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Seeking a pill to cure Covid: drugmakers eye alternative to vaccines

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This handout photo obtained May 26, 2021 courtesy of Merck & Co,Inc. shows capsules of the investigational antiviral pill Molnupiravir.

Prevention is better than cure—but when it comes to COVID, what happens when people can't get the vaccine, don't want it, or they're immune suppressed and it fails to stop infection?

The hunt is on for a coronavirus treatment that can be taken as a pill

soon after a confirmed positive, halting the disease in its tracks so that cases that might have been severe end up being nothing more than a bad cold.

Several companies are working on so-called oral antivirals, which would mimic what the drug Tamiflu does for influenza.

"It's great that we have vaccine rollout that has been significant, but it certainly will not be taken by everybody in our population, and not everybody who takes the vaccine will have a full response to it," David Hirschwerk, an infectious diseases physician at Northwell Health in New York told AFP.

An easily storable and transportable pill would also offer practical advantages over existing treatments such as monoclonal antibodies, which are mainly injected by drips at hospital infusion centers.

Promising results

One of the frontrunners in these efforts is a twice-a-day drug called Molnupiravir, which is being developed by Merck in partnership with Ridgeback Biotherapeutics.

Early results from a Phase 2 trial showed that, among dozens of volunteers who tested positive at the start, none of those who received the drug had any detectable virus by day five; while a quarter of those who received a placebo did.

The numbers are promising but too small to draw firm conclusions from, and the company is now enrolling for a Phase 3 trial involving 1,850 people with results expected by fall.

"Viruses are basically little machines and they need certain components

to replicate themselves," Daria Hazuda, Merck's chief scientific officer of the company's exploratory science center, told AFP. Antivirals are designed to interfere with that process.

Molnupiravir belongs to a class of antiviral called "polymerase inhibitors," which work by targeting an enzyme that viruses need to copy their genetic material, and introducing mutations that leave them unable to replicate.

Because antibodies target a surface protein of the coronavirus that is continually evolving, antivirals are expected to be more variant-proof.

Early use

Currently, there's just one antiviral approved by the Food and Drug Administration to treat COVID, which is Remdesivir by Gilead Sciences.

Like Molnupiravir, it is a polymerase inhibitor, though their precise actions differ.

Remdesivir's biggest disadvantage is that it was developed as an intravenous drug and targeted at hospitalized COVID patients, among whom it was shown to modestly reduce recovery time.

But by the time COVID has progressed to severe, much of the harm to patients' health comes from their own immune systems going into overdrive and damaging their organs, rather than viral replication.

That's why the focus now is on oral formulations that can be taken within days of infection, and apart from Merck, there are a few other notable entrants.

Roche and Atea have begun a 1,400 patient trial to study their own oral polymerase inhibitor, AT-527.

"This drug has so far been shown to be very potent in vitro," Jean-Pierre Sommadossi, founder and CEO of Atea told AFP.

"I think that after the pandemic, you're going to have a phase which is going to be endemic," he predicted, with the company hoping to file for authorization by the end of the year and launch the drug by 2022.

Curing the cold?

Pfizer, which has developed one of pandemic's foremost vaccines, is also attracting significant attention for its oral drug PF-07321332, which has begun Phase 1 human trials in healthy patients.

Its timeline is a little behind the others, because the medicine, which belongs to a class called "protease inhibitors," was designed specifically against the SARS-CoV-2 virus, with work beginning in March 2020.

Protease enzymes act as molecular scissors that cut long protein chains into smaller pieces, that are then re-assembled as part of viral replication.

"Our investigational orally-administered protease inhibitor was designed to 'fit into' the protease (ie stick into the scissors) and 'block it' (i.e. keep the scissors from working)," Charlotte Allerton, head of medicine design for Pfizer, told AFP.

The company is hoping to expand to late stage studies by the middle of this year, she added.

All the drugmakers also plan to study their medicines for preventative

use among close contacts of infected people.

The antivirals under development have demonstrated effectiveness in lab studies against other types of coronaviruses—some of which cause serious diseases like SARS and MERs, while others cause the cold.

"If it is proven to be very safe and proven to be effective, then it can be used broadly, irrespective of the diagnosis, to treat and prevent multiple respiratory infections," said Hazuda of Merck's product.