AKT and GSK3 Gene Silencing Using Electroporation in *R. microplus* Eggs

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**Introduction:** *Rhipicephalus microplus* cattle tick is an obligatory parasite, and vector for several diseases such as bovine babesiosis and anaplasmosis. Current need for discovery of novel molecular targets and/or new drugs development for tick control strategies rely on the rapid development of resistance. Here we studies the AKT/GSK3 signaling axis during *R. microplus* embryogenesis. Physiological and metabolic processes related to tick embryogenesis may offer an attractive approach of research by using functional genomic tools such as gene silencing by RNA interference (RNAi) directly delivered into embryos via electroporation. **Material and methods:** AKT or GSK3 gene silencing was promoted by delivering dsRNA via electroporation in *R. microplus* eggs at the first or seventh days after ovoposition. Gene silencing was confirmed by qRT-PCR seven days after electroporation. Additionally, morphological analyses of electroporated eggs were performed under a stereomicroscope and by staining the eggs in different developmental stages with DAPI. Moreover, time and rate of hatching were also evaluated. **Results and discussion:** AKT gene silencing was near 90% in one day-old eggs and 80% with seven days-old eggs. It also reduced the hatching rate of eggs electroporated both at either 1\textsuperscript{st} of 7\textsuperscript{th} day of development, when compared with control treatment. Interestingly, GSK3 gene silencing reduced hatching rate by 70% and 30% in eggs electroporated at 1\textsuperscript{st} and 7\textsuperscript{th} day of development, respectively. However, no larva morphological changes were observed with either gene silencing. **Conclusion:** The delivery of dsRNA via electroporation provides a powerful tool for future and current functional genomic of target proteins. Our results suggest that AKT and GSK3 relative transcription may be differentially regulated during tick egg formation and embryogenesis. Further studies on how to interfere in the biology and development of ticks and the roles of maternally-transmitted and zygote-activated genes in and throughout embryogenesis are on the way.

Key words: AKT, GSK3, RNAi, *Rhipicephalus microplus*, electroporation, tick eggs

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