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Poster Presentation

Expression of functional recombinant rabies virus glycoprotein in *Drosophila melanogaster* S2 cells

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Background

The rabies virus belongs to the genus Lyssavirus from the Rhabdoviridae family and is widely distributed in nature infecting mammals. Upon infection it can be transmitted to animals or humans and leads to a fatal disease that nowadays has no treatment. Vaccines are commercially available and prevent the disease in animals and humans. Protocols for human or veterinarian vaccine manufacturing evolved from animal tissue homogenates to cell culture technology and today recombinant viral proteins and DNA vaccines are under investigation. The evidence that rabies virus infects and can cause disease in animals and humans, being neutralized by an immune response mounted by very similar vaccines opens a great possibility of testing new vaccines first in experimental animals prior to use in humans [1].

Results

Recombinant rabies vírus glycoprotein (rGPV) was expressed in *Drosophila melanogaster* Schneider 2 (S2) cells. The cDNA encoding the *GPV* gene was cloned in expression plasmids under the control of the inducible metallothionein promoter (Mt) or the constitutive actin promoter (Ac). These were alternatively co-transfected into S2 cells together with a hygromycin selection plasmid. Selected S2 cell populations (S2MtGPV or S2AcGPV) had a decreased ability to grow and consume substrates, when compared to the non transfected cells (S2). They were shown, by PCR, to express the *GPV* gene and mRNA as well as, by immunoblotting, to synthesize the rGPV in its expected molecular weight of 65 kDa. ELISA kinetic studies showed the rGPV expression in cell lysates and supernatants attaining concentrations ranging from 150 to 300 μg of rGPV/L. By flow cytometry analysis, about 30% of the cells in these populations were shown to express the rGPV in their membrane. Cell populations selected by limiting dilution expressed higher rGPV yields. Mice immunized with S2MtGPV or S2AcGPV derived rGPV were capable of mounting a protective immune response characterized by the synthesis of antibodies reacting against the rabies virus. Immunization led to protection against rabies virus experimental infection in challenge studies.

Conclusion

The data presented here show that S2 cells are suitable hosts for the rGPV expression allowing its synthesis in a high degree of physical and biological integrity.

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