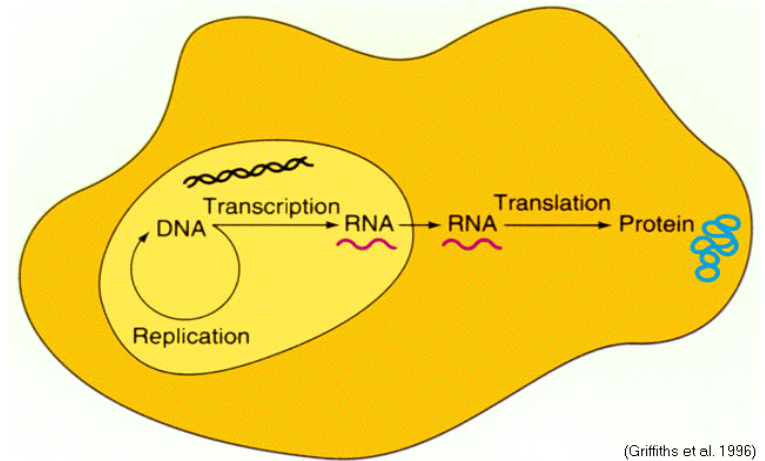


RNA Modification

1. During **RNA splicing**, non-protein coding regions of the RNA strand are removed

- Intron
- Exon
- Spliceosome
- Alternative splicing

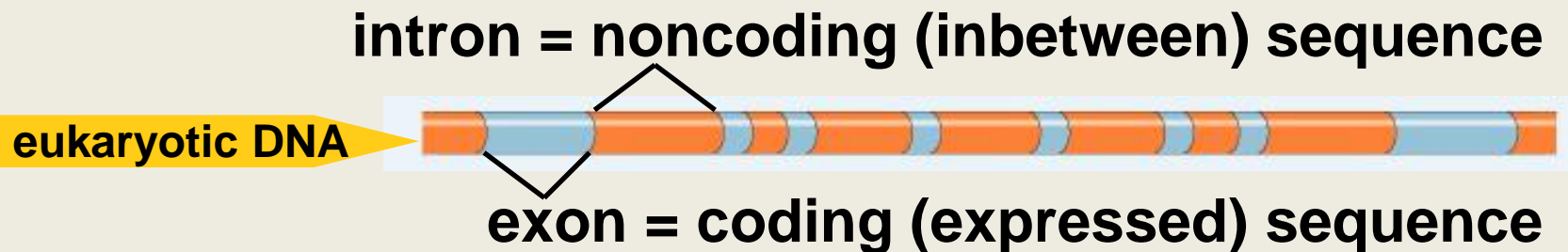


2. During **RNA processing**, the RNA is modified before leaving the nucleus.

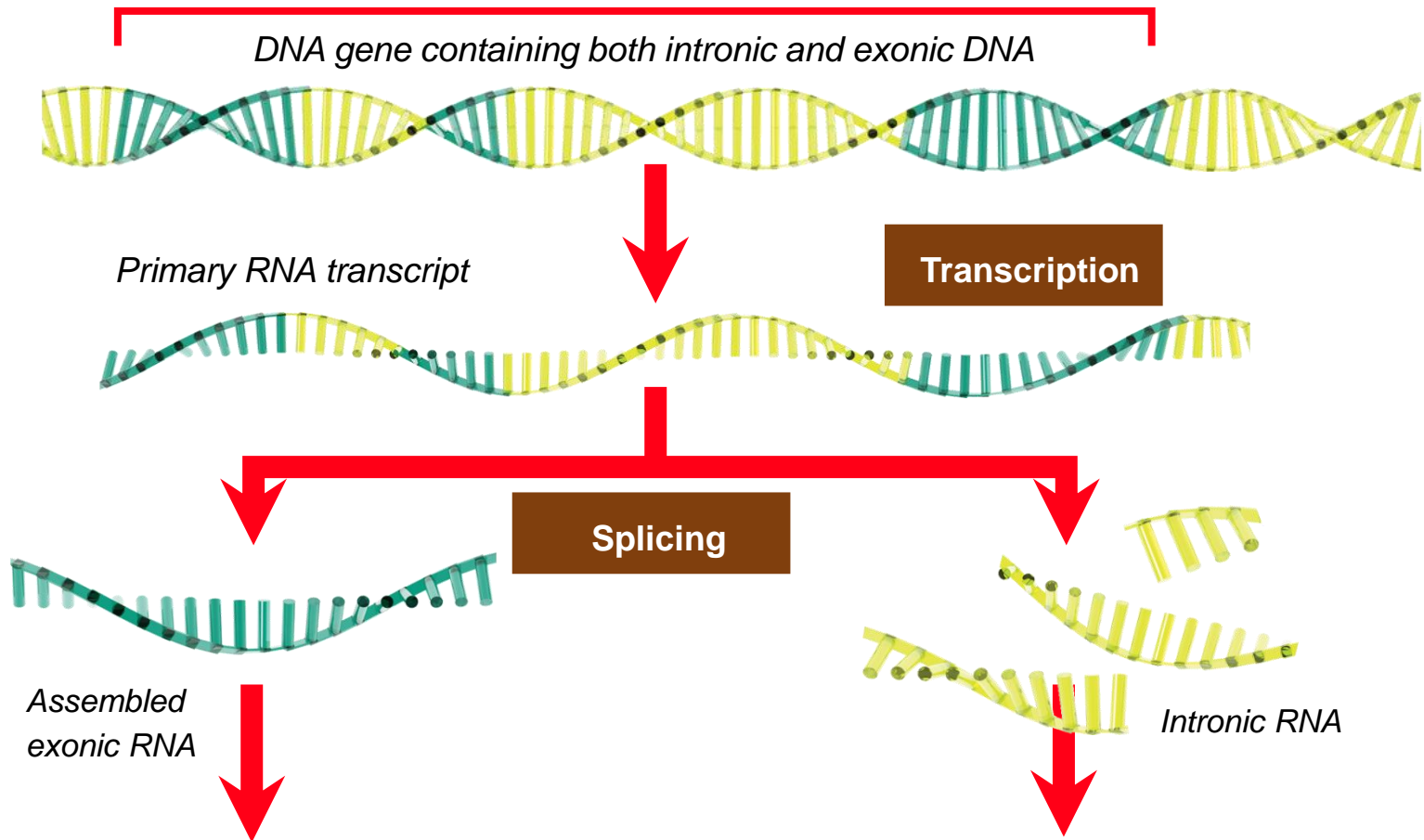
- 5' guanine cap
- Poly A tail

Eukaryotic genomes contain a large amount of DNA that does not code for proteins.

- exons = the real gene
 - expressed / coding DNA
- introns = the “junk”
 - inbetween sequence

