LIPOSOMAL

NAD+ PLATINUM®

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NAD+ Platinum® is a liposomal formulation of nicotinamide mononucleotide (NMN), vitamin B12 as methylcobalamin, riboflavin, trimethylglycine (TMG), quercetin, and resveratrol. Together, these ingredients are designed to support healthy aging through NAD+ generation, sirtuin activation, and methylation.

Supplement Facts

Serving Size: 2.5 mL (1/2 tsp.)
Servings Per Container: 40

	Amount Per Serving	% Daily Value
Riboflavin (as Riboflavin-5-Phosphate)	3.6mg	277%
Vitamin B12 (as Methylcobalamin)	250mcg	10417%
NMN (β-Nicotinamide mononucleotide)	50mg	**
Proprietary Blend Trimethylglycine (as Betaine), Quercetin Dihydrate (from Sophora japonica flower), Resveratrol (from Polygonum cuspidatum root)	60mg	**

**Daily Value not established

Other Ingredients: Water, glycerin, ethanol, highly purified phospholipids, tocofersolan, medium chain triglycerides, natural citrus oils, natural mixed tocopherols, natural flavoring

EDUCATION

NUTRIENTS FOR HEALTHY AGING

NAD+ (nicotinamide adenine dinucleotide) is naturally present in every cell of the body and is critical for DNA repair, cellular bioenergetics, genomic signaling, and cell survival.[1,2] It is also a coenzyme for sirtuins, a family of proteins involved in cellular health and longevity. NMN is a direct, stable, immediate precursor to NAD+ that supports healthy aging by bolstering cellular NAD+ levels. Quercetin and resveratrol are potent phytochemicals that activate sirtuins, effectively synergizing with NAD+ to support optimal sirtuin activity. Quercetin also has the benefit of acting as a senolytic, selectively destroying pro-inflammatory aging cells.

A growing body of research indicates that NAD+ generation must be balanced with methylation for optimal health-enhancing effects. Several nutrients are necessary for balanced methylation, including riboflavin, vitamin B12, and trimethylglycine (TMG). Supplying these nutrients alongside NMN enables the NAD+ cycle to function optimally.

NICOTINAMIDE ADENINE DINUCLEOTIDE (NAD+)

NAD+ is a critical molecule found in every cell of the body essential for cellular energy generation. It is a carrier of high-energy electrons and drives oxidative phosphorylation, the process by which cells oxidize nutrients to produce ATP.

Mammalian cells must synthesize NAD+ either de novo from tryptophan through the kynurenine pathway or from vitamin B3 in the form of nicotinamide (NAM) and nicotinic acid (NA). Besides de novo synthesis, the other major NAD+ generation route is through the salvage pathway, which makes NAD+ from precursor molecules.

NAD+ levels naturally decline with age. According to the world's leading longevity researcher, Dr. David Sinclair, at

50 years old, you have less than half of the NAD+ that you had at age 20.

NAD+ insufficiency hinders hundreds of NAD+ dependent metabolic processes, pushing us towards physiological decline. Conversely, enhancing NAD+ levels may enhance the body's resilience and extend healthy human lifespan.

NAD+ AND DETOXIFICATION

Detoxification is a complex, essential set of bodily processes that occur on both a microcosmic and a macrocosmic level, ultimately processing and eliminating toxins from the body. At the microcosmic level, toxins are mobilized and shuttled out of cells via special transporters. At the macrocosmic level, toxins are ushered through the liver, kidneys, and GI tract to be eliminated via the urine or stool. Most detoxification protocols target the macrocosmic level of detox, ignoring crucial processes that occur at the cellular level. However, when we ignore the microcosmic level of detoxification, toxins may remain within cells and even the most well-intentioned detox protocol may fall flat. Cellular energy is crucial for driving the microcosmic level of detoxification. By enhancing our NAD+ levels with NMN, we can bolster our cellular energy production, drive detoxification bioenergetics, and efficiently mobilize and eliminate toxins from our bodies.

Optimal NAD+ levels may be particularly important for the detoxification of mercury. One study found that treatment of mercury-exposed Caenorhabditis elegans, a worm commonly used for preclinical research, with supplemental NAD+ provided protection against mercury-induced oxidative stress and mitochondrial dysfunction.[3] These findings suggest that the enhancement of NAD+ levels should be a central part of any comprehensive mercury detoxification protocol.

