In the swine hepatitis E virus (HEV), open reading frame 2 (ORF2) is rich in antigenic determinants and neutralizing epitopes that could induce immune protection. We chose the Bac-to-Bac® Baculovirus Expression System to express fragments containing the critical neutralizing antigenic sites within the HEV ORF2 protein of pigs to obtain a recombinant baculovirus. The fragment of swine HEV ORF2 region (1198-1881bp) was cloned into vector pFastBac™. A recombinant baculovirus, rBacmid-ORF2, was obtained after transposition and transfection. The molecular mass of the recombinant protein was 26 kDa. Mice were immunized by the intraperitoneal and oral routes with cell lysates of recombinant baculovirus rBacmid-ORF2. Serum and feces of the mice were collected separately at 0, 14, 28, and 42 d after immunization and the antibody levels of IgG and secretory IgA against swine HEV were determined using an enzyme-linked immunosorbent assay. The results suggested that rBacmid-ORF2 induced antibodies of the humoral and mucosal immune responses in mice and that the oral route was significantly superior to the intraperitoneal route. This is the first study to demonstrate that that recombinant baculovirus swine HEV ORF2 could induce humoral and mucosal immune responses in mice.

Key words: swine HEV, ORF2, baculovirus, immunogenicity

Introduction

Hepatitis E (HE) is a zoonotic disease caused by hepatitis E virus genus (HEV) genotypes (I-IV), which are considered as the same serotypes (Bautista et al. 1999). Humans and other mammals (especially pigs) are the primary sources of HEV infection (Vasickova et al. 2007, Lewis et al. 2010, Baumann et al. 2011, Smith et al. 2014). Genotypes I and II of HEV can infect human and non-human primates, whereas humans and pigs are infected by Genotypes III and IV (Balayan et al. 1997). The prevalence of Genotype IV in humans and animals remains unclear, even though Genotype IV of HEV was confirmed to cause zoonosis. The morbidity of this disease in developing countries (Asia and Africa) is higher than that in developed countries (the United States and several European countries) (Meng 2008).