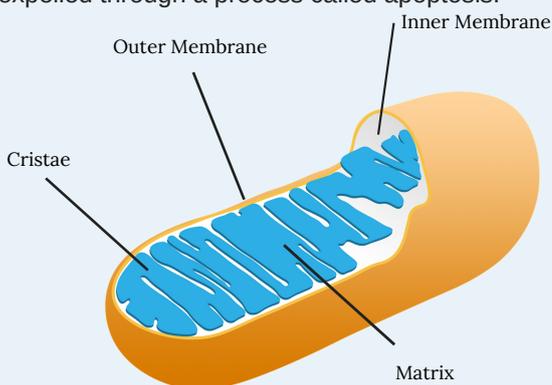


## WHAT'S YOUR MITOCHONDRIA IQ?

### Mitochondria: The Powerhouse of the Cell

Mitochondria are double-membraned organelles within the body's cells that provide critical and necessary functions – one of which is producing energy – hence the name the "powerhouse" of the cell. Mitochondria take the food we eat and synthesize it into energy that runs our biological processes. But, mitochondria do more than just produce energy – they are crucial to the survival, and death, of the body's cells.

The human body is said to be made up of approximately 37 trillion cells, with each cell containing 300 to thousands of mitochondria[1]. The survival of the body's cells is dependent on the mitochondria's production of adenosine triphosphate (ATP), which jumpstarts metabolic processes and helps provide energy to the body. The body also relies on mitochondria to decide which cells are needed and which can be expelled through a process called apoptosis.



In addition to these critical processes, mitochondria help to store calcium, which are vital for muscular function, preventing blood clotting, releasing neurotransmitters and more. The mitochondria absorb these calcium ions and store them until they need to be released.

It's clear from research that healthy mitochondria play a significant role in supporting important indicators of cognition, physical performance and aging. By giving mitochondrial function a boost, a person can support these power centers in the body and keep cells healthy as we age.

### Energize: Mitochondria at Work

Mitochondrial biogenesis is an essential function that works in conjunction with mitophagy, the removal of damaged mitochondria. Both of these processes are crucial for cell regulation, as the body needs to replace old, damaged mitochondria with the new. Mitochondrial biogenesis is the process by which mitochondria divide and create new mitochondria from the old, which is essential to maintaining healthy mitochondria and cells. This process is necessary for regulating homeostasis, or the balance, within mitochondria and ultimately, the cell.

***"...healthy mitochondria play a significant role in supporting important indicators of cognition, physical performance and aging."***

One way that people can activate mitochondrial biogenesis and enhance mitochondrial health in the body is through exercise. Participating in aerobic or high intensity interval training (HIIT) exercises can boost mitochondrial function throughout the body[2]. The more one performs these exercises, the more proteins the mitochondria are being fed, increasing energy and stalling aging at a cellular level[3]. While exercise can be done by people of all ages, whether they're healthy and fit or live an active lifestyle, there is also an older population who may not be able to perform these sometimes strenuous activities due to a variety of reasons, including age, health conditions and physical ailments. Still, others don't have the energy to workout because of diet restrictions and could benefit from a mitochondria enhancer.

