



**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.

Assigned Core Concept: # 2 *MACROMOLECULAR STRUCTURE DETERMINES FUNCTION AND REGULATION.*

Core Concept Learning Objective(s): *2b: Given: A figure depicting the key structural features of a biological complex, students will **hypothesize** forces stabilizing the structure and **design** an experimental test to evaluate the potential contributions of each force to stabilizing its structure, or (from 2.) interpret results of experiments on their interactions.*

Bloom's level: Level 3 application

**Rubric:**

**High proficiency (3)**

a) Answer clearly stated that other interactions between tRNA and the ribosome are required beyond just the anticodon to produce a stable interaction, *and* that the conserved bases in the rRNA in the ribosome are likely candidates because tRNA-rRNA base pairing could occur.

**Some proficiency (2)**

a) Answer stated that interactions are required between more than just the three nucleotides of the anticodon, clearly stated that the ribosome is where these additional interactions will take place, but does not specify rRNA

OR

Answer proposed that tRNA could interact with amino acid residues in the ribosome without acknowledging rRNA in ribosome.

**Not yet proficient (1)**

a) Answer failed to address the fact that additional interactions are important, or confuses nucleotide base pairing with protein-protein interactions. Does not mention ribosome in the answer or does not correctly state the role of tRNA.

**Answer not applicable (0)**

a) Answer left blank

OR

Suggested that the additional interactions involve other bases on mRNA

OR

Answer not relevant to question