Cyanovirin-Based Topical Microbicides For Prevention Of Sexual Transmission Of HIV

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Technology description

Summary

The development of an effective anti-HIV topical microbicide, especially a female-controlled, vaginal microbicide, has been deemed an urgent global priority by numerous international agencies, including the World Health Organization, the U.S. Department of Health and Human Services, the National Institute of Allergy and Infectious Diseases, and others.
Cyanovirin-N (CV-N) is a unique, 101 amino acid protein discovered , by U.S. government scientists, as a constituent of a cultured cyanobacterium, Nostoc ellipsosporum. CV-N has subsequently been produced recombinantly in E. coli. Both the sequence and the 3-D solution structure of CV-N are unprecedented. CV-N potently and irreversibly inactivates diverse primary strains of HIV-1, including M-tropic forms involved in sexual transmission of HIV, as well as T-tropic and dual-tropic forms; CV-N also blocks cell-to-cell transmission of HIV infection. CV-N is directly virucidal, interacting in an unusual manner with the viral envelope, apparently binding with extremely high affinity to poorly immunogenic epitopes on gp120.
CV-N was benign in vivo when tested in the rabbit vaginal toxicity/irritancy model, and was not cytotoxic in vitro against human immune cells and lactobacilli (unpublished). CV-N is readily soluble in aqueous media, is remarkably resistant to physicochemical degradation, and, is amenable to very large-scale production by a variety of genetic engineering approaches.

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