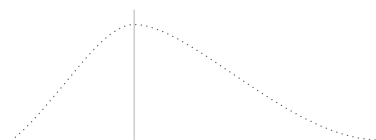
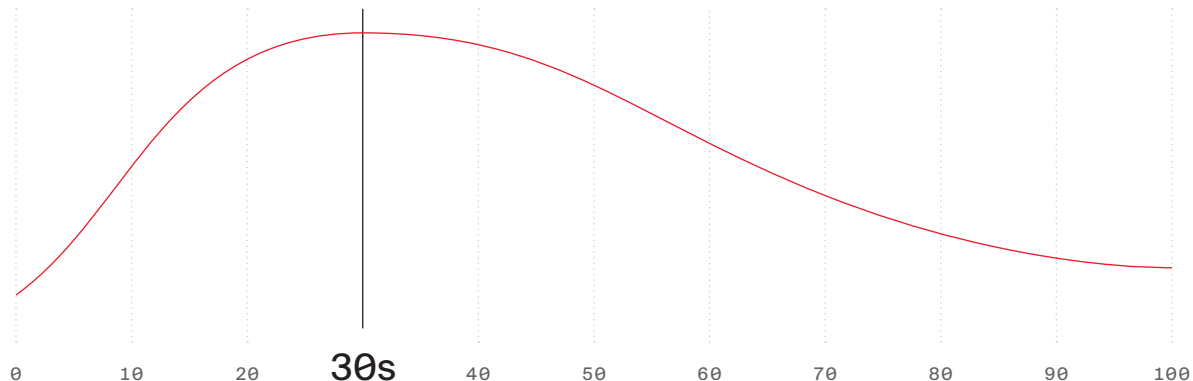


90% of the body's
cellular energy
is produced by
mitochondria

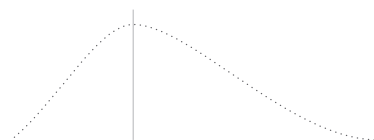
Mitochondrial Health Declines After 30

MITOCHONDRIAL HEALTH



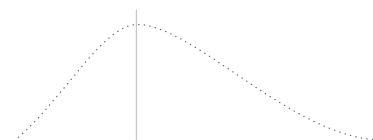
MUSCLE CELLS

- ⬇ Damaged mitochondria accumulate in muscle, contributing to loss of strength.



IMMUNE CELLS

- ⬇ Mitochondrial dysfunction can lead to increased inflammaging, CRP and IL-6 levels.



SKIN CELLS

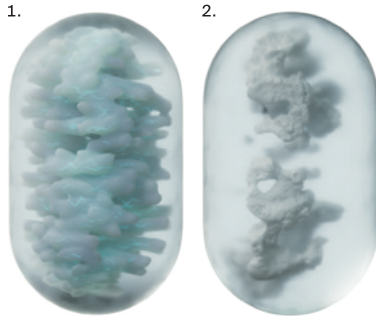
- ⬇ These energy-demanding cells contribute to wrinkle depth and loss of skin firmness.

Mitochondria Determine Cellular Energy

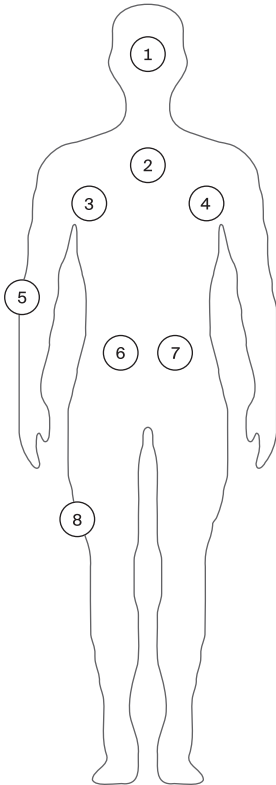
The body is made up of trillions of cells. The health of these cells determines longevity and healthspan. Mitochondria, the powerhouses of the cell, create energy for the body's systems.

Mitochondrial function begins declining after 30, impacting cellular energy and how nearly every body system performs.

Muscle, immune and skin cells are among the most energy-demanding cells in the body. A decline in mitochondrial health directly affects how these systems function.



-
1. Healthy Mitochondria
 2. Damaged Mitochondria



01. Brain

The brain accounts for only 2% of body mass, but uses about 25% of the body's metabolic energy making mitochondrial quality critical for cognitive health.

02. Heart

The heart never stops, so its mitochondria never stop. Mitochondria comprise about 30% of every heart cell, making their health essential.

03. Skin

Skin cells require substantial energy to combat aging, and mitochondria support barrier repair, collagen production and cell turnover. Mitochondrial dysfunction can lead to signs of skin aging, including loss of firmness, dullness and wrinkles.

04. Immune System

Immune regulation declines with age, and studies show that mitochondrial dysfunction can increase age-related inflammation (inflamm-aging).

05. Joints

Emerging studies link healthy joints to healthy mitochondria.

