The future of COVID-19 immunity looks good

Our COVID-19 vaccines have passed their first tests with flying colors. They work unbelievably well, and they're helping to slow the spread of disease in countries where they're widely available. Now, scientists are turning to the next key question: how long will they work that well?

In people who were sick with COVID-19 and then got vaccinated, new research shows that they probably work for years. That group has powerful memory cells in their bone marrow that produce new antibodies when they're needed. And they work so well that they can even block variants of the virus, studies show. These people may not even need vaccine boosters to stay protected long term.

Protection may be different for people who got vaccinated but never had COVID-19, Michel Nussenzweig, an immunologist at Rockefeller University in New York, told *The New York Times*. The immune system responds differently to vaccines than it does to natural infection, so they might need boosters against variants — even if they have strong and long-lasting protection against the original coronavirus strain. "That's the kind of thing that we will know very, very soon," Nussenzweig said.

Luckily, other research is charging ahead to figure out exactly what those potential boosters might look like. Scientists are honing in on the levels of antibodies someone needs to be protected against COVID-19. That benchmark, known as the immune correlate of protection, will give them an idea of the safety threshold — if someone's antibodies drop below it, they might be more vulnerable to infection again.

Zeroing in on that threshold does two things. First, it gives scientists a way to monitor protection in people who have already been vaccinated. They can watch to see how long it takes for antibodies to decline below it, and get an idea of when people might need that booster shot. Antibodies naturally decline over time, and they're not the only measure of protection (those long-lasting memory cells in bone marrow are another, for example). But they're an early look at how immunity might be changing.

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Second, having a threshold for protection opens up a shortcut to creating any needed booster shots against COVID-19 variants. COVID-19 vaccine trials included tens of thousands of people. They took months to run, because researchers needed to watch how frequently people with and without the shots got sick. Once we have a good idea of the immune response that stops infections, though, they can test boosters — which are functionally the same vaccine, with small tweaks — in smaller groups of people. We already know the shots are safe, so all they may need to do is check if the new version also pushes people's immune system above the cutoff.

Together, this research outlines a way to keep people safe from COVID-19 going forward. It starts to ease fears that protection against the coronavirus would start to fade over time, putting communities at risk for outbreaks down the road. The virus is tricky, and variants are a curveball, but — luckily — the human immune system has ammunition as well.

Here's what else happened this week.

Research

What Breakthrough Infections Can Tell Us

Finding and analyzing the rare cases of COVID-19 in people who

have been vaccinated can give us crucial information about variants. But testing vaccinated people too often can have drawbacks, as well. (Katherine Wu / *The Atlantic*)

Moderna says its COVID-19 vaccine is effective in teens

The shot could be the second vaccine available for people under 18 and key toward safely reopening schools in the fall. (Nicole Wetsman / *The Verge*)

Development

Half of all US adults are now fully vaccinated against COVID-19

The country hit this huge milestone in less than six months. (Bill Chappell / *NPR*)

The U.S. may never hit the herd immunity threshold. That's OK.

In places like the United States, where half of the population has been vaccinated, the pandemic will slow and stop being a threat even without reaching the level needed for herd immunity. (Erin Mordecai, Mallory Harris and Marc Lipsitch / *The New York Times*)

We have bigger problems than COVID-19's origins

Spending too much time arguing over the lab leak speculation is a distraction from the important steps governments need to take to end this pandemic and prepare for the next one. (Nicole Wetsman / *The Verge*)

Perspectives

> *During a brainstorming session at the end of April, we discussed a number of ideas, including gift cards, direct payments and free tickets to sporting events. My chief adviser, Ann O'Donnell, who has been with me since my time in*

> *Congress, hesitantly suggested the idea of a lottery. She almost didn't mention it because of its seeming absurdity. "This is kind of a wacky idea but …."*

—Ohio Governor Mike DeWine wrote in *The New York Times* about the decision to give $1 million to five vaccinated adults through a lottery.

More than numbers

To the people who have received the 1.8 billion vaccine doses distributed so far: thank you.

To the more than 168,927,298 people worldwide who have tested positive, may your road to recovery be smooth.

To the families and friends of the 3,509,402 people who have died worldwide — 592,938 of those in the US — your loved ones are not forgotten.

Stay safe, everyone.

https://www.theverge.com/2021/5/29/22458912/covid-immunity-vaccine-protection-lab-leak-antivirus