

Pangolins may possess evolutionary advantage against coronavirus

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The Chinese pangolin (*Manis pentadactyla*) Credit: Sarita Jnawali of NTNC – Central Zoo The United States, CC BY 2.0

Similar to how a smoke detector sounds off an alarm, certain genes sense when a virus enters the body, alerting of an intruder and triggering an

immune response in most mammals. But, according to a recent study published in *Frontiers in Immunology*, pangolins—mammals which resemble an anteater with scales, lack two of those virus-sensing genes. The finding is significant because while pangolins can be carriers of coronavirus, they appear able to tolerate it through some other unknown mechanism. Understanding their evolutionary advantage may point to possible treatment options for coronavirus in humans.

Researchers focused on pangolins because the exotic animal may have transmitted the virus to humans last year, creating the interspecies jump required for the current COVID-19 pandemic to take hold (bats have also been identified as possible agents of infection). To obtain their results, they analyzed the genome sequence of pangolins and compared it to other mammals including humans, cats, dogs, and cattle.

"Our work shows that pangolins have survived through millions of years of evolution without a type of antiviral defense that is used by all other mammals," says co-author Dr. Leopold Eckhart, of the Medical University of Vienna in Austria. "Further studies of pangolins will uncover how they manage to survive [viral infections](#), and this might help to devise new treatment strategies for people with viral infections."

In humans, coronavirus can cause an inflammatory [immune response](#) called a cytokine storm, which then worsens outcomes. Pharmaceutical suppression of gene signaling, the authors suggest, could be a possible treatment option for severe cases of COVID-19. Eckhart cautions though that such a remedy could open the door to secondary infections. "The main challenge is to reduce the response to the pathogen while maintaining sufficient control of the virus," he says. An overactivated [immune system](#) can be moderated, Eckhart says, "by reducing the intensity or by changing the timing of the defense reaction."

While the study identified [genetic differences](#) between pangolins and

other mammals, it did not investigate the impact of those differences on the antiviral response. Scientists don't yet understand how exactly pangolins survive coronavirus, only that their lack of these two signaling [genes](#) might have something to do with it. Eckhart adds that another gene, RIG-I, which also acts as a sensor against viruses, should be studied further as it could defend against coronaviruses. The study offers a starting point to better understand coronavirus's characteristics, the body's response, and the best options for treatment.

More information: *Frontiers in Immunology*, [DOI: 10.3389/fimmu.2020.00939](#) , [www.frontiersin.org/articles/10.3389/fimmu.2020.00939/full](#)

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