

Combating the deathly Coronavirus

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Scientists all over the world are on a quest for an antidote since the first patient died from the new coronavirus in summer 2012. Infection Researchers from the German Primate Center have now identified enzymes that activate the virus for infection. The scientists hope that their discovery will contribute to the development of treatment for the life-threatening disease.

The coronavirus 2c EMC/2012 causes severe respiratory disease and [renal failure](#). So far more than half of all patients with laboratory confirmed infection died from the disease. The virus presumably originated in the [Arabian Peninsula](#). [Genetic analyses](#) have revealed a close relationship to viruses in bats. However, it is at present unclear if the new coronavirus was transmitted from bats to humans.

Researchers at the DPZ have investigated the host cell entry of the new coronavirus jointly with colleagues from Hannover, Essen, Bonn and San Francisco. The paper by the first authors Stefanie Gierer and Stephanie Bertram was published online ahead of print by the renowned *Journal of Virology*.

The [surface protein](#) ("spike") of the virus attaches to host cells via the newly discovered receptor DPP4 (Raj et al. 2013, Nature) and subsequently the virus enters the cells. The activation of the spike-protein by [host cell](#) enzymes, proteases, is a prerequisite to infectious viral entry. The researchers at DPZ have now identified two of these activating proteases, both of which constitute potential targets for intervention. Also, the group demonstrated that a serum derived from an

EMC patient can block the spike-mediated entry. This proves that humans are able to generate blocking (so called "neutralizing") antibodies against the virus. For their research the team worked with harmless, artificial virus-like particles ("pseudotypes"), which may now be used as a diagnostic tool for identifying such neutralizing antibodies.

"The human coronavirus EMC is a potential threat to public health," says Stefan Pöhlmann, senior author of the study. "But our research and the research of other groups identified potential targets for intervention and might help to improve our diagnostic tools."

More information: Gierer, S. et al. (2013): The spike-protein of the emerging betacoronavirus EMC uses a novel coronavirus receptor for entry, can be activated by TMPRSS2 and is targeted by neutralizing antibodies. *Journal of Virology*. Epub ahead of print 6 March 2013. [doi:10.1128/JVI.00128-13](https://doi.org/10.1128/JVI.00128-13)

Provided by German Primate Center

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