

Signs of MERS coronavirus found in dromedary camels

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Researchers searching for signs of Middle East respiratory syndrome coronavirus (MERS-CoV) in livestock animals have found antibodies specific to the new virus in dromedary camels. The research, published in *The Lancet Infectious Diseases*, suggests that these animals have encountered MERS-CoV, or a closely related virus, and may be one reservoir of the virus that is causing MERS in humans.

While recent research has shown that MERS-CoV can replicate in cell lines taken from bats (which were thought to be the source of the 2002/03 SARS coronavirus [outbreak](#)), and is closely related to a bat coronavirus in circulation, it seems unlikely that the virus is transmitting directly from [bats](#) to humans, given the generally shy and nocturnal habits of these creatures. However, given that human-to-human transmissibility of the virus appears to be rare, many researchers suspect that another animal reservoir for the virus exists.

An international team of researchers led by Dr Chantal Reusken, of the National Institute for Public Health and the Environment in Bilthoven, the Netherlands, gathered 349 blood serum samples in total from a variety of [livestock animals](#), including dromedary camels, [cows](#), sheep, and goats, as well as from some animals closely related to dromedaries. The animals were from a variety of different countries, including Oman, the Netherlands, Spain, and Chile, and the investigation is the first reported animal serological study for MERS-CoV.

The researchers analysed the blood serum samples for the presence of antibodies specific to MERS-CoV, as well as antibodies reactive to SARS coronavirus, and another strain of coronavirus labelled HCoV-OC43, which can also infect humans, and is closely related to a bovine form of the virus. The researchers found no evidence of cross-reactivity between antibodies for MERS-CoV and those for SARS or HCoV-OC43,

and confirmed their findings using highly-specific virus neutralisation tests. The results suggest that the presence of MERS-CoV specific antibodies is likely to indicate previous infection with MERS-CoV, or a closely related virus, at some point in the animal's history.

No MERS-CoV antibodies were found in [blood serum](#) taken from 160 cattle, sheep, and goats from the Netherlands and Spain. However, antibodies specific to MERS-CoV were found in all fifty serum samples taken from dromedary camels in Oman. The Oman samples originated from a number of different locations in the country, suggesting that MERS-CoV, or a very similar virus, is circulating widely in dromedary camels in the region.

Lower levels of MERS-CoV-specific antibodies were also found in 14% (15) of serum samples taken from two herds of dromedaries (105 camels in total) from the Canary Islands, not previously known to be a location where MERS-CoV is circulating. No antibodies specific to the virus were detectable in tests on 34 animals closely related to the dromedary, such as Bactrian camel, alpaca, and llama sampled in the Netherlands and Chile.

According to the authors, "The dromedary camels that we tested from the Middle East (Oman) were more often positive and had much higher levels of antibodies to MERS-CoV than the dromedary camels from Spain. The best way to explain this is that there is a MERS-CoV-like virus circulating in dromedary camels, but that the behaviour of this virus in the Middle East is somehow different to that in Spain."*

"As new human cases of MERS-CoV continue to emerge, without any clues about the sources of infection except for people who caught it from other patients, these new results suggest that dromedary camels may be one reservoir of the virus that is causing MERS-CoV in humans. Dromedary camels are a popular animal species in the Middle East,

where they are used for racing, and also for meat and milk, so there are different types of contact of humans with these animals that could lead to [transmission](#) of a virus."*

"Research efforts now need to focus on well-designed animal studies in the Middle East, concentrating on finding the virus that triggers these [antibodies](#) in dromedaries, and comparing that with the virus from human cases. This will need to be done not only through veterinary studies, but also by careful follow-up of new human patients, ensuring that as much information as possible is gathered about patients' contacts with animals and animal products, such as camel milk."*

Dr Vincent Munster, of NIAID Rocky Mountain Laboratories in Hamilton, USA, writes in a linked Comment that, "Chantal Reusken and colleagues provide some insight into one potential animal reservoir that might be involved in the emergence of MERS-CoV in people—for the first time since the discovery of the virus a year ago...In the absence of prophylactic or therapeutic treatment options for MERS-CoV, blocking zoonotic and human-to-human transmission could be the most promising and cost-effective method to prevent further human fatalities. However, doing so requires knowledge of the [virus'](#) hosts. Although the study by Reusken and colleagues leaves many questions unanswered, it is an important step to a more comprehensive understanding of the emergence of MERS-CoV."

More information:

[www.thelancet.com/journals/lan ...](http://www.thelancet.com/journals/lan...)
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