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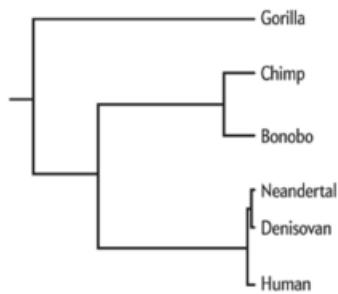
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Evolution > Scientific American Volume 311, Issue 3 > Graphic Science

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Family Tree



How to Read This Graphic

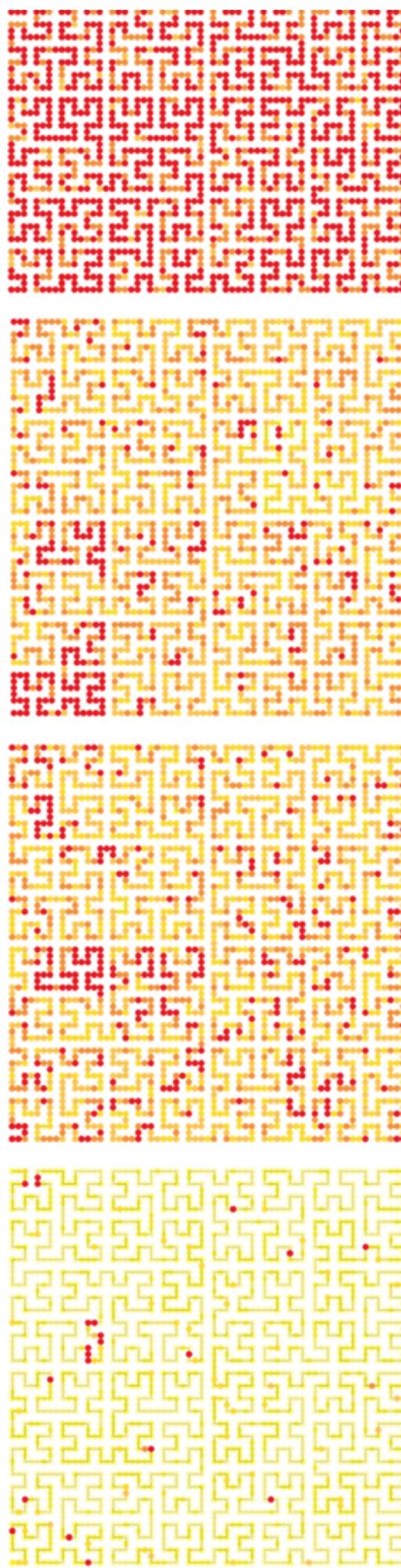
Each dot represents a sequence of about 500,000 pairs of chemical bases—the A, T, C and G of our genetic code—in the protein-coding portion of the human genome in the order that they appear on our chromosomes.

ATGCCCGTTCTGAA ...

The color of the dot indicates how well the human sequence matches up with the corresponding sequence in the comparison species, with red signifying a greater difference between the two.

Fraction of different or unaligned bases (%)





On the whole, our coding genome differs more from the gorilla's than from the chimp's or the bonobo's, reflecting the fact that we have been evolving along separate trajectories for a longer period. But about 15 percent of the human genome looks more like the gorilla's than the chimp's or the bonobo's.



Chimp

Researchers have traditionally considered the chimpanzee, which lives in patriarchal societies, to be our closest living relative and thus the best model for reconstructing the lives of ancient human ancestors. The recent genome-sequencing work calls that view into question, however.



Bonobo

The genome of the bonobo—which has a social structure centered on females—shows it to be just as closely related to us as chimps are, although we differ from the two species in distinctive ways. These findings may force scientists to reconsider how our long-ago forerunners lived.



Denisovan

The Denisovans—a group of archaic humans closely related to the Neandertals—show far fewer sequence differences from us than any of the African apes do, having shared a common ancestor with *H. sapiens* in the much more recent past, around 400,000 years ago.

Graphic by Martin Krzywinski, Illustrations by Portia Sloan Rollings (for SCIENTIFIC AMERICAN)