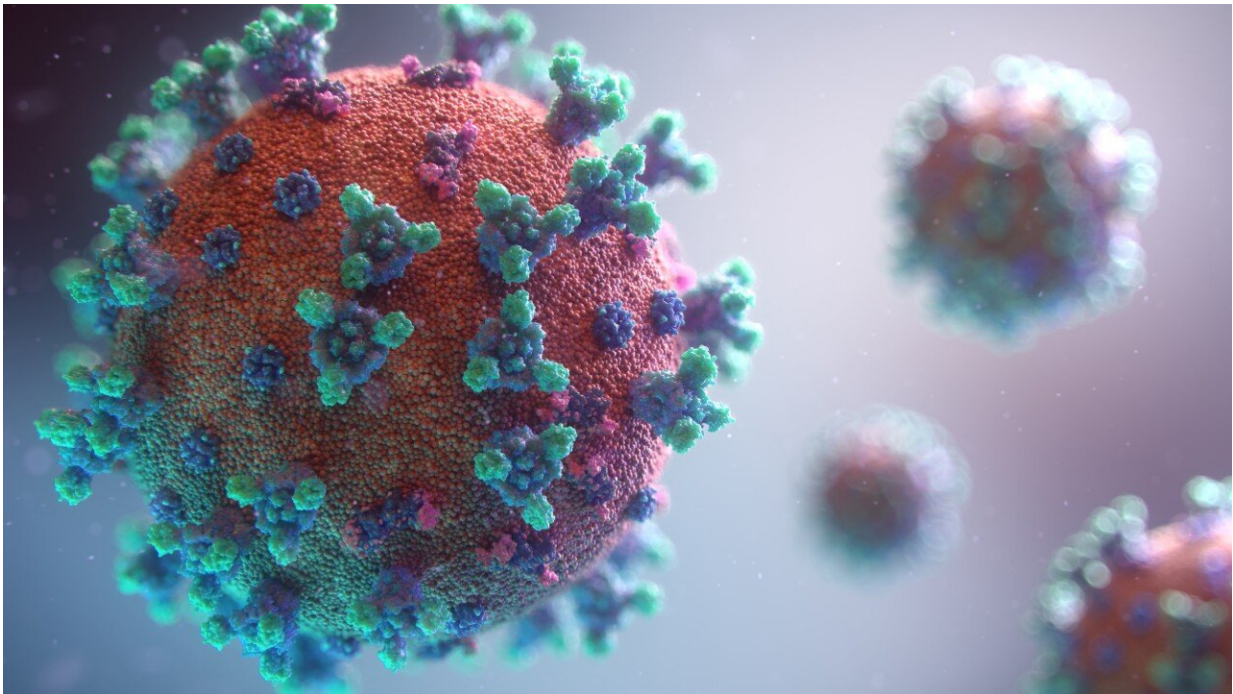


# Digestive disease expert examines COVID-19 attacks on the liver

April 24 2020, by Cedric Ricks

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Credit: Unsplash

An attack on the respiratory system causing severe cough and shortness of breath is what many of us associate with the worst effects of COVID-19.

But a University of Cincinnati physician-researcher says damage to the [liver](#) is also an area that needs more study. About 50% of COVID-19

patients in China and Italy saw inflammation of the liver, a characteristic of hepatitis.

"What was not clear early on was the danger of that liver injury," says Dr. Kenneth Sherman, Gould Professor of Medicine and Director of the UC Division of Digestive Diseases. "There have been individual reports of acute liver failure, but obviously most people that die of COVID-19 do so because of respiratory complications."

Sherman is using a \$48,000 pilot grant from the UC College of Medicine, to examine the replication of the SARS-CoV-2 virus, the pathogen of COVID-19, in [liver cells](#) to determine patterns of injury and understand resulting innate immune responses.

"There are several possible mechanisms in which SARS-CoV-2 could be causing injury to the liver," explains Sherman, also a UC Health physician. "It could be infecting the cells causing them to be immediately destroyed—we call that a 'lytic reaction.'"

"We see that in some forms of hepatitis," says Sherman. "Alternatively, it could be the virus replicates within the liver cells and then there are viral proteins that make the liver cells susceptible to immunologic injury as the body fights off the infection. The person that is infected is not just trying to clear virus from their lungs but they are trying to clear virus from their liver and that leads to liver damage."

Sherman says the virus or viral proteins may not cause direct infection but could, through [viral proteins](#) circulating in the blood, cause cell damage or death to the liver cells. There is also a possibility that damage to the liver in patients with COVID-19 may be a result of the antiviral medications used to treat the disease.

Sherman says the [pilot study](#) has two goals.

"One focuses on examining the effect of viral infection on liver cells as compared to kidney cells in culture that the virus is known to replicate in," says Sherman. "We will try to discern what is happening to understand which mechanisms are most operative in the process of damaging liver [cells](#)."

The study may obtain virus samples from both national and international sources. The sample will be standardized and will be representative of SARS-CoV-2 virus strains from Washington state or Wuhan, China, explains Sherman. Federally approved repository storehouses have large batches of pedigreed viruses available for research.

"There has been enough mild variation that we want our findings to be comparable to research from other groups," says Sherman.

A second goal of the study is to look at immunologic and clinical outcomes in patients with immunosuppression associated either with [liver transplantation](#), kidney transplantation or individuals living with HIV, says Sherman.

"The broad question is: Are there differences in the immunologic responses or host responses in those patients that are immunosuppressed?" says Sherman. "How can we characterize those responses? The first step requires that we begin to develop the capabilities to do antibody testing."

"We need antibody tests to know who has been exposed and we need to know how to identify COVID exposure when the virus is no longer there," says Sherman. "Those are immunologic tests, and we are leveraging relationships with test manufacturers in the U.S. and China. We will study characteristics of individuals focusing on comparing immunosuppressed populations with other people who have intact immune systems."

Funding from the College of Medicine is crucial in jump-starting this pilot program which will seek additional funding from the National Institutes of Health and other sources as findings become available, says Sherman,

"It's a good start and it gets us on the road to what we hope to accomplish relatively quickly," says Sherman.

Much of the focus on preventing COVID-19 has been in controlling its person-to-person spread through aerosolized infection. But Sherman notes that the disease can also be spread through the digestive tract.

"The digestive tract is probably involved in infection in almost all cases," says Sherman. "For many patients digestive symptoms predominate with abdominal pain, cramping and diarrhea due to infection in the intestine. Digestive tract infection may be very important since SARS-CoV-2 virus can be spread through contact with stool."

"This is very much an issue," says Sherman. "Health officials have identified contamination in bathrooms as a factor in both Italy and China."

Sherman offers a suggestion that has been widely recommended in combating COVID-19 infection.

"After using a public bathroom, you need to wash your hands and be well aware that surfaces on and around the toilet including the toilet paper roll could be contaminated along with handles of the door and fixtures of the sink. A small percentage of people appear to be shedding the [virus](#) in their stool and have no symptoms. Just a reminder to wash your hands thoroughly after using any bathroom."

Provided by University of Cincinnati

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