Scientists discover effects of PD-1 blockade on ART therapy in SIV-infected monkeys

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Scientists have discovered that blocking PD-1 (programmed death-1), an immune molecule that inhibits the immune response to viral infections, can have a significant effect on HIV-like illness in nonhuman primates.

In earlier research, the scientists showed that PD-1 blockade could restore T and B cell function against SIV. Now they have new findings about the effects of PD-1 blockade along with antiretroviral therapy (ART).

Vijayakumar Velu, PhD, a scientist at Yerkes National Primate Research Center and the Emory Vaccine Center presented the information at the 19th Conference on Retroviruses and Opportunistic Infections in Seattle, Wash. Rama Rao Amara, PhD, associate professor of microbiology and immunology at Yerkes and the Emory Vaccine Center, led the project.

The researchers treated SIV-infected rhesus macaque monkeys with ART from 16 to 21 weeks post infection then interrupted the therapy. The SIV viral load rapidly increased, along with the frequency of SIV-specific CD8 T cells. Four weeks later, the researchers treated some of the macaques with anti-PD-1 antibody and monitored both the treated and control animals.

Half the animals treated with PD-1 blockade, but only those with measurable CD8 T cells at the time of ART interruption, had a rapid decline in plasma viral load. PD-1 blockade did not enhance the

frequency of SIV-specific CD8 T cells, but rather enhanced their function.

"Our results show PD-1 blockade after ART interruption can significantly enhance viral control, but the effect seems to depend on maintaining measurable SIV-specific CD8 T cell response following therapy," says Velu.

Rafi Ahmed, director of the Emory Vaccine Center and a key member of this research team, first identified the PD-1 molecule as a target for therapy designed to reactivate exhausted immune cells in chronic diseases. Other members of the research team are Gordon J. Freeman of Harvard Medical School and Kehmia Titanji, Ravi Dyavar Shetty and Hyun Woo Lee from Yerkes and the Emory Vaccine Center. The team plans to continue studying the interactive effects of PD-1 blockade combined with ART.

Provided by Emory University

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