

# Age Reversal Update

**William Faloon**

**Life Extension<sup>®</sup>**

***September 4, 2026***

**RAADfest – Scottsdale, AZ**

**[www.age-reversal.net](http://www.age-reversal.net)**





# THE LONGEVITY ISSUE

What to expect when you're expecting to live longer *by Alice Park*



time.com

January 26<sup>th</sup>, 2026

## TIME front cover reports Age Delay and Reversal

<https://time.com/collections/the-age-of-longevity/>



### The New Old Age

*by Alice Park*



### Ovaries Could Unlock Secrets of Longevity

*by Dominique Mosbergen*



### 9 Resolutions That Can Help You Age Better This Year

*by Angela Haupt*



### How to Think Yourself Young

*by Veronique Greenwood*



### What the World's Longest-Lived Animals Can Teach Us About Aging

*by Veronique Greenwood*



### The Race to Measure Aging —And Why It Matters

*by Dominique Mosbergen*

“A new therapy has the potential to cure hundreds of diseases — and even reverse aging.”

“Many scientists now believe that mastering **cellular rejuvenation** may be the key to transforming how long and how well we live.”

“Some hope that they might eventually be able to harness the process to cure hundreds of diseases, **extend life** by decades and even **fend off aging** entirely.”





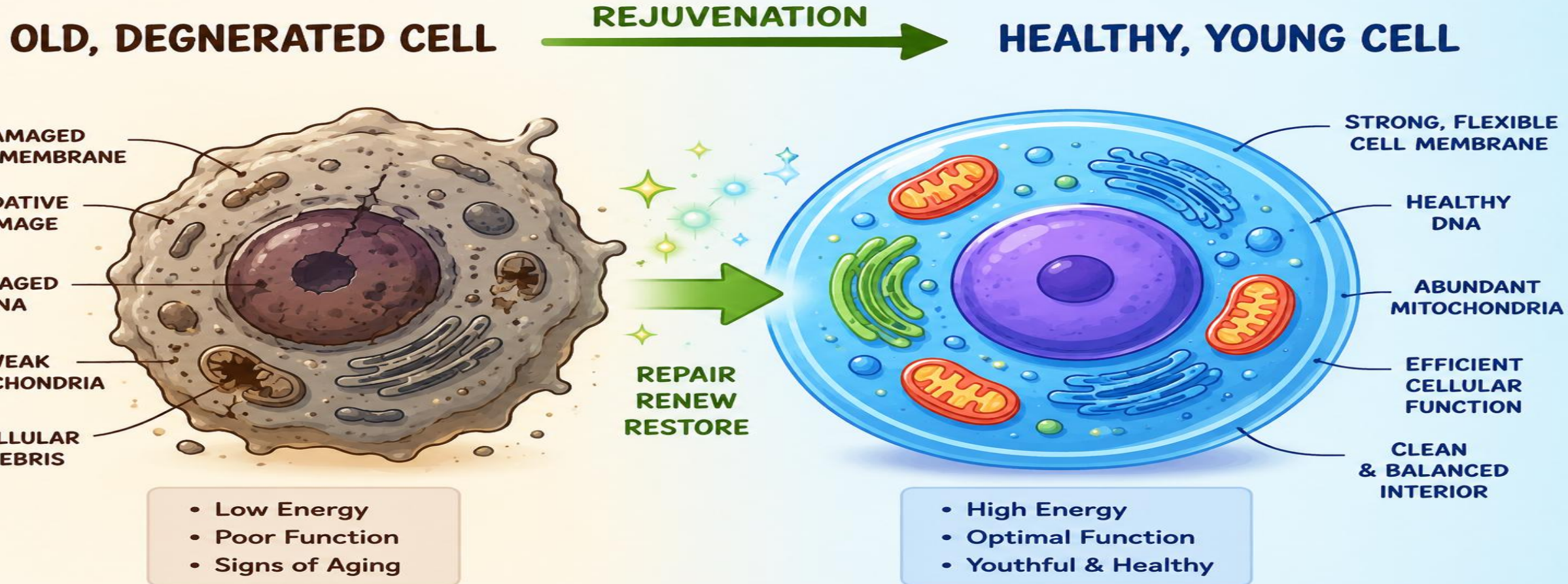
“**Rejuvenation** is one of the newest and most promising developments in **longevity research**...”

