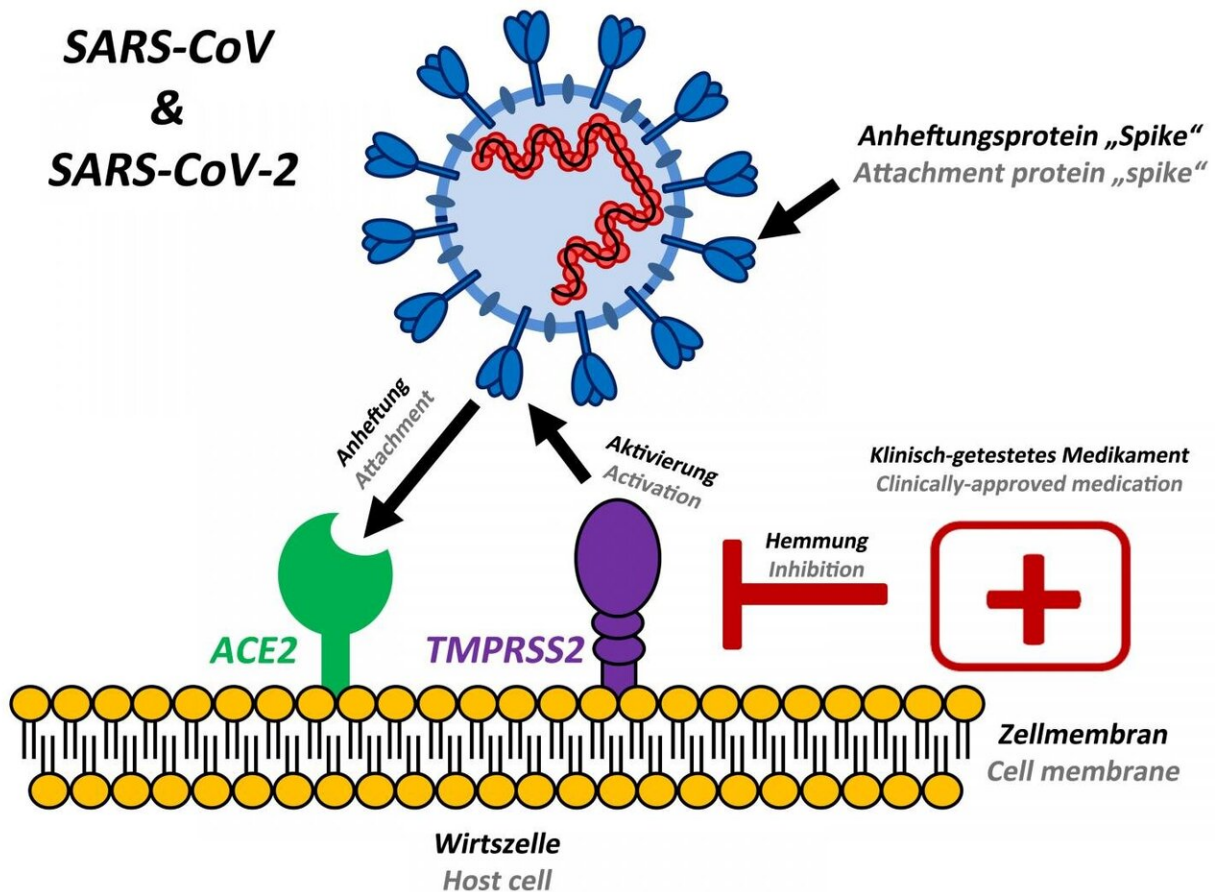


Preventing spread of SARS coronavirus-2 in humans

March 5 2020



The attachment protein "spike" of the new coronavirus SARS-CoV-2 uses the same cellular attachment factor (ACE2) as SARS-CoV and uses the cellular protease TMPRSS2 for its activation. Existing, clinically approved drugs directed against TMPRSS2 inhibit SARS-CoV-2 infection of lung cells. Credit: Markus Hoffmann

Several coronaviruses circulate worldwide and constantly infect humans, which normally causes only mild respiratory disease. Currently, however, we are witnessing a worldwide spread of a new coronavirus with more than 90,000 confirmed cases and over 3,000 deaths. The new virus has been named SARS coronavirus-2 and has been transmitted from animals to humans. It causes a respiratory disease called COVID-19 that may take a severe course. The SARS coronavirus-2 has been spreading since December 2019 and is closely related to the SARS coronavirus that caused the SARS pandemic in 2002/2003. No vaccines or drugs are currently available to combat these viruses.

