

Neanderthal bone gives DNA clues

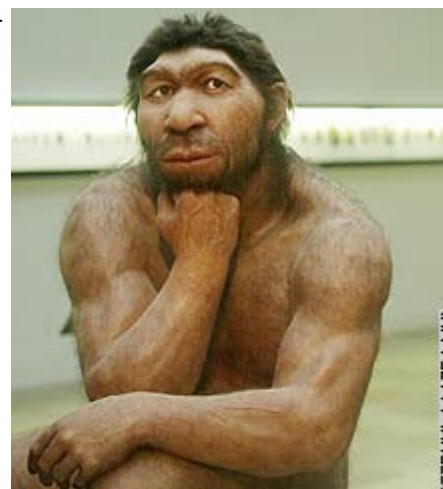


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NEW YORK (AP) -- A bone fragment that scientists had initially ignored has begun to yield secrets of the Neanderthal genome, launching a new way to learn about the stocky and muscular relative of modern humans, scientists say.

Genetic material from the bone has let researchers identify more than a million building blocks of Neanderthal DNA so far, and it should be enough to derive most of the creature's 3.3 billion blocks within the next two years, said researcher Svante Paabo.

"We're at the dawn of Neanderthal genomics," said gene expert Edward Rubin of the Lawrence Berkeley National Laboratory in Berkeley, California. (Watch what scientists found in a scrap of bone -- 3:35)



Neanderthals died out about 35,000 years ago.

Such research will "serve as a DNA time machine that will tell us about the biology and aspects of Neanderthals that we could never get" otherwise, Rubin said.

And the Neanderthal data will shed light on what DNA changes helped produce modern humanity by revealing which changes appeared relatively late in human evolution, after the ancestors of Neanderthals and of humans split apart, scientists said.

Paabo, of the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, and colleagues present an initial analysis of Neanderthal DNA in this week's issue of the journal *Nature*. Rubin and his collaborators present their own analysis in this week's issue of *Science*. Both are based on DNA extracted from a bone fragment that lay in a Croatian cave for 38,000 years. "It's rather small and uninteresting and was thrown into a big box of uninformative bones" at a museum in Zagreb, Croatia, Paabo said.

So it was not handled very much, which meant that its DNA was not extensively contaminated by that of modern-day people, a major plus for the new DNA work, he said. Only about one-seventh of an ounce or less of the bone will be enough to get a rough draft of the Neanderthal genome, he said.

DNA analysis indicated that the bone fragment came from a male.

Todd Disotell of the Center for the Study of Human Origins at New York University, who did not participate in the research, said he found it "really amazing (that) 38,000-year-old fossils are yielding enough DNA to eventually get a whole genome.... Just the fact that they can do this is amazing."

He also called the two new papers impressive "tours de force."

The two teams basically agree, within their margins of error, that the evolutionary lineages of Neanderthals and modern humans split somewhere around 500,000 years ago, he said. That number had been suggested by far more limited DNA analysis before, so it's comforting to see it backed up with more extensive analyses, he said.

Neanderthals and anatomically modern humans coexisted in Europe for thousands of years, until Neanderthals died out some 28,000 years ago. Scientists have been debating whether the two groups interbred and whether modern humans carry some genetic remnants of Neanderthals. Rubin said his analysis, like some previous work, found no evidence of such intermixing, though it'll take more DNA to rule it out.

Paabo's analysis didn't directly address whether modern humans have DNA from Neanderthals, but it did raise speculation that DNA from anatomically modern humans might have found its way into Neanderthals. Scientists will have to examine more Neanderthal DNA to study that, he said.

Rubin also said analysis so far suggests human and Neanderthal DNA are some 99.5 percent to nearly 99.9 percent identical.