“Major figures in Silicon Valley, including **Peter Thiel**, **Larry Ellison** and **Sam Altman**, have collectively **invested billions** in biotech companies and research centers devoted to slowing the **aging** process.”





# Cellular Rejuvenation pursued through Cellular Reprogramming



**OSK** reprograms old cells into young healthy adult cells

# Coinbase Founder's Longevity Startup Triples in Value

June 2<sup>nd</sup>, 2026

“NewLimit, a longevity startup co-founded by Coinbase CEO **Brian Armstrong**, completed a fundraising that brings its valuation to **\$3.1 billion**, the company said, more than **triple** what it was a year ago, on growing enthusiasm for **drugs that promise to slow or reverse aging.**”

“Investors poured **\$435 million** into **NewLimit**, which is focused on **reversing cellular aging** but doesn't have any products on the market yet.”



THE WALL STREET JOURNAL.

WSJ

<https://www.wsj.com/business/newlimit-startup-brian-armstrong-value-82ab9830>



Coinbase Founder invested \$105 million  
in NewLimit. It's now valued at \$3.1 Billion

“The hope is that these  
companies discover  
drugs that halt or even  
***reverse the biological  
course of aging...***”

June 2<sup>nd</sup>, 2026



THE WALL STREET JOURNAL.

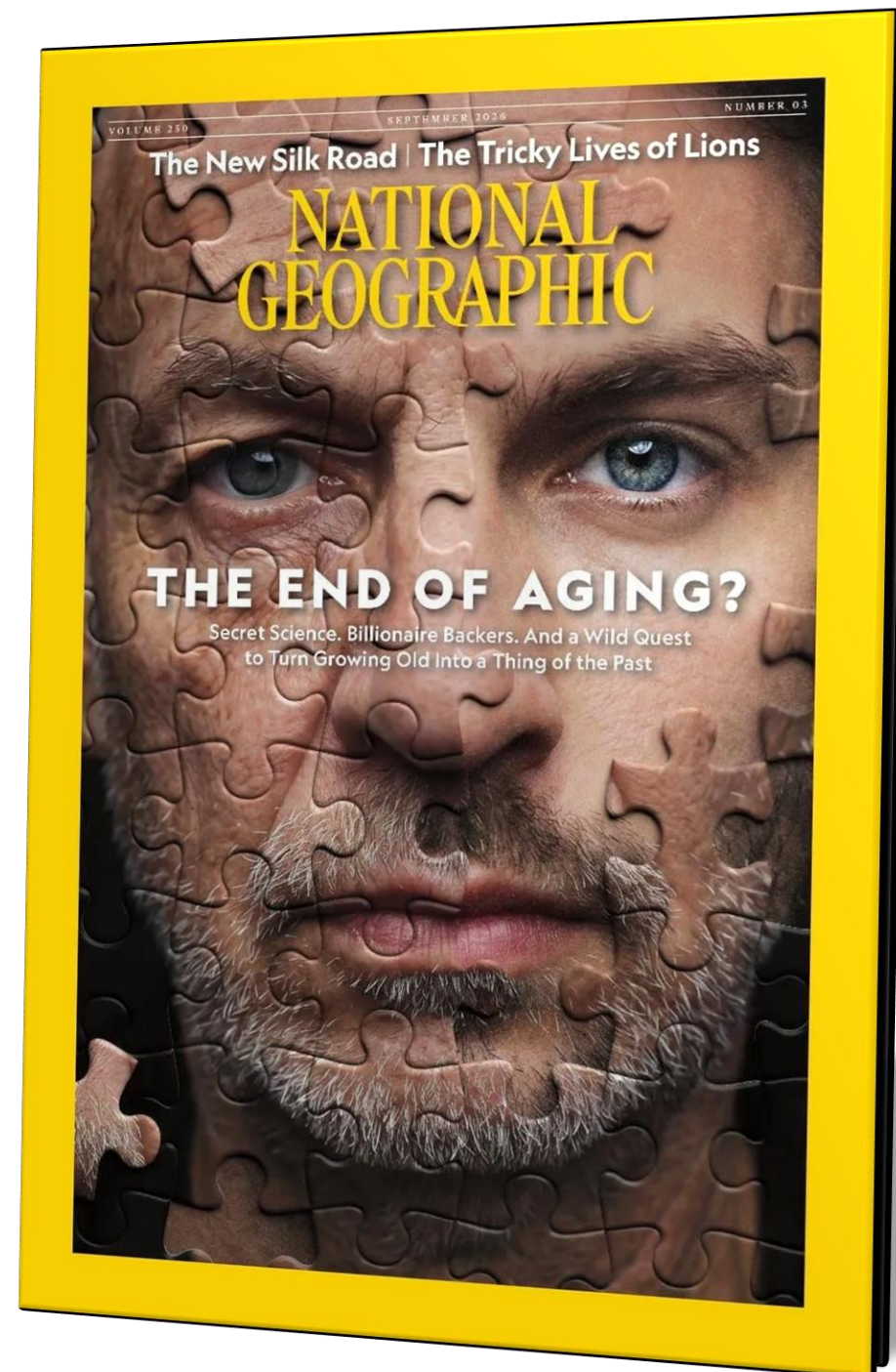
WSJ

<https://www.wsj.com/business/newlimit-startup-brian-armstrong-value-82ab9830>

# **“THE END OF AGING?”**

**“It didn’t just target individual organs either. ‘This is whole body rejuvenation....”**

[nationalgeographic.com/magazine/issue/september-2026](https://nationalgeographic.com/magazine/issue/september-2026)





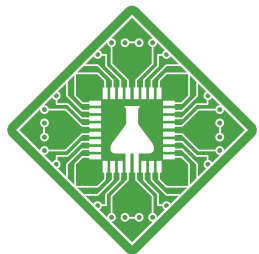
