THE EXONUCLEASE XRNA AND mRNA METABOLISM IN
Trypanosoma cruzi

Costa, J.F.; Dallagiovanna, B.; Goldenberg, G.; Ávila, A.R.; Holetz, F.B.

Laboratório de Regulação da Expressão Gênica, Instituto Carlos Chagas – FIOCRUZ/PR - Brasil

Introduction and objectives: Regulation of gene expression in trypanosomatids occurs mostly by post-transcriptional events. These events involve changes in stability or access of mRNAs to the translational machinery, and are directly related to adaptation of parasites to environmental changes during the life cycle. RNA granules, like p-bodies and stress granules, comprise mRNPs that are responsible for regulating gene expression at the post-transcriptional level. In trypanosomatids, proteins specific of stress granules and p-bodies like DHH1, LSM1-7, SCD6, POP2 and XRNA have been already identified. However, the role of these parasite granules is still not clear. Therefore, we have decided to investigate the role of the exonuclease TcXRNA and its association with mRNA granules in T. cruzi to understand the biological role of these granules. Materials and methods: So parasites containing the TcXRNA protein fused to GFP were subjected to the in vitro metacyclogenesis and treated with cycloheximide and puromycin drugs. Results and conclusions: We observed that TcXRNA, an exonuclease 5'→3' conserved and considered a p-body marker in yeast and mammals, is constitutively expressed throughout T.cruzi metacyclogenesis. It is localized mainly at cytoplasmic foci whose number is altered when the cells are under stress conditions or drug treatment that blocks the translation. Moreover, TcXRNA and TcDHH1 seems to partially co-localize in epimastigotes and this co-localization is reduced during parasite differentiation. We observed that TcXRNA is present at the perinuclear region. This localization is similar to the perinuclear granules of C. elegans, which may be involved in the quality control of mRNA exported to the cytoplasm. However, it is still necessary to investigate the functional relation between these two types of granules. So far, our data suggests that TcXRNA granules are dynamic and might be involved in mRNA metabolism with an important role in controlling the gene expression in T. cruzi.

Key Words: XRNA, p-bodies, Trypanosoma cruzi

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