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Title: Vector-pathogen interactomics: connecting the dots using tick cell lines

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Abstract

Introduction: Tick-borne diseases (TBD) are a threat to human and animal health. With the (re-)emergence of such diseases, new effective control methods, based on the complex vector-pathogen interactions and their impact in vector infestation/capacity, have to be developed. In an early stage of research, the combination of tick cell lines (TCL) and gene modulation technologies could create an opportunity to investigate the functions of tick proteins at a cellular level to further elucidate about tick-pathogen interactomics *in vivo*.

Objectives: This work intends to analyze sialotranscriptome/proteome in response to infection and blood meal to further select potential targets for a deeper understanding of their role in pathogen transmission and cell viability *in vitro*.

Methods: With this propose, two catalogues from *Rhipicephalus sp.* ticks of previously identified differentially expressed gene/proteins in response to infection and feeding have been analyzed. To overcome the extensive animal manipulation and be useful to investigate and deepen the current knowledge of tick-pathogen interplay, TCL that are established and well characterized, will be a good *in vitro* model. Two strains of TCL were maintained. *R. sanguineus* (RSE6) was grown with a 1:1 mixture of L-15 and L-15B medium[1], and *I. scapularis* (IDE8) in L-15B medium[2]. To enable TCL infection with a pathogen, *Ehrlichia canis* was maintained in the canine monocyte-macrophage cell line, DH82, in Dulbecco's modified Eagle's medium (DMEM)[3].

Results: At this point, metabolic pathways, such as apoptosis or cholesterol biosynthesis, have been identified as targets. The next step will be the analyses of potential antigens of such pathways present and conserved among *Rhipicephalus* or among other tick species such *Ixodes scapularis*.

Conclusions: The deep complexity of biological systems such as tick–pathogen interactions could be uncovered with pioneering methodologies to further discover pan-arthropod antigens which could improve the control of tick and TBD.

References

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