IMMUNIZATION WITH NANOPARTICLE DISPLAYING EPSTEIN-BARR VIRUS GH/GL ELICITS NEUTRALIZING ANTIBODIES IN RHESUS MACAQUES

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Epstein-Barr virus (EBV) infects over 90% of adults It primarily infects B cells and epithelial cells and is associated with malignancies of both. It is also the causative agent of infectious mononucleosis and is associated with autoimmune disorders like Multiple Sclerosis. Thus, the development of a successful EBV vaccine would have a significant public health benefit. The viral glycoproteins gH and gL form a heterodimeric complex essential for infection of both B cells and epithelial cells. Previously our lab demonstrated that passive transfer of the anti-gH/gL mAb AMMO1 was protective against high-dose EBV challenge in a humanized mouse model and prevented oral transmission of rhesus lymphocryptovirus (rhLCV), the EBV ortholog that infects rhesus macaques. These results indicate that eliciting anti- gH/gL antibodies is a promising strategy for an EBV vaccine. To this end, we developed a gH/gL nanoparticle vaccine that elicited high titers of neutralizing antibodies in mice. Passive transfer of vaccine-elicited polyclonal antibodies protected humanized mice against lethal high-dose challenge. Here we evaluate the immunogenicity of the gH/gL nanoparticle in Rhesus macaques in combination with two adjuvants. Macaques were immunized at 0, 4, and 12 weeks with either adjuvant alone or adjuvant plus the gH/gL nanoparticle. Vaccination with the gH/gL nanoparticle was immunogenic, with all vaccinated animals developing antibody titers against gH/gL. Formulation with the adjuvant SMNP lead to increased immunogenicity compared to formulation with RIBI, leading to higher binding and neutralizing titers. These results encourage further pursuit of a vaccine to prevent EBV infection.