## Retrovirology



Poster presentation

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# P02-I0. Plant expression of chimeric Gag/gp4I virus-like particles as a mucosally-targeted subunit vaccine against HIV-I

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### **Background**

The HIV-1 envelope protein gp41 has been shown to play critical roles in the viral mucosal transmission and infection of CD4+ cells. Gag is a structural protein configuring the viral capsid, and has been suggested to constitute a target of cellular immunity potentially controlling viral load.

#### **Methods**

The goal of this project is to express in plants enveloped virus-like particles (eVLPs) consisting of Gag and a "deconstructed" version of gp41 (dgp41) as a broad-acting mucosal immunogen.

#### Results

Using a PCR-based *de novo* gene synthesis method, a plant optimized HIV-1 gag gene was constructed. The gene was expressed in Nicotiana benthamiana using a modified tobacco mosaic virus-based transient expression system and leaf accumulation of the 55 kDa Gag protein was confirmed. Sucrose gradient sedimentation showed that the full-length Gag protein migrated at a density corresponding to that reported for Gag VLPs. Furthermore, examination of leaf material and the extract in transmission electron microscopy showed budding of 100-nm VLPs. Stable lines harboring the gag gene were created and were shown to accumulate the Gag protein. The dgp41 gene was then transiently expressed in these stable lines, and expression was confirmed with western blotting using anti-2F5 Abs. Preliminary evidence based on sucrose gradient sedimentation suggests that the two proteins may assemble into eVLPs.

#### Conclusion

These results suggest that plant cells can support the formation of HIV-1 dgp41/Gag eVLPs.