CLAIMS

[Claim 1]

A method for solubilizing an insoluble protein and/or peptide, the method comprising:

a step of mixing an insoluble protein and/or peptide and a denaturing agent in one solution, and dissolving the insoluble protein and/or peptide, thereby forming a solution of the insoluble protein and/or peptide; a step of adding a nucleotide to the solution wherein the final concentration of the nucleotide in the solution is 0.5 mM to 10 mM; and a step of removing the denaturing agent from the solution.

[Claim 2]

The method for solubilizing an insoluble protein and/or peptide according claim 1, wherein the nucleotide is deoxyribonucleotide or ribonucleotide.

[Claim 3]

The method for solubilizing an insoluble protein and/or peptide according claim 1 or 2, wherein a base constituting the nucleotide is any one of adenine, cytosine, guanine, thymine, and uracil; and a combination of one or more of the nucleotides is added.

[Claim 4]

The method for solubilizing an insoluble protein and/or peptide according to any one of claims 1 to 3, wherein the number of phosphate groups constituting the nucleotide is one to three.

[Claim 5]

The method for solubilizing an insoluble protein and/or peptide according to any one of claims 1 to 4, wherein the nucleotide is added after or concurrently with mixing the insoluble protein and/or peptide with the denaturing agent.

[Claim 6]

The method for solubilizing an insoluble protein and/or peptide according to any one of claims 1 to 5, wherein in the step of removing the denaturing agent from the solution, the denaturing agent is removed while the solution is replaced with a physiological solvent, and preferably the physiological solvent includes nucleotide.

[Claim 7]

The method for solubilizing an insoluble protein and/or peptide according to any one of claims 1 to 6, wherein the insoluble protein and/or peptide is a naturally

occurring protein and/or peptide, a protein and/or peptide produced by a gene recombination technology, or chemically synthesized protein and/or peptide.

[Claim 8]

The method for solubilizing an insoluble protein and/or peptide according to any one of claims 1 to 7, wherein the insoluble protein and/or peptide is an antigen protein.

[Claim 9]

The method for solubilizing an insoluble protein and/or peptide according to any one of claims 1 to 8, wherein the denaturing agent is urea and/or guanidine hydrochloride.

[Claim 10]

The method for solubilizing an insoluble protein and/or peptide according to any one of claims 1 to 9, wherein in the step of mixing the insoluble protein and/or peptide and the denaturing agent in one solution, a reducing agent is further added.

[Claim 11]

The method for solubilizing an insoluble protein and/or peptide according to any one of claims 1 to 10, wherein the reducing agent is dithiothreitol or 2-mercaptoethanol.

[Claim 12]

A method for introducing an insoluble protein and/or peptide into a cell, the method comprising:

a step of mixing an insoluble protein and/or peptide and a denaturing agent in one solution, and dissolving the insoluble protein and/or peptide, thereby forming a solution of the insoluble protein and/or peptide;

a step of adding a nucleotide to the solution wherein the final concentration of the nucleotide in the solution is 0.5 mM to 10 mM;

a step of removing the denaturing agent while the solution is replaced with a physiological solvent, thereby forming a physiological solution of the insoluble protein and/or peptide; and

introducing the physiological solution into cytoplasm or inside of a desired cell.

[Claim 13]

The method for introducing an insoluble protein and/or peptide into a cell according claim 12, wherein the nucleotide is deoxyribonucleotide or ribonucleotide.

[Claim 14]

The method for introducing an insoluble protein and/or peptide into a cell according to claim 12 or 13, wherein a base constituting the nucleotide is any one of adenine, cytosine, guanine, thymine, and uracil; and a combination of one or more of the nucleotides is added.

[Claim 15]

The method for introducing an insoluble protein and/or peptide into a cell according to any one of claims 12 to 14, wherein the number of phosphate groups constituting the nucleotide is one to three.

[Claim 16]

The method for introducing an insoluble protein and/or peptide into a cell according to any one of claims 12 to 15, wherein the nucleotide is added after or concurrently with mixing the insoluble protein and/or peptide with the denaturing agent.

[Claim 17]

The method for introducing an insoluble protein and/or peptide into a cell according to any one of claims 12 to 16, wherein the physiological solvent to be used for replacing the solution of the protein and/or peptide includes nucleotide.

[Claim 18]

The method for introducing an insoluble protein and/or peptide into a cell according to any one of claims 12 to 17, wherein the cell is a cell having an antigen presenting function.

[Claim 19]

The method for introducing an insoluble protein and/or peptide into a cell according to any one of claims 12 to 18, wherein the cell having the antigen presenting function is a dendritic cell.

