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LIAISON® SARS-CoV-2 TrimericS IgG assay

A quantitative assay for immune status
monitoring with an accurate correlation
of neutralizing IgG antibodies

INFECTIOUS DISEASE

FOR OUTSIDE
THE US
AND CANADA ONLY

DiaSorin

The Diagnostic Specialist

LIAISON® SARS-CoV-2 TrimericS IgG assay

The value of DiaSorin assay

The LIAISON® SARS-CoV-2 TrimericS IgG assay is the second generation of DiaSorin serological tests with an important diagnostics improvement. The selection of a new recombinant Trimeric Spike glycoprotein as a capture antigen, offers a new product with high standard quality that provides the following benefits:

- A quantitative assay for the detection of IgG antibodies anti-Trimeric Spike glycoprotein of SARS-CoV-2
- Trimeric Spike Glycoprotein is the stabilized native form of the SARS-CoV-2 Spike protein and a stabilized trimer may elicit an accurate detection of IgG Neutralizing antibodies ⁽¹⁾
- Clinical Sensitivity: 98.7% - Clinical Specificity: 99.5%
- Correlation with Microneutralization test: PPA: 100%, NPA: 96.9%
- A fully automated solution with up to 171 results/hour on LIAISON® XL
- Complete traceability combined with a simplified sample workflow

Intended Use of LIAISON® SARS-CoV-2 TrimericS IgG assay

LIAISON® SARS-CoV-2 TrimericS IgG assay is a new generation of chemiluminescence immunoassay (CLIA), for the quantitative determination of anti-trimeric spike protein specific IgG antibodies to SARS-CoV-2 in human serum or plasma samples. The assay is intended as an aid in the diagnosis of COVID-19 and to support the study of the immune status of infected patients by providing an indication of the presence of neutralizing IgG antibodies against SARS-CoV-2.

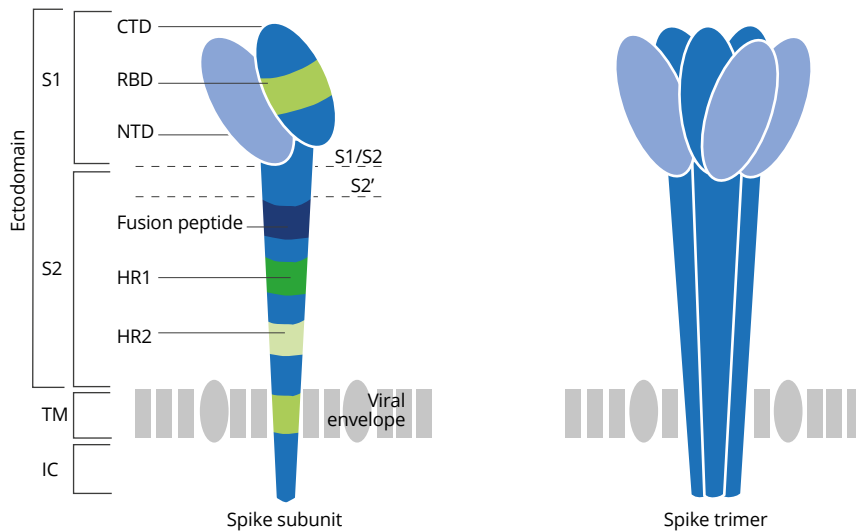
Technical Specification

Analyte	IgG antibodies to SARS-CoV-2
Platform	LIAISON® XL
Expression of Results	AU/mL Quantitative
Test Format	Indirect immunoassay
# Determinations	110 tests/integral 50 determinations/control vial
Sample Type	Equivalence to serum shown for SST, Lithium heparin and EDTA plasma
Sample Storage	21 days 2-8°C – 48h Room temperature
Sample Volume	10 µL
Time to first Results	35 minutes
Throughput	171 test/hour XL
Clinical Sensitivity (<i>days post PCR</i>)	98.7% (≥15 days)
Clinical Specificity	99.5% (95% CI: 99.0% - 99.7%)
Correlation Microneutralization test	PPA: 100% (95%CI: 97.8% - 100.0%) NPA: 96.9% (95%CI: 92.9% - 98.7%)
Assay Range	1.85 – 800 AU/mL