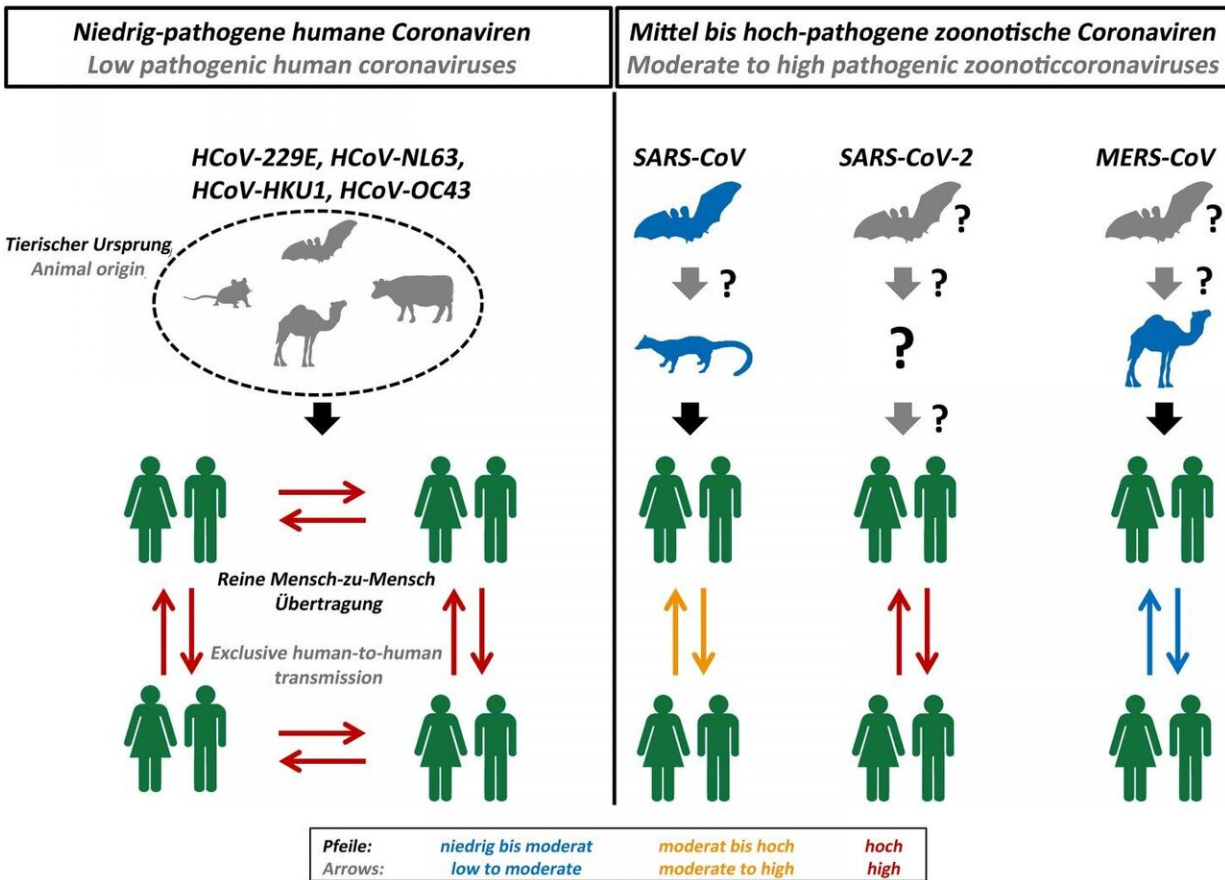
Stopping virus spread

A team of scientists led by [infection](#) biologists from the German Primate Centre and including researchers from Charité, the University of Veterinary Medicine Hannover Foundation, the BG-Unfallklinik Murnau, the LMU Munich, the Robert Koch Institute and the German Center for Infection Research, wanted to find out how the new coronavirus SARS-CoV-2 enters host cells and how this process can be blocked. The researchers identified a cellular protein that is important for the entry of SARS-CoV-2 into lung cells. "Our results show that SARS-CoV-2 requires the protease TMPRSS2, which is present in the [human body](#), to enter cells," says Stefan Pöhlmann, head of the Infection Biology Unit at the German Primate Center. "This protease is a potential target for therapeutic intervention."

Promising drug

Since it is known that the [drug](#) camostat mesilate inhibits the protease TMPRSS2, the researchers have investigated whether it can also prevent infection with SARS-CoV-2. "We have tested SARS-CoV-2 isolated from a patient and found that camostat mesilate blocks entry of the [virus](#)

into lung cells," says Markus Hoffmann, the lead author of the study. Camostat mesilate is a drug approved in Japan for use in pancreatic inflammation. "Our results suggest that camostat mesilate might also protect against COVID-19," says Markus Hoffmann. "This should be investigated in clinical trials."



Origin and transmission of pathogenic coronaviruses. Credit: Markus Hoffmann

More information: Hoffmann, M et al. (2020). SARS-CoV-2 cell

entry depends on ACE2 and TMPRSS2 and is blocked by a clinically-proven protease inhibitor. *Cell* [DOI: 10.1016/j.cell.2020.02.052](https://doi.org/10.1016/j.cell.2020.02.052)

Provided by Deutsches Primatenzentrum (DPZ)/German Primate Center

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