

# RIBOSOME

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# Introduction

- It is a large & complex molecule.
- Found in all living cells prokaryote & eukaryote.
- That serves as the primary site of biological protein synthesis.
- Ribosome was first observed in 1953s by romanian cell biologist george emil palade using a electrone microscope.

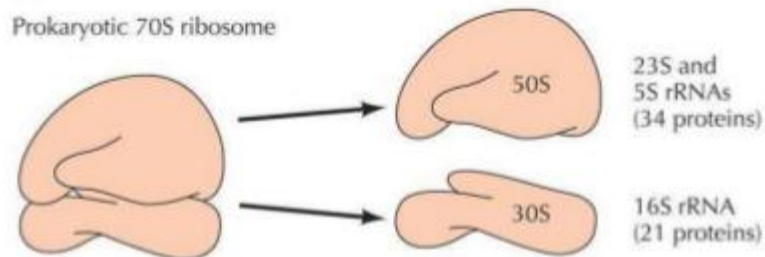
# Discovery of Ribosomes

- **Palade** was the first person to study them in 1955



# Structure of Ribosomes

- Ribosomes are not bounded by membrane
- Prokaryotic Ribosomes are smaller and less dense than Eukaryotic Ribosomes
- Ribosomes are composed of two subunits, each of which consists of protein and a type of RNA called **Ribosomal RNA (rRNA)**



# Ribosomal Subunits

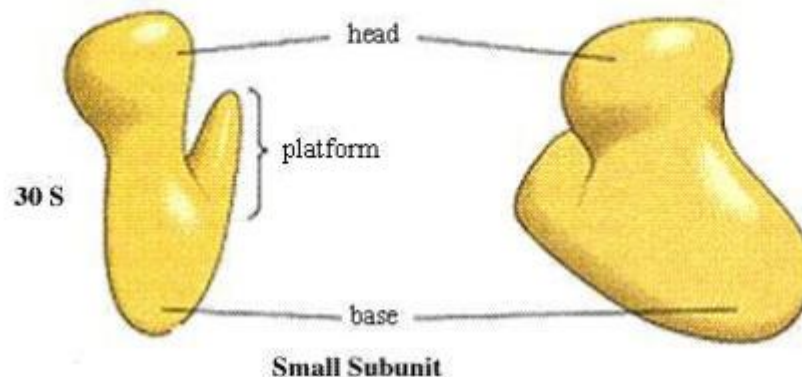
- Each subunit is constructed from one to two rRNA molecules and many polypeptides
- 30S smaller Subunit
- 50S larger Subunit

# Svedberg Unit

- The S in 70S and similar values stand for **Svedberg units**
- The faster a particle travels when centrifuged, the greater its Svedberg value or Sedimentation coefficient
- The sedimentation coefficient is a function of a particles molecular weight, volume and shape
- Heavier and more compact particles normally have larger Svedberg numbers or sediment faster

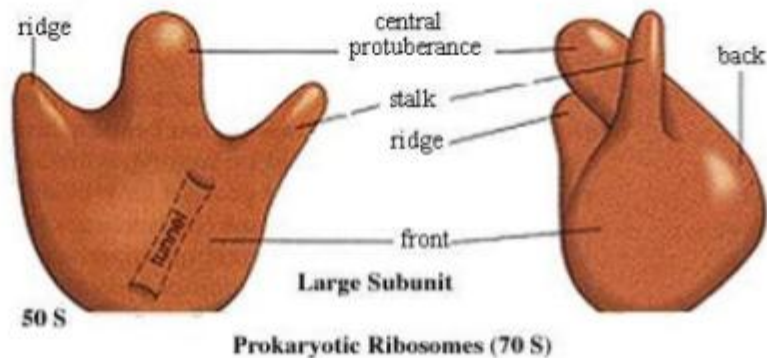
# 30S Subunit

- 30S Subunit is smaller and has a molecular weight of  $0.9 \times 10^6$  daltons
- It is made up of 16S rRNA and 21 Polypeptide chains



# 50S Subunit

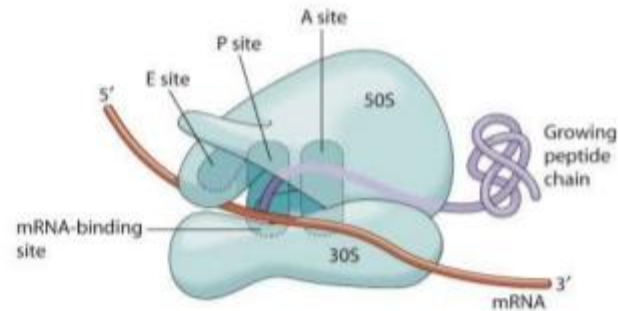
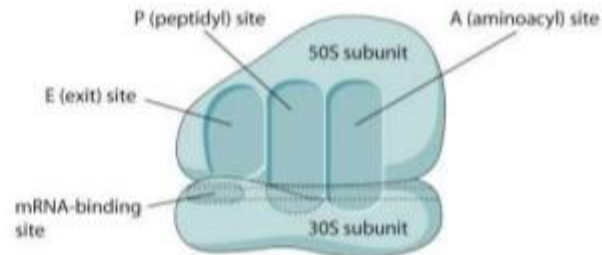
- The 50S subunit is larger one and has a molecular weight of about  $1.8 \times 10^6$  daltons
- It consists of 5S rRNA, 23S rRNA and 34 Polypeptide chains





# Sites of Ribosome

- The ribosome has three sites for binding tRNA
- The Peptidyl or Donor site (the P site)
- The Aminoacyl or Acceptor Site (the A site)
- The Exit Site (the E site)



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# Function of Ribosomes

- The Ribosome is involved in the process of **Protein Synthesis**
- Protein Synthesis is divided into three stages:
  1. Initiation
  2. Elongation
  3. Termination