The Selection of the antigens for the assay: the value of using SARS-CoV-2 recombinant Trimeric S glycoprotein

- Trimeric Spike Glycoprotein is a stabilized trimer offering an improved detection of IgG Neutralizing antibodies ⁽¹⁾
- For diagnostics, the Trimeric Spike Glycoprotein detects a broader repertoire of Neutralizing Antibodies improving sensitivity and accuracy of the immune status monitoring ^(2, 3)
- Trimeric Spike Glycoprotein improved the sensitivity and the specificity with a better correlation with the Microneutralization test ⁽³⁾

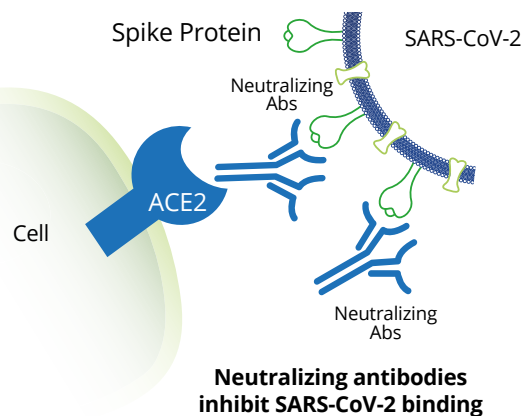
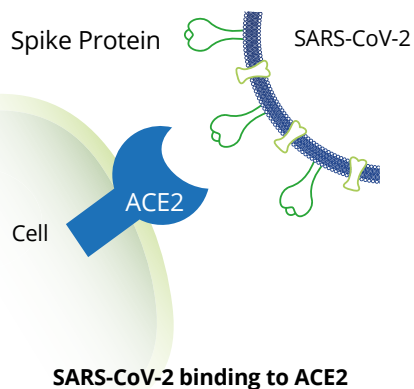
Recombinant Trimeric SARS-CoV-2 Spike protein



The protein Spike is a glycoprotein consisting of two subunits S1 and S2. The S1 subunit consists among other RBD and NTD sites, which are the most immunogenic regions. The test detects antibodies against the Trimeric complex, which includes the RBD and NTD sites from the three subunit S1 (the Trimeric complex).

SARS-CoV-2 polyclonal antibodies inhibit SARS-CoV-2 spike mediated entry into cells.

The Spike Protein is the target for neutralizing antibodies



The Value of detecting Neutralizing Antibodies

Neutralizing Antibodies (NAbs) are defined as an antibody that defends a cell from a pathogen or infectious particle by neutralizing any effect it has biologically. ⁽¹⁾

The presence of NAb is commonly considered as a sign of protection against a pathogen, ⁽²⁾ even if it should be noted that lack of scientific data at this time does not allow yet to determine if neutralizing IgG antibodies against SARS-CoV-2 provide long term immunity to the virus or if they protect patients against re-infection.

Results Interpretation

AU/mL	Results	Interpretation
< 13.0	Negative	A negative result may indicate the absence or a very low level of IgG antibodies to the pathogen. The test could score negative in infected patients during the incubation period and in the early stages of infection.
≥ 13.0	Positive	A positive result indicates the presence of IgG antibodies to SARS-CoV-2 and generally indicates exposure to SARS-CoV-2.

Test results are reported as positive or negative along with a numeric value for quantitative measurement.

However, diagnosis of SARS-CoV-2 infection should not be established on the basis of a single test result, but should be determined in conjunction with clinical findings, patient history, and always in association with medical judgment.

Clinical sensitivity

Clinical sensitivity was determined by testing 203 samples collected over the course of time from subjects with a clinical diagnosis of COVID-19 based on a positive SARS-CoV-2 polymerase chain reaction (PCR) method.

The following table describes positive percent agreement (PPA) by time of sampling following a positive PCR result.

Days Post RT-PCR	N	Positive	Negative	PPA	95% CI (Wilson Score)
0-7	24	16	8	66.7%	46.7%-82.0%
8-14	24	22	2	91.7%	74.2%-97.7%
≥ 15	155	153	2	98.7%	94.5%-99.6%

Clinical specificity

Clinical specificity was evaluated by testing 1899 presumed SARS-CoV-2 negative samples from US blood donors collected prior to the COVID-19 outbreak.

