Retrovirology

Poster presentation

P12-10. Immunogen utilizing the stable interaction of cytoplasmic tails of HIV-1 envelope and cores

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Background

HIV-1 gag precursor proteins assemble at cytoplasmic membrane, interacting with the cytoplasmic tails of envelope. The interaction could be useful for presentation of native HIV-1 antigens.

Methods

First, we have investigated the interaction by treating immature or mature virus-like particles with detergent to remove the lipid membrane, and purifying the resulting cores by equilibrium sediment centrifugation. To analyze the interaction of gag precursor and envelope in mature virions, we purified virions and treated with trypsin in the presence or absence of detergent. To further prove the core purified from HIV-1 particles contains envelope, we immunized BALB/c mice with the purified core and examined if this could induce antibodies against envelope. Female BALB/c mice at age of 8 weeks were subcutaneously immunized twice at a 7-day interval. Two weeks after the second immunization, the immunized mice were bled and sera were examined for neutralizing activity by luciferase assay on MAGIC5 cells. Neutralizing activity was expressed as the serum dilution yielding a 50% reduction in the infectivity versus control wells.

Results

The mature cores contained a major fraction of uncleaved envelope. Part of the uncleaved envelope in virions was trypsin-resistant in the absence of detergent. The stable interaction of gag precursor and envelope in mature virions is not observed in SIV. Subcutaneous immunization of the purified core induced a high anti-envelope IgG response. In addition, we demonstrate that mice sera revealed neutralizing activity against NL43 and JRFL strain.

Conclusion

HIV-1 acquires a stable interaction between gag precursor and uncleaved envleolpe in viral maturation. We propose that the core purified from HIV-1 particles is an effective antigen for induction of neutralizing antibodies in mice.