

CLAIMS

1. Use of a desmoglein 2 (DSG2) fusion polypeptide in the manufacture of a pharmaceutical composition for treating post-COVID-19 syndrome in a subject, the fusion polypeptide comprising:
 - a. a whole or a portion of a DSG2 protein (SEQ ID NO: 1); and
 - b. a protein or a fragment of a protein which is capable of improving the expression and/or stability of the DSG2 protein *in vitro* or *in vivo* or used for purification of the DSG2 fusion polypeptide.
2. The use of claim 1, wherein serum of the subject comprises anti-DSG2 antibodies.
3. The use of claim 1, wherein the subject was previously diagnosed with COVID-19.
4. The use of any one of claims 1 to 3, wherein the protein or the fragment of a protein is a sequence tag.
5. The use of any one of claims 1 to 3, wherein the portion of the DSG2 protein comprises the whole extracellular region of DSG2 protein comprising the amino acid sequence of SEQ ID NO: 3.
6. The use of any one of claims 1 to 3, wherein the portion of the DSG2 protein is a portion of an extracellular region of the DSG2 protein.
7. The use of claim 6, wherein the portion of the extracellular region of the DSG2 protein comprises at least one domain, wherein the at least one domain is an extracellular cadherin domain 1 (EC1), an extracellular cadherin domain 2 (EC2), an extracellular cadherin domain 3 (EC3), an extracellular cadherin domain 4 (EC4), or an extracellular anchor domain (EA).
8. The use of any one of claims 1 to 3 and 5 to 7, wherein the protein or the fragment of a protein which is capable of improving the expression and/or stability of the DSG2 protein *in vitro* or *in vivo* is a whole or a portion of an immunoglobulin protein.
9. The use of claim 8, wherein the immunoglobulin is an IgG.
10. The use of claim 8 or 9, wherein the portion of the immunoglobulin protein is an Fc region.
11. Use of a desmoglein 2 (DSG2) fusion polypeptide in the manufacture of a pharmaceutical composition for treating COVID-19 in a subject, the fusion polypeptide comprising:
 - a. a whole or a portion of a DSG2 protein (SEQ ID NO: 1); and
 - b. a protein or a fragment of a protein which is capable of improving the expression and/or stability of the DSG2 protein *in vitro* or *in vivo* or used for purification of the DSG2 fusion polypeptide.

12. The use of claim 11, wherein the serum of the subject comprises anti-DSG2 antibodies.
13. The use of claim 11 or 12, wherein the protein or the fragment of a protein is a sequence tag.
14. The use of any one of claims 11 to 13, wherein the portion of the DSG2 protein comprises the whole extracellular region of DSG2 protein comprising the amino acid sequence of SEQ ID NO: 3.
15. The use of any one of claims 11 to 13, wherein the portion of the DSG2 protein is a portion of an extracellular region of the DSG2 protein.
16. The use of claim 15, wherein the portion of the extracellular region of the DSG2 protein comprises at least one domain, wherein the at least one domain is an extracellular cadherin domain 1 (EC1), an extracellular cadherin domain 2 (EC2), an extracellular cadherin domain 3 (EC3), an extracellular cadherin domain 4 (EC4), or an extracellular anchor domain (EA).
17. The use of any one of claims 11, 12, and 14 to 16, wherein the protein or the fragment of a protein which is capable of improving the expression and/or stability of the DSG2 protein *in vitro* or *in vivo* is a whole or a portion of an immunoglobulin protein.
18. The use of claim 17, wherein the immunoglobulin is an IgG.
19. The use of claim 17 or 18, wherein the portion of the immunoglobulin protein is an Fc region.
20. A desmoglein 2 (DSG2) fusion polypeptide for use in the treatment of post-COVID-19 syndrome, the fusion polypeptide comprising:
 - a. a whole or a portion of a DSG2 protein (SEQ ID NO: 1); and
 - b. a protein or a fragment of a protein which is capable of improving the expression and/or stability of the DSG2 protein *in vitro* or *in vivo* or used for purification of the DSG2 fusion polypeptide.
21. A desmoglein 2 (DSG2) fusion polypeptide for use in the treatment of COVID-19, the fusion polypeptide comprising:
 - a. a whole or a portion of a DSG2 protein (SEQ ID NO: 1); and
 - b. a protein or a fragment of a protein which is capable of improving the expression and/or stability of the DSG2 protein *in vitro* or *in vivo* or used for purification of the DSG2 fusion polypeptide.