

The lectins griffithsin, cyanovirin-N and scytovirin inhibit HIV-1 binding to the DC-SIGN receptor and transfer to CD4+ cells

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ABSTRACT

It is generally believed that during the sexual transmission of HIV-1, the glycan-specific DC-SIGN receptor binds the virus and mediates its transfer to CD4+ cells. The lectins griffithsin (GRFT), cyanovirin-N (CV-N) and scytovirin (SVN) inhibit HIV-1 infection by binding to mannose-rich glycans on gp120. We measured the ability of these lectins to inhibit both the HIV-1 binding to DC-SIGN and the DC-SIGN-mediated HIV-1 infection of CD4+ cells. While GRFT, CV-N and SVN were moderately inhibitory to DC-SIGN binding, they potently inhibited DC-SIGN-transfer of HIV-1. The introduction of the 234 glycosylation site abolished HIV-1 sensitivity to lectin inhibition of binding to DC-SIGN and virus transfer to susceptible cells. However, the addition of the 295 glycosylation site increased the inhibition of transfer. Our data suggest that GRFT, CV-N and SVN can block two important stages of the sexual transmission of HIV-1, DC-SIGN binding and transfer, supporting their further development as microbicides.

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