2020/4/1

Recombinant Coronavirus Antigens

SHENZHEN SEKBIO Company is now offering recombinant spike glycoproteins for SARS-CoV-2 (Covid-19) in response to urgent demand. These proteins are suitable for use in diagnostics, including ELISA, lateral flow, CLIA, etc.

Product Name	Catalog No.	Origin	Molecular Weight	Purity
Recombinant COVID-19 nucleocapsid antigen	HP811-01	E. coli	49KD	Purity>90%
Recombinant COVID-19 nucleocapsid antigen	HP811-04	E. coli	99KD	Purity>95%
Recombinant COVID-19 nucleocapsid antigen	HP811-08	E. coli	62KD	Purity>95%
Recombinant COVID-19 nucleocapsid antigen	HP811-50	E. coli	49KD	Purity>90%
Recombinant COVID-19 spike antigen (RBD)	HP811-60	HEK293 Cells	51.5KD	Purity>95%
Recombinant COVID-19 spike antigen (RBD)	HP811-61	HEK293 Cells	26.7KD	Purity>95%

Contacted: info@sekbio.com. for quotation and more product information

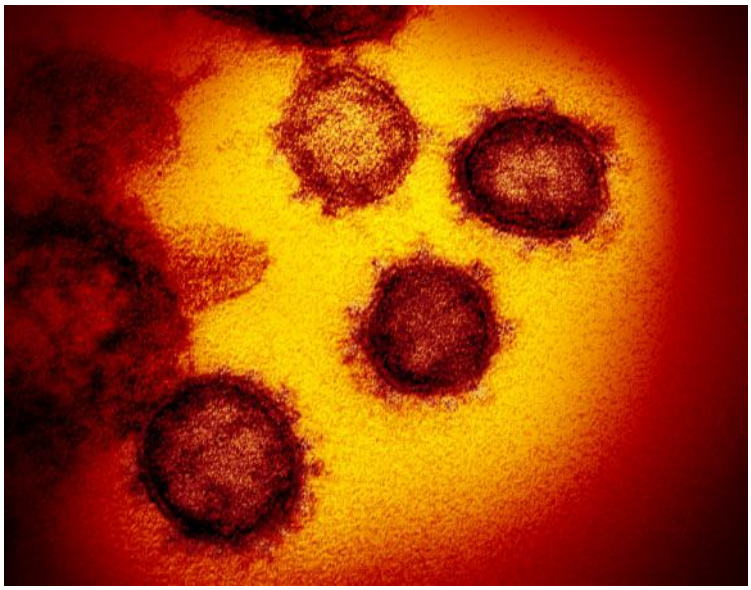
Background

On 31 December 2019, a cluster of pneumonia cases of unknown aetiology was reported in Wuhan, Hubei Province, China. On 9 January 2020, China CDC reported a novel coronavirus as the causative agent of this outbreak, coronavirus disease 2019 (COVID-19).

As of 25 March 2020, more than 416 916 cases of COVID-19 were reported worldwide by more than 150 countries.

Illnesses associated with COVID-19 are similar to several other respiratory diseases and show the typical features of viral pneumonia, including fever, dry cough, sore throat, and headache. Most cases of COVID-19 infection are considered mild to moderate, with a subset of patients experiencing more severe illness with shortness of breath and difficulty breathing. According to WHO, the national mortality rate in China is thought to be approximately 2% of confirmed cases.

Coronavirus



Coronavirus are positive sense, single stranded RNA viruses.

This transmission electron microscope image shows 2019-nCoV, the virus that causes COVID-19, isolated from a patient in the U.S., emerging from the surface of cells cultured in the lab. Image credit: NIAID-RML.

There are seven types of coronaviruses known to infect humans.

