

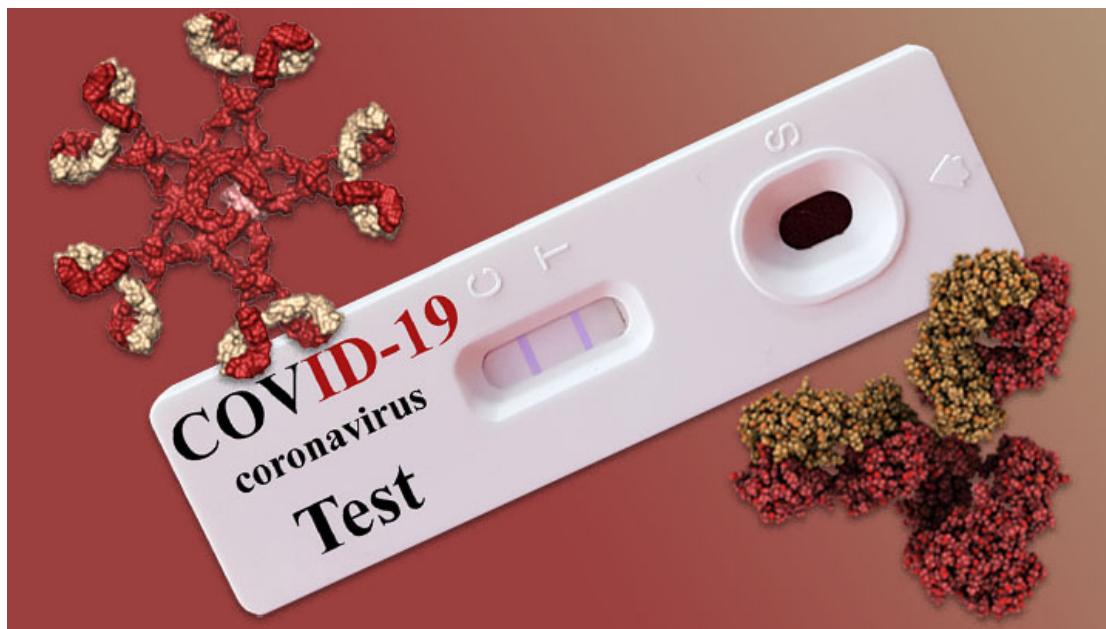
# NIH Director's Blog

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## Study Finds Nearly Everyone Who Recovers From COVID-19 Makes Coronavirus Antibodies

Posted on May 7th, 2020 by Dr. Francis Collins



Credit: NIH

There's been a lot of excitement about the potential of antibody-based blood tests, also known as serology tests, to help contain the coronavirus disease 2019 (COVID-19) pandemic. There's also an awareness that more research is needed to determine when—or even if—people infected with SARS-CoV-2, the novel coronavirus that causes COVID-19, produce antibodies that may protect them from re-infection.

A recent study in *Nature Medicine* brings much-needed clarity, along with renewed enthusiasm, to efforts to develop and implement widescale antibody testing for SARS-CoV-2 [1]. Antibodies are blood proteins produced by the immune system to fight foreign invaders like viruses, and may help to ward off future attacks by those same invaders.

In their study of blood drawn from 285 people hospitalized with severe COVID-19, researchers in China, led by Ai-Long Huang, Chongqing Medical University, found that all had developed SARS-CoV-2 specific antibodies within two to three weeks of their first symptoms. Although more follow-up work is needed to determine just how protective these antibodies are and for how long, these findings suggest that the immune systems of people who survive COVID-19 have been primed to recognize SARS-CoV-2 and possibly thwart a second infection.

Specifically, the researchers determined that nearly all of the 285 patients studied produced a type of antibody called IgM, which is the first antibody that the body makes when fighting an infection. Though only about 40 percent produced IgM in the first week after onset of COVID-19, that number increased steadily to almost 95 percent two weeks later. All of these patients also produced a type of antibody called IgG. While IgG often appears a little later after acute infection, it has the potential to confer sustained immunity.

To confirm their results, the researchers turned to another group of 69 people diagnosed with COVID-19. The researchers collected blood samples from each person upon admission to the hospital and every three days thereafter until discharge. The team found that, with the exception of one woman and her daughter, the patients produced specific antibodies against SARS-CoV-2 within 20 days of their first symptoms of COVID-19.

Meanwhile, innovative efforts are being made on the federal level to advance COVID-19 testing. The NIH just launched the Rapid Acceleration of Diagnostics (RADx) Initiative to support a variety of research activities aimed at improving detection of the virus. As I recently highlighted on this blog, one key component of RADx is a "shark tank"-like competition to encourage science and engineering's most inventive minds to develop rapid, easy-to-use technologies to test for the presence of SARS-CoV-2.

On the serology testing side, the NIH's National Cancer Institute has been checking out kits that are designed to detect antibodies to SARS-CoV-2 and have found mixed results. In response, the Food and Drug Administration just issued its updated policy on antibody tests for COVID-19. This guidance sets forth precise standards for laboratories and commercial manufacturers that will help to speed the availability of high-quality antibody tests, which in turn will expand the capacity for rapid and widespread testing in the United States.

Finally, it's important to keep in mind that there are two different types of SARS-CoV-2 tests. Those that test for the presence of viral nucleic acid or protein are used to identify people who are acutely infected and should be immediately quarantined. Tests for IgM and/or IgG antibodies to the virus, if well-validated, indicate a person has previously been infected with COVID-19 and is now potentially immune. Two very different types of tests—two very different meanings.

There's still a way to go with both virus and antibody testing for COVID-19. But as this study and others begin to piece together the complex puzzle of antibody-mediated immunity, it will be possible to learn more about the human body's response to SARS-CoV-2 and home in on our goal of achieving safe, effective, and sustained protection against this devastating disease.

