FAQs for the Roche Cobas Electrochemiluminescent Immunoassy (ECLIS) 6-25-02020

WHAT DOES THE TEST MEASURE ?

It measures detectable antibodies (IgG, IgA, and IgM) to the nucleocapsid protein of SARS-CoV-2

WHAT IS THE SCIENCE BEHIND THIS TEST

The Roche Cobas Electrochemiluminescent Immunoassay (ECLIA)
Total Antibody serology for SARS-CoV-2 is an aid in the diagnosis of primary and secondary SARS-COV-2 infections.

IS THIS TEST NECESSARY FOR EVALUATION OF THE POPULATION ?

Dr Debra Birx, the coordinator of the White House coronavirus task force, has called this Antibody testing **"Critical**". We agree.

What is the expected Turn Around Time?

Currently we are sending the test to our reference lab, which results in a 1-3 days draw to result timeline. We are working on getting our own instrument, but the DOD, military, and large hospital systems with inpatient populations are first in line to receive rationed platforms and kits.

Has the test been reviewed by the FDA?.

No. This test has not been reviewed by the FDA. So the test report will include the following bullet points.

- Negative results do not rule out SARS-CoV-2 infection, particularly in those who have been in contact with the virus. Follow-up testing with a molecular diagnostic should be considered to rule out infection in these individuals.
- Results from antibody testing should not be used as the sole basis to diagnose or exclude SARS-CoV-2 infection or to inform infection status.
- Positive results may be due to past or present infection with non-SARS-CoV-2 coronavirus strains, such as coronavirus HKU1, NL63, OC43, or 229E."
- Not for the screening of donated blood.

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IS THE TEST ACCURATE?

Yes. **Roche Reported Specificity and Sensitivity**

Specificity

A total of 5272 samples were tested with the Elecsys Anti-SARS-CoV-2 assay. All samples were obtained before December 2019. 10 false positive samples were detected.

The resulting overall specificity in the internal study was 99.81 %. The 95 % lower confidence limit was 99.65 %.

Cohort	N	Non-reactive	Reactive	Specificity, % (95 % CI[c])
Diagnostic routine	3420	3413	7	99.80 (99.58-99.92)
Blood donors	1772	1769	3	99.83 (99.51-99.97)
Common cold panel	40	40	0	100 (91.19-100)
Coronavirus panel[d]	40	40	0	100 (91.19-100)
Overall	**5272**	**5262**	**10**	**99.81 (99.65-99.91)**

c) CI = confidence interval

d) 40 potentially cross-reactive samples from individuals following an infection with Coronavirus HKU1, NL63, 229E or OC43, confirmed via PCR

Sensitivity

A total of 204 samples from 69 symptomatic patients with a PCR confirmed SARS-CoV-2 infection were tested with the Elecsys Anti-SARS-CoV-2 assay. 1 or more consecutive specimens from these patients were collected after PCR confirmation at various time points.

Days post PCR confirmation	N	Reactive	Non-reactive	Sensitivity, % (95 % CI)
0-6	116	76	40	65.5 (56.1-74.1)
7-13	59	52	7	88.1 (77.1-95.1)
≥ 14	29	29	0	100 (88.1-100)

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The false positive rate is less than 1% ((181/182)-100) when tested with 182 pre covid-19 stored sample of convalescent serum from infection prior to the first date of identification of SARS-CoV-2 virus.

DOES THE TEST INFER IMMUNITY?

No positive or negative definitive statement can be made. The infection is just too new for the longitudinal studies needed to answer the question.

Perhaps Dr Harvey Fineberg, Chairman of the NAS committee put it best when he commented that the $64 question is **if the antibody level(s)equate(s) to resistance to getting ill again?".**

The Oxford chart below seems to indicate that immunity is achieved with the identification of the IgG antibody, but that has not been proven for this SARS-CoV-2 coronavirus we are now testing for. The chart only illustrates the normal antigenic stimulus to antigenic response for IgM and IgG antibody to a general antigenic challenge. For example, measles or mumps virus infections cause the body to make IgG antibodies that are protective for years and even decades, while for many coronaviruses, long term immunity is variable at best.

