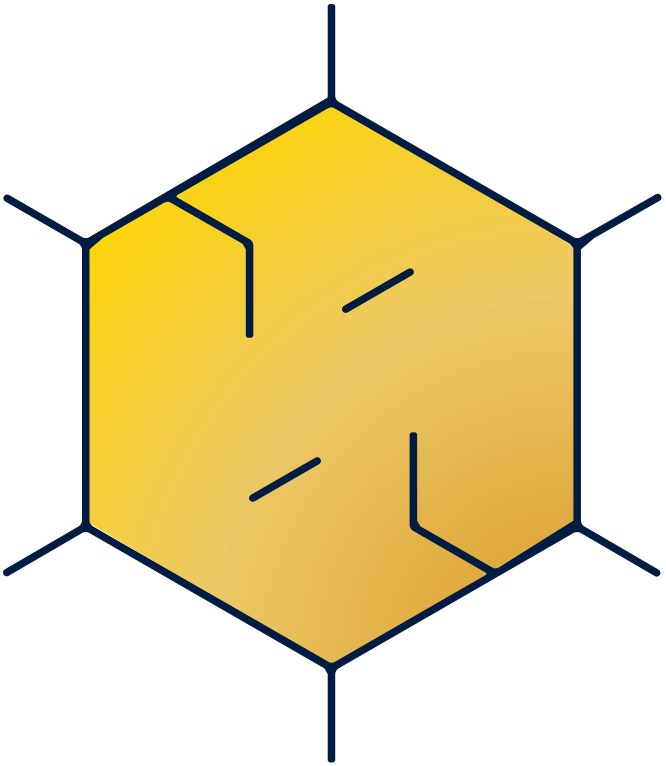
spermidine LIFE®

SPERMIDINE

the longevity molecule



Trigger autophagy. Renew your cells.

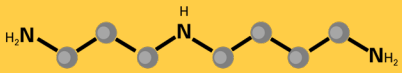
Official Distributor:
Tam Plenus Switzerland
www.tam-plenus.ch

Renewal begins at the cellular level, and it begins with us. Each day presents the chance to make choices that promote a healthy life.

spermidineLIFE® is the world's first natural nutritional supplement with a high spermidine content to activate autophagy and promote cell renewal for a longer and healthier life. **spermidine**LIFE® is the result of a decade of research, passion, and dedication, and has been tested by independent clinics and universities for tolerability and effectiveness.

With **spermidine**LIFE®, ***essentials***, and **nad**LIFE®, our mission is to transform scientific findings into simple solutions for the challenges of everyday life.

What is **spermidine?**

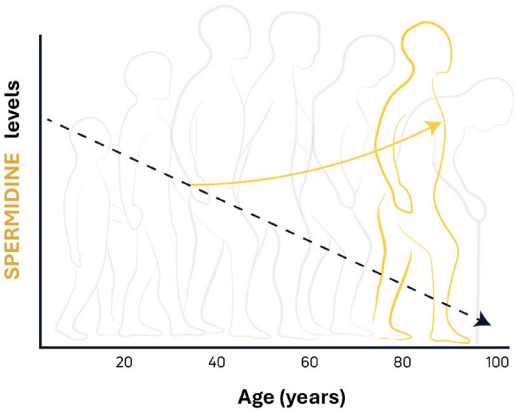


Spermidine is a **natural substance** that plays a crucial role in the cellular health of our bodies. It is a polyamine (i.e., a molecule that has more than one amino group) found in all living organisms that is essential for proper cellular function. It is critical to **promote the process of autophagy**.

About two thirds of the spermidine content in our body is produced by our own cells and our gut microbiome. The rest is **absorbed through food or dietary supplements**. As we age, our body's production declines, and we become more reliant on dietary sources.

Increasing spermidine intake through diet has been linked to a longer and healthier life. Because of the depletion of nutrients in western diets, it can be challenging to get enough spermidine from food alone. **spermidine**LIFE® is the first supplement derived from food that can increase spermidine levels. Spermidine can help maintain efficient autophagy to fight age-related diseases and **increase healthspan and lifespan**.

A **spermidine-rich diet** is important for our health. Many foods are rich in spermidine, including legumes, mushrooms, nuts, and aged cheeses, with **wheat germ** being one of the most concentrated sources. However, the **spermidine content in these foods can vary widely** depending on environmental and processing factors.
spermidineLIFE® is clinically tested, confirmed by external laboratories, and guaranteed to have a high spermidine content.



