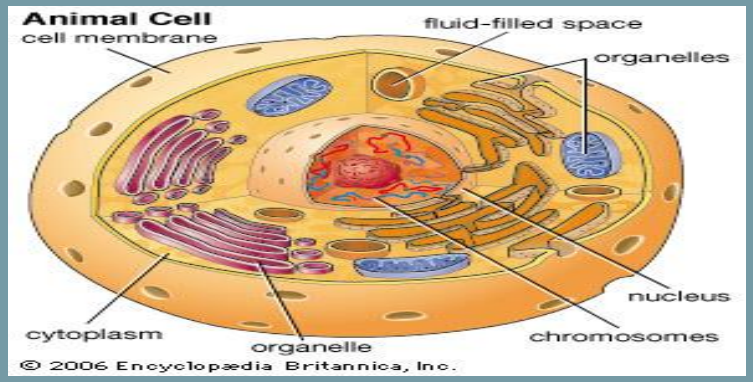
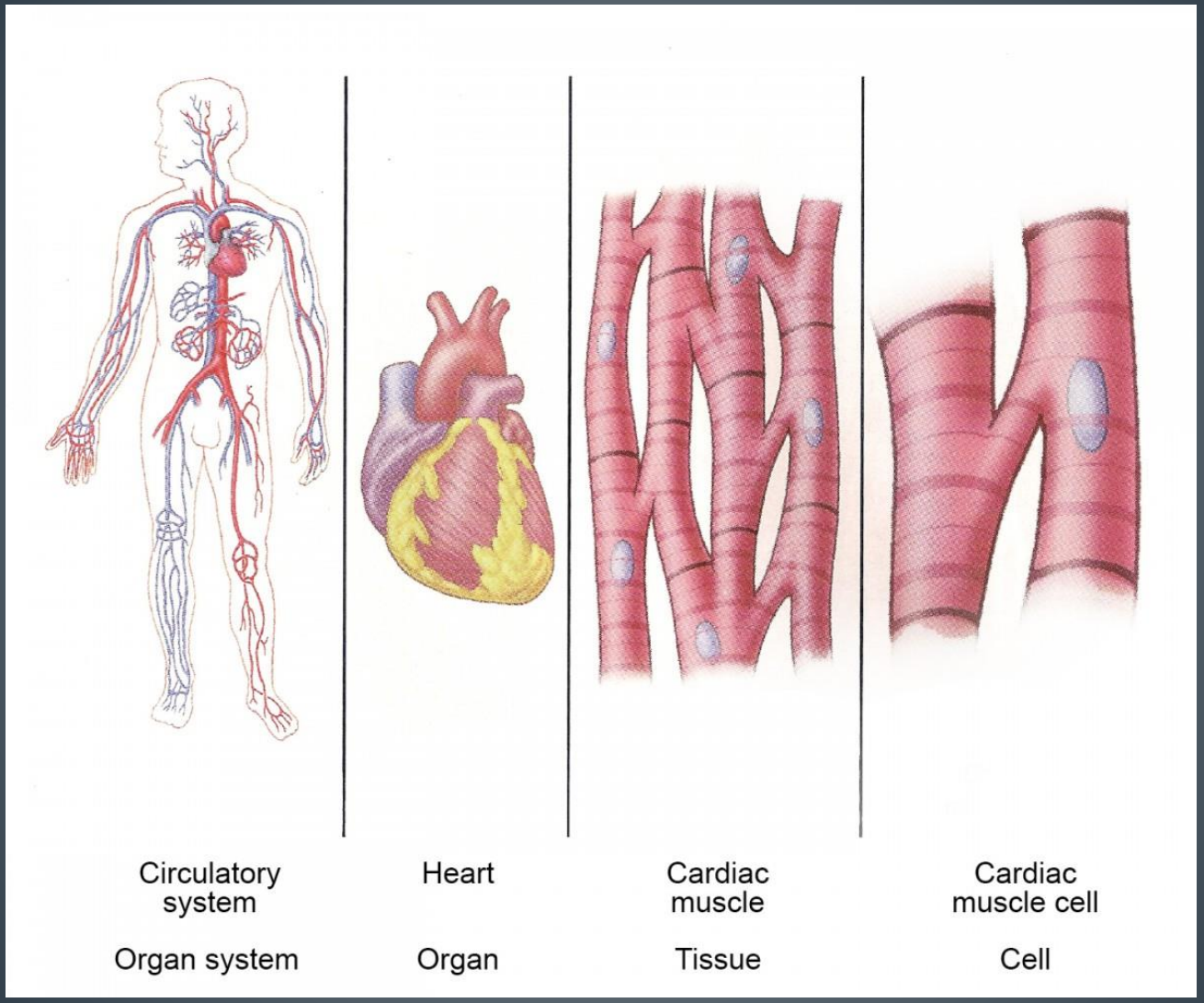
Structure of the cell

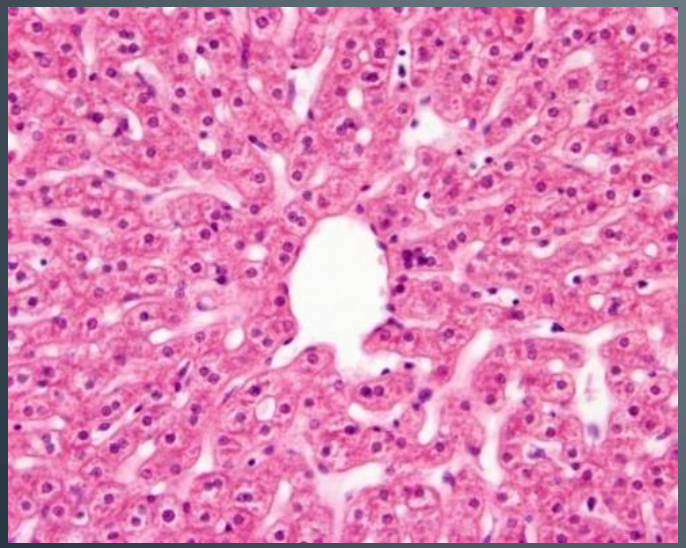


Anatomy

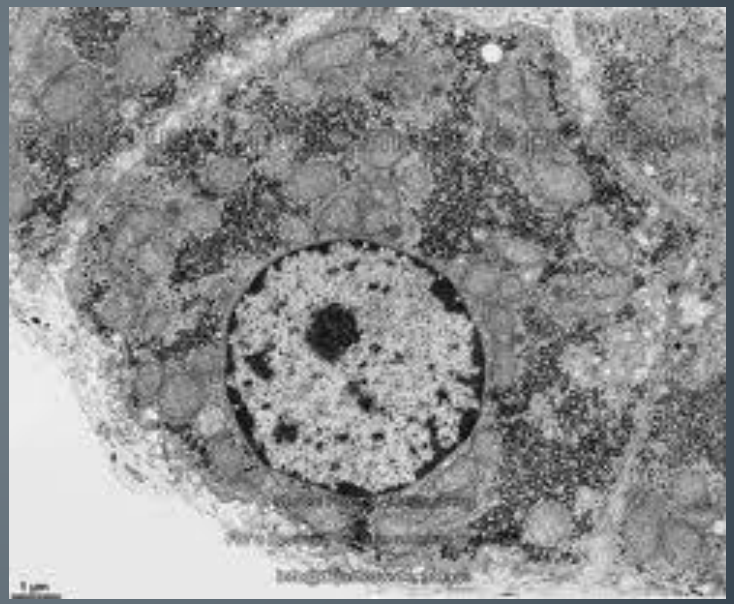
- 1-Gross anatomy (Macroscopic A.)
- 2-Histology (Microscopic A.)
- 3-Embryology
- 4-Ultra structural

