

Conceptual Biology

Chapter 5: DNA and Genes

Genetic Mutations

1. Define the following terms:

Genetic mutation _____

Point mutation _____

Nonsense mutation _____

Frameshift mutation _____

2. Translate the following mRNA sequence into amino acids. You can use the genetic code table on the back of this page.

AAU GUC CCG ACC AAA GCU

3. What point mutation in the sequence above could cause the substitution of the amino acid serine for asparagine?

4. How could a change in a single nucleotide in the sequence above result in a nonsense mutation?

5. The insertion or deletion of one or two nucleotides causes a frameshift mutation. Why doesn't the insertion or deletion of three nucleotides cause a frameshift mutation as well?

Name _____ Class _____ Date _____

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		Second base					
		U	C	A	G		
First base	U	UUU } Phenylalanine UUC } (Phe)	UCU } UCC } Serine UCA } (Ser)	UAU } Tyrosine UAC } (Tyr)	UGU } Cysteine UGC } (Cys)	U	Third base
		UUA } Leucine UUG } (Leu)	UCG }	UAA } Stop UAG } Stop	UGA } Stop UGG } Tryptophan (Trp)	C	
	C	CUU } CUC } Leucine CUA } (Leu)	CCU } CCC } Proline CCA } (Pro)	CAU } Histidine CAC } (His)	CGU } CGC } Arginine CGA } (Arg)	A	
		CUG }	CCG }	CAA } Glutamine CAG } (Gln)	CGG }	G	
First base	A	AUU } AUC } Isoleucine AUA } (Ile)	ACU } ACC } Threonine ACA } (Thr)	AAU } Asparagine AAC } (Asn)	AGU } Serine AGC } (Ser)	U	Third base
		AUG } Met or start	ACG }	AAA } Lysine AAG } (Lys)	AGA } Arginine AGG } (Arg)	C	
	G	GUU } GUC } Valine GUA } (Val)	GCU } GCC } Alanine GCA } (Ala)	GAU } Aspartic GAC } acid(Asp)	GGU } GGC } Glycine GGA } (Gly)	A	
		GUG }	GCG }	GAA } Glutamic GAG } acid (Glu)	GGG }	G	