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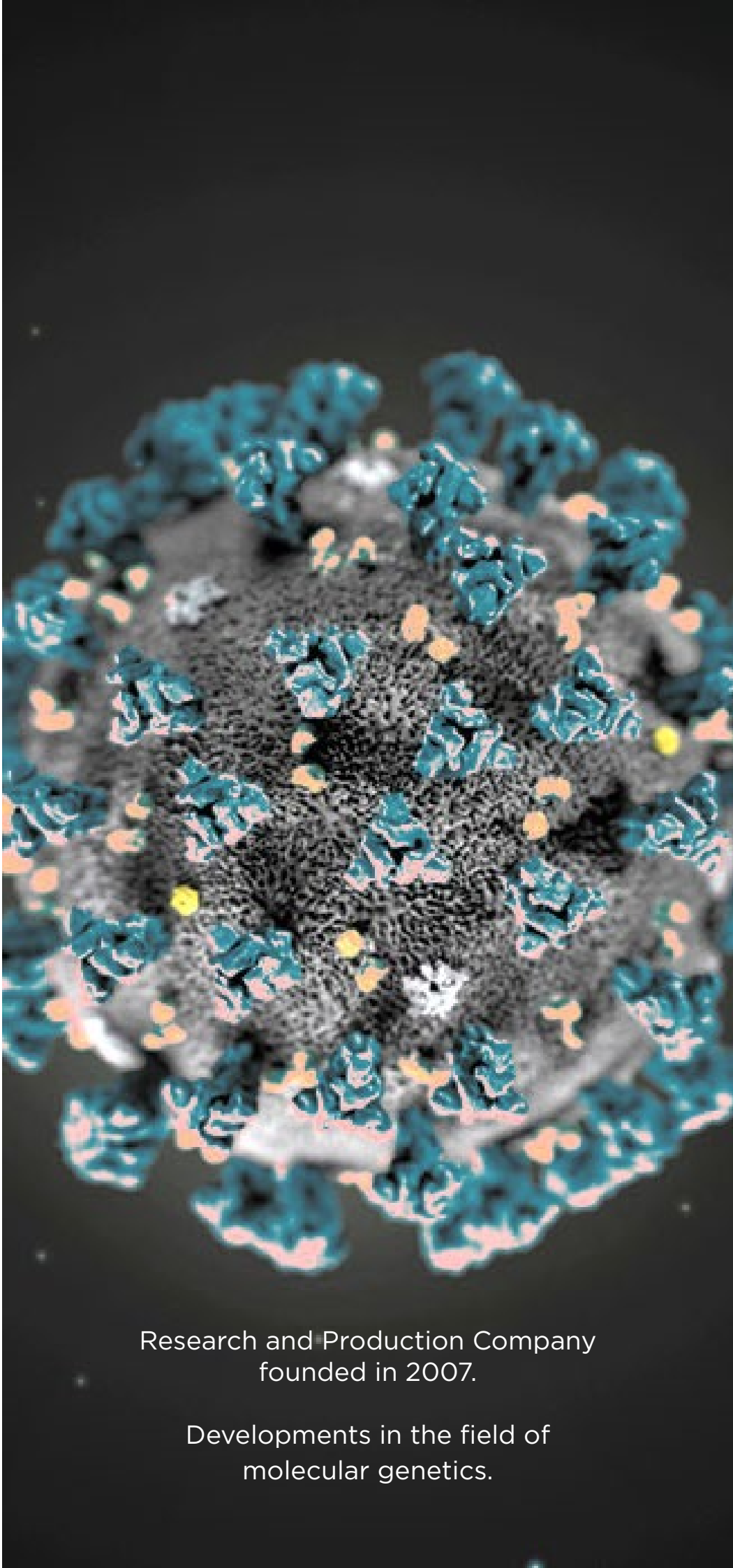
Areas of business:

- Genotyping;
- Development and Production of test-systems for molecular genetic research and research by the ELISA method;
- Development of gene therapy products;
- Performance of preclinical trials of new medicines.



