**Your Biohacking journey with Vitamin B**

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Supplements are a popular tool that biohackers have in their arsenal. These could vary from anti-aging supplements to smart drugs or what we like to call nootropics. If you are a neophyte biohacker who hasn't tried anything crazy yet and is looking to dive deeper into nootropics, there is one group of vitamins that you may want to test as your starting point to supplements, the B vitamins.

Vitamin B is the Swiss army knife of vitamins because the benefits from this group of vitamins are seemingly endless. One of the best-known function of vitamin B is in helping with metabolism. If you are looking for ways to lose weight and develop muscle, consider taking vitamin B supplements, specifically thiamine and riboflavin, because it helps with carbohydrate, protein, and fat metabolism. If you are looking to improve your cognitive function, pyridoxine or vitamin B6 would be a useful supplement for you as it helps with enhancing your memory.

**Deeper into the vitamin B complex**

Vitamin B is an excellent supplement because it encompasses an extensive array of effects on your performance. Vitamin B is composed of individual vitamins with their different functions, making up the B-complex vitamins.

**Vitamin B1 (Thiamine)**

Thiamine is one of the most useful among the eight B vitamins because it is utilized by nearly every type of tissue in the body.

One of the most basic functions of Thiamine is in assisting the body in generating ATP, the energy currency of the cell. Thiamine is involved in the [conversion of carbohydrates](https://pubmed.ncbi.nlm.nih.gov/29208764/) into basic sugars such as glucose, which can then be used by the body as an energy source.

In adults 20 years and older, the average daily intake is 1.95 mg. There is no risk of over-consumption for vitamin B1, but thiamine deficiency could manifest mainly by neuropathy and muscle wasting. In its early stages, thiamine deficiency could be seen as weight loss, short-term memory loss, and muscle weakness.

**Vitamin B2 (Riboflavin)**

Much like thiamine, the role of riboflavin in the body is to extract energy from the food we have consumed. However, there is one popular function of riboflavin that thiamine cannot do, and that is the breakdown of fats into usable energy. This means that the intake of riboflavin can assist in weight loss and fat-burning exercises to make your regimen more effective.

Other than assisting in metabolic functions, riboflavin has a couple of different roles such as absorbing and utilizing iron to prevent the onset of anemia, keeping the eyes healthy by preventing cataracts, and it even helps in [relieving migraines](https://pubmed.ncbi.nlm.nih.gov/28485121/).

The standard daily recommended allowance for vitamin B2 is 1.3 mg per day. Riboflavin is relatively non-toxic and considered as safe at high doses because any excess of it is disposed of through urine. On the other hand, riboflavin deficiency is also a possible risk for developing anemia if you do not take the daily recommended level.

**Vitamin B3 (Niacin)**

Niacin is essential in the production of nicotinamide adenine dinucleotide or NAD molecules. This NAD molecule is a crucial cofactor that assists in metabolic functions, cellular repair signaling, and defenses. Vitamin B3 is also essential for the [growth and maintenance of the central nervous system](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6412771/).

Niacin is a known vasodilator, which works by relaxing the constricted blood vessels, allowing for the rebuilding and maintenance of the axons, as well as activating the new astroglial cells and synaptic regions.

The daily recommended intake of vitamin B3 for adult men is 16 mg. Taking higher doses of more than 500 mg per day have been known to cause diarrhea and easy bruising. Although uncommon in developed countries, niacin deficiency can cause carcinoid syndrome wherein tumors to develop in the gastrointestinal tract.

**Vitamin B6 (Pyridoxine)**

Pyridoxine is a known cofactor in around 100 enzymatic reactions in the body. One of its primary functions is producing hemoglobin and enhancing the ability of hemoglobin to bind oxygen, therefore, improving the blood's ability to deliver oxygen to different organs. It is also involved in [protein, fat, and carbohydrate metabolism](https://www.hsph.harvard.edu/nutritionsource/vitamin-b6/), and helps in keeping the lymph nodes, thymus, and spleen healthy.

