

## **Study shows no long-term removal of Neandertal DNA from Europeans**

January 16 2019, by Bob Yirka



Comparison of Modern Human and Neanderthal skulls from the Cleveland Museum of Natural History. Credit: DrMikeBaxter/Wikipedia

A team of researchers at the Max Planck Institute for Evolutionary Anthropology has found evidence that suggests there has been no longterm removal of Neandertal DNA from modern Europeans. In their paper published in *Proceedings of the National Academy of Sciences*, the group describes using whole-genome simulations to trace the history of



Neandertal DNA in the human genome and what they found.

Over the past several years, multiple teams of researchers have conducted studies with the goal of learning more about what has happened with the Neandertal DNA that became mixed with human DNA approximately 45,000 years ago. Most have agreed that introduction of DNA from Neandertals underwent negative selection and thus has slowly diminished—at least in modern Europeans. In this new effort, the researchers have found evidence that suggests these earlier results were wrong, and that there is no evidence of negative selection. They further contend that the reason the other researchers got it wrong was because they made incorrect assumptions about gene flow between non-Africans (Europeans) and Africans.

To learn more about the fate of Neandertal DNA introduced into the <u>human genome</u>, the researchers started by obtaining DNA from two actual long-dead Neandertals—one from Mongolia, the other from a site in Croatia. They used that data to create a whole-<u>genome</u> simulation of introgression in modern human DNA. Doing so allowed them to follow the level of Neandertal DNA in the human genome over the time of first introduction until now. They report that the levels remained nearly constant.

The researchers were also interested in learning more about the impact of Neandertal DNA on functional classes of genomic sites. To find out more about it, they separated the human genome by functional annotation and by primate conserved areas, and made comparisons. They found no noticeable depletion of Neandertal contribution in proteincoding sequences. They did, however, find depletions in conserved and promoter regions.

The researchers suggest their results are likely transferable to other cases in which one species introduces its DNA to another. Over time,



reductions in DNA would likely not occur, and if they did, it would be due to admixture with other populations.

**More information:** Martin Petr et al. Limits of long-term selection against Neandertal introgression, *Proceedings of the National Academy of Sciences* (2019). DOI: 10.1073/pnas.1814338116

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