

Topic: Cell Organelles  
B.Sc. Botany Hons. III  
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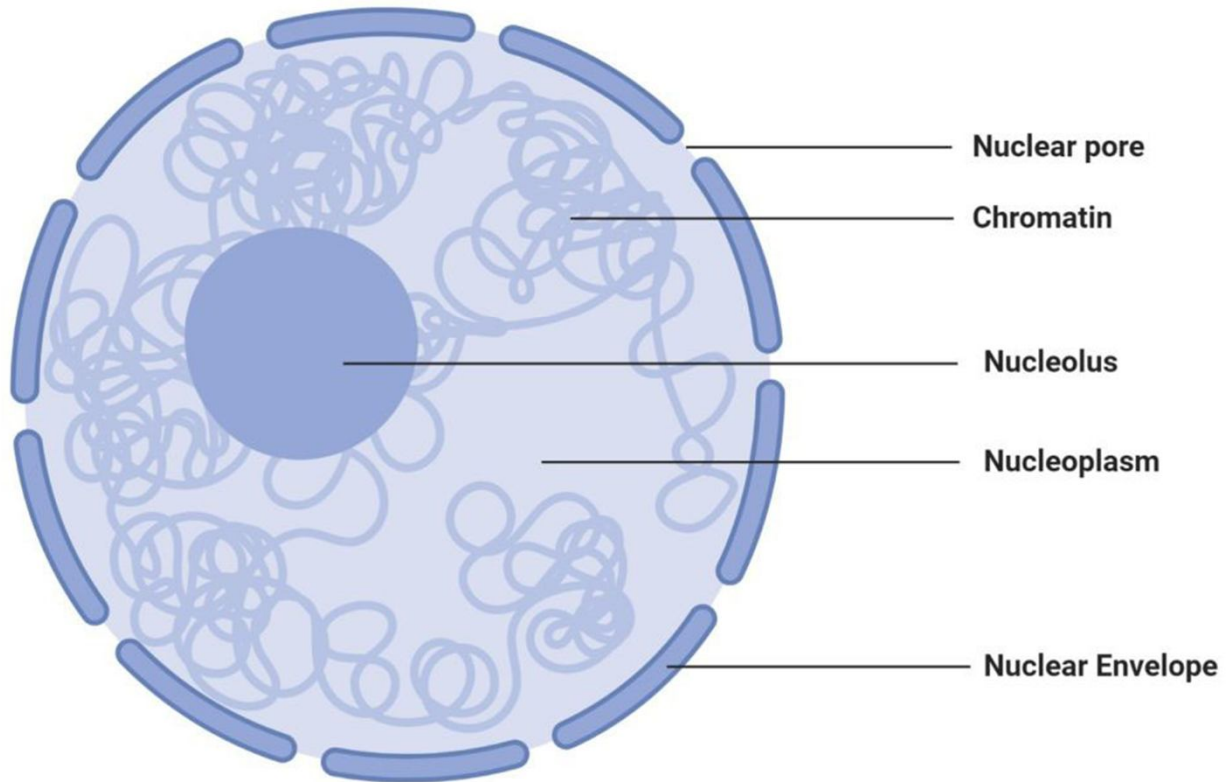
## Nucleus

- The nucleus is a double membrane-bound structure responsible for controlling all cellular activities as well as a center for genetic materials, and it's transferring.
- It is one of the large cell organelles occupying 10% of total space in the cell.
- It is often termed the “brain of the cell” as it provides commands for the proper functioning of other cell organelles.
- A nucleus is clearly defined in the case of a eukaryotic cell; however, it is absent in prokaryotic organisms with the genetic material distributed in the cytoplasm.

## Structure

- Structurally, the nucleus consists of a nuclear envelope, chromatin, and nucleolus.
- The nuclear envelope is similar to the cell membrane in structure and composition.
- It has pores that allow the movement of proteins and RNA in and outside the nucleus.
- It enables the interaction with other cell organelles while keeping

# Nucleus





nucleoplasm and chromatin within the envelope.

- The chromatin in the nucleus contains RNA or DNA along with nuclear proteins, as genetic material that is responsible for carrying the genetic information from one generation to another.
- It is present in a dense and compact structure which might be visible as chromosome under powerful magnification.
- The nucleolus is like a nucleus within the nucleus. It is a membrane-less organelle that is responsible for the synthesis of rRNA and assembly of ribosomes required for protein synthesis.

## Functions

- The nucleus is responsible for storage as well as the transfer of genetic materials in the form of DNA or RNA.
- It aids in the process of transcription by the synthesis of mRNA molecules.
- The nucleus controls the activity of all other organelles while facilitating processes like cell growth, cell division and synthesis of proteins.