Spermidine levels decrease with age.

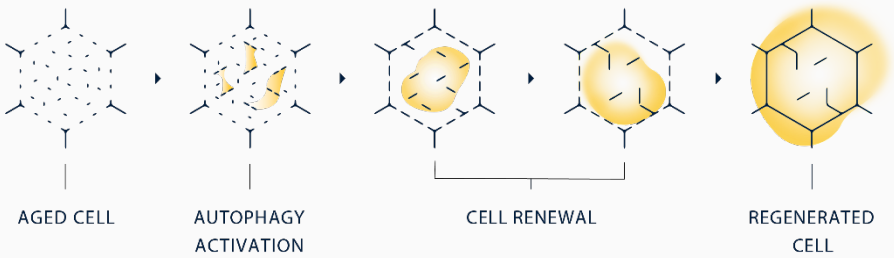
Supplementation can help restore healthy levels of spermidine and prevent age-related diseases.

What is the effect of spermidine?

Spermidine acts as a fasting mimetic that activates autophagy.

Autophagy

The process at the core of cell renewal

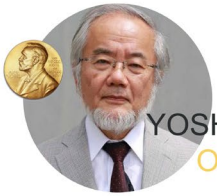


What is **autophagy?**

Autophagy (“self-eating” in Greek) is a critical process in cellular function and regeneration. It is a **cellular recycling process** in which cells metabolize damaged components and produce energy as a result. Damaged cell components contribute significantly to the development of age-related diseases. Through the activation of autophagy, cells are kept “young” and healthy. Autophagy is essential for normal cell function. The process was elucidated by Yoshinori Ohsumi, who received a Nobel Prize in 2016.

Autophagy can be induced by fasting (caloric restriction), exercise, and some supplements, such as spermidine.

Since cells are the fundamental units of every organ system, stimulating their autophagy process could be a powerful strategy for combatting the mental and physical signs of aging.



NOBEL PRIZE

for Physiology or Medicine 2016

for his discoveries of mechanisms for autophagy, a fundamental process for degrading and recycling cellular components.

The mechanism of **autophagy** is at the core of our solutions.

FASTING MADE **FUNCTIONAL**

EXPERIENCE THE POWER OF CelVio Complex

spermidine LIFE®

Embracing and maintaining regular fasting to activate autophagy and gain its health benefits can be challenging for many people. Additionally, fasting may not be recommended for certain groups of people, such as:

- People of advanced age
- People with cardiovascular problems
- People with low weight

Spermidine helps activate the process of autophagy without having to rely on fasting.

What is the link to **fasting?**

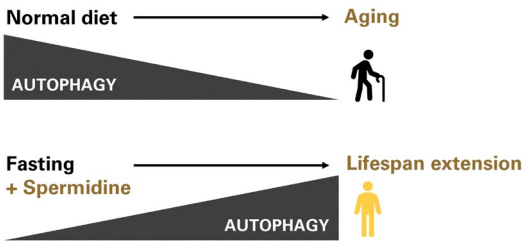
Fasting and caloric restriction is the most natural way to activate autophagy. The lack of energy due to reduced food consumption means that our cells must resort to internal alternative energy sources, such as damaged cell components. These defective components are metabolized in the cell, and new energy is produced.

Any form of avoidance or reduction of caloric ingestion, such as fasting, activates autophagy and thus contributes to an improvement in cellular health. However, this requires a high degree of discipline, as it is usually **difficult to integrate fasting** as a daily routine.

We know that **fasting extends the healthspan and lifespan of organisms by boosting autophagy through an increase in spermidine production**.

Spermidine supplementation can trigger the benefits of fasting without having to strictly fast.

A recent study published by our research partners and their collaborators found that **fasting increases the production of spermidine**, a key molecule that activates autophagy. Autophagy, in turn, plays a crucial role in maintaining cellular health and preventing age-related diseases. By working together, fasting and spermidine can significantly enhance the benefits of autophagy. **Supplementing with spermidine during fasting** may maximize the health benefits of fasting.



Spermidine is essential for fasting-mediated autophagy and longevity. Nature Cell Biology, 2024.

Spermidine is key to unlocking the health benefits of fasting.

Without spermidine, cellular recycling is reduced, leading to fewer positive effects of fasting on overall health and lifespan.

What is spermidineLIFE®?

spermidineLIFE® products were the first food-derived spermidine supplements. Supplementing with spermidine can help restore healthy levels and support efficient autophagy, aiding in the prevention of age-related diseases.

