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Probiotic Biotherapeutics as a self-sustaining MPT component against multiple STI indications

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OBJECTIVES

While the first generation of multipurpose prevention technologies should focus on combining already existing compounds such as tenofovir and the contraceptive levonorgestrel, the pipeline for basic and clinical research needs to include new compounds with multiple indications, new strategies for sustainable delivery of these compounds, and new underrepresented targets such bacterial and viral sexually transmitted infections (STIs).

METHODS

Probiotic biotherapeutics, based on Lactobacillus strains that are native to the human vagina, could be used to provide coitally independent and self-replicable protection against bacterial vaginosis (BV) and HIV.

RESULTS

Lactobacillus crispatus CTV-05 was given to women after antibiotic treatment of BV in order to replenish the depleted number of lactobacilli. Results indicated good safety of the product. Eleven of 18 women (61%) colonized within one month, and colonization was inversely associated with a continued presence of Gardnerella vaginalis or Atopobium vaginae. Lactobacillus jensenii 1153-1666 is a genetically enhanced lactobacilli strain producing the HIV entry inhibitor Cyanovirin-N in vivo. Preclinical data from non-human primates shows a reduction of SHIV transmission by two thirds after vaginal administration.

CONCLUSION

Probiotic biotherapeutics, with their self-sustaining and cost-effective delivery mechanism, a protective effect against BV, and the potential of the genetically-enhanced strains to produce a number of protein-based compounds and antibodies, are promising candidates for the MPT pipeline.