Zika Virus Vaccines

Description of Technology

Zika virus (ZIKV) is a flavivirus transmitted by mosquitoes that is strongly linked to neurological complications including Guillain-Barré syndrome, meningoencephalitis, and microcephaly. The association between active ZIKV infection during pregnancy and microcephaly and intrauterine growth retardation in the fetus has been confirmed in murine models of ZIKV infection.

Scientists at NIAID have developed nucleic acid-based vaccine candidates to prevent ZIKV infection in humans. The current lead candidate vaccine is a plasmid DNA vaccine demonstrated to accord protection in preclinical models and is undergoing clinical trial evaluation. Nucleic acid-based vaccines have been developed previously for West Nile virus, another flavivirus similar to Zika (J.E. Ledgerwood, et al. J. Infect. Dis. (2011) 203 (10): 1396–1404). Immunization with the nucleic acid ZIKV vaccine candidate results in production of noninfectious virus like particles (VLPs) made of ZIKV proteins. These ZIKV VLPs elicit an immune response which includes neutralizing antibodies to ZIKV.

Other preclinical ZIKV vaccine candidates include mRNA, protein, and noninfectious VLPs. NIAID is continuing development of these vaccine candidates. The DNA-based ZIKV vaccine candidate is currently in clinical trials. Consequently, for some fields of use, NIAID will evaluate a license applicant’s capabilities and experience in advancing similar technologies through the regulatory process.

This technology is available for licensing for commercial development in accordance with 35 U.S.C. 209 and 37 CFR part 404, as well as for further development and evaluation under a research collaboration. This technology is not eligible for NIH’s start up license.

Potential Commercial Applications:

• Prevention of Zika virus infection

Competitive Advantages:

• There is currently no licensed Zika virus vaccine

Development Stage:

• Currently, DNA-based vaccine candidate in Phase I clinical trial
• Phase II clinical trial planned for early 2017 for DNA-based vaccine candidate

• Other candidates are in pre-clinical development

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Collaborative Research Opportunity: The National Institute of Allergy and Infectious Diseases is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize Zika virus vaccine technologies. For collaboration opportunities, please contact Dr. Amy Petrik, 240–627–3721; amy.petrik@nih.gov.