Research and Production Company founded in 2007.

Developments in the field of molecular genetics.

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“SARS-CoV-2-IgG-ELISA” kit

“SARS-CoV-2-IgG-ELISA” kit is a semi-quantitative test-system based on the ELISA method and is meant for detection of class G immunoglobulins to the receptor-binding domain (RBD) of surface glycoprotein S (spike) of the SARS-CoV-2 coronavirus, which is the most sensitive indicator of the immune response tension after the vaccination.

Advantages of the test system:

- Specific detection of immunoglobulins G to the receptor-binding domain (RBD) of S1 protein of SARS-CoV-2 virus;
- A unique production method of the antigen for test-system “SARS-CoV-2-IgG-ELISA” allows almost complete elimination of possible non-specific background signals when performing reactions, which helps to reduce the number of “border-line” and false-positive test results;
- Duration of testing - from 75 minutes;
- All the reagents of the kit are ready for use;
- It does not require preliminary dilution of samples before testing;
- Convenient format – 96 tests in the kit;

- High diagnostic properties (sensitivity – 98,1%; specificity – 99%). Confirmed for blood serum and plasma as a biological sample;
- Suitable for open semi-automatic and automatic ELISA analyzers.
- The use of the test system makes it possible to assess the effectiveness of the vaccination with medicines based on S1-protein as an antigen, such as SPUTNIK V, as well as to monitor the immunity stress of vaccinated individuals and those, who have recovered from COVID-19
- The test system can be used as a reference system for minimization of false-positive results of the testing *.

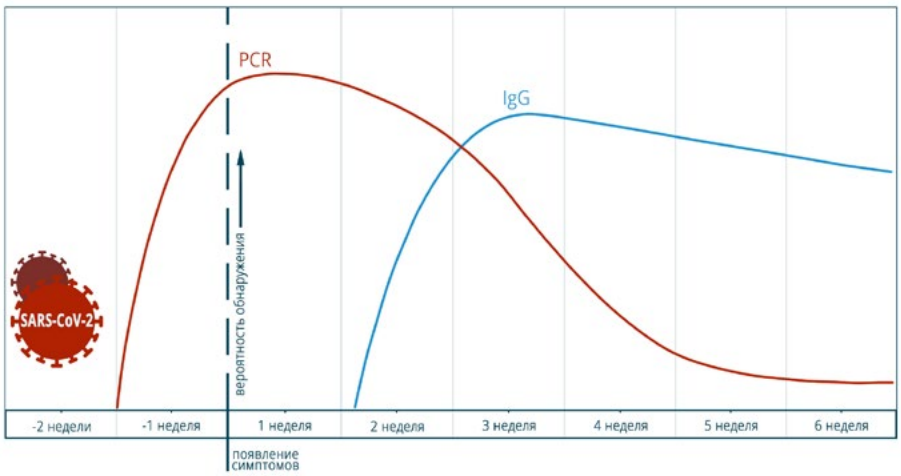
**Provisional methodological recommendations «Prevention, diagnosis and treatment of the new coronavirus infection (COVID-19). Version 9 (26.10.2020)»

Seroconversion duration:

IgG appear in the period from several days up to two weeks after the onset of symptoms**. The immune response may vary and develop later due to the individual characteristics of the organism. IgG antibodies can remain in blood for a long time and perform a protective role.

PCR

IgG



PCR and IgG COVID-19 LEVEL GRAPH

**Nandini Sethuraman, MD1; Sundararaj Stanleyraj Jeremiah, MD2; Akihide Ryo, MD, PhD2. Interpreting Diagnostic Tests for SARS-CoV-2. JAMA. 2020;323(22):2249-2251.

