

Source: [KBhBIO101EukaryoticOrganelles](#)

1 | Organizing Organelles Based on Membranes

By organizing [KBhBIO101EukaryoticOrganelles](#) based on whether or not they have membranes, it helps us gauge the evolutionary history of cells.

1.1 | Membranous Organelles

These have membranes! They have their own plasma, regulates their own macromolecule consumption, hormones, etc. Based on [KBhBIO101Endosymbiotic](#) endosymbiotic theory, double-membranous organelles may perhaps be the organelles that were originally independent prokaryotic cells that evolve to coexist with Eukarotes; by the same token, single-membraneous organelles may be fragments of prokaryotic cells.

1.1.1 | Double Membranes

- Mitochondria => store ATP and extract energy from ATP
- Chloroplasts => Does photosynthesis

1.1.2 | Double Membranes, Evolved Later

- Endoplasmic reticulum => forms the network of transferring proteins and other elements
- Golgi body/Giolli apparatus => packs, sorts, and modifies proteins and other elements throughout the cell

1.1.3 | Single Membranes

- Vesticles
- Lysosomes => breaking stuff down and garbage dumps
- Vacuoles => storing water, nutrients, waste

1.2 | Non-Membraneous