

Name: _____ EID: _____

Topic: Expanded Genetic Codes (Week 12)

Pre-discussion questions. Answer briefly. Use only the space provided.

- 1) What are the so-called 21st and 22nd natural amino acids that are found in the expanded genetic codes of certain (non-engineered) microorganisms?
- 2) If you could rewrite the genetic code from scratch, how many amino acids could theoretically be encoded by a non-overlapping nucleotide triplet code? (Consider that you might need some codons for functions related to translation other than encoding amino acids.)
- 3) What are three genetic parts and/or modifications to the host organism genome that are needed to create an efficient and high-fidelity orthogonal translation system for incorporating an unnatural 21st amino acid into the genetic code? Briefly explain the function of each one.
- 4) What is an application of adding a new amino acid to the genetic code of a microorganism? Why would you want to do it? Give an example of a chemical activity that an unnatural amino acid has that is not present in the 20 amino acids of the canonical genetic code.