

# Origin of MERS coronavirus identified

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The newly emerged Middle East respiratory syndrome coronavirus (MERS-CoV) has circulated in bats for a substantial time, before making the species leap to humans, according to research published in *BioMed Central's* open access publication *Virology Journal*. By analysing the genome of various bat species, scientists show that bat DPP4 genes have adapted significantly as they evolved, suggesting a long-term arms race between the bat and the virus.

Previous work has shown that MERS-CoV uses the DPP4 receptor to enter the cell and it is well known that viruses can leave evolutionary footprints in receptor-encoding genes of hosts and their binding domains during long battles with the hosts. Jie Cui, colleagues from the University of Sydney and collaborators from the Duke-NUS Graduate Medical School and CSIRO analysed the sequence of DPP4 from seven bat genomes. They then compared the findings to those of a range of non-bat mammalian species. They go on to identify three residues in bat DPP4 under positive selection that directly interact with the viral surface glycoprotein.

Their findings show more pressure on the bat genes than in other species, with mutations occurring at a faster rate, suggesting that the newly emerged MERS-CoV not only has a bat origin, but also evolved over an extended time period in [bat populations](#) before making the leap to infect humans. Further research will be needed to understand the transmission route by collecting more bat MERS-CoVs.

Jie Cui, lead author on the paper, says: "Our analysis suggests that an

evolutionary lineage leading to the current MERS-CoV co-evolved with bat hosts for an extended time period, eventually jumping species boundaries to infect humans, perhaps through an intermediate host."

**More information:** Cui, J. et al. Adaptive evolution of bat dipeptidyl peptidase 4 (dpp4): implications for the origin and emergence of Middle East respiratory syndrome coronavirus, *Virology Journal* 2013, 10:304.

Provided by BioMed Central

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