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Chimpanzees Infected With SIV Do Contract And Die From AIDS, Contrary To Prevailing View

ScienceDaily (July 22, 2009) — Although the AIDS virus (HIV-1) entered the human population through chimpanzees, scientists have long believed that chimpanzees don't develop AIDS. But a new study from an international team, including University of Minnesota professors Anne Pusey and Michael Wilson, shows that chimpanzees infected with SIV (simian immunodeficiency virus), the precursor to HIV-1, do contract and die from AIDS. The discovery is published in the July 23 issue of *Nature*.

The authors report that infected chimpanzees in their study group were 10-16 times more likely to die than those who were uninfected. The team also found that infected females were less likely to give birth and infants born to infected mothers were unlikely to survive. The virus, they learned, was transmitted sexually and through mother's milk. Over the nine-year study period, 10-20 percent of the 94 chimpanzees were infected at any one time.

The finding opens up new opportunities for research.

"We hope this will lead to a better understanding of the virus that will benefit both humans and chimpanzees," said Jane Goodall, whose focus has shifted in recent years from research to conservation of chimpanzees and their habitats.

The study focused on chimpanzees at Gombe National Park, Tanzania, where Goodall and her colleagues have studied chimpanzees for nearly 50 years. Researchers used data that Pusey, a long-time associate of Goodall's, archived at the Jane Goodall Institute's Center for Primate Studies at the University of Minnesota, to understand how SIV is transmitted among chimpanzees, and how the virus affects chimpanzee survival and reproduction.

Virologist Beatrice Hahn at the University of Alabama led the Nature study, which involved Pusey and her colleagues. Brandon Keele and Rebecca Rudicell in Hahn's lab used techniques they developed to detect SIV in chimpanzee fecal samples. Samples were collected by research staff at Gombe and shipped to Alabama for analysis.

Examination of tissue samples from dead chimpanzees revealed a loss of CD4+ T cells (which are vital to immunity) in SIV-infected chimpanzees. Loss of these cells renders victims susceptible to many other infections – the classic indication of AIDS. Wilson organized a team of Tanzanian and American specialists to conduct the first post-mortem exam of a chimpanzee that died from AIDS.

"From a scientific perspective, it is fascinating to learn that the virus affects chimpanzees in similar ways to humans," Wilson said. "But it is difficult knowing that there isn't much we can do to help those whose lives may be shortened by the virus." Wilson is a McKnight Land-Grant Professor with a joint appointment in Anthropology and Ecology, Evolution and Behavior.

"It isn't practical to treat the chimpanzees for SIV infections, but it appears that SIV in chimpanzees is not quite as pathogenic as HIV-1 in humans," said Pusey, who is a Distinguished McKnight University Professor in the College of Biological Sciences Department of Ecology, Evolution and Behavior. "So far, the main study community has maintained its size despite mortality from diseases."

Including Pusey and Wilson, six of the co-authors are associated with the University of Minnesota. Doctoral candidate Emily Wroblewski sequenced DNA from fecal samples. Research Administrator Joann Schumacher-Stankey prepared demographic and behavioral data. Elizabeth

Lonsdorf (Ph.D. 2003) is now based at Lincoln Park Zoo and leads a health-monitoring project at Gombe. Anna Moser (Ph.D. 2008) is director of Research at Gombe.

Adapted from materials provided by University of Minnesota.