06. Metabolism

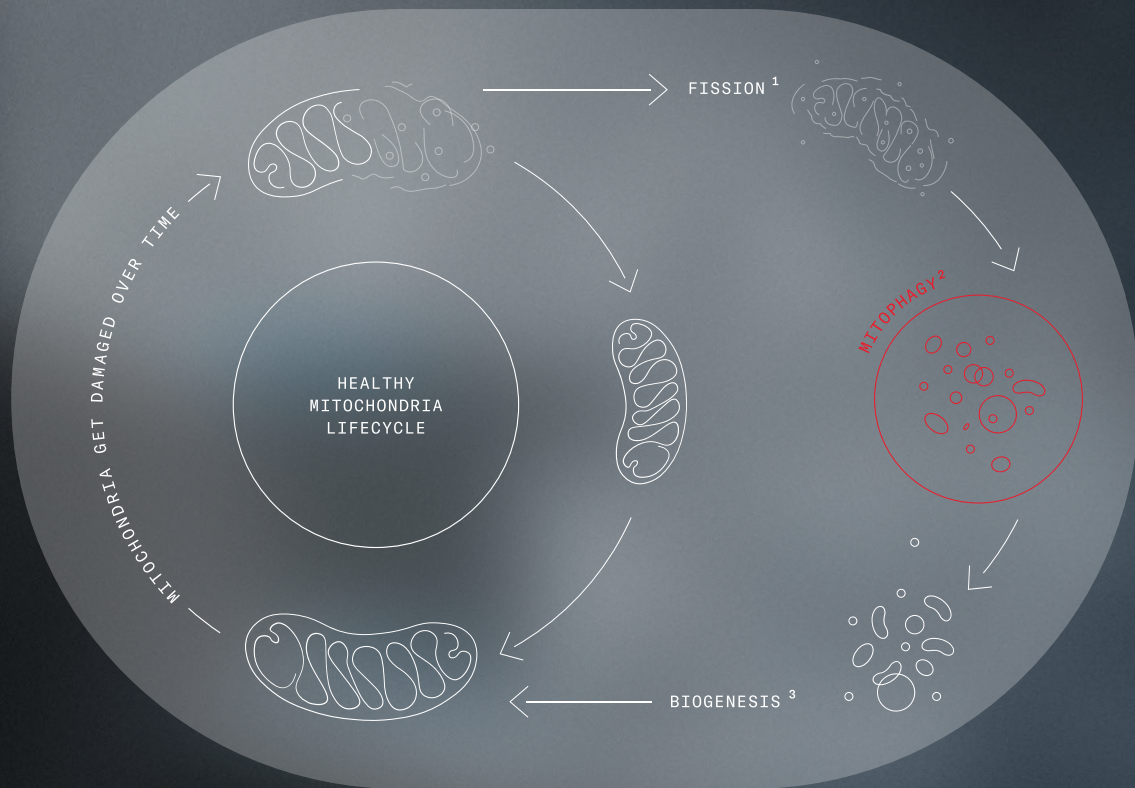
Mitochondria control how the body stores and utilizes fuel, impacting metabolic efficiency with age.

07. Digestive System

Mitochondrial function is critical for gut barrier health and overall well-being.

08. Skeletal Muscle

Muscle cells require 100x more energy during strenuous activity, and mitochondrial function is essential to meet this demand.



Mitophagy Renews Mitochondria

Mitophagy is a foundational cellular cleanup process that repairs and removes damaged mitochondria. Mitophagy becomes less efficient with age, exactly when the body needs it most. Damaged mitochondria accumulate faster, and the system designed to clear it slows down.

Mitochondrial dysfunction is a hallmark of aging, and stimulating mitophagy targets it at its root.

Energy production and biogenesis (increasing the division of healthy mitochondria) cannot be optimized while defective mitochondria are accumulating. Some mitochondria-targeted supplements focus on biogenesis, optimizing the function of healthy mitochondria, but they ignore the damaged ones taking up metabolic real estate. It's like organizing a junk drawer while still throwing trash in it.

Mitopure is a pure and patented form of Urolithin A that has been clinically proven to stimulate mitophagy, renew mitochondria and address signs of aging.*

It's one of the few clinically validated options to induce mitophagy, including daily exercise and fasting.

60% of people
don't have the gut
composition to make
enough Urolithin A
from food

Urolithin A Stimulates Mitophagy and Renews Mitochondria

Urolithin A is a postbiotic nutrient that is naturally produced when gut bacteria metabolize ellagitannins from foods like pomegranates and walnuts.

But 60% of people don't have the gut composition to make enough Urolithin A from food.

The 40% of people who can produce Urolithin A would need to consume substantial quantities of pomegranates and walnuts to achieve meaningful levels.

Mitopure fills this gap. It's designed to bypass the gut conversion, increasing Urolithin A in the blood six-fold compared to pomegranate juice intake. Mitopure is also absorbed faster and more consistently, achieving peak levels at six hours compared to pomegranate's 24 hours.⁹

The Proof Is in the Science

25+ clinical trials and counting show that Mitopure improves aging at the cellular level.

Timeline is committed to advancing longevity science through rigorous, gold-standard research published in high-impact peer reviewed journals, partnering with leading researchers and institutions to inform product development and provider education.

18+

Years of rigorous clinical research

25+

Completed clinical trials on Mitopure

500+

Studies on Urolithin A

#1

Doctor-recommended Urolithin A brand

7

Gold standard clinical trials on 1000 mg Pro dose

80+

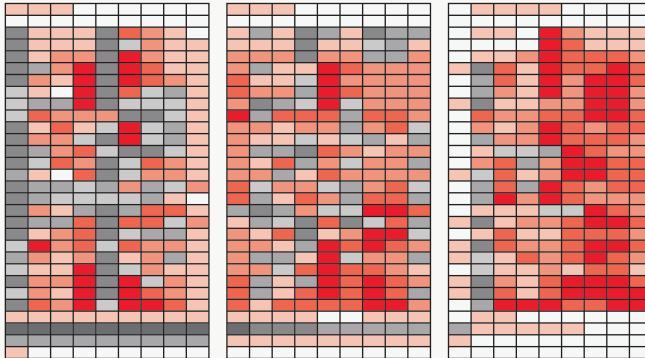
Global patents



Mitochondrial Renewal*

Mitopure supports mitochondrial function, mitophagy and biogenesis for healthier, more efficient mitochondria.¹

INEFFICIENT MITOCHONDRIAL HEALTH EFFICIENT



PLACEBO

500 MG

mitopure®

1000 MG

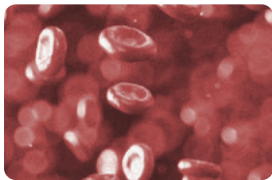
mitopure®

Heat map represents genes related to mitochondrial function.



How Supplemental Mitopure Works

[†]According to preclinical data



Hour 08

Urolithin A levels peak in the bloodstream



Day 02

Mitophagy begins, activating cellular recycling^{†,6}



Day 30

Healthy mitochondria replace damaged ones and immune fitness improves^{1,2,c}



Day 42

Physical performance improves⁷



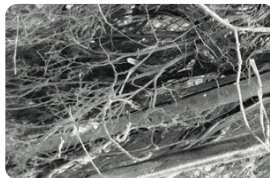
Day 60

Muscular endurance increases^{5,8,a,b}



Day 120

Muscle strength increases^{3,a}



Day 120+

Clinical trials are studying the system-wide benefits of long-term use⁹



Timeline is a longevity brand on a mission to extend healthspan through clinically proven research. Our scientists uncovered that Urolithin A, a postbiotic nutrient, can change how we age.

mitopure®, our proprietary Urolithin A technology, improves mitochondrial function and targets signs of aging in the body and skin – helping you and your patients, live the life you love for longer.*

A handwritten signature in black ink, reading 'Chris Rinsch'.