Another exciting benefit of Vitamin B6 is its potential in protecting against air pollution. A 2017 study by researchers at UC Berkeley, California, shows the ability of pyridoxine in [minimizing the epigenetic effects of pollution](https://www.pnas.org/content/114/13/3503.abstract).

Unlike other vitamins, pyridoxine is not produced naturally by the body, and its sources include supplements and a variety of foods from avocados to salmon.

Just like riboflavin, vitamin B6 intake should also be 1.3 mg per day. There are also no reported issues with a high intake of pyridoxine, but deficiency is associated with anemia, dermatitis, depression and confusion, and a weakened immune system.

**Vitamin B7 (Biotin)**

Biotin has two significant functions: assisting in [cellular metabolic pathways](https://pubmed.ncbi.nlm.nih.gov/22116691/), and in supporting gene expression. However, biotin is also a popular name in beauty products like shampoo, hair conditioners, and skincare products. This popularity is mainly owed to studies telling us that [vitamin B7 deficiency](https://pubmed.ncbi.nlm.nih.gov/29057689/) could result in deterioration in cellular repair mechanisms, which manifest physically as brittle hair and nails, and dry skin.

Vitamin B7 should be consumed at 30 mcg a day. There is no evidence that biotin is toxic in high intake, but biotin deficiency manifests as skin rashes, hair loss, and brittle nails. These claims are supported by studies showing that biotin helps in the promotion of hair, skin, and nail health.

**Vitamin B12 (Cyanocobalamin)**

Cyanocobalamin, sometimes called cobalamin, is an essential vitamin that is known to be responsible for a wide array of functions, from the production of red blood cells, synthesis of DNA, proper bone development, to supporting [neurological functions](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3875920/). Among elderly individuals, vitamin B12 deficiency has been associated with progressive brain atrophy. It was reported that vitamin B12 deficiency carries a risk of permanent nerve and brain damage, and some patients develop psychosis, mania, and dementia.

The primary function of Vitamin B12 is to assist in the production of red blood cells, the main component of blood whose purpose is the distribution of oxygen from the lungs to different organs of the body. The [lack of vitamin B12](https://pubmed.ncbi.nlm.nih.gov/2680773/) could result in weakness and fatigue.

For adults, the recommended daily intake of vitamin B12 is 2.4 mcg. Much like the other vitamins, the risk of cyanocobalamin is not in the high level of consumption but in taking a dose much lower than is recommended. Cyanocobalamin deficiency is characterized by fatigue, weakness, constipation, loss of appetite, weight loss, and anemia.

**Benefits of Vitamin B complex**

With almost 10,000 clinical studies published in PubMed on vitamin B, it is easy to see why this vitamin complex is the perfect gateway smart drug. It offers so many benefits that encompass a lot of different body systems that it only makes sense that starting biohackers learn about its benefits first before going into more complex smart drugs.

Just from the information above about vitamin B, you should be thinking of getting supplements by now. If you are not yet convinced, read further because I am going to lay out exactly what benefits you will gain from increasing your vitamin B intake.

**Neuroplasticity**

To those who are not familiar with neuroplasticity, it refers to the ability to adapt to injury, disease, and even aging.

Neural pathways change depending on various factors such as your environment, your response to the environment, such as your emotions, behavior, and neural processes. When these changes happen, your brain will maximize its capacity by cutting connections that are no longer needed or useful and goes on to strengthen the important ones.

There have been [studies](https://pubmed.ncbi.nlm.nih.gov/27488863/) claiming that low levels of vitamin B1 or thiamine were found in patients with ataxia, a condition that causes the loss of muscle function and movement. More so, patients that were given thiamine for long-term treatment showed significant improvement in muscle movement.

Another vitamin B that could help with improving neuroplasticity is vitamin B12 or cyanocobalamin. Vitamin B12 supplements are reported to help in reducing the loss of neurons that typically happen as we age. One [study](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2013350/?page=1) shows increasing the vitamin B12 intake of people who have less than the average level of cyanocobalamin improves their memory.

