CLAIMS

1. A method of identifying/characterizing coronavirus infection in a subject, the method comprising:

contacting a sample from the subject with an isolated host cell comprising a nucleic acid encoding for the spike protein (S protein) of the coronavirus;

detecting a binding of an antibody to the host cell; and

contacting/incubating the sample with detection or secondary antibodies selected from the group consisting of IgM, IgG, IgG1, IgG2, IgG3 and IgG4.

2. A method of identifying a subject having immunity for coronavirus infection, the method comprising:

contacting/incubating a sample from the subject with an isolated host cell comprising a nucleic acid encoding for the spike protein (S protein) of the coronavirus;

detecting a binding of an antibody to the host cell; and

contacting/incubating the sample with detection or secondary antibodies selected from the group consisting of IgM, IgG, IgG1, IgG2, IgG3 and IgG4.

3. The method of any one of the preceding claims,

wherein the detecting step comprises using a fluorescence detection instrument.

4. The method of any one of the preceding claims,

wherein the method is a diagnostic method.

5. The method of any one of the preceding claims, the method further comprising performing a further assay such as a polymerase chain reaction (PCR)-based assay to detect/confirm coronavirus infection.

6. The method of any one of the preceding claims, wherein the method is an in-vitro or an ex-vivo method.

7. A nucleic acid encoding for the spike protein (S protein) of severe acute respiratory syndrome (SARS)-like coronavirus (SARS-CoV-2),

wherein the nucleic acid comprises SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, or a sequence sharing at least about 75% sequence identity with SEQ ID NO: 6, SEQ ID NO: 7, or SEQ ID NO: 8.

8. A nucleic acid encoding for the spike protein (S protein) variant of severe acute respiratory syndrome (SARS)-like coronavirus (SARS-CoV-2),

wherein the S protein comprises the S protein from an alpha variant (SEQ ID NO: 3), a beta variant (SEQ ID NO: 4), a delta variant (SEQ ID NO: 5), or a sequence sharing at least about 75% sequence identity with SEQ ID NO: 3, SEQ ID NO: 4, or SEQ ID NO: 5.

9. A viral vector comprising the nucleic acid of claim 7 or claim 8.

10. A host cell comprising the nucleic acid of the claim 7 or claim 8.

11. The host cell of claim 10, the host cell expressing the S protein.

12. The nucleic acid of claim 7 or claim 8, the viral vector of claim 9 or the host cell of claim 10 or 11, wherein the S protein comprises a full-length S protein.

13. The host cell of any one of claims 10 to 12, bound to an antigen binding protein.

14. The method of any one of claims 1, 2 or 5, where in the coronavirus infection comprises a SARS-CoV-2 infection.

15. The host cell of claim 10, wherein the host cell is transduced with the viral vector of claim 8.

16. The host cell of claim 13, wherein the antigen binding protein comprises an antibody against SARS-CoV-2.