Chapter 8
8.5 Translation

Review:

- Recall that at the end of transcription, RNA (mRNA, rRNA, and tRNA) are produced, they detach from the DNA, and enter into the cytoplasm

Translation

- **Translation** is converting words from one language to another.
- **Translation** occurs in cells (in the cytoplasm)—cells translate RNA messages into amino acids (the building blocks that make **protein**)
- *recall central dogma!

The "words"

- Recall that the words in DNA language are called Codons
- Codons: a sequence of 3 nucleotides that codes for an amino acid.
- Examples: AUG CUU CGA
- Different codons code for different amino acids (see table)

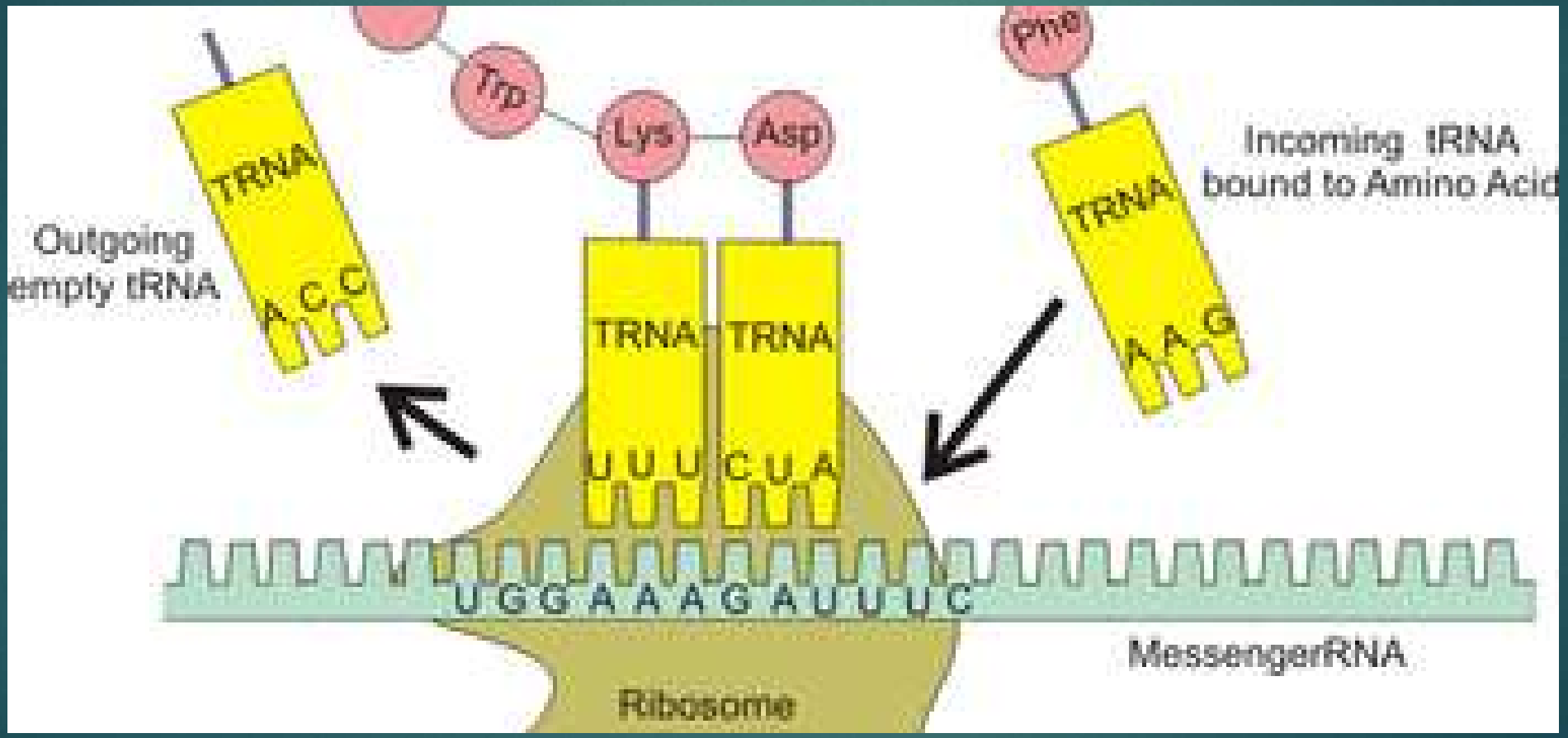
Genetic Code (table)

- On page 244 in textbook—use table to determine what amino acid each codon codes for.
- Practice: AAU GAU AUU
- AUG (methionine) is a start codon—signals the start of translation
- UAA and UAG are stop codons—they signal the end of an amino acid chain.
- A "reading frame" is the process of reading every codon continuously without overlapping. (much like in English reading left to right or it doesn't make sense)
  "Punctuation like the Start/Stop codons are very important.

Every organism shares the exact same genetic code!

tRNA….

- tRNA acts a an adaptor between mRNA and amino acids.
- They carry free-floating amino acids from the cytoplasm to the ribosome.
- They have an "L" shape
- One end carries an amino acid, the other end is an anticodon that is complementary to the mRNA codons, so it "fits together" with mRNA.


Trp
Lys
Asp
Phe
TRNA
TRNA
TRNA
TRNA
Outgoing
empty tRNA
Incoming tRNA
bound to Amino Acid
A C C
U U U C U A
A A G
U G G A A A G A U U U C
MessengerRNA
Ribosome

Translation

- This process continues to translate the mRNA strand until it reaches a STOP CODON!
- It then releases the new protein and disassembles
- The exiting tRNA goes back to the cytoplasm to recharge

See for yourself

- Transcription and Translation video