**Improve your mental health**

Not only does it help with keeping your neural functions intact, but vitamin B12 can also help [regulate your mental health](https://pubmed.ncbi.nlm.nih.gov/25644193/) and improve your mood. Cyanocobalamin is an essential molecule that assists in synthesizing and metabolizing serotonin, a neurotransmitter that is produced by the body that gives you the feeling of well-being and general happiness. It has been studied that low levels of serotonin are linked to low emotional states such as depression and irritability. Since vitamin B is needed by the body to produce serotonin, the increase in levels of vitamin B is a great way to help improve your mood.

**Deal with migraines better**

Not only is riboflavin useful as a fat-burning vitamin, another significant benefit that might interest you is its known effect on migraines. If you are one of the many thousands that suffer from migraine, I know that you are willing to try absolutely anything to get rid of these recurring headaches. [Supplementing riboflavin](https://pubmed.ncbi.nlm.nih.gov/26780280/) lessens the occurrence, as well as the length of migraine attacks both in adults and children.

**Cardiovascular health**

In [clinical research](https://pubmed.ncbi.nlm.nih.gov/23910704/) performed with patients with congestive heart failure, thiamine has been shown to help in the improvement of cardiac function. Another [study](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3865826/) that focused on the meta-analysis of randomized, placebo-controlled trials on patients with systolic heart failure, clinical researchers have found out that thiamine deficiency is detected in patients that have congestive heart failure. With vitamin B1 supplemented, researchers saw a significant improvement in left ventricular ejection fraction and overall cardiovascular health.

**Promote fat reduction and avoid atherosclerosis**

Atherosclerosis is the build-up of fat, later on turning into hardened plaque in the arteries. This happens due to the consumption of cholesterol, and as we age, our ability to metabolize fat declines. With the help of niacin, one of the fat burners among the vitamin B complex, researchers have found that the mechanism of action has beneficial effects such as [lipid modulation](https://pubmed.ncbi.nlm.nih.gov/21045681/). Niacin helps in keeping the endothelial wall of the arteries clean by making sure that no lipid build-up may lead to plaque deposits that could restrict the blood flow.

**Enhance your memory**

Pyridoxine can help in improving brain function, specifically your memory. A study on the [concentrations of vitamin B6](https://pubmed.ncbi.nlm.nih.gov/8602585/) present in the plasma shows that people with higher levels scored better on the battery of cognitive tests for male subjects. They used two measures of memory and concluded that higher concentrations of pyridoxine were related to better memory performance. This is complementary to another study which shows that inadequate vitamin B6 intake is a predictor for [cognitive decline](https://pubmed.ncbi.nlm.nih.gov/16155277/) among aging men.

**Minimize hair loss**

Among the micronutrient deficiencies that affect skin, nails, and hair, the essential element lacking among the patients observed is biotin. The [administration of biotin](https://pubmed.ncbi.nlm.nih.gov/31638351/) to patients suffering from hair loss showed a marked improvement. This promising outcome was also observed in patients suffering from comedonal acne, which is remedied by increasing the biotin levels. Patients have reported less flaking, irritation, and redness taking biotin as supplements. The researchers found that there is no risk in increasing the levels of biotin in the body.

**Vitamin B: too much or not enough?**

B vitamins are found naturally in various plant and animal food. However, should you decide to take supplements for it, you have to know how much of it you should be taking per day. The good news is that most B vitamins do not have a daily maximum limit, and there is no possibility of toxic over-consumption. However, you still have to watch out for those that do have a toxic effect when taken too much. You also have to be aware if you are taking too little of the supplements, especially that vitamin B deficiency can affect your physical and cognitive performance.

There is little to no adverse side effect if you take vitamin B supplements, while too little intake will cause you a lot of different health problems. For biohackers, this vitamin complex is an essential part of their regimen because of the innumerable benefits.