

## WGU C785 Biochem Final Exam (GRADED A) Questions and Answers (Verified Answers)

Which mRNA sequence results in a polypeptide that contains three amino acids?

✓ 5' - CUU GAU ACU UAG - 3'

Which RNA sequence would end in the following polypeptide?

Phe-Thr-Val-Stop

✓ 5' - UUC ACA GUA UAA - 3'

What is the complementary sequence for the following DNA sequence?

5' - GCC ATC TCG AAT - 3'

✓ 5' - ATT CGA GAT GGC - 3'

Assuming 100% reaction efficiency, how many DNA copies are created after the completion of four complete PCR cycles?

✓ 16

What is the function of DNA polymerase in the process of PCR?  
It recognizes the primers and uses the available dNTPs to replicate the template DNA sequence.

✓ 5' - [...] ATT CGC TAG GGC [...] - 3' - Normal DNA  
5' - [...] ATT CGC GAG GGC [...] - 3' - Mutant DNA

Which type of mutation and outcome characterizes the Mutant DNA?

✓ A missense mutation leading to a longer protein

In sickle-cell disease, the glutamic acid (Glu) at position number seven is mutated to valine (Val).

What change in codons corresponds to this mutation?

✓ GAA to GTA

What are possible blood types of the parents of a patient with blood type AB?

✓ A and B

Which pair of chromosomes accurately depicts the genotype of a person with an autosomal recessive mutant HBB allele and sickle cell anemia?

✓ option 3- 2 mutant genes on chromosome 11

Which pair of chromosomes accurately depicts the genotype of a person with an X-linked recessive mutant ALAS2 allele and sideroblastic anemia?

✓ option 3, mutated allele

Studies have shown that increased expression of two genes called SIRT1 and SIRT2 is associated with chronic exposure to cocaine and contributes to drug addiction.

What difference in the regions of the SIRT1 and SIRT2 genes in people addicted to cocaine increases their expression?

✓ The nucleosomes become more widely spaced.

Mice with low levels of agouti gene expression tend to have yellow fur and are obese, while mice with higher levels of expression are brown and of normal weight. Studies show that expression of the agouti gene in mice can be controlled by epigenetics. Mice with low levels of agouti gene expression tend to have yellow fur and are obese, while mice with higher levels of expression are brown and of normal weight. Studies show that expression of the agouti gene in mice can be controlled by epigenetics.

What scenario describes epigenetic regulation of the agouti gene?

✓ Mother mice fed methyl-rich diets during pregnancy give birth to offspring with decreased agouti gene expression compared to those fed a methyl-poor diet.

Oxidative damage to DNA can often result in the alteration of a single nucleotide.

Which DNA repair mechanism would repair this type of damage?

✓ Base excision repair

Xeroderma pigmentosum (XP) is a recessive genetic disease that occurs when one or more of the genes that perform nucleotide excision repair are nonfunctional.