

CLAIMS

1. A pharmaceutically acceptable salt of a peptide consisting of the amino acid sequence of SEQ ID NO: 1.
2. The pharmaceutically acceptable salt according to claim 1, wherein the salt is a chloride or a trifluoroacetate salt.
3. A peptide as defined in claim 1 to 2, wherein said peptide is modified and/or includes non-peptide bonds.
4. A fusion protein, comprising a peptide consisting of the amino acid sequence of SEQ ID NO: 1 and the N-terminal amino acids of the HLA-DR antigen-associated invariant chain (Ii).
5. A peptide consisting of the amino acid sequence of SEQ ID NO: 1 or a pharmaceutically acceptable salt thereof, for use in therapy or diagnosis of prostate cancer.
6. The peptide for use of claim 5 or 6, wherein said peptide is modified and/or includes non-peptide bonds.
7. Use of a peptide consisting of the amino acid sequence of SEQ ID NO: 1, or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for the treatment of prostate cancer.
8. An antibody, in particular a soluble or membrane-bound antibody, preferably a monoclonal antibody or fragment thereof, that specifically recognizes a peptide consisting of the amino acid sequence of SEQ ID NO: 1, or a peptide consisting of the amino acid sequence of SEQ ID NO: 1 when bound to an MHC molecule, for use in therapy or diagnosis of prostate cancer.
9. Use of the antibody, or the fragment thereof, defined in claim 8, in the manufacture of a medicament for the treatment of prostate cancer.
10. A T-cell receptor, preferably soluble or membrane-bound, or a fragment thereof, that is reactive with a peptide consisting of the amino acid sequence of SEQ ID NO: 1, or a peptide

consisting of the amino acid sequence of SEQ ID NO: 1 when bound to an MHC molecule, for use in therapy or diagnosis of prostate cancer.

11. The T-cell receptor for use of claim 10, wherein said T-cell receptor is provided as a soluble molecule and optionally carries a further effector function such as an immune stimulating domain or toxin.

12. Use of the T-cell receptor, or the fragment thereof, defined in claim 10 or 11, in the manufacture of a medicament for the treatment of prostate cancer.

13. A recombinant host cell for use in therapy or diagnosis of cancer, the recombinant host cell comprising a peptide consisting of the amino acid sequence of SEQ ID NO: 1, the antibody or fragment thereof defined in claim 8, the T-cell receptor or fragment thereof defined in claim 10 or 11, wherein said host cell preferably is selected from an antigen presenting cell, such as a dendritic cell, a T cell or an NK cell, for use in therapy or diagnosis of prostate cancer.

14. An *in vitro* method for producing activated T lymphocytes, the method comprising contacting *in vitro* T cells with antigen loaded human class I or II MHC molecules expressed on the surface of a suitable antigen-presenting cell or an artificial construct mimicking an antigen-presenting cell for a period of time sufficient to activate said T cells in an antigen specific manner, wherein said antigen is a peptide consisting of the amino acid sequence of SEQ ID NO: 1.

15. An activated T lymphocyte, produced by the method according to claim 14, that selectively recognizes a cell which presents a polypeptide consisting of the amino acid sequence of SEQ ID NO: 1.

16. A pharmaceutical composition for use in therapy of cancer, the composition comprising at least one active ingredient selected from the group consisting of a peptide consisting of the amino acid sequence of SEQ ID NO: 1 or a pharmaceutically acceptable salt thereof, the peptide of claim 3, the fusion protein of claim 4, the antibody or fragment thereof as defined in claim 8, the T-cell receptor or fragment thereof as defined in claim 10 or 11, the host cell according to claim 13, or the activated T lymphocyte according to claim 15, or a conjugated or labelled active

ingredient, and a pharmaceutically acceptable carrier, and optionally, pharmaceutically acceptable excipients and/or stabilizers.

17. A kit for use in therapy of cancer, the kit comprising:

- a) a container comprising the pharmaceutical composition defined in claim 16, in solution or in lyophilized form;
- b) optionally, a second container containing a diluent or reconstituting solution for the lyophilized formulation;
- c) optionally, at least one more peptide selected from the group consisting of SEQ ID NO: 1 to SEQ ID NO: 249 and SEQ ID NO: 252 to SEQ ID NO: 272.

18. The kit for use according to claim 17, further comprising one or more of i) a buffer, ii) a diluent, iii) a filter, iv) a needle, or v) a syringe.

19. A method for producing a personalized anti-prostate cancer vaccine or a compound-based and/or cellular therapy for an individual patient, said method comprising:

- (a) identifying a tumor-associated peptide (TUMAP) presented by a tumor sample of said individual patient;
- (b) comparing the peptides as identified in (a) with a warehouse of peptides that have been pre-screened for immunogenicity and/or over-presentation in tumors as compared to normal tissues;
- (c) selecting at least one peptide from the warehouse that matches the TUMAP identified in the sample of the patient; and
- (d) manufacturing and/or formulating the personalized vaccine or compound-based or cellular therapy based on step (c);

wherein said warehouse comprises a peptide consisting of the amino acid sequence of SEQ ID NO: 1.

20. The method according to claim 19, wherein said TUMAP is identified by:

- (a1) comparing expression data from the tumor sample to expression data from a sample of normal tissue corresponding to the tissue type of the tumor sample to identify proteins that are over-expressed or aberrantly expressed in the tumor sample; and
- (a2) correlating the expression data with sequences of MHC ligands bound to MHC class I and/or class II molecules in the tumor sample to identify MHC ligands derived from proteins over-expressed or aberrantly expressed by the tumor.

21. The method according to claim 19 or 20, wherein the sequences of MHC ligands are identified by eluting bound peptides from MHC molecules isolated from the tumor sample, and sequencing the eluted ligands.
22. The method according to any one of claims 19 to 21, wherein the normal tissue corresponding to the tissue type of the tumor sample has been obtained from the same patient.
23. The method according to any of claims 19 to 22, wherein the immunogenicity of the peptides included in the warehouse is determined by a method comprising in vitro immunogenicity assays, MHC multimer staining, ELISPOT assays and/or intracellular cytokine staining.
24. The method according to any of claims 19 to 23, further comprising identifying at least one mutation that is unique to the tumor sample relative to normal corresponding tissue from the individual patient, and selecting a peptide that correlates with the mutation for inclusion in the vaccine or for the generation of cellular therapies.
25. The method according to claim 24, wherein said at least one mutation is identified by whole genome sequencing.