Name:_____ Dr. Reichler's Bio 325-uex Spring 2009 Quiz 2/12

1) What happens at translation initiation that explains the common functions of the 5' cap and poly-A tail?

2) What are the three RNA molecules involved in translation, and what does each do?

3) There are 64 codons, what are two reasons that there are less than 64 tRNA's?

4) Which ribosome would have a longer polypeptide attached to it, one at the 5' end or the 3' end of the mRNA?

5) What is a basic difference in regulation of gene expression between prokaryotic and eukaryotic cells?

6) After a wound, what might be a change in gene expression that takes place over hours or days? (We did not directly discuss this in class)

7) If there were low glucose and low lactose, would the lac operon be transcribed?

8) How could inhibition of transcription lead to an overabundance of the ompF protein?

9) Give two examples of modifications to proteins that regulate gene expression in bacteria.

Answers:

1) The mRNA loops around so the 5'-cap and poly-A tail are close together.

2) rRNA- serves as a platform for translation to occur and makes the peptide bond. tRNA- matches with the mRNA and brings the appropriate amino acid. mRNA- contains the codons for stringing the amino acids together.

3) There are start and stop codons plus wobble.

4) At the 3' end. Translation starts at the 5' end and moves to the 3' end.

5) In prokaryotes most of gene expression regulation takes place at the level of transcription, in eukaryotes in can occur at any of the steps between DNA and the protein. Also, prokaryotic genes are 'on' and can be repressed while eukaryotic genes are 'off' and need to be activated.

6) There are several potential answers. Activating an immune response or repair mechanisms that takes several hours or days to be activated.

7) No, without lactose the repressor binds to the lac promoter blocking transcription.

8) The expression of ompF is repressed post-transcriptionally by an anti-sense RNA. Without transcription the anti-sense RNA would not be produced leading to an inability to repress expression of ompF.

9) Any two of: Lactose binding to the lac repressor. cAMP binding to CAP. Arabinose binding to araC.