

CLAIMS

What Is Claimed Is:

1. An isolated antibody or an antigen-binding fragment thereof that specifically binds to Respiratory Syncytial Virus (RSV) F protein (F), wherein the antibody or antigen-binding fragment thereof comprises:

- a CDRH1 comprising an amino acid sequence of SEQ ID NO: 947;
- a CDRH2 comprising an amino acid sequence of SEQ ID NO: 949;
- a CDRH3 comprising an amino acid sequence of SEQ ID NO: 951;
- a CDRL1 comprising an amino acid sequence of SEQ ID NO: 955;
- a CDRL2 comprising an amino acid sequence of SEQ ID NO: 957; and
- a CDRL3 comprising an amino acid sequence of SEQ ID NO: 959.

2. The isolated antibody or the antigen-binding fragment thereof of claim 1, wherein the antibody or the antigen-binding fragment thereof comprises one or more of the following characteristics:

- a) the antibody or the antigen-binding fragment thereof displays better binding affinity for the prefusion conformation (PreF) form of RSV-F relative to the postfusion conformation (PostF) form;
- b) the antibody or the antigen-binding fragment thereof displays neutralization activity towards RSV subtype A and RSV subtype B in vitro;
- c) the antibody or the antigen-binding fragment thereof displays antigenic site specificity for RSV-F Site Ø;
- d) the antibody or the antigen-binding fragment thereof displays antigenic site specificity for RSV-F Site Ø relative to RSV-F Site I, Site II, or Site IV;
- e) at least a portion of the epitope with which the antibody or the antigen-binding fragment thereof interacts comprises the $\alpha 3$ helix and $\beta 3/\beta 4$ hairpin of PreF;
- f) the antibody or the antigen-binding fragment thereof displays an in vitro neutralization potency (IC_{50}) of between 0.5 microgram/milliliter ($\mu g/ml$) to 5 $\mu g/ml$; between 0.05 $\mu g/ml$ to 0.5 $\mu g/ml$; or less than 0.05 mg/ml ;
- g) the binding affinity and/or epitopic specificity of the antibody or the antigen-binding fragment thereof for any one of the RSV-F variants designated as 1, 2, 3, 4, 5, 6, 7, 8, 9, and DG in

Figure 7A is reduced or eliminated relative to the binding affinity and/or epitopic specificity of said antibody or antigen-binding fragment thereof for the RSV-F or RSV-F DS-Cav1;

- h) the antibody or the antigen-binding fragment thereof displays a cross-neutralization potency (IC₅₀) against human metapneumovirus (HMPV);
- i) the antibody or the antigen-binding fragment thereof does not compete with MPE8, palivizumab, motavizumab, or AM-14; or
- j) the antibody or the antigen-binding fragment thereof displays at least about 2-fold; at least about 3-fold; at least about 4-fold; at least about 5-fold; at least about 6-fold; at least about 7-fold; at least about 8-fold; at least about 9-fold; at least about 10-fold; at least about 15-fold; at least about 20-fold; at least about 25-fold; at least about 30-fold; at least about 35-fold; at least about 40-fold; at least about 50-fold; at least about 55-fold; at least about 60-fold; at least about 70-fold; at least about 80-fold; at least about 90-fold; at least about 100-fold; greater than about 100-fold; and folds in between any of the foregoing; greater neutralization potency (IC₅₀) than D25 and/or palivizumab.

3. The isolated antibody or the antigen-binding fragment thereof of claim 2, wherein the antibody or the antigen-binding fragment thereof comprises: at least two; at least three; at least 4; at least 5; at least 6; at least 7; at least 8; at least 9; or at least 10 of characteristics a) through j).

4. The isolated antibody or the antigen-binding fragment thereof of any one of claims 1 through 3, wherein the antibody or the antigen-binding fragment thereof comprises:

- a) a heavy chain (HC) amino acid sequence of SEQ ID NO: 946; and
- b) a light chain (LC) amino acid sequence of SEQ ID NO: 954.

5. The isolated antibody or the antigen-binding fragment thereof of any one of claims 1 through 4, wherein the antibody is a human antibody.

6. An isolated nucleic acid sequence encoding the antibody or the antigen-binding fragment thereof according to any one of claims 1 through 5.

7. An expression vector comprising the isolated nucleic acid sequence according to claim 6.

8. A host cell transfected, transformed, or transduced with the nucleic acid sequence according to claim 6 or the expression vector according to claim 7.
9. A pharmaceutical composition comprising:
the isolated antibody or the antigen-binding fragment thereof according to any one of claims 1 through 5; and
a pharmaceutically acceptable carrier and/or excipient.
10. A pharmaceutical composition comprising:
the nucleic acid sequence according to claim 6 or the expression vector according to claim 7;
and
a pharmaceutically acceptable carrier and/or excipient.
11. A non-human transgenic organism comprising the nucleic acid sequence according to claim 6; or the expression vector according to claim 7.
12. The antibody or the antigen-binding fragment thereof according to any of claims 1 through 5, the nucleic acid sequence according to claim 6, the expression vector according to claim 7, or the host cell according to claim 8 for use in therapy.
13. The pharmaceutical composition according to claim 9 or 10 for use in therapy.
14. Use of the antibody or the antigen-binding fragment thereof according to any of claims 1 through 5, the nucleic acid sequence according to claim 6, the expression vector according to claim 7, or the host cell according to claim 8 in the manufacture of a medicament for the treatment of a Respiratory Syncytial Virus (RSV) infection, or at least one symptom associated with said RSV infection, in a patient in need thereof or suspected of being in need thereof.
15. Use of the pharmaceutical composition according to claim 9 or 10 in the manufacture of a medicament for the treatment of a Respiratory Syncytial Virus (RSV) infection, or at least one

symptom associated with said RSV infection, in a patient in need thereof or suspected of being in need thereof.

16. The use according to claim 14 or 15, wherein said medicament is to be administered in combination with a second therapeutic agent to the patient.

17. The use according to claim 16, wherein the second therapeutic agent is selected from the group consisting of: an antiviral agent; a vaccine specific for RSV, a vaccine specific for influenza virus, or a vaccine specific for metapneumovirus (MPV); an siRNA specific for an RSV antigen or a metapneumovirus (MPV) antigen; a second antibody specific for an RSV antigen or a metapneumovirus (MPV) antigen; an anti-IL4R antibody, an antibody specific for an influenza virus antigen, an anti-RSV-G antibody and a NSAID.