PrEP Prevents Rectal and Intravenous Transmission in Mice

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Pre-exposure prophylaxis (PrEP) prevents infection by both rectal and intravenous exposure to HIV in mice, according to a study published January 21 in the online journal *PLoS ONE* and reported by ScienceDaily. PrEP involves giving antiretroviral therapy to an uninfected individual daily to prevent HIV infection.

A number of clinical trials are currently underway in countries around the world to determine whether PrEP can prevent HIV transmission. Results from the first efficacy studies in humans, using only Viread (tenofovir), are expected as early as the end of 2010. Later studies, using two drugs combined into the single pill Truvada (tenofovir plus emtricitabine), are also underway.

A variety of studies in monkeys have demonstrated that PrEP is likely to work at least somewhat. Scientists can't be sure, however, that a strategy that works against the monkey version of HIV, called simian immunodeficiency virus (SIV), will work as well against HIV in humans. Nor can they be sure that PrEP will work equally well against different types of exposure, such as vaginal, anal or intravenous.

To determine the efficacy of PrEP against two types of exposure in mice bread to have a human immune system, Paul Denton, PhD, from the University of Texas Southwestern Medical Center in Dallas, and his colleagues compared Truvada PrEP with a placebo in 46 BLT mice. BLT stands for the transplantation of human bone marrow, lymph tissue and thymus tissue into mice whose own immune systems have been knocked out.

Denton's team gave the mice either Truvada or a placebo for seven consecutive days. On the third day of PrEP, they exposed the mice rectally and intravenously to HIV.

The team found that PrEP, in these circumstances, was highly effective in preventing HIV infection. In the mice who were exposed rectally, none of the nine who received Truvada were infected with HIV, compared with 12 of 19 who had received a placebo. In the mice exposed intravenously, eight of the nine mice receiving Truvada were protected. By contrast, all of the placebo-treated mice who received an intravenous infusion of HIV were infected.

"This is outstanding work that helps to advance the field of HIV prevention science," said Mark Wainberg, PhD, from McGill University in Montreal. "This research provides excellent rationale for

the continuation of PrEP clinical trials.”

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