CLAIMS

1. An immunoreactive substance carrier, comprising:

porous silica particle which carry an antibody or cytokine,

wherein the porous silica particles are prepared by: reacting silica particles having pores with a pore diameter of less than 5 nm with a swelling agent at 120 to 180 °C for 24 to 96 hours to expand the pores with a pore diameter of less than 5 nm; and calcining the silica particles having expanded pores at a temperature of 400 °C or higher for at least 3 hours,

an average diameter of the porous silica particles ranges from 150 to 1000 nm, a BET surface area ranges from 200 to 700 m^2/g, and a volume per g ranges from 0.7 to 2.2 ml,

the porous silica particles have a plurality of pores with a diameter of 5 nm to 100 nm, and

the porous silica particles are characterized in that t, at which an absorbance ratio in the following Equation 1 becomes 1/2, is 24 or more,

[Equation 1]

A_t/A_0

(wherein A_0 is absorbance of the porous silica particles at λ = 640nm measured by placing 5 ml of suspension containing 1 mg/ml of porous silica particles in

a cylindrical permeable membrane having pores with a pore diameter of 50 kDa,

15 ml of the same solvent as the suspension comes into contact with outside of the permeable membrane, and the inside/outside of the permeable membrane is horizontally stirred at 60 rpm and 37 °C,

pH of the suspension is 7.4, and

A_t indicates absorbance of the porous silica particle measured after lapse of "t" hours since A_0 was measured).

2. The immunoreactive substance carrier according to claim 1, wherein the antibody is an antibody specifically bound to interleukins or interferon protein.

3. The immunoreactive substance carrier according to claim 1, wherein the antibody is IgG or an antibody specifically bound to at least one protein selected from the group consisting of PD-1, CTLA-4, TIM-3, BTLA, VISTA, LAG-3, PD-L1, PD-L2, B7-H3, B7-H4, CD28, CD27, CD137, HVEM, GITR, VEGFR, VEGF, EGFR, EGF, IL-1, IL-6, IL-23, TGF-beta, CTGF, TSLP, TNF-alpha, Notch and OX40.

4. The immunoreactive substance carrier according to claim 1, wherein the antibody is an antibody specifically bound to at least one selected from the group consisting of

PD-1, PD-L1 and CTLA-4.

5. The immunoreactive substance carrier according to claim 1, wherein the cytokine is interleukins or interferons.

6. The immunoreactive substance carrier according to claim 1, wherein the cytokine is at least one selected from the group consisting of IL-7, IL-10, IL-12, IL-13, IL-15, IL-21, IL-23, IL-24, IL-27, G-CSF, GM-CSF, HGF, EGF, VEGF, LTF, TGF-β and IL-2.

7. The immunoreactive substance carrier according to claim 1, wherein the cytokine is at least one selected from the group consisting of IL-2, IL-12, IL-15, IL-21, IL-24 and IL-13.

8. The immunoreactive substance carrier according to claim 1, wherein the porous silica particles are charged at neutral pH on an outer surface thereof or an inside of the pores.

9. The immunoreactive substance carrier according to claim 1, wherein the porous silica particles have hydrophilic or hydrophobic functional groups on the outer

surface thereof or an inside the pores.

10. The immunoreactive substance carrier according to claim 1, wherein the carrier includes the porous silica particles loaded with the antibody and the porous silica particles loaded with the cytokine.

11. An immunoreactive substance carrier, comprising:

porous silica particle which carry an antibody or cytokine,

wherein the porous silica particles have an average diameter ranges from 150 to 1000 nm, a BET surface area ranges from 200 to 700 m^2/g, and a volume per g ranges from 0.7 to 2.2 ml,

the porous silica particles have a plurality of pores with a diameter of 5 nm to 100 nm, and

the porous silica particles are characterized in that t, at which an absorbance ratio in the following Equation 1 becomes 1/2, is 24 or more,

[Equation 1]

A_t/A_0

(wherein A_0 is absorbance of the porous silica particles measured by placing 5 ml of suspension containing 1 mg/ml of porous silica particles in a cylindrical permeable membrane having pores with a pore diameter of 50

kDa,

15 ml of the same solvent as the suspension comes into contact with outside of the permeable membrane, and the inside/outside of the permeable membrane is horizontally stirred at 60 rpm and 37 °C,

pH of the suspension is 7.4, and

At indicates absorbance of the porous silica particle measured after lapse of "t" hours since A_0 was measured).

12. An immunotherapeutic composition, comprising the immunoreactive substance carrier according to any one of claims 1 to 11.

13. A pharmaceutical composition for use in the prevention or treatment of cancers or immune diseases, comprising the immunoreactive substance carrier according to any one of claims 1 to 11.