

Genetic clues to how dogs became man's best friends

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Two mutations in the melanocortin 2 receptor gene—which is involved in the production of the stress hormone cortisol—may have played a role in the domestication of dogs by allowing them to develop social cognitive skills in order to interact and communicate with humans. The findings are published in *Scientific Reports*.

Changes to different [genes](#), usually controlling hormones that influence [social behavior](#), have been implicated in the domestication of dogs, but it has not been established precisely which [genetic changes](#) might have taken place.

Miho Nagasawa and colleagues investigated the social cognitive interactions of 624 [domestic dogs](#) using two tasks. In the first task, the dog had to decide which bowl had food hidden under it based on cues, such as gazing, pointing and tapping, from the experimenters. This tested the dog's understanding of [human](#) gestures and communication.

In the second task, the dog was presented with a problem solving test, which involved them attempting to open a container in order to access food. In this task, the frequency and length of time the dog spent looking at the experimenters was measured, which represented social attachment to humans. The authors separated the dogs into two groups depending on their breed: the Ancient group (consisting of breeds considered genetically closer to wolves such as the Akita and Siberian Husky) and the General group (all other breeds which are more genetically distant from wolves).

The authors report that dogs in the Ancient group looked at the experimenters less often than other dogs during the problem solving task, suggesting that they were less attached to humans. There were no significant breed-related differences in the first task.

The authors then looked for differences in genes associated with human-related cognitive abilities between the Ancient and General groups, including genes for oxytocin (OT), [oxytocin receptor](#) (OTR), melanocortin 2 receptor (MC2R), and a gene called WBSCR17 which is implicated with Williams-Beuren syndrome (characterized by hyper-social behavior) in humans. Two changes to the MC2R gene were associated with both correctly interpreting gestures in the first task and

gazing at the experimenters more often in the problem solving task.

The authors suggest that these findings imply that MC2R may have played a role in the domestication of dogs, perhaps by promoting lower levels of stress around humans.

More information: Miho Nagasawa, Identification of genes associated with human-canine communication in canine evolution, *Scientific Reports* (2022). [DOI: 10.1038/s41598-022-11130-x](https://doi.org/10.1038/s41598-022-11130-x).
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