

Claims

1. An isolated polypeptide comprising a sequence selected from:
 - (a) the sequence of SEQ ID NO. 1; and
 - (b) a variant of the sequence of (a); and
 - (c) an immunogenic fragment of the sequence of (a).
2. An isolated polypeptide according to claim 1 comprising or consisting of the sequence of SEQ ID NO. 3.
3. The isolated polypeptide according to claim 1 or claim 2 fused to a second or further polypeptide selected from (i) one or more other polypeptides according to claim 1 or claim 2 (ii) other polypeptides which are ovarian cancer associated antigens (iii) polypeptide sequences which are capable of enhancing an immune response (i.e. immunostimulant sequences) and (iv) polypeptide sequences, e.g. comprising universal CD4 helper epitopes, which are capable of providing strong CD4+ help to increase CD8+ T cell responses to antigen epitopes.
4. An isolated nucleic acid encoding the polypeptide according to any one of claims 1 to 3.
5. The nucleic acid according to claim 4 which is a DNA.
6. The nucleic acid according to claim 5 comprising or consisting of a sequence selected from any one of SEQ ID NOs. 5 and 7.
7. The nucleic acid according to claim 6 which is codon optimised for expression in a human host cell.
8. The nucleic acid according to claim 4 which is an RNA.
9. The nucleic acid according to claim 4, 5, 7 or 8 which is an artificial nucleic acid sequence.
10. A vector comprising the nucleic acid according to any one of claims 4 to 9, preferably wherein the vector comprises DNA encoding regulatory elements suitable for permitting transcription of a translationally active RNA molecule in a human host cell.
11. The vector according to claim 10 which is a viral vector, preferably wherein the vector is selected from an adenoviral vector, an adeno-associated virus (AAV), alphavirus, herpes virus, arena virus, measles virus, poxvirus, paramyxovirus, lentivirus and rhabdovirus vector.

12. An immunogenic pharmaceutical composition comprising a polypeptide, nucleic acid or vector according to any one of claims 1 to 11 together with a pharmaceutically acceptable carrier.
13. A vaccine composition comprising a polypeptide, nucleic acid or vector according to any one of claims 1 to 11 together with a pharmaceutically acceptable carrier.
14. The composition according to claim 12 or claim 13 which comprises one or more immunostimulants, preferably wherein the immunostimulants are selected from aluminium salts, saponins, immunostimulatory oligonucleotides, oil-in-water emulsions, aminoalkyl glucosaminide 4-phosphates, lipopolysaccharides and derivatives thereof and other TLR4 ligands, TLR7 ligands, TLR8 ligands, TLR9 ligands, IL-12 and interferons.
15. The composition according to any one of claims 12 to 14 which is a sterile composition suitable for parenteral administration.
16. A polypeptide, nucleic acid, vector or composition according to any one of claims 1 to 15 for use in medicine.
17. Use of a polypeptide, nucleic acid, vector or composition according to any one of claims 1 to 15 in the manufacture of a medicament for the treatment of cancer, wherein the medicament is for raising an immune response in a human, preferably wherein the immune response is to be raised against a cancerous tumor expressing a sequence selected from SEQ ID NO. 1 and variants and immunogenic fragments thereof.
18. Use of a polypeptide, nucleic acid, vector or composition according to any one of claims 1 to 15 in the manufacture of a medicament for the treatment or prevention of cancer in a human, wherein the cells of the cancer express a corresponding sequence selected from SEQ ID NO. 1 and immunogenic fragments thereof.
19. Use of a polypeptide, nucleic acid, vector or composition according to any one of claims 1 to 15 in the manufacture of a medicament for the treatment of cancer, wherein T-cells derived from a human suffering from cancer are to be *ex vivo* stimulated and/or amplified, and wherein said stimulated and/or amplified T cells are to be subsequently reintroduced into the said human for the treatment of the said cancer in the said human.