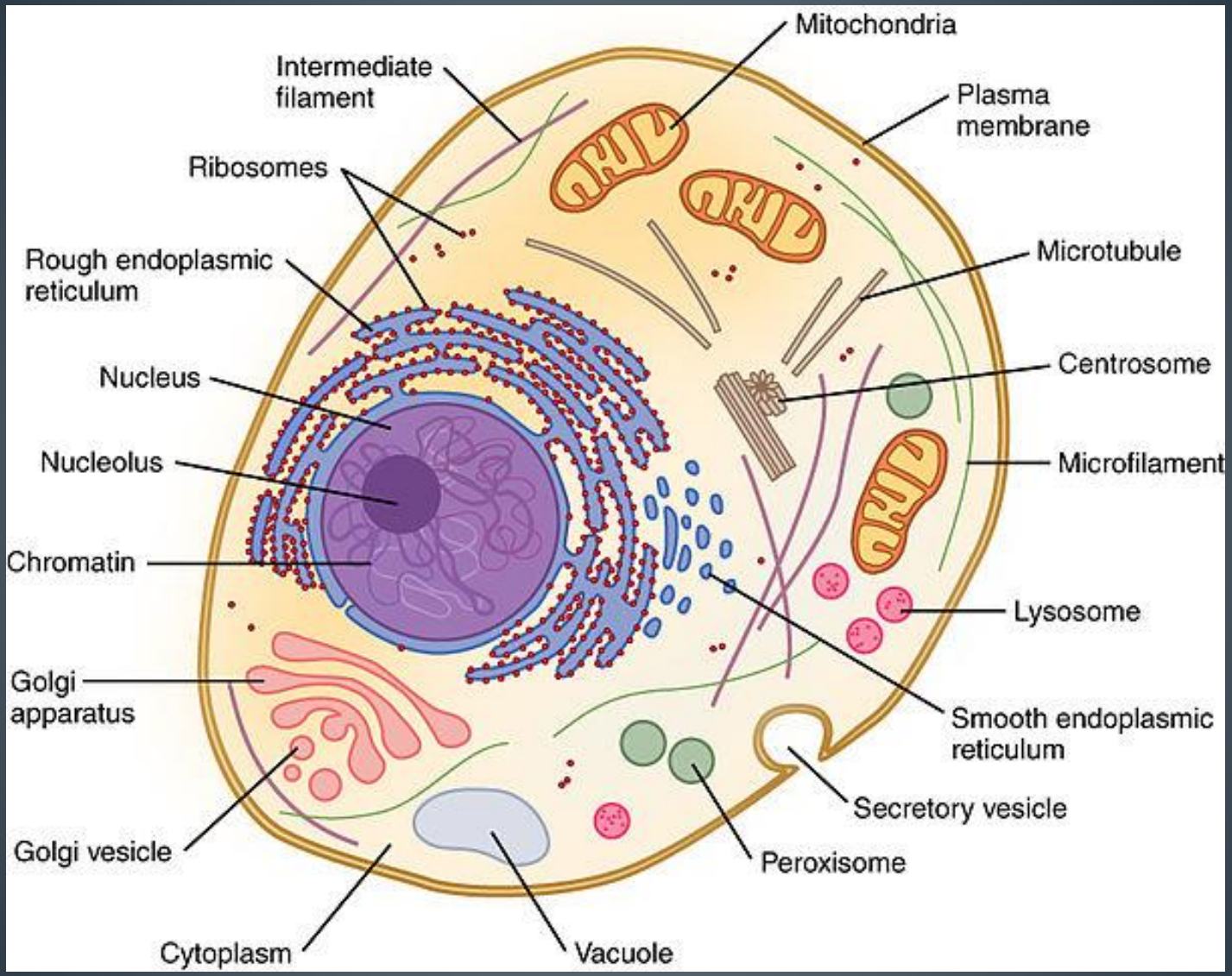
- 1-Applied A.
- 2-Topograghic A.
- 3-Systemic A.
- 4-Comparative A.
- 5.Functional A.
- 6.Radiographic A.

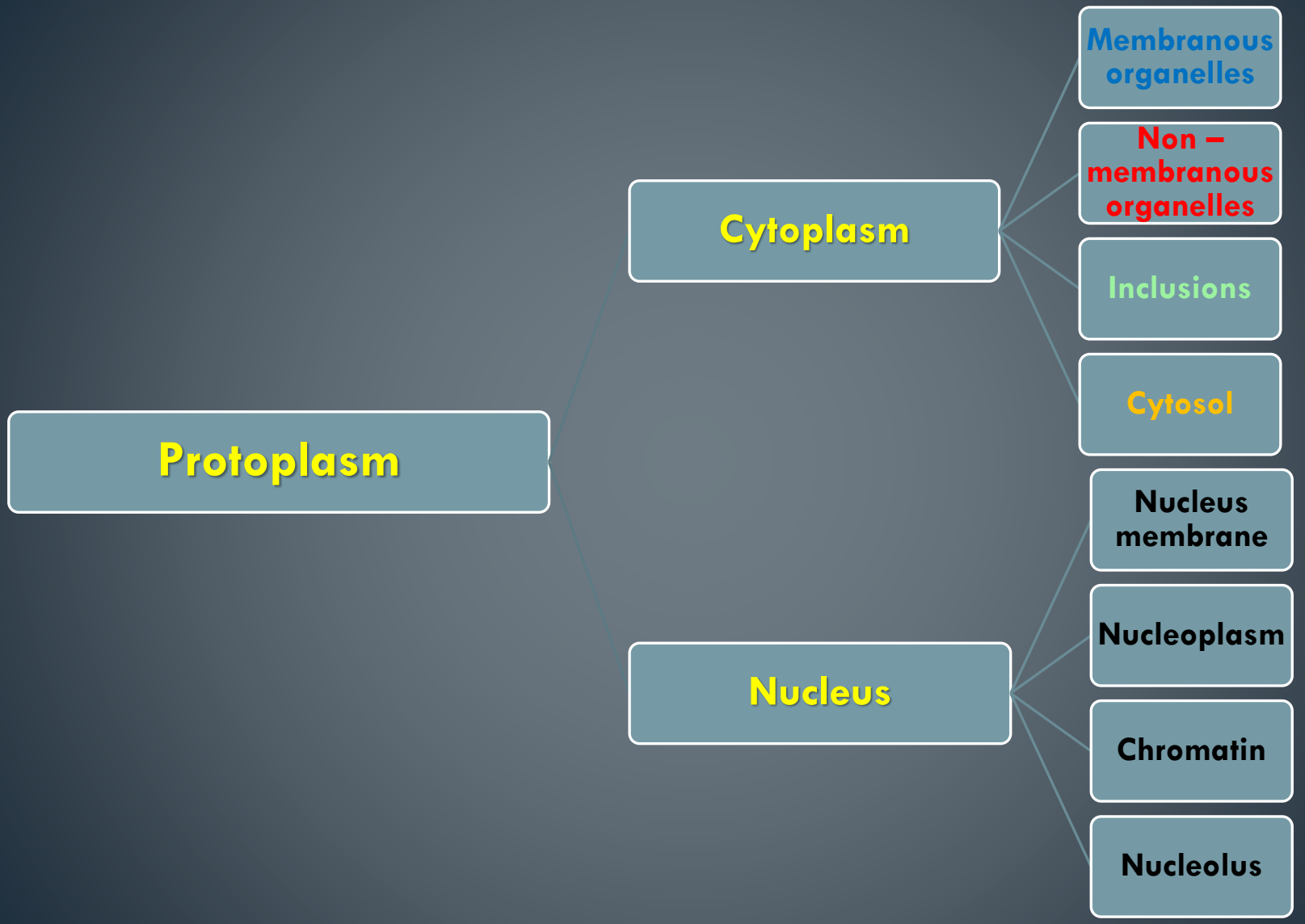

Circulatory system
Organ system
Heart
Organ
Cardiac muscle
Tissue
Cardiac muscle cell
Cell




PHILIPS

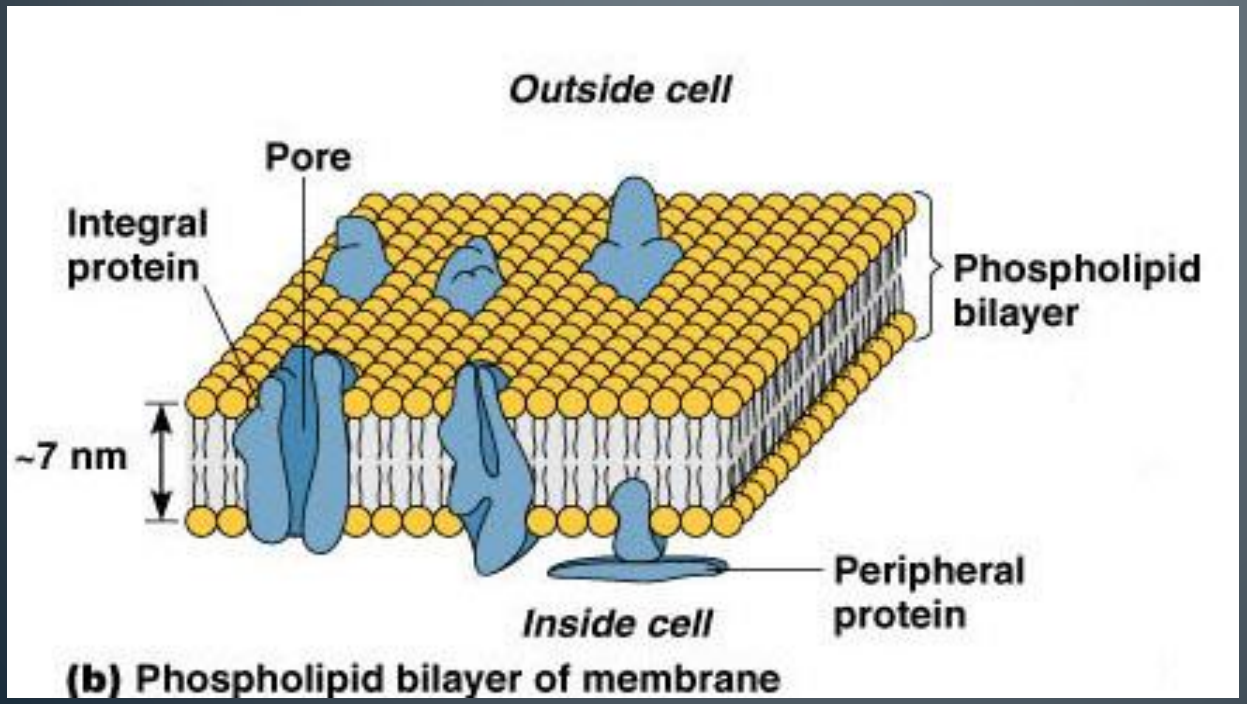



Mitochondria
Intermediate filament
Plasma membrane
Ribosomes
Rough endoplasmic reticulum
Microtubule
Nucleus
Centrosome
Nucleolus
Microfilament
Chromatin
Lysosome
Golgi apparatus
Smooth endoplasmic reticulum
Secretory vesicle
Golgi vesicle
Peroxisome
Cytoplasm
Vacuole


Protoplasm
Cytoplasm
Membranous organelles
Non – membranous organelles
Inclusions
Cytosol
Nucleus
Nucleus membrane
Nucleoplasm
Chromatin
Nucleolus

