Involvement of a GSK in the Control of Gluconeogenic Enzymes in Embryonic Tick Cells Line BME26

Nogueira, C.L[1]; Martins, R.S.[1]; da Silva Vaz I Jr[3]; Della Noce, B[1]; Waltero, C. F.[1]; Logullo, C[1]

[1]Laboratório de Química e Função de Proteínas e Peptídeos/ Unidade de Experimentação Animal, Universidade Estadual do Norte Fluminense Darcy Ribeiro, Campos dos Goytacazes- RJ, Brazil; [3]Centro de Biotecnologia, Universidade Federal do Rio Grande do Sul, Porto Alegre- RS, Brazil.

Introduction: The tick *Rhipicephalus microplus* is the main ectoparasite in cattle herds. Chemical control costs are high and represent hazards to human health, contaminating the meat, milk and the environment. BME26 is a cell line obtained from *R. microplus* and has been used to examine regulators of glucose metabolism under experimental conditions. The glycogen synthase kinase 3 (GSK3) and the phosphoenolpyruvate carboxykinase (PEPCK) are two enzyme involvced in the control of glycogen and gluconeogenic metabolism, respectively. **Objectives**: The aim of this study is investigate the relationship between a GSK3 and PEPCK together with the transcription factors involved in the glucose metabolism (FOXO, PPAR, CREBB and PGC1α). **Material and Methods**: The cell line BME26 was maintained in Leibovitz L-15 medium in three different conditions. (i) cells treated with a high glucose concentration (100 mM); (ii) cells treated with a low glucose concentration (without additional glucose); and (iii) cells maintained under standard glucose concentration (50 mM) that is used in BME26 maintenance media (control cells). The enzymatic activity and the transcriptional analysis of the GSK3 and PEPCK have been performed to understand how the metabolism is regulated and the relationship between PEPCK and GSK3. Primers for real-time PCR have been designed to evaluate the transcriptional response of GSK3, PEPCK, PGC1α, PPAR and FOXO to the GSK3 silencing. **Results and Discussion**: The GSK3 silencing promoted an increase in the PEPCK transcription, suggesting an indirect relationship between both enzymes. Surprisingly, the results also showed that the gluconeogenesis is necessary to mantain the tick cell integrit under higher glucose treatment. The response of the transcriptional factors still not been performed in all conditions. **Conclusions**: The involvement of GSK3 in the gluconeogenesis, as well as its relationship with transcriptional factors will contribute to understand how the carbohydrate metabolism respond to the nutritional stress in ticks, in addiction to find new targets to anti-tick vaccine development.

Keywords: *Rhipicephalus microplus,* GSK3, metabolism, glycogen.

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