# How To Live This Life Better: Effective Altruism In The Context Of Longevity

Alexander Zhavoronkov, Ph.D., is the Chief Executive Officer of **Insilico Medicine, Inc**, applying the latest advances in **artificial intelligence** to drug discovery, biomarker development, and **aging research**.

Alex Zhavoronkov is the author of over **90 research** publications in peer-reviewed journals



ALEX ZHAVORONKOV



**Insilico  
Medicine**

**2014**

**Alexander Zhavoronkov, Ph.D.**  
founded **Insilico Medicine** and is  
dedicated to finding an **aging cure**.

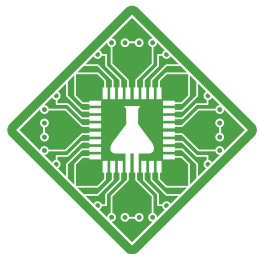
He pioneered **AI** for **biomedical research**  
before most understood potential  
of **AI** in drug discovery.

<https://insilico.com>



**Alexander Zhavoronkov, Ph.D**  
**Founder, Chairman and CEO**

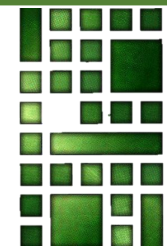




**Insilico  
Medicine**

**2016-2017**

**Insilico Needed  
More Funding...**



**LifeExtension®**  
provides **\$140,000**  
to **Insilico Medicine**

<https://insilico.com>



**Alexander Zhavoronkov, Ph.D**  
**Founder, Chairman and CEO**

## For the First Time AI Designs and Validates New Drug Candidate in Days

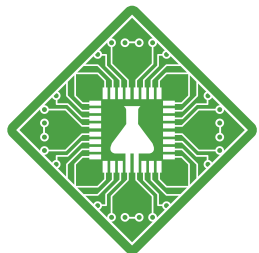
*“Insilico Medicine has succeeded in using **AI** to design a **new molecule** from scratch in **21** days and validate it in **24** days.*

*This is the first time that the potential for **AI** in the Pharma industry has been **validated** in practice, moving from **theory into reality**.”*

<https://www.linkedin.com/pulse/pharmas-alphago-moment-first-time-ai-has-designed-new-colangelo>

<https://pubmed.ncbi.nlm.nih.gov/31477924/>





**Insilico  
Medicine**

**Sept. 2019**

Landmark **AI** paper  
resulted in a **\$37  
million** series B  
round of additional  
**funding** from  
venture capitalists.

