Welcome Back! 11/16/18

DNA Strand:
TAC  CGA  CCA  GCT

mRNA :

Amino Acid:

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Mutations
Mutation

• **Mutation** - any change in the sequence of DNA

• **Mutagen** - any agent causing a mutation to occur (Example - Radiation)

• **Three types of mutations**
  1. Substitution
  2. Deletion
  3. Insertion

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**Original sequence**

- Substitution: TGG → CAG
- Insertion: TGGC → CAG
- Deletion: TGGC → CAG

**Mutated sequence**

- Substitution: TGG → TAG
- Insertion: TGGTAT → CAG
- Deletion: TGG → G
Do not write

THE FAT CAT ATE THE RAT

THF ATC ATA TET HER AT
Mutation - Deletion

- Deletion - A base is removed/deleted
  - Causes a frameshift

Example -

- AAA  CCC  GGG  TTT  (Original DNA Strand)
- AAA  CCC  GGT  TT   (Mutated DNA Strand)
Mutation - Insertion

• Insertion - A base is added
  • Causes a frameshift

Example -

• AAA   CCC   GGG   TTT  (Original DNA Strand)
• AAA   CCC   GGC   GTT   T   (Mutated DNA Strand)
Mutation - Substitution

- Substitution - A base is replaced/substituted

- Example -

- AAA  CCC  GGG  TTT  (Original DNA Strand)
- AAA  CCC  CGG  TTT  (Mutated DNA Strand)
Impact of Mutation (Need Codon Chart)

**Original:** TAC  CGA  
mRNA:  AUG GCU  
Amino Acid: MET - ALA

**Substitution**
Original: TAC  CGA  
Mutated: TAC  CTA  
mRNA:  AUG GAU  
Amino Acid: MET -

**Deletion**
Original: TAC  CTA  
Mutated: TAC  CT  
mRNA:  AUG  
Amino Acid: MET -

**Insertion**
Original: TAC  CTA  
Mutated: TAC  CTT  A  
mRNA:  AUG  
Amino Acid: MET -
Question?

Are all mutations bad?

Go to website and watch one of the two video:
Sickle Cell Anemia and Lactose Tolerance.

Mrmsmith.weebly.com
USAtestprep

- Sign up for USA Testprep
- Newton78 – Activation code
- Westlake – Account ID
- Create username and password
- “Join class”, select “Mr. Smith” and class period.
- Need to join by the end of your class