

RHBP Uptake by Heart and Midgut of *Rhodnius prolixus*: Role in Transport and Heme Detoxification.

Walter-Nuno, A. B.¹; Rojas, V.B.¹; Lara F.A.²; Oliveira, P.L.¹ & Paiva-Silva, G.O.

1- Laboratório de Artrópodes Hematófagos, IBqM, UFRJ, 2- Laboratório de Microbiologia Celular, IOC, Fiocruz, RJ

Hematophagous insects are vectors of numerous diseases that affect millions of people around the world. These insects have to digest hemoglobin, releasing free heme in the intestinal lumen. Since heme is a pro-oxidant molecule, these organisms may present a vast array of antioxidant mechanisms to avoid undesired heme-induced oxidations. In *Rhodnius prolixus*, one of these defenses is the *Rhodnius* heme-binding protein (RHBP), present in the hemolymph of these insects as an apoprotein. RHBP is capable of binding free heme, avoiding heme deleterious effects. Previous works of our group suggested that RHBP may act as a heme transporter. In order to test this hypothesis, we study the interaction of RHBP with midgut and heart cells, where heme degradation takes place. Fluorescence microscopy revealed that Rhodamine-labelled RHBP (Rhd-RHBP) was able to bind to both tissues when injected in the hemocoel of starved females. Furthermore, it was possible to observe that, in the heart, RHBP was found inside the cells, in structures similar to granules, whereas in the midgut it seems to be restricted to the cells membrane. *In vitro* experiments showed that RHBP binding to heart cells was inhibited by low temperature and by an excess of non-labelled RHBP but not by BSA, indicating that RHBP is specifically taken up by these cells. Females that present diminished RHBP expression caused by injection of dsRHBP RNA are unable to produce eggs. Experiments evaluating heme transport and degradation in these insects are being performed to elucidate the role of RHBP in these processes.

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