[nature.com/articles/s41587-019-0224-x](https://nature.com/articles/s41587-019-0224-x)

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Brief Communication | Published: 02 September 2019

## Deep learning enables rapid identification of potent DDR1 kinase inhibitors

[Alex Zhavoronkov](#) , [Yan A. Ivanenkov](#), [Alex Aliper](#), [Mark S. Veselov](#), [Vladimir A. Aladinskiy](#), [Anastasiya V. Aladinskaya](#), [Victor A. Terentiev](#), [Daniil A. Polykovskiy](#), [Maksim D. Kuznetsov](#), [Arip Asadulaev](#), [Yury Volkov](#), [Artem Zholus](#), [Rim R. Shayakhmetov](#), [Alexander Zhebrak](#), [Lidiya I. Minaeva](#), [Bogdan A. Zagribelnyy](#), [Lennart H. Lee](#), [Richard Soll](#), [David Madge](#), [Li Xing](#), [Tao Guo](#) & [Alán Aspuru-Guzik](#)

[Nature Biotechnology](#), **37**, 1038–1040 (2019) | [Cite this article](#)

95k Accesses | 1406 Citations | 1608 Altmetric | [Metrics](#)

### Abstract

We have developed a deep generative model, generative tensorial reinforcement learning (GENTRL), for de novo small-molecule design. GENTRL optimizes synthetic feasibility, novelty, and biological activity. We used GENTRL to discover potent inhibitors of discoidin domain receptor 1 (DDR1), a kinase target implicated in fibrosis and other diseases, in 21 days. Four compounds were active in biochemical assays, and two were validated in cell-based assays. One lead candidate was tested and demonstrated favorable pharmacokinetics in mice.

# Eli Lilly invests \$2.75 billion in deal with AI-longevity company Insilico Medicine

Eli Lilly is putting up nearly **\$3 billion** for an exclusive, world-wide license to pre-clinical oral drug candidates identified by **Insilico Medicine's** AI research models.

“This deal will involve a collaboration on identifying the next **generation of AI-predicted longevity drugs**”





Insilico  
Medicine

# Chronology

**2014:**

Insilico Medicine, Inc, founded to apply advanced artificial intelligence to drug discovery, biomarker development and **aging** research.

**2016-2017:**

Life Extension contributes **\$140,000** in funding for Insilico.

**2019:**

Venture capitalists invest **\$37 million**.

**2026:**

Eli Lilly signs **\$multi-billion** deal.

Market cap of Insilico Medicine: **> \$4 billion**



**Alex Zhavoronkov, PhD**

Chairman of the Board  
Executive Director, CEO, CBO



**Feng Ren, PhD**

Chief Scientific Officer  
Executive Director, CEO, CSO



**Alex Aliper, PhD**

President



| InSilico Medicine Cayman TopCo (XHKG:3696) |                   |
|--------------------------------------------|-------------------|
| FX pair                                    | HKD/USD           |
| <b>Initial investment, January 2017</b>    | <b>\$ 10,000</b>  |
| Divided by: share price                    | \$ 5.0996         |
| Shares purchased (common stock)            | 1,961             |
| Reverse stock split, 12/30/25 (1:20)       | 20                |
| # shares @ IPO, 12/30/25                   | 39,220            |
| Current price, 05/13/26                    | HK\$ 59.50        |
| Investment value, 05/13/26 (HKD)           | HK\$ 2,333,590    |
| FX rate                                    | \$ 0.1277         |
| <b>Investment value, 05/13/26 (USD)</b>    | <b>\$ 297,999</b> |
| Investment multiple                        | 29.8x             |
| Average <u>annual</u> return               | 49.1%             |

# *Eli Lilly* Pharma Funding *Longevity* Research

“Lilly is already one of the companies most reshaping the public conversation around aging..., even if it rarely uses the word “**longevity**” in headlines...

Its obesity and diabetes franchises have done more than just create blockbuster sales. It has changed how markets think think about **age-related** disease.”



## Additional Winners:

**Alpha 1 Biomedical**, Inc    Thymosin research    IPO: **\$6**/share    **\$21**/share early 1990s    Sold near high to cover other expenses  
(Company now worthless)

**Geron**, Inc    Stem cell research    IPO: **\$5**/share    **\$65**/share in 2001    Sold near high to cover other expenses  
(Company share price now around \$3)

**Adaptive AI**, Inc    Artificial Intelligence research    Private offering **\$250,000**  
(Year **2009**)    Sold for **\$400,000** to fund other projects

**Ichor**, Inc.    Multiple projects    Private offering **\$548,000**    **\$1,082,000** conservative estimate

**Intervene Immune**, Inc.    MRIs to show thymic growth-**\$60,000**    **\$139,000** estimated value

These investments by **Life Extension**® affiliates were intended to advance the science.

Some were **fortuitously** sold near highs to fund new projects.



