

MUTATION WORKSHEET

Work in pairs to analyze the DNA sequences and determine what is wrong with them. First you must find what is different in the DNA sequence. Write down the name of the type of mutation. Then determine how that difference would change the amino acid sequence, if it changes it at all by looking at the **Codon Table**. Mark the difference in sequence with a different color or circle it so that your teacher can easily see where the change is.

1.

5'-GGUGGUUAUCGUAAUUUAUUGGAAGACAAAUGC-3' - original
5'-GGUGGUUAUACGUAAUUUAUUGGAAGACAAAUG-3' - mutated

Answer: insertion of A

5'-GGU GGU UAU CGU AAU UUA UUG GAA GAC AAA AUG-3' C - original
gly gly tyr arg asp leu leu glu asp lys met

5'-GGU GGU UAU **ACG** UAA UUU AUU GGA AGA CAA AAU-3' G - mutant
gly gly tyr **ser** stop phe phe gly arg stop asp

2.

5'-GGUAAACCCUAUGGCUUGAUCACGCAACACCGCUUA-3' - original
5'-GGUAAACCCUAUGGCUUGAUCACGCAACACCGCUUAA-3' - mutated

answer: deletion of C after 8th codon

5'-GGU AAA CCC UAU GGC UUG AUC ACG **CAA** CAC CGC UUA-3' - original
gly lys pro tyr gly leu ile thr **glu** his arg leu

5'-GGU AAA CCC UAU GGC UUG AUC ACG **AAC** ACC GCU UAA-3' - mutated
gly lys pro tyr gly leu ile thr **asp** thr ala Stop

3.

5'-GGUAAACCCUAUGGCUUGAUCACGCAACACCGCUUA-3' - original
5'-GGUAAACCCUAUGGCUUGAUCAACGCACACCGCUUA-3' - mutant

answer: inversion of ACG CAA to AAC GCA

5'-GGU AAA CCC UAU GGC UUG AUC **ACG CAA** CAC CGC UUA-3' - original
gly lys pro tyr gly leu ile thr glu his arg leu

5'-GGU AAA CCC UAU GGC UUG AUC **AAC GCA** CAC CGC UUA-3' - mutant
gly lys pro tyr gly leu ile asp ala his arg leu

4.

5'-GGUGGUUAUCGUAAUUUAUUGGAAGACAAAUGC-3'
5'-GGUGGUUAUCGUAAUUUAUUGGAAGACAACAUGC-3'

answer: base-pair substitution with amino acid change

5'-GGU GGU UAU CGU AAU UUA UUG GAA GAC **AAA** AUG C-3' - original
gly gly tyr arg asp leu leu glu asp **lys** met

5'-GGU GGU UAU CGU AAU UUA UUG GAA GAC **AAC** AUG C-3' - mutant
gly gly tyr arg asp leu leu glu asp **asp** met

5.

5'-GGUGGUUAUCGUAAUUUAUUGGAAGACAAA AUGC-3'

5'-GGUGGUUAUCGUAAUUUAUUGGAAGACAACAUGC-3'

answer: base-pair substitution without amino acid change

5'-GGU GGU UAU CGU AAU UUA UUG GAA GAC AA A AUG C-3' - original
gly gly tyr arg asp leu leu glu asp lys met

5'-GGU GGU UAU CGU AAU UUA UUG GAA GAC AA G AUG C-3' - mutant
gly gly tyr arg asp leu leu glu asp lys met