Dr. Chris Rinsch
Co-founder and President at Timeline

Overview

Immune, muscle and brain function are key drivers of aging and healthspan. One key factor that impacts these systems is mitochondrial health.

The immune system is highly metabolically demanding — a significant amount of energy is needed to create healthy immune cells.

The immune system depends on mitochondrial integrity to deliver the energy needed to fuel its energy-demanding tasks.

Mitochondria become less efficient with age, and mitophagy, the process that clears out damaged mitochondria, slows down.

Mitochondrial dysfunction contributes to immune cell issues. Damaged mitochondria themselves may play a role in chronic low-grade inflammation (also known as inflammaging).

Stimulating mitophagy helps maintain mitochondrial quality and healthy immune cell activity.

The Science

3 Hallmarks of Immune Aging

Immune Cells Shift

Lymphocytes, leukocytes and naive CD8+ T cells naturally decline with age, and the thymus gland reduces the body's ability to make new naive T cells.

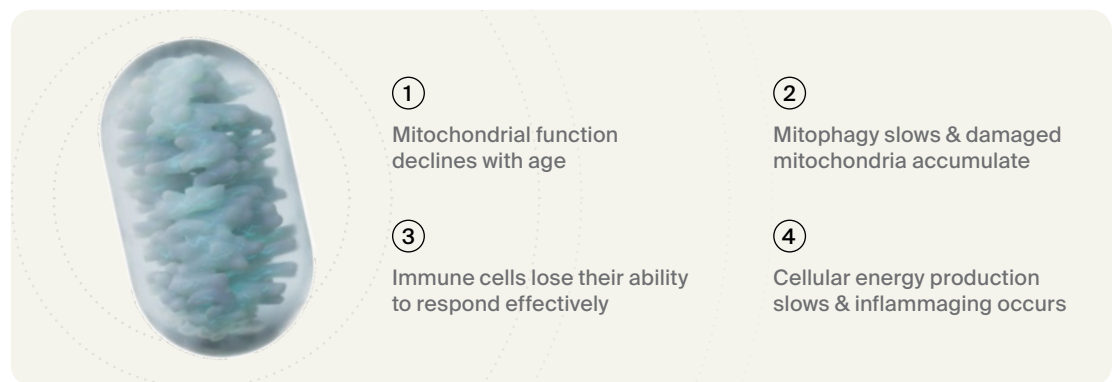
Inflammaging

Occurs when the immune system stays activated for a prolonged period of time.

Mitochondrial Dysfunction

Occurs when mitochondria do not work optimally — immune cells may have less activity to carry out their normal functions.

Immune Fitness Depends on Healthy Mitochondria

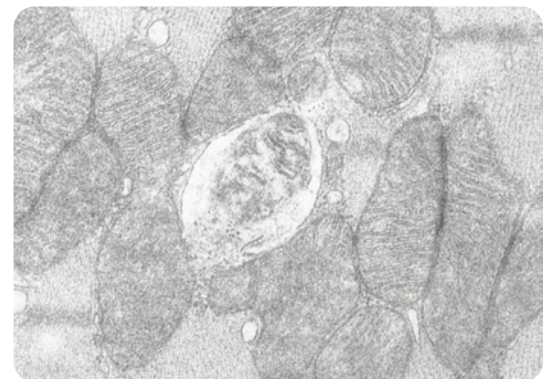


Stimulating Mitophagy Helps Address Immune Aging

Mitophagy targets a root cause of immune aging: the accumulation of dysfunctional mitochondria.

Stimulating mitophagy is foundational; it activates the cleanup process that repairs and clears damaged mitochondria. This allows energy production and biogenesis to work effectively, making room for healthy mitochondrial production.

Urolithin A is clinically proven to stimulate mitophagy, making Mitopure® a foundational mitochondrial supplement.*



Key Takeaways

The immune system becomes less adaptable with age. Immune cells lose energy and repair slows with mitochondrial dysfunction.

Even subtle changes to the immune system impacts aging, influencing cellular energy and overall balance across the body.

Supporting mitochondrial health with Mitopure can promote immune fitness by rejuvenating immune cells.**

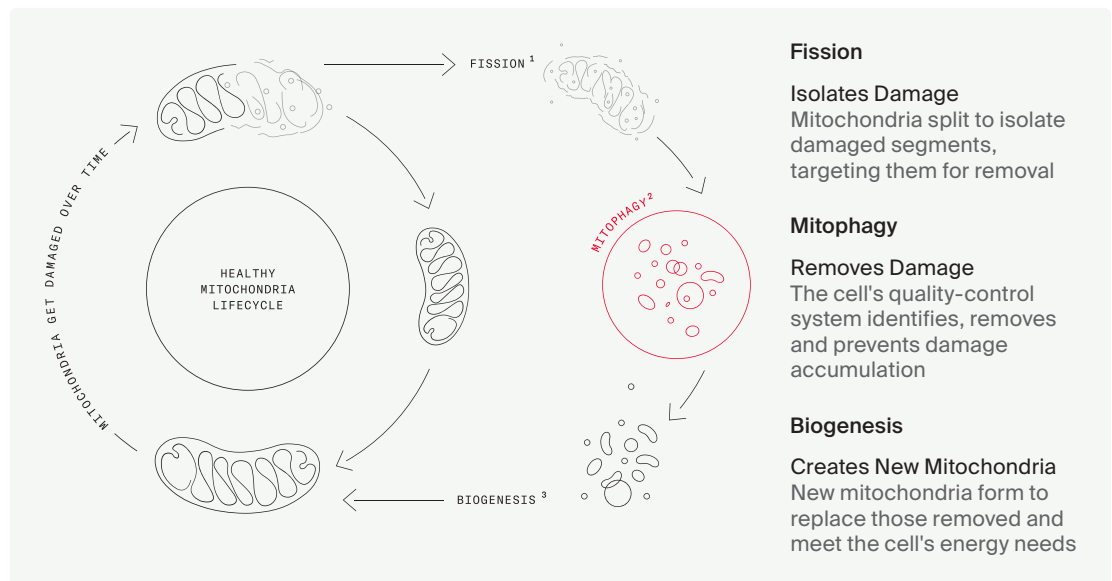
Mitophagy & Biogenesis Why Clearing Damage Matters As Much as Building New Mitochondria

