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EARLY MAN'S BEST FRIEND MAY HAVE BEEN A DOG SCIENTISTS SAY CANINES HAVE BEEN AROUND UP TO 100,000 YEARS

Author(s): CAMILLE MOJICA, Mercury News Staff Writer **Date:** June 13, 1997 **Section:** Front

Fred Flintstone wasn't the only caveman with a pet. In fact, the relationship between humans and dogs may be as old as modern humans themselves.

The first comprehensive study of dog DNA suggests that man's best friend originated 60,000 to 100,000 years ago -- four to seven times earlier than previously believed.

According to today's edition of the journal Science, a pooch watched as modern humans first appeared on the evolutionary stage.

Cats are newcomers

Domestic cats, in contrast, are relative newcomers, going back no more than 7,000 years, according to the latest evidence.

Researcher Carles Vila and molecular geneticist Robert Wayne of the University of California-Los Angeles examined the dog's origin as part of a project on the evolution of the wolf.

"The more we looked at wolves," Vila said, "the more interesting dogs became."

Based on mathematical analysis of DNA data, Vila also concluded that all dogs are descendants of wolves, and not other canines -- jackals and coyotes -- as once thought.

The information will be added to the growing data gathered to reveal the genetic makeup of the dog. Much of that work is being done at the Dog Genome Project, located at the University of California-Berkeley.

Previous attempts to determine the origin of dogs used only archaeological evidence and placed the domestication of the dog at 14,000 years ago.

At that time, an ice age was ending and Homo sapiens was beginning to disperse across the Earth. They began to settle, engaging in the first agricultural activities -- a logical time for dogs to enter the scene.

If dogs were around 100,000 years ago, they witnessed the first modern humans splitting from their hominid cousins in Africa. Even 60,000 years ago, humans still lived in nomadic groups, exclusively stalking large prey.

Exactly what the relationship between early human and early dog was -- or even whether the dogs were domesticated -- remains unclear, the researchers said.

And why no previous evidence of 100,000-year-old puppies? Vila and Wayne believe that archaeologists discovering the bones of ancient dogs simply discarded them. "They probably looked just like wolves," Vila said.

He and his collaborators gathered the DNA of 162 wolves from 27 populations around the world and 140 dogs representing 67 different breeds. They decoded the DNA sequence in one region of the power-producing part of the cell known as the mitochondrion.

This type of DNA changes at a specific rate. The number of changes increases with time and reveals how long two animals have been evolving separately.

But just how long the dog has been kept as a pet is less certain.

And there are those who think it isn't 100,000 years. "It's completely at odds with what we know," said James Serpell, a professor at the University of Pennsylvania who studies people and their companion animals. He maintains that archaeologists would know the difference between domestic and wild animals.

"You usually see very rapid (physical) change in just a few generations," Serpell said, noting that Vila's theory requires that archaeologists wouldn't have been able to tell the difference between animals changing over hundreds of generations.

One scientist had another explanation for the conflicting data.

Canine ancestors

Dogs' ancestors might have split from other wolves and remained isolated from them, coexisting with humans but not necessarily as pets.

"Evolution is different from domestication," said Gregory Acland, a dog geneticist at Cornell University.

Scientists were less divided over the finding that the wolf was the lone ancestor of the dog. "Not surprising," said Serpell.

A controversy had flared briefly when Nobel Prize-winning behaviorist Konrad Lorenz first endorsed, then retracted his opinion that some dogs descended from jackals.

"I hope this finally puts the lid on it," said Serpell.

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