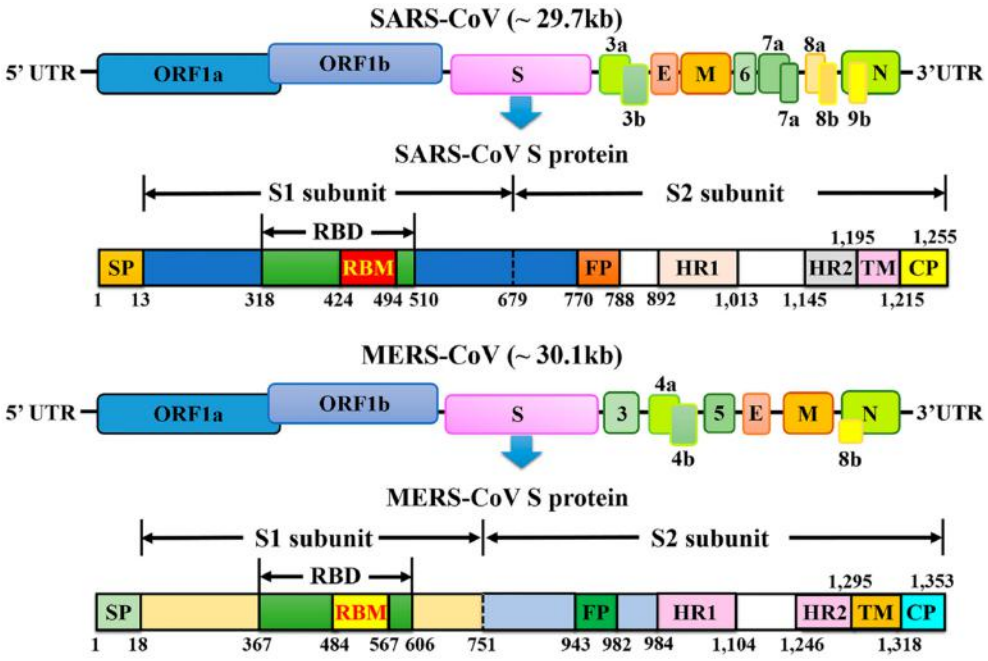
1) 229E (alpha coronavirus)
2) NL63 (alpha coronavirus)
3) OC43 (beta coronavirus)
4) HKU1 (beta coronavirus)
5) SARS-CoV
6) MERS
7) COVID-19

Patients infected with these viruses develop respiratory symptoms of various severity. HCoV-229E and HCoV-OC43, the two coronaviruses discovered in early years, cause common cold. The other five coronaviruses lead to more severe respiratory tract infection, which can potentially be lethal. Since 2000, there have been three major world-wide health crisis caused by coronaviruses, the 2003 SARS outbreak, the 2012 MERS outbreak, and the 2019 COVID-19 outbreak. Thousands of people died during these epidemics, while surprisingly no vaccine, treatment, or diagnostic has been established.

To support the fight against the coronavirus, SHENZHEN SEKBIO has developed a comprehensive panel of recombinant viral antigens.

Our products are well proven by Chinese IVD companies. Many of they have place bulk order to us as large as Grams protein. Some of their lateral flow test are approved by MNPA (cFDA) and CE, and millions of their test have been sold at home and abroad.

The antigens have been derived specifically from the newly identified novel coronavirus using SHENZHEN SEKBIO's mammalian expression system. The system is able to introduce proper protein folding and post-translational modifications to recombinant proteins, which are essential for full biological and antigenic activity.



