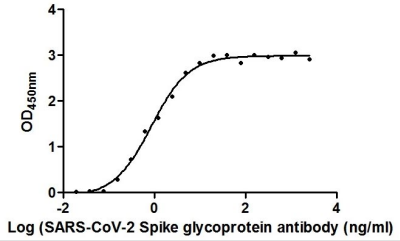
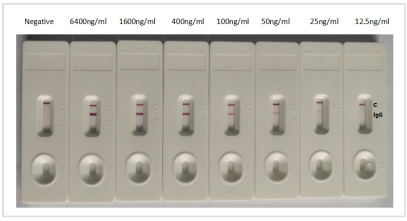
SARS-CoV-2 Spike RBD Nanobody

Product Code	CSB-RA33245A2GMY
Abbreviation	S
Storage	Upon receipt, store at -20°C or -80°C. Avoid repeated freeze.
Uniprot No.	P0DTC2
Immunogen	Recombinant Human Novel Coronavirus Spike glycoprotein(S) (319-541aa) (CSB-YP3324GMY1 and CSB-MP3324GMY1b1)
Species Reactivity	Human Novel Coronavirus (SARS-CoV-2/ 2019-nCoV)
Tested Applications	ELISA, GICA, Neutralising; Recommended dilution: ELISA:1:10000-1:100000, GICA:1:10000-1:40000, Neutralising:1:100-1:10000
Form	Liquid
Conjugate	Non-conjugated
Storage Buffer	Preservative: 0.03% Proclin 300 Constituents: 50% Glycerol, 0.01M PBS, pH 7.4
Purification Method	Affinity-chromatography
Isotype	VHH fusion with human IgG1 Fc
Clonality	Monoclonal
Alias	Anti-coronavirus spike Antibody; Anti-cov spike Antibody; Anti-ncov RBD Antibody; Anti-ncov S1 Antibody;Anti-ncov spike Antibody; Anti-novel coronavirus RBD Antibody; Anti-novel coronavirus S1 Antibody; Anti-novel coronavirus spike Antibody; Anti-RBD Antibody; Anti-S1 Antibody; Anti-Spike RBD Antibody; E2 Antibody; E2 glycoprotein Antibody; Human coronavirus spike glycoprotein Antibody; S Antibody; SARS-CoV-2 S1 RBD Antibody; S glycoprotein Antibody; Spike glycoprotein Antibody
Immunogen Species	Human Novel Coronavirus (SARS-CoV-2/ 2019-nCoV)
Research Area	Microbiology
Gene Names	S (Spike glycoprotein)
Accession NO.	A1

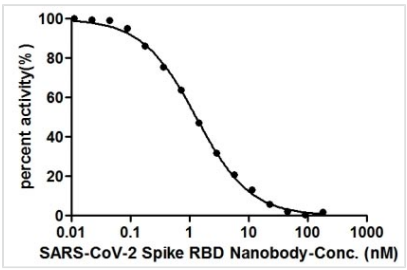
Image



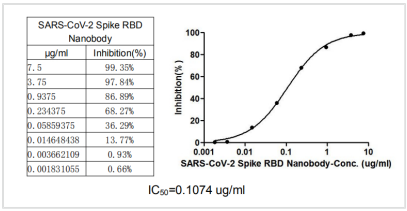
Activity Assay- ELISA
The Binding Activity of SARS-CoV-2 Spike RBD Nanobody with SARS-CoV-2-S1-RBD
Activity: Measured by its binding ability in a functional ELISA. Immobilized SARS-CoV-2-S1-RBD (CSB-YP3324GMY1) at 2 μg/ml can bind SARS-CoV-2 Spike RBD Nanobody, the EC_{50} is 0.8674 ng/ml.



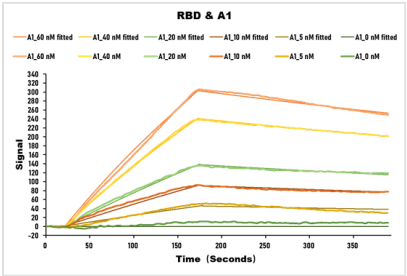
GICA
In the Colloidal Gold Immunochromatography Assay detection system, the background of antibody (CSB-RA33245A2GMY) is clean, the detection limit can be as low as 25ng/ml (1.75ng/0.07ml), and the sensitivity is very good.



