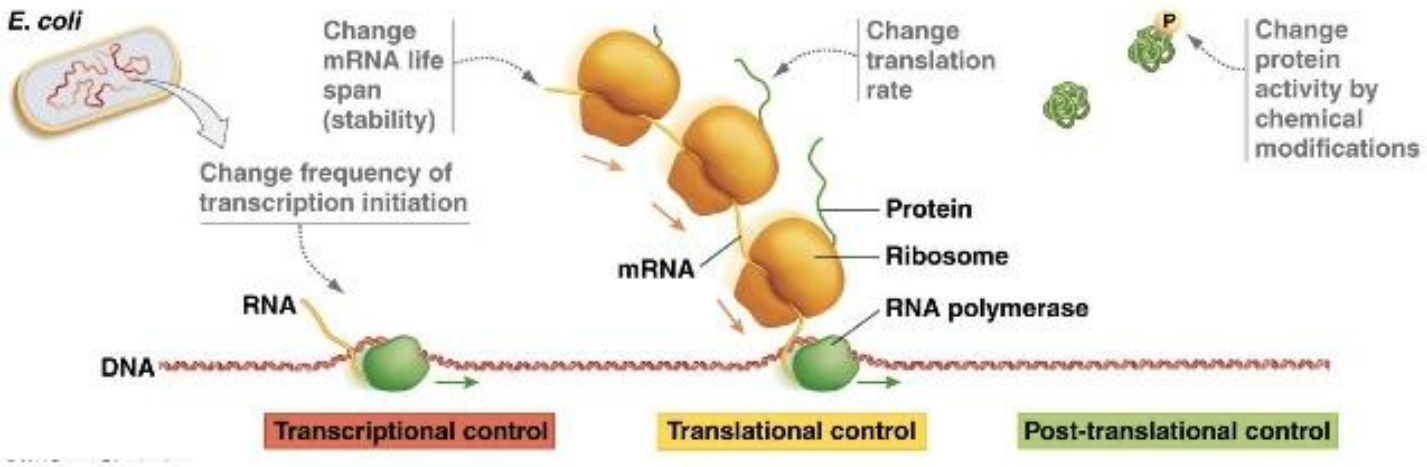
Review

Review topic “regulation of gene expression in prokaryotes”. Classes 19-2-04, 05 and 06

Gene Expression in Eukaryotes

Regulation of Gene Expression



- Gene expression can be regulated:
  - During transcription (transcriptional control).
  - During translation (translational control).
  - After translation (post-translational control).

Differences in gene expression between prokaryotes and eukaryotes -1

- In prokaryotes transcription and translation often occurs simultaneously and co-localized
- In eukaryotes transcription occurs in nucleus. Messenger RNA is transported outside nucleus where it is translated

Differences in gene expression between prokaryotes and eukaryotes-2

- Bacterial messenger RNA is often polycystronic i.e. encodes more than one polypeptide separately within the same RNA molecule.
- Eukaryotic messenger RNA is monocystronic

Differences in gene expression between prokaryotes and eukaryotes -3

- Bacterial messenger RNA is translated as without undergoing modifications
- Eukaryotic messenger RNA undergoes splicing and processing

Differences in gene expression between prokaryotes and eukaryotes -4

- In bacteria promoter is recognized by RNA polymerase and an associated sigma factor.
- In eukaryotes the process is more complicated, and at least seven different factors are necessary for the binding of an RNA polymerase II to the promoter.