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Researchers find that antiretroviral therapy reduces HIV in the female reproductive tract

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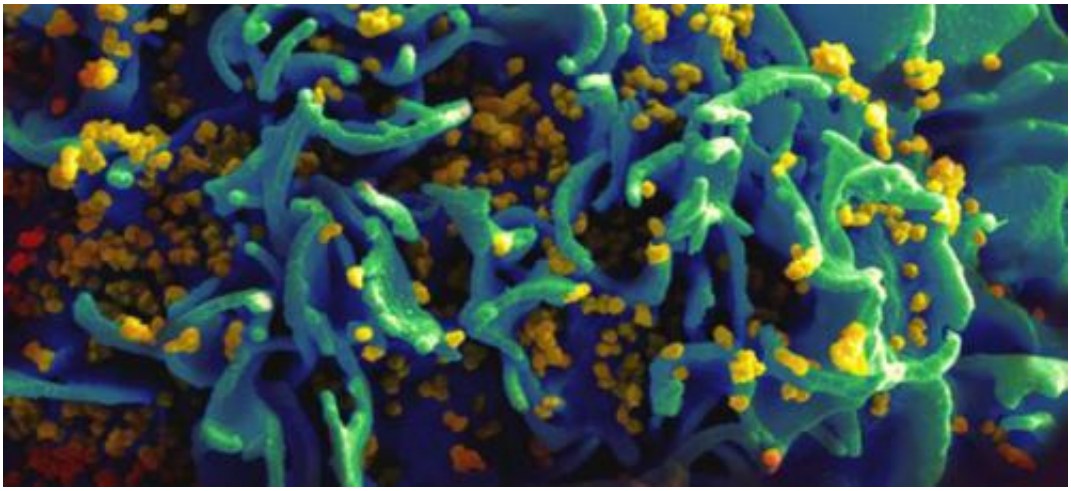

An HIV-infected cell. Credit: NIAID

For the first time, investigators in the Division of Infectious Diseases at the University of North Carolina School of Medicine have determined how antiretroviral therapy (ART) affects the way HIV disseminates and establishes infection in the female reproductive tract. These observations have significant implications for future HIV prevention, vaccine and cure studies. A recent HIV prevention clinical trial demonstrated 93 percent protection against secondary heterosexual transmission when infected partners received early ART. Vaginal transmission accounts for the majority of new HIV infections worldwide. Globally, 35 million people are living with HIV and 2.1 million are newly infected each year. These findings were published in the *Journal of Clinical Investigation* on

Monday, Feb. 8.

"Surprisingly, it does not matter how a woman is exposed to HIV - vaginally, rectally, etc. - the virus goes very quickly to the female reproductive tract," said J. Victor Garcia, PhD, study co-author, and a professor of medicine in the Center for AIDS Research, the Institute for Global Health & Infectious Diseases, and the Division of Infectious Diseases at UNC. "Your body's CD4 T cells, which are the cells HIV infects, also migrate to the female reproductive tract shortly after exposure. It is like putting more kindling on a smoldering fire."

Using humanized mouse models, Garcia and his team also noticed that CD8 T cells, the cells in the body that fight infection, are delayed in getting to the female reproductive tract. This delay allows HIV to establish itself not only in the female reproductive tract, but also in cervicovaginal secretions.

"Your CD8 T cells, which are supposed to protect you, are not arriving in the female reproductive tract in time," said Garcia. "When we think about potential vaccines against HIV, this is important information to have."

Yet, when ART is taken regularly, the likelihood of transmission rapidly declines.

"Once ART was introduced into our models, the number of infected cells in the female reproductive tract and cervicovaginal secretions vastly decreased," said Angela Wahl, PhD, study co-author and an assistant professor of medicine in the Division of Infectious Diseases at UNC School of Medicine. "However, even on therapy, there is still residual virus in the female reproductive tract, just not enough to transmit infection. And these remaining infected cells are persistently making HIV RNA. This has implications for cure research and indicates that the

female reproductive tract could represent a potential reservoir for HIV during therapy."

Provided by University of North Carolina Health Care