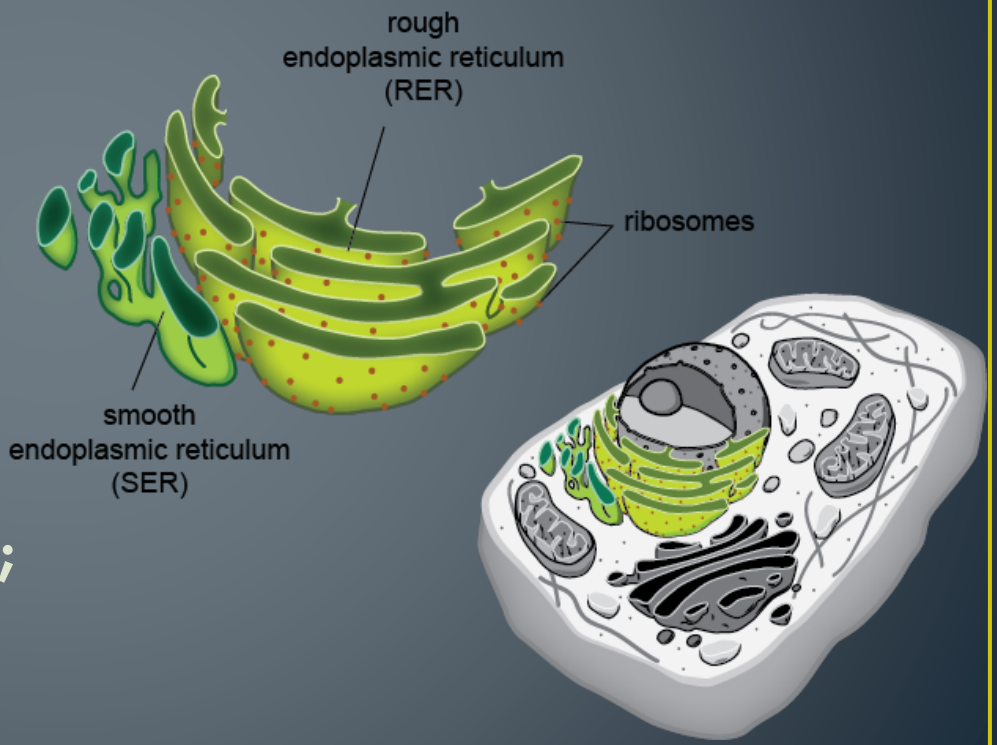
Cell Membrane

- Boundary of the cell
- Made of a phospholipid bilayer



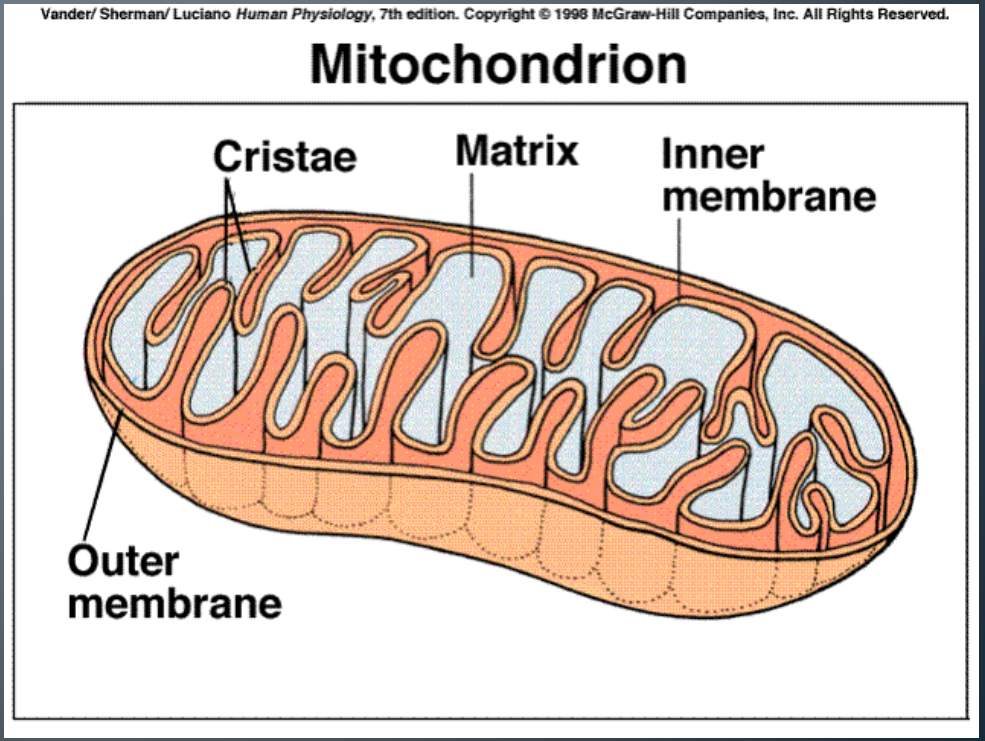
Endoplasmic Reticulum

- A.k.a. "ER"
- Connected to nuclear membrane
- Highway of the cell
- Rough ER: studded with ribosomes; it makes proteins
- Smooth ER: no ribosomes; it makes lipids



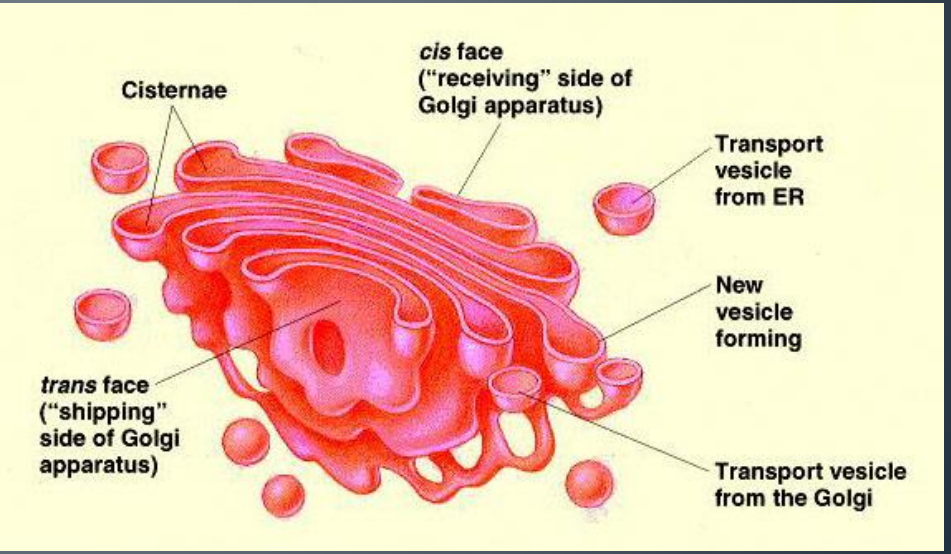
Mitochondria

- "Powerhouse of the cell"
- Cellular respiration occurs here to release energy for the cell to use
- Bound by a double membrane
- Has its own strand of DNA



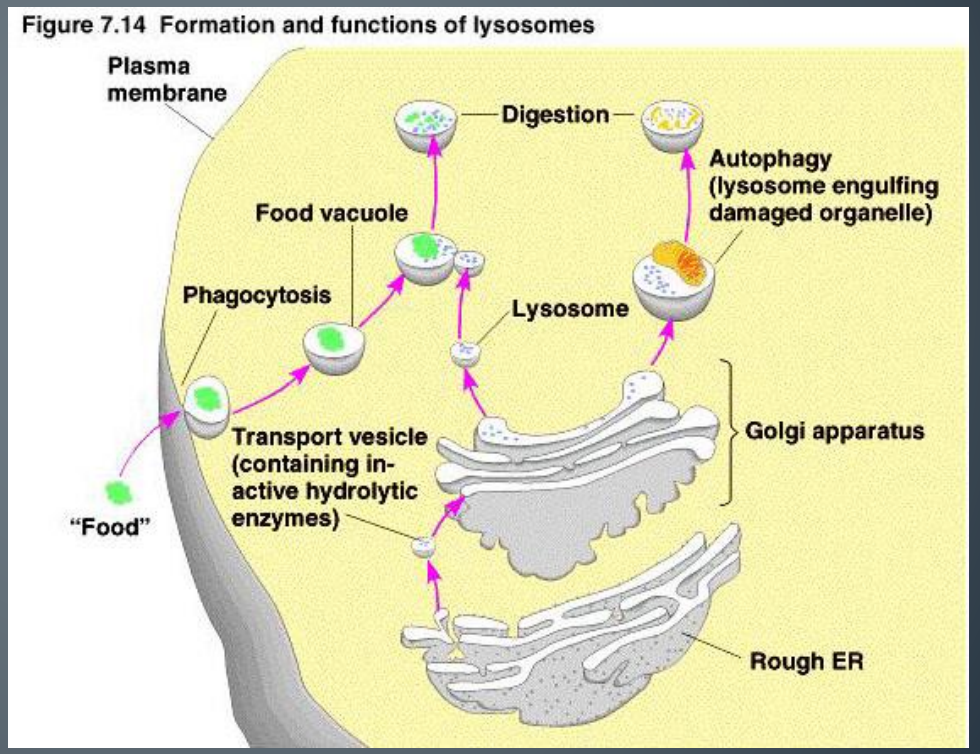
Golgi Apparatus

- Looks like a stack of plates
- Stores, modifies and packages proteins
- Molecules transported to and from the Golgi by means of vesicles



