SERION antigens

SARS-CoV-2 Antigens

Global spread of SARS-CoV-2

Since mid-December 2019, the pathogen Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) has been on the rise and the global spread of Coronavirus Disease 19 (COVID-19) was declared a pandemic by the WHO on March 11th, 2020. Typical clinical symptoms of affected patients are fever, dry cough and shortness of breath, headache and pneumonia. Severe disease progressions lead to respiratory arrest due to alveolar damage, septic shock and/or multiple organ dysfunction or failure and can be fatal (Zhou et al., 2020). The number of cases worldwide continues to rise (WHO Coronavirus Dashboard, Nov. 2021). Since there is still no adequate and widely applicable antiviral therapy available and vaccination rates are not sufficient, laboratory diagnostics for SARS-CoV-2 play a crucial role in understanding and controlling the pandemic. While PCR and antigen rapid tests are widely used to identify acutely infected individuals, antibody detection assays additionally provide information about epidemiological developments, the immune status after infection or vaccination and even the course of the disease (Perkmann et al., 2021; Fedele et al., 2021).

SARS-CoV-2 Antigens and Antibody Responses

The enveloped, single-stranded RNA virus SARS-CoV-2 consists of 4 structural proteins and 16 non-structural proteins. The 4 structural proteins are spike, envelope, nucleocapsid and membrane. The spike protein consists of two domains, the S1 domain, which contains the receptor binding domain (RBD) for host cell interaction, and the S2 domain containing the transmembrane and endodomain. It is presented on the viral surface in a trimeric structure. The mRNA vaccine BNT162b1 encodes the RBD of the spike protein and induces neutralizing antibodies (Sahin et al., 2020). Early IgG and IgA responses to the spike protein in COVID-19 patients were described to be associated with less severe disease (Fedele et al., 2021). This indicates that monitoring antibody responses might help in understanding and managing the disease. Natural exposure to the virus additionally induces a strong antibody response against the nucleocapsid protein, thus allowing the discrimination between vaccinated and previously infected individuals (Assis et al., 2021).

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Product Description

The SARS-CoV-2 antigens Spike Ectodomain (S1-S2) and Nucleoprotein complement SERION Immunologics' growing raw material portfolio for IVD assay development. They are developed for the detection of IgA, IgG and IgM antibodies in diagnostic applications. Their superior performance has been shown in ELISA as well as in bead based immunoassays. The recombinant expression in insect cells within an ISO 13485 certified production environment in bioreactor systems guarantees highest lot-to-lot consistency and constant availability of bulk quantities. The eukaryotic expression system was carefully chosen to provide best product performance for the development of highly specific and sensitive diagnostic assays.

Features

- ✓ 2 structural antigens (Spike S1/S2 & NP)
- ✓ Eukaryotic expression system (insect cells)
- ✓ High specificity and sensitivity proven
- ✓ ELISA and bead assay approved
- ✓ Bulk-quantities
- ✓ ISO 13485 certified manufacturing conditions

Order Information and Related Products

Product Code	Description	Packaging
BA400R03	SARS-CoV-2 Spike Ectodomain (S1-S2) Spike glycoprotein ectodomain (spikes comprised of multiple S1 and S2 domains) of SARS-CoV-2 Molecular weight: 135 kDa Affinity tag: Strep-tag	1 mg
BA400R04	SARS-CoV-2 Nucleoprotein Nucleoprotein (nucleocapsid protein) of SARS-CoV-2 Molecular weight: 47 kDa Affinity tag: Strep-tag	1 mg

References

Zhou P et al., "A Pneumonia Outbreak Associated with a New Coronavirus of Probable Bat Origin", Nature 579, 2070-273 (March 2020)

WHO Coronavirus Dashboard, https://covid19.who.int/, November 2021

Perkmann T et al., "Anti-Spike Protein Assays to Determine SARS-CoV-2 Antibody Levels: a Head-to-Head Comparison of Five Quantitative Assays", Microbiol Spectr 9:e00247-21 (June 2021)

Fedele G et al., "Early IgG/IgA response in hospitalized COVID-19 patients is associated with a less severe disease", Diagnostic Microbiology and Infectious Disease 102, 115586 (October 2021)

Sahin U et al., "COVID-19 vaccine BNT162b1 elicits human antibody and TH1 T cell responses", Nature 586, 594-599 (October 2020)

Assis R et al., "Distinct SARS-CoV-2 antibody reactivity patterns elicited by natural infection and mRNA vaccination", Vaccines 6:132 (November 2021)

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