Overview

The mitochondria life cycle

The body contains quadrillions of mitochondria, and their quality determines cellular energy and how the body's systems and processes function, including the brain, muscle, metabolism and heart.¹

Mitochondrial health depends on an efficient life cycle: fission, mitophagy and biogenesis.²

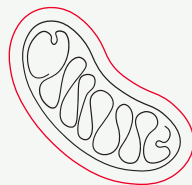


MITOPHAGY²

Necessary for mitochondrial renewal

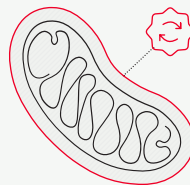
Tag

PINK1 accumulates on the outer membrane of damaged mitochondria



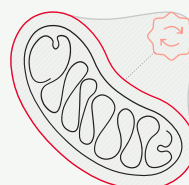
Mark

Parkin tags damaged membrane proteins, marking them as ready for recycling



Engulf

An autophagosome wraps around the damaged mitochondrion



Recycle

A lysosome fuses and enables the full breakdown and recycling process



BIOGENESIS³

Creates new mitochondria

Sense

AMPK and SIRT1 sense an energy imbalance, signaling a need for new mitochondria

Activate

PGC-1α, the key regulator of mitochondrial biogenesis, switches on

Signal

PGC-1α activates nuclear respiratory factors (NRF) 1/2, which induce TFAM

Build

TFAM binds mtDNA, driving the transcription and replication that build new mitochondria

Mitophagy & Biogenesis Why Clearing Damage Matters As Much as Building New Mitochondria

The Problem

Mitophagy declines with age

Damaged mitochondria accumulate faster with age, at the same time when mitophagy, the system designed to clear that damage, slows down.⁴

The Result⁴

Inflammatory response

Uncleared mitochondria release components that may influence inflammatory response markers, including C-reactive protein (CRP) levels.

Heart health

The heart is densely packed with mitochondria, about 30% of cardiomyocyte volume, making efficient mitophagy important for cardiac health.

Metabolism

Mitochondria control how the body stores and uses fat, so reduced mitophagy can affect metabolic efficiency.

Muscle strength

Damaged mitochondria accumulate in muscle, contributing to the age-related decline in muscle strength and quality.

Cognition

The brain accounts for only 2% of body mass but uses about 25% of the body's metabolic energy, so inefficient mitophagy can affect brain health.

Skin health

Skin cells require substantial energy to combat aging, and mitochondria support barrier repair, collagen production and cell turnover.

Targeting biogenesis alone isn't sufficient

Most mitochondrial supplements target biogenesis while overlooking mitophagy. New mitochondria form from existing ones, so if damage isn't cleared first, it replicates too — accumulating more damage.

The Solution

Urolithin A stimulates mitophagy and promotes biogenesis

Urolithin A is a compound clinically proven to stimulate mitophagy in human cells. Through this process, damaged mitochondria are cleared first so new healthy mitochondria form.

Urolithin A promotes the PINK1-Parkin pathway to tag, mark and clear damaged mitochondria. Then, it signals mitochondrial biogenesis via PGC-1 α .^{5, 6}

Urolithin A is the only compound clinically shown to act at two stages of the life cycle: mitophagy and biogenesis. As the bioavailable form of Urolithin A backed by 18+ years of research, Mitopure delivers a clinical dose shown to be effective in 7+ human clinical trials across diverse patient populations.^{a, b, 5, 6}

time—line

Mitophagy & Biogenesis Why Clearing Damage Matters As Much as Building New Mitochondria

How Supplements Compare

A healthy mitochondrial life cycle depends on both mitophagy and biogenesis. Most mitochondrial-targeted supplements support biogenesis or energy production, but few act on mitophagy, the step that declines most with age.

Supplement	Primary Role	Mitophagy	Biogenesis	Key Evidence
Mitopure® (Urolithin A) ^{5, 6}	Induces mitophagy and promotes biogenesis	Direct clinical data	Clinical gene expression data	Strong; Multiple human clinical trials on muscle, energy and cellular health ^a
CoQ10 (Ubiquinol) ⁷	Supports the electron transport chain and ATP production	—	—	Moderate; Supports daily function of healthy mitochondria
Spermidine ⁸	May induce autophagy	Preclinical data	—	Growing; Small human trials with mitophagy data largely preclinical
NAD+ and NAD Precursors ⁹	Restores NAD+ for sirtuin activity and energy metabolism	Indirect preclinical data	Indirect preclinical data	Growing; Largely preclinical or small human clinical trials
Resveratrol ¹⁰	SIRT1/PGC-1α activation	Indirect preclinical data	Indirect preclinical data	Limited; Constrained by low bioavailability
PQQ ¹¹	Activates PGC-1α to support biogenesis	—	Preclinical data	Growing; Small human trials with biogenesis data largely preclinical
Carnitine (Acetyl-L-Carnitine) ¹²	Transports fatty acids into mitochondria for energy	—	—	Moderate; Supports fatty-acid metabolism and energy production
Alpha-Lipoic Acid ¹³	Antioxidant and enzyme cofactor supporting redox balance	—	—	Moderate; Antioxidant studied in metabolic health
Methylene Blue ¹⁴	Acts as an alternative electron carrier in the electron transport chain	—	—	Limited; Largely preclinical with small human studies

Disclaimer: The information contained herein is for educational purposes only and does not establish a doctor-patient relationship. When using this educational material, you understand that it is educational. Consult your provider before making changes to your health habits.

