



MITOCHONDRIA

Let's look at a basic, but very interesting cellular function. In every cell (except one, which we will identify later) there are very tiny particles called mitochondria. The word has Greek roots: mitos (thread) and chondrion (small grain) and was coined in 1898 by a German microbiologist. Mitochondria are around 0.5-1 micrometer in diameter. That is one-thousandth of a millimeter. The number of mitochondria in the cytoplasm of a given cell (ranging from zero to over 600,000) is dependent on the cell's energy needs. Your brain is a small percentage of your whole body, but it uses a very large percentage of your body's energy demand. Increased muscle function increases the need for mitochondria to produce more energy.

You can think of mitochondria as the powerhouse of energy because they produce 90% of the energy that a cell needs to function. This energy is packed into a chemical called ATP (adenosine triphosphate) which functions like a battery giving up energy to the cell as needed. How does that happen? In the Krebs cycle (remember your biology?) molecules are produced that transport electrons to the mitochondria who then create the ATP 'batteries'! The process is called oxidative phosphorylation. Your mitochondria are unique in the biological world because they have their own genome which is inherited from your mother. I find it difficult to accept that this energy production all happened 'by chance' through an evolutionary process.

Did you remember? One cell does not have mitochondria. That would be the red blood cell (RBC) known as an erythrocyte. The life span of an RBC is about 120 days. It has a biconcave shape like a donut with a thin center, not a hole. This unique shape gives the RBC a high surface area to volume ratio. In addition, the RBC does not have a nucleus, and it does not have any mitochondria taking up space. Hence the RBC is uniquely designed for the purpose of carrying as much oxygen as possible to every part of your body.

Mitochondria are talked a lot about in the "supplement" world, and many products are advertised as being important for "mitochondrial health". But it is back to basics: exercise, healthy diets that includes fiber, healthy fats, antioxidants, and adequate sleep will keep your mitochondria healthy.

Information for this article was gleaned from AI and an NIH article: www.nih.gov/news-events/nih-research-matters/mitochondria-health

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