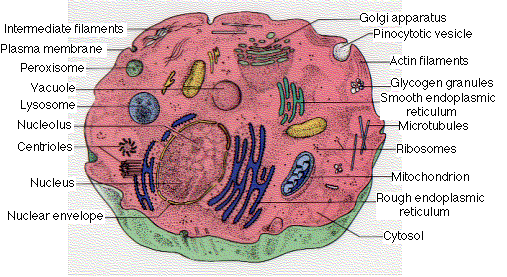
# Chapter 7: Section 3: Cell Organelles

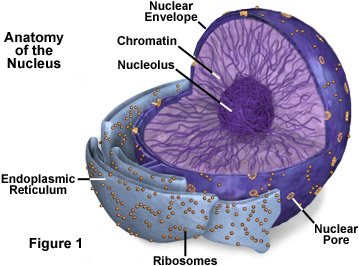
## Student Notes

Animal Cell



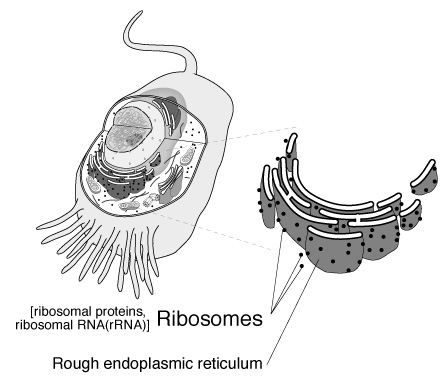
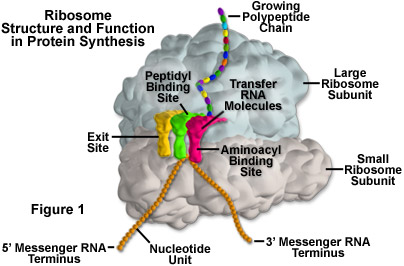
Nucleus

* Controls most of the cell functions
* Surrounded by a double membrane = **nuclear envelope**
  + made up of 2 lipid bilayers that separate the nucleus from the cytoplasm.
  + Scattered over the surface of the nuclear envelope, are many small channels through the envelope called **nuclear pores**.
* Substances made in the nucleus are:
  + RNA-ribosomal protein complexes
* Ribosomes are partially assembled in a region of the nucleus called nucleolus.



Ribosomes

* Play an important role in synthesizing proteins.
* Cells make proteins on ribosomes
* There are also ribosomes called “free ribosomes”
  + Make proteins that remain inside of the cell
  + These proteins are used to build organelles

Endoplasmic Reticulum (ER)

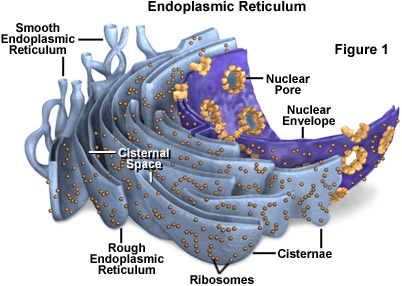
* Extensive system of internal membranes that move proteins and other substances through the cell.
* Membrane is made up of a lipid bilayer with embedded proteins.
* Two types of ER:
  + Rough ER
  + Smooth ER

Rough ER

* Ribosomes synthesize proteins
* Transported to the golgi apparatus

Smooth ER

* Contains enzymes involved in the manufacturing of lipid molecules and steroid hormones.
* Endoplasmic Reticulum (ER)

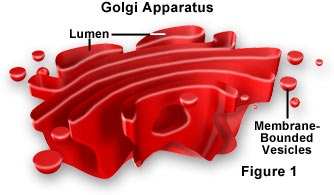


Vesicle

* Small, membrane-bound sac that transports substances in cells.

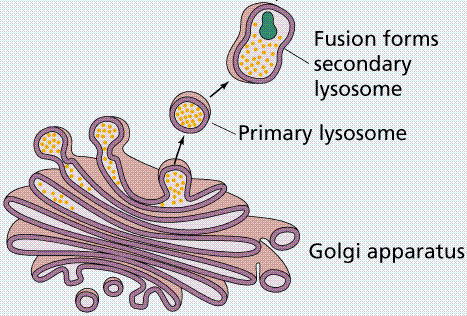
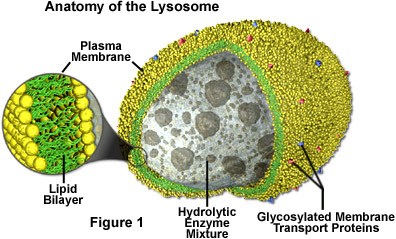
Golgi Apparatus

* Set of flattened, membrane-bound sacs that serves as the packaging and distribution center of the cell.
* Enzymes inside the Golgi apparatus modify the protein that are received in vesicles that bud from the surface of the Golgi apparatus.



Lysosomes

* Small, spherical organelles that contain the cell’s digestive enzymes.

Working Together (ER, Golgi apparatus & Lysosomes)

* Step 1:
  + Ribosomes make proteins on the rough ER. The proteins are packaged into vesicles.
* Step 2:
  + The vesicles transport the newly made proteins from the rough ER to the Golgi apparatus.
* Step 3:
  + In the Golgi apparatus, proteins are processed and then packaged into new vesicles.
* Step 4:
  + Many of these vesicles move to the cell membrane and release their contents outside the cell.
* Step 5:
  + Other vesicles (lysosomes) remain within the cytoplasm. Lysosomes digest and recycle the cell’s used components by breaking down proteins, nucleic acids, lipids, and carbohydrates.