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Expression of HEV 239 ORF2 protein with Beclin-1 as new adjuvant

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Hepatitis E virus (HEV) is a non-enveloped, single-stranded, positive-sense RNA virus and the main causative agent of enterically transmitted non-A, non-B hepatitis. Death of the mother and fetus, abortion, premature delivery or death of a live-born baby soon after birth is common complications of hepatitis E infection during pregnancy. HEV is found in both wild and domestic animals. *ORF2* gene of HEV virus encodes a single structural protein (ORF2) for the HEV capsid that is responsible for virus-host interaction and subsequently accounts for antigenicity and immunogenicity in vaccine design. HEV 239 is a fragment of ORF2 containing aa 368-606 which induces a vigorous T cell response. Beclin-1 has a central role in autophagy. Autophagy is a process of programmed cell survival that is increased during cell stresses. In this study, HEV 239 ORF2 and Beclin-1 (as adjuvant) were separately expressed in *E. coli* BL21 and purified. Then, HEV 239 ORF2 and Beclin-1 protein administrated subcutaneously in BALB/c mice. Finally, elicited cellular and humeral immunity were evaluated. Our results showed that HEV 239 protein when formulated with Becline-1+Alum adjuvants induced higher humoral and cellular immunity than other candidate vaccine formulations. Calculation of the TH1/TH2 also showed that immunity responses polarized and trend toward cellular immunity that is very important to decrease viral titer in infections. We concluded that Beclin-1 in combination with HEV 239 ORF2 could increase the humoral and especially cellular immunity responses.

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