

## Organelles and Functions

### Nucleus

- Houses genetic material
- Nuclear envelope with pores
- Nucleolus: rRNA synthesis
- Chromatin organization

### Endoplasmic Reticulum

- Rough ER: protein synthesis
- Smooth ER: lipid synthesis
- Calcium storage
- Detoxification

### Mitochondria

- ATP production (powerhouse)
- Double membrane
- Own DNA and ribosomes
- Apoptosis regulation

### Golgi Apparatus

- Protein modification
- Glycosylation
- Protein sorting and packaging
- Vesicle formation