Retrovirology

Poster presentation

P20-13. Identification and characterization of early founder populations in Rhesus macaques vaginally infected with SIVmac251

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Background

HIV transmission most commonly occurs at mucosal surfaces, and vaccine development and other preventative strategies should be directed at the transmitted viruses that are responsible for establishing productive infection. The simian immunodeficiency virus (SIV) models of HIV infection use virus stocks for inoculation of monkeys at defined times. This greatly simplifies the process of identifying the transmitted or early founder virus populations, the variants evolving after transmission that establish systemic infection and the role of viral selection during sexual transmission.

Methods

We used the single genome amplification (SGA) method to amplify a 2.2 kb env sequence from the SIVmac251 stock and plasma of 7 rhesus macaques at the earliest plasma vRNA+ time point after intravaginal infection with SIVmac251. Neighbour-joining methods and Highlighter analysis were used to analyze the relationships between the env sequence.

Results

Three animals were infected with a single SIV variant, and 4 animals were infected with multiple (5–9) SIV variants. The maximum diversity among the env sequences within an individual animal ranged from 0.18 to 1.10%. Importantly, a specific env variant representing ~20% of the sampled stock sequences was directly transmitted to three animals by vaginal inoculation, perhaps reflecting its relatively high frequency in the stock.

Conclusion

These results are consistent with the low number of HIV variants transmitted by mucosal HIV exposure. For a vaccine or microbicide to be effective, it must interdict the broadest range of HIV variants possible, including every clade in the pandemic. However, in any one subject the number of viruses that must be blocked at each mucosal exposure event is small, since most viruses in the inoculum are unsuccessful at establishing infection and only one or few variants establish productive infection.