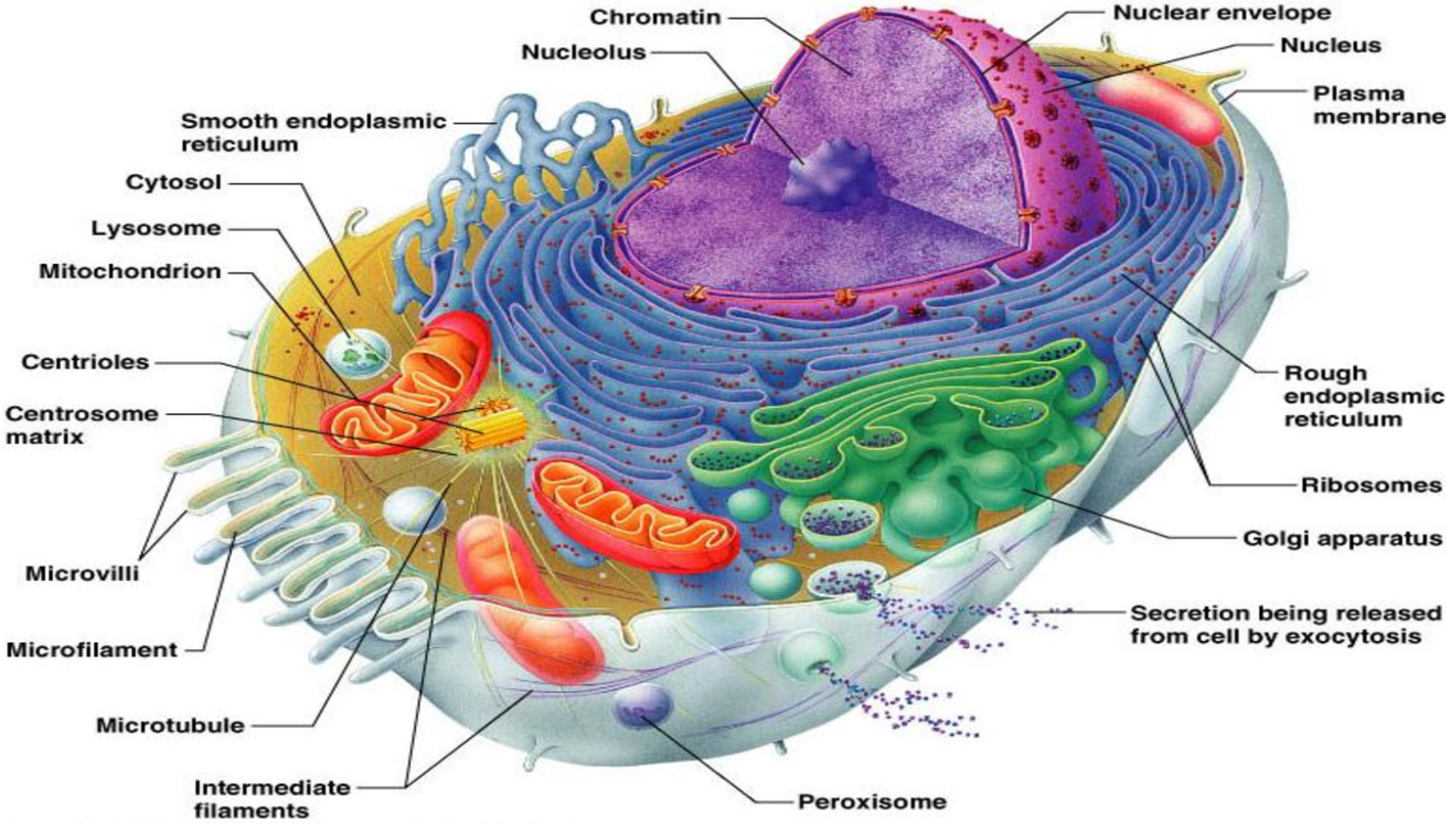
Lesson 7
Cellular organization

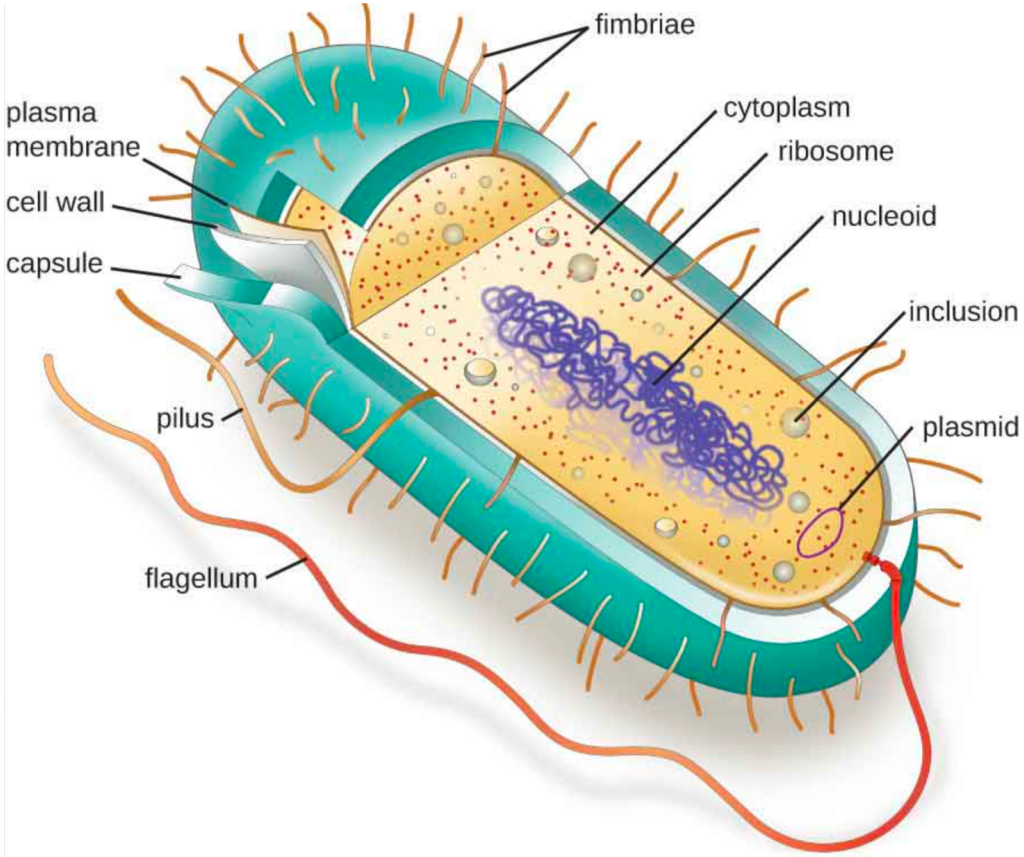


Inside a cell

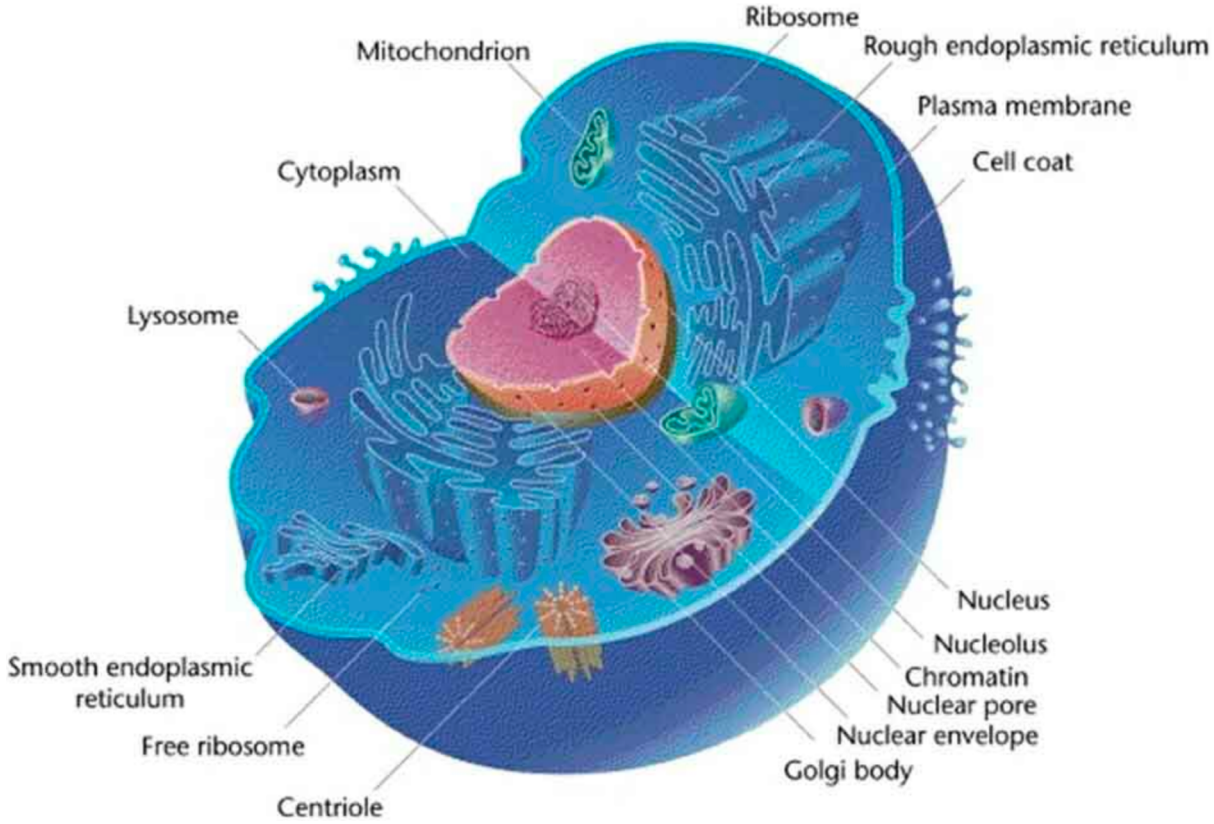
- Cells are replicating, membrane-bond factories
- **Organelles** = subcellular structures with specific functions
  - May be membrane-bound themselves

