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**Supplementary Data**

**An mRNA vaccine encoding Chikungunya virus E2-E1 protein elicits robust neutralizing antibody responses and CTL immune responses**

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**Supplementary Figure S1. The SDS-PAGE in denaturing and non-denaturing conditions of purified sE1, sE2 and sE2-E1.** In denaturing condition, proteins with SDS-PAGE sample loading buffer (Beyotime) were incubated at 100°C for 10 min, and in non-denaturing condition, proteins with native gel sample loading buffer (Beyotime) followed by gel electrophoresis.

**Supplementary Figure S2. Competitive inhibition assay of sE2-E1 to CHIKV infection. 293A cells were seeded in 96-well-plate and cultured overnight.** The sE2-E1 and S-Gc proteins were 2-fold diluted in DMEM medium and added into cells for 1 hour’s incubation. Then the protein was removed followed by adding CHIKV pseudoviruses. After 18 h, the medium was replaced with fresh DMEM with 10% FBS. 72 hours later, the medium was removed and 50 µL 1×Glo lysis buffer was added into each well. Then 30 µL Bright-Glo luciferase substrates (Promega, USA) were added into the cell lysate. The luminescence was measured using a multimode plate-reader.