

Catalase as a Potential Target for Control of the One-Host Tick *Rhipicephalus (Boophilus) microplus*: A Molecular Approach

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Rhipicephalus microplus is the principal ecto-parasite of bovine cattle. Adult females ingest large volumes of blood that is degraded intracellularly by digest cells. Digestion of hemoglobin results in an intense release of heme, a powerful generator of reactive oxygen species. Recently, we showed that digest cells produce H₂O₂. Inhibition of catalase increased H₂O₂ and impaired heme detoxification. *In vivo*, these effects were accompanied by reduced survival and oviposition. The aim of this work is to identify enzymes related to H₂O₂ detoxification in tick digest cells and evaluate their role in redox metabolism. Three enzymes were found: a single catalase transcript that was identified in the TIGR database; a thioredoxin glutathione-peroxidase (non-selenium, phospholipid-dependent; our unpublished data) and a selenium-dependent GPx (Se-GPx). All enzymes are expressed in digest cells. Using real-time PCR, both catalase and Se-GPx showed increased expression during blood digestion, paralleling the course of hemoglobin degradation and formation of hemosomes, a specialized organelle where heme from hemoglobin digestion is accumulated. Taken together, these data confirm that hemoglobin degradation is an oxidative challenge to these cells. We cloned the C-terminus of *R. microplus* catalase, a region with low homology with bovine catalase, in order to be used in vaccine development. Supported by HHMI, CNPq, CAPES, FAPERJ, PRONEX.