

Efficacy and durability of a recombinant subunit West Nile vaccine candidate in protecting hamsters from West Nile encephalitis

Douglas M. Watts^a, Robert B. Tesh^a, Marina Siirin^a, Amelia Travassos da Rosa^a, Patrick C. Newman^a, David E. Clements^b, Steven Ogata^b, Beth-Ann Collier^b, Carolyn Weeks-Levy^b and Michael M. Lieberman^b

(a) University of Texas Medical Branch, 301 University Boulevard, Galveston, TX 77551, USA

(b) Hawaii Biotech, Inc., 99-193 Aiea Heights Drive, Suite 200, Aiea, HI 96701, USA

Vaccine: Volume 25, Issue 15, 12 April 2007, Pages 2913-2918

Abstract

The efficacy of a new recombinant subunit West Nile virus (WNV) vaccine candidate was determined in a hamster model of meningoencephalitis. Groups of hamsters were immunized subcutaneously with a WNV recombinant envelope protein (80E) with or without WNV non-structural protein 1 (NS1) mixed with adjuvant or adjuvant alone. At 2 weeks, 6 months, and 12 months after two immunizations at 4 week intervals with the respective immunogens, groups of animals were challenged via the intraperitoneal route with a virulent strain of WNV. The two recombinant antigen preparations gave similar results; hamsters in both groups had a strong antibody response following immunization, and none of the animals became ill or developed detectable viremia after challenge with WNV at 2 weeks or 6 months post-booster vaccination. In contrast, mortality among the control animals at 2 weeks post-booster challenge was 73%, and at 6 months post-booster, the mortality was 53% among the control animals. When challenged 12 months after the booster vaccination, a low level viremia was detected in some of the vaccinated hamsters, and one hamster became sick, but recovered. In contrast, all of the control animals that received adjuvant only developed a viremia, and the mortality rate was 77%. These results with the recombinant subunit WNV vaccine are very encouraging and warrant further animal studies to evaluate its potential use to protect humans against WNV disease.