Chapter 3: Cell Structure and Function

3.1 *Introduction to Cells*

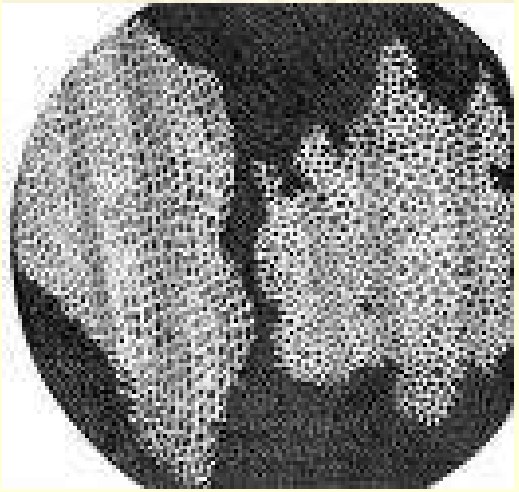
How were cells discovered?

The Discovery of the Cell

Robert Hooke

English Scientist in the year 1665 looked at a slice of cork under his crude microscope.

In the cork he saw little boxes and because they reminded him of the monk's rooms in the monastery, called them cells.



He was the first to name them Cells.

The Discovery of the Cell

Anton van Leeuwenhoek

Dutch lens maker. In 1675 made a more powerful microscope (300x) and looked at pond water.

Anton van Leeuwenhoek was the first to look at living cells.

He called tiny living things “animalcules” (bacteria now)

Formation of the Cell Theory

Not until the 1830's did the results of Hooke and van Leeuwenhoek become appreciated.

1838 – German botanist *Matthais Schleiden* states that all plants are made up of Cells.

1839 – German zoologist *Theodor Schwann* states that all animals are made up of cells.

1855 – German doctor *Rudolf Virchow* states that all cells come only from existing cells.

The Cell Theory

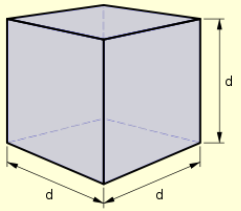
1. All organisms are made of one or more cells.

2. All life functions of organisms occur within cells.

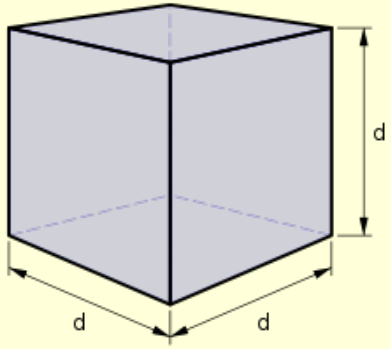
3. All cells come from already existing cells.

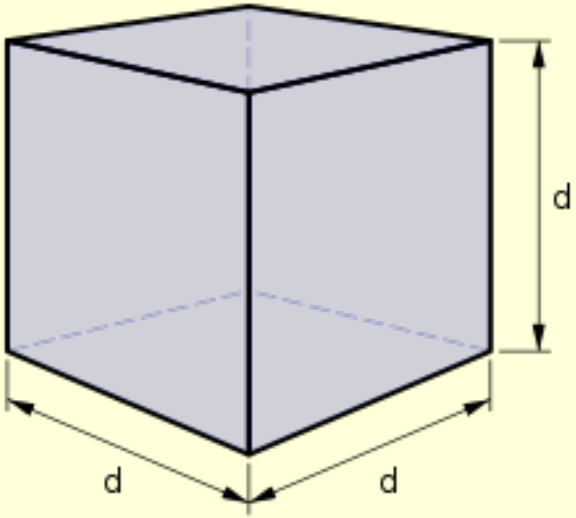
Diversity of Cells

1. Cell size – If Cells are so important for life, why are they so small? (microscopic)



A ratio compares two numbers by dividing one number by the other.

