**Identification of an immunodominant Babesia gibsoni 47-kDa antigen**

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**Abstract**

The inosine monophosphate dehydrogenase(IMPDH) enzyme has been characterized and validated as a molecular drug target in other apicomplexans but not in the genus Babesia. Subsequently, we cloned and expressed a Babesia gibsoni IMPDH (BgIMPDH) cDNA in Escherichia coli. We also determined the inhibitory effect of mycophenolic acid (MPA) on recombinant BgIMPDH (rBgIMPDH) activity and the Babesia-growth in vitro. The translated BgIMPDH peptide contained thirteen amino acid residues responsible for substrate and cofactor binding in its catalytic domain with Gly374 in BgIMPDH being replaced by Ser388 in mammalian IMPDH. The native BgIMPDH enzyme in the parasite was approximately 54-kDa mass similar to His-tagged BgIMPDH protein. The Km values of the Bg IMPDH were $8.18 \pm 0.878$ (mean±standard error of the mean)μM and $360.80 \pm 43.41$μM for IMP and NAD+, respectively. MPA inhibited the rBgIMPDH activity yielding a Ki value of $20.93 \pm 1.83$μM with respect to NAD+. For Babesia growths, the IC50s were $0.95 \pm 0.21$ and $2.88 \pm 0.49$μM for B. gibsoni and B. bovis, respectively. Therefore, our results suggest that MPA may inhibit there placation of Babesia parasites by targeting IMPDH enzyme of the purine pathway.