[Claim 20]

The method for introducing an insoluble protein and/or peptide into a cell according to any one of claims 12 to 19, wherein the insoluble protein and/or peptide is a naturally occurring protein and/or peptide, a protein and/or peptide produced by a gene recombination technology, or chemically synthesized protein and/or peptide.

[Claim 21]

The method for introducing an insoluble protein and/or peptide into a cell according to any one of claims 12 to 20, wherein the insoluble protein and/or peptide is an antigen protein or peptide.

[Claim 22]

The method for introducing an insoluble protein and/or peptide into a cell according to any one of claims 12 to 21, wherein the denaturing agent is urea and/or guanidine hydrochloride.

[Claim 23]

The method for introducing an insoluble protein and/or peptide into a cell according to any one of claims 12 to 22, wherein in the step of mixing the insoluble protein and/or peptide and the denaturing agent in one solution, a reducing agent is further added.

[Claim 24]

The method for introducing an insoluble protein and/or peptide into a cell according to any one of claims 12 to 23, wherein the reducing agent is dithiothreitol or 2-mercaptoethanol.

[Claim 25]

The method for introducing an insoluble protein and/or peptide into a cell according to any one of claims 12 to 24, wherein the solubilized insoluble protein and/or peptide is introduced into cytoplasm and/or inside a cell by electroporation.

[Claim 26]

A method for producing an antigen presenting cell that presents an insoluble antigen, the method comprising:

a step of mixing the insoluble antigen and a denaturing agent in one solution, and dissolving the insoluble antigen, thereby forming a solution containing the insoluble antigen;

a step of adding a nucleotide to the solution wherein the final concentration of the nucleotide in the solution is 0.5 mM to 10 mM;

a step of removing the denaturing agent while the solution is replaced with a physiological solvent, thereby forming a physiological solution containing the insoluble antigen; and

introducing the physiological solution containing the insoluble antigen into cytoplasm or inside of the antigen presenting cell.

[Claim 27]

The method for producing an antigen presenting cell according to claim 26, wherein the nucleotide is deoxyribonucleotide or ribonucleotide.

[Claim 28]

The method for producing an antigen presenting cell according to claim 26 or 27, wherein a base constituting the nucleotide is any one of adenine, cytosine, guanine, thymine, and uracil; and a combination of one or more of the nucleotides is added.

[Claim 29]

The method for producing an antigen presenting cell according to any one of claims 26 to 28, wherein the number of phosphate groups constituting the nucleotide is one to three.

[Claim 30]

The method for producing an antigen presenting cell according to any one of claims 26 to 29, wherein the physiological solvent to be used for replacing the solution of the antigen includes nucleotide.

[Claim 31]

The method for producing an antigen presenting cell according to any one of claims 26 to 30, wherein the antigen is an insoluble fraction obtained from a fractured product of a tumor cell, a tumor tissue, an infectious disease cell or a pathogenic cell.

[Claim 32]

The method for producing an antigen presenting cell according to any one of claims 26 to 31, wherein the antigen is a protein or a peptide.

[Claim 33]

The method for producing an antigen presenting cell according to any one of claims 26 to 32, wherein the antigen is a naturally occurring protein and/or peptide, a protein and/or peptide produced by a gene recombination technology, or chemically synthesized protein and/or peptide.

[Claim 34]

The method for producing an antigen presenting cell according to any one of claims 26 to 33, wherein the antigen presenting cell is a dendritic cell.

[Claim 35]

The method for producing an antigen presenting cell according to any one of claims 26 to 34, wherein the denaturing agent is urea and/or guanidine hydrochloride.

[Claim 36]

The method for producing an antigen presenting cell according to any one of claims 26 to 35, wherein in the step of mixing the insoluble protein and/or peptide and the denaturing agent in one solution, a reducing agent is further added.

[Claim 37]

The method for producing an antigen presenting cell according to any one of claims 26 to 36, wherein the reducing agent is dithiothreitol or 2-mercaptoethanol.

[Claim 38]

An antigen presenting cell produced by the producing method according to any one of claims 26 to 37.

[Claim 39]

A composition for inducing a cytotoxic T cell, the composition comprising, as an active ingredient, an antigen presenting cell produced by a producing method according to any one of claims 26 to 37.

[Claim 40]

A composition for treating or preventing cancer and/or an infectious disease, the composition comprising, as an active ingredient, an antigen presenting cell produced by a producing method according to any one of claims 26 to 37.

[Claim 41]

Use of an antigen presenting cell produced by a producing method according to any one of claims 26 to 37 in the manufacture of a medicament for treating or preventing cancer and/or an infectious disease.