

Ray

1. Write your own definition for a point mutation. Then, following the given mRNA, show a) a silent mutation, b) one that changes the peptide, and c) one that stops the sequence.
- Given: UUU-AAU-UUC-CAU-CGU-UAU-GUG Phe-Asn-Phe-His-Arg-Tyr-Val
- a) silent mutation: UUU, AAC, UGC-CAU-CGU-UAU-GUG Phe-Asn-Phe-His-Arg-Tyr-Val
- b) peptide change: UUU-AAU-UUC-CAU-CGU-UAU-GUG Phe-Lys-Phe-His-Arg-Tyr-Val
- c) steps: UUU-AAU-UUC-UGA-CGU-UAU-GUG Phe-Asn-Phe

2. Write your own definition for an insertion/deletion mutation. Then, from the given mRNA, delete C9, C10, and A12. Is this a frameshift mutation?
- UUU-AAU-UUC-CAU-CGU-UAU-GUG Phe-Asn-Phe-His-Arg-Tyr-Val
- adding or removing bases
 UUU-AAU-UUU-CGU-UAU-GUG
 Phe-Asn-Phe-Arg-Tyr-Val
 - just a deletion, no frame shift

3. For each statement, tell whether it describes either Cystic Fibrosis or Huntington's Disease.
- a. Involves a repeat of CAG bases, producing a string of glutamines HD
 - b. Appears in middle age HD
 - c. The deletion of the amino acid F508 CF
 - d. Mutation in the CF transmembrane conductance regulator (CFTR) CF
 - e. Digestive failure, mucus buildup in the lungs, salty sweat CF
 - f. A change in the DNA that codes for the protein Huntingtin HD
 - g. A cure could be to find a way to insert the missing Phe codon back into mRNA CF
 - h. Affects the nervous system, leading to physical impairment HD
 - i. Death by mid thirties CF

4. What is translation? Describe the process. What is an anticodon?
- process: attach amino acid to unactivated tRNA to activate it
 - it is on unactivated tRNA
- 3 steps: 1) initiation - mRNA attaches to small ribosome, activated tRNA for met attaches to mRNA, large ribosome attaches
 2) elongation - adding more a.a. to it - growing peptide chain
 3) termination - stop codon is reached, release factor binds and ribosome falls apart
- anti-codon - complement to the codon ex. UUU: codon, AAA: anti-codon