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Monkeys able to fend off AIDS-like symptoms with enhanced HIV vaccine

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Researchers at the University of Pennsylvania School of Medicine have discovered that using an immune system gene to enhance a vaccine used to study HIV in macaque monkeys provides the animals with greater protection against simian HIV (SHIV) than an unmodified vaccine. This multi-year study found that the addition of a molecule called Interleukin-15 effectively boosts the effects of a vaccine derived from the DNA of simian HIV.

The study illustrates that DNA vaccine effectiveness can be improved by the inclusion of specific immune adjuvants, or helpers. The findings are published in last week's online edition of the *Proceedings of the National Academy of Sciences.*

"DNA vaccine technology has great promise for the development of vaccines and immune therapeutics for a variety of infectious diseases and cancers," says senior author David B. Weiner, PhD, Professor of Pathology and Laboratory Medicine at Penn. While previous studies have established that the technology can induce immune responses safely, "improving the immune potency of this platform is critical for further development in humans."

The research builds on previous work aimed at engineering a more potent immune response to SHIV DNA vaccine technology. Mouse model studies previously showed that the cytokine IL-15 -- a substance that can improve the body's natural response to infection and disease -- helps better immune responses and protection, while this study mirrors

those findings in a larger, non-human primate species.

In this study, the group of macaques that was injected with the vaccine containing a loop of DNA enabling them to make IL-15 developed no signs of AIDS-like symptoms when exposed to live SHIV, compared to four animals in the control group that received only the DNA vaccine. The modified vaccine appeared to help suppress viral replication among the IL-15 group.

Next, Weiner's team will study the protected macaques to determine the actual mechanism of their protection, and seek out any pockets of the virus that may be hiding in specific immune compartments. The approach will also be tested for safety and immunogenicity in humans through the HIV Vaccine Trials Network.

Source: University of Pennsylvania