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HIV-1 Nef and SERINC5; the Front Line of an Evolutionary Arms Race

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The relationship between Human Immunodeficiency Virus Type 1 (HIV-1) and their human host is best described as an evolutionary arms race. The host immune system is highly effective at identifying and eliminating invading HIV-1 and as such, HIV-1 must evolve novel mechanisms to evade host immunity in order to successfully replicate.

Cellular immunity, which is conferred by restriction factors, is one such barrier HIV-1 must overcome in order to establish successful infection. Several restriction factors potently inhibit various stages of HIV-1 replication, and accordingly, HIV-1 proteins have evolved mechanisms to counter these restriction factors; consistent with the arms race analogy.

One such restriction factor, SERINC5, drastically reduces HIV-1 virion infectivity by incorporating into virions as they egress from infected cells. My research primarily focuses on defining how the HIV-1 accessory protein Nef has evolved in such a manner to counter SERINC5, which thereby enhances HIV-1 virion infectivity.