Cell Theory

by Sophia

WHAT'S COVERED

In this lesson, you will learn how to identify the basic elements of cell theory. Specifically, this lesson will cover:

1. Cell Theory

As you know, a **scientific theory** is a scientific explanation for something that has been thoroughly tested. The **cell theory** is actually a theory that explains the characteristics of cells, like how cells behave.

The cell theory is the work of several scientists who came up with three points that they believe explain the characteristics of cells. They came up with these points through various types of testing, experiments, and observations.

Cell Theory	
1. All organisms are made up of cells.	If you remember, an **organism** is a living thing; anything that is living is made up of cells.
2. Cells are the smallest units of life.	The smallest organism is going to be made up of one cell; if it's not made up of cells, it can't be living. Therefore, a **cell** is the smallest unit of life. You can probably think of many unicellular organisms that are just made up of one cell. These are the smallest living things.
3. All cells arise from preexisting cells.	Cells don't just spontaneously appear. New cells are made from preexisting cells, through either meiosis or mitosis.

TERMS TO KNOW

Scientific Theory

An explanation of an observation that has been rigorously tested.

Cell Theory

A theory that states all things are made of cells, cells are the smallest unit of life and all cells come from preexisting cells.

Organism

A single living thing, composed of one or more cells.

Cell

The basic unit of life. A part of a cell cannot make a whole cell; at least one whole cell is required to metabolize, maintain homeostasis and reproduce.

2. Basic Characteristics of All Cells

All cells, whether they're prokaryotic or eukaryotic—which you'll learn more about soon—have three main characteristics in common.

Characteristics of Cells	
1. All cells have a plasma membrane.	A **plasma membrane** is just something that will enclose all of the cell parts. It is the membrane which surrounds the outer body of the cell and controls what can enter and exit the cell.
2. All cells have DNA.	**DNA** is genetic information. All cells contain some sort of genetic information that allows the cell to function and reproduce.
3. All cells have cytoplasm.	**Cytoplasm** is basically just a jelly-like fluid that fills the inside of the cell. It protects the cell and acts as a medium for all the organelles to remain in.

TERMS TO KNOW

Plasma Membrane

The membrane that surrounds the outer body of the cell and controls what can enter and exit the cell.

DNA

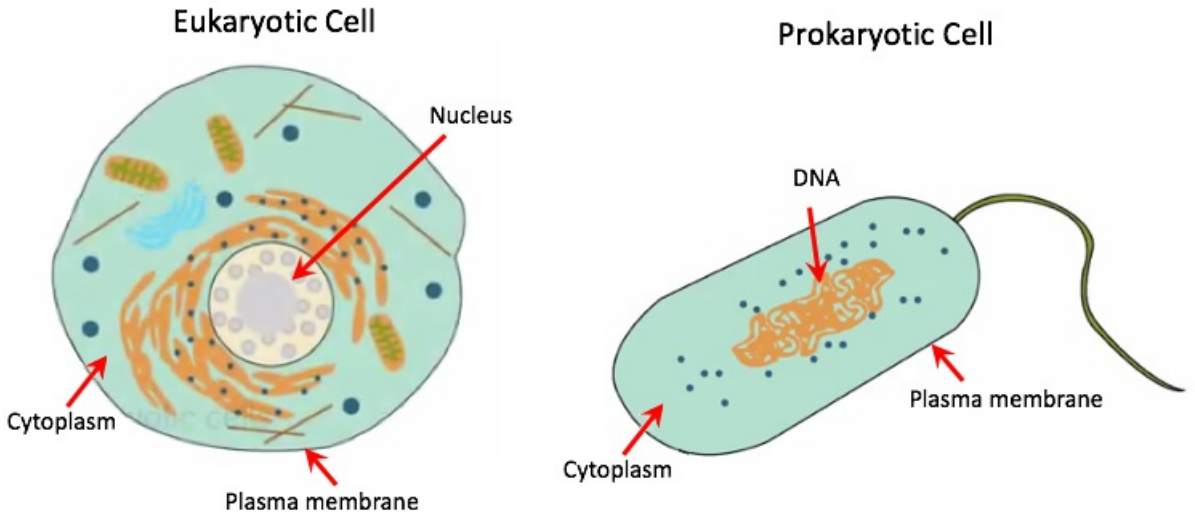
A large molecule that contains all of an organism's genetic information.

Cytoplasm

The jelly-like substance found inside of a cell which holds all other organelles.

3. Eukaryotic and Prokaryotic Cells

The two main categories of cells are prokaryotic and eukaryotic cells.



Eukaryotic cells are cells where the DNA is contained in a nucleus. Our body cells are considered eukaryotic because they all contain a nucleus.

Another characteristic of eukaryotic cells is that they, like all cells, have a plasma membrane. This is the outer layer of the cell that encloses all of the cell **organelles**.

The plasma membrane of our cells is made up of a lipid bilayer, which is composed of two layers of phospholipids. That lipid bilayer is what makes up the plasma membrane of your cells and helps to control what goes into and what can come out of the cell. It also contains DNA within the nucleus. All the free space within the cell is the cytoplasm.

Something else you might want to know about eukaryotic cells is that, generally, they are more complex than prokaryotic cells and they contain a lot more organelles (mitochondria, ribosomes, endoplasmic reticulum, Golgi apparatus, et cetera).

Prokaryotic cells do contain DNA, as all cells contain DNA. But the difference between a prokaryotic cell and a eukaryotic cell is that in a prokaryotic cell, the DNA is not contained within a nucleus. It still has the plasma membrane, which is the outer layer of the cell, and it still has cytoplasm.

You'll notice in the prokaryotic cell, there are some ribosomes as well, which help to make proteins for the cell.

Prokaryotic cells are a little bit less complex than eukaryotic cells and generally smaller in size. Many prokaryotic cells have something which is called flagella. Basically, that's a means of movement for the cell, which is something eukaryotic cells don’t have.

TERMS TO KNOW

Eukaryotic Cells

Type of cells which holds all of its genetic information (DNA) inside of a membrane-bound nucleus.

Organelle

A small, organized structure within a cell. A ribosome is an organelle found within both prokaryotic and eukaryotic cells; a nucleus is an organelle found within eukaryotic cells, but not prokaryotic cells.

Prokaryotic Cells
Type of cells which does not contain a nucleus.

SUMMARY

This has been an overview of the **cell theory**, as well as some **basic characteristics of eukaryotic and prokaryotic cells**.

Keep up the learning and have a great day!

Source: THIS WORK IS ADAPTED FROM SOPHIA AUTHOR AMANDA SODERLIND AND NATHAN LAMPSON

TERMS TO KNOW

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Cell Theory
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