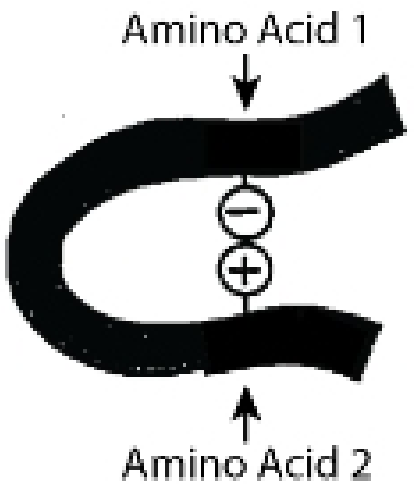
Instructions: Each of these questions is worth 5 points. Questions that may have multiple answers are indicated by the phrase "**Choose all that are correct.**"

1. Amino acids 1 and 2 interact as shown in the figure below. Amino acid 1 is coded for by the codon 'GAA'. Amino acid 2 is coded for by the codon 'CGA'. A mutation changes the codon of amino acid 1 to 'AAA' and disrupts its interaction with amino acid 2. The sequences listed below are mutations to the codon for amino acid 2 - which of these mutations would likely restore the interaction between acids 1 and 2? **Choose all that are correct.**



a. AAG

b. ACU

c. GUA

d. GAU

e. UUU

f. GAG

g. AGG

h. None of the above

2. Which of the following terms **always** describe the type of mutation that occurs when an T base undergoes a tautomeric shift during DNA replication? **Choose all that are correct.**

a. point mutation

b. transversion

c. nonsense mutation

d. silent mutation

e. transition

f. suppressor mutation

g. deamination

3. Where is a nonsense suppressor mutation most likely to occur? **Choose all that are correct.**

a. in non-coding DNA

b. in a regulatory element

c. in a protein-coding gene

d. in a tRNA gene

e. in an rRNA gene

f. None of the above

4. A mutation changes a codon from 'AUU' to 'AUC'. Which of the following terms correctly describes this mutation? **Choose all that are correct.**

a. missense

b. nonsense

c. silent

d. antisense

e. omnisense

f. It is not possible to determine

5. The *Salmonella* strain that you are using to perform the Ames test randomly acquires a mutation that inactivates MutH. When you use this strain to perform an Ames test, you expect that (**Choose all that are correct**):

a. UV light will be more mutagenic in this strain than in wild-type *Salmonella*.

b. UV light is less mutagenic in this strain than in wild-type *Salmonella*.

c. There will be no difference in how mutagenic UV light is in this strain.

d. More bacterial growth will occur in the control sample.

e. Less bacterial growth will occur in the control sample.

f. There will be no change in the amount of bacterial growth that occurs in the control sample.

6. A cell acquires a mutation that inactivates its only AP endonuclease enzyme. Which of the following is the cell most likely to be more sensitive to? (**Choose all that are correct**).

a. UV light

b. Nitrous acid

c. Ethidium bromide

d. Spontaneous deamination

e. depurination

f. None of the above

7. A point mutation changes an amino acid from alanine to valine. A second point mutation changes the same amino acid from valine back to alanine. Is this reverse mutation a true reversion?

a. Yes

b. No

c. I can't tell based on this information

8. What type(s) of mutation is **most** likely to occur if a double strand break occurs within a gene and is repaired by non-homologous end-joining? **Choose all that are correct.**