

Nucleus

by Sophia



WHAT'S COVERED

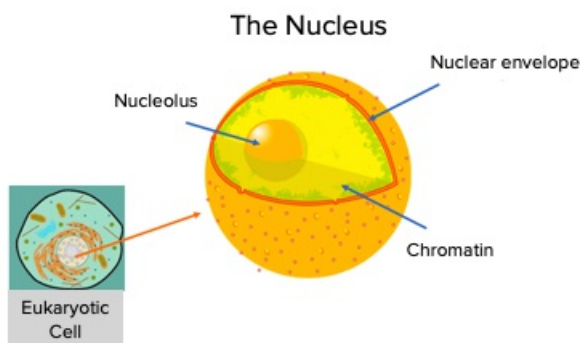
In this lesson, you will learn the definition and components of the nucleus. Specifically, we'll discuss:

1. Nucleus Structure

The **nucleus** is a cellular organelle found in eukaryotic cells. The nucleus contains the cell's **DNA** and is basically the control center of the cell. Think of it as the brain of the cell or the control center that controls everything happening within the cell.

➞ **EXAMPLE** An example of a eukaryotic cell would be human or animal cells because they have a nucleus.

The diagram below is a drawing of a eukaryotic cell. Within the cell, you have the nucleus and several other different organelles.



The structure of the nucleus includes:

- Nuclear envelope
- Nucleolus
- Chromatin



TERMS TO KNOW

Nucleus

A cell organelle found in eukaryotic cells that houses the DNA and controls activity within the cell.

DNA

DNA stores an organism's genetic information.

1a. The Nuclear Envelope

Outside, surrounding the nucleus, is something called a **nuclear envelope**. This nuclear envelope is a double layer membrane composed of two lipid bilayers.

Within the nuclear envelope are pores—the little black dots all over represent the pores in the nuclear envelope. These pores are very important because they allow for RNA to leave the cell, along with certain ions or molecules. There are many different types of proteins embedded within this membrane as well that provide various functions.



TERM TO KNOW

Nuclear Envelope

A double membrane that surrounds the nucleus.

1b. The Nucleolus

Another part of the structure of the nucleus is the **nucleolus**, a structure found inside of the nucleus. The purpose of the nucleolus is to construct **ribosome** subunits.

The subunits of ribosomes are made within the nucleolus. Then, they'll cross through the pores and into the cytoplasm of the cell, where they will connect and form the protein building organelles known as ribosomes.



TERMS TO KNOW

Nucleolus

A structure found within the nucleus that produces subunits of ribosomes.

Ribosome

A cell organelle responsible for synthesizing proteins.

1c. The Chromatin

Chromatin is all of the eukaryotic cell's DNA (and therefore, all its genetic information) stretched out within the nucleus, along with some protein. When chromatin condenses, it will form chromosomes. Chromatin becomes so condensed when it forms **chromosomes** that these chromosomes become visible under a microscope. The purpose of chromosomes is to allow for the passage of genetic information.

➞ **EXAMPLE** You can think of DNA like yarn: A chromosome is the "yarn" wound into a neat ball and chromatin is when the "yarn" is unwound all over the room. Just like it's much easier to knit yarn that is unwound, it's much easier to make RNA from DNA when DNA is uncondensed in the form of chromatin.

On the other hand, it's easier to move yarn to another room when it's neatly wound into a ball; similarly, DNA is easier to move during cell division when it's condensed into chromosomes.

When the cell is preparing to divide, our DNA will condense into those chromosomes that you might be familiar with. This allows for the passing of genetic information into the new cell. The nucleus helps to keep this genetic information organized and separate from the rest of the cell.



TERMS TO KNOW

Chromatin

A form of uncondensed DNA and protein found within the nucleus of the cell.

Chromosomes

A condensed form of DNA that occurs when the cell is dividing.



SUMMARY

Today you have learned about the different structural elements of the **nucleus** and their functions. Specifically, you learned about the functions of the cell's **nuclear envelope, nucleolus and chromatin**.

Keep up the learning and have a great day!

Source: THIS WORK IS ADAPTED FROM SOPHIA AUTHOR AMANDA SODERLIND



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TERMS TO KNOW

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Chromosomes

A condensed form of DNA that occurs when the cell is dividing.

DNA

DNA stores an organism's genetic information.

Nuclear Envelope

A double membrane that surrounds the nucleus.

Nucleolus

A structure found within the nucleus that produces subunits of ribosomes.

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