

Claims

1. A recombinant binding protein comprising a first ankyrin repeat domain, wherein said first ankyrin repeat domain comprises an amino acid sequence selected from the group consisting of SEQ ID NOs 1 to 11, 76, 77 and 85.
2. The recombinant binding protein according to claim 1 further comprising a second ankyrin repeat domain, wherein said second ankyrin repeat domain is selected from the group consisting of SEQ ID NOs 1 to 11, 76, 77 and 85.
3. The recombinant binding protein according to claim 1 or claim 2 further comprising a third ankyrin repeat domain, wherein said third ankyrin repeat domain is selected from the group consisting of SEQ ID NOs 1 to 11, 76, 77 and 85, optionally wherein said first, second and third ankyrin repeat domains comprise amino acid sequences and are arranged, from the N-terminus to C-terminus, as follows:
 - (xx) amino acid sequences of SEQ ID NOs 6, 3 and 5; or
 - (xxxii) amino acid sequences of SEQ ID NOs 3, 76 and 77.
4. The recombinant binding protein according to any preceding claim further comprising at least one serum albumin binding domain, optionally wherein said serum albumin binding domain comprises an amino acid sequence selected from the group consisting of SEQ ID NOs: 47-49.
5. A recombinant binding protein comprising a polypeptide, wherein said polypeptide has an amino acid sequence that is selected from the group consisting of SEQ ID NOs: 12-42, 75, 84, 87 and 88.
6. The recombinant binding protein according to claim 5, wherein said polypeptide has the amino acid sequence of:
 - (a) SEQ ID NO: 31;
 - (b) SEQ ID NO: 75; or
 - (c) SEQ ID NO: 87.
7. The recombinant binding protein according to any one of claims 1 to 3, or 5 to 6, wherein said binding protein binds to a coronavirus spike protein, optionally wherein:
 - (a) said spike protein is SARS-CoV-2 spike protein; and/or
 - (b) said binding protein binds said coronavirus spike protein with a dissociation constant (K_D) of or below about 100 nM.
8. The recombinant binding protein according to any one of claims 1 to 7, wherein said binding protein is capable of:

- (a) inhibiting infection of cells by a coronavirus; or
 - (b) inhibiting infection of cells by SARS-CoV-2.
9. A nucleic acid encoding a recombinant binding protein according to any one of claims 1 to 8.
10. The nucleic acid according to claim 9, wherein:
- (a) said nucleic acid comprises or consists of SEQ ID NO 74 or of a variant thereof encoding the same amino acid sequence as SEQ ID NO 74; or
 - (b) said nucleic acid comprises or consists of SEQ ID NO 78 or of a variant thereof encoding the same amino acid sequence as SEQ ID NO 78.
11. A host cell comprising the nucleic acid molecule of claim 9 or claim 10.
12. A method of making the recombinant binding protein according to any one of claims 1 to 8, comprising culturing the host cell of claim 11 under conditions wherein said recombinant binding protein is expressed.
13. A pharmaceutical composition comprising the binding protein of any one of claims 1 to 8 or the nucleic acid of claim 9 or claim 10, and a pharmaceutically acceptable carrier or excipient.
14. A binding protein according to any one of claims 1 to 8, or a nucleic acid of claim 9 or claim 10, or a pharmaceutical composition according to claim 13 for use in treating or preventing a coronavirus infection.
15. The use of a binding protein according to any one of claims 1 to 8, or a nucleic acid of claim 9 or claim 10, or a pharmaceutical composition according to claim 13 for the manufacture of a medicament for treating or preventing a coronavirus infection.
16. A method of detecting a coronavirus infection in a subject, said method comprising:
- a) obtaining a sample from a subject;
 - b) contacting said sample with at least one binding protein according to any one of claims 1 to 8;
- and
- c) detecting the presence of a coronavirus infection.
17. The binding protein, nucleic acid or pharmaceutical composition for use according to claim 14, the use of claim 15, or the method of claim 16, wherein:
- (a) the coronavirus infection is caused by SARS-CoV-2; and/or
 - (b) said subject is a human.