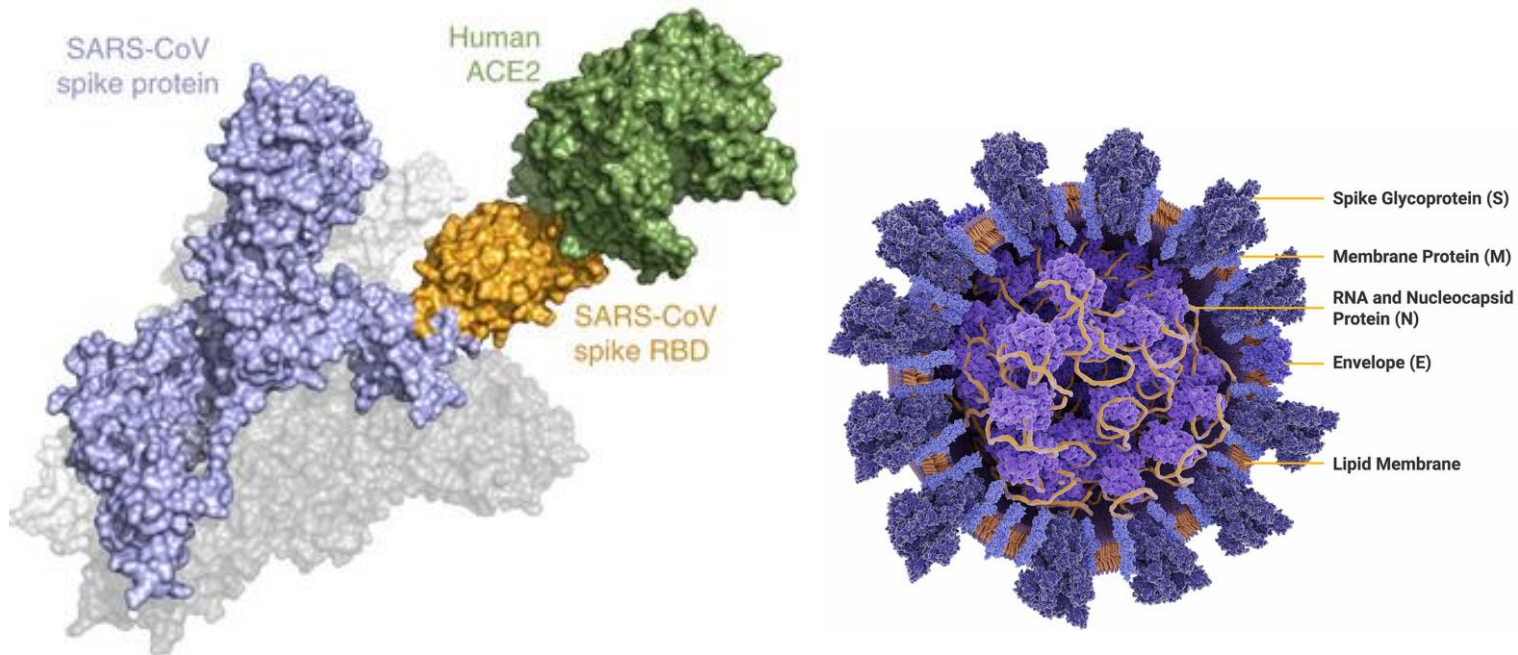


Novel Macroarray and RBD-specific ELISA for the detection of SARS-CoV-2-specific antibodies

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Anti-SARS-CoV-2 RBD IgG ELISA

