POST-TRANSCRIPTIONAL REGULATION OF GENE EXPRESSION IN TRYPANOSOMES.

A.C. Frasch, I. J. De Gaudenzi, A. Jager, A. Cassola, G. Noe and I. D'Orso.

Instituto de Investigaciones Biotecnologicas- Instituto Tecnologico de Chascomus, UNSAM-CONICET, Buenos Aires, Argentina.

A main task of the parasite is to coordinate the stage-specific expression of the large number of mucin and trans-sialidase genes in each of the hosts. Regulation of expression in these cells can not be done at the transcriptional level. One mechanism of post-transcriptional regulation analyzed in some detail in trypanosomatids is the modulation of mRNA stability. We have identified a number of motives in the 3'unstranslated region (3'UTR) of mucin transcripts whose deletion modifies the mRNA half-life and translation efficiency. Likewise, a family of RNA-binding proteins characterized by the presence of RRM (RNA recognition motives) was found to be expressed in trypanosomatids and, some of them were shown to modulate mucin transcript stability. RRM-containing proteins have, in addition to the RRM interacting with the target mRNA, domains likely to be involved in protein-protein interactions allowing to incorporate other proteins to the ribonucleoprotein complexes. Under special and natural conditions, ribonucleoprotein complexes were found to be present in cytoplasmic granules where poly(A)+RNA is accumulated. Recently we have explored the possibility that other, parasite specific, mechanisms modulating gene expression might occur in these cells. Evidence was obtained indicating that some intercistronic regions are not trans-spliced/polyadenylated during polycistronic unit processing. The lack of this processing generates dicistronic units. A second trans-splicing/polyadenylation site that is skipped during the processing of the corresponding polycistron is located in the 3' UTR of the transcripts encoding the trans-sialidase. As a consequence, the mRNAs coding for this enzyme contain longer 3' UTR that are further processed by trans-splicing and polyadenylation. Our hypothesis is that these events are required to regulate gene expression since the cistrons involved are differentially expressed during the developmental stages of the parasite in the insect and mammalian hosts.
Key words: Gene expression, trypanosomes, RNA-protein complexes.