

I

Difference between

Prokaryotic Ribosome

Eukaryotic Ribosome

→ 1) Smaller in size $\sim 200 \text{ \AA}$

Larger in size
($250 - 300 \text{ \AA}$)

2) Sedimentation Co-efficient is
70S

Sedimentation Co-efficient
80S

(subdivided into 80S & 50S
subunits)

(subdivided into
60S + 40S subunits)

3) 50S - has - 5S rRNA
- 23S rRNA

3) ~~40S~~ - 60S has
5S, 5.8S, 28S
rRNA

30S - has 16S rRNA

40S has 18S rRNA

4) Free in cytoplasm

4) most are attached to
outer surface of nucleus
and ER (RER)

II

Fidelity in Translation

Q How is accuracy maintained during protein translation, so that wrong amino acid does not get incorporated??

A High fidelity of Protein synthesis from mRNA is maintained at 2 steps (mainly)

✓ 1) t-RNA charging with correct amino acid
(correct aminoacylation)

✓ 2) Codon-directed - attachment of correct tRNA
to ribosome (at initiation step)
Correct codon-anticodon pairing

Details:

1) tRNA charging: is by enzyme aminoacyl tRNA synthetase - it recognizes incorrect amino acid immediately & proofreads it

This enzyme has 2 sites: 1) catalytic site

2) editing site - wrongly acylated tRNA are hydrolyzed

2) Selection of incorrect tRNA during elongation cycle & its incorporation into ribosome

charged tRNA (aminoacyl tRNA) reaches ribosome as a complex with GTPase, Elongation factor (Tu in bacteria & EF1A in eukaryotes), GTP

↓
As soon as codon-anticodon match happens

↓
GTP hydrolysis

↓
elongation takes place