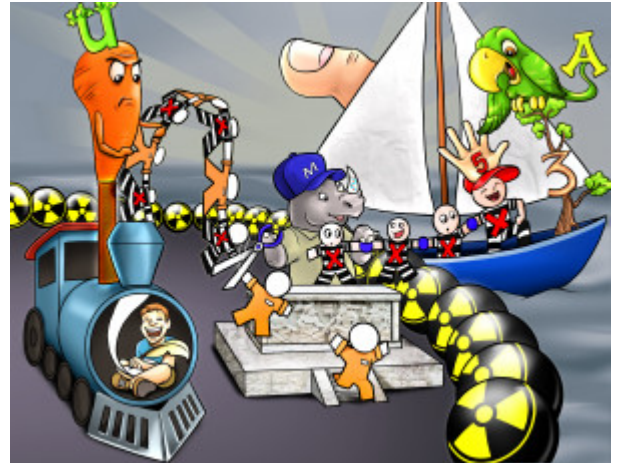


Eukaryotic Post Transcriptional Modification

After transcription, eukaryotic cells have certain modifications made to mRNA before it is fully functional. These modifications occur in the nucleus, which is the location of the mRNA template before proteins are synthesized from it. Splicing of the mRNA occurs, as introns are cut out and exons are spliced together. Introns are the non-coding regions to be removed, while exons contain the codes for functional protein. This allows for the mRNA to be one full continuous functional piece. Alternate splicing can occur, which is the inclusion of particular exons resulting in two different protein isoforms. To prevent damage to the mRNA, a 5' cap is added as a modified guanine that prevents RNases from destroying the newly-created mRNA. Also, a 3' poly A tail is added, which is a long series of adenine nucleotides that serve as a buffer against damage from exonuclease activity. The RNA is then transported to the cytosol for protein synthesis.



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Modifications in Nucleus

Modification taking place in the Nuclear-membrane

These modifications occur in the nucleus because the mRNA is synthesized in the nucleus.

mRNA Splicing

Mail-(RNA)-rhino cutting

mRNA splicing allows for the creation of one continuous mRNA that is full of coding regions.

Introns Cut Out

Inmates being Cut Out

Introns are the non-coding regions, or "junk" regions, that are cut out of mRNA.

Exons spliced together

Ex-cons being connected together

Exons are the coding regions of mRNA that are joined together during splicing.

Alternate Splicing

Ex-cons spliced on the Altar

In alternate splicing, some exons are kept resulting in two or more protein isoforms from one gene.

5' Cap added

(5) Hand Baseball-cap

The 5' cap is a modified guanine that prevents RNases from damaging the new mRNA.

3' Poly A tail added

(3) Tree Polly with A tail

The 3' Poly A tail is a series of adenine nucleotides that create a buffer zone in the event of accidental exonuclease activity at the end of the mRNA.

Transported to Cytosol

Being Transported to Side-toe-sail

The mRNA is transported to the cytosol after modifications for protein synthesis.