

Source: [KBhBIO101ProteinSynthesis](#)

1 | Protein Translation

After [KBhBIO101DNATranscription](#) and [KBhBIO101mRNAPreprocessing](#).pdf, the mature mRNA was sent to ribosome. mRNA must travel to the cytoplasm in the Eukarotes to catch the RNA, whereas in prokarotes they don't have to go anywhere.

1.1 | Ribosomes

Ribosomes are the protein devices that takes mRNA and create the actual sequence of amino acids that are folded together to create a protein.

Ribosomes has two units: 50S unit + 30S unit => they come together whenever a mRNA needs it. Each contained specialized rRNA + tRNA to catalyze attachment of and carry amino acids + adapt the incoming mRNA respectively.

1.2 | The Actual Process of Translation

Firstly, a **Note! The beginning of mRNA is not translated.** There a portion on the 5' end of the mRNA (starts with AGGAGG) — about 170 nuclotides in humans, and shorter in bacteria — that's called UTR (untranslated region.) This region helps ribosomes bind to it + stablize the binds.

Basically: smaller ribosome unit grabs the incoming mRNA, larger facilitate the attraction of amino-acid carrying tRNA to the mRNA and pluck the resulting amino acids on the tRNA to form an amino acid.

1. 3 protein factors IF1, IF2, IF3 forms a complex for transcription by binding to a subunit on the ribosome
2. Methionine-carrying tRNA binds to the start of the mRNA, which forms the initiation complex. This is typically removed after translation if not coded for (f M-A amino acid pair coded for, methonine removed; but if M-L pairs coded for, methonine not removed.)
3. A-site: translates mRNA to tRNA — anti-codon pairs
4. P-site: amino acid dumped from tRNA to the actual chain being built
5. Spent tRNA ejected to the E-site, which is then recycled
6. Catalyst tRNA combines with rRNA to catalyze amino acid peptide bond
7. Each codon (group of 3 units in tRNA), matches a specific [KBhBIO101AminoAcids](#)

After the amino acids are assembled, it's time for [KBe2020bio101refProteinFolding](#). See also [KBhBIO101Proteins](#) => After the amino acid sequence is done, shaperones fold proteins, and if its finds proteins impossible to fold, it flags it using ubiquitin to send to the garbage