Supplemental Instruction – Biology 2300

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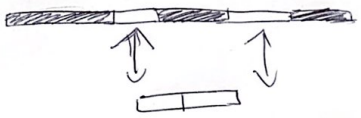
Session: 8 – Transcription-2

1. Like DNA polymerase during DNA replication, RNA polymerase catalyzes _____ bonds to link nucleotides together.
   a. Peptide
   b. Phosphate
   c. Phosphodiester
   d. Dimerized

2. True/False: Unlike DNA polymerase, which can only add nucleotides to the 3' end, RNA polymerase can add nucleotides to the 5' end.

3. mRNA: Transcribed from DNA and encodes amino acid sequences.
   a. The main difference between prokaryotes and eukaryotes regarding the location of translation? prokaryotes - translation occurs in the nucleus
      eukaryotes - cytosol is where translation occurs

4. In Eukaryotes, mRNA has introns/exons which are interrupting sequences that are removed from final mRNA, as well as introns/exons which are expressed sequences in the final mRNA.



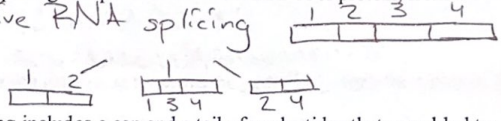
5. Eukaryotic translation takes place in the cytosol, before it leaves via a pore in the nuclear envelope, in what ways is the mRNA processed? Does this increase/decrease stability?

- polyadenylation - poly(A) tail
- 5' capping - modified guanine
- RNA splicing

6. RNA splicing: one of the forms of RNA processing, involves the removal of introns and the joining of exons to produce a continuous coding sequence.

7. What kind of splicing can produce different mRNA or protein, from the same gene?

alternative RNA splicing



8. RNA processing includes a cap and a tail of nucleotides that are added to protect mRNA. Are the cap and tail translated into the final protein product?

a. What kind of nucleotides are used?
b. Which end are they attached to?
c. What is the name of the tail?

- poly(A) tail
  - adenine
  - 3' end
- 5' cap
  - modified guanine
  - 5'

- poly(A) tail

9. What happens to improperly processed RNA?

- disposed off

10. There are signals in DNA that tell RNA polymerase where to start and finish transcription. In prokaryotes these are called the -35 and -10 boxes. In eukaryotes these recruiters are called the TATA Box and the InR Initiation Sequence.

ribosome

11. spliceosome: a protein-RNA complex involved in RNA splicing. U
-osome

a. This complex consists of snRNPs U1, U2, U4, U5, and U6. Of these U1 and U2 have an affinity for one another. When U4, U5, and U6 bind they form the spliceosome

12. mRNA splice sites: *you will want to memorize these

- splice sites
- kozak sequence

a. 5' splice site (otherwise known as the donor site):

5'-AG↓GUAAGU-3'

5'-AUGAAAGGUÜAGGUAAGU"-3'

b. 3' splice site (otherwise known as the acceptor site): "hint: polypyrimidine tract"

5'-PyPyPyPyPyPyPyNCAG↓-3'

13. A multiprotein complex that catalyzes nucleotide change in RNA editing is called the

editosome

14. RNA's

RNA type	Function
mRNA	encodes info for protein
rRNA	-component of the ribosome -catalyze protein synthesis
tRNA	-serves as an adaptor, carries amino acid to site of translation
miRNA	- endogenous
siRNA	-foreign
gRNA - guide RNA	-gene editing

circRNA | circular double-stranded RNA

miRNA - endogenous, double-stranded RNA

siRNA - foreign, double stranded RNA