COVID-19 is Mutating. What Does That Mean?

The coronavirus that has spread so quickly across the country is different than the one that sneaked into California from China earlier this year. SARS-CoV-2 — the official name of the virus that causes COVID-19 — is sporting a mutation, a small and subtle change that likely makes it more infectious.

While such news may cause alarm among laypeople, researchers assure the public that a mutating virus is not unusual. It’s to be expected as the virus spreads through the population. Some mutations help a virus reproduce, others hinder it, and still, others don’t affect it at all.

“Think of a CD or videotape,” says Bhavarth Shukla, M.D., M.P.H., medical director of infection control at the University of Miami Health System. “The more it’s played, the more scratches it’s likely to get. Something similar happens to a virus. When a virus replicates, it has a certain error rate depending on its machinery.”

In the case of coronaviruses in general, Dr. Shukla adds, the error rate – or the rate of mutation – tends to be low, which is a good thing. “The more mutations, the more possibilities of problems.”

When compared to the common flu, this coronavirus is slow to change.

That’s because it feels no pressure to adapt to make itself more effective. There’s no immunity in the population, nor are there treatments or vaccines to stop it, so the virus can continue spreading without obstacle.
To understand how SARS-CoV-2 shapeshifted as it traveled around the world requires a short history of the virus’s genealogy:

There are 30,000 letters in the SARS-CoV-2 genome. Sometime in the not so distant past, a mutation at position 23,403 occurred. It was a tiny change and certainly not the only mutation — but it has drawn a lot of attention because of its placement. The mutation changed an amino acid on position 614 of the virus’s spike, which contains the protein that attaches itself to human cells.

Scientists express this with abbreviations. For example, the old amino acid on the spike was aspartic, abbreviated with a D. The new one is a glycine represented with a G. Translation? The old version was shorthanded as D614, the new one as G614. In July, a paper published in the journal Cell reported that G614 had become the dominant strain, while D614 has almost disappeared. Researchers believe the mutation may have occurred in Italy as early as March. It’s now seen in more than 95% of the virus samples around the world.

**Researchers hypothesize that this mutation makes the virus better at entering human cells.**

That’s because the changes to the spike protein appear to make the virus more efficient in transmission. Though the Cell paper doesn’t offer definitive proof of better transmissibility, Dr. Shukla says later studies have shown higher infection rates in a laboratory setting.

In New York, a research team that works with the gene-editing technology CRISPR
compared the early Wuhan version with a G version the team created. The lab-edited mutated virus (G614) was better at spreading in human tissue cells than its predecessor. Outside the lab and in clinical settings, physicians have also found more of the G version in swab samples from infected patients. But having more copies of the G version, compared to patients with the D variant, doesn’t mean the illness is more severe, Dr. Shukla says.

**It doesn’t change the treatment protocol, either.**

“Clinically, there’s no evidence that this is worse, so we’re managing [the new strain] in the same way,” Dr. Shukla adds. Again, more efficient spread doesn’t translate into a more lethal virus.

Dr. Shukla also offers reassurance that the mutation “probably won’t affect the development of a vaccine.” Those in current clinical trials focus on a different section of the spike. At any rate, the mutation appears to be as sensitive to antibodies as the original Wuhan version. This means getting vaccinated will protect you against infection.

Will future and inevitable mutations change the way we treat the virus? “At this point, we don’t know what other mutation in the genome will occur or if a mutation will require the change-up of a vaccine,” Dr. Shukla concedes.

But he suggests the public focus on what healthcare experts have been urging the public to do.

“The key take away here,” Dr. Shukla says, “is to wear a mask and have sanitizer on hand. That’s been proven to stop the virus from spreading.”
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