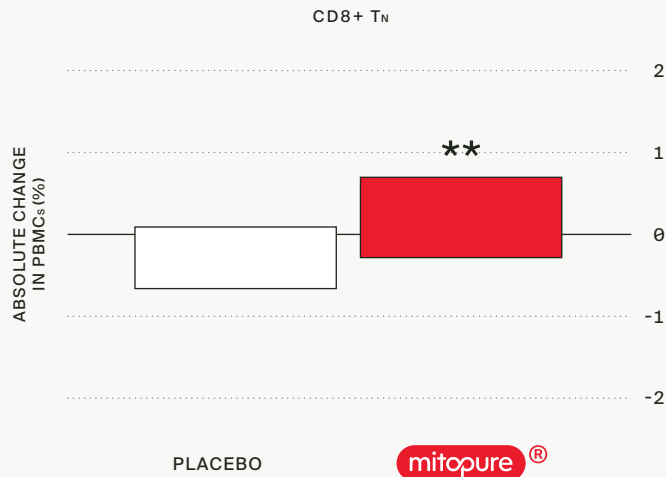
a. Clinical studies consistently find improvements in muscle strength and endurance in a varied subset of the population ranging from resistance-trained athletes in their 20s to middle-aged adults with an average BMI of 29.52.

b. 500mg Mitopure® have been shown to deliver at least 6 times higher Urolithin A plasma levels over 24 hours (area under the curve) than 8 ounces (240ml) of pomegranate juice in a randomized human clinical trial.

- Atlante A. et al, Curr Issues Mol Biol. 2023.
- Shelbayeh OA. et al, Antioxidants (Basel). 2023.
- Narendra DP. et al, Nat Cell Biol. 2024.
- Picca A. et al, Nat Metab. 2023.
- Andreux PA. et al, Nat Metab. 2019.
- Singh A. et al, Cell Rep Med. 2022.
- Hidalgo-Gutiérrez A. et al, Antioxidants (Basel). 2021.
- Borsky P. et al, Nutr Res Rev. 2025.
- Picca A. et al, Nat Metab. 2025.
- Rogina B. et al, Frontiers in Genetics. 2024.
- Yan T. et al, Curr Res Food Sci. 2024.
- Alhasaniah AH. et al, Saudi J Biol Sci. 2022.
- Superti F. et al, Antioxidants (Basel). 2024.
- Ostrovsky A. et al, StatPearls. 2026.

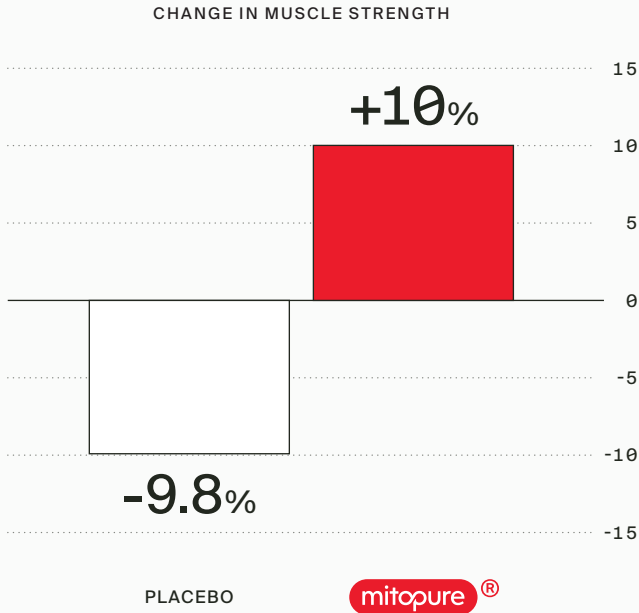
Immune Fitness

Taking 1000 mg Mitopure daily increases the number of early-responding immune cells and improves mitochondrial function and biogenesis in immune cells after 4 weeks.^{2,c}



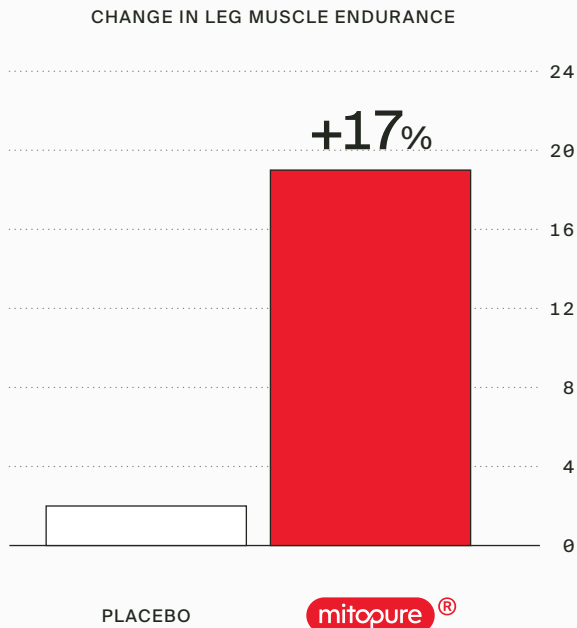
Muscle Strength

Taking 1000 mg of Mitopure daily for 4 months improves lower-body muscle strength by 10%.^{3,a}



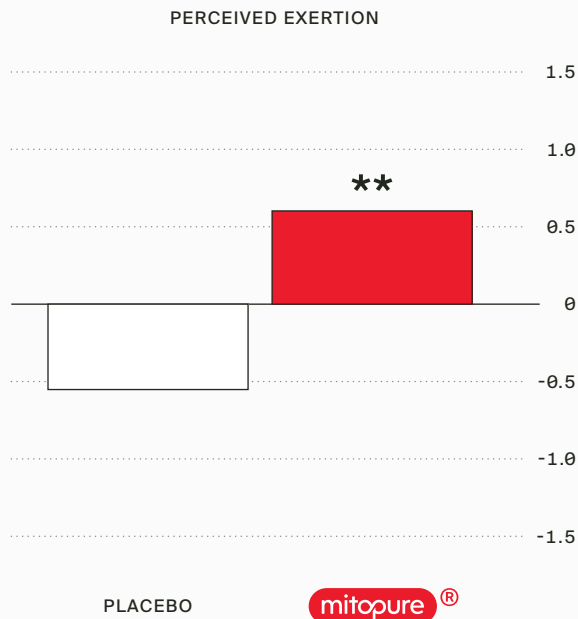
Endurance

Leg muscle endurance increases by up to 17% after 8 weeks in healthy, sedentary, older adults.^{5,b}



Athletic Performance

Rate of perceived exertion (RPE) improves after 4 weeks of supplementing with Mitopure compared to a placebo group.^{4,d}

