Purification of His-tagged hepatitis B core antigen from unclarified bacterial homogenate using immobilized metal affinity-expanded bed adsorption chromatography

Abstract

Hepatitis B core antigen (HBcAg) is used as a diagnostic reagent for the detection of hepatitis B virus infection. In this study, immobilized metal affinity-expanded bed adsorption chromatography (IMA-EBAC) was employed to purify N-terminally His-tagged HBcAg from unclarified bacterial homogenate. Streamline Chelating was used as the adsorbent and the batch adsorption experiment showed that the optimal binding pH of His-tagged HBcAg was 8.0 with a binding capacity of 1.8 mg per ml of adsorbent. The optimal elution condition for the elution of His-tagged HBcAg from the adsorbent was at pH 7 in the presence of 500 mM imidazole and 1.5 M NaCl. The IMA-EBAC has successfully recovered 56% of His-tagged HBcAg from the unclarified E. coli homogenate with a purification factor of 3.64. Enzyme-linked immunosorbent assay (ELISA) showed that the antigenicity of the recovered His-tagged HBcAg was not affected throughout the IMA-EBAC purification process and electron microscopy revealed that the protein assembled into virus-like particles (VLP).

Keyword: IMA-EBAC, His-tagged HBcAg, Unclarified bacterial homogenate, Streamline Chelating, Virus-like particles