GNA, NPA and CA; the procaryotic cyanovirin-N (CV-N)) and the GlcNAc-specific (i.e. the plant lectin UDA) CBAs efficiently abrogate the DC-SIGN-directed HIV-1 capture and subsequent transmission to T-lymphocytes. The aim of our study is to demonstrate the ability of CBAs to inhibit HIV-1 capture in M/M, and subsequent virus transmission to $CD4^+$ T-lymphocytes. Our results show that CBAs efficiently prevent the capture of a variety of HIV-1 laboratory strains and isolates, and HIV-2 in human primary M/M cultures. Moreover, we observed that pre-exposure of HIV-1 to CBAs is able to prevent syncytia formation in co-cultures of CD4+ T-lymphocyte C8166 cells and CBA-exposed HIV-1 infected M/M. Thus CBAs can efficiently target the glycans of HIV, blocking the virus-cell interaction and preventing the transmission of the virus from M/M to $CD4^+$ T lymphocytes. The potential of CBAs to impair M/M in their capacity of capture and transmission of HIV to T-lymphocytes might be an important property to be taken into consideration in the eventual choice to select microbicide candidate drugs to the clinical setting. For these reasons, CBAs represent promising compounds able to compromise the infectivity and transmission of HIV by M/M.

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70

Generation and Characterization of Fully Human Antibodies Against Orthopoxviruses

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The genus Orthopxviruses includes several species of well-known pathogens, e.g. variola, vaccinia, cowpox and monkeypox viruses. Reemergence of monkeypox as a serious human disease in Africa have fueled renewed interest in orthopoxviruses. Vaccinia virus (VACV) was used in the past as an effective vaccine against smallpox. Although, VACV is generally safe vaccine, disseminated, life-threatening infections occur infrequently, especially in individuals with impaired immunity. Such complications can be treated by therapeutic administrations of human VACV immunoglobulin (VIG). However, their limitations include lot-to-lot variation, low content of specific antibodies and potential contamination by infectious agents. Recombinant fully human antibodies offer an obvious alternative to VIG and human antibodies from the traditional hybridomas technology.

Specific single-chain phage antibodies were selected from the synthetic phage display library of human scFvs antibodies biopanning procedure against VACV, strain Elstree. Positive clones were characterized and sequenced. One of the most promising scFv—1F4 was used for creation of fully human antibody. To generate this antibody the V genes from the 1F4 scFv were amplified by olgonucleotides specific for V genes with extensions including restriction-enzyme cleavage sites for cloning into modified pcDNA eukaryotic expression vectors carrying constant domains of human IgG1 for H-chain and L-chain correspondingly. The 293T human cells have been co-transfected with these constructs using Lipofectamine 2000 reagent. Fully human 1F4 antibody (fh 1F4) was purified from culture supernatant by affine chromatography.

Immunochemical properties of fh 1F4 obtained have been assayed by ELISA and Western-blot analysis. Specificities of the fh 1F4 were tested by ELISA using different orthopoxviruses such as VACV, cowpox virus, Ectromelia virus. Binding activity of the fh1F4 was assyed using subsequent dilutions of antigens and antibodies in ELISA, and affinity constant was calculated and compared with parental scFv. The fh 1F4 affinity constant was determined as $1.3 \times 109\,M^{-1}$, approximately 100 times more, than for the parental scFv. The fh Ab 1F4 did not neutralize vaccinia virus as a parental scFv.

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71

Susceptibility of German Porcine H3N2 Influenza A viruses Against Existing Antiviral Drugs

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Influenza A viruses (FLUAV) of subtype H3N2 are circulating in the European human population as well as in pigs. As a "mixing vessel" of avian and human FLUAV pigs may contribute to interspecies virus transmission and reassortment of viral genes including those responsible for antiviral susceptibility. During this study, the susceptibility of selected porcine H3N2 FLUAV isolated in Germany between 1982 and 1999 against: (a) the M2 ion channel blocker amantadine and (b) the neuraminidase inhibitors (NAI) oseltamivir and zanamivir was examined. Plaque reduction assay was performed to examine the amantadine phenotype. The NAI susceptibility phenotype was determined in enzyme- and cell culture-based inhibition assays. Genotypes were examined by sequencing the viral matrix protein (M), hemagglutinin (HA) and neuraminidase (NA) genes. Additionally, agglutinating properties of these viruses were compared.

In the result of antiviral studies, only two of seven isolates were shown to be amantadine-susceptible. The amino acid substitution S31N in viral M2 protein, known to confer amantadine resistance, was found in all resistant virus strains. In neuraminidase enzyme-inhibition assays all isolates were susceptible against oseltamivir and zanamivir. Both compounds inhibited virus spreading, reduced the virus yields as well as plaque size at nanomolar concentrations. But, much higher drug concentrations are necessary to achieve reduction in plaque number.

Genotyping revealed several substitutions in the NA and HA proteins including substitutions that were suggested to affect NAI susceptibility. However, neither R249K in NA nor T155Y and Q226L in HA impaired NAI susceptibility. Two isolates that