The **CelVio Complex®**, the main ingredient of our **spermidine**LIFE® products, features, **100% all-natural, organic, non-GMO, spermidine**, and is **extracted in-house from pure European wheat germ**.

spermidineLIFE® products are clinically tested, confirmed by external laboratories, and guaranteed to have a high spermidine content.

What is the CelVio Complex®?

The **CelVio Complex®** is the heart of our products. It is a unique **extract from wheat germ** that contains 100% naturally derived spermidine.

It is obtained through a **special water-based extraction process** that we developed together with the University of Graz to ensure that the ingredients are extracted gently. We rely on pure nature - from the beginning to the end of production. The wheat germ is processed completely untreated without the addition of artificial spermidine.

Our CelVio Complex® is the top innovation in cell renewal. Longevity Labs+ was the **first to introduce a spermidine-rich dietary supplement** in 2019, making it the top choice for research teams conducting studies on spermidine. With the ***European Novel Food*** approval and its 100% natural and organic source, the CelVio Complex® is now **utilized in human research studies** worldwide.

The **CelVio Complex®** is the result of a unique extraction process that preserves the natural ingredients of wheat germ and is **naturally rich in spermidine**.

Natural vs synthetic spermidine?

Synthetic spermidine is a lab-produced chemical designed for use in mice, not intended for human consumption.

THE DANGERS OF
SYNTHETIC
SPERMIDINE

LAB MADE CHEMICAL
Not safe for human consumption

UNETHICAL PROCESSING
Spraying with synthetic spermidine

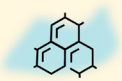
EXPLOITING REGULATORS
Not following FDA regulations

MISLEADING MARKETING
No disclosure of ingredients and associated risks

VS

spermidineLIFE®

SOURCE: ANCIENT GRAINS
High quality wheat from Europe, rigorously screened for high spermidine content



EXTRACTION: WATER-BASED
Natural, high-pressure, water-based extraction

QUALITY CONTROL: RIGOROUS TESTING
Tested in our facility in Austria before being packaged for global customers

STRICT EU STANDARDS
Exceeding the highest EU standards, used by renowned research hospitals & doctors

spermidineLIFE® ONLY uses all natural, organic, plant-derived sources of spermidine.

Side effects to taking spermidineLIFE®?

There are no known negative side effects from the consumption of spermidineLIFE®.

Key features of our **CelVio Complex®**

Approved as ***Novel Food*** by the European Food Safety Authority **(EFSA)**	✓
All natural from local European wheat germ	✓
Organic and non-GMO sources of wheat germ	✓
Manufactured and tested (3x) in **Austria**	✓
Clinical tests for **safety and tolerability**	✓
Various clinical tests for **efficacy**	✓
Based on preclinical data, we know that our **CelVio Complex®** is **more effective** and **safer** than synthetic spermidine!	✓

Recent results of scientific studies

Neurodegeneration [1,2,3]

- Protection against cognitive decline
- Prevention of dementia and Alzheimer's disease
- Reduction of inflammatory factors

Digestion & liver [4,5,6]

- Prevention of intestinal inflammation
- Reduction and reversal of liver damage by alcohol
- Prevention of liver fibrosis and hepatocellular carcinoma

Muscle [7,8]

- Reduction of age-dependent muscular atrophy

Aging and longevity [9,10]

- Reduction of age-related diseases
- Prolongation of healthy lifespan

This list is a selection of scientific studies on spermidine and does not intend to be exhaustive.

1. *Schwarz C, et al. Safety and tolerability of spermidine supplementation in mice and older adults with subjective cognitive decline. Aging (2018). DOI: 10.18632/aging.101354*

2. *Wang I-F, et al. Autophagy activators rescue and alleviate pathogenesis of a mouse model with proteinopathies of the TAR DNA-binding protein 43. PNAS (2012). DOI: 10.1073/pnas.1206362109*

3. *Schroeder S, et al. Dietary spermidine improves cognitive function. Cell Reports (2021). DOI: 10.1016/j.celrep.2021.108985*

4. *Adhikari R, et al. Spermidine prevents ethanol and lipopolysaccharide-induced hepatic injury in mice. Molecules (2021). DOI: 10.3390/molecules26061786*

