Abstract

Helicases are proteins with the catalytic ability to unwind double-stranded nucleic acids. An important group are helicases with a DEAD motif, which includes helicase UA56 and the more recently discovered helicase URH49. These helicases are orthologs and they share some functions. Both helicases are involved in the splicing of pre-mRNA and they take part in the transport of mRNA from the nucleus to the cytoplasm. Slight differences between the two helicases lead to different affinites for different mRNAs. Overproduction of the URH49 helicase has been reported in many cancer tissues and has therefore been suggested to function as a potential biomarker of adverse cancer prognosis. The association of helicases UAP56 and URH49 with nuclear export has led to research of their role in cells infected by viruses which replicate in the nucleus. The helicases UAP56 and URH49 have been shown to promote virus replication in several ways. They either participate in the transport of viral RNAs into the cytoplasm and thus help to translate important proteins for the virus or play a role in their encapsidation. They also help recruit the export complex, which is normally dependent on the formation of a splicing apparatus, to viral transcripts without introns. The URH49 helicase has also been described to suppress nuclear export of antiviral transcripts.

Key words: helicases, DEAD-box, URH49, DDX39A, UAP56, DDX39B, viral life cycle