CONCEPT: HISTORY OF CELL BIOLOGY

Discovery of Cells

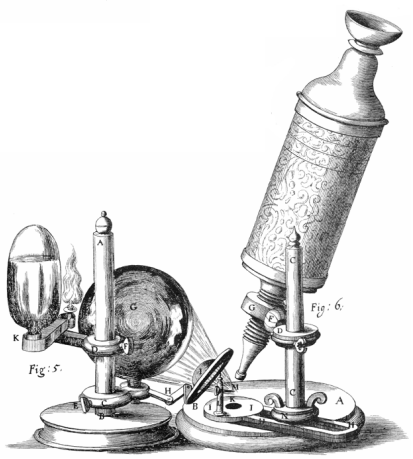
● The discovery and study of cells has been limited by the fact cells cannot be seen with the _____ eye

□ **Microscopes**, or instruments that provide magnification of a tiny object, are used to study cells

□ Lenses were invented in the 13th century

□ Mid 1600s, scientists were beginning to make homemade microscopes

EXAMPLE: Example of 1600s microscope



● **Robert Hooke** was the first person to propose the _____ of cells (1660s)

□ Wanted to answer the question "Why are corks so good at holding air in a bottle"

□ Cut off a piece of cork and examined it under his homemade microscope (30x magnification)

□ Saw and named "cells" based off the living cells monks lived in

- Dead plant tissue – cell walls

EXAMPLE: Hooke's drawing of cork cells

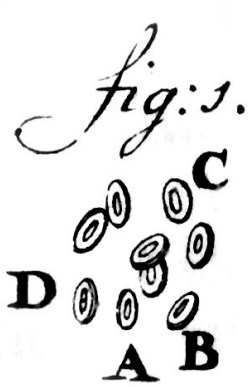
● **Anton van Leeuwenhoek** was the first to visualize _____ cells (1670s)

□ Increase magnification of lenses to 300x magnification

□ Observed pond water, blood, sperm – and recorded what he saw

□ Wrote letters to the Royal Society – who then sent Hooke to confirm his observations

EXAMPLE: Leeuwenhoek's drawings of blood cells



<u>The Cell Theory</u>

● The **cell theory** was created by three scientists (1800s)

□ Invention of the **compound microscope** allowed for greater magnification and **resolution**

□ Matthias Schleiden discovered that _____ were made of cells, and derived from a single cell (1830s)

□ Theodor Schwaan discovered that _____ were made of cells (1830s)

□ Together they published the first two tenants of the cell theory

- *All organisms are composed of one or more cells*

- *The cell is the structural unit of life*

□ Rudolf Virchow added to the cell theory (1850s) that:

- *Cells can arise only by division from a preexisting cell*

EXAMPLE: 1800s Compound Microscope

Modern Cell Study

- Modern Cell Biology consists of three fields: **Cytology, Biochemistry,** and **Genetics**
    - □ Cytology: Study of cellular structure
    - □ Biochemistry: Study of cellular structure and function
    - □ Genetics: Study of the storage and propagation of genetic material
- Science is continually _____ and adding to the scientific knowledge base
    - □ *Hypothesis*: Statement consistent with most observations and experimental evidence to date
    - □ *Theory*: A hypothesis that has been critically tested multiple times by multiple investigators
    - □ *Law*: A theory that has been thoroughly tested and confirmed over a long period of time

PRACTICE:

1. Which of the following is not a part of the cell theory?
    a. Organisms are composed of one or more cells
    b. Cells always interact with the external environment
    c. The cell is the structural unit of life
    d. Cells arise from preexisting cell division

2. Which of the following scientist was the first to observe blood cells using a microscope?
    a. Robert Hooke
    b. Anton van Leeuwenhoek
    c. Matthias Schleiden
    d. Theodor Schwaan

3. Which of the following is NOT a field that makes up modern cell biology?
    a. Genetics
    b. Biochemistry
    c. Cytology
    d. Evolution