Inside a cell

Prokaryotic cell

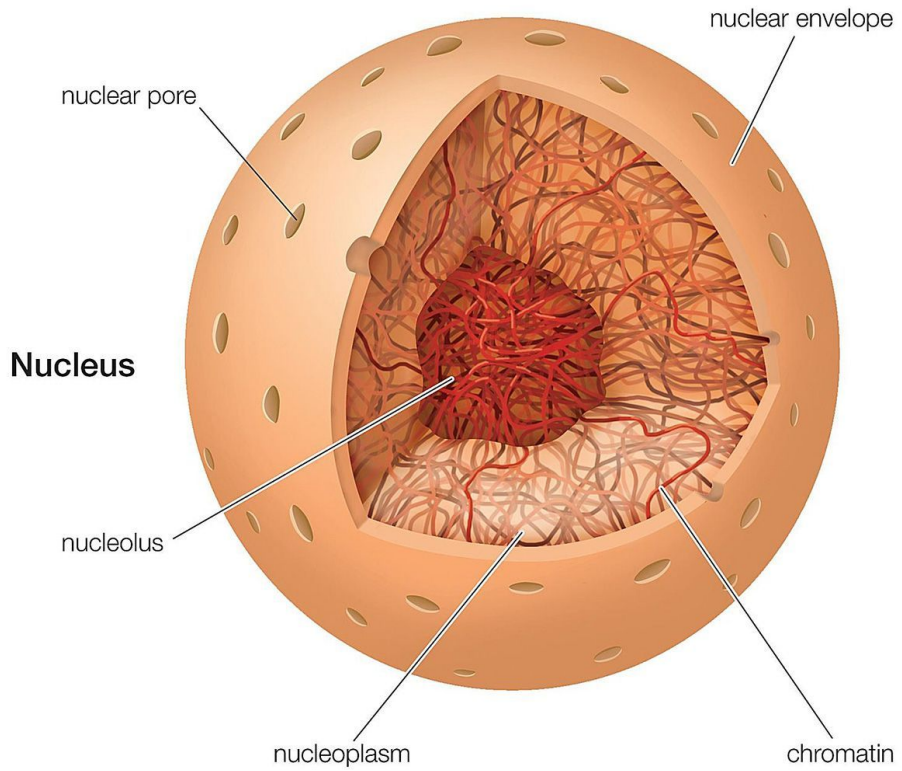


Eukaryotic cell



Cellular organelles (eukaryotes)

- **Nucleus** = repository for genetic information, cell control center
- **Nucleolus** = r-RNA synthesis, ribosome construction
- **Nuclear envelope** = an inner and an outer membrane which run parallel to each other
- **Nuclear pores** = gaps in nuclear envelope
  - ~ 100 nm in real diameter (however due to the presence of central regulatory proteins, the true size of the gap is around 9 nm)
    - control the passage of molecules in&out of the nucleus
    - larger molecules (e.g., big proteins and nucleic acid are unable to pass through these pores → nuclear envelope works to selectively separate the contents of the nucleus from that of the cytoplasm



