



Cure: mRNA Unmasks HIV

A team in Australia hypothesized that mRNA encoding proteins that reverse HIV latency could help flush out the virus.

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Researchers have found a way to deliver messenger RNA (mRNA) to infected CD4 T cells and coax in-active HIV out of hiding, an approach that could potentially contribute to a functional cure. Antiretroviral therapy can keep HIV suppressed, but the virus inserts its genetic blueprints into host cells and establishes a long-lasting reservoir that is nearly impossible to eliminate. A team in Australia hypothesized that mRNA encoding proteins that reverse HIV latency could help flush out the virus. They developed a novel lipid nanoparticle, or fat bubble—dubbed LNP X—that could successfully ferry mRNA into CD4 cells from people with HIV. Specifically, LNP X was used to deliver mRNA that encodes instructions for Tat, an HIV protein that triggers viral transcription. Once inside infected cells in the laboratory, LNP X exposed the dormant virus with no apparent toxicity. The novel nanoparticles can also deliver CRISPR, a gene-editing tool. The researchers are preparing for preclinical testing in animals, with the goal of eventually moving toward human clinical trials.

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