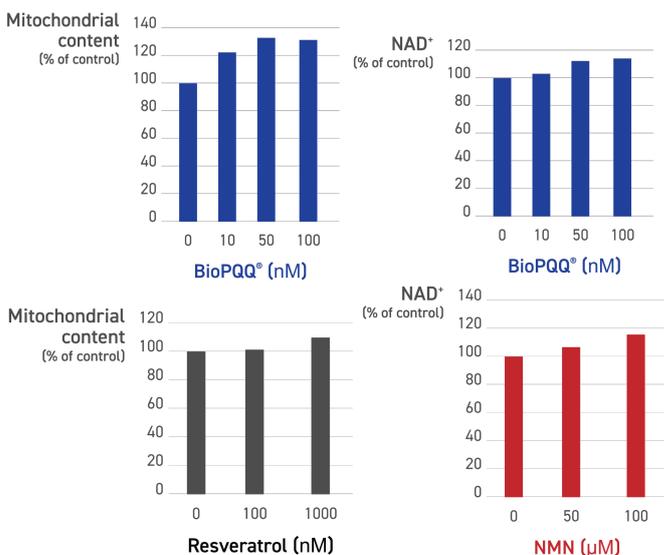


# Give Your Mitochondria a Boost

Although mitochondrial biogenesis can be stimulated through exercise, it can also be activated through supplements like, BioPQQ®, a safe, all-natural supplement ingredient manufactured by Mitsubishi Gas Chemical Co. Inc. in Japan and sold in the United States, Canada and Japan. The ingredient is known under the brand name MGCPQQ® in Europe. Studies have shown that BioPQQ may activate and increase mitochondrial biogenesis more so than other mitochondria-enhancing supplements, while also helping to boost cognitive function, memory, energy and overall mood, as well as promoting healthy aging.



Made through a proprietary fermentation process utilizing bacteria from nature, the main ingredient Pyrroloquinoline quinone (PQQ) disodium salt is a quinone compound that can be found in certain meats, vegetables and fruits. Although it is found in only small doses within these food groups, a study of mice that were deficient in PQQ developed various disorders such as immunodeficiency, reduced mitochondrial function and fetal growth failure, which lead to the conclusion that PQQ may play a role as a nutrient[4]. With 40 years of scientific research, BioPQQ is the only supplement ingredient of its kind with a New Dietary Ingredient (NDI) notification from the U.S.



**BioPQQ has been shown to help activate mitochondrial biogenesis and work up to 10 to 1,000 times better than ingredients known to support mitochondria production. [5]**

Food and Drug Administration (FDA). This notification is a testament of BioPQQ's stringent safety standards throughout production.

Moreover, BioPQQ can provide more efficient energy production by increasing mitochondria and raising NAD+ levels due to its effect on proteins containing L-lactate dehydrogenase (LDH)-A chain. An animal study revealed that BioPQQ inhibited the forward reaction of this cycle (pyruvic acid to lactic acid in the presence of NADH), causing the reverse reaction (lactic acid to pyruvic acid in the presence of NAD+) to take place. BioPQQ, when bound to LDH, creates NAD+ from NADH, reducing production of lactic acid and raising ATP levels within the cell.[5]

***"With 40 years of scientific research, BioPQQ is the only supplement ingredient of its kind with a New Dietary Ingredient (NDI) notification from the FDA"***

## Protect the Body's Power Source

The healthier one's mitochondria are, the more active the mitochondria can be. As the body grows older, mitochondria levels decline and can become dysfunctional, which can lead to problems such as diabetes, sarcopenia, infections, as well as neurodegenerative diseases like Alzheimer's and dementia. Over time, mitochondria decrease in number and efficacy, creating issues with a person's energy and overall functionality. The body only creates the amount of energy that is needed.

As such, when people age, their energy levels naturally decline. When exercising becomes more challenging, the body becomes accustomed to a sedentary lifestyle which causes it to lose the ability to produce energy in general, making the activation of mitochondrial biogenesis harder to obtain on its own.[7] Boosting mitochondria is also beneficial for those who are generally healthy and are looking for new approaches to reduce the risks associated with aging. Using supplements like BioPQQ daily can help increase quality mitochondria, boost mitochondrial function and enhance energy in a natural, healthy way.

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.*

References: [1] <https://www.ncbi.nlm.nih.gov/pubmed/23829164>  
[2] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1540458/>  
[3] <https://www.ncbi.nlm.nih.gov/pubmed/28273480>

[4] <https://science.sciencemag.org/content/245/4920/850>  
[5] <https://pubs.acs.org/doi/abs/10.1021/acs.biochem.7b01185>  
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[7] <https://www.sunmark.co.jp/eng/book/health-and-beauty11/>