Acyl-CoA-binding proteins (ACBPs) are a protein family that have a conserved domain that binds medium and long chain acyl-CoA esters with high affinity and specificity. The gene RpACBP-1 is highly expressed in Rhodnius prolixus midgut and it is upregulated soon after blood meal by serotonin that is released in the hemolymph. However, this hormone may not be the only regulator of RpACBP-1 expression. Artificial feeding of insects with Tyrode buffer was able to increase RpACBP-1 expression, but not as highly as blood feeding, indicating that some blood component may be important to induction of gene expression. Supplementation of Tyrode buffer with albumin induced RpACBP-1 gene expression at the same level as blood feeding. Furthermore, supplementation with glycine or lysine, but not glutamine, had the same effect of feeding with albumin. These results suggest that the proteic fraction of blood is a regulator of RpACBP-1 expression. Injection of rapamycin inhibited the increase of gene expression, indicating a possible role of TOR in this regulation. Moreover, rapamycin did not inhibit the increase in RpACBP-1 expression induced by serotonin injection, which indicated that amino acids and serotonin act through different pathways. At last, the transcription factor RpFoxA2 gene expression, which has a predicted binding site at RpACBP-1 promoter, was reduced after blood meal. These results may indicate a relationship between the amino acids coming from meal, TOR activation, RpFoxA2 gene expression inhibition and induction of RpACBP-1 expression, although more experiments are necessary to corroborate this hypothesis.

Keywords: Rhodnius prolixus, ACBP, gene expression, TOR, amino acids
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