

Transcription Factors and Antioxidant Genes Involved in the Response Against Oxidative Stress in *Aedes aegypti*

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Blood digestion by hematophagous insects represents an oxidative challenge due to the release of great amounts of heme, a pro-oxidant molecule, in the digestive system. We aim to characterize the antioxidant gene expression and the transcription factors that modulate the expression of these genes in the midgut of the mosquito *Aedes aegypti*, in response to oxidative stress. Insects presented increased expression of Glutathione Synthetase and Thioredoxin, two proteins involved in the intracellular defense against oxidative stress, when fed on blood supplemented with Paraquat, a known source of intracellular reactive oxygen species (ROS), as measured by qRT-PCR. We also observed that the expression of E75 and HR3, two transcription factors implicated in the regulation of both oogenesis and vitellogenesis in many insects, increased significantly in female midguts during blood digestion and in response to paraquat ingestion. These results suggest that E75 and HR3 may have a role in the control of the redox state of the mosquito. In Aag2 mosquito cells culture, the presence of heme alters the intracellular redox state, as observed by fluorescence microscopy, possibly by modulating the intracellular antioxidant protein levels. The expression of E75, HR3 and many antioxidant genes in these cells is under investigation. In conclusion, our results suggest that mosquito cells can respond to diverse oxidative challenges, including that ones produced by changes in the intracellular heme levels, by inducing the transcription of antioxidant genes. The pathways and transcription factors involved in this response remains to be revealed.

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