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NUMONA™

Advanced Cellular Reprogramming for Rejuvenation Optimization

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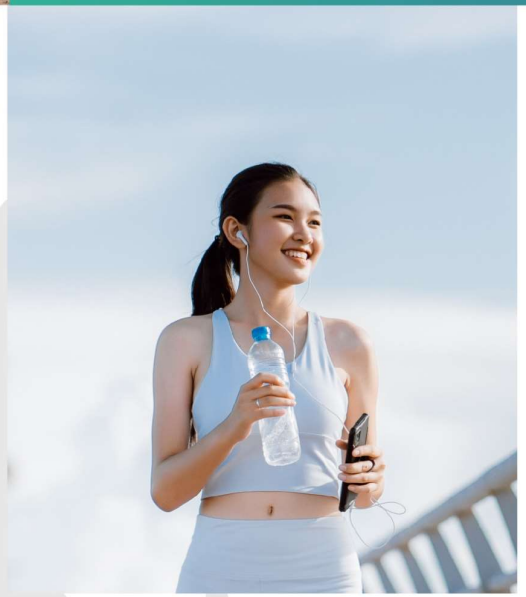
Rising Demand for Nutraceuticals in Asia-Pacific



- Consumers increasingly prioritize nutraceutical products.
- Driven by a commitment to holistic health and a healthy lifestyle.
- Focus on both external and internal well-being.

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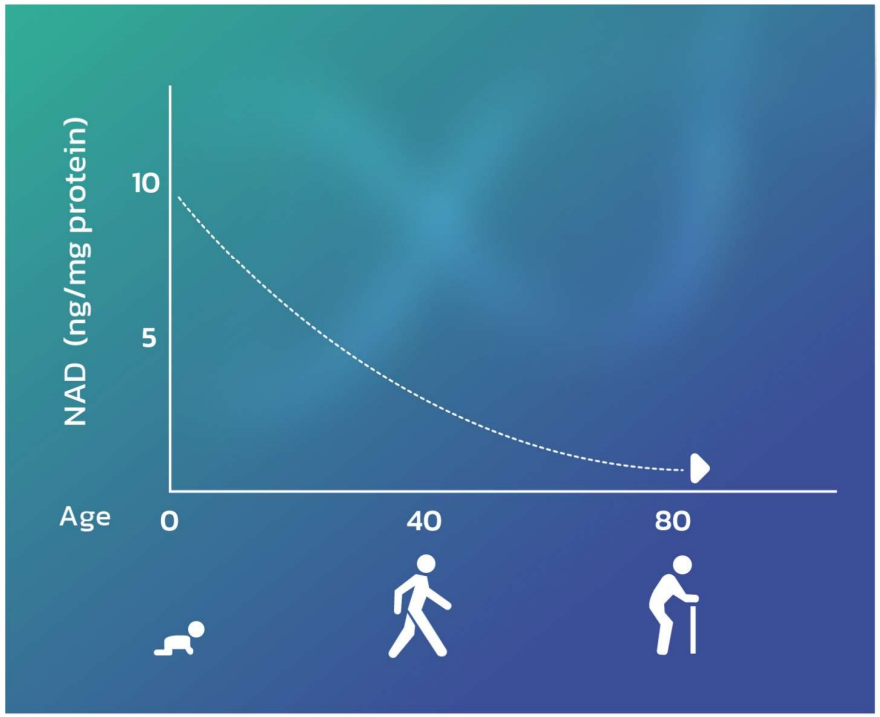

NAD+ and Its Impact on Aging

- **Decline with Age:** NAD+ levels decrease over time, reducing SIRT1 expression and PARP enzyme activity.
- **Health Effects:** Impacts brain function, memory, nervous system, heart health, and contributes to aging-related conditions like obesity.
- **Key Benefits:** Higher NAD+ levels protect DNA, repair cellular damage, regulate aging, and promote overall health and longevity

