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Use of Equine Herpesvirus 1 glycoprotein pseudotyped lentiviral particles for the development of serological tests and assessment of lyophilisation for transport and storage

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Equine herpesviruses (EHVs) are enveloped DNA viruses predominantly infecting members of the Equidae family. EHVs primarily cause respiratory disease, however EHV-1 can produce cases of a neurological disease, abortion and neonatal death. Thus, these viruses represent a welfare issue for the equine industry and scientific focus for researchers. EHV-1 exhibits a complex array of 12 glycoproteins on its surface envelope, but it is unclear precisely which 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 useful study tool. We have successfully generated functional EHV-1 pseudotyped lentiviruses bearing four glycoproteins, gB, gD, gH and gL (sequences derived from an aborted foetus during a large EHV1 outbreak strain in Normandy, France). PVs were employed in a pseudotype virus neutralisation test (PVNT) to measure levels of specific neutralising antibodies serum samples (n=52) taken longitudinally from experimentally infected ponies, compared with uninfected controls.

PVs routinely require -80oC for long term storage and a dry ice cold-chain during transport which can impede dissemination and utilisation in other laboratories. Consequently, we further investigated whether freeze-drying (lyophilisation) of EHV-1 PV could address this issue. PVs were lyophilised and pellets either reconstituted [PDF](#) immediately or stored under various temperature conditions, sampling at different timepoints. The recovery and [Help](#) functionality of these lyophilised PVs was compared with standard frozen aliquots in titration and neutralisation tests.

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