Lysosomes

- Garbage disposal of the cell
- Contain digestive enzymes that break down wastes



Peroxisome

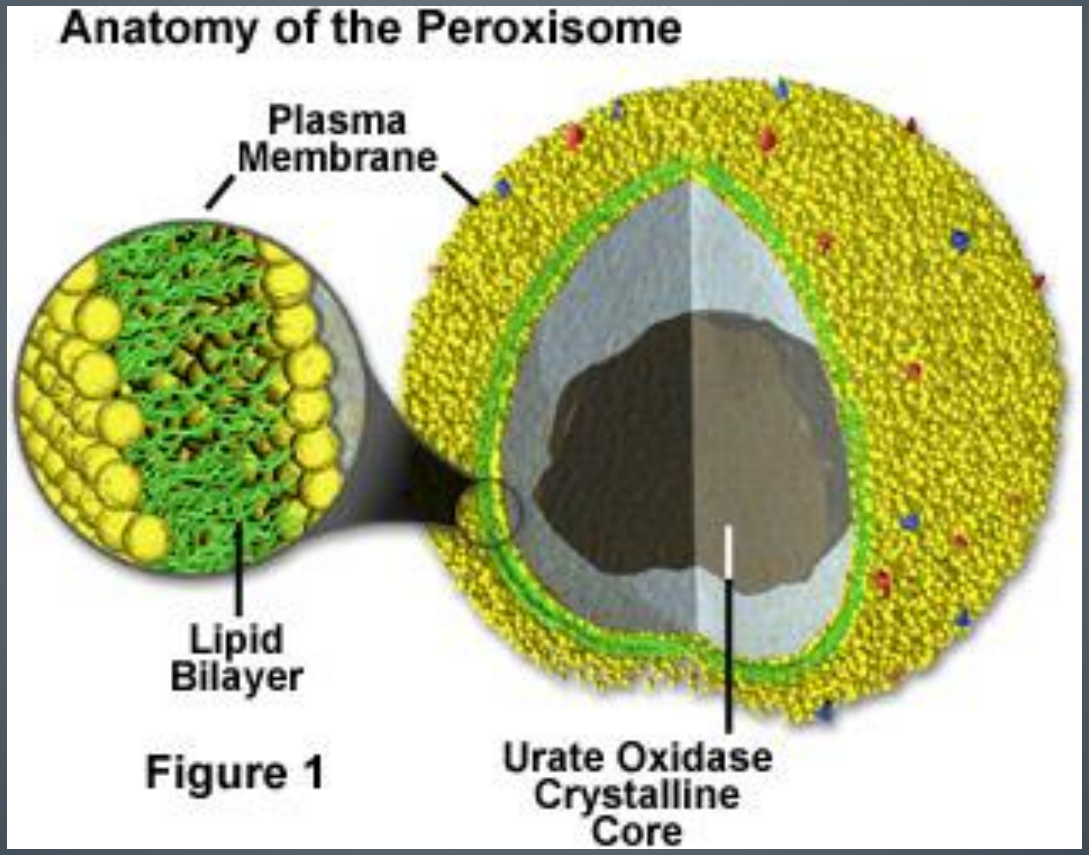
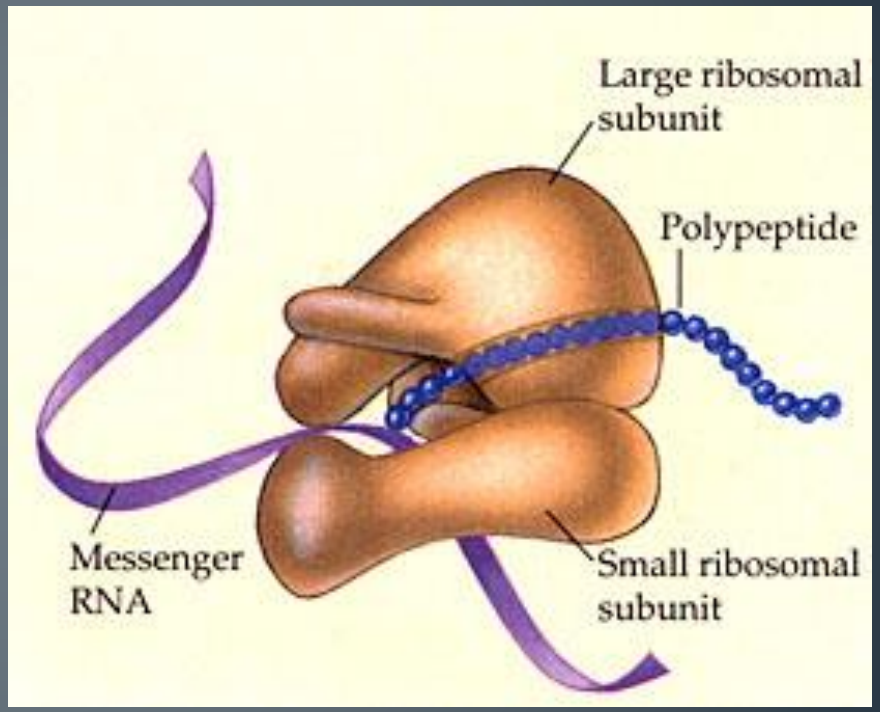


Figure 1

Ribosome

- Site of protein synthesis
- Found attached to rough ER or floating free in cytosol
- Produced in a part of the nucleus called the nucleolus



