

- One enzyme for each of the 20 amino acids
- Attachment uses ATP
 - The amino acids are *phosphorylated* by ATP
 - This makes the amino acid active. Now it is called *activated amino acid*
- A specific enzyme joins a specific amino acid and a specific tRNA molecule
- *Hydrogen bonds* will be formed between complementary bases in tRNA
 - This causes tRNA to fold and form loops that include unpaired bases
- One of the loops contains an exposed anticodon
 - This anticodon is unique to each type of tRNA
 - This anticodon will pair with a specific codon of mRNA
- Initiation of translation involves assembly of the components that carry out the process
 - The activated amino acid methionine attaches to a tRNA with the anticodon UAC and then combines with the codon AUG that exists on the 5' of the mRNA
 - The small ribosomal subunit joins in
 - The small subunit moves down the mRNA until it contacts the start codon
 - This contact starts the translation process
 - Hydrogen bonds form between the initiator tRNA and the start codon
 - The large ribosomal subunit combines with these parts to form the *translation initiation complex*
 - The complex is joined by proteins called *initiation factors*
 - They require energy from *guanosine triphosphate (GTP)*
 - Similar to ATP

Elongation phase

- tRNAs bring amino acids to mRNA
 - The triplet bases of the mRNA codon form complementary base pairs with the triplet anticodon of the tRNA
- Process:
 - tRNAs bind to mRNA codons at the A site with the help of proteins called *elongation factors*
 - The initiator tRNA moves to the P site