

Efficacy of eastern equine encephalitis virus vaccine candidates

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Eastern equine encephalitis (EEE) virus is a member of the Alphavirus genus in the family Togaviridae. EEE virus has the highest mortality of the alphaviruses with rates ranging from 33-75% in humans and 90% in horses. Although natural infections are acquired by mosquito bite, EEE virus is highly infectious by aerosol. Veterinary vaccines have been effective in the control of EEE virus and unlicensed vaccines have been used under investigational new drug status for at-risk individuals. However, there is no licensed vaccine available for EEE or any other Alphavirus.

Previously published studies demonstrated protective efficacy of low-dose formalin- and gamma-irradiated inactivated vaccine candidates for Venezuelan equine encephalitis (VEE) virus against subcutaneous challenge with wild-type virus. However, these candidates were only partially protective against an aerosol challenge. In this study, we compared the efficacy of inactivated EEE virus vaccine candidates of varying doses, schedules and routes of administration against an aerosol challenge. Formalin, gamma-irradiation and 1,5-iodonaphthylazide (INA) were used to inactivate a genetically modified strain of EEE virus (CVEV1219). BALB/c mice were administered one or two doses of the inactivated candidates by the subcutaneous (SC), intramuscular (IM), or intranasal (IN) routes and subsequently challenged 28 days after final vaccination by the aerosol route. INA-inactivated CVEV1219 was unable to provide substantial protection against an aerosol challenge by any route, dose or schedule tested. Both formalin- and gamma-inactivated CVEV1219 were able to protect against mice from lethal EEE virus aerosol challenge. Future studies will examine onset and duration of the protective inactivated vaccines.

Biography

Dr. Glass earned her Ph.D. in Virology from Baylor College of Medicine, Houston, TX, in 2001. Currently, she is the Chief of the Viral Biology Department, within the Virology Division at USAMRIID. She has over 10 years experience in viral vaccine, therapeutic and animal model development. The focus of her lab involves studies to examine the effectiveness and targets of potential therapeutics against viruses in cell culture and animal models as well as safety and efficacy of vaccines in animal models.

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