LIVE ATTENUATED VIRUS VACCINE AGAINST HERPES AND USES OF VC2 AS VECTOR FOR OTHER DISEASES

LSU Office of Innovation & Technology Commercialization

The Inventor

K. Gus Kousoulas, PhD
LSU Associate Vice President for Research and Economic Development

Summary

Disclosed is a live attenuated and recombinant Herpes Simplex Virus (HSV) vaccine, VC2, that has demonstrated effective immunity against both HSV-1 and HSV-2 in mice models. The recombinant HSV contains modifications in particular regions of the UL53 and UL20 genes. In the wild -type virus, glycoprotein K (gK) and UL20 membrane proteins form a complex that interacts with glycoprotein B (gB). The deletions in the N-termini of gK and UL20 disrupt this protein interaction and thus modulate virus-host cell fusion.

Vaccination with the recombinant virus, VC2, leads to 100% rescue from mortality in mice by both HSV-1 and -2. After vaccination, there was much less viral shedding and no viral DNA in dorsal root ganglia. The mice displayed a full adaptive immune response that protected them from subsequent infection as well as “sterile” immunity, since there was no HSV -1 or HSV-2 viral DNA detected in dorsal ganglia of challenged mice. Protection was associated with high neutralizing antibodies against both viruses and induction of robust cytotoxic T cell responses. VC2’s strong immunogenicity suggests its use as a vector to combat other diseases.

Benefits

- Does not cause disease symptoms in mice. 100% of the vaccinated mice survived the subsequent challenges with HSV-1 and HSV-2, while 100% of the mock-vaccinated mice died.
- Capable of replication in host cell without entering axonal compartments of neurons.
- Vaccination prevents mice from developing disease symptoms from wild-type virus.

Applications

- Immunity against HSV-1 and HSV-2.
- Protection against latent HSV-1 and HSV-2 infections.
- Added protection against HIV .
- May be used as a vector for immunity against other pathogens and diseases (pre-clinical data to support use in equine herpes, ovarian cancer, melanoma, and malaria so far to date).

Tech ID No.: LSU-2014-020
IP Status:
US 10,130,703
US DIV 16/148,414
EPO 15789628.3
CA 2,948,491

For more information contact:

Robert J. Brown

LSU Office of Innovation & Technology Commercialization

Tel: 225-615-8916