

Virus-Like Particles (VLP) of animal papillomavirus; PV vaccines and serological studies

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Papillomaviruses are ubiquitous, species-specific DNA viruses that cause benign and malignant tumors in their natural host. During last two decades, we have developed papillomavirus virus-like particles (VLP) vaccines for many different animal species, including dogs, domestic cat, snow leopards, horse, rodents such as laboratory and European harvest mice, and sea mammals, particularly manatees, and dolphins. PV VLPs display type-specific conformationally dependent neutralizing epitopes maintained on virions and induce high titers of neutralizing antibodies that protect against infection. On the other hand, antibodies raised against disrupted VLPs are cross-reactive among different PVs and can be used to detect most productive PV infection by immunohistochemistry. VLPs of manatee PVs (TmPVs) have been used as substrates for sero-epidemiological studies to re-establish manatee migration routes in Florida. Meanwhile, E7 protein of snow leopard (UuPV1) have been used to putatively determine which L1 VLP positive snow leopards in zoos are at high risk for developing PV-induced carcinomas. Animals that have been naturally infected by type-specific PVs but have no detectable neutralizing antibody response can be identified by amnestic responses against inoculation by the respective VLPs. In sum, animal PV VLPs can be used for many different purposes, some of which shed light on the role of HPV in various human carcinomas.

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