Neutralising antibodies after immunisation with the transmembrane envelope proteins of HIV-1, HIV-2, two foamy viruses and three gammaretroviruses

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Introduction

Despite worldwide efforts a vaccine against the human immunodeficiency virus (HIV) is still not available. Due to highly conserved domains, the ectodomain of the transmembrane envelope (TM) protein gp41 of HIV-1 represents a vulnerable target for broadly neutralising antibodies, such as MAb 2F5 and MAb 4E10, which react with the membrane proximal external region (MPER) of gp41 and have been isolated from HIV infected individuals. However, all attempts to induce such antibodies failed. In contrast, using TM proteins of gammaretroviruses, neutralising antibodies that recognise two epitopes, one located in the fusion peptide proximal region (FPFP) of the TM-protein (designated E1), and the other in the MPER (E2) have been easily induced (1-6). Here we compare the results of immunisation studies using the recombinant TM proteins of 7 different retroviruses, three gammaretroviruses (PERV, FeLV, KoRV) and two lentiviruses (HIV-1, HIV-2 and two foamy viruses (FFV and PFV).

Materials and Methods

The recombinant ectodomains of the TM protein of 7 different retroviruses were cloned and expressed, binding and neutralising antibodies were analysed, an epitope recognition and neutralisation study was performed. The recombinant ectodomains of the TM protein of 7 different retroviruses, three gammaretroviruses (PERV, FeLV, KoRV) and two lentiviruses (HIV-1, HIV-2 and two foamy viruses (FFV and PFV).

Results

Antibodies neutralising gammaretrovirus recognise epitopes in the FPPR and MPER, 2F5 and 4E10 only in the MPER

Epitopes recognised by neutralising antibodies obtained after immunisation with p15E of the porcine endogenous retrovirus (PERV)

Immunisation with the TM protein of HIV-1 and HIV-2

Immunisation with the TM protein of the feline foamy virus (FFV)

Conclusion

Whereas immunisation with the small and non-glycosylated TM proteins of gammaretroviruses resulted in neutralising antibodies binding to the MPER, immunisation with the larger glycosylated TM proteins of two lentiviruses and two foamy viruses failed.

References