

DEVELOPMENT OF VACCINES AGAINST HIV/AIDS: A CHALLENGE FOR SCIENCE AND SOCIETY

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In response to the growing problems related with HIV-infections industrialized countries responded with strategies to intensify the development of HIV-vaccines. INCO-projects and the formation of sizeable research clusters in the EU allowed strategies starting from molecular epidemiology to evaluation of vaccine candidates in primates and humans. Together with the Chinese Center for Disease Control early at onset of the HIV-epidemic in China relevant HIV-strains could be selected (B-clade RL42 and C-clade 97CN54, 97CN54 is a B'-C recombinant and the most prevalent strain in Western and North-Western provinces of China).

Using sequence modified genes from 97CN54 a set of immunogens comprising gag pol nef and env was developed which was found to be highly immunogenic but inactive in their original enzymatic functions. In context of the EUROVAC-cluster and the INCO-programme different presentation systems based amongst others in DNA-plasmids (COBRA) and vaccinia viruses (NYVAC, MVA, TienTan) have been developed into GMP-manufactured products. These have been evaluated in parallel to the human trials in Rhesus monkeys. The combination of DNA prime vaccinia boost gave strong immune response in almost all animals in multiple HIV reading frames and on the basis of IFN α , IL-2 and IL-4 Elispots. Parallel experiments using the SHIV 89.6p-model showed protection from disease and rapid clearance of viremia to set point in challenge experiments.

Data from human trials with NYVAC-C alone looked encouraging with 50 % responders, DNA alone did upon first preliminary evaluation not induce significant immune response by CTL with about 10 % of the vaccinees. A trial with the combination of DNA-C prime and NYVAC-C boost parallels data in primates and achieved excellent broad and long lasting immunogenicity on almost all vaccines (above 90 %). Further trials are up-coming in Regensburg and Beijing/China.