

After the nucleus, mitochondria are probably the most known and talked about organelle in the athletic arena, due to their role in the generation of energy. Referred to as the powerhouse of the cell, mitochondria are small, complex organelles that resemble a sausage in shape. They consist of a smooth outer membrane, which surrounds an inner membrane, forming a sac within a sac. The inner membrane is folded like an accordion, and it forms a number of inward extensions called cristae. The enzymes that are essential for making one of the most important biomolecules, adenosine triphosphate (ATP), exist in the mitochondria. It is here in the mitochondria that ATP stores energy which is used to power biological functions. Within the inner mitochondria membrane, catabolic enzymes (which are involved in breaking down of biomolecules) catalyze reactions that provide the cells with life-sustaining energy. Nutrients such as glucose and fatty acids are made of carbon atoms linked together with chemical bonds. When these chemical bonds are broken, energy is released. Within the intricate confines of the mitochondria, this energy can be trapped and stored in the ATP molecule, which can then make use of it. In other words, the energy from glucose is transferred to the ATP molecule, and the energy is now in a form that the body can use. These biological structures are the main components of the cell. Some of the other structures include glycogen granules, which store glycogen and enzymes for glycogen breakdown and synthesis. Although not a structure, the cytoplasm is worth mentioning. This liquid portion of the cell is the site of many reactions, including gluconeogenesis (glucose and glycogen formation), fatty acid synthesis, activation of amino acids, and glycolysis (the first phase of breaking down glucose to make ATP molecules for energy).