# Major Losers

## BioTime, Inc.

- Invested/grants **>\$2.2 million**  
Recovered circa \$500,000 (80% loss)

## Elevian, Inc.

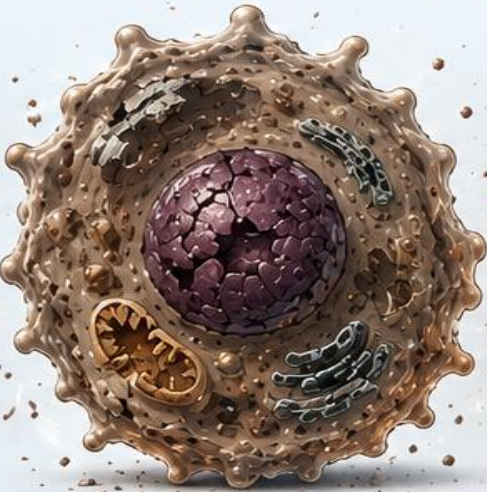
- Provided **\$100,000** seed capital  
Company went on to raise circa **\$60 million**  
but then became insolvent (100% loss)

# A CELL GROWING YOUNGER

## The Process of Cellular Rejuvenation

### 1. OLD CELL

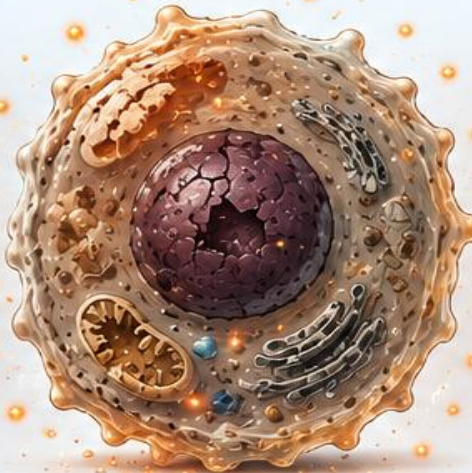
Aged & Damaged



- ⚡ Oxidative stress
- 🧬 DNA damage
- 🔥 Mitochondrial dysfunction
- 🩹 Inflammation
- ⚡ Low energy
- 🕒 Cellular aging

### 2. ACTIVATION

Repair Signals On



- 🔧 Repair pathways activated
- 🛡️ Antioxidant defenses increase
- 🧹 Cellular cleanup initiated
- ⚡ Energy production improving

### 3. REPAIR

Damage Reversed



- 🧬 DNA repair
- 🗑️ Damaged proteins removed
- 🔧 Mitochondria repaired
- ⚡ Reduced oxidative stress

### 4. RENEWAL

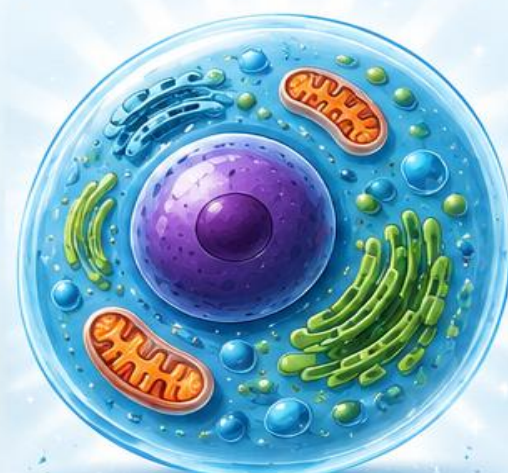
Function Restored



- 🔋 Stronger mitochondria
- ⚖️ Balanced metabolism
- 🧬 Healthy protein synthesis
- 🌱 Optimal cellular function

### 5. YOUNG CELL

Vibrant & Healthy



- ⚡ High energy
- 🏃 Resilient & efficient
- 🧬 Strong DNA integrity
- 🌱 Youthful, vibrant cell
- 🕒 Longevity support