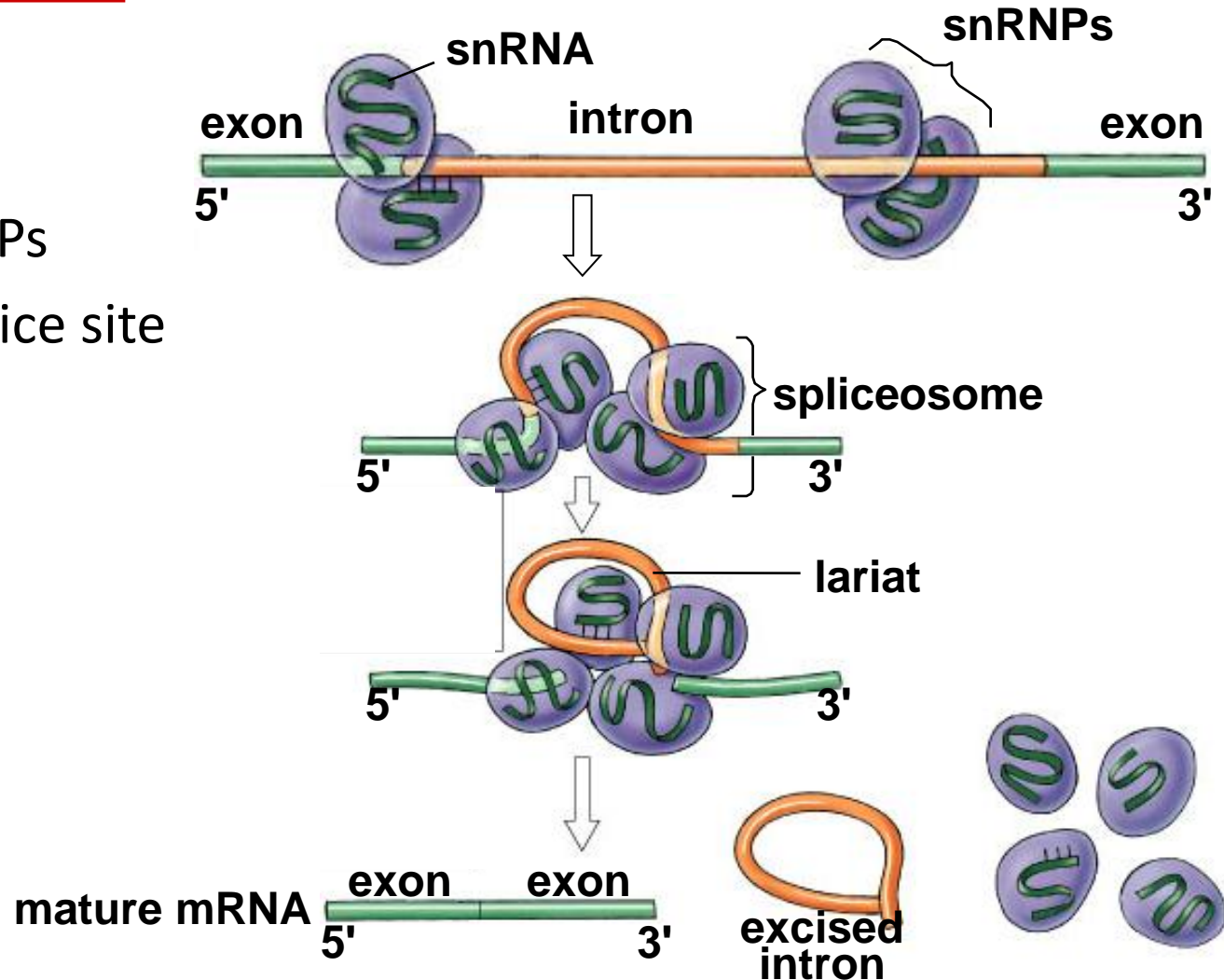


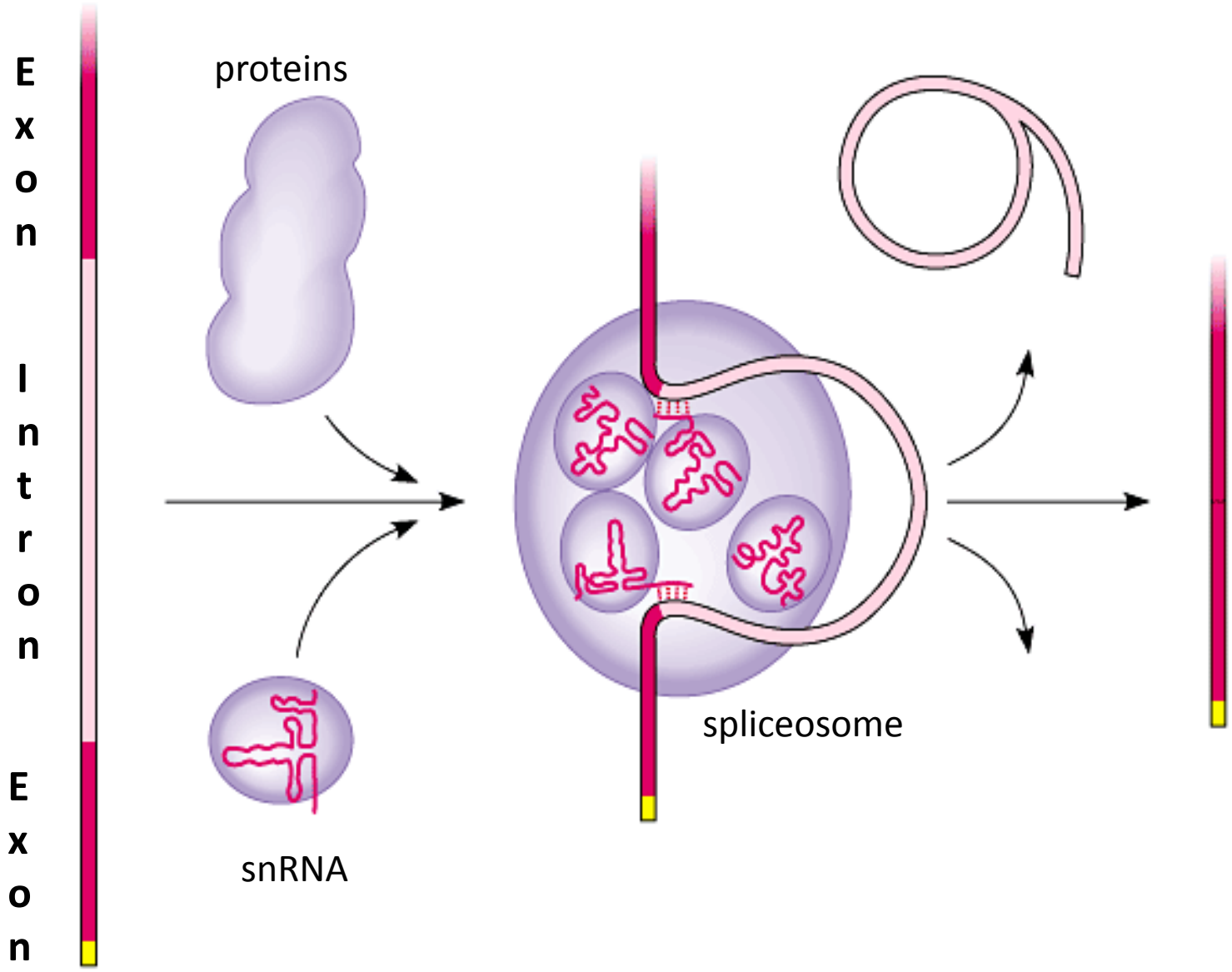
The introns are “spliced” out of the RNA and the exons are joined together.