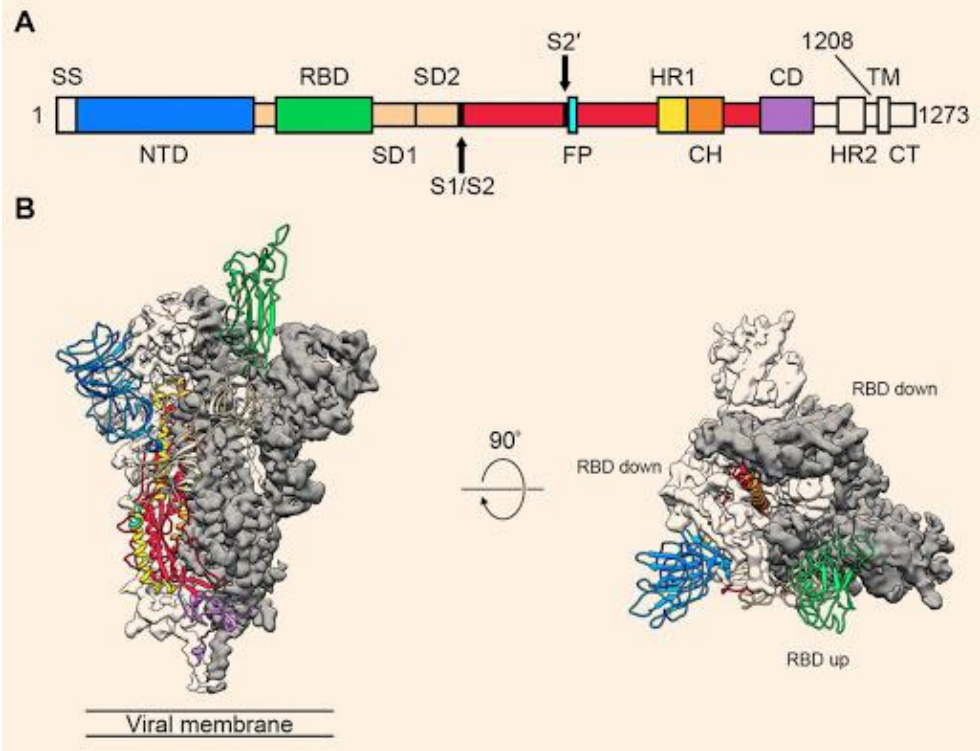
Schematic representation of the genome organization and functional domains of S protein for SARS-CoV and MERS-CoV. The single-stranded RNA genomes of SARS-CoV and MERS-CoV encode two large genes, the ORF1a and ORF1b genes, which encode 16 non-structural proteins (nsp1–nsp16) that are highly conserved throughout coronaviruses. The structural genes encode the structural proteins, spike (S), envelope (E), membrane (M), and nucleocapsid (N), which are common features to all coronaviruses. The accessory genes (shades of green) are unique to different coronaviruses in terms of number, genomic organization, sequence, and function. The structure of each S protein is shown beneath the genome organization. The S protein mainly contains the S1 and S2 subunits. The residue numbers in each region represent their positions in the S protein of SARS and MERS, respectively. The S1/S2 cleavage sites are highlighted by dotted lines. SARS-CoV, severe acute respiratory syndrome coronavirus; MERS-CoV, Middle East respiratory syndrome coronavirus; CP, cytoplasm domain; FP, fusion peptide; HR, heptad repeat; RBD, receptor-binding domain; RBM, receptor-binding motif; SP, signal peptide; TM, transmembrane domain. Image credit: Zhiqi Song *et al*, doi: 10.3390/v11010059

Nucleocapsid Protein (N-Protein)

The nucleocapsid protein (N-protein) is a structural protein that binds to the coronavirus RNA genome, thus creating a shell (or capsid) around the enclosed nucleic acid. The N-protein also 1) interacts with the viral membrane protein during viral assembly, 2) assists in RNA synthesis and folding, 3) plays a role in virus budding, and 4) affects host cell responses, including cell cycle and translation.

Spike Protein (S-Protein)

The spike protein (S-protein) performs two primary tasks that aid in host infection: 1) mediates the attachment between the virus and host cell surface receptors, and 2) facilitates viral entry into the host cell by assisting in the fusion of the viral and host cell membranes.



Structure of SARS-CoV-2's spike protein: (A) schematic of the spike protein's primary structure, colored by domain; domains that were excluded from the ectodomain expression construct or could not be visualized in the final map are colored white. Abbreviations: SS – signal sequence, NTD – N-terminal domain, RBD – receptor-binding domain, SD1 – subdomain 1, SD2 – subdomain 2, S1/S2 – S1/S2 protease cleavage site, S2′ – S2′ protease cleavage site, FP – fusion peptide, HR1 – heptad repeat 1, CH – central helix, CD – connector domain, HR2 – heptad repeat 2, TM – transmembrane domain, CT – cytoplasmic tail; arrows denote protease cleavage sites; (B) side and top views of the prefusion structure of SARS-CoV-2's spike protein with a single RBD in the up conformation; the two RBD-down protomers are shown as cryo-EM density in either white or gray and the RBD-up protomer is shown in ribbons, colored corresponding to the schematic in (A). Image credit: Wrapp *et al*, doi: 10.1126/science.abb2507.