

Genomic fossils in lemurs shed light on origin and evolution of HIV and other primate lentiviruses

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A retrovirus related to HIV became stably integrated into the genome of several lemurs around 4.2 million years ago, according to research led by Dr. Cédric Feschotte at the University of Texas, Arlington. Published March 20 in the open-access journal *PLoS Genetics*, the analysis of prosimian immunodeficiency virus (pSIV) offers new insights into the evolution of lentiviruses.

During replication, [retroviruses](#) integrate within the chromosomes of their host cells. If germ cells are infected, the integrated viral DNA can be transmitted from parent to offspring and may eventually become assimilated as part of the genetic material of the host species. This 'endogenization' process has occurred repeatedly during evolution, and has involved diverse retroviruses, giving rise to a sizeable portion of the [genome](#) of many vertebrate species - for example, ~8% of the human genome. Until now, the process was believed to be extremely rare for lentiviruses, an evolutionarily elusive group of retroviruses that infect diverse mammals, including humans (in the form of human immunodeficiency virus [[HIV](#)]).

Based on 'fossil' sequences collected from different lemur species, the researchers computationally reconstructed an apparently intact and complete DNA sequence for the ancestral prosimian lentivirus. The discovery that two different species of [lemurs](#) endemic to Madagascar suffered, independently and quasi-simultaneously, multiple germline

infections of pSIV provides evidence that lentiviruses have repeatedly infiltrated the germline of prosimian species.

These findings should allow future functional analysis of the extinct virus and advance our understanding of the biology of lentiviruses, including HIV. In addition, the characterization of this ancient lentivirus in lemurs raises the possibility that HIV-like retroviruses are still circulating today in the mammalian fauna of Madagascar.

More information: Gilbert C, Maxfield DG, Goodman SM, Feschotte C (2009) Parallel Germline Infiltration of a Lentivirus in Two Malagasy Lemurs. PLoS Genet 5(3): e1000425.

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