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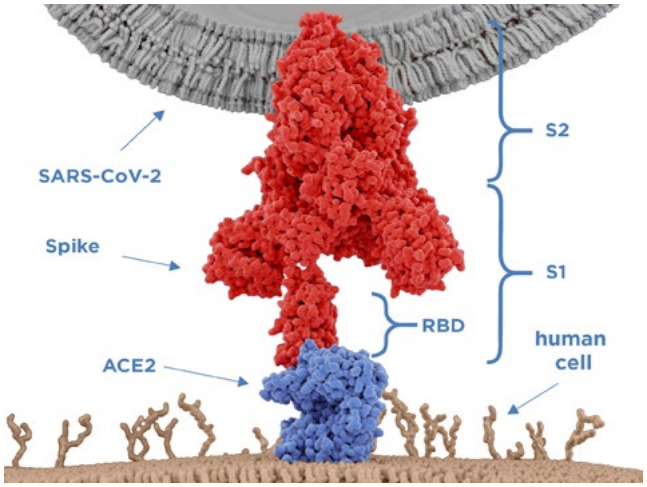
According to the recommendations of the Ministry of Health of the Russian Federation* the testing for antibodies to the SARS-CoV-2 virus is recommended for use in the following cases:

- As an additional method to diagnose acute infections (taking into consideration the seronegative period) or, if it's impossible to study smears by the method of amplification of nucleic acids, including cases of inpatient hospitalization because of somatic pathology;
- To identify persons with asymptomatic infections;
- To establish the fact of a previous infection while examining risk groups and conducting a mass survey of population to assess the level of the population immunity;
- To select potential donors of immunocompetent plasma;
- To assess the immunity stress over time, including the period after vaccination;
- Laboratory testing for IgA, IgM and/or IgG (in individual studies or in total) to SARS-CoV-2 is recommended for all medical professionals that have not been tested yet or the result was negative. Frequency of examination – 1 time every 7 days.

*Provisional methodological recommendations «Prevention, diagnosis and treatment of the new coronavirus infection (COVID-19). Version 9 (26.10.2020)»

Operating principle of the system

The entrance gate of the pathogen – epithelium of the upper respiratory tract and epithelial cells of the stomach and intestines. The initial stage of infection is a penetration of SARS-CoV-2 into target cells, carrying the receptors of type II angiotensin converting enzyme (ACE2). ACE2 receptor is a virus transporter into a human cell.

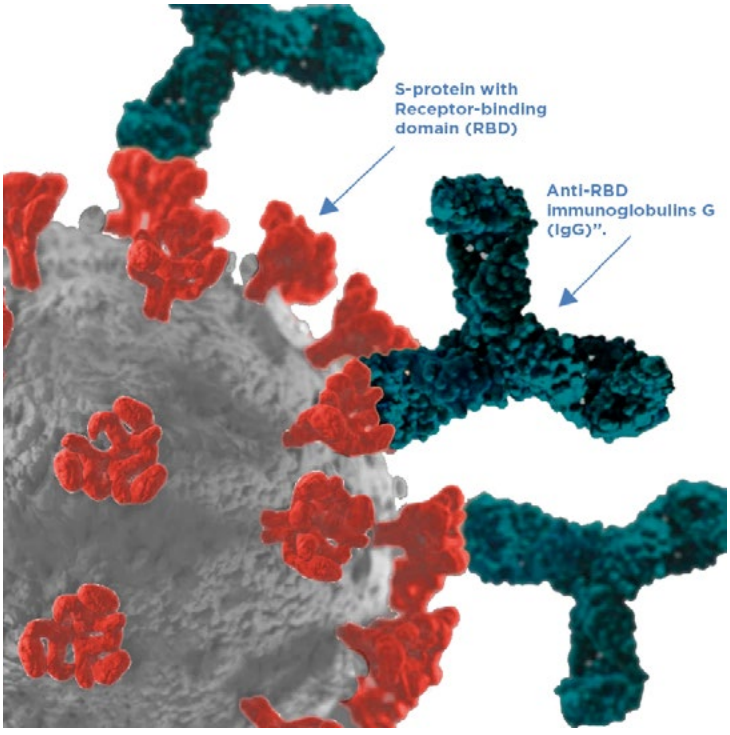


RBD – Receptor binding domain is a structural domain of S1- protein of SARS-CoV-2 virus. The RBD binds to the ACE2 receptor of the human cell, thereby, promoting the process of penetration of the virus into the cell.

