HIV Can Take Shortcuts to Reproduce

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HIV can reproduce without going through its usual life cycle steps, suggesting that the human body may harbor more copies of the virus capable of damaging the immune system than was previously thought, according to new research published online in the journal *Retrovirology*.

The HIV life cycle—the normal process HIV follows to infect CD4 cells in order to reproduce—has been well described. The virus must first insert its genetic material into a CD4 cell, translate that material from RNA to DNA, and then integrate the viral DNA into the CD4 cell's DNA. Scientists, however, have found that only about one in every 100 HIV virions ultimately manages this vital step in the HIV life cycle and conclude that only a tiny amount of HIV in the body is capable of reproducing by ordinary measures.

In laboratory studies of HIV-infected CD4 cells, David Levy, MD, from the New York University College of Dentistry, in New York City, and his colleagues have determined that HIV can replicate without integrating itself into the host cell's genome, provided that another virus had already infected the cell, integrated itself and started producing viral particles. In other words, once a single virus infects a single CD4 cell and begins reproducing, several other HIV virions can infect that same cell and reproduce themselves without ever having to integrate their genetic material.

The authors stress that viruses taking this reproductive shortcut may not produce robust or efficient offspring, compared with viruses that follow the traditional steps in the HIV life cycle. However, the authors conclude that these new findings may explain how HIV is able to produce such vast numbers of new virions every day.

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