

Recombinant Spike S1 (RBD) antigen for COVID-19

CATALOG NUMBER: RAG0074

LOT NUMBER: #

RECOMBINANT ANTIGEN: SARS-CoV-2 spike glycoprotein Receptor Binding Domain (Walls *et al.* 2020).

DESCRIPTION: a recombinant antigen has been prepared by expressing nucleotides corresponding the receptor binding domain (RBD) of S glycoprotein from SARS-CoV-2 (COVID-19).

PRESENTATION: liquid protein solution

SOURCE: *Pichia pastoris*

MOLECULAR WEIGHT: determined by SDS-PAGE, the protein band is between the molecular markers of 66,200 Da and 45,000 Da due to the glycosylation pattern, while relative molecular mass calculated from amino acid sequence and without glycosylation, is 26,551.89 Da.

BATCH COMPOSITION:

COMPONENTS	COMPOSITION
His-S1-RBD	recombinant RBD from spike protein with a his-tag
Storage buffer	20 mM phosphate buffer pH 7 and 0.15 M NaCl

QUALITY CONTROL:

1. PROTEIN CONCENTRATION DETERMINED ESPECTROPHOTOMETRICALLY

DO₂₈₀ = 1.77
 A_{0.1%} (=1 g/l) = 1.331
 CONCENTRATION*: 1.33 mg/ml

* The measurement of the protein concentration has been performed with the theoretical extinction coefficient of the recombinant protein obtained from Gill and vonHippel, 1989. It is recommended that the users carry out their absorbance determinations to avoid equipment variabilities regarding final concentration, mainly in reproducibility analysis.

2. PURITY CONTROL IN SDS-PAGE: 15%

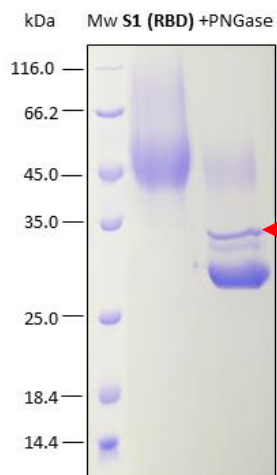


Figure 1. SDS-PAGE analysis of glycosylated and de-N-glycosylated S1(RBD) expressed in *P. pastoris*. Lane S1(RBD): the protein domain expressed before de-N-glycosylation; lane + PNGase: the protein domain after treating with PNGase. Purity is > 95% as determined by gel electrophoresis. The red arrow shows the band corresponding PNGase.

3. POSITIVE AND NEGATIVE SERA DISCRIMINATION BY AN ELISA ASSAY

The titer has been suggested in reference to an "in-house" ELISA kit performed at Rekom Biotech over the first lot obtained. ELISA assays were performed with a serum sample panel of pre-validated 26 IgG-positive specimen sera obtained from Andalusian Public health System Biobank and 6 negative pre-COVID specimen sera from general population.

Each end user should carry out his own titration for his particular application.

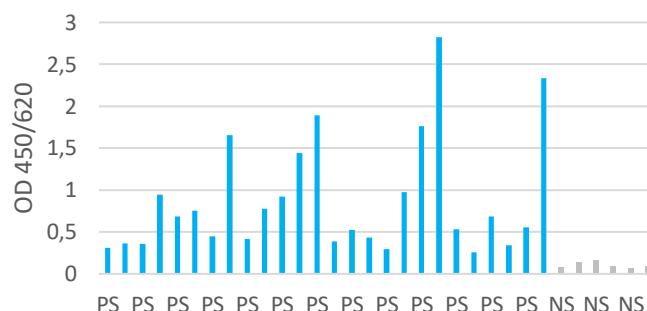


Figure 2. This plot shows an indirect IgG ELISA assay performed with the S1(RBD) recombinant antigen. The optical density at 450/620 nm for positive sera (pale blue) and negative sera (gray) are displayed in the graphic. **For specimen discrimination sera, the coating was performed with 0.5 µg/ml of protein in microtiter plates, 12.5 µg of anti-CCD blocker (Ref. Rekom SOR0001) was added to the sera 10 min before incubation with the coated antigen.**

4. ACE-2 BINDING CAPACITY

The angiotensin converting enzyme 2 (ACE-2) is a functional receptor for the spike glycoprotein (S) of SARS-CoV. The ACE-2 binding capacity of our S protein has been measured by an ELISA assay, by coating the plates with 1 µg/ml of S1(RBD), 38 nM, and increasing the ACE-2 concentration from 10 ng/ml to 10 µg/ml.

