

Quiz #9 Key, 6:30 lab

1. Define:

Transfer-RNA (t-RNA) – Transfer-RNA molecules are copies of small regions of DNA called t-RNA genes. They are single-stranded, but fold into clover-leaf shapes by forming hydrogen bonds across complimentary regions. Transfer-RNA molecules carry individual amino acids to ribosomes for protein synthesis.

Promoter site – The promoter site is the region of an operon (segment of DNA) where the sigma factor of RNA-polymerase binds to begin transcription. The promoter sites of inducible operons are only weakly attractive to sigma factors, but can be enhanced by cyclic-AMP and catabolite activating protein.

Catabolite repression – Catabolite repression is a regulatory mechanism allowing bacteria such as *E. coli* to utilize constitutive metabolic pathways in favor of inducible ones. Glucose, a common catabolite, will repress inducible operons by preventing the formation of cyclic-AMP, a regulatory nucleotide. Without cyclic-AMP, catabolite-activating protein cannot enhance the promoter sites of inducible operons, and without enhancement, sigma factor is so weakly attracted to them, that transcription is very limited.

2. Sigma factor/ polycistronic

3. Small-RNA (s-RNA)/ introns

4. Two answers here are – micro-RNA (mi-RNA) and small interfering RNA (si-RNA)

5. Translation/ peptidyl transferase

6. Transfer-RNA (t-RNA)/ aminoacyl-t-RNA-synthase

7. Codons are sets of three bases on m-RNA that form hydrogen bonds with complimentary anti-codon regions on t-RNA molecules bringing amino acids to ribosomes. This complimentary bonding insures that amino acids are placed in the correct sequence within growing polypeptide chains.

8. Allosteric/ operons

9. Repressor/ operator

10. Permease

11. Inducible/ allolactose

The etiological agents of Legionnaire's disease are identified as *Legionella pneumophila*.