HIV Cure Search Sees New Protein Work on Latently Infected Cells

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A manufactured, two-headed protein has succeeded in awakening latently HIV-infected immune cells and summoning an immune response to kill them. This finding could become part of a therapy intended to cure HIV-positive individuals of the virus.

Researchers drew latently infected CD4 cells from people taking antiretrovirals (ARVs) to treat HIV and then incubated those cells in the laboratory with the individuals' own CD8 cells, also known as killer T-cells.

They also adapted a protein, called VRC07-αCD3, for primates and gave it to monkeys infected with SIV—HIV's simian cousin—that were taking ARVs. The protein proved safe and well tolerated. The researchers are now testing to see how well it works in the animals.

One end of VRC07-αCD3 binds to a surface molecule on CD4 cells called the CD3 receptor; this causes the latently infected CD4 cells to start replicating again and to produce virus. The other end of the protein, which is based on an antibody called VRC07, binds to more than 90 percent of HIV strains found in the world.

To prompt the infected cell's death after causing it to once again produce new copies of HIV, VRC07-αCD3 detaches from the CD3 receptor and attaches one end of itself to pieces of HIV on the surface of the CD4 cell. Then the protein attaches its other end to the CD3 receptor on the surface of a CD8 cell. This activates the CD8 cell and draws it close to the infected CD4 cell to ultimately destroy it.

To read the NIH press release about the study, click here.

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