

Why Some Monkeys Don't Get AIDS

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Sooty Mangabeys

(PhysOrg.com) -- Two studies published this month in the *Journal of Clinical Investigation* provide a significant advance in understanding how some species of monkeys such as sooty mangabeys and African green monkeys avoid AIDS when infected with SIV, the simian equivalent of HIV.

Using comparative genomics of SIV infection, researchers at the University of Pennsylvania School of Medicine, with collaborators from University of Minnesota, the University of Toronto, and Emory University, looked at sooty mangabeys, and a second group at the Pasteur Institute in France, looked at African green monkeys to identify possible genes related to disease progression or resistance.

“Sooty mangabeys are able to rapidly shut down the immune response

after the initial SIV infection, and remain healthy. The mangabeys respond to SIV in a manner similar to rhesus macaques, which get sick, or to humans infected with [HIV](#), but the mangabeys do not get sick,” says first author Steven E. Bosinger, PhD, a postdoctoral fellow in the Department of Pathology and Laboratory Medicine.

“The Penn study is a step forward in understanding why some African monkeys do not get sick when they are infected with SIV, which is a key question in contemporary [AIDS](#) research,” says senior author Guido Silvestri, MD, associate professor of Pathology and Laboratory Medicine and Director of Clinical Virology.

The Penn study compared changes induced by SIV infection on the overall profile of gene expression in two species of [monkeys](#): rhesus macaques, which undergo an AIDS-like disease when infected with SIV, and sooty mangabeys, which, in stark contrast, remain AIDS-free despite life-long infection. Sooty mangabeys, which are native to Western Africa and infected naturally in the wild, were previously believed by some to remain asymptomatic because of a genetic inability to mount innate immune responses to SIV, and in particular, to produce type I interferons.

However, the current studies change the way AIDS researchers think about human versus simian AIDS infection. The sooty mangabeys' robust antiviral immune response upon SIV infection, including a massive up-regulation of interferon response genes, or ISGs, indicates production of type I interferons in the mangabeys. Of note, this antiviral response is transient, as seen in sooty mangabeys, lasting for about four weeks, but remains constant over time in rhesus macaques, which may contribute to the immunodeficiency seen in this species. SIV induces a massive activation of immune molecules in both species, but only sooty mangabeys are able to bring the response under control.

In addition, by comparing the changes induced by [SIV](#) infection on the overall profile of [gene expression](#) of rhesus macaques versus sooty mangabeys, the research teams identified genes whose expression may be responsible for disease progression or, alternatively, disease resistance. These genes may provide novel targets for AIDS therapy.

Provided by University of Pennsylvania School of Medicine ([news](#) : [web](#))

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