginal cancer, penile cancer, oropharyngeal cancer, nasopharyngeal carcinoma, laryngeal papillomatosis, laryngeal cancer, head and neck cancer, or a dysplasia of any of site thereof.

18. The use according to claim 17, wherein the individual has received, is receiving, or will receive an additional cancer therapy, optionally wherein the additional cancer therapy is surgery, radiation, hormone therapy, chemotherapy, immunotherapy, or a combination thereof.

19. The use according to any one of claims 14 to 18, wherein the subject is determined as having HPV-associated cancer, optionally wherein the subject is determined as having HPV16-associated cancer and/or HPV18-associated cancer.

20. A method of preparing a pharmaceutical composition, medicament or vaccine, the method comprising stimulating peripheral blood or T-cells or producing therapeutic T-cells according to any one of claims 1 to 13, and mixing the cells obtained with a pharmaceutically acceptable carrier, adjuvant, diluent or excipient.