Chapter 6

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- Two types of cells:
  1. Prokaryote (Bacteria) − No organelles, have DNA, no nucleus, have ribosomes
  2. Eukaryote (Plant and Animal cells) − Have organelles, nucleus, etc.
- The greater the size of the cell, the surface area to volume ratio decreases. Cell size may then be inadequate for cell size
- Why are organelles used?
  1. Specialized structures, with specialized tasks
  2. Compartmentalize the cell (higher pH in some regions)
  3. Membranes used as places for chemical reactions (embedded enzymes and reaction centers)
- What jobs do cells have?
  1. Make proteins
  2. Make energy
  3. Make more cells
- Organelles involved in building a protein:
  1. Nucleus
  2. Ribosome
  3. Endoplasmic Reticulum (ER)
  4. Golgi Apparatus
  5. Vesicles
- Endoplasmic Reticulum (rough) has ribosomes on the outside

- Lysosome functions:
    1. Digests macromolecules (use enzymes)
    2. Cleans up broken down organelles
    3. Fuse with food vacuoles to break down polymers
    4. May sometimes work incorrectly (lead to problems such as Tay-Sachs disease)
- White blood cells attack foreign agents (phagocytosis)
- Apoptosis − Programmed cell death (broken down by lysosomes)
    1. Ex. Loss of webbing between fingers during fetal development
- Smooth Endoplasmic Reticulum is where lipids are made
- Mitochondria and Chloroplasts:
    1. Organelles not part of the endomembrane system (have separate DNA)
    2. Grow and reproduce in cell
- Endosymbiosis Theory:
    1. Mitochondria and chloroplasts were once free living bacteria, then were engulfed by a eukaryote
    2. Endosymbiont − Cell that lives within another (host) cell
        (a) One supplies energy, while others supply raw materials and protection