mRNA export in mammals and parasites: they use the same pathways?

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Regulation of gene expression occurs on several levels in eukaryotic organisms and involves transcriptional and post-transcriptional mechanisms. The nucleo-cytoplasmic RNA export is an essential post-transcriptional pathway for gene expression control in eukaryotic cells, but it is still poorly understood in protozoan parasites. Previous work from our group, using bioinformatic comparisons, suggests that the basic components of the RanGTP-dependent RNA pathways are conserved throughout the eukaryotic phylogeny, whereas proteins involved in RanGTP-independent mRNA export are less conserved or absent in protozoan. One exception is UAP56, a highly conserved DEAD-box helicaseand a component of the TREX complex (Transcription Export) that is essential for mRNA export in most eukaryotes. We have demonstrated that this protein is essential for mRNA export in Trypanosomes and Toxoplasma. Furthermore, we performed afunctional characterization ofnovel factors ofthis pathway. Using a combination of genetic screens and proteomic approacheswe were able to identify divergent componentsof the mRNA export machinery and to obtain mechanistic insights of their function in these important human and veterinary parasites.

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