Trypanosoma cruzi infection and Rhodnius prolixus hemocytes phagocytosis: Role of glycosaminoglycans

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Rhodnius prolixus is a triatomine bloodsucking bug that feeds exclusively on vertebrate blood during all life stages. It is a vector of the protozoa Trypanosoma cruzi, a non-invasive parasite and the etiologic agent of Chagas disease. Insects possess humoral and cellular immune responses. The main cellular immune reaction is mediated by hemocytes phagocytosis. In this work, we investigated T. cruzi orally infection as well as the effect of the glycosaminoglycans, on the phagocytosis response of R. prolixus hemocytes. Herein, we demonstrated that the phagocytic activity is significantly decreased by oral infection with T. cruzi. To understand the phagocytosis inhibition mechanisms by the parasite we also orally treated infected and no infected insects with two macromolecules involved in parasite cell attachment to the insect luminal gut surface, chondroitin-6-sulfate (6S) and heparin. Our results showed that the treatment with chondroitin 6S reversed, more efficiently than heparin, the phagocytosis activity inhibition caused by ingestion of T. cruzi with a lot of hemocytes internalizing great number of yeast cells. It is known that sulfated glycosaminoglycans inhibited the attachment of T. cruzi in the gut surface, and the insect treatment with these compounds counteracted the effect of this parasite on the phagocytosis, we conclude that T. cruzi adhesion is determinant for induce the inhibition of this cellular immune response in R. prolixus hemocytes. Further studies are under development to better understand the recognition mechanisms involved in this process.

Word Keys: Trypanosoma cruzi, Rhodnius prolixus, glycosaminoglycans, phagocytosis

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