

S-NAD⁺ and S-NAD based Dietary Supplements

1. Aging is a Natural Process

1. Human aging is caused by external environmental factors and internal factors.

- **External factors:** Such as ultraviolet rays, environmental pollution, and toxins.
- **Internal factors:** Our body has a "power plant" called mitochondria. The primary function of mitochondria is to produce ATP (adenosine triphosphate) to provide energy for cells. However, while generating energy, mitochondria also pollute the intracellular environment by releasing reactive oxygen species (ROS, free radicals). To prevent this pollution from being released into the environment, mitochondria produce superoxide dismutase (SOD) to neutralize these free radicals. However, as we age, the production of SOD decreases, leading to an inability to clear excessive ROS, resulting in oxidative stress. These free radicals react with DNA, proteins, and lipids, causing DNA replication failure, cell death, protein structure damage, hormone dysfunction, increased vascular permeability, and intracellular

structural damage, among other issues. This significantly impairs the ability of stem cells to repair tissues and organs.

- **Direct supplementation of SOD is ineffective:** SOD is quickly destroyed in the gastrointestinal tract, making it difficult to enter the bloodstream. The precursor natural extract developed by our team can promote mitochondria to produce SOD.
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2. Causes of Aging

1. **Genomic instability**
 2. **Telomere attrition**
 3. **Epigenetic alterations**
 4. **Loss of proteostasis**
 5. **Dysregulated nutrient sensing**
 6. **Mitochondrial dysfunction**
 7. **Cellular senescence**
 8. **Stem cell exhaustion**
 9. **Altered intercellular communication**
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3. Manifestations of Aging

1. **Decline in memory and cognitive abilities**
 2. **Slowed reaction time, reduced physical strength, and low adaptability**
 3. **Decline in cardiovascular and metabolic functions**
 4. **Weakened immunity**
 5. **Onset of age-related diseases**
 6. **Atrophy of gonads and muscles**
 7. **Vascular hardening**
 8. **Osteoporosis and calcium loss**
 9. **Loss of skin elasticity**
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4. Technologies to Increase Intracellular NAD⁺ Levels

1. **Current types of NAD⁺ anti-aging products:**
 - The molecular weight of NAD⁺ itself is too large (660-690 Daltons), making it difficult to be absorbed through the digestive tract. Therefore, small-molecule NAD⁺ boosters are needed.
 - **Nicotinamide (NAM):** Molecular weight of about 120 Daltons. It is easily absorbed by cells but inhibits the activity of Sirtuin, a longevity protein, causing cells to

overwork and become exhausted. This is not a good option.

- **Nicotinic Acid (NA):** Molecular weight of about 123 Daltons, a form of vitamin B3. NA causes flushing (skin redness, itching, or tingling) and, in excessive amounts, can lead to liver toxicity. It has been used globally since the 1940s to fortify flour and rice. NA enters NAD⁺ through the Preiss-Handler pathway, but its integration efficiency is low, requiring high doses that lead to significant side effects, making it unsuitable for long-term anti-aging use.
- **Tryptophan (Trp):** Molecular weight of about 204 Daltons. Trp converts to NAD⁺ through the de novo biosynthesis pathway, but its efficiency is 60 times lower than other precursors, making it unsuitable for long-term anti-aging use.
- **Nicotinamide Riboside (NR):** Molecular weight of about 256 Daltons. It is relatively easily absorbed by cells and increases NAD⁺ levels. NR is a form of vitamin B3 and is considered an efficient precursor, requiring minimal energy to convert to NAD⁺. However, NR's

patent is owned by Chromadex, limiting its widespread use.