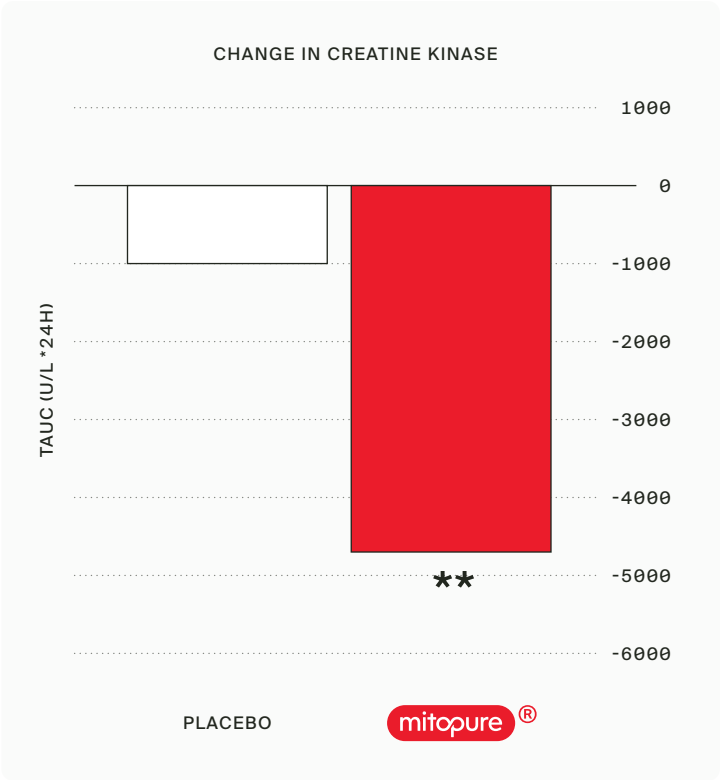


#Different from other group
[main effect group]



Recovery

Athletes who supplement daily for 4 weeks have lower creatine kinase (CK) levels 1 and 24 hours after exercise.^{4,d}

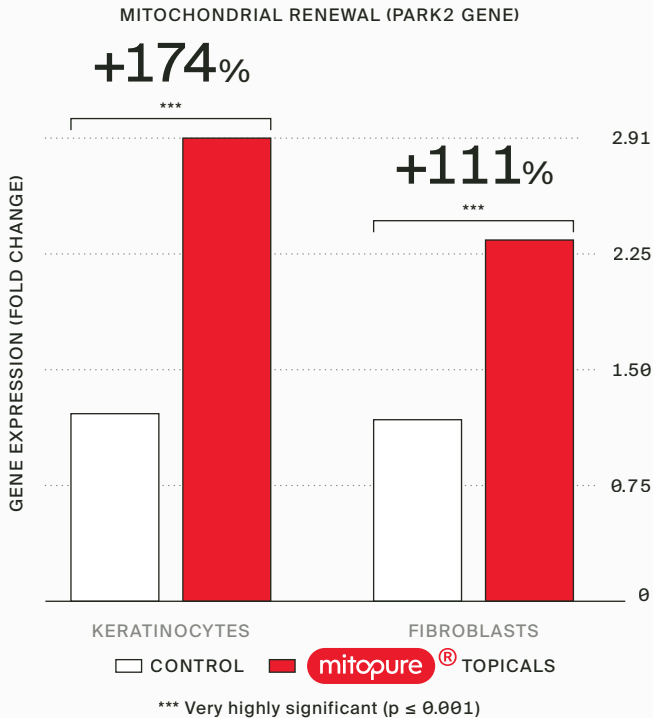


#Different from first race (baseline)
[main effect of time]

PRECLINICAL RESEARCH

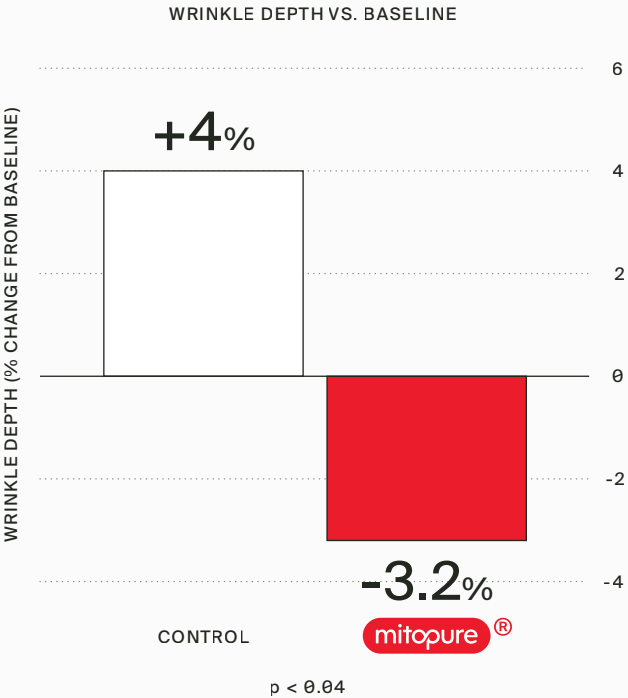
Mitopure® Improves Mitochondrial Function in Skin Cells

Preclinical studies in human keratinocyte and fibroblast skin cells find that Mitopure stimulates mitophagy and supports mitochondrial quality after 72 hours. Skin cell renewal increases by 174%, which may contribute to improvements in skin appearance and function observed in human studies.^{f,10}

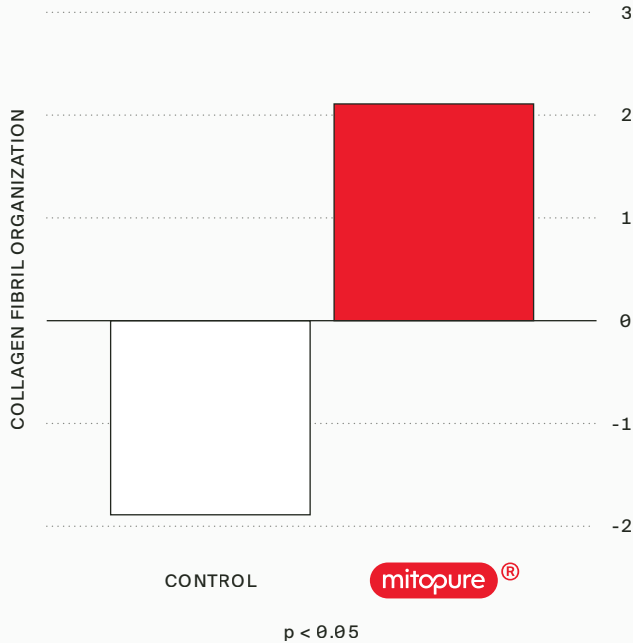


Mitopure Reduces Wrinkle Depth

Wrinkle depth significantly reduces in participants using topical Mitopure, with visible effects observed after just two weeks. Wrinkle depth continues to reduce significantly after eight weeks compared to placebo.^{e,10}



