MedicalXpress

New anti-HIV drug target identified

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University of Minnesota researchers have discovered a first-of-its-kind series of compounds possessing anti-human immunodeficiency virus (HIV) activity. The compounds present a new target for potential HIV drug development and future treatment options.

Complete findings are printed in today's issue of the *Journal of Virology*.

The compounds, known as ribonucleoside analogs 8-azaadenosine, formycin A, 3-deazauridine, 5-fluorocytidine and 2'-C-methylcytidine, were found to stop the replication and spread of HIV by blocking HIV DNA synthesis or by inducing lethal mutagenesis. Lethal mutagenesis annihilates HIV by causing it to mutate to the point of extinction.

The compound 3-deazauridine stopped HIV by creating so many mutations in the virus that the virus was no longer able to spread throughout the body by infecting other cells. The other compounds caused early termination of HIV DNA synthesis, again preventing the virus from being able to reproduce. Studies prior to this one determined certain ribonucleosides analogs impact HIV DNA synthesis, a process called reverse transcription. The extent to which they worked was not previously known.

"It's a counterintuitive finding," said University of Minnesota virologist Louis Mansky, Ph.D. "These ribonucleoside analogs were not generally thought to be associated with affecting HIV DNA synthesis – a critical step in virus replication. We don't yet know all the details for how these particular compounds stop the virus in its path."

The research, if translatable, will provide a potentially cost-effective and fresh treatment option to counter HIV's rapid evolution and treat HIV resistance to currently approved anti-HIV drugs. Anti-HIV ribonucleoside analogs are less expensive to create in a laboratory than deoxyribonucleoside analogs, which are key in drugs currently used to stop HIV replication and cell spread. Additionally, the similarity of ribonucleoside analogs to deoxyribonucleosides may help speed up the development process to make full use of this target as a wealth of understanding around ribonucleoside analogs already exists.

Provided by University of Minnesota