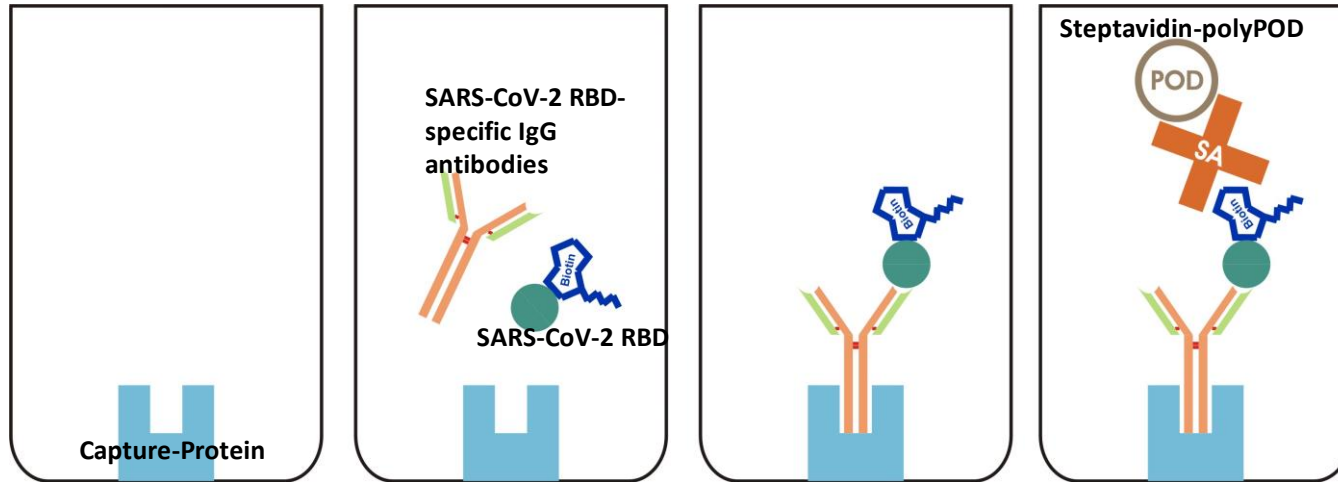


- The entry of SARS-CoV-2 into its target cells depends on binding between the receptor-binding domain (RBD) of the viral spike protein and its cellular receptor, angiotensin-converting enzyme 2 (ACE2).

• Pictures: Soufi et al. 2020, SARS-CoV-2 (COVID-19): New Discoveries and Current Challenges und <https://www.promega.de/>



Anti-SARS-CoV-2 RBD IgG ELISA

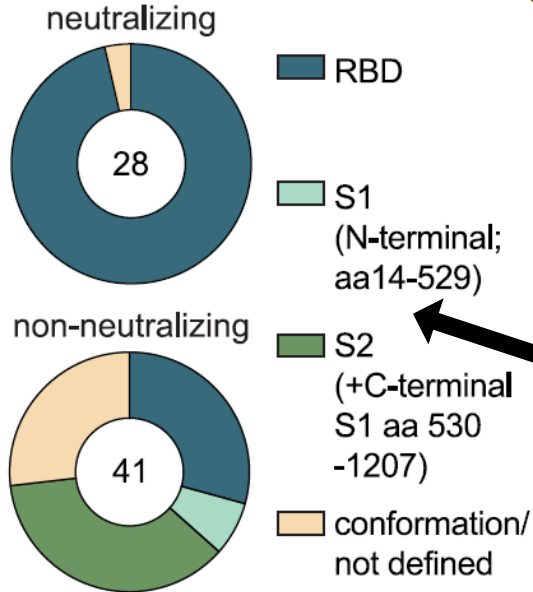


HEK-Cells (human cells) expressed receptor binding domain (RBD) of SARS-CoV-2 Spikeprotein in liquid phase

Detection of RBD-specific antibodies



Anti-SARS-CoV-2 RBD IgG ELISA



Many investigations show a clear correlation between the presence of neutralizing antibodies and the detection of RBD-specific antibodies. (e.g. Yang et al. 2020; Zost et al. 2020)

RBD-specific antibodies could suppress the virus replication and prevent the infection of the cells. (Robbiani et al. 2020; Ju et al. 2020; Tai et al. 2020)

The antibody response of 12 COVID-19 patients from 8 to 69 days after diagnosis was analyzed. By screening 255 antibodies were isolated and of these antibodies, 28 potentially neutralized authentic SARS-CoV-2. (Kreer et al. 2020)

Through single cell analysis of 4,000 SARS-CoV-2 S-protein-reactive B cells from 12 infected individuals, highly potent human monoclonal SARS-CoV-2-neutralizing antibodies were identified that preferentially target the RBD. These antibodies fully block authentic viral infection. (Baum et al. 2020).



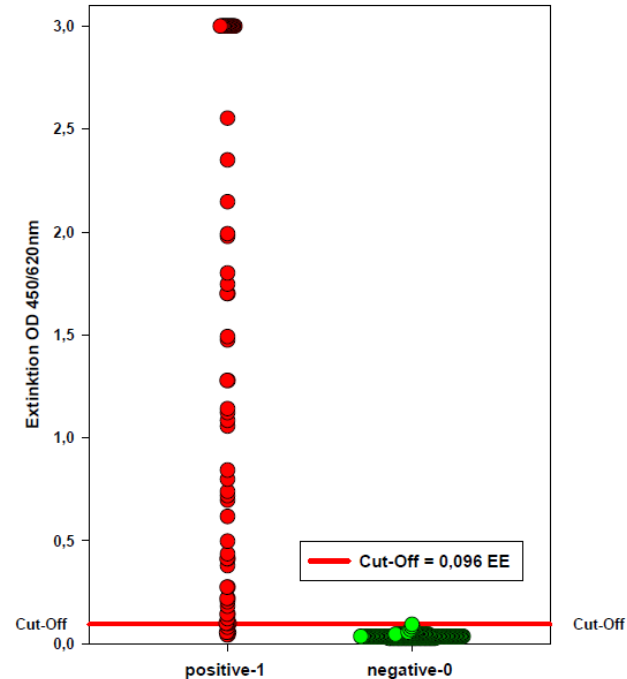
Anti-SARS-CoV-2 RBD IgG ELISA

- SARS-CoV-2 RBD showing a low identity on amino acid level (12,7% - 22.6%) compared to other human-pathogenic coronaviruses (e.g. OC43)
- RBD is a highly specific target for the SARS-CoV-2-antibody diagnostic (Prekumar et al. 2020), antibody-crossreactivities with other human- and animal-pathogenic coronaviruses are unlikely
- Spike-protein → extensive glycosylation (approx. 40%) identification and attachment of antibodies hampered
- RBD is the largest + exposed epitope of the Spike-protein, with a low glycosylation grade (n=1)
- Vaccines based on RBD → no influence of antigenetic drift (variation of the glycan structure through mutations) RBD probably more efficient as a full length Spike-protein based vaccine (Grant et al. 2020)



