CMB PhD School Seminars 2022-2023

February 21st, 2023, 3:00 p.m.

Online meeting on Teams

Link: https://teams.microsoft.com/l/meetup-join/19%3aN09c0NIyEssBnF7ObCyDOQwkgDWm1qdd9f7F2nJV9fw1%40thread.tacv2/1631519544944?context=%7b%22Tid%22%3a%22e99647dc-1b08-454a-bf8c-699181b389ab%22%2c%22Oid%22%3a%225a941351-ef41-4aa4-8771-fa50a6d62ca1%22%7d

Gram-positive-derived extracellular vesicles in protecting from HIV-1 transmission

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Abstract

Vaginal microbiota dominated by lactobacilli protect women from sexually transmitted infection, in particular HIV-1. This protection is, in part, mediated by *Lactobacillus*-released extracellular vesicles (EVs). Here, we investigated whether EVs derived from other Gram-positive bacteria also present in healthy vaginas, in particular *Staphylococcus aureus*, *Gardnerella vaginalis*, *Enterococcus faecium*, and *Enterococcus faecalis*, can affect vaginal HIV-1 infection. We found that EVs released by these bacteria protect human cervico-vaginal tissues ex vivo and isolated cell from HIV-1 infection by inhibiting HIV-1-cell receptor interactions. This inhibition was associated with a diminished exposure of viral Env by steric hindrance of gp120 or gp120 modification evidenced by the failure of EV-treated virions to bind to nanoparticle-coupled anti-Env antibodies. Furthermore, we found that protein components associated with EV's outer surface are critical for EV-mediated protection from HIV-1 infection since treatment of bacteria-released EVs with proteinase K abolished their anti-HIV-1 effect. We identify numerous EV-associated proteins that may be involved in this protection. The identification of EVs with specific proteins that suppress HIV-1 may lead to the development of novel strategies for the prevention of HIV-1 transmission.

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