CLAIMS

1. A method for producing a recombinant protein aggregate comprising the following steps (A) to (C):

a step (A) of disrupting a recombinant cell expressing a target recombinant protein as insoluble bodies in the cell to obtain a disrupted suspension containing the insoluble bodies of the recombinant protein;

a step (B) of adding one or more selected from the group consisting of a metal salt, an acid, and an anionic flocculant to the disrupted suspension obtained in the step (A), and aggregating the insoluble bodies of the recombinant protein to obtain the recombinant protein aggregate; and

a step (C) of separating the aggregate obtained in the step (B) from the suspension, wherein the recombinant protein is not substantially dissolved in the disrupted suspension.

2. The method for producing a recombinant protein aggregate according to claim 1, further comprising:

separating the recombinant protein aggregate by a centrifugal force of 10,000 × g or less.

3. The method for producing a recombinant protein aggregate according to claim 1, further comprising:

separating the recombinant protein aggregate by using a centrifuge selected from the group consisting of a separation plate type centrifuge, a basket type centrifuge, and a decanter type centrifuge.

4. The method for producing a recombinant protein aggregate according to claim 1, further comprising:

separating the recombinant protein aggregate by spontaneous

sedimentation or filtration.

5. The method for producing a recombinant protein aggregate according to claim 1, further comprising:

heating in the step (B).

6. The method for producing a recombinant protein aggregate according to claim 5, further comprising:

stirring in the step (B).

7. The method for producing a recombinant protein aggregate according to claim 1, wherein the metal salt is a metal salt selected from the group consisting of an alkaline earth metal salt and an earth metal salt.

8. The method for producing a recombinant protein aggregate according to claim 7, wherein the metal salt is a metal salt selected from the group consisting of an alkaline earth metal halide, an alkaline earth metal nitrate, an alkaline earth metal sulfate, an earth metal halide, an earth metal nitrate, and an earth metal sulfate.

9. The method for producing a recombinant protein aggregate according to claim 1, wherein the acid is an oxo acid.

10. The method for producing a recombinant protein aggregate according to claim 9, wherein the oxo acid is an oxo acid selected from the group consisting of acetic acid, sulfuric acid, and citric acid.

11. The method for producing a recombinant protein aggregate according to claim 1, wherein the anionic flocculant is an anionic flocculant selected from the group consisting of a polyacrylate, an anionic polyacrylamide, and an acrylamide-acrylate copolymer.

12. The method for producing a recombinant protein aggregate according to claim 1, wherein the disruption of the recombinant cell is mechanical disruption.

13. The method for producing a recombinant protein aggregate according to claim 1, wherein the separation of the recombinant protein aggregate is carried out by filtration.

14. The method for producing a recombinant protein aggregate according to claim 1, wherein the recombinant cell is a recombinant cell transformed with a host selected from the group consisting of a bacterium, a yeast, a filamentous fungus, an insect cell, a plant cell, and an animal cell.

15. The method for producing a recombinant protein aggregate according to claim 1, wherein the recombinant protein is a structural protein.

16. The method for producing a recombinant protein aggregate according to claim 15, wherein the structural protein is a protein derived from a protein selected from the group consisting of keratin, collagen, elastin, resilin, silkworm silk, and spider silk.

17. The method for producing a recombinant protein aggregate according to claim 1, wherein the resulting recombinant protein aggregate has a particle size of 4 μm to 50 μm as measured by an electrical sensing zone method.