

also provides pharmaceutical compositions, comprising at least one active ingredient selected from (a) to (e) below and a pharmaceutically acceptable carrier:

- (a) a peptide of the present invention;
- (b) a polynucleotide encoding a peptide of the present invention in an expressible form;
- 5 (c) an APC of the present invention;
- (d) an exosome of the present invention; and
- (e) a CTL of the present invention.

Further, the pharmaceutical compositions of the present invention can comprise, as needed, stabilizers, suspensions, preservatives, surfactants, solubilizing agents, pH adjusters, aggregation inhibitors and such.

The DEPDC1 expression significantly up-regulates in cancer cells compared with normal tissues. Thus, a peptide of the present invention or a polynucleotide encoding the peptide can be used to treat and/or prevent cancer, and/or prevent postoperative recurrence thereof. Therefore, the present invention provides pharmaceutical compositions for treating and/or preventing cancer, and/or preventing postoperative recurrence thereof, comprising one or more types of peptides or polynucleotides of the present invention as an active ingredient.

Alternatively, the peptides of the present invention can be made to be presented on the surface of exosomes or APCs for use as pharmaceutical compositions. In addition, CTLs of the present invention targeting any one of the peptides of the present invention can also be used as an active ingredient of the pharmaceutical compositions of the present invention. The pharmaceutical compositions of the present invention may comprise a therapeutically effective amount or a pharmaceutically effective amount of the above-described active ingredient.

The pharmaceutical compositions of the present invention may also be used as a vaccine. In the context of the present invention, the term “vaccine” (also called “immunogenic composition”) refers to a composition that has a function of inducing an immune response that leads to antitumor action when inoculated into an animal. Thus, a pharmaceutical composition of the present invention can be used to induce an immune response that leads to antitumor action in a subject. The immune response induced by a peptide, a polynucleotide, an APC, a CTL and a pharmaceutical composition of the present invention is not particularly limited as long as it is an immune response that leads to antitumor action, and examples include induction of cancer cell-specific CTLs and induction of cancer cell-specific cytotoxic activity.

The pharmaceutical compositions of the present invention can be used to treat and/or prevent cancer, and/or prevent postoperative recurrence thereof in human subjects or patients. The pharmaceutical compositions of the present invention can be used preferably to a subject positive for at least one HLA selected from among HLA-A11 and HLA-A01. Further, the pharmaceutical compositions of the present invention can be used preferably to treat and/or

- (b) a polynucleotide encoding a peptide of the present invention in an expressible form;
- (c) an APC that presents on its surface a peptide of the present invention;
- (d) an exosome that presents on its surface a peptide of the present invention; and
- (e) a CTL of the present invention.

5           The present invention further provides methods or processes for manufacturing pharmaceutical compositions that induce an immune response against DEPDC1-expressing cancers, which is a method that may comprise a step of mixing or formulating a peptide or polynucleotide of the present invention with a pharmaceutically acceptable carrier.

10           Alternatively, the present invention provides methods for inhibiting proliferation of DEPDC1-expressing cancer cells or methods of inducing an immune response against DEPDC1-expressing cancers, which comprises a step of administering to a subject vaccines or pharmaceutical compositions comprising an active ingredient selected from below:

- (a) a peptide of the present invention;
- (b) a polynucleotide encoding a peptide of the present invention in an expressible form;
- 15       (c) an APC that presents a peptide of the present invention on its surface;
- (d) an exosome that presents a peptide of the present invention on its surface; and
- (e) a CTL of the present invention.

20           In the context of the present invention, DEPDC1-expressing cancers can be treated by administering a peptide, a polynucleotide, an APC, an exosome and/or a CTL of the present invention. Alternatively, an immune response against DEPDC1-expressing cancers can be induced by administering a peptide, a polynucleotide, an APC, an exosome and/or a CTL of the present invention. Examples of such cancers include bladder cancer, breast cancer, cervical cancer, cholangiocellular cancer, chronic myeloid leukemia (CML), colon cancer, gastric cancer, non-small-cell lung cancer (NSCLC), lymphoma, osteosarcoma, prostate cancer, small-cell lung cancer (SCLC), soft tissue tumor and such, but are not limited thereto. Further, an immune response against DEPDC1-expressing cancer cells can be induced by administering a peptide, a polynucleotide, an APC, an exosome and/or a CTL of the present invention. Therefore, before administering a vaccine or pharmaceutical composition comprising an active ingredient described above, it is preferable to confirm whether the level of DEPDC1 expression at a diseased site in the subject to be treated is augmented or not.

30           Thus, in one embodiment, the present invention provides a method of treating a DEPDC1-expressing cancer in a patient in need of the cancer treatment, wherein the method comprises the steps below:

- (i)     measuring the level of DEPDC1 expression in a biological sample collected from the diseased site of a subject with cancer;