Is Defective HIV DNA Still a Problem?

Research shows that HIV-positive people may still have defective HIV DNA in their cells.

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Even when their virus is fully suppressed by antiretroviral (ARV) treatment, HIV-positive people may have defective HIV DNA in their cells that can give rise to HIV-related proteins. These proteins in turn may help spur harmful persistent activation of the immune system.

Researchers came to these conclusions by creating and studying multiple copies of nearly complete HIV proviral DNA and cell-associated HIV RNA.

Proviral DNA is the term for the genetic material of a virus that has been integrated into a human cell's DNA. Cell-associated HIV RNA refers to the RNA copies produced by the viral DNA in a cell's genome.

The scientists detected copies of HIV RNA that corresponded to defective HIV pro-viruses. This suggested that the defective provirus had given rise to HIV RNA. The researchers then found that such RNA could itself give rise to intact HIV-related proteins (but not an intact virus). Previously, scientists had thought of defective proviruses as a biological dead end.

The development of such proteins could help explain why people on suppressive HIV treatment have persistently activated immune systems, a harmful condition.

Anthony S. Fauci, MD, director of the National Institute of Allergy and Infectious Diseases (NIAID) and a study coauthor, says, "By identifying one possible source of persistent inflammation, despite [viral loads below 50], one can begin to develop strategies directed toward these cells in an effort to decrease this inflammation and its resulting effects."

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