

6. Summary

The EU project "European Network for Vaccine Evaluation in Primates (ENVEP)" was designed to evaluate recombinant vaccine candidates in rhesus macaques as part of ongoing efforts to develop an AIDS vaccine. Eight European institutes were involved in this horizontal and vertical network, each of which used a different combination of the vaccine candidates for immunising the monkeys. Following immunisation, the animals were challenged with the simian AIDS-inducing virus SIVmac to evaluate the protection against infection or disease development induced by the vaccine candidates. The aim was to identify the combination of recombinant vaccine candidates able to induce the best level of protection. In addition, the data collected would allow the correlation between the animal's protection from SIV/AIDS and the corresponding immune responses to be investigated.

The combination used in our study was an initial DNA immunisation followed by an immunisation with recombinant Modified Vaccinia Ankara (rMVA) and two immunisations with recombinant Semliki Forest Virus (rSFV). All immunisations were given at eight-week intervals and all constructs carried the following SIVmac genes: *gag*, *pol*, *env*, *tat*, *rev* and *nef*. In addition, animals of one control group were immunised with empty vectors (without SIV genes) using the same schedule while a second control group remained untreated.

Analysis of the SIV-specific humoral and cellular immune responses during this period revealed a clear antibody and T-helper cell response following the second rSFV immunisation as well as a T-cell response in IFN γ ELISpot, particularly after the first two immunisations (DNA and rMVA).

The animals were challenged with SIVmac eight weeks after the final immunisation. The cellular and humoral immune responses, the virus loads and the numbers of CD4⁺ and CD8⁺ T-cells were continuously measured thereafter.

Although none of the immunised animals were protected from SIV infection, this group did show a significantly reduced peak virus load two weeks after challenge. One immunised animal was even able to rapidly control the virus replication and remained virus-negative from then on. However, no difference between the vaccinated and the control animals with regard to the number of CD4⁺ and CD8⁺ T-cells was observed during the study.

Following challenge, all animals developed robust humoral and cellular immune responses against SIV. Some of the immunised monkeys showed, in comparison to the others, distinct anamnestic responses in terms of SIV-specific antibodies and IFN γ -secreting cells in ELISpot.

By comparing our results with those of the other participants it is clear that the efficacy of the different combinations was not equal and that the choice of combination can influence the immunogenicity and subsequent control of infection.