RNA splicing enzymes

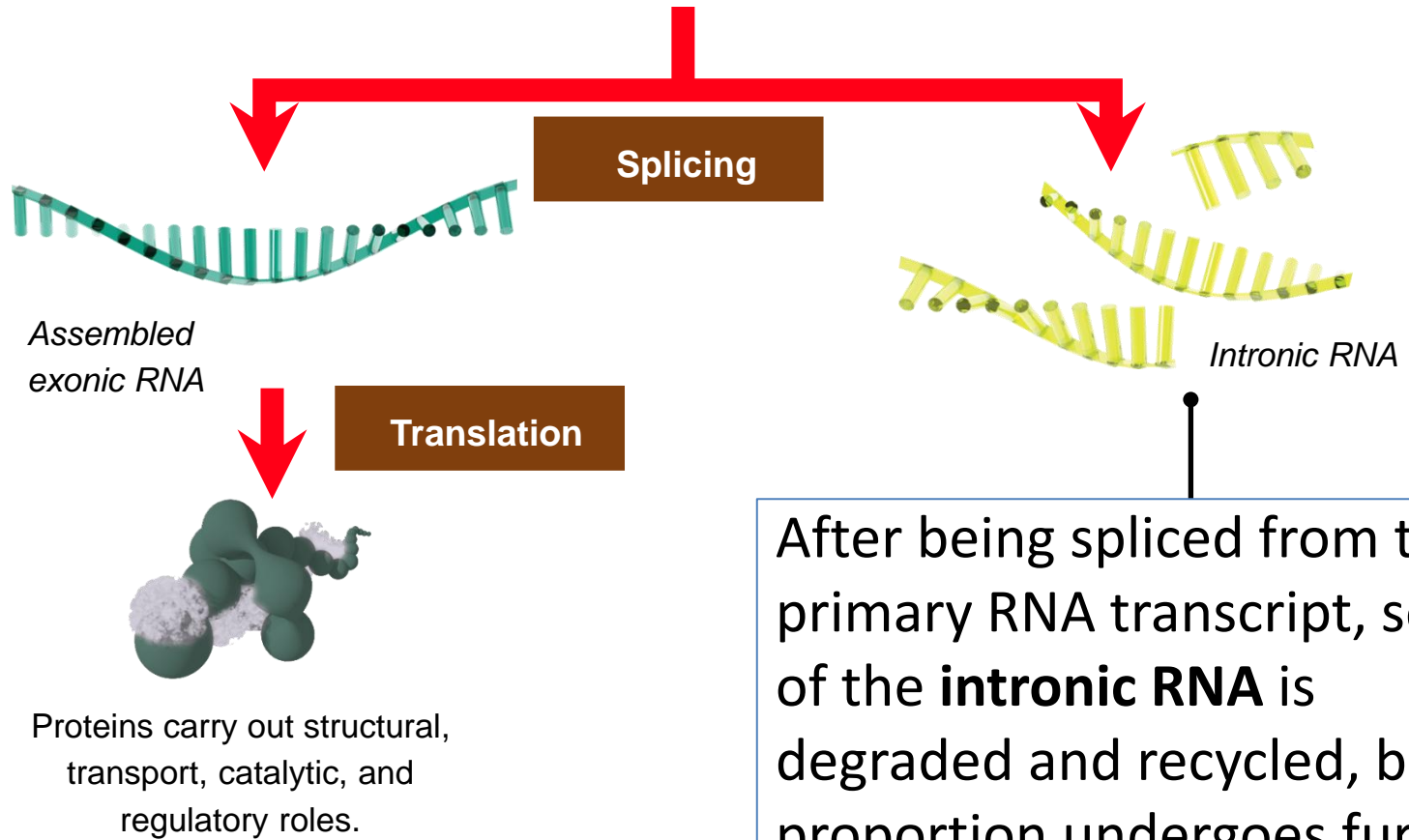
- snRNPs
 - small nuclear RNA
 - proteins
- Spliceosome
 - several snRNPs
 - recognize splice site sequence





