Abstract

Antibody against HBsAg (hepatitis B surface antigen) is advocated for the passive immunotherapy in certain cases of hepatitis B infections. A recombinant monoclonal antibody against HBsAg would offer several advantages over the currently used polyclonal human hepatitis B immunoglobulin. 5S is a mouse monoclonal antibody that binds to HBsAg with very high affinity. However, this mouse antibody cannot be used for therapeutic purposes, as it may elicit antimouse immune responses. Chimaerization, by replacing mouse constant domains with human counterparts, can reduce the immunogenicity of this molecule. We have cloned the V(H) (heavy-chain variable region) and V(L) (light-chain variable region) genes of this mouse antibody, and fused them with C(H)1 (heavy-chain constant domain 1) of human IgG1 and C(L) (light-chain constant domain) of human kappa chain respectively. These chimaeric genes were cloned into a mammalian expression vector (pFab-CMV), which has a modular cassette coding for part of the hinge, C(H)2 and C(H)3 of human IgG1. The recombinant construct was transfected in CHO (Chinese-hamster ovary) cells to generate a stable transfectoma. The resulting transfectoma was maintained in a serum-free medium and the full-length chimaeric anti-HBsAg antibody was purified from the culture supernatant. The yield of the purified chimaeric antibody was moderate (approximately 5.5 mg/l). We further characterized the chimaeric antibody using several in vitro techniques. It was observed that the chimaeric molecule was glycosylated and expressed in the expected heterodimeric form. This chimaeric antibody has very high affinity and specificity, similar to that of the original mouse monoclonal antibody