

(<https://www.coronavirus.gov>)

(<https://www.nih.gov/coronavirus>)



Antiviral Remdesivir Prevents Disease Progression in Monkeys with COVID-19

Study Supports Clinical Testing Under Way Across U.S.

April 17, 2020

This scanning electron microscope image shows SARS-CoV-2 (round gold objects) emerging from the surface of cells cultured in the lab. SARS-CoV-2, also known as 2019-nCoV, is the virus that causes COVID-19. The virus shown was isolated from a patient in the U.S.

Credit: NIAID-RML

Early treatment with the experimental antiviral drug remdesivir significantly reduced clinical disease and damage to the lungs of rhesus macaques infected with SARS-CoV-2, the coronavirus that causes COVID-19, according to National Institutes of Health scientists.


The study was designed to follow dosing and treatment procedures used for hospitalized COVID-19 patients being administered remdesivir in a large, multi-center, [clinical trial \(https://www.niaid.nih.gov/news-events/nih-clinical-trial-remdesivir-treat-covid-19-begins\)](https://www.niaid.nih.gov/news-events/nih-clinical-trial-remdesivir-treat-covid-19-begins) led by NIH's National Institute of Allergy and Infectious Diseases (NIAID). The scientists [posted the work \(https://www.biorxiv.org/content/10.1101/2020.04.15.043166v1?ct=ct\)](https://www.biorxiv.org/content/10.1101/2020.04.15.043166v1?ct=ct) on the preprint server bioRxiv. The findings are not yet peer-reviewed and should not be considered clinical advice, but are being shared to assist the public health response to COVID-19. A study detailing the development of the rhesus macaque model of mild- to-moderate human disease, conducted by the same team of NIAID scientists, was [posted to bioRxiv](https://www.biorxiv.org/content/10.1101/2020.03.21.001628v1) [on March 21.](https://www.biorxiv.org/content/10.1101/2020.03.21.001628v1)

The current study of remdesivir, a drug developed by Gilead Sciences Inc. and NIAID-supported investigators, involved two groups of six rhesus macaques. One group of monkeys received remdesivir and the other animals served as an untreated comparison group. Scientists infected both groups with SARS-CoV-2. Twelve hours later the treatment group received a dose of remdesivir intravenously, and then received a daily intravenous booster dose thereafter for the next six days. The scientists timed the initial treatment to occur shortly before the virus reached its highest level in the animals' lungs.

Twelve hours after the initial treatment, the scientists examined all animals and found the six treated animals in significantly better health than the untreated group, a trend that continued during the seven-day study. They report that one of the six treated animals showed mild breathing difficulty, whereas all six of the untreated animals showed rapid and difficult breathing. The amount of virus found in the lungs was significantly lower in the treatment group compared to the untreated group, and SARS-CoV-2 caused less damage to the lungs in treated animals than in untreated animals.

The investigators note that the data supports initiating remdesivir treatment in COVID-19 patients as early as possible to achieve maximum treatment effect. The authors, from NIAID's Rocky Mountain Laboratories in Hamilton, Montana, also note that while remdesivir helped prevent pneumonia, it did not reduce virus shedding by the animals. "This finding is of great significance for patient management, where a clinical improvement should not be interpreted as a lack of infectiousness," they write.

ARTICLE:

B Williamson *et al.* [Clinical benefit of remdesivir in rhesus macaques infected with SARS-CoV-2](https://www.biorxiv.org/content/10.1101/2020.04.15.043166v1) 
(<https://www.biorxiv.org/content/10.1101/2020.04.15.043166v1>).

WHO:

Emmie de Wit, Ph.D., and Marshall Bloom, M.D., from NIAID's Laboratory of Virology are available to comment on this study.

Contact

To schedule interviews, contact

Ken Pekoc

(301) 402-1663

NIAIDNews@niaid.nih.gov ([mailto:](mailto:NIAIDNews@niaid.nih.gov)).

Content last reviewed on April 17, 2020