Retrovirology

Poster presentation

P19-08. Immunisation with recombinant HLA class I and II, HIV-1gp140 and SIVp27 antigens elicits protection against SHIV-SF162P4 infection in rhesus macaques

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Background

HIV virions incorporate HLA class I and II molecules during budding from the host cell, and these proteins are potential alternative targets for neutralising antibodies. Exposure to foreign HLA may result in a protective immune response. Immunisation of macaques with inactivated SIV grown in human cells has been shown to induce protection against challenge with virus grown in human cells. We have used novel recombinant HLA-I and -II dextran-attached antigens to find out if immunisation of macaques can elicit protection against a high dose i.v. SHIV challenge.

Methods

Groups of eight female rhesus macaques were immunised with HLA class I (A*01, A*02, A*03 and A*11) and II (DRB1*04) (group 1), these antigens plus trimeric HIV-1gp140 and SIVp27 (group 2), HIV-1gp140 and SIVp27 (group 3), all with Hsp70 coupled to dextran backbones, and mixed with the Titermax Gold adjuvant. Group 5 received the same vaccine as group 2, but without Titermax Gold. Four weeks after the last immunisation these macaques plus eight naive macaques were challenged i.v. with 18 MID_{50} of SHIV-SF162P4 grown in the human T cell line C8166-CCR5 (expressing HLA-A*01 and -DRB1*04).

Results

Group 2 animals, two of which remained uninfected, showed a significantly decreased viral load ($p < 0.05$) compared to the naïve animals. Group 1 showed some delay in the viremia. No protection was observed in groups 3 and 5. Complement-dependent neutralising antibodies as well as anti-HLA and anti-C8166 antibodies were elicited in groups 1 and 2, with titers being inversely correlated with the plasma viral load at 2 weeks postinfection and highest in the two protected animals.

Conclusion

Significant protection against a high-dose i.v. SHIV-SF162P heterologous challenge in macaques has been achieved by immunisation with recombinant HLA class I and II in combination with trimeric HIVgp140 and SIVp27 antigens. The protection correlated with induction of anti-HLA antibodies and complement-dependent neutralising antibodies.