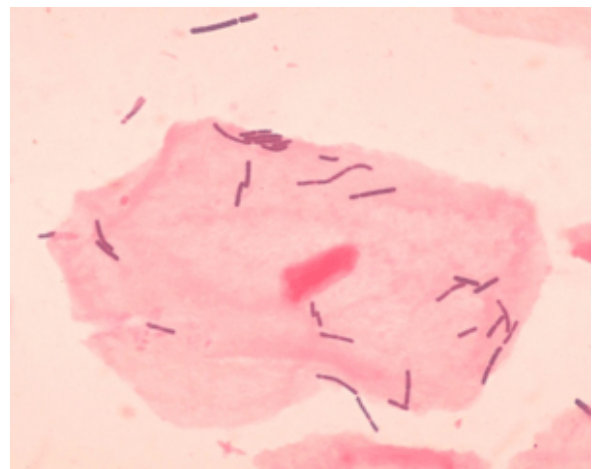
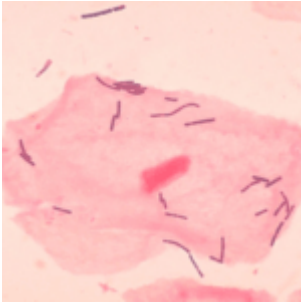


Vaginal Microbiome Affects HIV Prevention



Lactobacillus organisms from vaginal smear

(Janice Carr, CDC/Dr. Mike Miller, Centers for Disease Control and Prevention's Public Health Image Library (PHIL))

Tenofovir is used as a pre-exposure drug for HIV prevention in high risk individuals. While pre-exposure drugs have proven to be highly effective for men, studies on their efficacy on women have been inconsistent. In their study, Klatt *et al.* discovered a link between tenofovir efficacy and the type of vaginal microbiome in African women.

The vaginal microbiome consists of a wide variety of microbial species that maintain vaginal mucosal health. Vaginal

microbiomes usually fall into two categories: 59.2% of microbiomes are *Lactobacillus*-dominant while 40.8% are non-*Lactobacillus*-dominant, where a high abundance of *Gardnerella vaginalis* and other anaerobic bacteria can be found. A dysbiosis of this microbiome is commonly referred to as bacterial vaginosis and occurs when a microbiome shifts from being *Lactobacillus*-dominant to non-*Lactobacillus*-dominant. While bacterial vaginosis is usually asymptomatic, it is associated with higher HIV infection risk.

In Klatt *et al.*'s study, 688 women were either assigned a tenofovir topical gel or a placebo gel to use. In the *Lactobacillus*-dominant group, consistent tenofovir use reduced the risk of HIV infection by 61% compared to participants who used a placebo. In the non-*Lactobacillus*-dominant group, consistent tenofovir use still reduced the risk of HIV infection, but only by 18%.

Upon closer inspection, the researchers noticed that the *Lactobacillus*-dominant group had much higher mucosal tenofovir levels compared to the non-*Lactobacillus*-dominant group. After testing the interactions between *G. vaginalis* and tenofovir, researches discovered that *G. vaginalis* metabolized tenofovir at a rapid rate. This explained the lower tenofovir levels in non-*Lactobacillus*-dominant participants, which led to a higher risk of HIV infection.

Journal Article: [Klatt NR et al., 2017. Vaginal bacteria modify HIV tenofovir microbicide efficacy in African women. Science](#)

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