Why HIV That Transmits Is More Infectious and Resilient

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The individual HIV particles that succeed in transmitting between people are particularly resistant to the human immune response and are also structured to better access and enter immune cells, according to new research from Los Alamos National Laboratory and the University of Pennsylvania. The Penn researchers cloned virus from an acute, or recent, infection as well as viruses from people chronically infected and then compared the two.

Because HIV mutates so rapidly, the properties of the overall population of virus within an individual person changes significantly over time, meaning that it soon becomes different from the virus that initially caused the infection. There is also diversity in the viral population at any given time.

The investigators found that the transmitted viruses were more infectious and also had a more significant amount of what is known as envelope protein, which is a tool HIV uses to enter human immune cells. The transmitted HIV also had the capacity to thrive in the presence of alpha interferon, which belongs to a class of anti-viral immune cells called cytokines. When HIV first infects the body, the immune system reacts with a massive assault known as a “cytokine storm,” which eventually tapers as someone becomes chronically infected. By comparison, alpha interferon had a significant anti-viral effect against the cells cloned from the chronically infected people.

“The viruses that make it through transmission barriers to infect a new person are particularly infectious and resilient,” Los Alamos National Laboratory scientist Bette Korber said in a release. “Through this study we now better understand the biology that defines that resilience.”

To read the release on the study, click here.

To read the abstract, click here.

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