CLAIMS

1. A cell culture matrix comprising a biomaterial component and a fungal derived protein,

wherein the fungal derived protein forms particles having an average diameter of 500 nm to 1600 nm and a zeta potential of -10mV to -50mV.

2. The cell culture matrix of claim 1 wherein the fungal derived protein comprises a cell-adhesive sequence, optionally, the fungal derived protein retains its primary sequence.

3. The cell culture matrix of any one of claim 1 or claim 2, wherein the fungal derived protein is free of native functions.

4. The cell culture matrix of any one of the preceding claims, wherein the fungal derived protein forms a gel and/or a coating, optionally the fungal derived protein extract forms a hydrogel.

5. The cell culture matrix of any one of the preceding claims, wherein the fungi are non-pathogenic fungi.

6. The cell culture matrix of any one of the preceding claims, wherein the fungi are from the order of Agaricales, optionally from the division Basidiomycota.

7. The cell culture matrix of any one of the preceding claims, wherein the fungi are species selected from the group consisting of *Flammulina velutipes, Lentinus edodes*, and *Hypsizigus marmoreus*.

8. The cell culture matrix of any of the preceding claims, wherein the biomaterial component comprises one or more selected from the group consisting of alginate, chitosan, chitin, and cellulose fibres.

9. The cell culture matrix of any of the preceding claims, where in the cell culture matrix further comprises crosslinkers, optionally the crosslinker is calcium.

10. The cell culture matrix of any of the preceding claims, wherein the cell culture matrix forms a coating comprising alginate that is calcium crosslinked.

11. A composition comprising the cell culture matrix of any one of the preceding claims.

12. A cell culture system comprising a cell culture matrix comprising a fungal derived protein of claim 1.

13. The cell culture system of claim 12, comprising the cell culture matrix of any one of claims 1 to 10 and/or the composition of claim 11.

14. Method of forming a cell culture matrix from a fungus, comprising extracting a fungal derived protein from the fungi, and wherein the extraction comprises aggregation of the fungal derived protein to form self-aggregating precipitate.

15. The method of claim 14, wherein the extraction step comprises aggregation by boiling the fungal derived protein and/or incubating the fungal derived protein in a condition that allows self-aggregating precipitate.

16. The method of claim 14 or 15, wherein the extraction step comprises a fungal derived protein denaturation step that causes aggregation to occur, optionally wherein the denaturation step retains the primary sequence structure of the fungal derived protein, optionally the denaturation step retains the cell-adhesive sequence of the fungal derived protein.

17. The method of any one of claims 14 to 16, wherein the extraction step comprises aggregation step comprising heat treating the fungal derived protein for 1 min to 30 mins, optionally the aggregation step comprises heating the fungal derived protein from 50°C to 350°C.