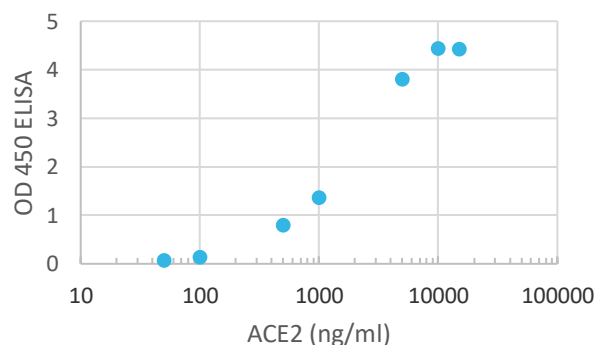


Figure 3. This plot shows the binding ability in a functional ELISA, of our protein S1(RBD) RAG0074, to the ACE-2 protein (expressed in CHO cells, SignalChem Catalog#A51C2-6342F) with an Fc tag.

5. ABSENCE OF PRECIPITATION AFTER A FREEZING AND THAWING CYCLE: ok

LOT SPECIFICATIONS:

1. CONCENTRATION: 1.33 mg/ml

2. TOTAL QUANTITY PER ALIQUOT: 1 mg

3. TOTAL VOLUME PER ALIQUOT: 0.789 ml

4. SUGGESTED TITER BY ELISA: up to 1:2,660, which corresponds to 0.5 µg/ml of protein concentration in plates for IgG detection.

5. STORAGE: Protein is shipped with dry ice. Upon arrival, it should be aliquoted to avoid repeated freezing and thawing cycles and stored at -20°C to -80°C. In order to defrost the protein, maintain the aliquot at 25°C without shaking to avoid aggregation.

6. TESTED APPLICATIONS: ELISA.

7. POSSIBLE APPLICATIONS: WB, DB, Indirect ELISA, positive control in direct ELISA, CLIA, lateral-flow. Where this product has not been tested for use in a particular technique, this does not necessarily exclude its use in such procedures. Suggested working dilutions are given as a guide only. **Due to the nonspecific interaction with anti-CCDs present in normal human or animal sera, we strongly recommend using our blocker SOR0001 on the analyzed sera in any immunoassay.** It is recommended that the user titrates.

8. OBSERVATIONS: proteins should be maintained frozen at high concentrations. The dilution to be performed for ELISA assays should be made with a small quantity of protein, the same day of the experiment. In order to defrost the protein, maintain the aliquot at 25°C without shaking to avoid aggregation. Prior making test dilutions and after defrosting the protein, is recommended to remove possible protein aggregates by centrifuging the stock solution, avoiding alterations in the immobilization of the biomolecule to the solid surface.

RELATED PRODUCTS:

NP (CTD) SARSCoV-2, NP (CTD) SARSCov (2003).

BIBLIOGRAPHY:

Walls, A.C., Park, Y-J., Tortorici, M. A., Wall, A. McGuire, A.T. and D. Veessler. Structure, Function, and Antigenicity of the SARSCoV-2 Spike Glycoprotein. 2020. *Cell* 180, 1–12.

Gill SC, von Hippel PH. Calculation of protein extinction coefficients from amino acid sequence data. *Anal Biochem.* 1989 Nov 1;182(2):319-26.

Important Notes: During shipment, small volumes of product will occasionally become entrapped in the seal of the product vial. For products with volumes of 200 µl or less, we recommend gently tapping the vial on a hard surface or briefly centrifuging the vial in a tabletop centrifuge to dislodge any liquid in the containers cap.

Although recombinant antigens are expressed in non-pathogenic *P. pastoris* and bacterial integrity is destroyed during purification, the antigen preparation should be handled as potentially infectious.

FOR RESEARCH AND COMMERCIAL USE *IN VITRO*: not for human *in vivo* or therapeutic use.