

hey

Translation & Proteins

T/F & fill in:

Microbiome analysis helps to understand the microbiome population.

Ribosomes need both subunits to work. True

Bacteria ribosomes are 16S RNA while Eukaryotes are 18S RNA.

18S RNA sequencing can be used to identify bacteria species. false

polypeptides are precursors to proteins.

chaperones assist in protein folding.

What does translation require?

Amino Acids, mRNA, ribosomes, and tRNA

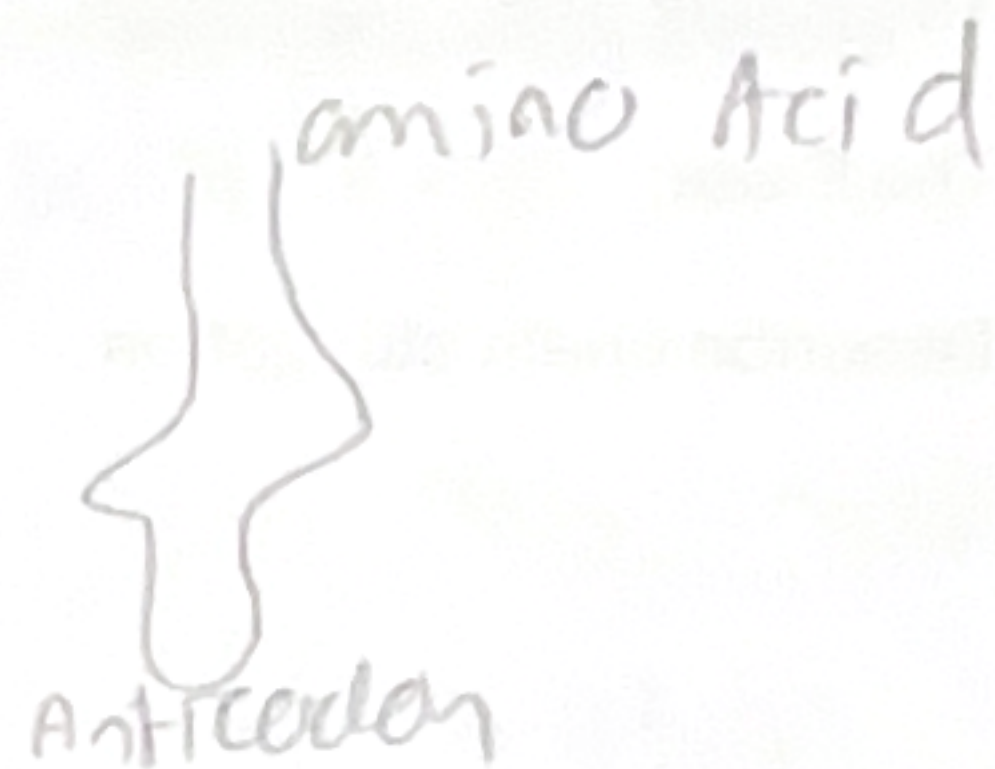
Compare and contrast high yield and low yield dairy cattle and their microbiome.

HY = more firmicutes

LY = more bacteroidetes

Describe the tRNA molecule.

- clover leaf
- holds anticodon
- has posttranscriptionally modified bases



Describe tRNA charging.

Aminoacyl tRNA synthetase adds the appropriate amino acid

What does initiation require?

small and large subunits
mRNA
GTP

charged tRNA
 Mg^{2+}
initiation factors

Describe how initiation works in bacteria.

Initiation factors bind to small subunit and takes in mRNA and is released. The large subunit comes in and binds to start.

What is the shin-Dalgarno sequence in prokaryotes? What is its sister sequence in eukaryotes?

An initiation sequence that increases the efficiency of translation. Kozak sequence

The A site: mRNA enters

The P site: AA added

The E site: tRNA leaves

Describe chain elongation.

Translation proceeds and the tRNA will keep adding AA and grow the polypeptide chain

Describe termination. What release factors are needed?

Either stop codon or GTP-dependent release factors (energy breaks bond and frees the polypeptide).

What are polysomes?

mRNA strand read/translated by many ribosomes to make more than 1 protein at a time.

Describe some differences in translation in eukaryotes compared to prokaryotes.

- Ribosomes live longer
- 5' mg cap and 3' poly A tail
- 5' UTR sequence
- ribosomes on Rough ER.
- closed loop

What post-transcriptional modifications allow for closed loop translation in eukaryotes?

What is a closed-loop translation?

A 5' mg cap and poly-A tail
when the mRNA form a loop, regular translation
will still occur

Describe phenylketonuria, a metabolic error due to protein translation.

Phenylalanine can't be converted into tyrosine
because phenylalanine hydroxylase is
inactive. too much causes mental
retardation

What is Alkaptonuria?

Alkapton can't be metabolized

Describe amino acids.

- a carboxyl group
- An amine group
- a r group

What are peptide bonds? What is produced when they are formed?

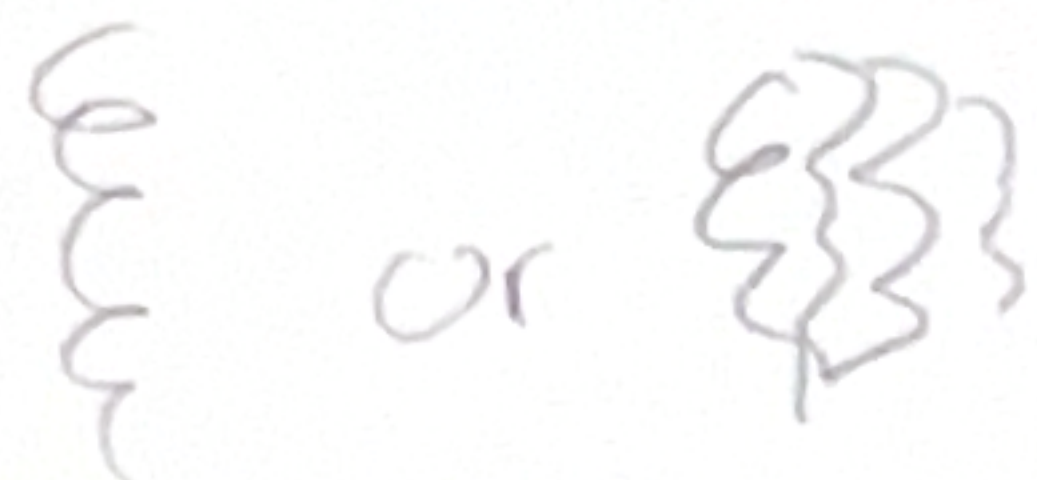
They link AA and produce H_2O
when formed

Primary proteins:

a chain of AA

Secondary proteins:

Alpha helix and beta pleated sheets



Tertiary proteins:

3D



Quaternary protein:

multiple polypeptides



List the posttranslational modifications added to the proteins to make them functional.

- N terminus AA removal/modification
- AA residues modified
- carb side chains added
- trim polypeptides
- signal sequence removed

- metals added

What are the two diseases of protein folding?

scrapie and BSE