

IRON METABOLISM AFTER BLOOD MEAL IN THE TICK IXODES RICINUS

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Ticks, which increase their body weight more than hundred times during blood-meal, have to deal with a potential risk of toxic free heme/iron produced by the intracellular digestion of hemoglobin. Here, we contribute to the knowledge of heme/iron metabolism in the hard tick *Ixodes ricinus* by functional study of an intracellular iron storage protein ferritin (FER), and an iron responsive protein (IRP, cytoplasmic aconitase). RNAi knock-down studies clearly demonstrated that silencing of ferritin has a deleterious effect on tick feeding, egg maturation and larval development. Whereas ferritin mRNA levels are uninfluenced by blood meal, the amount of protein in tick tissues is markedly increased in fed ticks. The RNAi silencing of IRP confirmed its role in regulation of ferritin synthesis at the translational level. Our data indicate that the tick IRP-FER system is likely more related to vertebrates than to insects or nematodes. Heme degradation and transport of free iron in ticks are still obscure processes since there is still no evidence indicating an involvement of tick endogenous heme-oxygenase and transferrin. Novel data on iron metabolism in ticks can help in rational development of efficient “anti-tick” vaccines that could prevent transmission of a variety of pathogens.

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