Microtubule

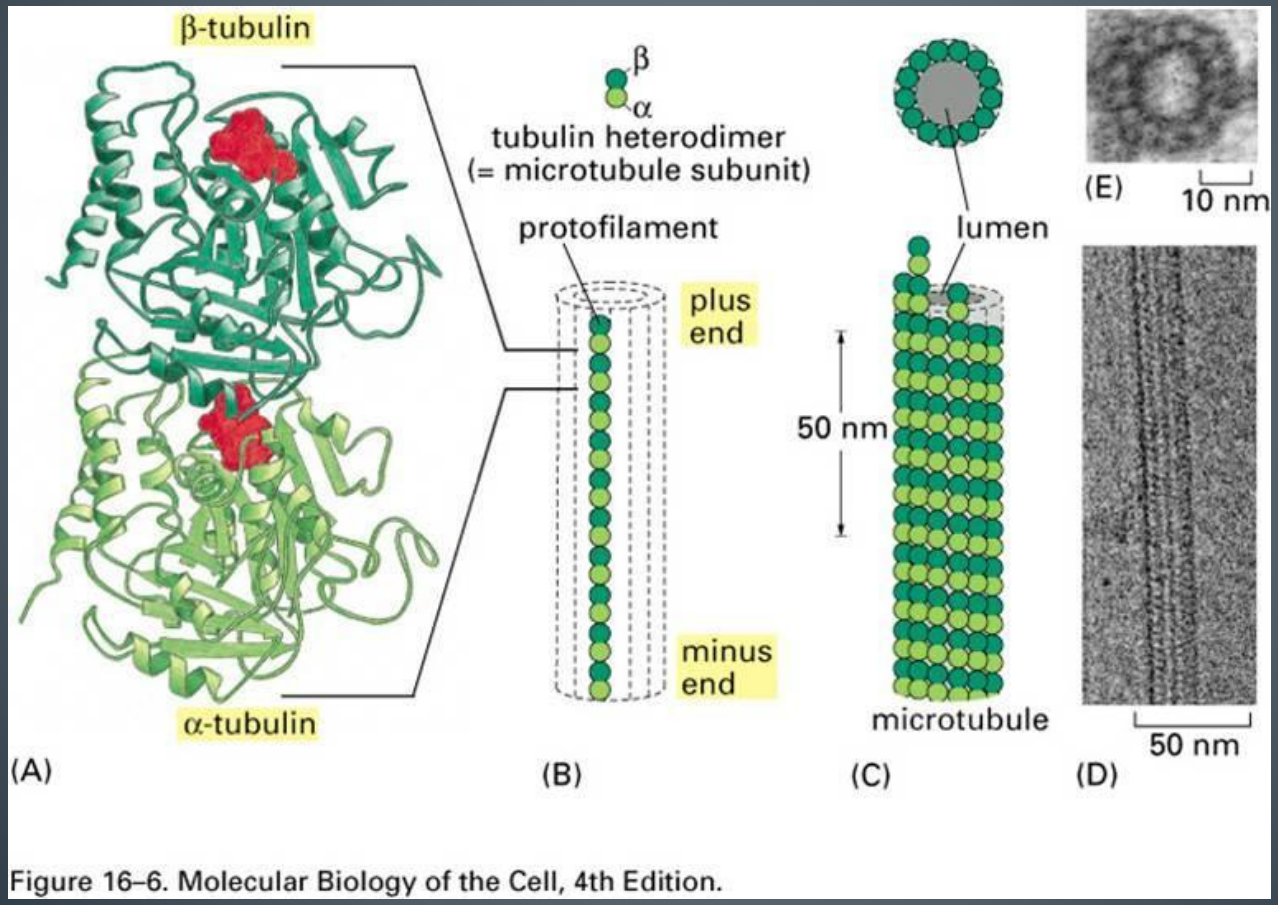
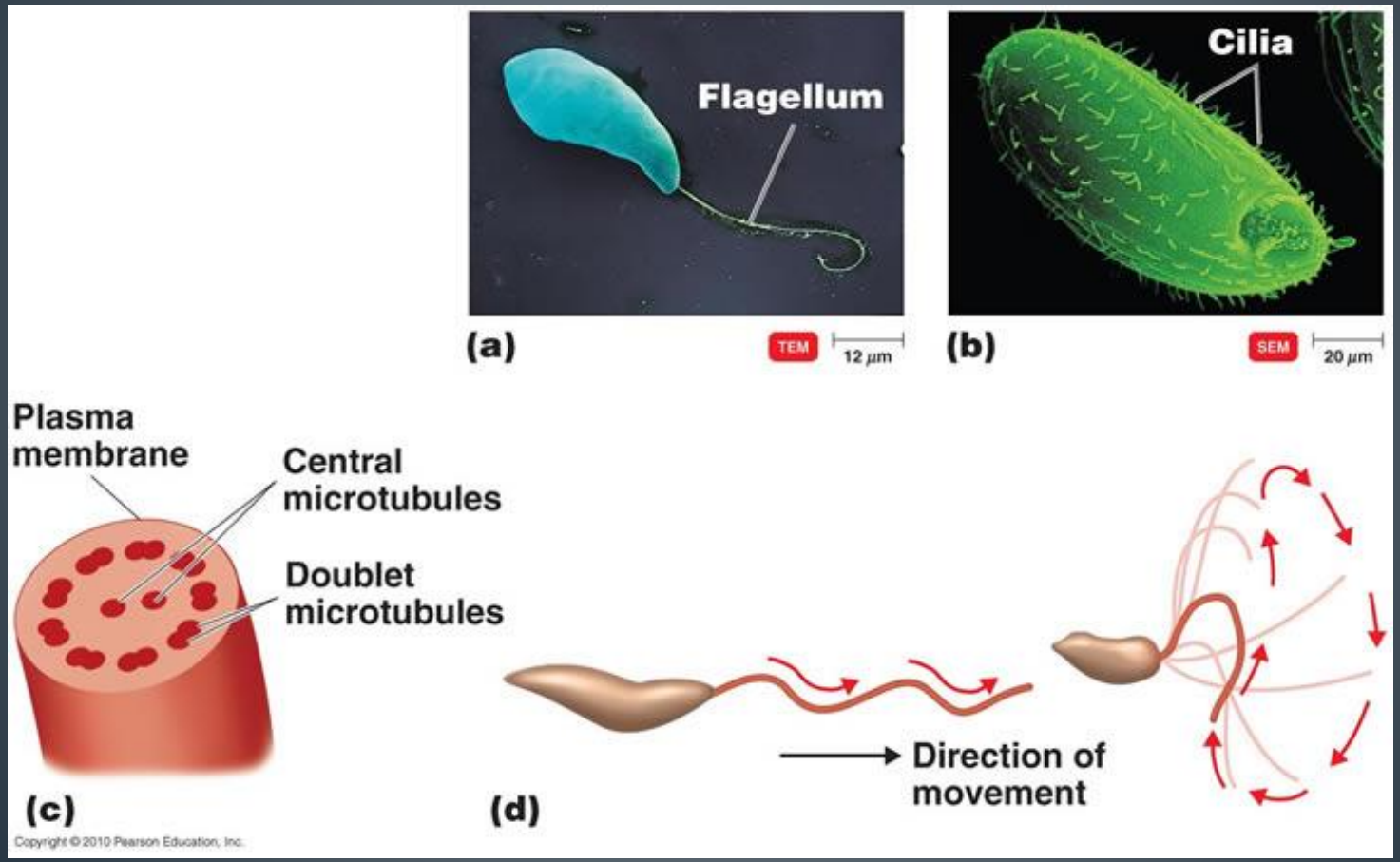
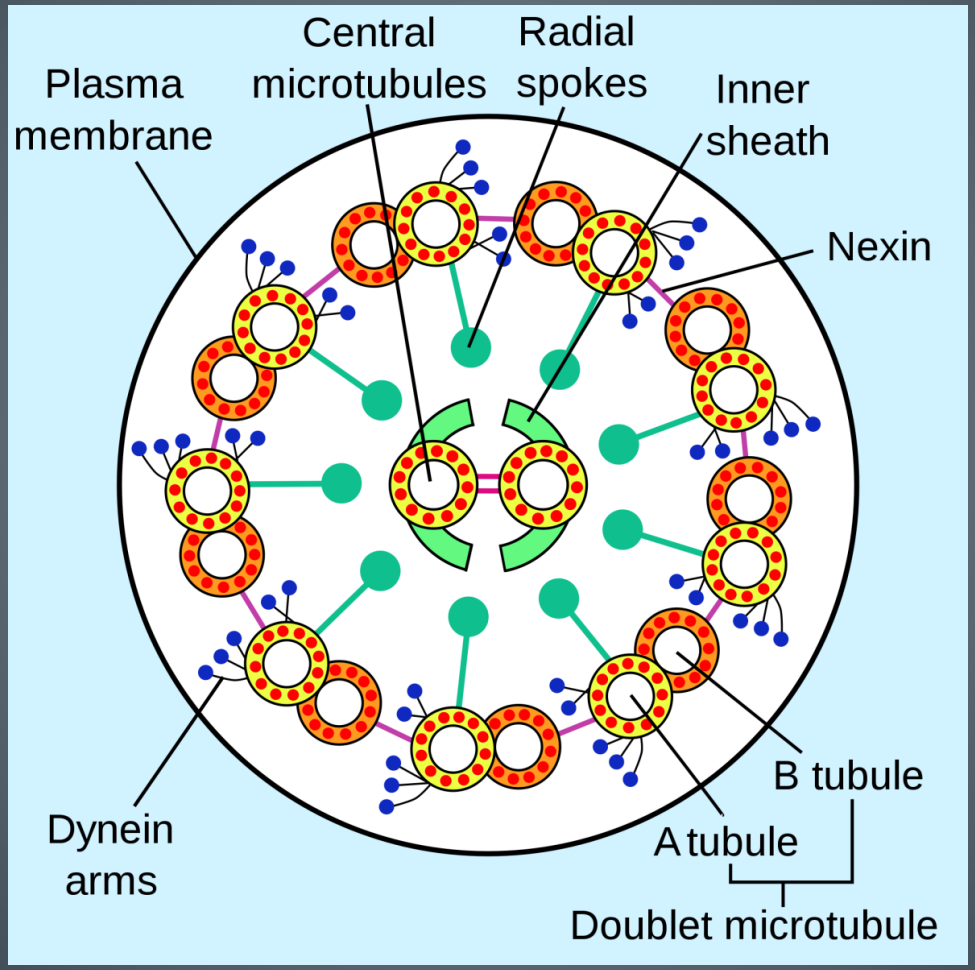


Figure 16–6. Molecular Biology of the Cell, 4th Edition.