## Reference:

[1] Antibody responses to SARS-CoV-2 in patients with COVID-19. Long QX, Huang AI, et al. Nat Med. 2020 Apr 29. [Epub ahead of print]

## Links:

Coronaviruses  (NIH)

"NIH Begins Study to Quantify Undetected Cases of Coronavirus Infection," NIH News Release, April 10, 2020.

"NIH mobilizes national innovation initiative for COVID-19 diagnostics," NIH News Release, April 29, 2020.

Policy for Coronavirus Disease-2019 Tests During the Public Health Emergency (Revised), May 2020 (Food and Drug Administration)

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**sw says:**

May 14, 2020 at 12:49 am

Telemedicine is making a very positive contribution to healthcare during the pandemic and is being used in a variety of ways. Thanks for sharing this informative article.

Reply

**Ms Susan Harding says:**

May 14, 2020 at 9:10 am

I have not been confirmed as having coronavirus virus. I had every symptom of the virus in February 2020 a few days after my return to Chatham Kent after spending time with my family who live in Windsor Berkshire-traveling via London. At the time the reports of the virus were new so I thought was just a general winter virus. As my possible infection was 3 months ago I thought I may be of value with tests on antibodies

Reply

**Kimberly says:**

May 20, 2020 at 9:29 am

Same here trip from Florida first week in February I get sick they said I had double pneumonia I was hospitalized for six days but there was very little conversation about corona at the time I did go yesterday for my physical and my doctor suggested let's see if you had it by checking for antibodies so we will see the results today.

Reply

**Billy says:**

May 20, 2020 at 11:05 am

what were the results?

Reply

**Teresa Ramos (MD PhD Immunologist) says:**

May 15, 2020 at 10:12 am

A number of studies have now shown that ab are produced after infection with Covid 19, what now one look at is whether these Ab are neutralizing! Having Ab does not mean protection. They could even be enhancing! It seems to me that it is important to alert people for this fact for knowing that one has Abs might give a false sense of security.

Reply

**Lauren S says:**

May 18, 2020 at 11:14 am

I tested positive for COVID 19 with mild symptoms on 4/2 but on 5/15 tested negative for antibodies. how is this possible?

Reply

**Brits says:**

May 20, 2020 at 1:10 pm

As far as I can tell, no test is a "gold" standard. Only by taking enough samples tests to create a statistically valid result, can we reasonably discern which approaches are effective. Best wishes to you that you remain healthy!

Reply

***Sandra Libby says:***

May 15, 2020 at 2:58 pm

I am a blood donor (O Neg CMV neg) and in 2006 I received a note from Hema Quebec saying I have Anti M in my blood and to be careful of transfusions. I don't know to what or when I formed this antibody. Would this antibody be good against Covid 19. I presume its IgM..If I were to be tested for the Covid 19 antibody, would there be a way to tell that it isn't the antibody discovered in 2006? Thanks for any info.

Reply

***Emma says:***

May 17, 2020 at 4:52 pm

Note that it says "In their study of blood drawn from 285 people HOSPITALIZED with SEVERE COVID-19." There have been reports that those with mild cases of COVID-19 do not produce antibodies, likely because their innate immune system (cell-mediated immunity) wiped out the virus before the adaptive immune system (antibodies) had to kick in. Not much solace for those of us who had "mild" symptoms and were nonetheless extremely ill with fever, nausea, chest pain, and shortness of breath; we'll never know if we had it, we won't be able to donate plasma, and we won't know if we'll get it again in a short period of time.

Reply

***Kwaaiikat says:***

May 18, 2020 at 2:14 am

Cell mediated immunity and antibodies are both part of the adaptive and innate immune systems. When acquired after an infection, both protect against future infections.

Both can be a response to serious or mild infections. New approved anti body tests have near 100% detection rate of past infections (some of which were identified for testing through contact tracing rather than symptoms), which suggests that as with most viruses, cell mediated immunity is rarer.

It is of course possible for some, which means our immunity estimates derived from anti body testing will be conservative.

Developing symptoms but fighting it off with innate immunity is a paradox. You can only recover from an illness without an anti infectious agent medication if you develop increased immunity during the course of the infection. If you have sufficient innate immunity to recover, you cannot get infected.

Individuals for whom a mild infection does not confer relatively lasting immunity, will also not respond to vaccinations.

Reply

**Lauren S says:**

May 18, 2020 at 11:13 am

I tested positive for COVID 19 on 4/2, and had a antibody test 5/15 which was negative via Abbott reliable platform. How is this possible? I am concerned

Reply

**Lauren says:**

May 18, 2020 at 11:03 am

I had coronavirus (swabbed positive 4/2) and do not have antibodies.

Reply

**Dobhran C. says:**

May 18, 2020 at 1:27 pm

I was hellishly sick over the Christmas, until mid Jan. I would get better and feel like going out, then two days later flat non my back again. With no paid sick leave it was a problem. Fortunately I had a bit of back pay from another employer. Full range of symptoms though. Fine now thank goodness.

Reply

**Phil Smith says:**

May 20, 2020 at 5:01 pm

NEARLY all patients developed antibodies? What about the ones who didn't? Why not?

Reply

**Anita Broadhead says:**

May 20, 2020 at 7:03 pm

Can you develop antibodies and still be contagious?

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### **Francis S. Collins, M.D., Ph.D.**


Appointed the 16th Director of NIH by President Barack Obama and confirmed by the Senate. He was sworn in on August 17, 2009. On June 6, 2017, President Donald Trump announced his selection of Dr. Collins to continue to serve as the NIH Director.

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