We've Got A Movie Here, Too

Fate of RNA



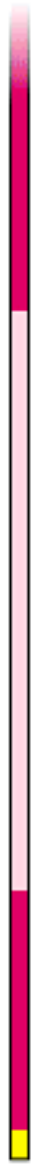
Exon RNA is translated into proteins.

After being spliced from the primary RNA transcript, some of the **intronic RNA** is degraded and recycled, but a proportion undergoes further processing into **microRNAs**. Many of them control timing of developmental processes.

E
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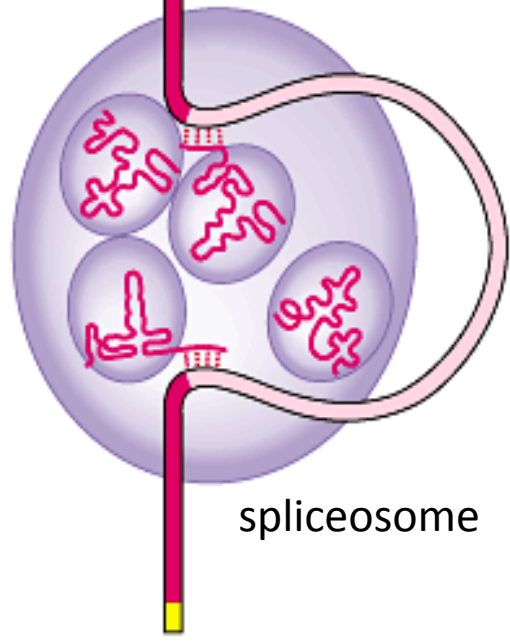
E
x
o
n



proteins

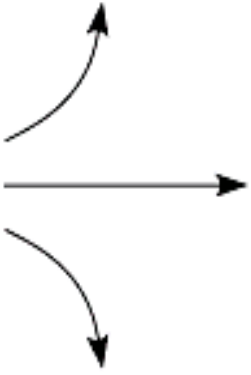
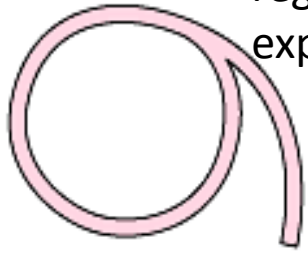