From Damage to Vitality — Reversing Time at the Cellular Level

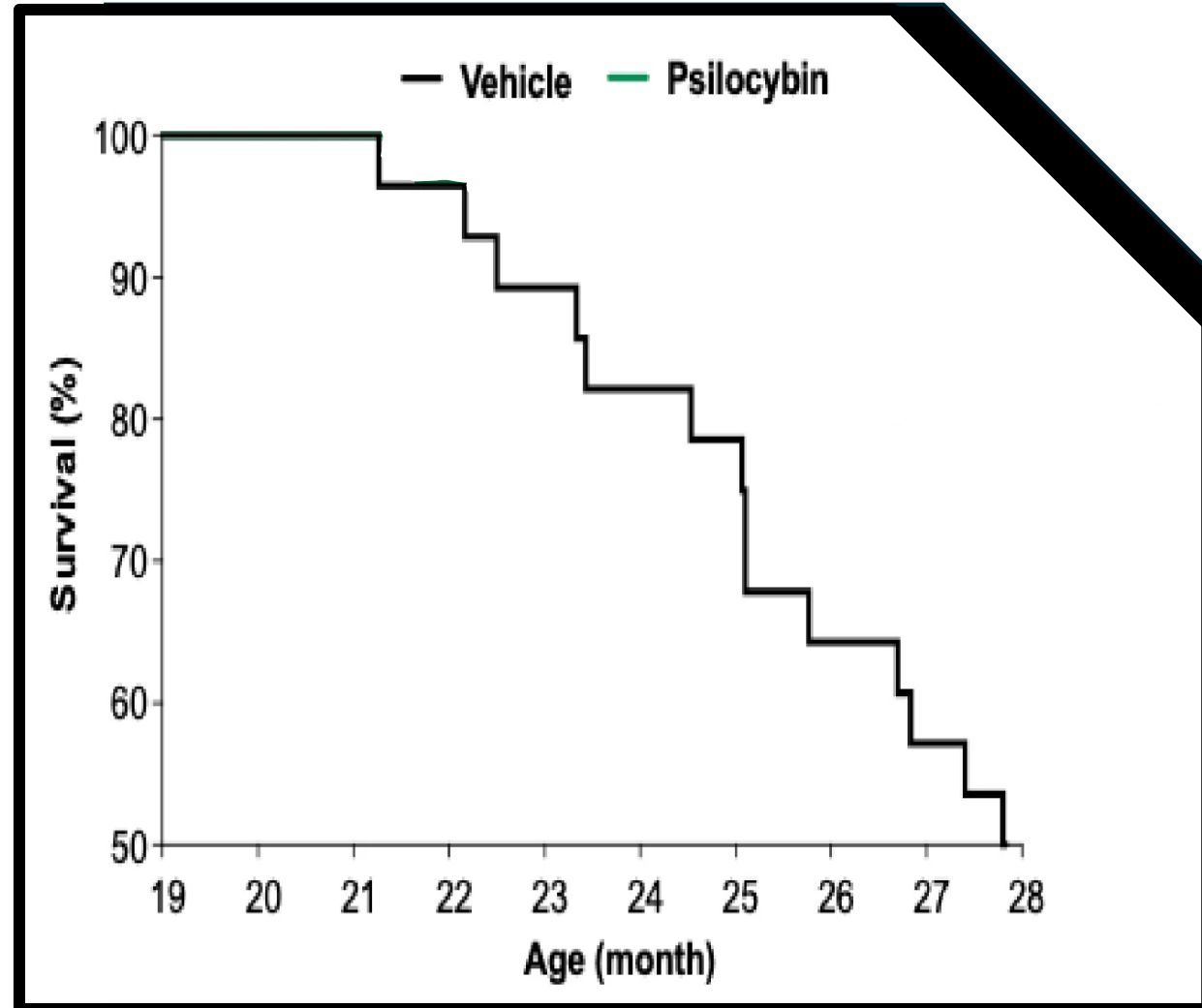
**July 8<sup>th</sup>, 2025**

<https://www.nature.com/articles/s41514-025-00244-x>

Study findings of **psilocybin** in **mice** were impressive:

- ▶ Mice receiving psilocybin were **1.6 times** more likely to be **alive** than controls at 10 months, which represents about a **60%** lower risk of **death**.