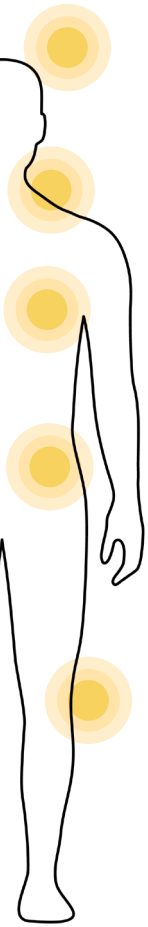
5. *Ma L, et al. Preventive and therapeutic spermidine treatment attenuates acute colitis in mice. Journal of Agricultural and Food Chemistry (2021). DOI: 10.1021/acs.jafc.0c07095*

6. *Fei Y, et al. Spermidine prolongs lifespan and prevents liver fibrosis and hepatocellular carcinoma by activating MAP1S-mediated autophagy. Cancer Research (2017). DOI: 10.1158/0008-5472.CAN-16-3462*

7. *Fan J, et al. Spermidine coupled with exercise rescues skeletal muscle atrophy from D-gal-induced aging rats through enhanced autophagy and reduced apoptosis via AMPK-FOXO3a signal pathway. Oncotarget (2017). DOI: 10.18632/oncotarget.15728*

8. *Segalés J, et al. Sestrin prevents atrophy of disused and aging muscles by integrating anabolic and catabolic signals. Nature Communication (2020). DOI: 10.1038/s41467-019-13832-9*

9. *Eisenberg T, et al. Induction of autophagy by spermidine promotes longevity. Nature Cell Biology (2009). DOI: 10.1038/ncb1975*



Skin & hair [11,12]

- Protection and renewal of skin cells
- Stimulation of hair and nail growth

Immune system [13,14]

- Enhanced immune response
- Inhibition of virus replication

Cardiovascular system [15,16]

- Reduction of high blood pressure
- Strengthening of the heart muscle
- Prevention of heart failure

Metabolism [17,18]

- Promotion of lipid metabolism
- Increase in glucose tolerance

Bones, joints & cartilage [19,20]

- Increase in stem cell production & positive effect on bone density
- Protection of chondrocytes and restoration of cartilage mass

10. *Kiechl S, et.al. Higher spermidine intake is linked to lower mortality: a prospective population-based study. The American Journal of Clinical Nutrition (2018). DOI: 10.1093/ajcn/nqy102*
11. *Ito D, et al. Systemic and topical administration of spermidine accelerates skin wound healing. Cell Communication and Signaling (2021). DOI: 10.1186/s12964-021-00717-y*
12. *Ramot Y, et al. Spermidine promotes human hair growth and is a novel modulator of human epithelial stem cell functions. PLOS One (2011). DOI: 10.1371/journal.pone.0022564*
13. *Gassen N, et al., SARS-CoV-2-mediated dysregulation of metabolism and autophagy uncovers host-targeting antivirals. Nature communications (2020). DOI: 10.1038/s41467-021-24007-w*
14. *Nakagawa I, et al. Autophagy defends cells against invading group A Streptococcus. Science (2004). DOI: 10.1126/science.1103966*
15. *Michiels CF, et al. Spermidine reduces lipid accumulation and necrotic core formation in atherosclerotic plaques via induction of autophagy. Atherosclerosis (2016). DOI: 10.1016/j.atherosclerosis.2016.07.899*
16. *Eisenberg T, Abdellatif M, Schroeder S, et al. Cardioprotection and lifespan extension by the natural polyamine spermidine. Nature Medecine (2016). DOI: 10.1038/nm.4222*
17. *Sadasivan SK, et al. Exogenous administration of spermine improves glucose utilization and decreases bodyweight in mice. European Journal of Pharmacology (2014). DOI: 10.1016/j.ejphar.2014.01.073*
18. *Lingyan Ma, et al. Spermidine ameliorates high-fat diet-induced hepatic steatosis and adipose tissue inflammation in preexisting obese mice. Life Sciences (2020). DOI: 10.1016/j.lfs.2020.118739*
19. *Pradeep K, et al. Spermidine restores dysregulated autophagy and polyamine synthesis in aged and osteoarthritic chondrocytes via EP300. Experimental & Molecular Medicine (2018) DOI: 10.1038/s12276-018-0149-3*
20. *D'Adamo S, et al. Spermidine rescues the deregulated autophagic response to oxidative stress of osteoarthritic chondrocytes. Free Radical Biology & Medecine (2020). DOI: 10.1016/j.freeradbiomed.2020.03.029*

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An unprecedented scientific board that challenges and supports us in research and product development

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