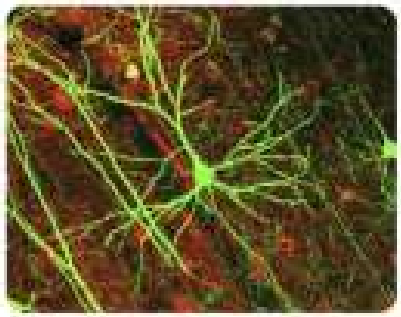




Surface Area and Volume

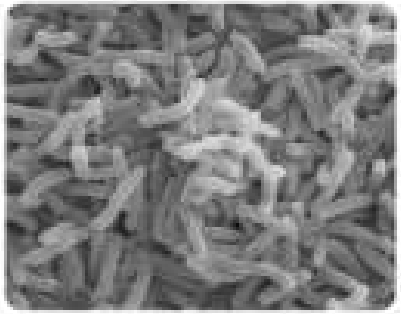
Side Length	Surface Area	Volume	Surface Area – to - Volume
1 mm	6 mm^2	1 mm^3	6:1
2 mm	24 mm^2	8 mm^3	3:1
4 mm	96 mm^2	64 mm^3	3:2

Diversity of Cells



Nerve cell

Red blood cells



Bacteria

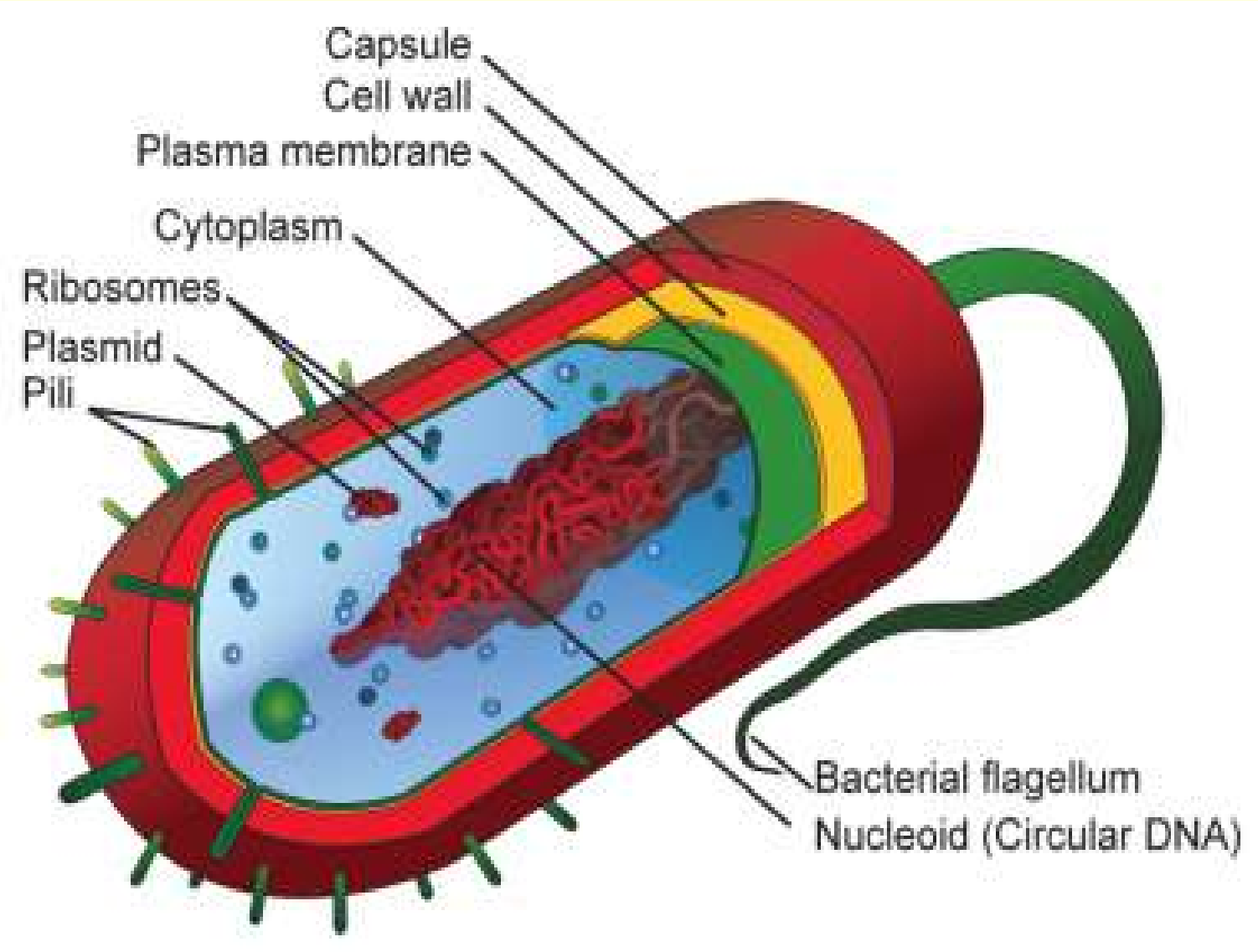
