ATTENUATED DENGUE VIRUSES

ABSTRACT

The present invention provides for modified Flavivirus such as a modified dengue virus type 1, 2, 3, 4, a combination of these, or a tetravalent combination of these. The modification according to various aspects of the invention results in reduced viral protein expression compared to a parent virus, wherein the reduction in expression is the result of recoding one or more regions of the virus. For example, the prM, or envelope (E) region can be recoded. In various embodiments one or more regions are recoded by reducing the codon pair bias or codon usage bias of the protein-encoding sequence. These modified Flaviviruses are used as vaccine compositions to provide a protective immune response.

Figure 10B