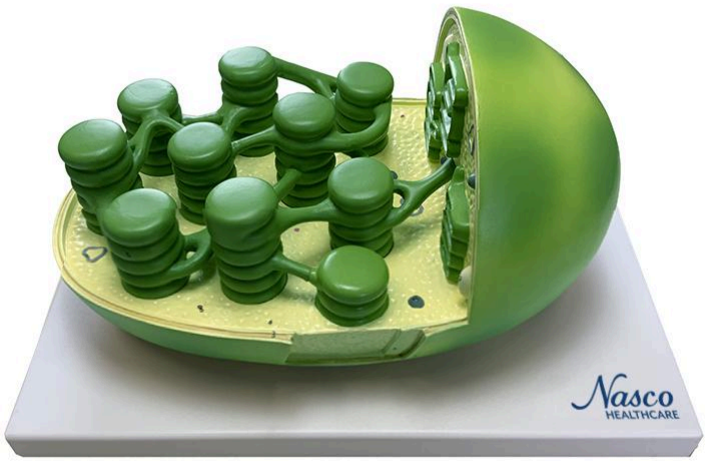
# MG6962 | PLANT CELL, CHLOROPLAST



An enlarged and detailed representation of a chloroplast, sectioned transversely and longitudinally to reveal its complex internal structure. The model includes the inner and outer membranes, granum, stroma, starch grains, and other important cellular structures. Mounted on a sturdy resin base, the model is ideal for in-depth studies of the plant cell.

**Applications:**

The model is suitable for the study of the plant cell, specifically the chloroplast, in educational institutions, laboratories, and for professional training in biology, botany, and related fields. It is a useful tool for understanding photosynthesis and plant cell structure.

**Differentiators:**

* High-precision molding.
* Manufactured from stable synthetic material and resin approved in toxicological tests.
* Numbered and hand-painted.
* Includes an information card with related structures.
* Enlarged several times compared to natural size.

**3D Technology and Augmented Reality:**

Our anatomical models offer a visual complement through information cards that activate 3D models viewable in augmented reality (AR). This interactive platform assists learning, allowing for comparative analysis of anatomical structures and offering resources for education in anatomy, physiology, and pathophysiology.

**Technical Specifications:**

* Material: Synthetic resin.
* Scale: Enlarged several times compared to natural size.

**Main Structures:**

**Outer membrane:** The outer membrane of the chloroplast is a lipid bilayer that delimits the organelle, regulating the entry and exit of substances. It is permeable to small molecules, but has transport proteins for larger molecules.

**Inner membrane:** The inner membrane, also a lipid bilayer, is less permeable than the outer membrane and has internal folds called thylakoids, where the light-dependent reactions of photosynthesis occur.

**Granum (Grana):** The grana are stacks of thylakoids, disc-shaped membranous structures where chlorophyll and other photosynthetic pigments are located.

**Starch granule:** Starch granules are inclusions in the stroma, representing the storage product of photosynthesis.

**Thylakoid lumen:** The thylakoid lumen is the internal space of the thylakoids, where important reactions of photosynthesis occur.

**Thylakoid (lamella):** Thylakoids, also called lamellae, are interconnected flattened membranous sacs, forming the grana stacks and stromal lamellae that connect the grana.

**Intermembrane space:** The intermembrane space is the region between the inner and outer membranes of the chloroplast.

**Stroma:** The stroma is the gelatinous fluid that fills the internal space of the chloroplast, outside the thylakoids. It contains enzymes, DNA, ribosomes, and starch granules.

**Ribosome:** Chloroplast ribosomes are responsible for the synthesis of proteins necessary for the organelle's function.

**DNA:** Chloroplast DNA is a circular molecule that encodes some of the proteins necessary for photosynthesis and other chloroplast functions.

**Osmium-loving globules:** These are lipid-rich structures whose function is not yet fully elucidated, but they are believed to be related to the lipid metabolism of the chloroplast. Other structures can be verified directly on the physical piece or on the interactive 3D model.

**About Anatomical Models:**

They are developed with resin replication technology, offering an alternative to natural anatomical models for teaching and research. They present the main morphological characteristics with good cost-benefit, resistance, hand painting and numbering for precise identification of structures.

**List of all visible structures:**

- Outer membrane
- Inner membrane
- Grain
- Starch granule
- Thylakoid lumen
- Thylakoid (lamella)
- Intermembrane space
- Stroma
- Ribosome
- DNA
- Osmiophilic globules