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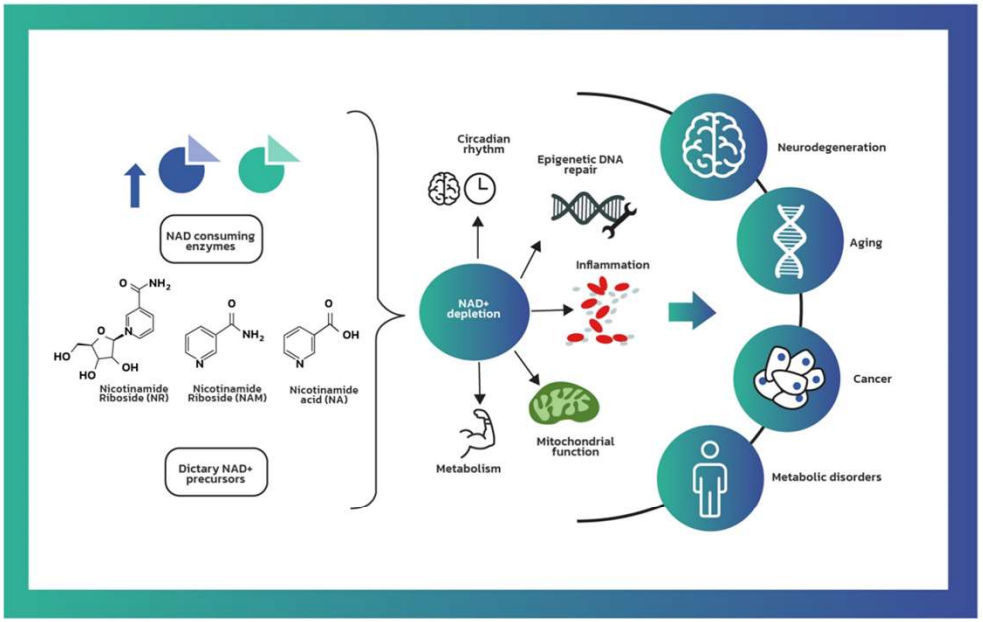
NAD: A Key to Cellular Health



What is NAD?

- Nicotinamide Adenine Dinucleotide (NAD) is a critical coenzyme found in all living cells.

Essential Functions

- Supports cellular energy metabolism and bioenergetic processes.Facilitates ATP production, DNA repair, and cell signaling.

Role in Health

- Central to maintaining optimal cellular function and overall health

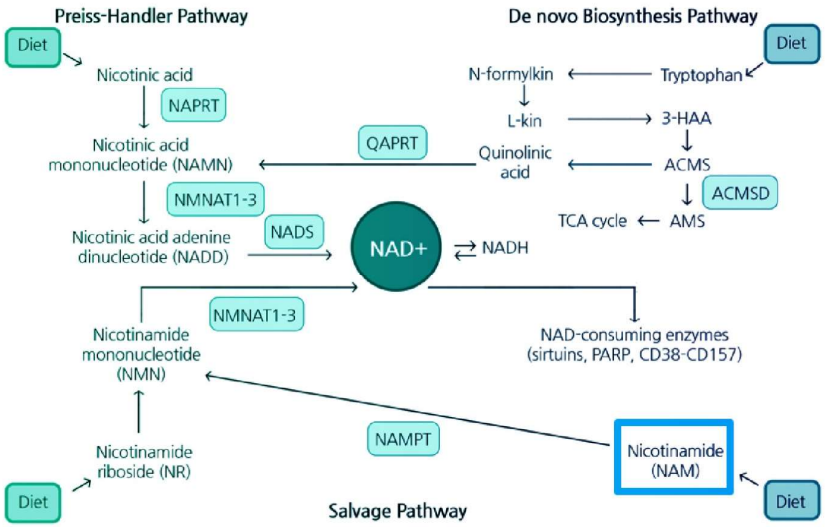
Impact of Cellular NAD Depletion

- Linked to **cellular stress** and **reduced neuroplasticity** (impaired brain adaptability).
- Contributes to **DNA damage** and **accelerated cellular aging.**
- Plays a key role in the development of various diseases.

