Retrovirology

Poster presentation

P04-30. Sorting of infectious and non-infectious viral particles by Env-specific mAb

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Background

The majority of HIV particles produced *in vivo* are non-infectious due to incorrectly processed or incomplete envelope spikes, and may act as potential decoys for humoral immunity. Specific targeting of the infectious subpopulations of virions by vaccine-induced antibodies may be required for sterilizing immunity. We have assessed the impact of defective Env, associated with non-infectious virions on the activity of neutralizing/non-neutralizing mAbs targeting different components of the Env.

Methods

Purified HIV-1 was incubated with the mAb of interest and captured using microbeads. Labelled and unlabelled fractions were analyzed for virion capture. To correlate with infectivity, the unbound fractions were tested for infectivity in TZM-bl cells. The sensitivity of the unbound fractions to broadly neutralizing mAbs was then determined. Correlation of infectivity with gp120 incorporation into mAb bound and unbound fractions were determined by ELISA.

Results

The relative binding of mAbs against Env did not show direct correlation between p24 capture and infectivity. Non-neutralizing Env mAbs 4B3 and 3D6 bound the highest proportion of virion associated p24, but the unbound fraction retained all infectious virions. Depletion with neutralizing Env mAb 2G12 captured only 15.3% of p24, but included 76.0% of infectious virions. Removing the non-infectious virions with non-neutralizing antibodies increased the neutralizing activity of broadly neutralizing mAbs by 1.8 to 5 fold. Correlation of gp120 concentration with p24 did not show statistical significance. However, gp120 capture showed a positive correlation with percentage of infectivity.

Conclusion

Subpopulations of virions can be separated by their ability to bind different Env specific mAbs. Differences in viral infectivity of the resulting fractions offer the ability to further phenotype the characteristics of functional and non-functional envelope spikes. The variability of anti-HIV-1 Env mAbs to precipitate infectious virus indicates a novel way to characterize subsets of HIV-1 virions and determine the relative frequency of those virions with functional Env.