

1.8 Do DNA Mutations Matter?

Name: _____ **Hr:** ____

Directions: In each of the cases below, one small segment of DNA is shown at the location where a mutation is found. For each case, compare the mutated sequence to the original sequence to determine if the change in DNA is likely to change the trait.

Case 1:

	DNA	RNA	Amino Acid	(circle one)	Protein	Trait
Original Sequence	AAA			Hydrophobic or Hydrophilic	Is the shape of the protein likely to change due to the mutation?	Is the trait likely to change due to the mutation?
Mutated Sequence	AAG			Hydrophobic or Hydrophilic		

Case 2:

	DNA	RNA	Amino Acid	(circle one)	Protein	Trait
Original Sequence	AAA			Hydrophobic or Hydrophilic	Is the shape of the protein likely to change due to the mutation?	Is the trait likely to change due to the mutation?
Mutated Sequence	AAT			Hydrophobic or Hydrophilic		

Case 3:

	DNA	RNA	Amino Acid	(circle one)	Protein	Trait
Original Sequence	AAA			Hydrophobic or Hydrophilic	Is the shape of the protein likely to change due to the mutation?	Is the trait likely to change due to the mutation?
Mutated Sequence	AGA			Hydrophobic or Hydrophilic		

		Second letter				
		U	C	A	G	
First letter	U	UUU } Phe UUC } UUA } Leu UUG }	UCU } UCC } Ser UCA } UCG }	UAU } Tyr UAC } UAA Stop UAG Stop	UGU } Cys UGC } UGA Stop UGG Trp	U C A G
	C	CUU } CUC } Leu CUA } CUG }	CCU } CCC } Pro CCA } CCG }	CAU } His CAC } CAA } Gln CAG }	CGU } CGC } Arg CGA } CGG }	U C A G
	A	AUU } AUC } Ile AUA } AUG Met	ACU } ACC } Thr ACA } ACG }	AAU } Asn AAC } AAA } Lys AAG }	AGU } Ser AGC } AGA } Arg AGG }	U C A G
	G	GUU } GUC } Val GUA } GUG }	GCU } GCC } Ala GCA } GCG }	GAU } Asp GAC } GAA } Glu GAG }	GGU } GGC } Gly GGA } GGG }	U C A G

Hydrophobic (water fearing) Amino Acids	Hydrophilic Amino (water loving) Amino Acids
Gather on the inside of the protein away from water.	Gather on the outside of the protein forming hydrogen bonds with water
Alanine (Ala) Isoleucine (Ile) Leucine (Leu) Methionine (Met) Phenylalanine (Phe) Valine (Val) Proline (Pro)	Glutamine (Glu) Asparagine (Asn) Histidine (His) Serine (Ser) Threonine (Thr) Tyrosine (Tyr) Cysteine (Cys) Tryptophan (Trp)