NAD+ AND DNA PROTECTION AND REPAIR

Our bodies are inundated daily with environmental factors that can harm our DNA. Some of these DNA-damaging influences are ones our bodies have evolved to handle, such as UV radiation. Other novel forces that damage DNA have only recently been introduced into our world, including non-native EMF from Wi-Fi and other technological advances, heavy air pollution, and diets high in processed, inflammatory foods.[4,5,6,7,8]

DNA damage is implicated in many chronic diseases, including cancer and cardiovascular and neurodegenerative diseases. Finding ways to repair DNA damage is a high priority if we hope to stem the tide of the chronic disease epidemic.[9,10,11]

An expanding body of research shows that NAD+ is vital for DNA protection and repair. NAD+ plays multiple roles in maintaining DNA integrity. It is a cofactor for enzymes that repair damaged DNA, including PARP enzymes and sirtuins. NAD+ also affects DNA integrity by regulating the balance of prooxidants and antioxidants inside the body; prooxidants are chemicals that induce oxidative stress and can harm DNA, whereas antioxidants combat oxidative stress and protect DNA. Restoring NAD+ levels with NAD+ precursors may alleviate DNA damage and support DNA integrity.[12]

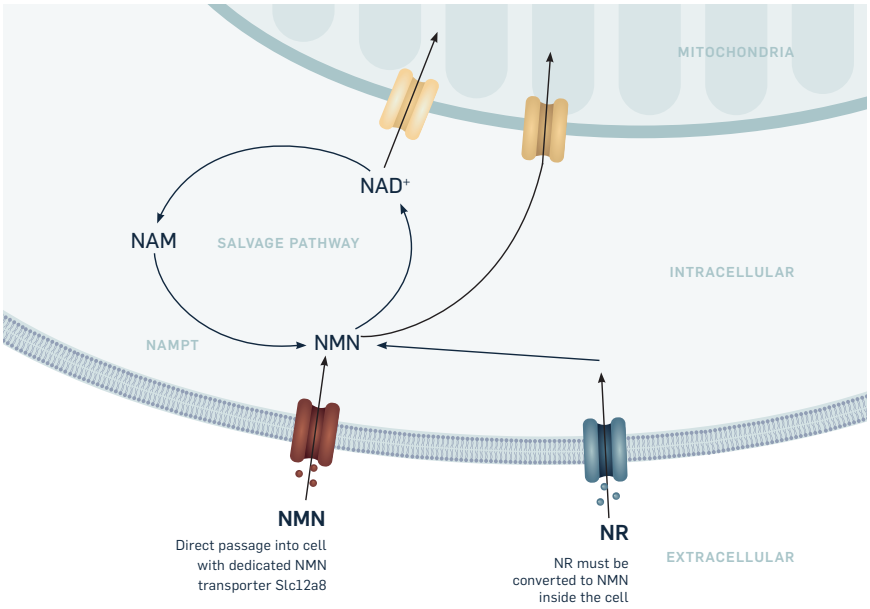
NAD+ PRECURSORS ARE NOT ALL CREATED EQUAL

As our understanding of NAD+'s importance for health and longevity has expanded, the scientific community has leaped into action, researching safe, efficacious ways to boost cellular NAD+ levels. The scientific community has identified several molecules with therapeutic NAD+ boosting effects; these compounds are referred to as "NAD+ boosters." However, not all NAD+ boosters are created equal.

For example, nicotinic acid (NA) and nicotinamide (NAM) are two molecules that can be used to generate NAD+. However, the processes required to convert these precursors into NAD+ are complicated and inefficient.

Nicotinamide riboside (NR) is another NAD+ precursor that offers more therapeutic potential than NA and NAM. However, it must first be converted into NMN before transforming into NAD+.

