Modulation of Immune Response in *Aedes aegypti* by Heme During Bacterial Infections

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The blood meal provides to females *Aedes aegypti* a large amount of heme, the prosthetic group of hemoglobin. The presence of heme in the mosquito midgut lead to marked modifications of redox metabolism. Levels of reactive oxygen species (ROS) produced by a DUOX enzyme are decreased after blood meal, favoring the proliferation of intestinal microbiota, which may act as a negative factor for the transmission of pathogens. This work studied how immune response against bacteria is influenced by the presence of heme in the mosquito gut. We performed an oral infection with a mixture of salts, proteins and lipids (with or without heme) supplemented with *Enterobacter asburiae*, a symbiont bacteria. Greater mosquito mortality occurred when bacterial infections were associated with heme, which was explained by reduced levels of ROS stimulating proliferation of bacteria. Using qPCR we show that heme also modulates the immune response since some immune genes had their expression level decreased (attacin, cecropin D), while others, like cecropin G, were upregulated in the presence of heme in the diet. Taken together, our results suggest that heme is an important molecule that modulates the mosquito response to bacteria.

*Key words: Heme, Aedes aegypti, Immune response, Gut Microbiota, ROS*

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