Retrovirology

Poster presentation

P19-09. Site-specific incorporation of an unnatural amino acid into the HIV-1 Env spike

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Background

A major roadblock to understanding HIV-1 structure and function, and the development of an effective vaccine, is the lability of the infectious Env trimer complex. Despite several methodologies, including disulfide bonds, chemical cross-linking and truncation, this lability has made it difficult to obtain detailed information about contact points within the Env spike.

Methods

Using the technology pioneered by Peter Schultz, an unnatural amino acid with novel reactivity, including ketones, azides, and actelyenes groups, can be site-specifically incorporated into gp120. Such an unnatural amino acid can be subsequently derivatized with high efficiency and selectivity for labeling purposes.

Results

We are working towards co-translationally introducing an unnatural amino acid at a defined site in gp120. An orthogonal suppressor transfer RNA – aminoacyl-tRNA synthetase pair has been developed to genetically encode an unnatural amino acid in response to an amber nonsense codon in the HIV-1 glycoprotein.

Conclusion

Integration of this unnatural amino acid into the HIV-1 glycoprotein will provide a powerful tool to map biomolecular interactions within the Env spike.