To mitigate these effects, maintaining optimal NAD levels is essential for slowing cellular aging and boosting neuroprotection.

Amjad, S., Nisar, S., Bhat, A. A., Frenneaux, M. P., Fakhro, K., Haris, M., ... & Bagga, P. (2021). Role of NAD+ in regulating cellular and metabolic signaling pathways. Molecular Metabolism, 49, 101195.

NAD+ Biosynthesis



Cells produce NAD+ through multiple pathways such as:

1. **De Novo Synthesis**: Converts tryptophan into NAD+ via a series of enzymatic steps.
2. **Preiss-Handler Pathway:** Utilizes nicotinic acid (a form of vitamin B3) as the precursor.
3. **Salvage Pathway:** Efficiently regenerates NAD+ from nicotinamide, a by-product of NAD+ metabolism.

These mechanisms collectively maintain critical NAD+ levels for cellular energy and repair processes.

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An advanced solution for rejuvenation optimization through cellular reprogramming, offering a powerful approach to slowing cellular aging

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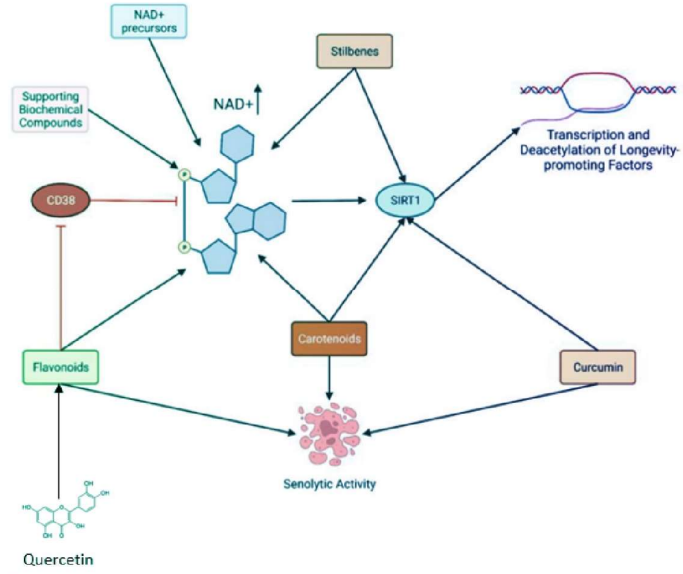
Quercetin

A Powerful Senolytic Compound



Senolytic Properties:

- Selectively targets and eliminates senescent (aging) or damaged cells.
- Removes harmful aging cells without affecting healthy, normal cells.

Health Benefits:

- Prevents age-related **cardiovascular diseases, inflammation, oxidative stress, cancer,** and **diabetes.**

Additional Benefits:

- Inhibits **CD38 enzyme,** which degrades NAD+ in the body.
- Helps protect against metabolic dysfunction and supports **cellular vitality.**

Sharma A, Chabloz S, Lapides RA, Roider E, Ewald CY. Potential Synergistic Supplementation of NAD+ Promoting Compounds as a Strategy for Increasing Healthspan. Nutrients. 2023 Jan 14;15(2):445. doi: 10.3390/nu15020445. PMID: 36678315; PMCID: PMC9861325.

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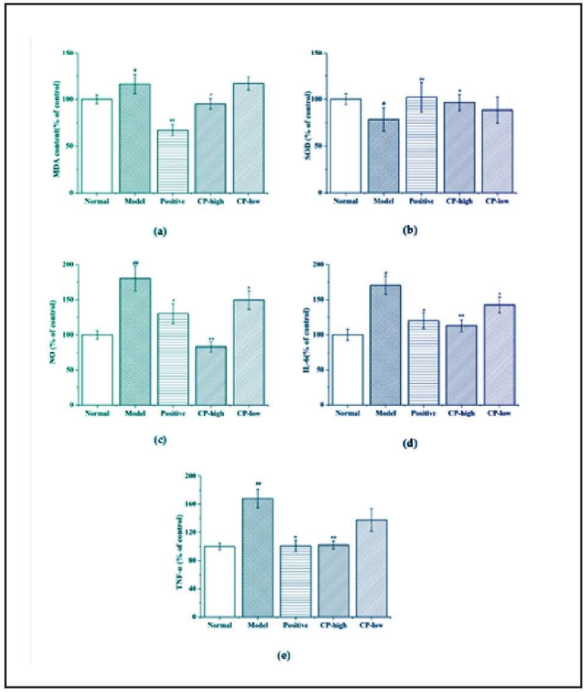
Chlorella Extract

