CLAIMS

[Claim 1]

An isolated peptide of less than about 15 amino acids selected from the group consisting of peptides comprising the amino acid sequences of SEQ ID NO: 19, 22, 30, 34, 344, 358, 41, 44, 46, 48, 78, 80, 100, 101, 110, 111, 387, 112, 394, 395, 133, 135, 137, 426, 196, 202, 210, 213, 214, 217 or 223.

[Claim 2]

A peptide having cytotoxic T cell inducibility, wherein said peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO: SEQ ID NO: 19, 22, 30, 34, 344, 358, 41, 44, 46, 48, 78, 80, 100, 101, 110, 111, 387, 112, 394, 395, 133, 135, 137, 426, 196, 202, 210, 213, 214, 217 or 223, wherein 1, 2, or several amino acids are substituted, deleted, or added.

[Claim 3]

The peptide of claim 2, wherein the second amino acid from the N-terminus is phenylalanine, tyrosine, methionine, or tryptophan.

[Claim 4]

The peptide of claim 2 or 3, wherein the C-terminal amino acid is phenylalanine, leucine, isoleucine, tryptophan, or methionine.

[Claim 5]

An isolated peptide of less than about 15 amino acids selected from the group consisting of peptides comprising the amino acid sequences of SEQ ID NO: 376, 379, 114, 116, 117, 121, 227, 228, 233, 254, 271, 272 or 288.

[Claim 6]

A peptide having cytotoxic T cell inducibility, wherein said peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO: SEQ ID NO: 376, 379, 114, 116, 117, 121, 227, 228, 233, 254, 271, 272 or 288, wherein 1, 2, or several amino acids are substituted, deleted, or added.

[Claim 7]

The peptide of claim 6, wherein the second amino acid from the N-terminus is leucine or methionine.

[Claim 8]

The peptide of claim 6 or 7, wherein the C-terminal amino acid is valine or leucine.

[Claim 9]

A pharmaceutical composition for treating or preventing a disease associated with over-expression of the genes of SEQ ID NO: 1, 3, 5, 7, 9, 13, 15 and/or 17 said composition comprising one or more peptides of claim 1 to 8 or a polynucleotide encoding the peptides.

[Claim 10]

A pharmaceutical composition of claim 9, wherein the disease associating genes of SEQ ID NO: 1, 3, 5, 7, 9, 13, 15 and/or 17 include cancers.

[Claim 11]

A pharmaceutical composition of claim 10, wherein the cancers include bladder cancer, breast cancer,

cervical cancer, cholangincellular carcinoma, CML, colorectal cancer, endometriosis, esophageal cancer, gastric cancer, diffused type gastric cancer, liver, NSCLC, lymphoma, osteosarcoma, ovarian cancer, pancreatic cancer, prostate cancer, renal carcinoma, SCLC, soft tissue tumor and testicular tumor.

[Claim 12]

An exosome that presents on its surface a complex comprising a peptide of claim 1-4 and an HLA antigen.

[Claim 13]

The exosome of claim 12, wherein the HLA antigen is HLA-A24.

[Claim 14]

The exosome of claim 13, wherein the HLA antigen is HLA-A2402.

[Claim 15]

An exosome that presents on its surface a complex comprising a peptide of claim 5-8 and an HLA antigen.

[Claim 16]

The exosome of claim 15, wherein the HLA antigen is HLA-A2.

[Claim 17]

The exosome of claim 16, wherein the HLA antigen is HLA-A0201.

[Claim 18]

A method of inducing antigen-presenting cells having a high cytotoxic T cell inducibility comprising the step of contacting an antigen-presenting cell with a peptide of claim 1-8.

[Claim 19]

A method of inducing cytotoxic T cells by contacting a T cell with a peptide of claim 1-8.

[Claim 20]

A method of inducing antigen-presenting cells having high cytotoxic T cell inducibility, said method comprising the step of transferring a gene comprising a polynucleotide encoding a peptide of claim 1 to 8 to an antigen-presenting cell.

[Claim 21]

An isolated cytotoxic T cell, which is induced by contacting a T cell with a peptide of claim 1-8 or which is transduced with the nucleic acids encoding the TCR subunits polypeptides binding with a peptide of any one claims 1 to 8 in the context of HLA-A24 or HLA-A2.

[Claim 22]

An antigen-presenting cell, which comprises a complex formed between an HLA antigen and a peptide of claim 1 to 8.

[Claim 23]

An antigen-presenting cell, induced by the method of claim 18-20.

[Claim 24]

A vaccine for inhibiting proliferation of cells expressing genes of 1, 3, 5, 7, 9, 13, 15 and/or 17 wherein the vaccine comprises a peptide of claim 1-8 as the active ingredient.