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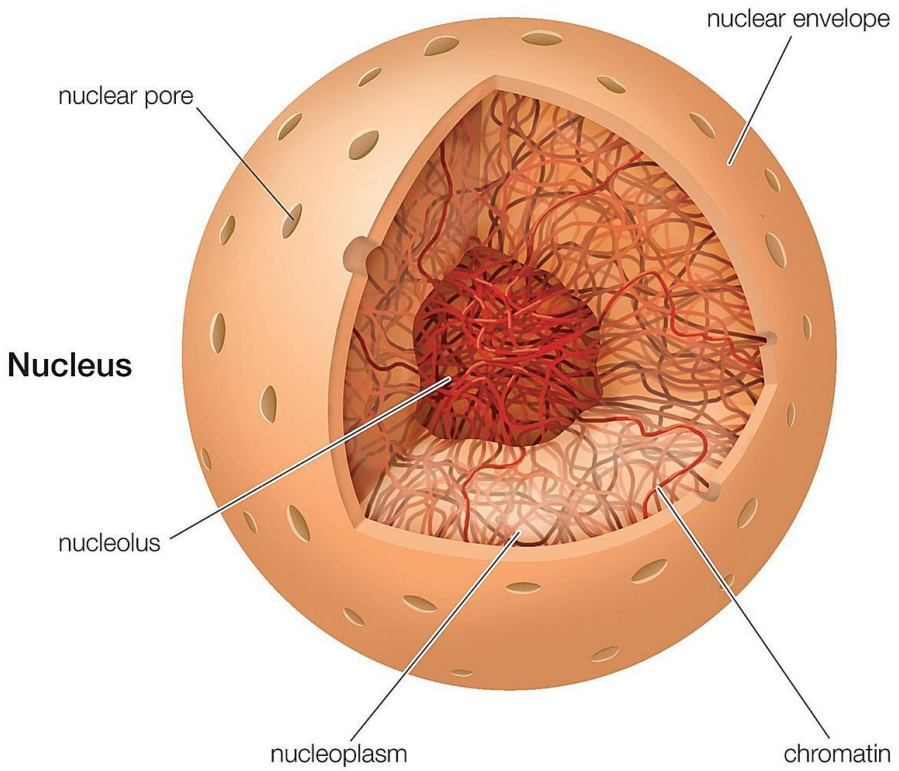
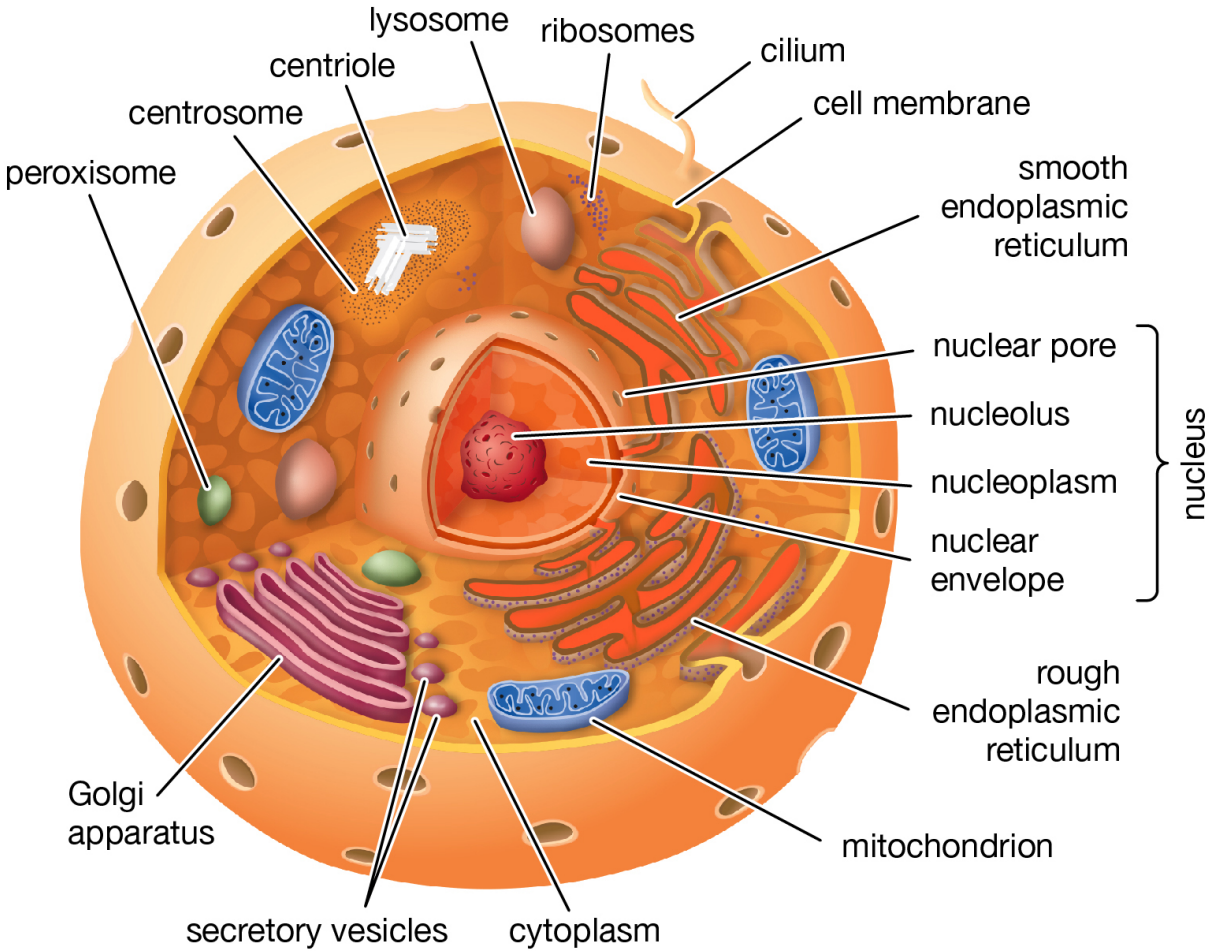
- **Chromatin =** DNA complexed with proteins (histones)
  - Histones combined with DNA form **nucleosomes**
    - a nucleosome describes a segment of DNA associated with **8** histone proteins
    - by associating with histones, DNA is more compact and able to fit into the nucleus



Cellular organelles (eukaryotes) – fly-by view

- Everything non-nuclear = **cytoplasm**
- **Mitochondria** = energy production/conversion
- **Endoplasmic reticulum**, **ribosomes**, **Golgi apparatus** = proteins synthesis
- **Lysosomes** = breaking down cellular components no longer needed/unwanted subtances
- **Cytoskeleton**, **cilia**, **flagella** = cellular movement, shape and size



Cellular organization

- Take assignment 7: Cellular organization