

Chapter 4

The Cell: Nucleus, Ribosomes

Nucleus

- **Function**
 - ◆ contains eukaryotic cell's genetic library
 - most genes in nucleus
 - some genes located in mitochondria & chloroplasts
- **Size:**
 - ◆ ~ 5 microns (μm) in diameter

Nucleus structure

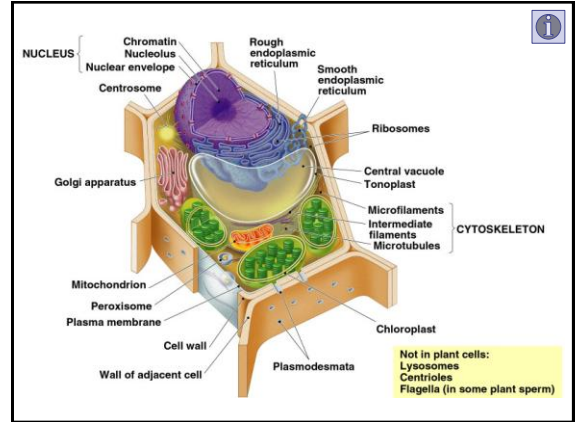
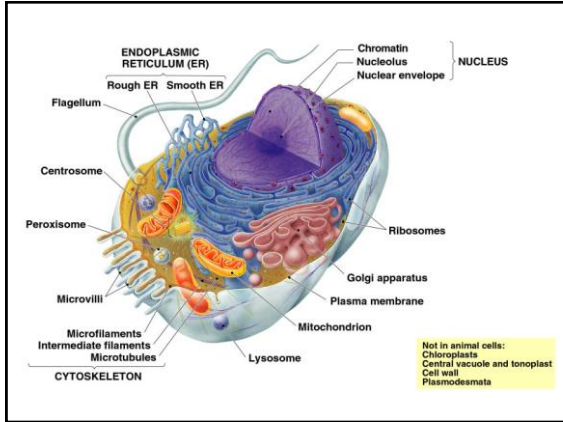
- **Structure**
 - ◆ separated from cytoplasm by a double membrane, nuclear envelope
 - ◆ double membrane is fused in spots forming pores
 - allows large macromolecules & particles to pass through

Nucleus structure

- Within nucleus, DNA organized into fibrous material, chromatin
 - ◆ in normal cell appears as diffuse mass
- When cell prepares to divide, chromatin fibers coil up as separate structures, chromosomes

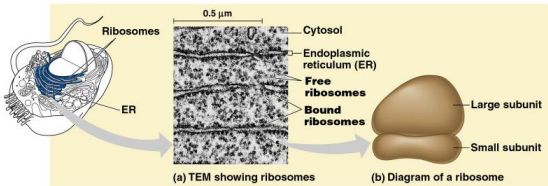
Nucleus structure

- Densely stained region in nucleus is nucleolus
- **Function**
 - ◆ production of ribosomal subunits from rRNA & proteins
 - pass through nuclear pores to cytoplasm & combine to form ribosomes



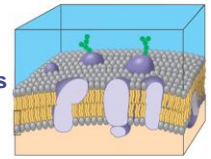
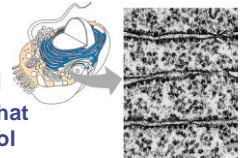
Ribosomes

- Function
 - protein production
- Structure
 - ribosomes contain rRNA & protein
 - composed of 2 subunits that combine to carry out protein synthesis



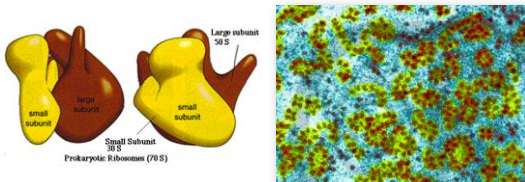
Types of Ribosomes

- Free ribosomes
 - suspended in cytosol
 - synthesize proteins that function within cytosol
- Bound ribosomes
 - attached to outside of endoplasmic reticulum
 - synthesize proteins for export or for membranes



Ribosomes

- Prokaryotes & eukaryotes have different ribosomes
 - different size subunits
 - different proteins



Prokaryote vs. eukaryote ribosomes

