Assessing the involvement of Dis3L1 in mammalian quality control pathways

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The exosome is an evolutionarily conserved protein complex that is involved in all aspects of RNA metabolism, namely, RNA decay, processing and quality control. The only catalytic subunit of the core exosome is a 3´end exoribonuclease from the RNase II family of enzymes. In humans, two different homologues of this protein were identified, Dis3 and Dis3L1. While Dis3 mainly localizes in the nucleoplasm and has endonucleolytic activity, Dis3L1 is strictly cytoplasmic and has no endonucleolytic activity. The rapid decay of aberrant transcripts is not completely understood, but it is known that involves both 5' to 3' and 3' to 5' degradation. Despite that it localizes in the same compartment where NMD generally occurs, nothing is known about the role of Dis3L1 in quality control processes. In this work, we assessed the involvement of Dis3L1 in the 3' to 5' degradation of reporter human β-globin transcripts with premature termination and nonstop codons.