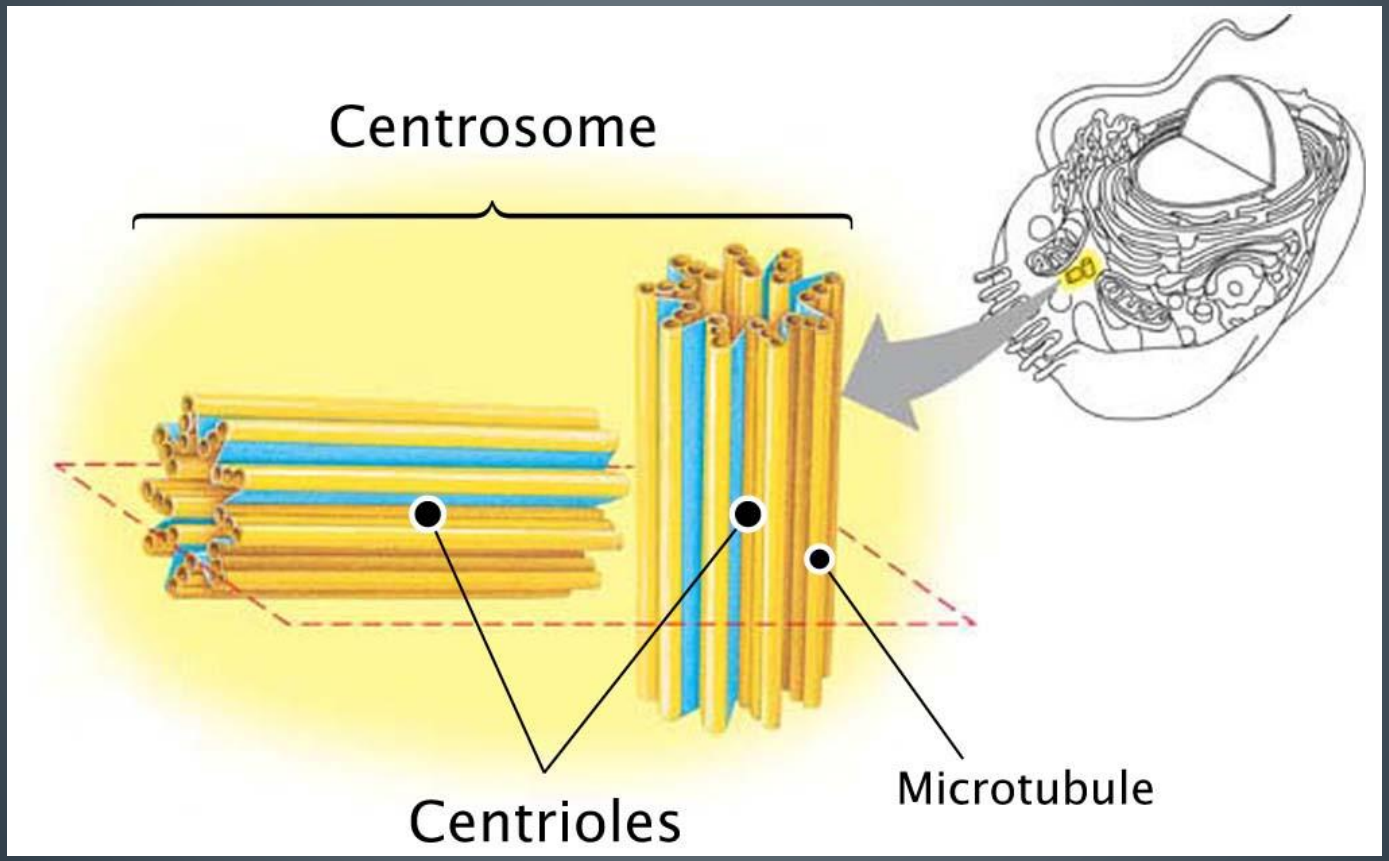
Cilia and Flagella



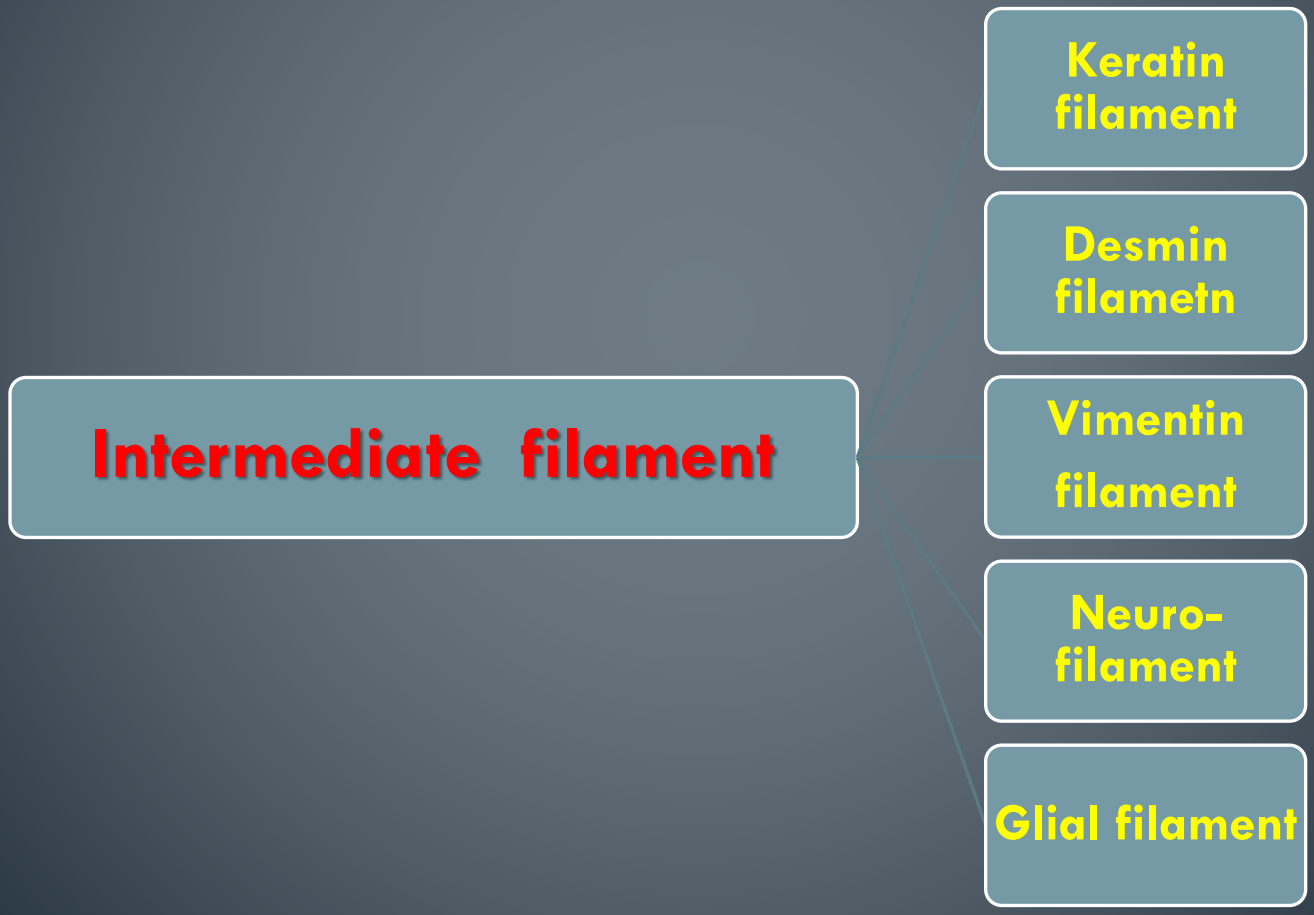
Axoneme


Central microtubules
Radial spokes
Plasma membrane
Inner sheath
Nexin
Dynein arms
B tubule
A tubule
Doublet microtubule

Centrosome



Intermediate filament



Actin and Myosin

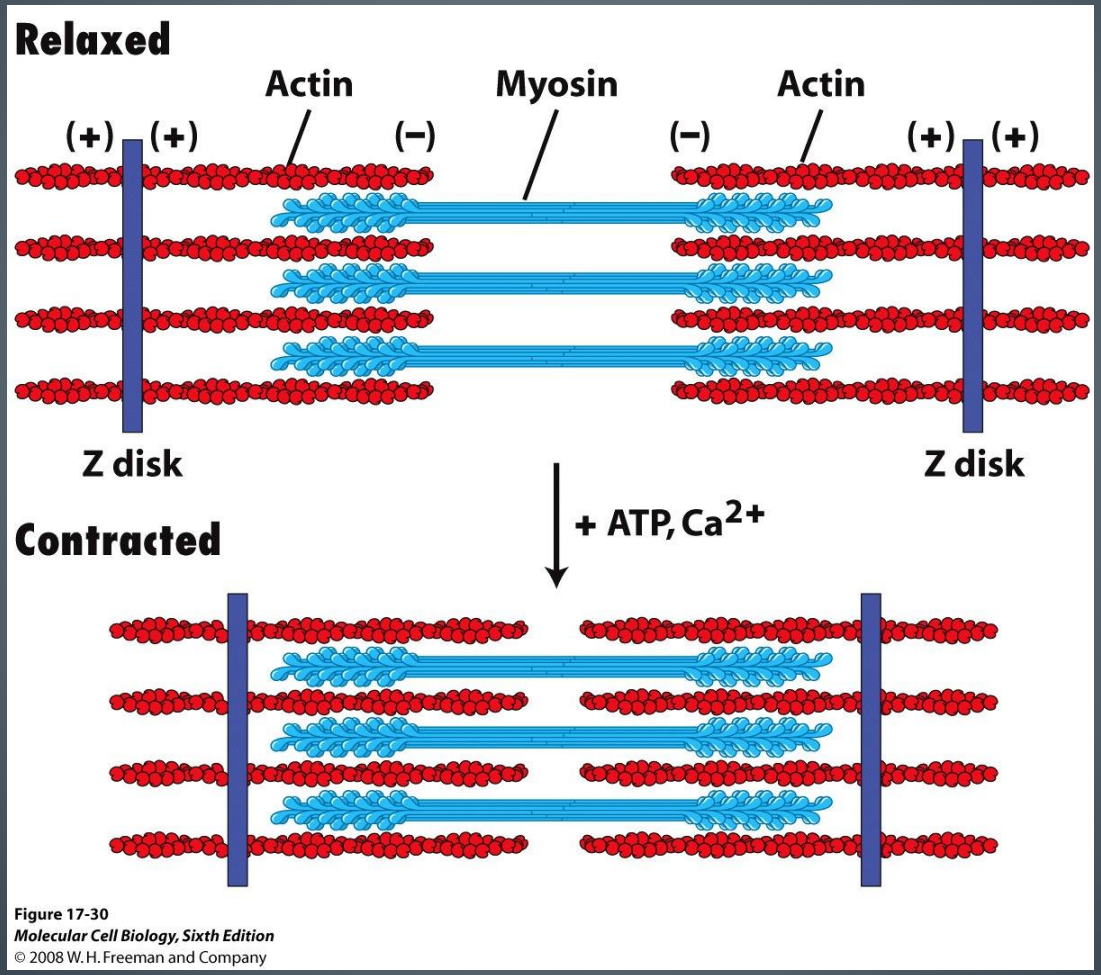
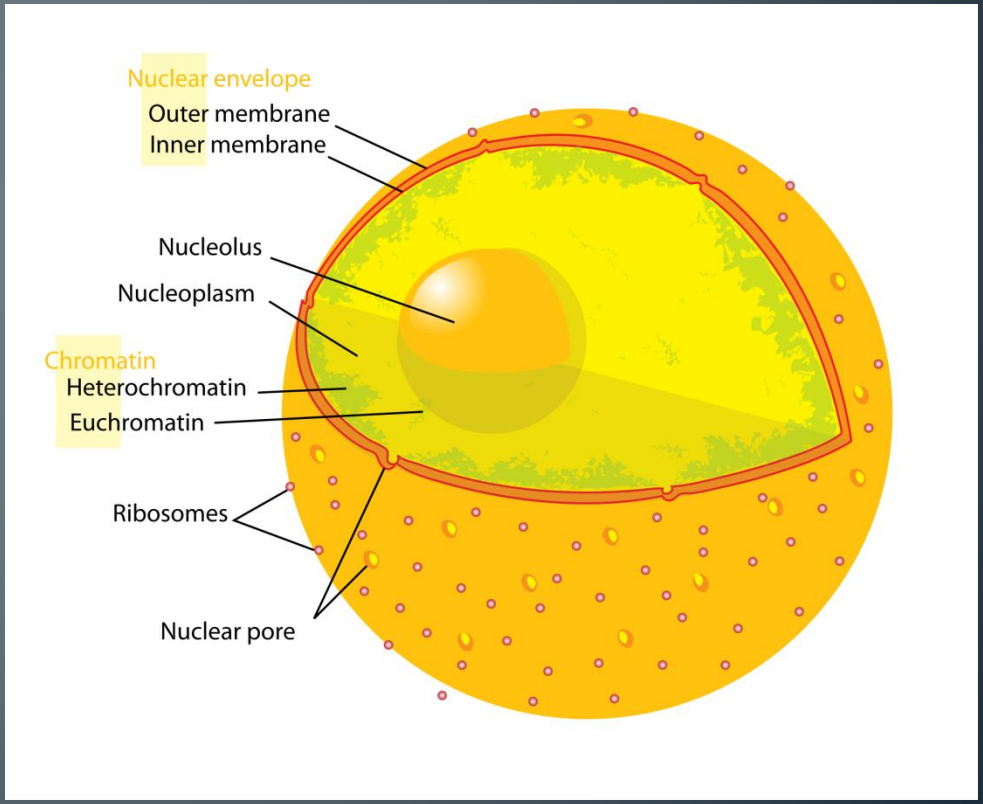