20. A process for preparing a T-cell population which is cytotoxic for cancer cells which express a sequence selected from SEQ ID NO. 1 and immunogenic fragments and variants thereof which comprises (i) obtaining T-cells optionally with antigen-presenting cells from a cancer patient and (ii) stimulating and amplifying the T-cell population *ex vivo* with a corresponding polypeptide, nucleic acid, vector or composition according to any one of claims 1 to 15.
21. A T-cell population obtainable by the process of claim 20.
22. A T-cell which has been stimulated with a polypeptide, nucleic acid, vector or composition according to any one of claims 1 to 15.
23. An antigen presenting cell modified by *ex vivo* loading with the polypeptide, nucleic acid, vector or composition according to any one of claims 1 to 15 or genetically engineered to express the polypeptide according to any one of claims 1 to 3, preferably wherein the antigen presenting cell is a dendritic cell.
24. An exosome loaded with a polypeptide prepared from cells loaded with a polypeptide, nucleic acid, vector or composition according to any one of claims 1 to 15 or genetically engineered to express the polypeptide according to any one of claims 1 to 3.
25. A pharmaceutical composition comprising the T-cell population, the T-cell, antigen presenting cell or exosome according to any one of claims 21 to 24 together with a pharmaceutically acceptable carrier.
26. A T-cell population, T-cell, antigen presenting cell, exosome or composition according to any one of claims 21 to 25 for use in medicine.
27. Use of a T-cell population, T-cell, antigen presenting cell, exosome or composition according to any one of claims 21 to 25 in the manufacture of a medicament for the treatment or prevention of cancer in a human, wherein the cells of the cancer express a corresponding sequence selected from SEQ ID NO. 1 and immunogenic fragments thereof.
28. An isolated antigen-binding polypeptide which is immunospecific for a polypeptide having a sequence selected from SEQ ID NO. 1 and immunogenic fragments thereof.
29. The antigen-binding polypeptide according to claim 28 which is a monoclonal antibody or a fragment thereof.

30. The antigen-binding polypeptide according to claim 28 or claim 29 which is coupled to a cytotoxic moiety.
31. An antigen-binding polypeptide according to any one of claims 28 to 30 for use in medicine.
32. A pharmaceutical composition comprising the antigen-binding polypeptide according to any one of claims 28 to 30 together with a pharmaceutically acceptable carrier.
33. Use of an antigen-binding polypeptide or a composition according to any one of claims 28 to 30 and 32 in the manufacture of a medicament for the treatment or prevention of cancer in a human, wherein the cells of the cancer express a corresponding sequence selected from SEQ ID NO. 1 and immunogenic fragments thereof.
34. An isolated antigen-binding polypeptide which is immunospecific for an HLA-bound polypeptide having a sequence selected from SEQ ID NO. 1 and immunogenic fragments thereof, preferably wherein the antigen-binding polypeptide is a T-cell receptor or a fragment thereof.
35. The antigen-binding polypeptide according to claim 34 which is coupled to another polypeptide that is capable of binding to cytotoxic cells or other immune components in a subject.
36. A cytotoxic cell that has been engineered to express the antigen-binding polypeptide of claim 34 or 35 on its surface, preferably wherein the cytotoxic cell is a T-cell.
37. A cytotoxic cell according to claim 36 for use in medicine.
38. A pharmaceutical composition comprising the cell according to claim 36.
39. Use of a cytotoxic cell according to claim 36 in the manufacture of a medicament for the treatment or prevention of cancer in a human, wherein the cells of the cancer express a corresponding sequence selected from SEQ ID NO. 1 and immunogenic fragments thereof.
40. A method of diagnosing a human as suffering from cancer, comprising the steps of:
determining if the cells of said cancer express a polypeptide sequence selected from SEQ ID NO. 1 and immunogenic fragments or variants thereof, or a nucleic acid encoding said polypeptide sequence, and

diagnosing said human as suffering from cancer if said polypeptide or corresponding nucleic acid is overexpressed in said cancer cells.

41. A method of diagnosing that a human suffering from cancer which is ovarian cancer particularly ovarian carcinoma, more particularly serous ovarian carcinoma e.g. ovarian serous cystadenocarcinoma, comprising the steps of: determining if the cells of said cancer express the polypeptide sequence of any one of SEQ ID NO. 1 and immunogenic fragments or variants thereof; or a nucleic acid encoding said polypeptide sequence, and diagnosing said human as suffering from cancer which is ovarian cancer particularly ovarian carcinoma, more particularly serous ovarian carcinoma e.g. ovarian serous cystadenocarcinoma if said polypeptide or corresponding nucleic acid is overexpressed in said cancer cells.
42. A polypeptide comprising a sequence selected from:
 - (a) the sequence of SEQ ID NOS. 1; or
 - (b) a variant of the sequence of (a); and
 - (c) an immunogenic fragment of the sequence of (a) isolated from the tumor of a human suffering from cancer, or a nucleic acid encoding said polypeptide, for use as a biomarker for the determination of whether said human would be suitable for treatment by a vaccine comprising a corresponding polypeptide, nucleic acid, vector, composition, T-cell population, T-cell, antigen presenting cell, exosome, antigen-binding polypeptide or cytotoxic cell according to any one of claims 1 to 15, 21 to 25, 28 to 30, 32, 36, and 38.
43. The use of any one of claims 17 to 19, 27, 33 or 39, the process of claim 20, and the polypeptide for use of claim 42, wherein the cancer is ovarian cancer particularly ovarian carcinoma, more particularly serous ovarian carcinoma e.g. ovarian serous cystadenocarcinoma.
44. A pharmaceutical composition comprising the antigen-binding polypeptide according to any one of claims 28 to 30 together with a pharmaceutically acceptable carrier for use in treating or preventing cancer in a human.