Conformational changes of the flavivirus E glycoprotein.

Zhang Y[1], Zhang W[1], Ogata S[2], Clements D[2], Strauss JH[1], Baker TS[1], Kuhn RJ[1], Rossmann MG[1].

(1) Department of Biological Sciences, Lilly Hall, 915 West State Street, Purdue University, West Lafayette, IN 47907, USA.
(2) Hawaii Biotech, Inc, 99-193 Aiea Heights Dr., Suite 200 Aiea, HI 96701, USA
(3) Division of Biology 156-29, California Institute of Technology
Pasadena, California 91125

Structure.: Volume 9, September 2004, Pages1607-1618.

Abstract

Dengue virus, a member of the Flaviviridae family, has a surface composed of 180 copies each of the envelope (E) glycoprotein and the membrane (M) protein. The crystal structure of an N-terminal fragment of E has been determined and compared with a previously described structure. The primary difference between these structures is a 10 degrees rotation about a hinge relating the fusion domain DII to domains DI and DIII. These two rigid body components were used for independent fitting of E into the cryo-electron microscopy maps of both immature and mature dengue viruses. The fitted E structures in these two particles showed a difference of 27 degrees between the two components. Comparison of the E structure in its postfusion state with that in the immature and mature virions shows a rotation approximately around the same hinge. Flexibility of E is apparently a functional requirement for assembly and infection of flaviviruses.