

## Cell and Cell Theory

### Cell

- the basic structural and functional unit of all living organisms
- the smallest unit of life and can replicate independently
- the study of cell is called Cell Biology
- cells vary from individual “single cell” organisms (bacteria) to “multi cellular” structures (tissue, organs) and organisms (animals and plants).

### Microscope

- The microscope is an instrument used to view objects that cannot be seen by the unaided eye. It can magnify the size of very small objects

### The Invention of the Microscope

- Romans had already invented and experimented with glasses during the first century.
- They discovered that small objects become larger when viewed through this glass sample.
- The word lens is derived from the Latin word lentil, because it closely resembled the shape of the lentil bean.
- Around 1595, the first compound microscope was invented by Zacharias Janssen (1580-1638)
- They made these microscopes by placing several lenses together, and discovered that objects were further enlarged upon viewing.

### Discovery of Cell

- Cell was discovered by Robert Hooke in 1665. The discovery of the cell was made possible through the invention of the microscope. He first observed cell in thin slices of bottle cork.
- Hooke discovered many tiny pores that he named "cells". This came from the Latin word "Cella". He described the cells as tiny boxes or a honeycomb. He thought that cells only existed in plants and fungi.
- Anton van Leeuwenhoek (1673): Used a handmade microscope to observe pond scum and discovered single-celled organisms. He called them “animalcules”
- He also observed blood cells from fish, birds, frogs, dogs and humans.

- Between the Hooke/Leeuwenhoek discoveries and the mid 19<sup>th</sup> century, very little advancements in cell were made.

### **Development of Cell Theory**

- 1838- German Botanist, Matthias Schleiden, concluded that all plant parts are made of cells.
- 1839- German physiologist, Theodor Schwann, who was a close friend of Schleiden, stated that all animal tissues are composed of cells.
- 1858- Rudolf Virchow, German physician, after extensive study of cellular pathology, concluded that cells must arise from preexisting cells.
- Robert Remak - Prove the idea of cell division by hardening the cell membrane

### **Cell Theory**

- Their researches became the bases of the cell theory.
  1. All organisms are composed of one or more cells .
  2. Cell is the basic unit of life in all living things.
  3. All cells are produced by the division of preexisting cells.

### **Modern Cell Theory**

- Modern Cell Theory contains four statements, in addition to the original Cell Theory:
  1. The cell contains hereditary information (DNA) which is passed on from cell to cell during cell division.
  2. All cells are basically the same in chemical composition and metabolic activities.
  3. All basic chemical and physiological functions are carried out inside the cells (movement, digestion etc.)
  4. Cell activity depends on the activities of sub-cellular structures within the cell (organelles, nucleus, plasma membrane etc.)