- Site of protein synthesis
- Prokaryotic Rb are 70S (smaller) while eukaryotic Rb are 80S in size (Svedberg Units)
- Small and large subunits

⇒ No membrane bound nucleus
- Single circle of dsDNA
- Nucleoid
- DNA looped and coiled to be packed inside the bacteria cell
- **Plasmids** – extra chromosomal DNA, there are different types as long as they are compatible

⇒ **Chemotaxis** – movement in response to chemicals
- Attracted by nutrients
- Repelled by toxic/harmful substances
- Can sense substances in their environment

⇒ **Acid Fast Bacteria**
- Stain poorly w/ Gram stain
- *Mycobacterium* and *Nocardia* – some are pathogenic
  - *M. tuberculosis, M. leprae, M. avium- intracellulare* complex
  - *Nocardia* spp.

⇒ Purpose of acid fast cell wall
- Grow slow – divide every 12 hours
- Resistant to chemicals and lysosomal components
- Strength

⇒ Acid fast cells in our body
- Activated both innate and adaptive immunity
- Triggers inflammation and antibody production

Ch 6 – Growth and Control

⇒ Growth
- Increase in cell number – but doesn't actually divide
- Increase in cell constituents
- Coenocytic cell – more than one nucleus

⇒ Cell Division
- **Binary fission** – how the majority of prokaryotes reproduce.
- **Septum** – when a nucleoid divides, the cell wall and membrane begin to form a septum
- Partitioning
- The time required to complete the growth is variable.
- It is dependent on availability of nutrients, genetic factors, and environmental conditions.
  - *V. natragens* – 6 mins
  - *E. coli* – 20 mins
  - *Mycobacterium tuberculosis* – 12 hr

⇒ **Generation time**
- The time it takes for the population to double in number.
- *E. coli* 20 minutes
- Tim 0 = 1 cell
- 6 h 40 m (20 generations) = 1,000,000
- 24 hours = 1,000,000,000,000,000,000,000 cells)

⇒ Generally, when organisms are studied, they are grown in a **batch culture**.