[Claim 25]

The vaccine of claim 24, wherein the cells expressing genes of 1, 3, 5, 7, 9, 13, 15 and/or 17 include cancers.

[Claim 26]

The vaccine of claim 25, wherein the cancers include bladder cancer, breast cancer, cervical cancer, cholangincellular carcinoma, CML, colorectal cancer, endometriosis, esophageal cancer, gastric cancer, diffused type gastric cancer, liver, NSCLC, lymphoma, osteosarcoma, ovarian cancer, pancreatic cancer, prostate cancer, renal carcinoma, SCLC, soft tissue tumor and testicular tumor.

[Claim 27]

The vaccine of claim 26, formulated for administration to a subject whose HLA antigen is HLA-A24 or HLA-A2.

[Claim 28]

A method of treating or preventing a disease associated with over-expression of the genes of 1, 3, 5, 7, 9, 13, 15 and/or 17 in a subject comprising administering to said subject a vaccine comprising a peptide of claim 1-8, an immunologically active fragment thereof, or a polynucleotide encoding said peptide or immunologically active fragment.

[Claim 29]

The method of claim 28, wherein the disease associating genes of 1, 3, 5, 7, 9, 13, 15 and/or 17 include cancers.

[Claim 30]

A method of treating or preventing cancers of claim 29, wherein the cancer cells include bladder cancer, breast cancer, cervical cancer, cholangincellular carcinoma, CML, colorectal cancer, endometriosis, esophageal cancer, gastric cancer, diffused type gastric cancer, liver, NSCLC, lymphoma, osteosarcoma, ovarian cancer, pancreatic cancer, prostate cancer, renal carcinoma, SCLC, soft tissue tumor and testicular tumor.

[Claim 31]

A method of screening for a peptide which 1, 2, or several amino acids are substituted, wherein said peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO: SEQ ID NO: 19, 22, 30, 34, 344, 358, 41, 44, 46, 48, 78, 80, 100, 101, 110, 111, 387, 112, 394, 395, 133, 135, 137, 426, 196, 202, 210, 213, 214, 217 or 223, said method comprising the steps of:

(a) comforming no significant sequence homology to the entire sequence of 1, 2 or several amino acids substitute;

(b) measuring the CTL inducibility of the candidate substitute peptide; and

(c) selecting the peptide which CTL inducibility is same to or higher than the original peptide.

CLAIMS

[Claim 1]
An isolated peptide of less than about 15 amino acids selected from the group consisting of peptides comprising the amino acid sequences of SEQ ID NO: 19, 22, 30, 34, 344, 358, 41, 44, 46, 48, 78, 80, 100, 101, 110, 111, 387, 112, 394, 395, 133, 135, 137, 426, 174, 178, 186, 194, 196, 202, 210, 213, 214, 217 or 223.
[Claim 2]
A peptide having cytotoxic T cell inducibility, wherein said peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO: SEQ ID NO: 19, 22, 30, 34, 344, 358, 41, 44, 46, 48, 78, 80, 100, 101, 110, 111, 387, 112, 394, 395, 133, 135, 137, 426, 174, 178, 186, 194, 196, 202, 210, 213, 214, 217 or 223, wherein 1, 2, or several amino acids are substituted, deleted, or added.
[Claim 3]
The peptide of claim 2, wherein the second amino acid from the N-terminus is phenylalanine, tyrosine, methionine, or tryptophan.
[Claim 4]
The peptide of claim 2 or 3, wherein the C-terminal amino acid is phenylalanine, leucine, isoleucine, tryptophan, or methionine.
[Claim 5]
An isolated peptide of less than about 15 amino acids selected from the group consisting of peptides comprising the amino acid sequences of SEQ ID NO: 376, 379, 114, 116, 117, 121, 227, 228, 233, 254, 271, 272 or 288.
[Claim 6]
A peptide having cytotoxic T cell inducibility, wherein said peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO: SEQ ID NO: 376, 379, 114, 116, 117, 121, 227, 228, 233, 254, 271, 272 or 288, wherein 1, 2, or several amino acids are substituted, deleted, or added.
[Claim 7]
The peptide of claim 6, wherein the second amino acid from the N-terminus is leucine or methionine.
[Claim 8]
The peptide of claim 6 or 7, wherein the C-terminal amino acid is valine or leucine.
[Claim 9]
A pharmaceutical composition for treating or preventing a disease associated with over-expression of the genes of SEQ ID NO: 1, 3, 5, 7, 9, 11, 13, 15 and/or 17 said composition comprising one or more peptides of claim 1 to 8 or a polynucleotide encoding the peptides.
[Claim 10]
A pharmaceutical composition of claim 9, wherein the disease associating genes of SEQ ID NO: 1, 3, 5, 7, 9, 11, 13, 15 and/or 17 include cancers.
[Claim 11]
A pharmaceutical composition of claim 10, wherein the cancers include bladder cancer, breast cancer, cervical cancer, cholangincellular carcinoma, CML, colorectal cancer, endometriosis, esophageal cancer, gastric cancer, diffused type gastric cancer, liver cancer, NSCLC, lymphoma, osteosarcoma, ovarian cancer, pancreatic cancer, prostate cancer, renal carcinoma, SCLC, soft tissue tumor and

