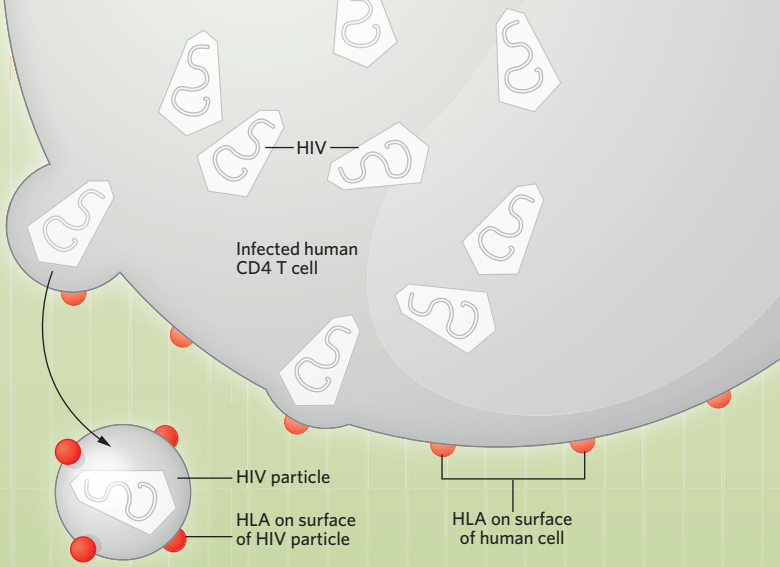
PART HUMAN, PART HIV

Like other enveloped viruses, HIV exits its host cell enshrouded in the cell's membrane, which contains membrane molecules such as the human leukocyte antigens (HLA). The HLA proteins act as a set of cell identification marks: every person expresses a slightly different HLA set. These molecules differentiate one person from another and allow the immune system to detect foreign invaders, and to reject tissue from other people or animals. Interestingly, each HIV particle has many more human HLA on its envelope surface than it has its own gp120 viral coat proteins, which the virus needs to bind to CD4 and CCR5 or CXCR4 on the lymphocyte surface in order to enter cells.



LUCY READING-IKKANDA FOR THE SCIENTIST, JUNE 2011

ALLOANTIGEN BASED AIDS VACCINE (ABAV)

An HLA vaccine could consist of both inactivated HIV grown from lymphocytes expressing an array of HLA molecules ❶. The vaccine would be taken up by dendritic and other antigen-presenting cells ❷, which would trigger both an innate response, and adaptive responses such as the production of antibodies specific for the foreign HLA ❸. During an infection, the antibodies would bind to the HIV particles' HLA, marking it for elimination ❹. Antibodies to CCR5 would also be made, which help block viral entry ❺. If the virus bypassed these extracellular barriers, the innate response would create additional barriers and defenses: The β-chemokines MIP-1α, MIP-1β, and RANTES would block the HIV coreceptors CCR5 and CXCR4. Once inside the cell, intracellular factors EDN and APOBEC3G would damage the viral RNA, preventing it from properly replicating ❻. This one-two punch would, in theory, be enough to stop a viral infection.