

Molecular and immunological characterization of Babesia gibsoni and Babesia microti heat shockprotein-70

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Abstract

Serological immunoscreening was used to identify a gene encoding heat shock protein-70 from *Babesia gibsoni* (BgHSP-70) that showed high homology with HSP-70s from other apicomplexan parasites. This gene corresponded to a full-length cDNA containing an open reading frame of 1968 bp predicted to result in a 70-kDa mature protein consisting of 656 amino acids. Analysis of the expression levels of BgHSP-70 indicated elevated transcription from cultured parasites incubated at 40°C for 1 h, but not at 30°C. Interestingly, antiserum raised against recombinant BgHSP-70 protein reacted specifically not only with a 70-kDa protein of *B. gibsoni* but also with a corresponding native protein of *B. microti* (BmHSP-70), indicating the high degree of conservation of this protein. The BmHSP-70 gene was then isolated and characterized and the immunoprotective properties of recombinant BgHSP-70 (rBgHSP-70) and rBmHSP-70 were compared in vitro and in vivo. Both proteins had potent mitogenic effects on murine and canine mononuclear cells as evidenced by high proliferative responses and IFN- γ production after stimulation. Immunization regimes in BALB/c and C57BL/6 mice using rBgHSP-70 and rBmHSP-70 elicited high antibody levels, with concurrent significant reductions in peripheral parasitaemias. Taken together, these results emphasize the potential of HSP-70s as a molecular adjuvant vaccine.