snRNA



spliceosome

intron RNA is recycled or used to regulate gene expression

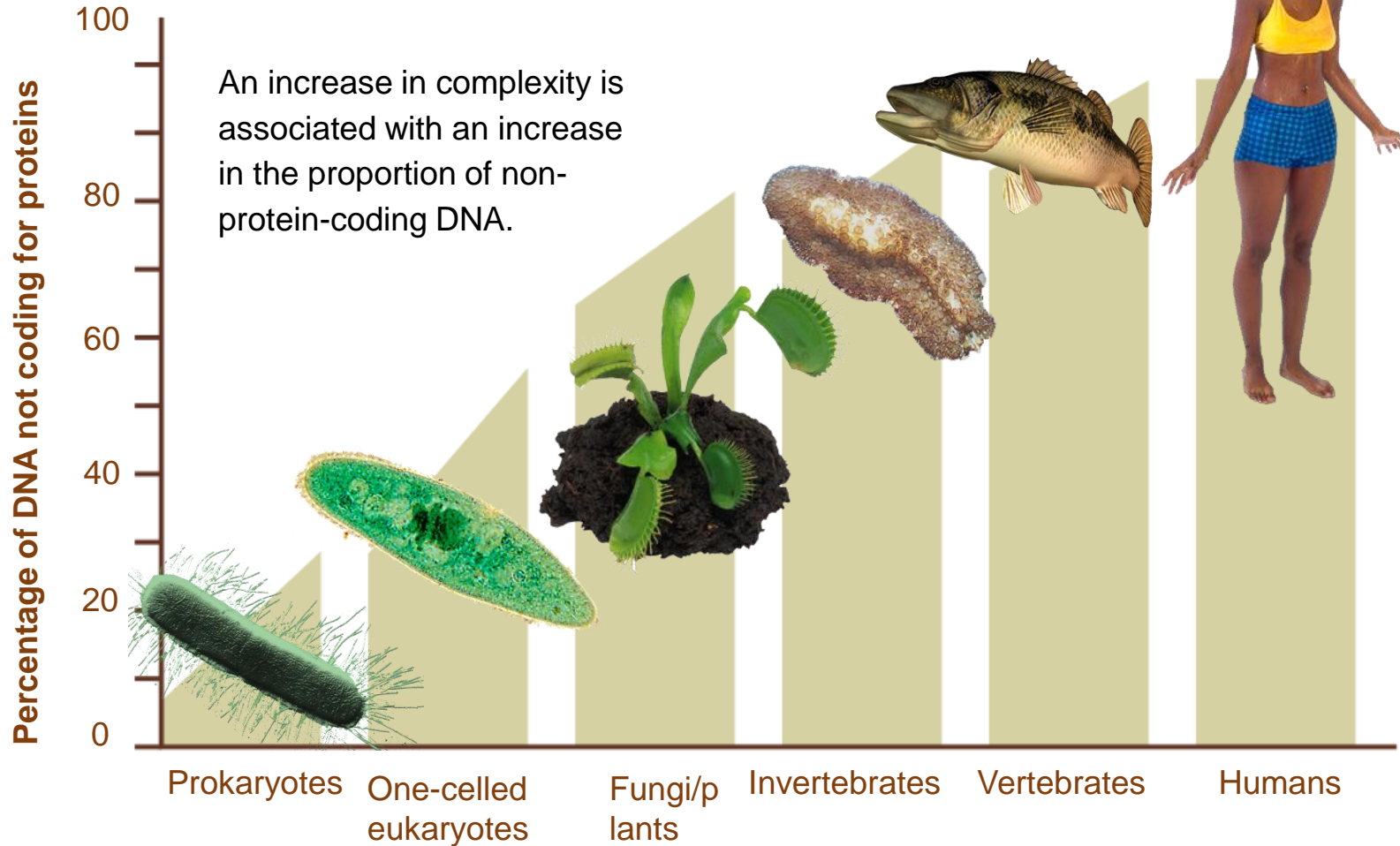


Exon RNA moves to translation



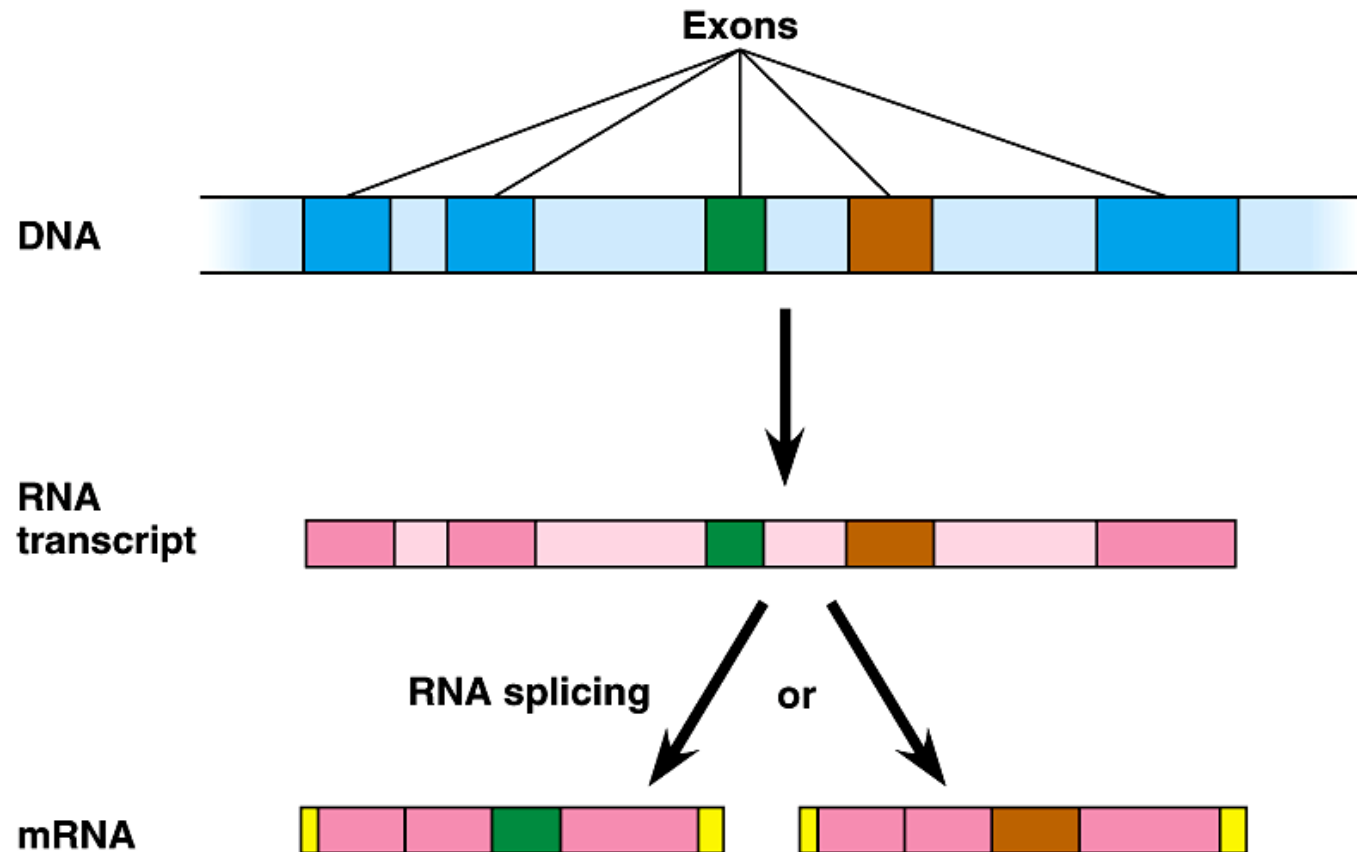
DNA in Eukaryotic Genomes

- In contrast to prokaryotes, eukaryotic genomes contain a large amount of introns.



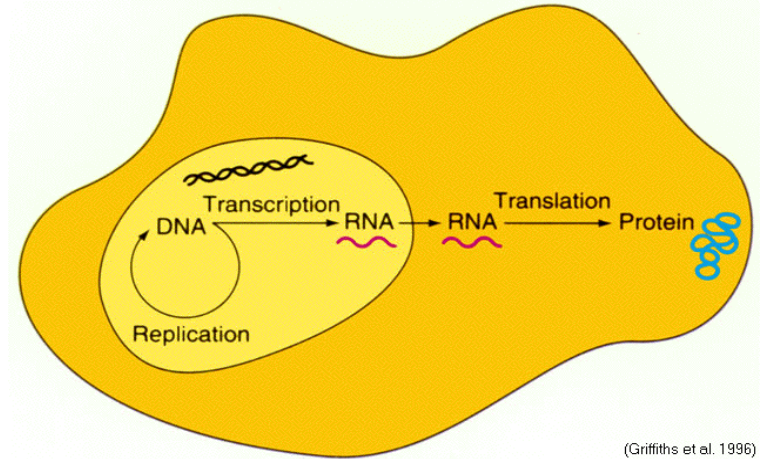
Alternative Splicing

- Alternative mRNAs produced from same gene
 - different segments treated as exons



1. During **RNA splicing**, non-protein coding regions of the RNA strand are removed

- Intron
- Exon
- Spliceosome
- Alternative splicing



2. During **RNA processing**, the RNA is modified before leaving the nucleus.

- 5' guanine cap
- Poly A tail

RNA Processing

- Need to protect mRNA from enzymes in cytoplasm that attack mRNA
- Protect the ends of the molecule by adding a
 - 5' GTP cap
 - 3' poly-A tail
 - longer tail, mRNA lasts longer: produces more protein