The current take home message on Immunity is that, to date (4-24-2020), there have been no longitudinal studies to demonstrate either partial or complete immunity to SARS-CoV-2 based upon the results of this test.

Demonstration of any long term immunity will take years of patient data to confirm or deny any relationship between test results and any possible immunity claims.

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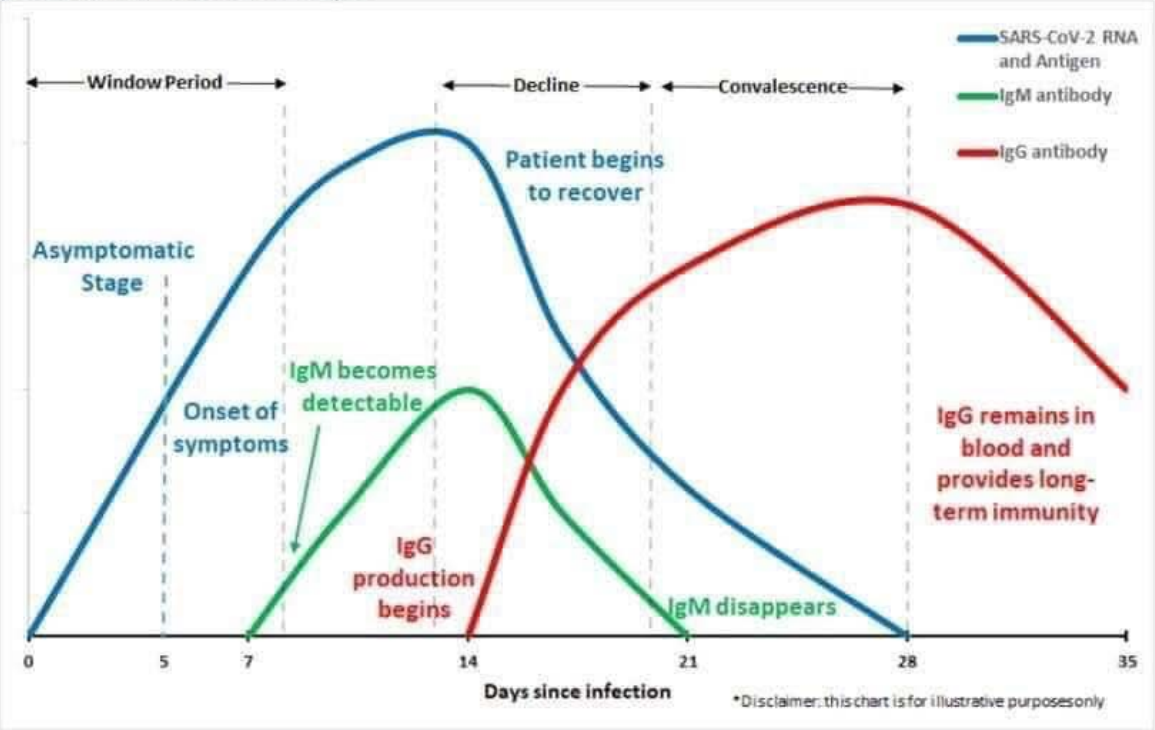
OXFORD CHARTi

Therefore, this COVID-19 Rapid Test should not be used until symptoms have been present for at least 3 days.



Test results			Clinical Significance
PCR	IgM	IgG	
+	–	–	Patient may be in the window period of infection.
+	+	–	Patient may be in the early stage of infection.
+	+	+	Patient is in the active phase of infection.
+	–	+	Patient may be in the late or recurrent stage of infection.
–	+	–	Patient may be in the early stage of infection. PCR result may be false-negative.
–	–	+	Patient may have had a past infection, and has recovered.
–	+	+	Patient may be in the recovery stage of an infection, or the PCR result may be false-negative.

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Dr Anthony Fauci, a member of the of the White House coronavirus task force, has stated **"The test can help determine if someone is immune to the coronavirus and that's going to be important when you think about getting people back into the workplace"**

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[i] With credit to Trisha Greenhalgh, Prof of Primary Care, University of Oxford.

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