The following table describes negative percent agreement (NPA).

Population	N	Positive	Negative	NPA	95% CI (Wilson Score)
Apparently Healthy	1899	10	1889	99.5%	99.0%-99.7%

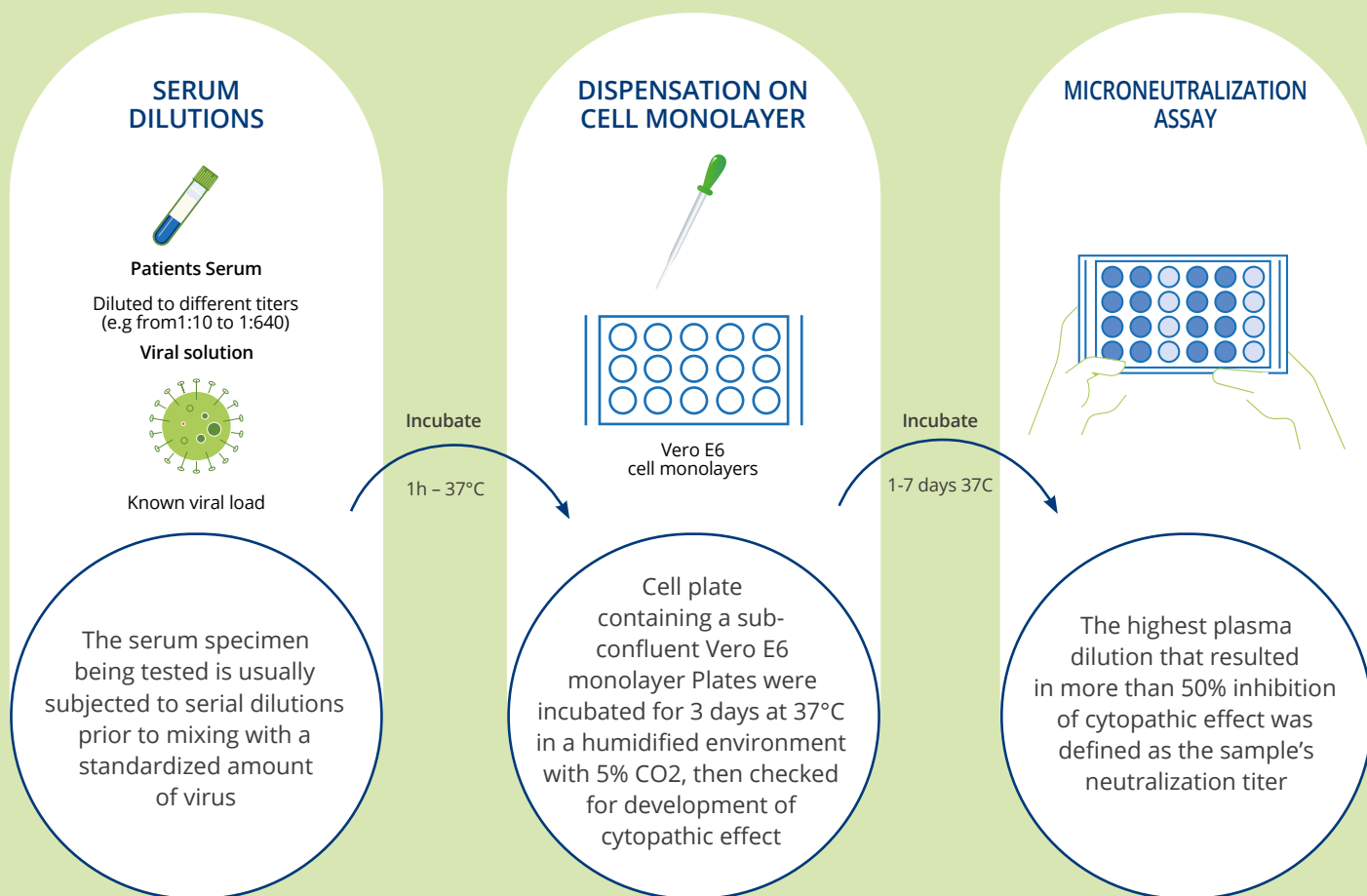
Measuring range

The LIAISON® SARS-CoV-2 TrimericS IgG assay measures between 1.85 and 800 AU/mL.