Anti-Inflammatory and Anti-Aging Benefits



Anti-Inflammatory Effects:

- Modulates cytokines TNF-α, IL-6, and nitric oxide (NO) in LPS-stimulated RAW 264.7 cells.

Protection Against Aging:

- Guards against aging induced by D-galactose (D-gal).
- Enhances antioxidant enzyme activity (Superoxide Dismutase - SOD).

Cellular Impact:

- Inhibits NF-κB activation caused by D-gal.
- Increases PPAR expression in the brain and intestines.

Therapeutic Potential:

- Strong anti-inflammatory and anti-aging properties.
- May aid in the treatment of acute inflammatory diseases and age-related conditions.

Zhang, R., Chen, J., Mao, X., Qi, P., & Zhang, X. (2019). Anti-Inflammatory and Anti-Aging Evaluation of Pigment-Protein Complex Extracted from Chlorella Pyrenoidosa. Marine drugs, 17(10), 586. https://doi.org/10.3390/md17100586

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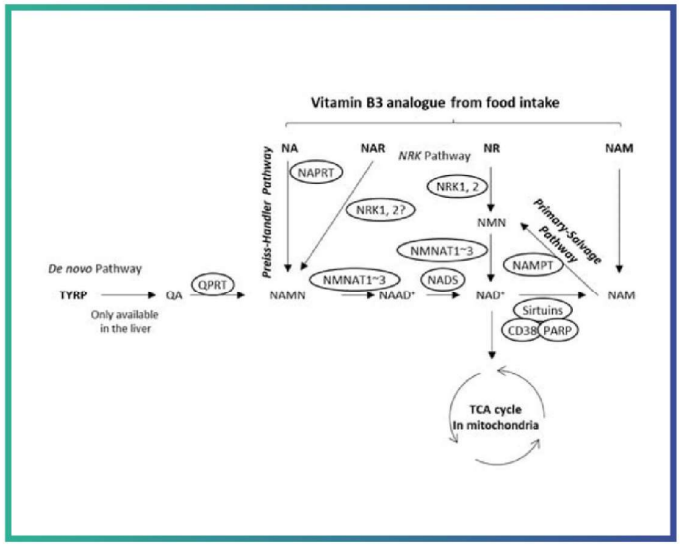
Vitamin B3 (Niacinamide)
Its Role in NAD Production



Precursor to NAD:
- Niacinamide is converted into bioactive forms: **Niacin, NAD+, NADH, NADP**, and **NADPH.**

Structure and Function:
- A **dinucleotide** consisting of **adenine** and **nicotinamide** bases.
- Exists in **oxidized (NAD+)** and **reduced (NADH)** forms.

Key Benefits:
- Essential for **energy production** in the body and brain.
- Slows **cellular degeneration** and promotes **cell health** across all organs.
- Supports **self-repair** and **regeneration** of tissues.

Oyama, T., Yamamoto, T., Kameda, T., Kamiya, T., Abe, H., Abe, T., & Tanuma, S. I. (2024). Supplementation of nicotinic acid and its derivatives up-regulates cellular NAD+ level rather than nicotinamide derivatives in cultured normal human epidermal keratinocytes. Life, 14(3), 413.