Nicotinamide mononucleotide (NMN) is a promising, potent alternative to NA, NAM, and NR for supporting NAD+ production. It is a direct, stable NAD+ precursor that has been found to effectively raise NAD+ levels and may thus help alleviate the downstream health impacts of NAD+ depletion.[13] It was originally thought that NMN was unable to enter cells on its own and that NR was the only precursor that could effectively raise NAD+ levels. However, in 2019, groundbreaking research showed that NMN has a unique and dedicated transporter (Slc12a8) that can move the molecule quickly across the cell membrane and into the cell where it can be transformed rapidly into NAD+.[14]



METHYLATION: THE MISSING LINK FOR SUSTAINABLE NAD+ PRODUCTION

NAM is an intermediate in the biochemical cycle used to generate NAD+. Aging, stress, high levels of body fat, an unhealthy diet, and inflammation inhibit the enzyme NAMPT, which converts NAM into NMN and then NAD+.[15] When the conversion of NAM to NMN and NAD+ is hindered, NAM builds up in the body. NAM accumulation prevents NAM from recycling back into NAD+, inhibiting vital NAD+-dependent processes such as sirtuin activation. This is where methylation nutrients come into play.

Methylation is a biochemical process in which methyl (-CH3) groups are added to molecules. Methylation is essential for removing excess NAM from the body, keeping the NAD+ cycle spinning. Simultaneous supplementation of methylation nutrients alongside NMN may optimize NAD+ bioenergetics, allowing you to experience the full potential of NMN supplementation.

AMPLIFY SIRTUINS FOR CELLULAR HEALTH, STAMINA, AND LONGEVITY

Sirtuins are a family of seven proteins that regulate cellular homeostasis, including metabolism, mitochondrial function, oxidative stress, inflammation, autophagy and apoptosis.[16,17] They coordinate which cellular "tasks" must be done at given points in time in response to environmental cues. Sirtuins also regulate crucial cellular mechanisms involved in aging and longevity. NAD+ is an essential coenzyme to sirtuins; without sufficient NAD+, sirtuins cannot function and drive a healthy cellular environment. The dependence of sirtuin activation on NAD+ was discovered by American biologist Leonard Guarente in the 1990s, leading to an explosion in scientific research on sirtuins.

Sirtuins play an important role in histone deacetylation, a biochemical process in which they remove a chemical group called an acetyl group from histones, the proteins around which your DNA is wrapped. Through this process, sirtuins regulate gene expression, turning genes on and off to maintain optimal health.

As a side note, NAD+ is also a coenzyme for poly-ADP-ribose-polymerases, or PARPs, enzymes involved in DNA repair, telomere maintenance, and longevity.[18]

NAD+ levels are gradually depleted in multiple tissues during the aging process. This subsequently leads to a decline in sirtuin and PARP activity. Administration of exogenous NAD+ boosters, such as NR and NMN, has been

found to enhance cellular NAD+ levels and support sirtuin activation.[14]

Sirtuin-activating compounds, also known as "STACs," are chemical compounds that initiate sirtuin activity. A handful of STACs have been identified, including the phytochemicals quercetin and resveratrol. By allosterically activating sirtuins, quercetin and resveratrol support NAD+'s coenzymatic activity to promote optimal sirtuin function.[19]

Sirtuin activation, in turn, offers a wide range of beneficial health effects, including:

- Healthy brain aging[20]
- Robust immune function[21]
- Appropriate inflammatory response[22]
- A healthy circadian rhythm[23]
- Metabolic and cardiovascular optimization[24]
- Increase insulin sensitivity[24]
- Physical stamina and endurance[26]
- Aging and longevity support[27]

REDUCE YOUR SENESCENT CELL BURDEN

Senescent cells are cells that have ceased to divide and instead secrete an array of pro-inflammatory mediators that damage surrounding cells. Certain pharmaceutical drugs and phytonutrients act as senolytics, selectively destroying senescent cells. Quercetin is one such phytonutrient that has been found to selectively target senescent cells.

Importantly, quercetin may work best alongside diet and lifestyle changes for reducing your senescent cell burden. For example, exercise has been found to attenuate cellular senescence.[28] Beta-hydroxybutyrate, a ketone body produced during fasting and by the ketogenic diet, also inhibits senescent cell generation.[29]

Quicksilver Delivery Systems® improve upon liposomal and emulsification technology with smaller, more stable particles made from the highest-grade ingredients available. In addition to exceptional absorption rates, these tiny liposomal and nanoemulsified particles increase diffusion across mucous membranes, enhance lymphatic circulation of nutrients and support cellular delivery.