- **Nicotinamide Mononucleotide (NMN):** Molecular weight of about 334 Daltons. It is an intermediate compound between NR and NAD⁺. NMN is larger and negatively charged, making it harder to enter cells. Due to the lack of patent protection, many companies promote NMN products.
- **S-Nicotinamide Riboside (S-NAD⁺):** It reduces the molecular weight of NR and NMN, making it easier to absorb and convert to NAD⁺ in various human cells. It also includes bioactive sulfur, which forms a high electron-density structure, providing antioxidant activity and reducing oxidative stress and inflammation. Health benefits include nourishing joints, muscles, skin, and hair; removing heavy metals; improving sleep; restoring energy; enhancing digestion; reducing inflammation; and increasing cellular absorption. S-NAD⁺ is currently the best anti-aging technology.

5. Innovations in S-NAD⁺ Technology

1. **Prevents rapid digestion and metabolism of nicotinamide derivatives in the stomach and liver**, enhancing absorption and conversion to NAD⁺.
 2. **Combines lipophilic and hydrophilic properties** for faster absorption and distribution.
 3. **Increases SOD production in mitochondria** to neutralize free radicals.
 4. **Includes bioactive sulfur and cell activation formulas** to enhance anti-aging effects. Suitable for both healthy individuals and cancer patients.
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6. Benefits of S-NAD⁺

1. **Unique bioactive sulfur effects:**
 - Nourishes joints, muscles, skin, and hair.
 - Helps remove heavy metals from the body.
 - Improves sleep and restores energy.
 - Enhances digestion and reduces inflammation.
 - Increases cellular absorption and flexibility.
 - Promotes glutathione production to protect cells from free radical damage.

- Stimulates connective tissue generation, supporting joint health.
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7. Summary of Anti-Aging Candidate Molecules

1. **NAD⁺ is too large to be absorbed directly**, so

small-molecule NAD⁺ boosters are needed.

- **Nicotinamide (NAM)**: Easily absorbed but inhibits Sirtuin activity.
 - **NR**: Easily absorbed but unstable in the digestive system.
 - **NMN**: Larger and harder to absorb due to its negative charge.
 - **S-NAD⁺**: Smaller molecular weight, easily converted to NAD⁺ in cells, making it the most effective NAD⁺ booster.
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8. The Best NAD⁺ Supplement: S-NAD⁺

1. **Slows the appearance of aging markers in stem cells** by

1.57 times compared to other brands.

2. **Increases intracellular NAD+ levels** by 1.62 times after one day and 2.57 times after one month.
 3. **Boosts ATP production** by 36% after one day and 66.8% after one month.
 4. **Reduces inflammatory cytokines** (IL-6 by 19.2% and TNF-alpha by 22%) after six months.
 5. **Increases male hormone levels** by 23% and female hormone levels by 32% after six months.
 6. **Enhances insulin-like growth factor levels** by 34% and insulin sensitivity by 38.1% after six months.
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9. Key Benefits of Increasing Intracellular NAD+ Levels

1. **Delays aging:** Enhances mitochondrial function and reduces oxidative stress.
2. **Improves physical strength and endurance:** Boosts energy and reduces fatigue.
3. **Enhances metabolism:** Promotes weight loss and reduces obesity.
4. **Boosts immunity:** Strengthens immune cell function and resistance to cancer.

5. **Improves cardiovascular health:** Enhances heart and brain cell function, lowers blood pressure, and maintains healthy cholesterol levels.
6. **Supports brain health:** Maintains healthy neural cells and prevents age-related cognitive decline.
7. **Promotes skin rejuvenation:** Enhances skin cell function for a youthful appearance.
8. **Improves mood, focus, and memory:** Stimulates the production of dopamine, serotonin, and norepinephrine.
9. **Regulates blood sugar and lipids:** Reverses insulin resistance and maintains healthy glucose levels.
10. **Protects and repairs DNA:** Reduces DNA mutations caused by aging, radiation, and toxins.
11. **Improves neurodegenerative diseases:** Activates neural stem cells and alleviates symptoms of Parkinson's and Alzheimer's diseases.
12. **Maintains muscle function:** Reduces muscle atrophy and enhances muscle strength.