

Going forward, will we need an annual COVID vaccine or will 'one and done' be enough?

[New COVID] mutations are popping up in increasingly complicated patterns, spurring a drive by top biologists to devise new ways to track a fire hose of incoming genomic data.

The goal: Quickly detect variants that can lessen the effectiveness of vaccines for a pathogen that's unlikely to be eradicated any time soon. The SARS-CoV-2 virus could settle down and become a mere nuisance like the common cold. Or much like influenza, it could retain its ability to cause severe disease in some segments of the population, a scenario that could require regular booster shots.

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"Does it mean we need to make a new vaccine every year?" said [Paul Duprex](#), who heads the [University of Pittsburgh](#)'s Center for Vaccine Research. "We don't know."

For one thing, mRNA vaccines for Covid-19 have efficacy rates above 90%, much higher than the 60% rate for flu shots in a good year. But vaccine makers Moderna and Pfizer, along with its partner BioNTech, aren't taking any chances. Just in case, they're already starting trials of booster shots aimed at B.1.351.

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What makes SARS-CoV-2's future so hard to predict is that viral evolution is like a three dimensional chess game. It's not just the individual mutations that matter, but also the order and combinations in which they occur.

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