Retrovirology

Poster presentation

P04-45. Characterization of the plasma cell repertoire in acute HIV-1 infection (AHI)

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Background

Analysis of immunoglobulin (Ig) *VH* and *VL* genes derived from sorted single B cells is a powerful technology for definition of Ig repertoires to viral infections. The purpose of this study was to characterize the Ig repertoire of plasma cells/plasmablasts (PCs) in subjects early on after HIV transmission.

Methods

Blood PCs from three AHI subjects obtained approximately 17, 20 and 30 days after HIV-1 transmission were sorted into 96-well plates for amplification of *VH* and *VL* genes by RT/PCR. The isolated VH and VL genes were expressed as recombinant IgG1 mAbs in 293T cells by transfection using linear Ig expression cassettes, The specificity of produced mAbs was determined by ELISA and luminex bead immunoassays against a panel of HIV-1 and non-HIV-1 antigens.

Results

The number of circulating plasma cells ranged from 1.9% to 21.0%. When HIV antibodies were detected in subject plasma, only antibodies to Env gp41 were present. A total of 787 Ig *VH* and *VL* gene pairs were expressed as whole IgG1 antibodies. HIV-specific antibodies accounted for only 6.5% of expressed antibodies (range 1.7% to 19%). All HIV-1 antibodies were against gp41 with no antibodies reacting with any other HIV-1 proteins. Non-HIV-1 antibodies identified from AHI PCs included those against influenza (0.6%), tetanus toxoid (1.9%), cardiolipin (0.8%), Cryptococcus (0.9%), Candida (0.5%), Hep-2 epithelial cells (5.2%), gut flora (1.7%), lipid A (0.6%) and unknown (79.3%).

Conclusion

While the initial plasma cell response to influenza vaccination was primarily antigen specific against hemagglutinin, the initial plasma cell response to HIV-1 was primarily polyclonal with massive expansion of non-HIV antibodies. The extraordinary degree of polyclonal B cell activation as early as 17 days after transmission is in part responsible for the ineffective initial antibody response to transmitted HIV.