Algae

Diversity of Cells

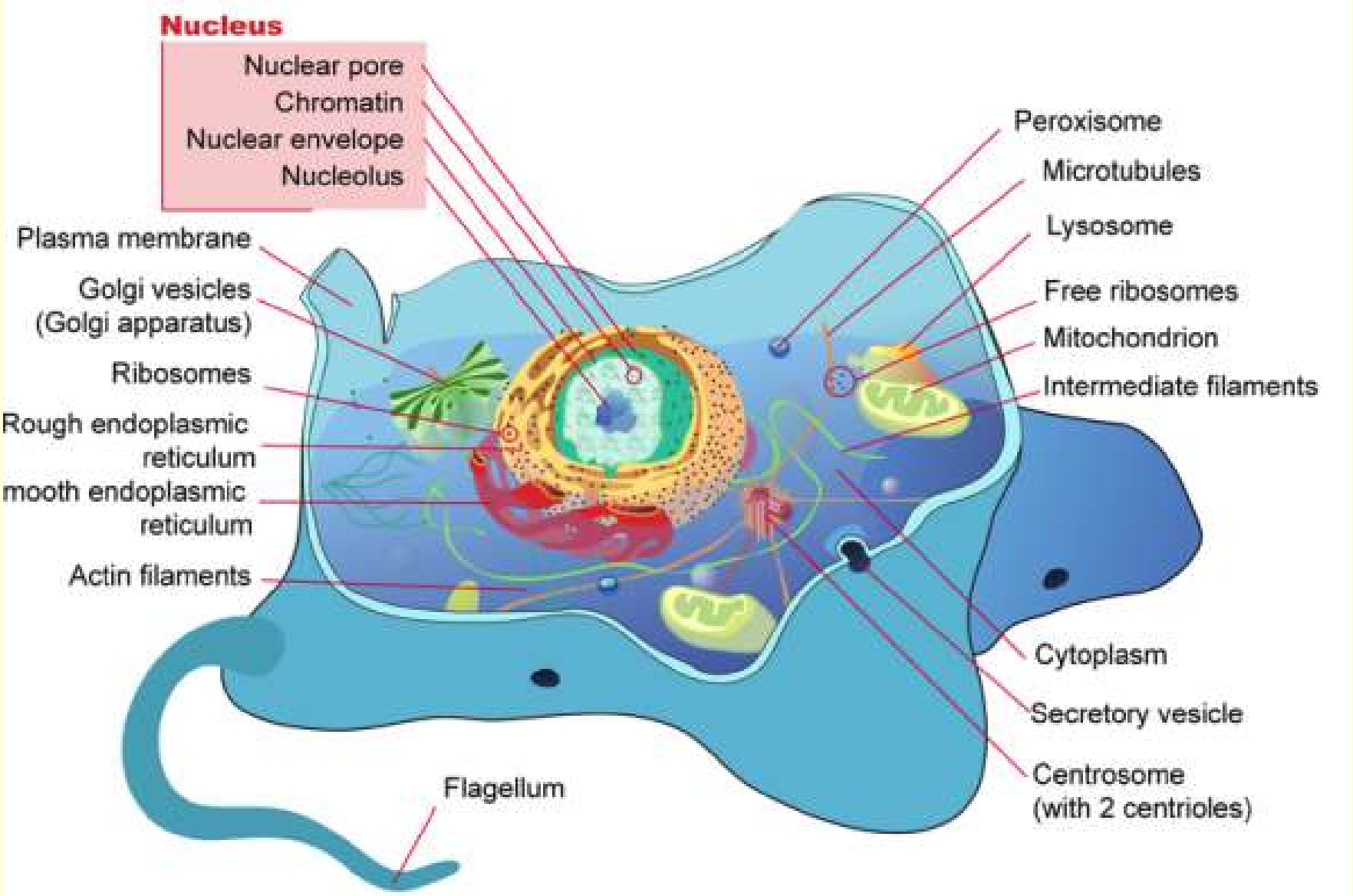
3. Cell parts - all cells share these 4 structures:

Diversity of Cells

4. Two Types of Cells



Prokaryote (typical) – notice few internal structures and NO NUCLEUS



<u>Eukaryote</u> (typical) – notice many internal structures (organelles) and a NUCLEUS