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AIDS virus ancestor over 32,000 years old
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AIDS virus ancestor over 32,000 years old

A NEW study shows that the monkey version of the virus behind AIDS is at least 32,000 years old, scientists say. The finding suggests that the human version of the pathogen won't stop killing anytime soon, they add.

The research shows that it could have taken millennia for monkeys to develop resistance to the lethal effects, the researchers involved in the study explained. If so, they went on, the same might be true for humans.

The research, by scientists at the University of Arizona and Tulane University in New Orleans, appears in the Sept. 17 issue of the journal *Science*.

The study shows that the monkey-infecting pathogen, the simian immunodeficiency virus or SIV, is at least 32,000 to 75,000 years old, and likely much older, members of the group said. They based their conclusions on a genetic analysis of unique SIV strains found in monkeys on Bioko Island, a former peninsula that separated from mainland Africa after the Ice Age more than 10,000 years ago.

The virus was previously thought to be a few hundred years old.

SIV doesn't cause AIDS in most of its primate hosts, scientists say, but it probably once did. Many viruses gradually evolve to become fairly harmless, as the more vulnerable hosts die out, leaving only resistant populations behind. This process can be good for the virus, too, as a dead host may not be very useful to a virus.

The new findings, if correct, could indicate that it could have taken thousands of years for SIV to evolve into a primarily non-lethal state. Thus the same may be true of the human version, called human immunodeficiency virus or HIV, according to the authors.

"HIV is the odd man out," because most other viruses of its type, called immunodeficiency viruses, "impose a much lower mortality," said University of Arizona biologist Michael Worobey, who co-led the study.

"So, if SIV entered the picture relatively recently as was previously thought, we would think it achieved a much lower virulence over a short timescale," Worobey said. "But our findings suggest the opposite. If HIV is going to evolve to lower virulence, it is unlikely to happen anytime soon."

The study also raises a question about the origin of HIV, which scientists believe evolved from SIV. If humans have been exposed to SIV-infected monkeys for thousands of years, why did the HIV epidemic only begin in the 20th century?

"Something happened in the 20th century to change this relatively benign monkey virus into something that was much more potent and could start the epidemic. We don't know what that flash-point was, but there had to be one," said virologist Preston Marx of Tulane University, the other co-leader of the study.

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Finding these virus strains trapped on Bioko Island settles a long-standing debate, Worobey said.

"It's like finding a fossilized piece of virus evolution," he said. "We now have this little island that is revealing clues about SIV, and it said, 'It's old.' Now we know that humans were almost certainly exposed to SIV for a long time, probably hundreds of thousands of years."

"Reconstructing the evolutionary past by comparing the genes of these viruses is like looking out onto the ocean," Worobey said. "You can see a long way, but you don't know what lies beyond the horizon."

SIV was distributed across the African continent before Bioko Island separated from the continent about 10,000 years ago, he added. "When that happened, whatever viruses were circulating at the time became isolated from the virus populations on mainland Africa."