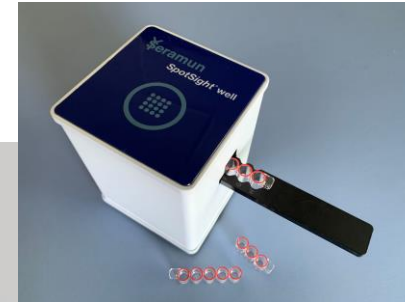
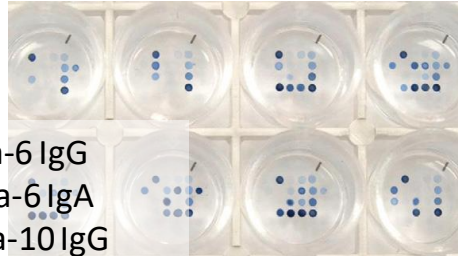
Anti-SARS-CoV-2 RBD IgG ELISA

- 64 COVID-19 patients
- 218 negative blood donors
- (incl. Control groups → CMV, EBV, HBV, HCV, RF, pregnant woman)
- **Sensitivity = 90,6 %**
- **Specificity = 100 %**
- **Semi-Quantification of RBD-specific antibodies**
- **vaccines, antibodies / vaccination control**
- **assay applicable for animal sera e.g. monkey, mouse and hamster**
→ Vaccine- and drug-research



SeraSpot® Anti-SARS-CoV-2 IgG / IgA

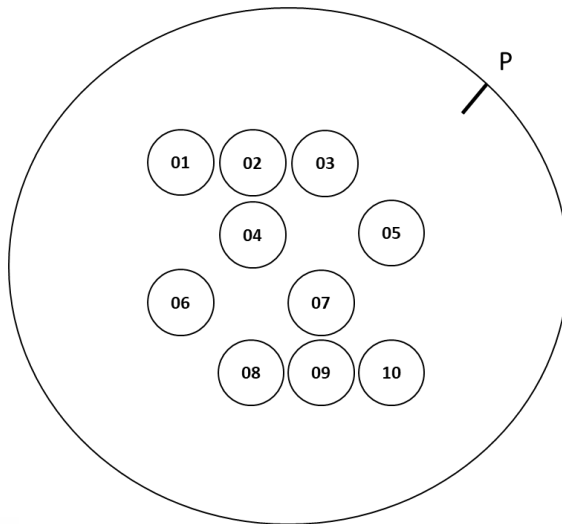
SeraSpot® Anti-Yersinia-6 IgG
SeraSpot® Anti-Yersinia-6 IgA
SeraSpot® Anti-Borrelia-10 IgG
SeraSpot® Anti-Borrelia-10 IgM
SeraSpot® Anti-Helicobacter-6 IgG
SeraSpot® Anti-Helicobacter-6 IgA
SeraSpot® Anti-Treponema-4 IgG
SeraSpot® Anti-Treponema-4 IgM
SeraSpot® Anti-Parvovirus-6 IgG
SeraSpot® Anti-Parvovirus-5 IgM
SeraSpot® Anti-EBV-4 IgG
SeraSpot® Anti-EBV-3 IgM



Microarray-based multiparameter diagnostic in
microtitre plate format for the medical routine-
laboratory



SeraSpot® Anti-SARS-CoV-2 IgG / IgA



Arraylayout SeraSpot® Anti-SARS-CoV-2 IgG / IgA SP-015-4 G/A			
Parameter		Kontrollen	
04	Nucleocapsid	01	Positive control (PC)
05	RBD	02	Cut-off control (CO)
06	S1	03	Negative control (NC)
07	Spike-protein	08	IgG conjugate control (GC)
		09	IgA conjugate control (AC)
		10	Serum control (SC)
		P	Position control

4 different antigens improve the diagnostic safety
in SARS-CoV-2 serology



Summary

- **Anti-SARS-CoV-2-RBD IgG ELISA**
 - High-specific (100%) detection of potential neutralizing antibodies (RBD-specific)
- **SeraSpot® Anti-SARS-CoV-2 IgG / IgA**
 - SARS-CoV-2 confirmation test for the serology diagnostic (NP, Spike-Full, Spike-S1, RBD)
 - **Antibody-Profiling**
 - Risk infections
 - Active or past infection
 - Protective antibodies
- **Antigens and antibodies**
 - Industrial production of substrates, antigens and antibodies for the IvD-diagnostic and research