SUPPORTS COLLAGEN ASSEMBLY



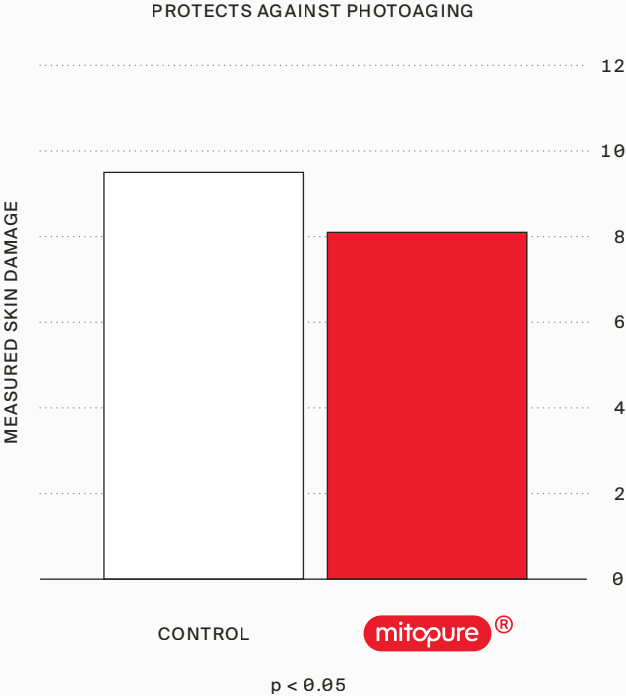
Mitopure Supports Collagen Assembly & Organization

Topical Mitopure activates genes involved in collagen organization and assembly. Genes related to the skin's most abundant collagen types I and III are typically downregulated with age, yet were upregulated after eight weeks of daily use.^{6,10}

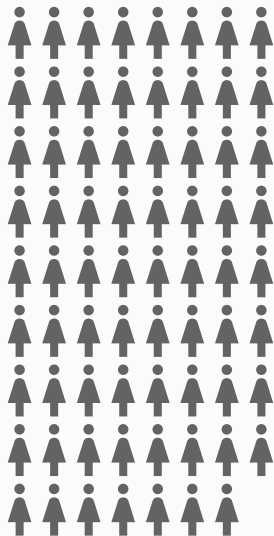


Mitopure Protects the Skin
From Photodamage

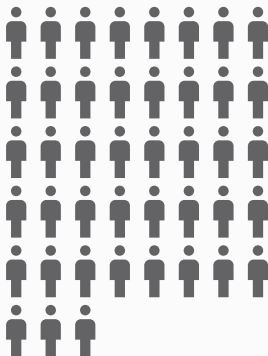
A UVB trial assessed redness and inflammation in 22 adults after controlled exposure to sunburn. Mitopure-treated skin had significantly lower erythema and redness compared with untreated skin over 24 hours, indicating photodamage protection.^{e,10}



71 WOMEN



38 MEN



NO SKIN IRRITATION OR SENSITIZATION

Mitopure Is Safe for All Skin Types & Tones Including Sensitive Skin

A standard human repeat insult patch test (HRIPT) shows that topical Mitopure has excellent tolerability across 109 men and women with no signs of irritation or sensitivity.^{e,10}



Longevity Takes Time

- 2007
MDs and PhDs at EPFL set out to target the root causes of aging
- 2008
Began pioneering research on the mitochondria
- 2009
Zeroed in on natural compounds found in pomegranates
- 2010
Identified Urolithin A
- 2011
Developed Mitopure



- 2015
Launched first-ever human clinical trial of Urolithin A



- 2018
Discovered mitochondria quality is the difference between frail and strong muscle in aging adults
- 2019
nature metabolism
Urolithin A safely and effectively activated mitophagy with positive effects on mitochondrial biomarkers
- 2020
Launched Mitopure®, a pure and patented form of Urolithin A

- 2022

Aging Cell

Urolithin A reduces cartilage degeneration and alleviates osteoarthritis pain in mice

Cell Reports Medicine

Clinical trial shows Mitopure improves muscle strength, performance, VO2max and mitochondrial health

CellPress

Preclinical data shows Mitopure improved cancer-fighting properties of T-cells, a key part of the immune system

JAMA Network™

Landmark clinical trial shows Mitopure improves muscle strength in older adults

EJCN

Mitopure delivers 6X more Urolithin A than 8 oz of pomegranate juice in clinical study

- 2023

medRxiv

Topical application of 1% Mitopure skincare slows intrinsic and extrinsic skin aging

- 2024

jissn

Mitopure helped improve muscle endurance, strength and oxidative stress in male athletes

- 2025

frontiers

A pilot study showed that Mitopure helped improve aerobic endurance and jump performance in soccer players

Sports Medicine

Mitopure helps facilitate recovery by downregulating inflammatory pathways, indirect markers of muscle damage and rate of perceived exertion

nature aging

Mitopure improved immune fitness and vitality in clinical trial

- Coming Soon ...