testicular tumor.
[Claim 12]
An exosome that presents on its surface a complex comprising a peptide of claim 1-4 and an HLA antigen.
[Claim 13]
The exosome of claim 12, wherein the HLA antigen is HLA-A24.
[Claim 14]
The exosome of claim 13, wherein the HLA antigen is HLA-A2402.
[Claim 15]
An exosome that presents on its surface a complex comprising a peptide of claim 5-8 and an HLA antigen.
[Claim 16]
The exosome of claim 15, wherein the HLA antigen is HLA-A2.
[Claim 17]
The exosome of claim 16, wherein the HLA antigen is HLA-A0201.
[Claim 18]
A method of inducing antigen-presenting cells having a high cytotoxic T cell inducibility comprising the step of contacting an antigen-presenting cell with a peptide of claim 1-8.
[Claim 19]
A method of inducing cytotoxic T cells by contacting a T cell with a peptide of claim 1-8.
[Claim 20]
A method of inducing antigen-presenting cells having high cytotoxic T cell inducibility, said method comprising the step of transferring a gene comprising a polynucleotide encoding a peptide of claim 1 to 8 to an antigen-presenting cell.
[Claim 21]
An isolated cytotoxic T cell, which is induced by contacting a T cell with a peptide of claim 1-8 or which is transduced with the nucleic acids encoding the TCR subunits polypeptides binding with a peptide of any one claims 1 to 8 in the context of HLA-A24 or HLA-A2.
[Claim 22]
An antigen-presenting cell, which comprises a complex formed between an HLA antigen and a peptide of claim 1 to 8.
[Claim 23]
An antigen-presenting cell, induced by the method of claim 18-20.
[Claim 24]
A vaccine for inhibiting proliferation of cells expressing genes of SEQ ID NO: 1, 3, 5, 7, 9, 11, 13, 15 and/or 17 wherein the vaccine comprises a peptide of claim 1-8 as the active ingredient.
[Claim 25]
The vaccine of claim 24, wherein the cells expressing genes of SEQ ID NO: 1, 3, 5, 7, 9, 11, 13, 15 and/or 17 include cancers.
[Claim 26]
The vaccine of claim 25, wherein the cancers include bladder cancer, breast cancer, cervical cancer, cholangincellular carcinoma, CML, colorectal cancer, endometriosis, esophageal cancer, gastric cancer, diffused type gastric cancer, liver cancer, NSCLC, lymphoma, osteosarcoma, ovarian cancer, pancreatic cancer, prostate cancer, renal carcinoma, SCLC, soft tissue tumor and testicular tumor.
[Claim 27]
The vaccine of claim 26, formulated for administration to a subject whose HLA antigen is HLA-A24 or HLA-A2.
[Claim 28]
A method of treating or preventing a disease associated with over-expression of the genes of SEQ ID NO: 1, 3, 5, 7, 9, 11, 13, 15 and/or 17 in a subject comprising admin-

istering to said subject a vaccine comprising a peptide of claim 1-8, an immunologically active fragment thereof, or a polynucleotide encoding said peptide or immunologically active fragment.

[Claim 29]

The method of claim 28, wherein the disease associating genes of SEQ ID NO: 1, 3, 5, 7, 9, 11, 13, 15 and/or 17 include cancers.

[Claim 30]

A method of treating or preventing cancers of claim 29, wherein the cancer cells include bladder cancer, breast cancer, cervical cancer, cholangincellular carcinoma, CML, colorectal cancer, endometriosis, esophageal cancer, gastric cancer, diffused type gastric cancer, liver cancer, NSCLC, lymphoma, osteosarcoma, ovarian cancer, pancreatic cancer, prostate cancer, renal carcinoma, SCLC, soft tissue tumor and testicular tumor.

[Claim 31]

A method of screening for a peptide which 1, 2, or several amino acids are substituted, wherein said peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO: SEQ ID NO: 19, 22, 30, 34, 344, 358, 41, 44, 46, 48, 78, 80, 100, 101, 110, 111, 387, 112, 394, 395, 133, 135, 137, 426, 174, 178, 186, 194, 196, 202, 210, 213, 214, 217 or 223, said method comprising the steps of:

(a) comforming no significant sequence homology to the entire sequence of 1, 2 or several amino acids substitute;

(b) measuring the CTL inducibility of the candidate substitute peptide; and

(c) selecting the peptide which CTL inducibility is same to or higher than the original peptide.