

Animal vaccine study yields insights that may advance HIV vaccine research

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A vaccine study in monkeys designed to identify measurable signs that the animals were protected from infection by SIV, the monkey version of HIV, as well as the mechanism of such protection has yielded numerous insights that may advance HIV vaccine research. Seven laboratories collaborated on the research led by Mario Roederer, Ph.D., and John R. Mascola, M.D., at the Vaccine Research Center of the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health.

By examining both viral amino-acid sequences and the animals' immune responses, the scientists could determine the mechanisms of protection from SIV [infection](#). The study demonstrated that antibodies to the virus spikes that SIV uses to infect cells are necessary and sufficient to prevent SIV infection. The study also identified clear measures of immune responses in monkeys that predict protection from SIV infection.

Amid the genetically heterogeneous mix of SIV to which the vaccinated monkeys were exposed, vaccine-induced immune responses tended to block infection by those viruses sensitive to neutralization by SIV antibodies, while neutralization-resistant forms of SIV tended to cause infection. A two-amino-acid change to the spikes on SIV converted neutralization-sensitive SIV to neutralization-resistant SIV, and vice versa. A similar change to the spikes on HIV had a related effect. Thus, SIV and HIV escape the immune system in similar ways, the scientists discovered. They concluded that the reasons why future human HIV

vaccine trials fail or succeed will become clearer if scientists integrate information on the amino-acid sequence and neutralization sensitivity or resistance of the infecting virus together with information about volunteers' immune responses to the [vaccine](#).

More information: M Roederer et al. Immunological and virological mechanisms of vaccine-mediated protection against SIV and HIV.

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