Retrovirology

Poster presentation

P04-20. Humoral immune response in acute HIV-1 infection

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Background

The elicitation of broadly neutralizing antibodies (Nabs) remains one of the most challenging goals in HIV-1 vaccine development. Some HIV-1 infected individuals present virus specific broadly neutralizing activity in their serum, proving that the desired Nabs can indeed be elicited *in vivo*. However, attempts to elicit this response in animal models using HIV-envelope based immunogens have failed so far. Still, we believe that viral variants with specific envelope properties may elicit these antibodies if formulated into an appropriate vaccine immunogen.

The aim of this study is to characterize the phenotype of HIV-1 variants obtained from acute HIV infection cases and to investigate their neutralization sensitivity to the patient's own sera and to a panel of monoclonal antibodies as to identify HIV-1 variants eliciting specific broadly Nabs.

Methods

Viruses obtained by biological cloning at different time points from pre-seroconversion throughout follow-up were tested for co-receptor usage with U87.CD4 glioma cells expressing wild type (CCR5 or CXCR4) or chimeric receptors. A full neutralization sensitivity pattern was achieved by testing a series of clones against the serum samples collected throughout follow-up of the patient, heterologous sera, and the monoclonal antibodies 2F5, 4E10, and 2G12.

Results

Results showed that clones isolated early in infection were able to use the wild type CCR5 receptor and none of the chimeric receptors or CXCR4. Virus phenotypic variation is detectable only several months later when clones able to infect also chimeric receptors emerge. The development of HIV-1 Nabs occurred several months after seroconversion, and increased as to fully neutralize the original early virus in about 1 year.

Conclusion

These results suggest a relation between the increase of variability and the onset of a neutralizing response.