

## **Tulane researcher uses gene editing technology in promising step toward eliminating HIV**

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Co-corresponding author Andrew MacLean, PhD, associate professor of microbiology and immunology at Tulane National Primate Research Center, is hopeful that the treatment strategy will translate to people living with HIV.

While HIV infection is now largely manageable with the help of antiretroviral therapy (ART), the virus persists in hard-to-reach reservoirs of the body, requiring those infected to remain on ART for life.

Now, research at Tulane and Temple universities may offer a promising step toward eliminating HIV throughout the body. Scientists using a sophisticated method of gene editing to precisely cut and remove segments of simian immunodeficiency virus (SIV)-specific DNA in viral reservoirs, have prevented the replication of new virus. SIV is a virus closely related to HIV. The team's findings were [published in Nature Communications](#). The gene editing construct used in this research was developed at Temple and employed at Tulane National Primate Research Center.

Using a nonhuman primate model of SIV infection, the researchers demonstrated that an adeno-associated virus can deliver CRISPR/Cas9 gene editing molecules into SIV viral reservoirs in the lymph, spleen, bone marrow and brain. Like using "molecular scissors," the treatment cuts out sections of viral DNA to prevent the cells in these reservoirs from making new virus.

Within three weeks, the treatment eliminated up to two-thirds of the virus from some hidden reservoirs in nonhuman primate subjects on ART.

Co-corresponding author Andrew MacLean, PhD, associate professor of microbiology and immunology at Tulane National Primate Research Center, is encouraged by the findings.

"This is an important development in what we hope will be an end to HIV/AIDS," MacLean said. "The next step is to evaluate this treatment over a longer period to determine if we can achieve complete elimination of the virus, possibly even taking subjects off of ART."

MacLean is hopeful that this treatment strategy will translate to people living with HIV. While lifesaving, ART may also have unintended side effects, and the viral reservoir untouched by the therapy may still be capable of causing neurological complications.

Co-corresponding author also includes Dr. Binhua Ling, one of the principal investigators of the research, and previous associate professor of microbiology and immunology at Tulane University School of Medicine and Tulane National Primate Research Center, and current associate professor at Texas Biomedical Research Institute.

Kamel Khalili, PhD, Laura H. Carnell professor and chair of the department of neuroscience and director of the center for neurovirology at the Lewis Katz School of Medicine at Temple University, was a senior co-investigator on the study with Tricia

Burdo, PhD, associate professor in the department of neuroscience. Pietro Mancuso, PhD, an assistant scientist in Khalili's laboratory in the department of neuroscience, was first author on the report.