Ongoing studies are investigating Mitopure's additional longevity benefits

● PROVIDER EXCLUSIVE



Cellular Longevity Pro Capsules

mitopure® 1000^{MG} UROLITHIN A

Aging well begins with the powerhouse of your cells. That's why healthcare providers trust Mitopure®, a supplement that supports mitochondrial health and longevity at the cellular level.*



3RD PARTY
TESTED



GLUTEN
FREE

● PROVIDER EXCLUSIVE



Longevity Serum Pro Skincare

mitopure® TOPICAL

Aging well begins with the powerhouse of your cells. That's why healthcare providers trust Mitopure®, skincare that supports mitochondrial health and longevity at the cellular level.*



DERMATOLOGIST
APPROVED



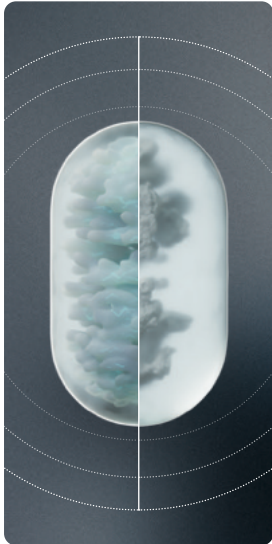
SENSITIVE
SKIN SAFE



FRAGRANCE &
COLORANT FREE

How Topical Mitopure Works

[†]According to preclinical data



Day 03

Mitophagy begins,
activating cellular recycling[†]



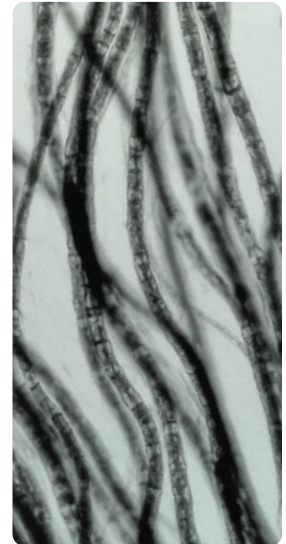
Day 15

Visibly reduces the
appearance of wrinkles[†]



Month 02

Significantly improves the
depth of wrinkles[†]



Significantly improves
collagen assembly[†]

● PROVIDER EXCLUSIVE

Mitopure Inside Out System **PRO**

Aging well begins with the powerhouse of your cells. This system supports longevity from the inside out.*

| 2 bottles Mitopure supplement

| 1 bottle Mitopure skincare



Disclaimers

*** These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.**

a Clinical studies consistently find improvements in muscle strength and endurance in a varied subset of the population ranging from resistance-trained athletes in their 20s to middle-aged adults with an average BMI of 29.52 to older adults 65 to 90.

b Our clinical studies showed that sedentary adults aged 65–90 improved muscle endurance, measured as leg and hand repetitions to fatigue, after daily supplementation with 1,000 mg Mitopure®.

c Our randomized, placebo-controlled clinical study showed that supplementation with Mitopure® 1,000 mg for 4 weeks was associated with improvements in mitochondrial health of immune cells, favorable shifts in T-cell populations (including naïve cells), and markers of healthy immune function, in healthy, middle-aged adults.

d Our clinical study showed that trained runners reported lower rate of perceived exertion (RPE) after 4 weeks of daily supplementation with 1,000 mg Mitopure®, and lower creatine kinase (CK) levels at 1 and 24 hours post-exercise, compared with placebo.

e Based on an 8-week randomized clinical trial of 48 healthy women aged 50 to 75 years.

f Based on in-vitro laboratory testing on skin cells

g 500mg Mitopure® have been shown to deliver at least 6 times higher Urolithin A plasma levels over 24 hours (area under the curve) than 8 ounces (240ml) of pomegranate juice in a randomized human clinical trial.

References

- 1 Andreux PA, Blanco-Bose W, Ryu D, et al. The mitophagy activator urolithin A is safe and induces a molecular signature of improved mitochondrial and cellular health in humans. *Nat Metab.* 2019;1(6):595–603. doi:10.1038/s42255-019-0073-4
- 2 Denk D, Singh A, Kasler HG, et al. Effect of the mitophagy inducer urolithin A on age-related immune decline: a randomized, placebo-controlled trial. *Nat Aging.* 2025;5(11):2309–2322. doi:10.1038/s43587-025-00996-x
- 3 Singh A, D'Amico D, Andreux PA, et al. Urolithin A improves muscle strength, exercise performance, and biomarkers of mitochondrial health in a randomized trial in middle-aged adults. *Cell Rep Med.* 2022;3(5). doi:10.1016/j.xcrm.2022.100633
- 4 Whitfield J, McKay AKA, Tee N, et al. Evaluating the Impact of Urolithin A Supplementation on Running Performance, Recovery, and Mitochondrial Biomarkers in Highly Trained Male Distance Runners. *Sports Med.* 2025;55(12):3183–3200. doi:10.1007/s40279-025-02292-5
- 5 Liu S, D'Amico D, Shankland E, et al. Effect of Urolithin A Supplementation on Muscle Endurance and Mitochondrial Health in Older Adults: A Randomized Clinical Trial. *JAMA Netw Open.* 2022;5(1):e2144279. doi:10.1001/jamanetworkopen.2021.44279
- 6 Ryu D, Mouchiroud L, Andreux PA, et al. Urolithin A induces mitophagy and prolongs lifespan in *C. elegans* and increases muscle function in rodents. *Nat Med.* 2016;22(8):879–888. doi:10.1038/nm.4132
- 7 Monsalve Acevedo A, Sanctuary C, Aitken RJ, Wilkins A, Harrison N, Naughton M. Effects of Urolithin A supplementation on performance and antioxidant status in academy soccer players during pre-season: a pilot randomised controlled trial. *Front Nutr.* 2025;12. doi:10.3389/fnut.2025.1674446
- 8 Zhao H, Zhu H, Yun H, et al. Assessment of Urolithin A effects on muscle endurance, strength, inflammation, oxidative stress, and protein metabolism in male athletes with resistance training: an 8-week randomized, double-blind, placebo-controlled study. *J Int Soc Sports Nutr.* 2024;21(1):2419388. doi:10.1080/15502783.2024.2419388
- 9 Amazentis SA. A Confirmatory, Randomised, Double-Blind, Placebo-Controlled, Parallel Study to Assess the Effects of a Dietary Supplement Containing Urolithin A (Mitopure®) on Muscle Strength and Performance in Healthy Middle-Aged Adults. *clinicaltrials.gov*; 2025. Accessed December 17, 2025. <https://clinicaltrials.gov/study/NCT07231783>
- 10 D D'Amico, AM Fouassier, J Faitg, N Hennighausen, M Brandt, D Konstantopoulos, C Rinsch, A Singh. Topical application of Urolithin A slows intrinsic skin aging and protects from UVB-mediated photodamage: Findings from Randomized Clinical Trials. *medRxiv.* June 20, 2023. <https://doi.org/10.1101/2023.06.16.23291378>