An Attenuated Live Mumps Virus Vaccine Candidate Expressing F and HN Protein Genes from Genotype G

Technology Summary

Despite near elimination of mumps in the US and other countries that immunize against mumps, there has been a resurgence of the disease, even in highly vaccinated populations. This has resulted in calls for development of new, more efficacious mumps vaccines. However, attenuation of mumps viruses has proven difficult, resulting in the use of some vaccine strains later identified as causing aseptic meningitis in recipients. This has led to vaccine withdrawal, public resistance to vaccination, and even cessation of immunization programs in some countries. There is a need for the development of newer, more efficacious mumps vaccines to address the growing cases of a once dormant disease.

This invention is a mumps vaccine candidate engineered for easy adaptability to match changes in the circulating strains, a robust immune response for lasting immunity, and a key mutation to reduce virulence and maintain attenuation. This mumps vaccine candidate is a Jeryl Lynn-based, recombinant virus construct that expresses the genotype G fusion (F) and hemagglutinin-neuraminidase (HN) proteins of circulating mumps strains. It includes a mutation in the viral protein V gene to prevent the expression of a key virulence factor and two restriction enzyme recognition sites to permit efficient exchange of the F and HN protein genes to accommodate the changes in the genotype of the circulating mumps virus. Using *in vivo* models, it was determined that (1) the HN and F proteins are the major drivers of the anti-mumps virus immune response and (2) matching the vaccine F and HN proteins to those of currently circulating strains would likely improve the duration of immunity. The candidate vaccine demonstrated proper attenuation to avoid aseptic meningitis in the animal model studies. The recombinant mumps virus can potentially be used as a vaccine to inhibit mumps virus infection and the development of the mumps disease.

Potential Commercial Applications

- Mumps vaccine
- Incorporation into a combination vaccine

Competitive Advantages

- The vaccine's F and HN proteins are matched to the current circulating strains to improve the efficacy of the product
- Plasmid has been designed to be easily and quickly modified to adapt to changes in the circulating strain

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Product Area: vaccine, mumps, parotitis, combination vaccine, meningitis, strains, virus, salivary, swollen, disease, MMR, outbreak, Jeryl Lynn, pediatric, attenuation, inflammation, infectious, encephalitis, orchitis,

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