T Memory Stem Cells Are Likely a Cornerstone of HIV Reservoir

January 13, 2014

Long-living, HIV-infected immune cells that have stem-cell-like properties appear to be a bedrock of the viral reservoir that prevents antiretroviral treatment from clearing the virus. Publishing their findings in Nature Medicine, researchers tested samples of blood drawn from people shortly after they acquired HIV, as well as samples from several years down the line, and then compared the viral sequences found in what are called T memory stem cells.

The scientists found that the viral sequences in the memory cells circulating shortly after infection were similar to those found in the memory cells following six to 10 years of ARVs. This suggests that the virus persisted in these cells without significant changes over an extensive period of time. Also, the amount of HIV's DNA found in the memory cells remained essentially the same across the years, regardless of the fact that HIV treatment had depleted the level of virus in other types of immune cells. In fact, in those receiving treatment, the amount of HIV DNA was highest in their T memory stem cells. The conclusion is that T memory stem cells can continuously produce new HIV-infected immune cells while evading ARV treatment.

"Our findings suggest that novel, specific interventions will have to be designed to target HIV-infected T memory stem cells," Mathias Lichterfeld, MD, an assistant professor of Medicine at Harvard Medical School and a corresponding author of the report, said in a release. "Methods of inhibiting stem cell pathways are being studied to eliminate cancer stem cells—persistent cells that are responsible for tumor recurrence after conventional treatments kill proliferating tumor cells. We are now investigating whether any of the drugs that target cancer stem cells might be effective against HIV-infected T memory stem cells.

"Identifying the reservoirs for HIV persistence is a critical step toward developing interventions that could induce a long-term remission without the need for antiviral medication, or possibly eliminate the virus entirely," Lichterfeld continued. "Although a real cure for HIV has been elusive, it is not impossible."

To read a copy of the release, click here.

To read the study abstract, click here.