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Effective protection induced by a monovalent DNA vaccine against dengue virus (DV) serotype 1 and a bivalent DNA vaccine against DV1 and DV2 in mice

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Dengue virus (DV) is the causal pathogen of dengue fever, which is one of the most rapidly spread mosquito-borne disease worldwide and has become a severe public health problem. Currently, there is no specific treatment; thus, a vaccine would be an effective countermeasure to reduce the morbidity and mortality. In this study, a DNA vaccine candidate pVAX1-D1ME expressing the DV1 prME protein was inoculated in BALB/c mice via intramuscular injection or electroporation, and the immunogenicity and protection were evaluated. Compared with traditional intramuscular injection, administration with 50 μg pVAX1-D1ME via electroporation with three immunizations induced persistent immune responses and effectively protection. In addition, immunization with a bivalent vaccine consisting of pVAX1-D1ME and pVAX1-D2ME via electroporation generated a balanced IgG response and neutralizing antibodies against DV1 and DV2 and could protect mice from lethal challenge with DV1 and DV2. This study sheds new light on developing a dengue tetravalent DNA vaccine.

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