The LIAISON® assay correlates with Micro Neutralization test (MNT)

A MNT measures how effective are patient antibodies to stop the virus from infecting cells, that is the neutralizing activity.

LIAISON® SARS CoV-2 Trimerics IgG Concordance with MNT

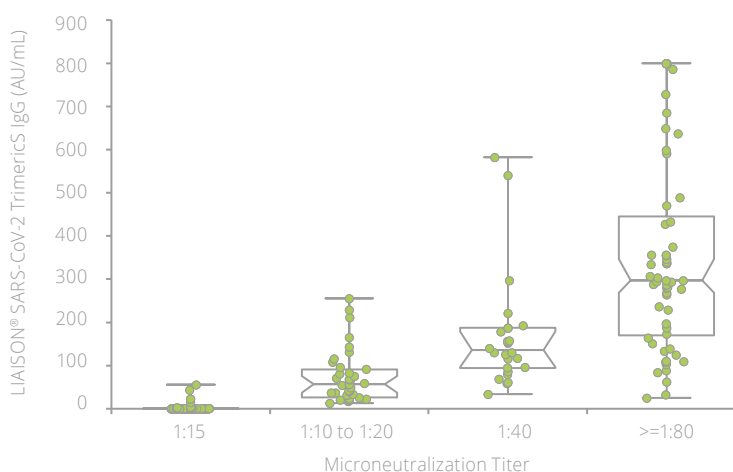


Concordance with Micro-neutralization Assay

Concordance with neutralizing antibody titers was evaluated by testing 282 samples with Micro-neutralization assay results. The following table describes negative and positive agreement to 160 Micro-neutralization assay negative and 122 Micro-neutralization assay positive (i.e. titer $\geq 1:10$) specimens, respectively.

LIAISON® SARS-CoV-2 TrimericS IgG	Micro-neutralization assay Titer		Total
	Negative	Positive	
Negative (< 13 AU/mL)	155	0	155
Positive (≥ 13 AU/mL)	5	122	127
Total	160	122	282
	Proportion		Wilson 95% CI
Negative Agreement	96.9%	(155/160)	92.9% - 98.7%
Positive Agreement	100.0%	(122/122)	97.8% - 100.0%

The distribution of LIAISON® SARS-CoV-2 TrimericS IgG assay results by microneutralization titer is shown in the graph below.



Results of 47 samples with high LIAISON® doses (i.e. ≥ 200 AU/mL) were compared to a higher microneutralization assay titer threshold of $\geq 1:80$ to demonstrate concordance at high neutralizing antibody titers.

LIAISON® SARS-CoV-2 TrimericS IgG	Microneutralization Assay Titer		Total
	<1:80	$\geq 1:80$	
≥ 200 AU/mL	15% (7)	85% (40)	47

Ordering Information

Part number	Description	Configuration
P/N311510	LIAISON® SARS-CoV-2 TrimericS IgG	110 tests
P/N311511	LIAISON® SARS-CoV-2 TrimericS IgG Control Set 2 vials SARS-CoV-2 Human serum non-reactive for SARS-CoV-2 IgG antibodies 2 vials SARS-CoV-2 Human serum/plasma reactive for SARS-CoV-2 IgG antibodies	50 determinations/vial

References:

1. A human monoclonal antibody blocking SARS-CoV-2 infection. Wang C., Li W. et al. Nature communications (2020) 11:2251. <https://doi.org/10.1038/s41467-020-16256-y>. www.nature.com/naturecommunications.
2. A thermostable, closed SARS-CoV-2 spike protein trimer Xiaoli Xiong Nature Structural & Molecular Biology. VOL 27. 934 October 2020. 934–941. www.nature.com/nsmb <https://doi.org/10.1038/s41594-020-0478-5>.
3. "Potent neutralizing antibodies against multiple epitopes on SARS-CoV-2 spike" Lihong Liu Nature. Vol 584. 20 August 2020 Neutralizing Ab and Epitopes <https://doi.org/10.1038/s41586-020-2571-7>.

Please visit: www.diasorin.com/covid19CE
for more information and updates

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Product availability subject to required regulatory approval

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