Particulate structures of the VP7 protein of AHSV as a display system of foreign antigens.

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We are investigating the possibility of developing two of the proteins of African horsesickness virus (AHSV) as general-purpose vaccine delivery systems, designed to present immunologically important epitopes/peptides to the immune system. One of these proteins, major core protein VP7, is very hydrophobic and forms trimers that aggregate into flat, hexagonal crystalline structures when expressed in a baculovirus expression system. To investigate the ability of VP7 to serve as a vaccine delivery system, we have modified VP7 to enable us to insert peptides into the top domain of the protein, that are then displayed on the surface of VP7 particles. We are currently evaluating various properties of the VP7 vector, such as different sites of insertion, size limitations of peptides to be presented, effect on crystal formation and immunological properties. Well-characterised linear epitopes, known to elicit humoral immune responses, were chosen for this purpose. Here we report on the insertion of different sized peptides from foot-and-mouth disease virus (FMDV) and human immunodeficiency virus (HIV) into different sites within the VP7 vector. While all inserts were tolerated, the crystalline structure was maintained with small inserts but became distorted with larger inserts. Preliminary assays indicate that HIV peptides are recognized by antiserum to the virus. Further studies aim to investigate the conformational authenticity of the peptides and their ability to elicit an immune response.