cells.

[0015]

The present invention includes the following aspects, although not limited thereto.

[Aspect 1]

A method for isolating, removing and/or analyzing cells, including: filtering a liquid sample containing cells with a polyimide porous film, and examining one or more cell properties selected from the group consisting of the number or type of cells, external or internal structure of the cells, type or amount of cell surface antigens, type or amount of substances secreted from the cells, cell adhesion and cell survival rate for cells that were captured in the polyimide porous film without being filtered by the film as well as cells in the liquid sample that passed through the polyimide porous film.

[Aspect 1a]

A method for isolating, removing and/or analyzing cells, including: filtering a liquid sample containing cells with a polyimide porous film, and examining one or more cell properties selected from the group consisting of the number or type of cells, external or internal structure of the cells, type or amount of cell surface antigens, type or amount of substances secreted from the cells, cell adhesion and cell survival rate for cells that were captured in the polyimide porous film without being filtered by the film as well as cells in the liquid sample that passed through the polyimide porous film, wherein the porous polyimide film has a three-layer structure consisting of an A-surface layer having a plurality of pores and a B-surface layer having a plurality of pores, and a macro-void layer sandwiched between the two surface layers, a mean pore size in the A-surface layer is smaller than a mean pore size in the B-surface layer, and the macro-void layer has a partition bonded to the A-surface layer and the B-surface layer, and a plurality of macro-void surrounded by the

partition, the A-surface layer, and the B-surface layer.

[Aspect 2]

The method described in Aspect 1, wherein the target cells are activated cells.

[Aspect 3]

The method described in Aspect 2, wherein the activated cells are activated leukocytes.

[Aspect 4]

The method described in any of Aspects 1 to 3, which includes a step for pretreating all or a portion of the surface of the polyimide porous film prior to the filtration step.

[Aspect 5]

The method described in Aspect 4, wherein surface treatment of the polyimide porous film is carried out using one or more agents or treatment methods selected from the group consisting of an anticoagulant, collagen, poly-L-lysine, UV light, plasma irradiation and the product of bonding pyridyl disulfide to a terpolymer composed of polyethylene oxide, polypropylene oxide and polyethylene oxide (PDS bound to a hydrophilic resin).

[Aspect 6]

The method described in any of Aspects 1 to 5, wherein the liquid sample containing cells is filtered with the polyimide porous film after having added a cell activator to the liquid sample and culturing the cells.

[Aspect 7]

A screening method for cell activation inhibitors, including:

(i) adding a cell activator to a liquid sample containing cells followed by culturing the cells depending on the case,

(ii) adding a test substance to the liquid sample of (i),

(iii) filtering the liquid sample of (ii) with a polyimide porous film and examining one or more cell properties selected from the group consisting of the

number or type of cells, external or internal structure of the cells, type or amount of cell surface antigens, type or amount of substances secreted from the cells, cell adhesion and cell survival rate for cells that were captured by the polyimide porous film without being filtered by the film as well as cells in the liquid sample that passed through the polyimide porous film, and

(iv) judging the test substance to be a cell activation inhibitor in the case the ratio and/or number of activated cells captured by the polyimide porous film without passing through the film decreases to a greater degree than in the case of not adding the test substance in step (ii), or in the case the ratio and/or number of activated cells in the liquid sample that passed through the polyimide porous film increases to a greater degree than in the case of not adding the test substance in step (ii).

[Aspect 7a]

A screening method for cell activation inhibitors, including:

(i) adding a cell activator to a liquid sample containing cells followed by culturing the cells depending on the case,

(ii) adding a test substance to the liquid sample of (i),

(iii) filtering the liquid sample of (ii) with a polyimide porous film and examining one or more cell properties selected from the group consisting of the number or type of cells, external or internal structure of the cells, type or amount of cell surface antigens, type or amount of substances secreted from the cells, cell adhesion and cell survival rate for cells that were captured by the polyimide porous film without being filtered by the film as well as cells in the liquid sample that passed through the polyimide porous film, and

(iv) judging the test substance to be a cell activation inhibitor in the case the ratio and/or number

of activated cells captured by the polyimide porous film without passing through the film decreases to a greater degree than in the case of not adding the test substance in step (ii), or in the case the ratio and/or number of activated cells in the liquid sample that passed through the polyimide porous film increases to a greater degree than in the case of not adding the test substance in step (ii). , wherein the porous polyimide film has a three-layer structure consisting of an A-surface layer having a plurality of pores and a B-surface layer having a plurality of pores, and a macro-void layer sandwiched between the two surface layers, a mean pore size in the A-surface layer is smaller than a mean pore size in the B-surface layer, and the macro-void layer has a partition bonded to the A-surface layer and the B-surface layer, and a plurality of macro-void surrounded by the partition, the A-surface layer, and the B-surface layer.

