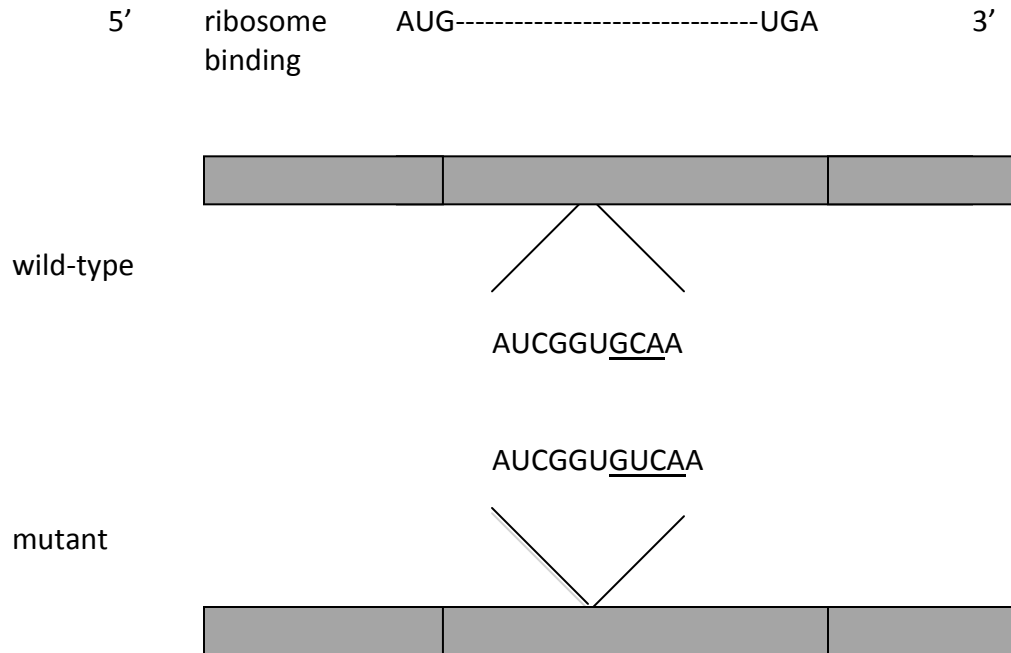


**Training Question 1.** Shown below is a schematic representation of an mRNA encoding a protein. The sequence of a portion of the wild type message is shown, and also the message produced by the gene following the occurrence of the point mutation displayed by underlining:



a) Circle the term(s) that describe(s) the nature of the mutation:

- i Frame shift
- ii Deletion
- iii Insertion
- iv Missense
- v Nonsense
- vi. Silent

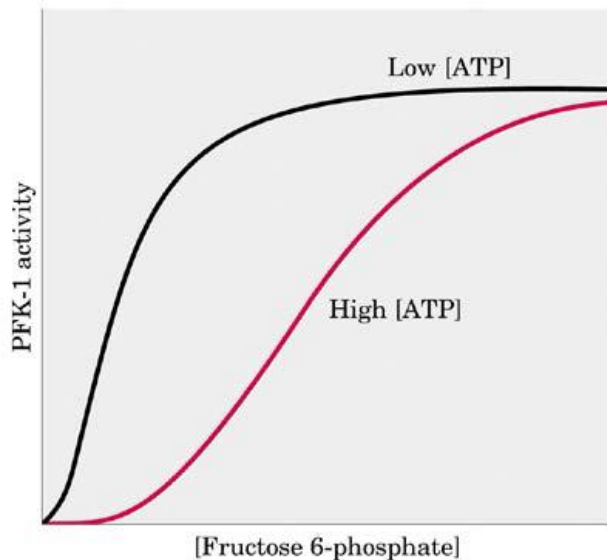
b) Predict the likely effect, if any, the mutation will have on the function of the polypeptide encoded by this gene. Explain your reasoning in the space provided below:

**Training Question 2.** Base pairing between the tRNA anticodon and the mRNA codon, within the ribosome, is an integral part of the tRNA function as an "adapter" between the genetic information and amino acid sequences of proteins.

However, when free in solution, tRNAs bind to their complementary trinucleotide codons on mRNA only weakly. Given this observation, predict what other kinds of interactions within the components of the ribosome, might be involved in correctly matching a tRNA to the appropriate codon.

**Training Question 3.** Shown below is the activity profile for the enzyme phosphofructokinase-1 (PFK-1) which catalyzes the reaction:

Fructose 6-phosphate + ATP  $\rightarrow$  fructose 1,6-biphosphate + ADP.



Describe the different patterns of regulation for different ATP levels. Explain the why such regulation is appropriate for this enzyme, given its role in metabolism.