

# Study shows effectiveness of pill form of remdesivir to treat COVID-19 in mice

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Scientists at the University of North Carolina at Chapel Hill are testing a new route for remdesivir, a pill form of the COVID-19 treatment that's given to half of all hospitalized patients with the disease.

In *Science Translational Medicine*, researchers describe [laboratory tests](#) that show a modification of [remdesivir](#) was as effective as molnupiravir, another oral antiviral, at reducing disease in mice. Further, the new drug compound can be adapted into a pill designed to halt coronaviruses before they multiply and cause severe disease.

The current form of remdesivir must be given intravenously. But an oral version could extend its reach and benefits to patients outside of the hospital, said senior study author Timothy Sheahan, a virologist at UNC Gillings School of Global Public Health.

"Oral antiviral medications have the potential to shorten the duration of disease, potentially diminish transmission and prevent hospitalization if taken early enough," Sheahan said.

Remdesivir works by blocking the machinery the virus needs to make copies of itself and spread throughout the body.

The compound tested at UNC-Chapel Hill is a prodrug named GS-621763 which can quickly turn into remdesivir inside the body. It was most protective against SARS-CoV-2, the virus that causes COVID-19, but was also very effective against MERS-CoV, a related virus that causes Middle East Respiratory Syndrome.

"We saw protective effects, like reduced [lung damage](#), [viral load](#) in the lungs, and improved [lung function](#) in infected mice, when we administered the drug at 12 hours or even at 24 hours after infection in mice," said lead study author Alexandra Schäfer, assistant professor of epidemiology at the UNC Gillings School of Global Public Health.

In early 2020, UNC-Chapel Hill virologist Ralph Baric and Gilead Sciences Inc. identified remdesivir as a potential COVID-19 treatment. For nearly two years, remdesivir has been used in hospitals to treat very

sick patients with COVID-19.

While the drug has shown mixed results in [clinical studies](#), it's been surprisingly effective in treating patients early in the disease.

The results of using remdesivir early in the course of disease in outpatients were dramatic. A three-day course resulted in an 87% lower risk of hospitalization and death.

Additional study is needed of the compound's safety and effectiveness, but the new study opens the door for remdesivir to take a place among the growing number of oral COVID-19 treatment options.

"Oral drugs that can be formulated as pills have potential to make a big impact on reducing the disease burden caused the COVID pandemic," said David R. Martinez, a viral immunologist and postdoctoral researcher at UNC Gillings School of Global Public Health. "People can safely take a round of pills at home while in isolation, and reduce community spread."

**More information:** Alexandra Schäfer et al, Therapeutic treatment with an oral prodrug of the remdesivir parental nucleoside is protective against SARS-CoV-2 pathogenesis in mice, *Science Translational Medicine* (2022). [DOI: 10.1126/scitranslmed.abm3410](https://doi.org/10.1126/scitranslmed.abm3410)

Provided by University of North Carolina at Chapel Hill

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