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Protective immunity to Ebola and Marburg viral infections using a venezuelan equine encephalitis virus replicon expressing filovirus glycoproteins

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Infection with filoviruses causes a severe disease accompanied by high mortality rates. While there are several vaccine platforms being evaluated, there are no licensed vaccines or therapies available for human use. A vaccine approach utilizing Venezuelan equine encephalitis virus (VEE) replicons expressing filovirus proteins was the first vaccine approach that provided complete protection against Marburg infection in non-human primates (Hevey, et al. 1998). We have previously presented data on the utility of VEE replicons expressing the glycoprotein, nucleoprotein, VP24, VP30, VP35, and VP40 to protect against Ebola Zaire challenge in mice and non-human primates by various routes of administration. Protective efficacy using a vaccine that expresses the glycoprotein of the homologous virus strain has been achieved in both cynomolgus and rhesus macaque virus challenge models. To date, we have determined that the VEE replicon platform is efficacious against multiple species of Ebolavirus and strains of Marburg protection through mixing of various VEE replicons, on the impact of anti-vector responses on immunogenicity and protective efficacy, durability, and on the search for a correlate of immunity. The data demonstrates that VEE replicons expressing Ebola or Marburg virus glycoproteins are capable of inducing immunity against Filoviruses in the relevant non-human primate models and warrant further evaluation as a human use vaccine.

Biography

Dr. Olinger is the principle investigator of several projects focused on the development of countermeasures against highly lethal viral hemorrhagic fever viruses (VHFV). Dr. Olinger's team has been working on the development of vaccines, immunotherapic approaches, and small molecule antiviral discovery for VHFV and Alphaviruses. Dr. Olinger has a Ph.D. in immunology and virology from Rush University in Chicago, IL and was awarded a post-doctoral research fellow with the National Research Council working at USAMRIID. Dr. Olinger has served as a subject matter expert for multiple DOD and Federal panels related to biodefense and serves as an NIH reviewer.

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