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ABSTRACT BOOK

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Generating an Immunogenic Elephant Endotheliotropic Herpesvirus (EEHV) Vaccine

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Asian elephants are an endangered species facing many threats, including severe hemorrhagic disease (HD) caused by the elephant endotheliotropic herpesvirus (EEHV). EEHV-HD is the leading cause of death in captive juvenile Asian elephants in North America and Europe, and also affects elephants in their natural range countries. Due to the rapid severe onset of EEHV, detection and treatment options are limited. Thus, our goal is to develop a vaccine eliciting strong antibody and cell-mediated immunity (CMI) against EEHV to prevent lethal disease. Previous studies with EEHV and human herpesviruses indicate that glycoproteins B, H, and L (gB, gH, gL) are likely to induce protective humoral immunity and CMI. Our vaccine approach includes recombinant immunoreactive EEHV protein subunits and Modified Vaccinia virus Ankara (MVA) vectors expressing these proteins. We have successfully generated an MVA recombinant expressing the EEHV gB glycoprotein and expressed gB purified from mammalian cells. In preclinical studies, we have shown that MVA-gB or gB subunit vaccinated mice induce robust gB-specific antibodies and polyfunctional CD4+ and CD8+ T cell responses after homologous prime-boosts. We also observed that a single priming vaccine and one boost are sufficient to induce immune responses and are not significantly different than two subsequent vaccine boosts. Future studies will incorporate multiantigenic MVA recombinants expressing EEHV gH/gL antigens in addition to gB, as well as compare immunogenicity of heterologous prime-boost vaccines with MVA and purified antigen subunits. Completion of this study will provide insights into EEHV vaccine development and protect elephants against lethal HD, as well as highlight MVA as an innovative vaccine platform for other herpesvirus infections.

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Strigolactone analogs are promising antiviral agents against Herpesviruses

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The human cytomegalovirus (HCMV) is a widespread pathogen and is associated with severe diseases in immunocompromised individuals. Moreover, HCMV infection is the most frequent cause of congenital malformation in developed countries. Although nucleoside analogs have been successfully employed against HCMV, their use is hampered by the occurrence of serious side effects. There is thus an urgent clinical need for less toxic, but highly effective, antiviral drugs. Strigolactones (SLs) are a novel class of plant hormones with a multifaceted activity. While their role in plant-related fields has been extensively explored, their effects on human cells and their potential applications in medicine are far from being fully exploited. In particular, their antiviral activity has never been investigated. In the present study, a panel of SL analogs has been assessed for antiviral activity against HCMV. We demonstrate that TH-EGO and EDOT-EGO significantly inhibit HCMV replication in vitro, impairing late protein expression. Moreover, we show that the SL-dependent induction of apoptosis in HCMV-infected cells is a contributing mechanism to SL antiviral properties. Overall, our results indicate that SLs may be a promising alternative to nucleoside analogs for the treatment of HCMV infections.

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