

Differences between human and Neanderthal brains are minimal — so why are we so much smarter?

Our closest human relatives are *Neanderthals* (split from modern humans at least 500,000 years ago) and their Asian relatives the *Denisovans* (split from modern humans around 800,000 years ago). The differences between *Homo sapiens* and these other groups are encoded in changes to the amino acids which are the building blocks of proteins in our cells and tissues.

About 100 amino acids changed in modern humans after these splits and spread throughout almost all of us. The biological significance of these changes, however, is largely unknown.

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To investigate how these six changes impact brain development, the scientists introduced the amino acids from modern human variants into mice. Interestingly, in those six amino acid positions, mice are identical to *Neanderthals*. That makes mice brains perfect for testing what happens when these amino acids are changed.

Lead author of the study, Felipe Mora-Bermúdez, says the changes result in more accurate transfer of genetic data in cell division. “We found that three modern human amino acids in two of the proteins cause a longer metaphase, a phase where chromosomes are prepared for cell division, and this results in fewer errors when the chromosomes are distributed to the daughter cells of the neural stem cells, just like in modern humans.”

[**This is an excerpt. Read the original post here**](#)