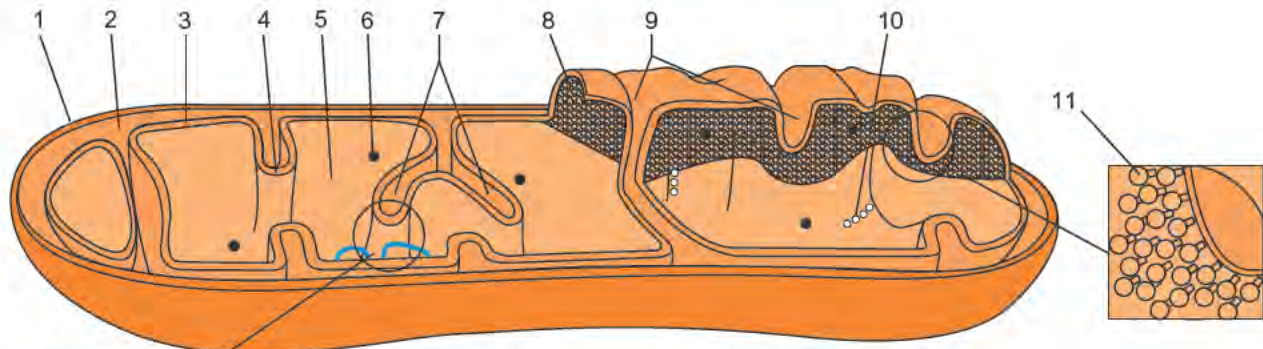




Model is fragile. Handle with care.



- 1. Outer Membrane
- 2. Intermembrane Space
- 3. Inner Membrane
- 4. Invagination to form Crista
- 5. Matrix
- 6. Granules of unknown function
- 7. Cristae
- 8. Stalked Spheres of Inner Membrane
- 9. Invagination to form Cristae
- 10. Ribosomes (size of bacterial ribosomes)
- 11. Sites of ATP Synthesis
- 12. Circular DNA Molecule

This simplified diagram shows some of the intermediate compounds of the Krebs Cycle and omits the enzyme systems. Briefly, before entry into the mitochondrion, the glucose molecule (protein or fat molecule would function similarly) becomes two molecules of pyruvic acid. Pyruvic acid forms  $\text{CO}_2$ ,  $\text{H}_2\text{O}$ , and Acetyl CoA. The latter combines with 4-carbon malate to form 6-carbon citrate. Citrate undergoes reaction with release of  $\text{CO}_2$  and hydrogen. Finally, the 4-carbon compound is reformed and the cycle begins again. Note that energy is produced only through the release of high energy electrons and the transfer of hydrogen ions to enzymes. It is the eventual union of hydrogen and oxygen in a series of reactions involving electron transfer which is responsible for the release of usable energy.

Two hydrogen atoms freed by the Krebs cycle convert three molecules of ADP to ATP. ATP molecules are also produced during the fermentation of glucose and during reactions involving phosphoglyceraldehyde and pyruvic acid.