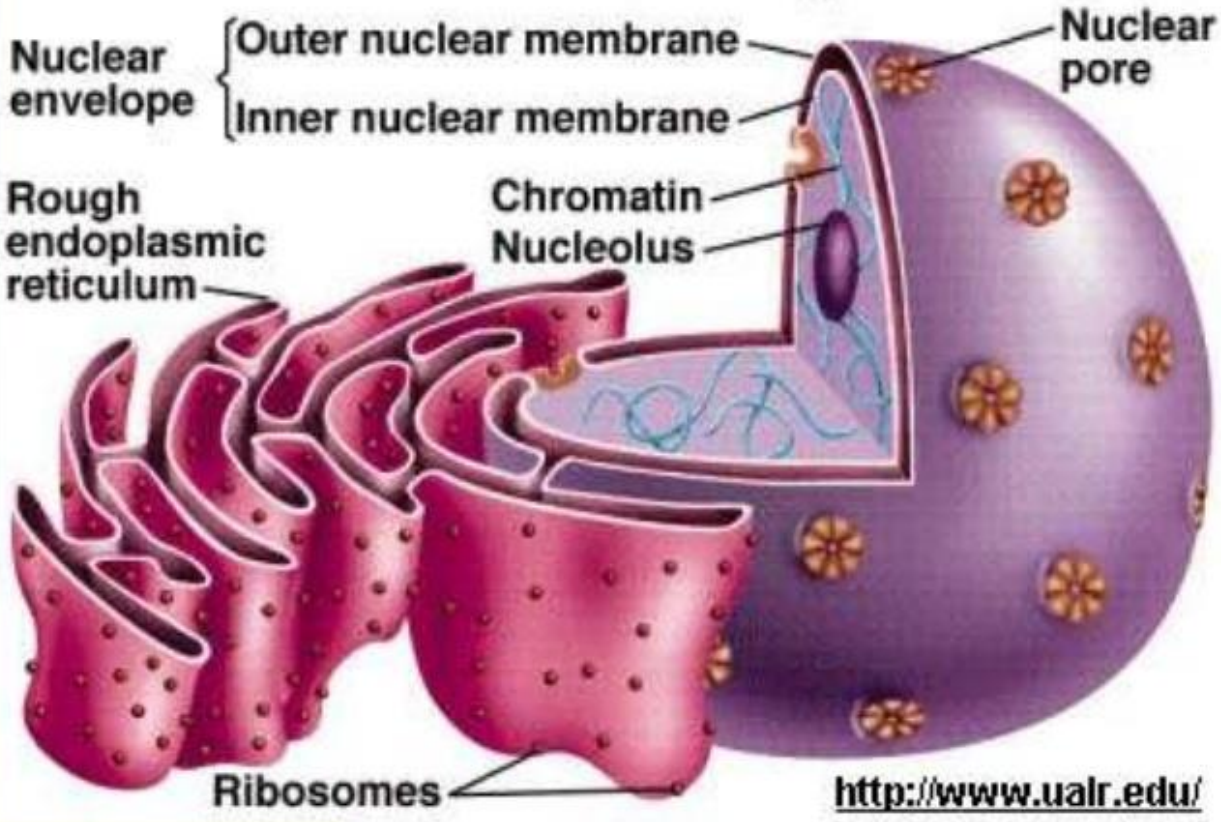
Figure 17-30
Molecular Cell Biology, Sixth Edition

Nucleus

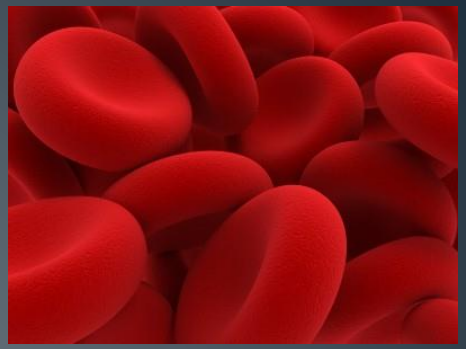
- Control center of the cell
- Contains **DNA**
- Surrounded by a double membrane
- Usually the easiest organelle to see under a microscope
- Usually one per cell



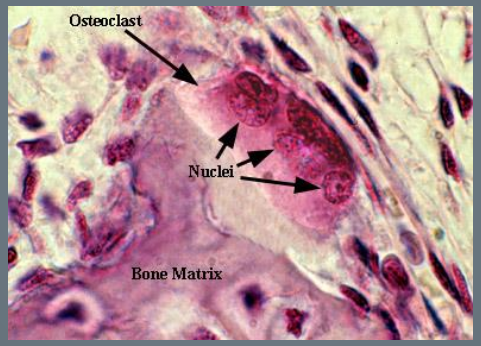
Nuclear Envelope

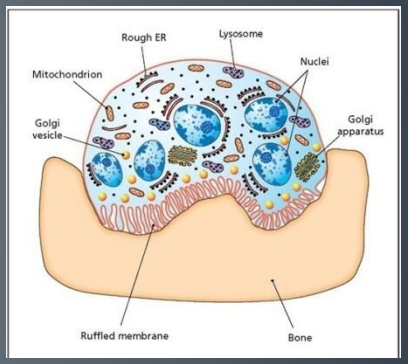


Non- nuclear : RBC , Platelets , Lens cells

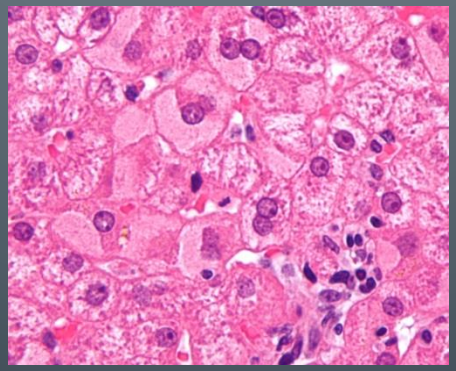


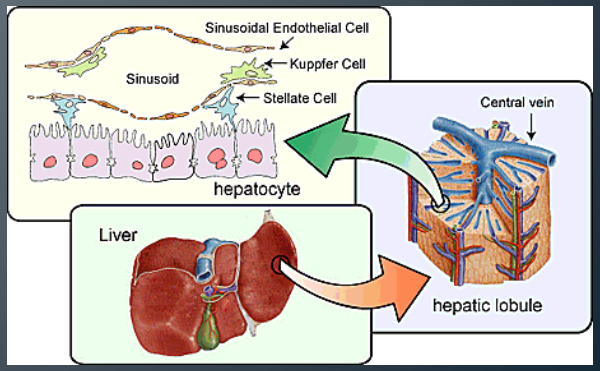
Poly nuclear : Osteoclast , Skeletal muscle