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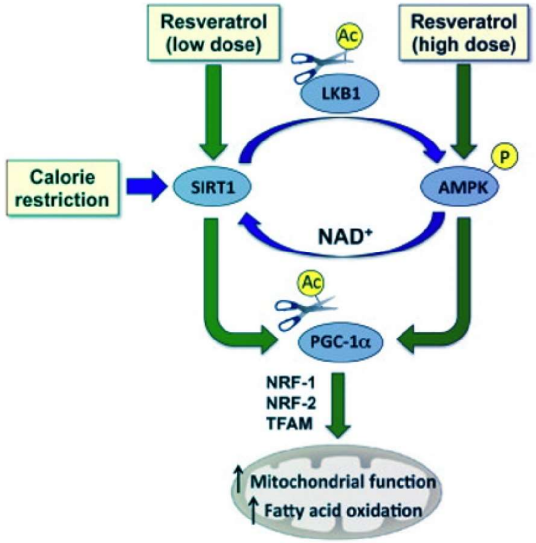
Trans-Resveratrol
Its Impact on NAD+ Function



Enhanced NAD+ Function:

- Increases mitochondrial activity, AMPK function, and NAD+ levels in muscles.

Research Findings:

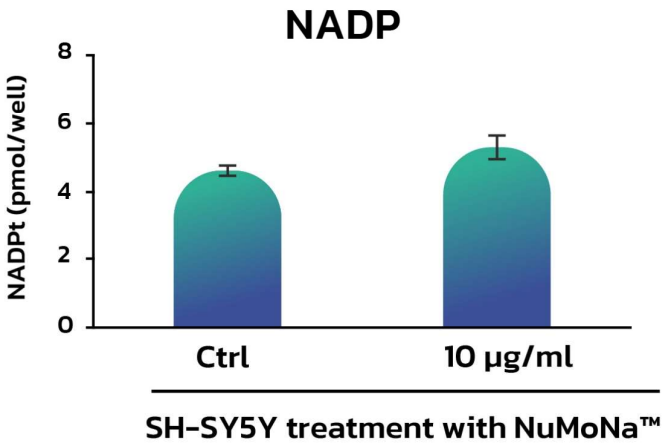
- Moderate doses of trans-resveratrol boost NAD+ and AMPK.
- No increase in NAD+ in mice with inhibited **SIRT1.**

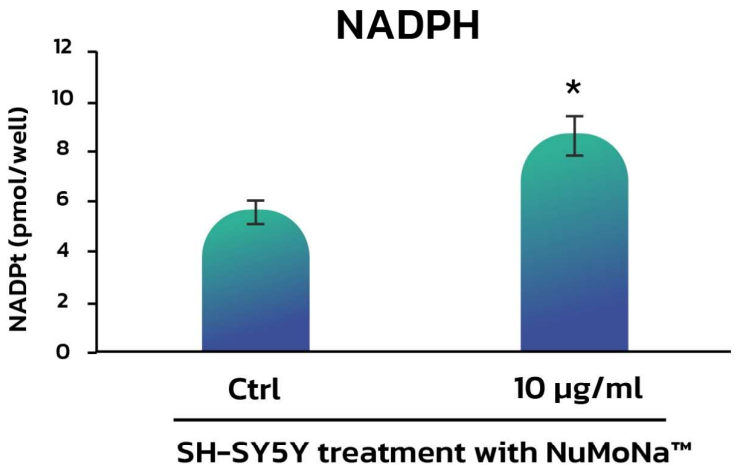
High Dose Effects:

- Stimulates **AMPK activation** in a **SIRT1-independent** manner.
- Dosage is a key factor in enhancing both **AMPK activity** and **NAD+ levels**

Price, N. L., Gomes, A. P., Ling, A. J., Duarte, F. V., Martin-Montalvo, A., North, B. J., ... & Sinclair, D. A. (2012). SIRT1 is required for AMPK activation and the beneficial effects of resveratrol on mitochondrial function. Cell metabolism, 15(5), 675-690.

NAD+ (Nicotinamide Adenine Dinucleotide) Stimulation Test in SH-SY5Y Neuroblastoma Cells





The measurement of NADP and NADPH in SH-SY5Y neuroblastoma cells treated with NuMoNa™ showed that cells treated with NuMoNa™ at a concentration of 10 µg/ml exhibited a **1.15-fold increase in NADP production** and a **1.53-fold increase in NADPH production**, compared to the control group.

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