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STRESS GRANULES IN *CIONA ROBUSTA*: MOLECULAR EVOLUTION OF TIAR AND TTP AND EARLY EVIDENCE OF THEIR GENE EXPRESSION UNDER STRESS CONDITIONS INDUCED BY METALS

Stress granules are non-membranous cytoplasmic foci composed of messengers (not translated), ribonucleoproteins, translation initiation components and other additional proteins, that represent a primary mechanism by which gene expression is rapidly modulated when cells are subjected to adverse environmental conditions. Very few works have been devoted to study the presence of molecular components of stress granules in invertebrate animals. In this work, we characterized, for the first time in the solitary ascidian *Ciona robusta*, the genetic sequences of two important protein components of stress granules, TIAR (TIA-1 related to proteins) and TTP (tristetraprolin), and carried out the first studies on their gene expression. The sequences characterized for *tiar* and *ttp* genes have allowed to start a study on the molecular evolution of these proteins in animals: for TIAR the obtained results are consistent with recent phylogenetic analysis that place tunicates as sister group of vertebrates, whereas the phylogenetic position of TTP remains still uncertain. The data on mRNA expression, provided by qRT-PCR analysis, are absolutely the first obtained in non-mammalian animals. As expected, the exposure to each metal (Cu, Zn and Cd) led to a generalized decrease in mRNA expression levels for both TIAR and TTP, suggesting that the metal accumulation induce acute stress and the inhibition of the transcription of *tiar* and *ttp* genes. The data presented here improved our knowledge about the molecular evolution anti-stress proteins in metazoans and emphasize the importance of the transcription of *tiar* and *ttp* genes, which represents an efficient physiological response allowing *C. robusta* to survive in the presence of metals in the marine environment (Supported by M.I.U.R. grant).