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Generation of Equine Herpesvirus type 1 glycoprotein pseudotyped lentiviral particles for use as a tool for tropism and diagnostic studies

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Equine herpesviruses (EHVs) are enveloped DNA viruses infecting mainly members of the Equidae family and also members of other taxa. EHVs primarily causing respiratory disease, however EHV type 1 (EHV-1) can produce cases of a neurological disease, abortion and neonatal death, sometimes as regional outbreaks. Thus these viruses represent a welfare issue for the equine industry and scientific focus for researchers. EHV-1 presents a complex array of 12 glycoproteins on its surface envelope, but it is unclear which ones are important for virus cell entry and the role of each in host immune response. In order to investigate the contribution of these glycoproteins, pseudotype viruses (PVs) could provide a perfect study tool. In 2016, Rogalin & Heldwein successfully generated the first functional herpesvirus pseudotype, bearing the four glycoproteins gB, gD, gH and gL from human Herpes simplex 1. Our study is the first to attempt pseudotyping of EHV-1. We have employed homologous glycoproteins of EHV-1 in lentivirus PV generation, using different mammalian cells (e.g. epithelial, dermal, CNS) as transduction targets. The glycoprotein sequences obtained from an EHV-1 strain isolated from organs of aborted foetus during a significant outbreak in Normandy (France) in 2010. Future work will focus on the development of a PV assay for detection of neutralising antibodies in naturally infected horses for diagnostics and for vaccine evaluation.

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