[Aspect 8]

The method described in any of Aspects 1 to 7, wherein the liquid sample containing cells contains one or more types of cells selected from the group consisting of primary cultured cells, established cells and isolated

CLAIMS

1. A method for isolating, removing and/or analyzing cells, including: filtering a liquid sample containing cells with a polyimide porous film, and examining one or more cell properties selected from the group consisting of the number or type of cells, external or internal structure of the cells, type or amount of cell surface antigens, type or amount of substances secreted from the cells, cell adhesion and cell survival rate for cells that were captured in the polyimide porous film without being filtered by the film as well as cells in the liquid sample that passed through the polyimide porous film, wherein the porous polyimide film has a three-layer structure consisting of an A-surface layer having a plurality of pores and a B-surface layer having a plurality of pores, and a macro-void layer sandwiched between the two surface layers, a mean pore size in the A-surface layer is smaller than a mean pore size in the B-surface layer, and the macro-void layer has a partition bonded to the A-surface layer and the B-surface layer, and a plurality of macro-void surrounded by the partition, the A-surface layer, and the B-surface layer.

2. The method according to claim 1, wherein the target cells are activated cells.

3. The method according to claim 2, wherein the activated cells are activated leukocytes.

4. The method according to any one of claims 1 to 3, which includes a step for pretreating all or a portion of the surface of the polyimide porous film prior to the filtration step.

5. The method according to claim 4, wherein surface treatment of the polyimide porous film is carried out using one or more agents or treatment methods selected from the group consisting of an anticoagulant, collagen, poly-L-lysine, UV light, plasma irradiation and PDS bound to a hydrophilic resin.

6. The method according to any one of claims 1 to

5, wherein the liquid sample containing cells is filtered with the polyimide porous film after having added a cell activator to the liquid sample and culturing the cells.

7. A screening method for cell activation inhibitors, including:

(i) adding a cell activator to a liquid sample containing cells followed by culturing the cells depending on the case,

(ii) adding a test substance to the liquid sample of (i),

(iii) filtering the liquid sample of (ii) with a polyimide porous film and examining one or more cell properties selected from the group consisting of the number or type of cells, external or internal structure of the cells, type or amount of cell surface antigens, type or amount of substances secreted from the cells, cell adhesion and cell survival rate for cells that were captured by the polyimide porous film without being filtered by the film as well as cells in the liquid sample that passed through the polyimide porous film, and

(iv) judging the test substance to be a cell activation inhibitor in the case the ratio and/or number of activated cells captured by the polyimide porous film without passing through the film decreases to a greater degree than in the case of not adding the test substance in step (ii), or in the case the ratio and/or number of activated cells in the liquid sample that passed through the polyimide porous film increases to a greater degree than in the case of not adding the test substance in step (ii) , wherein the porous polyimide film has a three-layer structure consisting of an A-surface layer having a plurality of pores and a B-surface layer having a plurality of pores, and a macro-void layer sandwiched between the two surface layers, a mean pore size in the A-surface layer is smaller than a mean pore size in the B-surface layer, and the macro-void layer has a partition bonded to the A-surface layer and the B-surface layer,

and a plurality of macro-void surrounded by the partition, the A-surface layer, and the B-surface layer.

8. The method according to any one of claims 1 to 7, wherein the liquid sample containing cells contains one or more types of cells selected from the group consisting of primary cultured cells, established cells and isolated blood cells.

9. The method according to any one of claims 1 to 7, wherein the liquid sample containing cells is a biological sample selected from the group consisting of blood, urine, sweat, accumulated coelomic fluid, body cavity washings and sputum.

10. The method according to any one of claims 1 to 9, wherein the filtration is that selected from the group consisting of natural gravity filtration, centrifugal filtration, vacuum filtration and pressure filtration.

11. The method according to any one of claims 1 to 10, including additionally culturing cells present in the liquid sample that passed through the polyimide porous film.

12. The method according to any one of claims 1 to 10, including additionally culturing cells captured in the polyimide porous film without passing through the film while still applied to the polyimide porous film.

13. The method according to any one of claims 1 to 12, wherein the polyimide porous film is a polyimide porous film containing a polyimide obtained from a tetracarboxylic dianhydride and a diamine.

14. The method according to claim 13, wherein the polyimide porous film is a colored polyimide porous film obtained by forming a polyamic acid solution composition containing a polyamic acid solution, obtained from a tetracarboxylic dianhydride and a diamine, and a colored precursor, followed by heat-treating at 250°C or higher.

15. The method according to claim 13 or 14, wherein the polyimide porous film is a multilayer-structured polyimide porous film having two different surface and

macrovoid layers.

16. The method according to claim 15, wherein the film thickness of the polyimide porous film is 75 μm or less.

17. The method according to any one of claims 1 to 16, wherein two or more polyimide porous films are used laminated above and below or side to side.

18. A device containing a polyimide porous film for use in the method according to any one of claims 1 to 17.

19. A kit containing a polyimide porous film for use in the method according to any one of claims 1 to 17.

20. A use of a polyimide porous film for the method according to any one of claims 1 to 17.