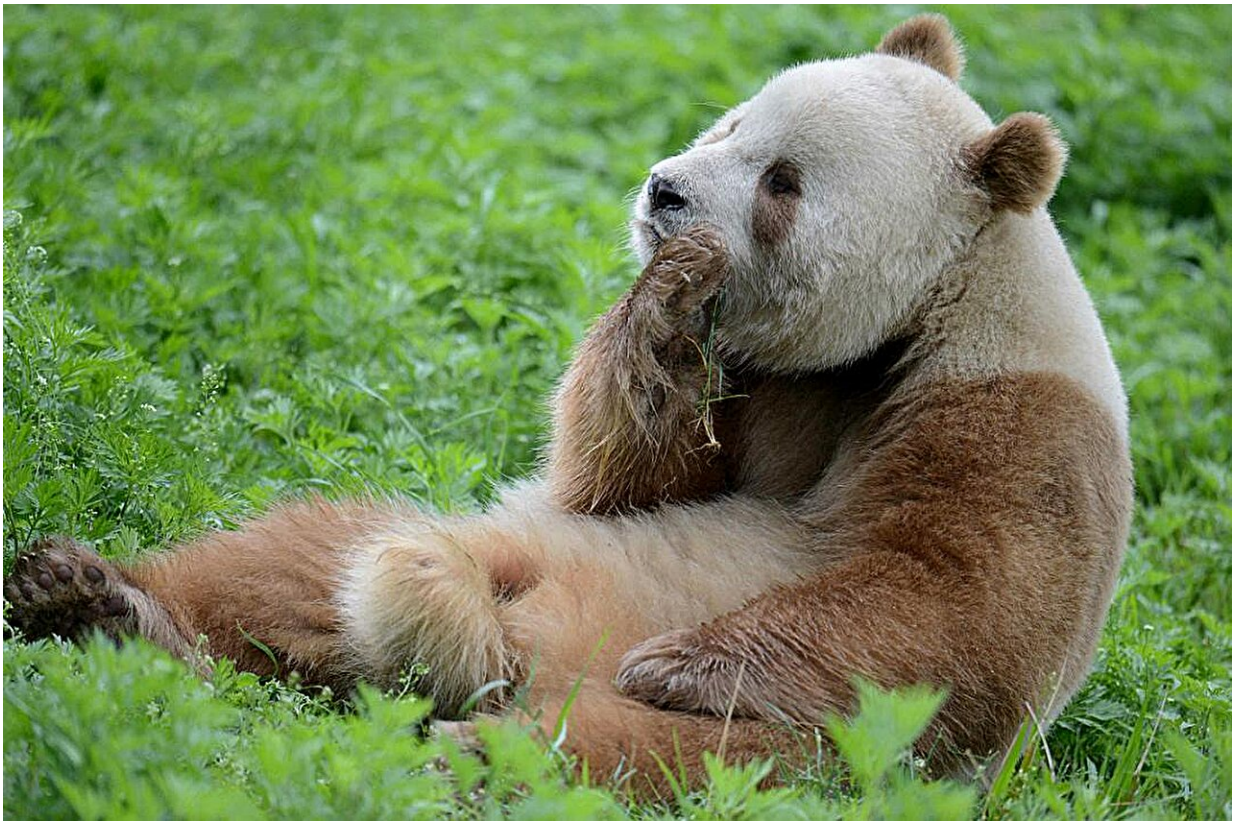


Researchers find gene mutation responsible for brown giant pandas

March 6 2024, by Bob Yirka



Quinling panda. Credit: Wikimedia, [CC BY-SA 4.0](#)

A multi-institutional team of geneticists in China has discovered the gene mutation responsible for a brown coat in giant pandas. In their study, [published](#) in the journal *Proceedings of the National Academy of*

Sciences, the group sequenced the genes of a captive giant panda with a brown coat and compared the results with the genes of hundreds of black and white pandas.

The vast majority of [giant pandas](#) have a starkly black and [white coat](#), but on rare occasions (only seven cases have ever been reported), a cub is born with a brown coat. In this new effort, the research team sought to find the [gene mutation](#) responsible for the unique coloring.

To that end, they began by sequencing the [genome](#) of the one and only brown-coated giant panda in captivity and compared its genes with another brown-coated giant panda in the wild and 35 black and white pandas. Included in the sequencing was the family of the captive panda. They found a mutation in a gene called *Bace2*, which prior research has shown encodes for a protein involved in Alzheimer's disease in humans.

Both of the brown pandas had two copies of mutated versions of the gene—they both had 25 base pairs missing. To confirm their findings, the team looked for further confirmation by sequencing the genomes of another 192 black and white pandas. None of them had the mutated genes. And for a final confirmation, they used gene editing on the genomes of several test mice to give them the same gene mutation and found that it led to lighter coats in all of them.

Convinced that they had found the mutation they were after, the team then explored how the gene caused the change in coat color. They found that its presence led to reductions in the size and number of melanosomes in hairs in the coat, likely leading to hypopigmentation.

More information: Dengfeng Guan et al, Taking a color photo: A homozygous 25-bp deletion in *Bace2* may cause brown-and-white coat color in giant pandas, *Proceedings of the National Academy of Sciences* (2024). [DOI: 10.1073/pnas.2317430121](https://doi.org/10.1073/pnas.2317430121)

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