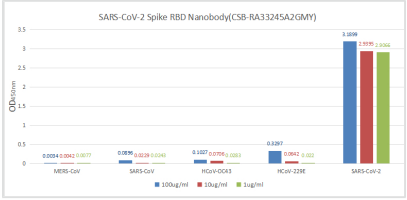
SARS-CoV-2 Spike RBD Nanobody (CSB-RA33245A2GMY) competed with ACE2-HRP conjugate (CSB-MP866317HU) for binding to SARS-CoV-2-S1-RBD (CSB-YP3324GMY1). The binding signal of SARS-CoV-2-S1-RBD and ACE2-HRP conjugate was gradually reduced as the SARS-CoV-2 Spike RBD Nanobody concentrations increased. It indicated that this SARS-CoV-2 Spike RBD Nanobody effectively inhibited the SARS-CoV-2-S1-RBD/ACE2 binding. And the IC_{50} of this SARS-CoV-2 Spike RBD Nanobody is 1.296 nM.



SARS-CoV-2 Spike RBD Nanobody (CSB-RA33245A2GMY) competitively prevented SARS-CoV-2-S1-RBD (CSB-YP3324GMY1) from binding to ACE2-HRP conjugate (CSB-MP866317HU). The inhibition efficacy of the SARS-CoV-2-S1-RBD/ACE2 binding was positively proportionally to the SARS-CoV-2 Spike RBD Nanobody concentrations. It showed that this SARS-CoV-2 Spike RBD Nanobody effectively inhibited the SARS-CoV-2-S1-RBD/ACE2 binding. And the IC_{50} of this SARS-CoV-2 Spike RBD Nanobody is 0.1074 μg/ml.



SARS-CoV-2 Spike protein RBD His/Sumostar Tag (CSB-YP3324GMY1) captured on COOH chip binding to the SARS-CoV-2 Spike RBD Nanobody (CSB-RA33245A2GMY), increases the local refractive index (RI), leading to a red shift of the LSPR peak position. The higher concentrations of SARS-CoV-2 Spike RBD Nanobody, the larger the wavelength shift. The detected affinity constant of SARS-CoV-2 Spike protein RBD/SARS-CoV-2 Spike RBD Nanobody binding is 28.2nM.



ELISA: Immobilize various types of SARS proteins at concentration of 2μg/ml on solid substrate, then react with SARS-CoV-2 Spike RBD Nanobody at concentration of 100μg/ml, 10μg/ml and 1μg/ml. It shows the SARS-CoV-2 Spike RBD Nanobody (CSB-RA33245A2GMY) is specific for SARS-CoV-2-S1-RBD protein, without any cross-reactivity with MERS-CoV, SARS-CoV, HCoV-OC43 or HCoV-229E.

Description

This SARS-CoV-2 S1-RBD (Spike Glycoprotein S1 receptor-binding domain) antibody is a recombinant monoclonal antibody (also a Nanobody) generated through the expression of a DNA sequence inserting a human IgG1 Fc domain at the C-terminus, in human embryonic kidney 293 cells (HEK293). The DNA sequence encodes the SARS-CoV-2 spike RBD. The antibody is purified by protein G in vitro. It has been validated with high reactivity towards SARS-CoV-2 S1-RBD by a functional ELISA and good sensitivity for human SARS-CoV-2 spike glycoprotein (S protein) via the Colloidal Gold Immunochromatography Assay (GICA).

The SARS-CoV-2 S1-RBD Nanobody is also validated in Neutralizing and LSPR. In neutralizing assay, the binding signal of SARS-CoV-2 S1 RBD and ACE2 was inhibited by SARS-CoV-2 Spike RBD Nanobody. The IC_{50} is typically 0.1074 ug/ml. In the LSPR assay, the SARS-CoV-2 S1 RBD antibody showed a high affinity with SARS-CoV-2 Spike protein RBD (affinity constant: 28.2nM).

Specifically binding and recognizing the RBD of the SARS-CoV-2 spike glycoprotein, the SARS-CoV-2 S1 RBD antibody can react with samples infected with human coronavirus SARS-CoV-2. But it does not respond to MERS or SARS-CoV spike protein. Akin to other nanobodies, this recombinant nanobody is small and stable, which allows for its reaching to hidden epitopes such as crevices of target proteins.