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Mitochondria: The Power-house of the Cell

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EDITORIAL

Mitochondria are small energy channels or factories in each cell in your body. The normal human cell contains anywhere from hundreds to thousands of mitochondria. Similar to your digestive system mitochondria are like tiny digestive systems in your cell which convert food into energy. The sugars, fats, and amino acids from the proteins we eat are converted into energy through mitochondria. They work so well that they produce about 90% of the energy needed by our cells. Mitochondria look like little beans in your cell. They are made of two layers, the outer layer and the inner layer. The outer layer acts as a wall, covering all of the organelles. The inner layer looks like a series of folds, consisting of several rooms. This fortified structure is designed to enlarge the surface area of the mitochondria supporting high efficiency in its function. Inside the inner membrane, there is a fluid called a matrix that's where the magic happens. Before mitochondria were essential to human cells they existed without them as single-celled independent organisms. They looked like germs. However, at some point in the ancient history of living things more than two billion years ago, they came together in a simple cell to form a cohesive relationship. At first, the plan was not just a compilation. Mitochondria like bacteria only wanted to rob the cells of their energy and leave them to die. But bacteria quickly see the benefits of interacting with simple cells. Light cells provide antioxidants to protect them from free radicals and toxic active forms produced by mitochondria as a product of energy production. Repeatedly, mitochondria produced much-needed simple cellular energy. It's a really good deal. It is as if mitochondria pay taxes on restoring housing and utilities. Mitochondria are strangers to your body. Our mitochondria have their DNA, called mtDNA, which gives them an independent genome. In addition, mitochondrial DNA is simply passed from mother to child, making you more like your mother than your father. Modern ancestral testing companies rely on your mother line using mitochondrial DNA. Our bodies do not simply create and use energy quickly. It stores the energy we produce in our food molecules. Adenosine Triphosphate (ATP) is an energy-efficient drug for our cells. They are like small batteries floating around waiting to be used. Tri means three, which means that there are three phosphates in the cell structure. When cells need energy, ATP is broken down by a process called hydrolysis. This is very easy to do because ATP is an unstable molecule. The three phosphates of ATP are similar to the three occupants living in the same room. They are not in love and are waiting to be separated. When a breakdown occurs the cellular bond between the phosphates in the tri-phosphate group of ATP breaks down removing one of the phosphates from the ATP molecule. Three became a duo making ATP into Adenosine Diphosphate (ADP) or adenosine diphosphate. This breakdown releases large amounts of energy and our cells use that energy to activate vital cellular activity. Our mitochondria work hard to make sure that our cells have enough of these batteries ready for use or ATP floating around.