The antibodies that are able to bind to RBD domain may block the contact with the ACE2 receptor and prevent the penetration of the virus into human cells and its subsequent reproduction.

According to the recent studies and FDA: Anti-RBD antibodies are virus-neutralizing.*

Detection of antibodies to RBD (anti-RBD antibodies) allows assessment of production of virus neutralizing protective antibodies, assessment of the protective immunity. **



* FDA: Emergency Use Autorization (EAU) Request, Covid – 19 Convalescent Plazma

** Kathleen M. McAndrews, et al. Heterogeneous antibodies against SARS-CoV-2 spike receptor binding domain and nucleocapsid with implications for COVID-19 immunity. JCI Insight 2020;

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Definition of diagnostic characteristics was made for blood serum and plasma as biological samples, within the frames of study "Assessment of specific characteristics of the medicine effectiveness for in vitro diagnostic "Detection kit for immunoglobulins G (IgG) to SARS-CoV-2 Coronavirus by enzyme-linked immunosorbent assay - "SARS-CoV-2-IgG-ELISA" according to Technical Specifications 21.10.60-001-83076696-2020, made by "Allelle" LLC, Russia.

Table 1. Assessment of the clinical sensitivity of "SARS-CoV-2-IgG-ELISA" test system.

Sample type	A day after RT-PCR testing	Samples tested	Samples with IgG (+) result	Sensitivity, Positive Percent Agreement (PPA)*	Confidence interval (CI)
Serum	12-21	20	20	100%	(83,9%; 100%)
EDTA plasma	12-21	33	32	96,9%	(84,7%; 99,5%)
Total samples	12-21	53	52	98,1%	(90,0%; 99,7%)
Positive predictive value (PPV)*				Value	Confidence interval
				98,1%	(90,2%; 99,7%)

*Borderline results were not included. Samples from patients with confirmed SARS-CoV-2 infection were analyzed to determine the diagnostic sensitivity.

Table 2. Assessment of the clinical sensitivity of "SARS-CoV-2-IgG-ELISA" test system.

Sample type	A day after RT-PCR testing	Samples tested	Samples with IgG (-) result	Specificity Negative Percent Agreement (NPA)*	Confidence interval (CI)
Serum	-	44	44	100%	(91,8%; 100%)
EDTA plasma	12-21	60	59	98,3%	(91,1%; 99,7%)
Total samples	12-21/-	104	103	99,0%	(94,7%; 99,8%)
Прогностическая ценность отрицательного результата, Negave predictive value (NPV)*				Value	Confidence interval
				99,0%	(94,8%; 99,8%)

*Borderline results were not included.

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Technical specifications and ordering details

Antigen	RBD domain S1 (spike) - protein sub-units Sl of SARS-CoV-2. RBD protein is expressed in human cells.
Calibration	Semiquantitative;
Interpretation of the result	Interpretation of the result: Coefficient < 0,9: negative; Coefficient = 0,9 - 1,1: borderline; Coefficient > 1.1: positive.
Sample dilution	No preliminary dilution is required. Blood serum or plasma, 1:101 in the dilution buffer for samples;
Quantity of a sample for testing	10 mcl;
Reagents	The reagents are ready for use;
Test procedure	Sample / conjugate / substrate incubation 30 min (37°C)/30 min (37°C)/15 min (22-25°C in darkness)
Measurement	wave length 450 nm
Time to obtain the result	from 75 minutes
Kit format	96 tests. 12*8 strip wells; the kit includes all the necessary reagents.
Kit compatibility	Manual format, open automatic and semi-automatic ELISA analyzers;
Stability	12 months;
Catalogue number	AL-EL-5.

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