CLAIMS

We Claim:

1. A recombinant construct for screening drugs against SARS-CoV-2 spike protein, wherein the recombinant construct comprises the sequence of Seq Id no. 2.

2. The recombinant construct as claimed in claim 1, wherein the construct expresses a fusion protein having Seq Id no. 1 comprising

   (i) a reporter protein;
   (ii) a SARS-CoV-2 spike protein cleavage sequence; and
   (iii) a cellulose binding domain.

3. The recombinant construct as claimed in claim 2, wherein the fusion protein further comprises hexa histidine tag at one end for protein purification.

4. The recombinant construct as claimed in claim 2, wherein methionine is added at the N terminus of the hexa histidine.

5. The recombinant construct as claimed in claim 4, wherein the recombinant construct comprises:

   (a) a start codon expressing the methionine; and

   (b) two stop codons at the 3'end of the sequence expressing the cellulose binding domain sequence.

6. The recombinant construct as claimed in claim 2, wherein the recombinant construct comprises:

   a. a sequence having Seq Id no. 3, expressing the reporter protein;
   b. a sequence having Seq Id no. 4, expressing the spike protein cleavage sequence; and
   c. a sequence having Seq Id no. 5, expressing the cellulose binding domain.

7. An *in vitro* assay system for drug screening against SARS-CoV-2 wherein the steps comprises:
    i. providing a fusion protein having Seq Id no. 1;
    ii. adding trypsin like protease and drug to be tested to the fusion protein obtained in step (i) to obtain a reaction mix;
    iii. providing cellulose matrix/slurry;
    iv. mixing the reaction mix obtained in step (ii) with the cellulose matrix obtained in step (iii);
    v. centrifuging the mixture obtained in step (iv) to get the reporter protein from the reaction supernatant for reporter assay;
    vi. measuring the reporter signal wherein decrease in reporter signal as compared with no inhibitor control confirms the positive activity of the drug screened.

8. The *in vitro* assay system as claimed in claim 7, wherein drug is selected from the group consisting of Camostat mesylate, cathepsin B inhibitor, furin inhibitor II, protease inhibitors, Furin inhibitor I, trypsin inhibitors, Ovomucoid, Kunitz Trypsin Inhibitor, serine protease inhibitors, and TMPRSS2 inhibitors.

9. The *in vitro* assay system claimed in claim 7, wherein cellulose matrix comprises of cellulose in buffer used for reaction at 33% w/v slurry composition.

10. The *in vitro* assay system as claimed in claim 7, wherein the reporter protein is luciferase reporter.