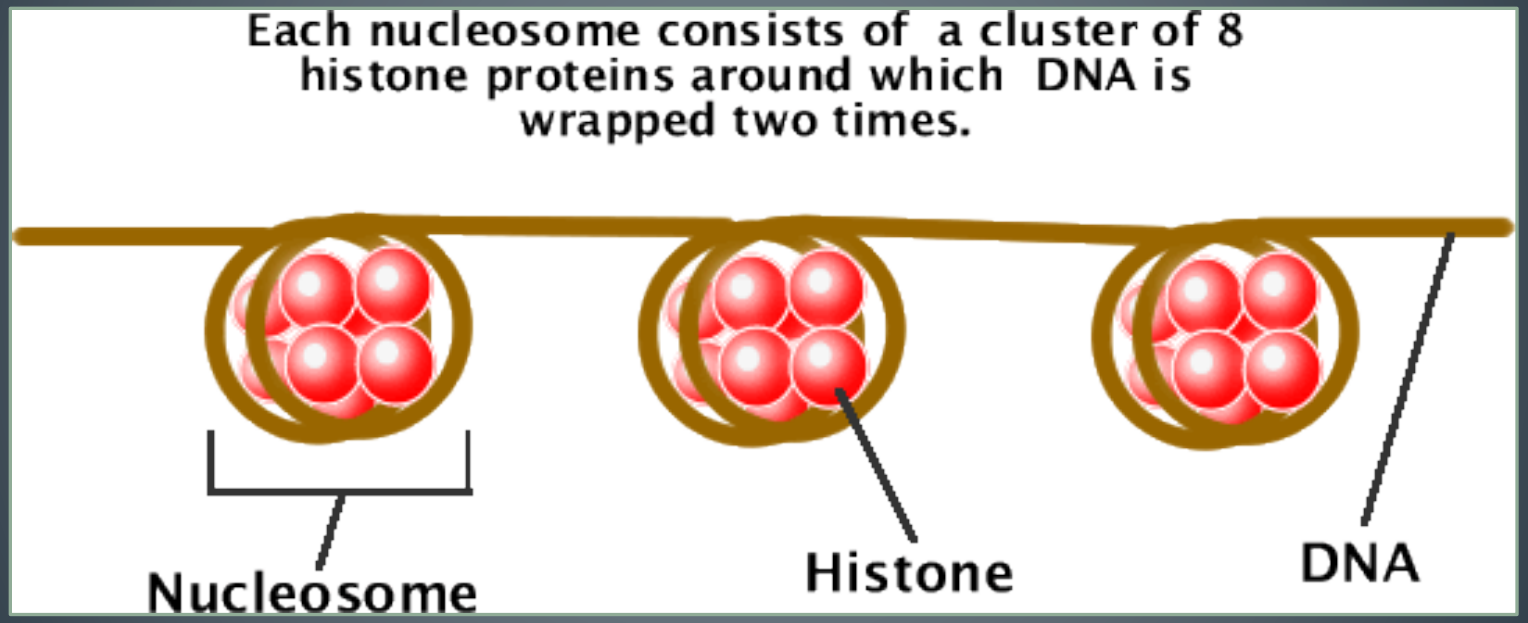


Bi nuclear : Cardiac cell , Hepatocyte

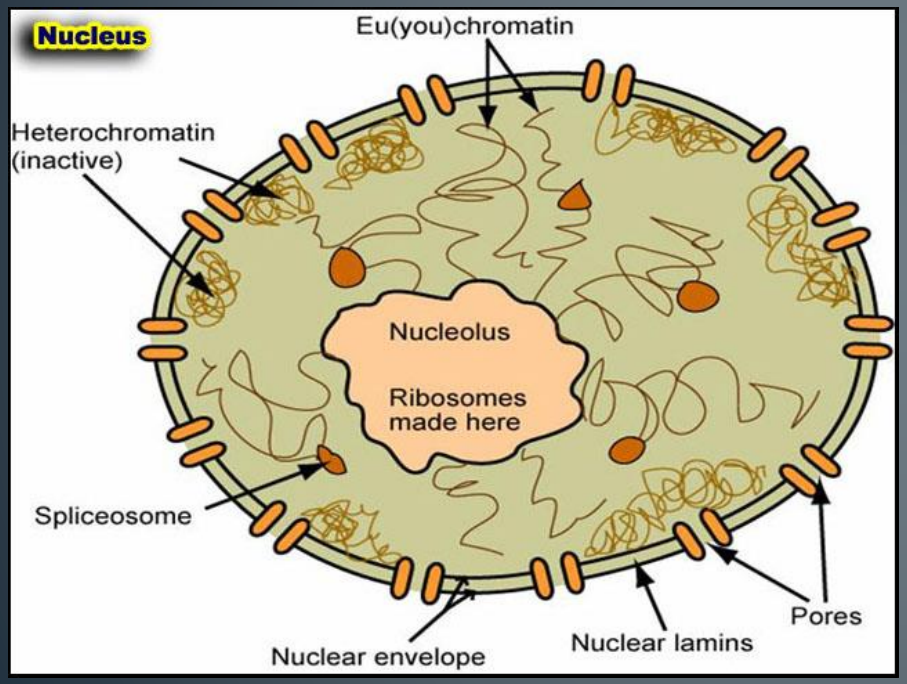


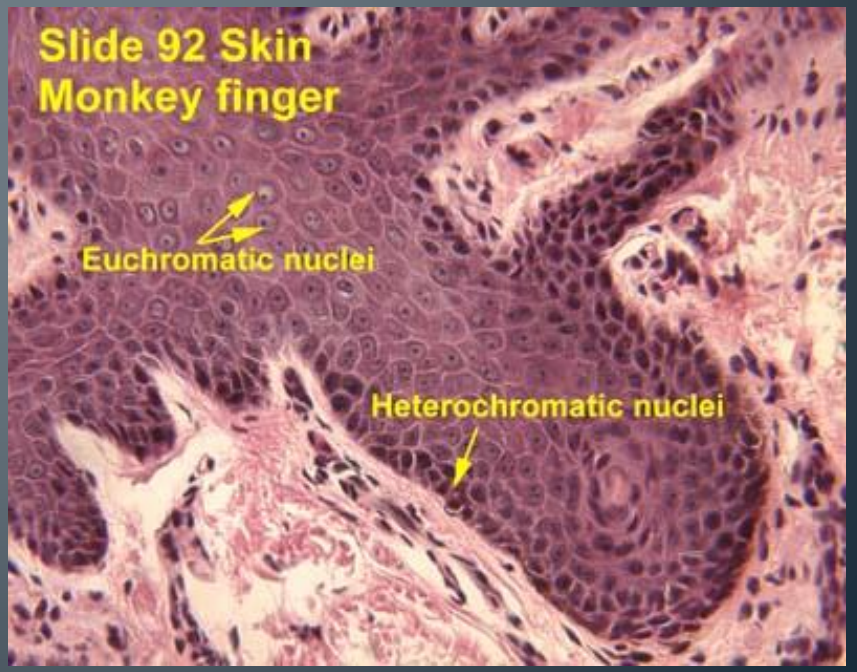


Chromatin

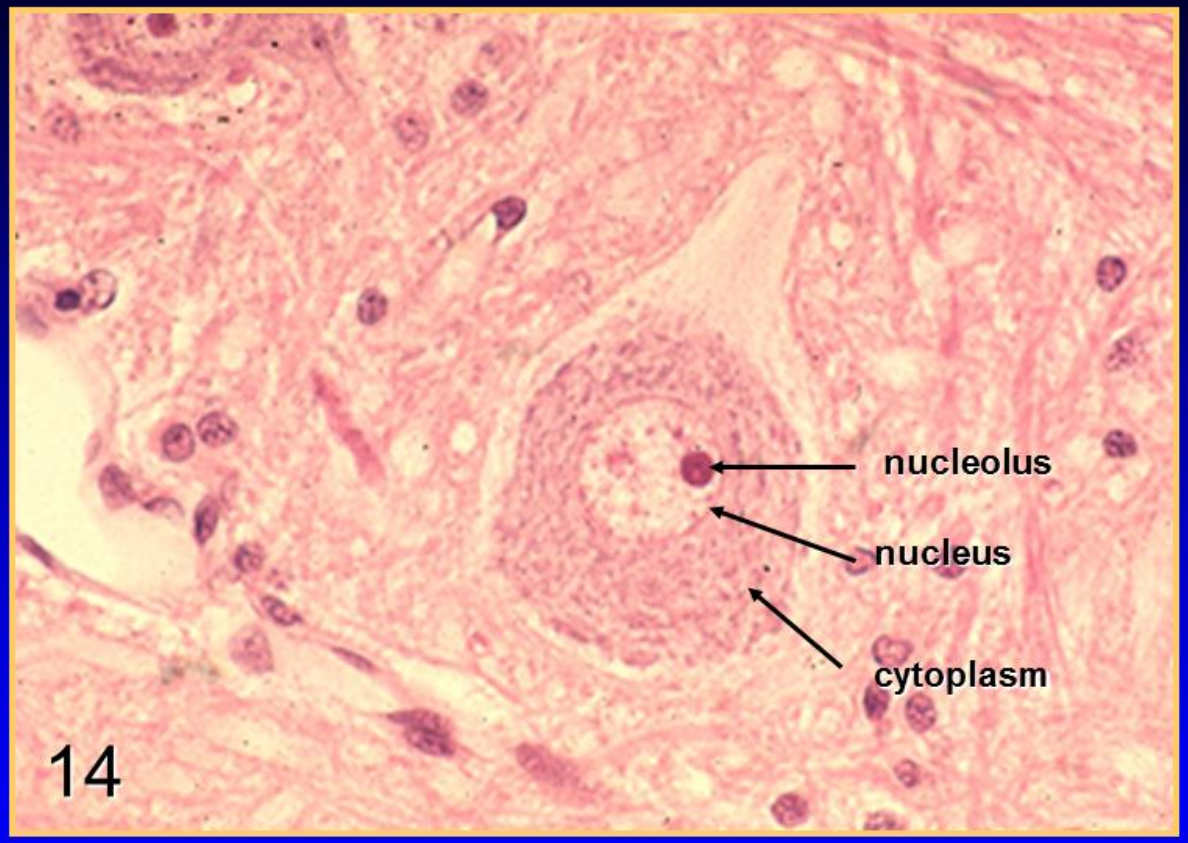

Each nucleosome consists of a cluster of 8 histone proteins around which DNA is wrapped two times.
Nucleosome
Histone
DNA

Euchromatin & Heterochromatin





Structure of the Cell



gure 14. High magnification of a neuron. 160X. Note that neurons have a large chromatic nucleus with prominent nucleolus and a basophilic granular toplasm. What cell organelle is responsible for the basophilia of the cytoplasm?