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Engineered vaginal Lactobacilli could reduce heterosexual HIV-1 transmission in women

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A normal, predominant bacterial species of the healthy vaginal microbiota can be engineered for potential use as a novel protective agent against HIV-1 transmission in women, according to a new publication from scientists at Osel, Inc. and their collaborators. The authors describe the engineering of *Lactobacillus jensenii* to stably express broadly neutralizing antibody fragments against the HIV-1 virus in an advanced online publication of *AIDS Research and Human Retroviruses*, entitled "Expression of HIV-1 Neutralizing Antibody Fragments Using Human Vaginal *Lactobacillus*."

Eradicating HIV-1 through the use of a vaccine that produces broadly neutralizing antibodies has been the ultimate goal for HIV prevention, however generating appropriate immune responses via vaccine strategies has proven difficult.

"Most viruses enter the human body through mucosal surfaces, and in women, the vagina and cervix are the major sites of entry for HIV-1 during sexual intercourse," said Laurel Lagenaur, Ph.D, senior author and Director of Research at Osel. "*Lactobacilli* already play a protective role in the vagina by reducing inflammation, which is a risk factor for HIV infection. Engineering these bacteria to deliver HIV-1 neutralizing antibodies mucosally at the site where the virus first enters the body may offer a cost-effective and long-lasting new barrier to HIV-1 transmission that is different but compatible with current antiviral therapies, barrier methods or future vaccines."

Osel scientists have previously demonstrated that *Lactobacillus* could be engineered to secrete another anti-HIV-1 protein. They also demonstrated that successful vaginal colonization by the engineered bacterium reduced vaginal HIV transmission in a primate animal model by over 63%.

"Engineered vaginal *Lactobacilli* with anti-HIV properties, like the delivery of neutralizing antibodies or antiviral proteins, offer considerable potential as Live Biotherapeutic Products for an important global health need -- reducing the heterosexual transmission of HIV in women," said K.T. Moortgat, Ph.D., Osel Chief Executive Officer. "If successfully developed, Osel's MucoCept technology could provide an accessible and durable approach that could be used inexpensively, discretely, and in a way that enhances the natural protective effects of the vaginal microbiota. Osel's MucoCept technology is currently in pre-clinical development, and we expect to progress to clinical testing within the next 2 years."

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