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mRNA stability in the nucleus

Key words: mRNA stability; Nuclear mRNA retention; Quality control;
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Eukaryotic gene expression is controlled by different levels of biological events, such as transcription factors regulating the timing and strength of transcripts production; alteration of transcription rate by RNA processing; mRNA stability during RNA processing and translation. The maintenance of quality and quantity of transcripts is a key issue for many biological processes. Extensive studies draw the conclusion that the stability of RNAs is dedicated-regulated, occurring co- and post-transcriptionally, and translation-coupled as well, either in the nucleus or cytoplasm. Recently, RNA stability in the nucleus arouses many research interests, especially in the stability of newly-made transcripts. Many studies suggested that nuclear mRNA degradations in eukaryotes are complicated, multi-facet but elaborated processes, and likely couple to every step of mRNA processing, including transcription initiation, RNP II pausing, capping, splicing, 3' end processing and mRNA export.

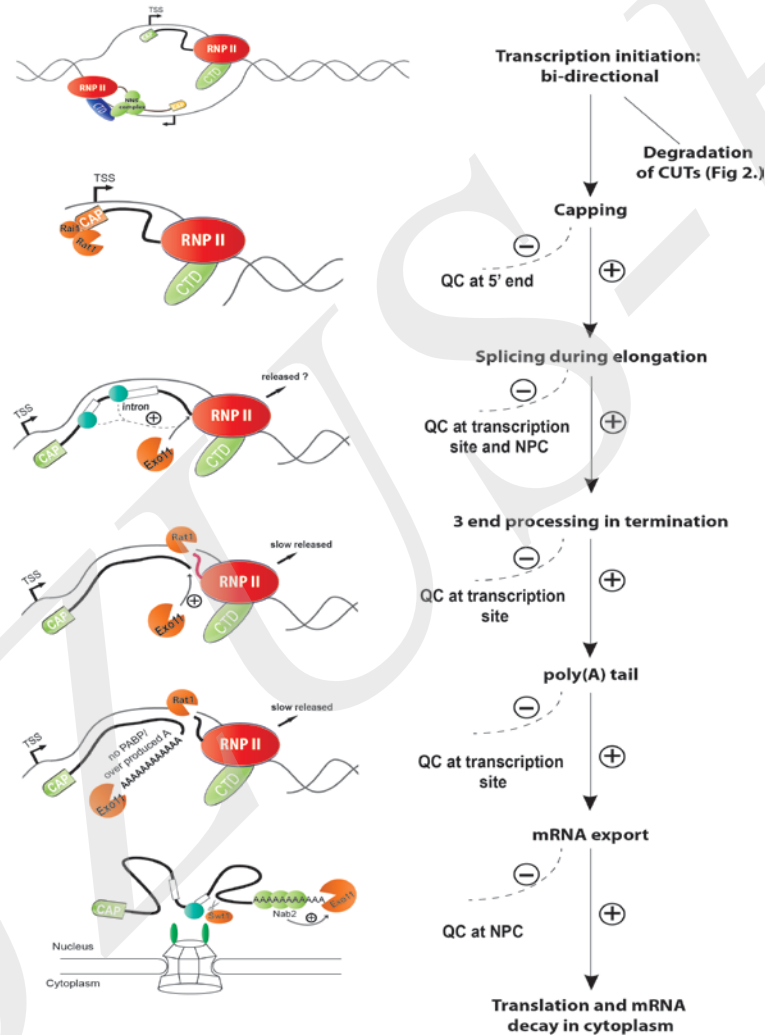


Figure 1. Quality control pathways occurred in transcription and mRNA processing.

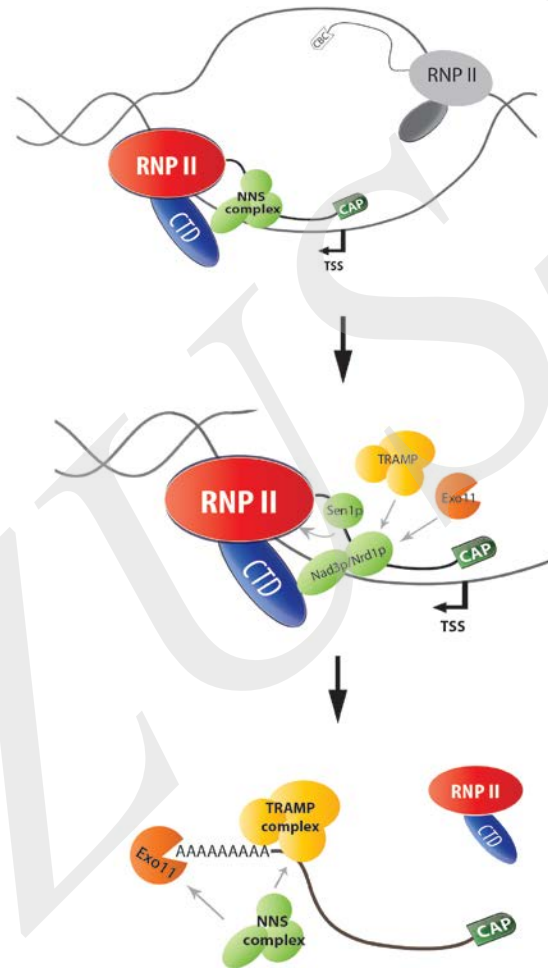


Figure 2. One case for newly-made transcripts: degradation of CUTs in the nucleus.