Retrovirology



Oral presentation



# Structured particles for antigen presentation

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Traditional antiviral vaccines have relied mostly on attenuated or chemically inactivated live viruses. However, the potential problems related either to an incomplete inactivation procedure or to the reversion of an attenuated vaccine strain result in growing concerns for their use in human vaccination approaches.

Virus-like particles (VLPs) are based on the expression of virus capsid proteins, which spontaneously assemble in particles structurally similar to native virus particles, without containing viral genetic material. Thus, VLPs represent a non-replicating, non-infectious particulate antigen delivery system able to present conformationally structured viral proteins to the immune system. We have developed a candidate HIV-1 vaccine model based on HIV-1 Pr55gag VLPs (HIV-VLPs), produced in a baculovirus expression system and presenting a gp120 molecule from a HIV-1 isolate of the clade A (HIV-VLPAs). HIV-VLPAs induce in Balb/c mice systemic and mucosal neutralizing antibodies as well as cytotoxic T lymphocytes, by intraperitoneal as well as intranasal administration. HIV-VLPAs efficiently induce maturation and activation of MDDCs which show an enhanced Th1- and Th2-specific cytokine production. In addition, HIV-VLP-loaded MDDCs are able to induce a primary and secondary response in autologous human CD4+ T cells, in an ex vivo immunization assay. The versatility of the presentation system, together with the strong immunogenicity, make the VLP approach a highly valuable tool for vaccination strategies.