- Moreover, treated mice **look** noticeably **better**, with **thicker** fur and less white hair



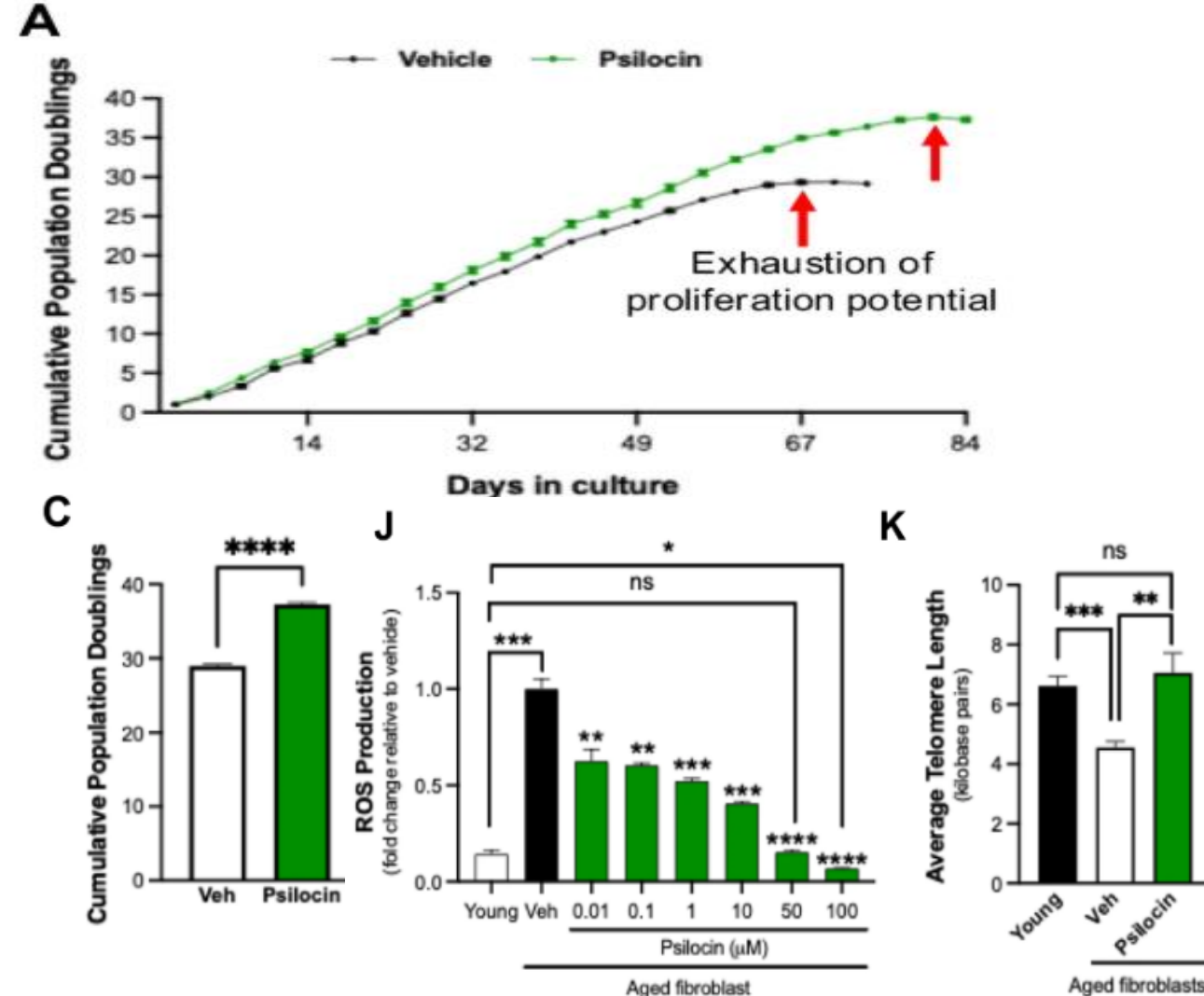


July 8<sup>th</sup>, 2025

<https://www.nature.com/articles/s41514-025-00244-x>

Other study findings of **psilocin** in **cell culture** include:

- ▶ **29-57%** extension of cellular **lifespan**  
(depending on cell type and concentration used)
- ▶ Delay in **cellular** senescence.
- ▶ Preservation of **telomere length** in treated cells comparable to that seen in **young cells**.



# Human Brain Changes After First Psilocybin Use

Study published in *Nature Communications* on May 6<sup>th</sup>, 2026

One dose (25 mg) of **psilocybin** given to 28 healthy people found:

Increased **structural organization** of white matter — consistent with **enhanced myelination** or **axonal remodeling**.

Greater integration between brain networks — brain becomes **more interconnected** and less rigidly siloed.

Participants whose brains showed the greatest **network integration** also reported the greatest **psychological** improvement.

<https://www.nature.com/articles/s41467-026-71962-3>

# Human Brain Changes After First Psilocybin Use

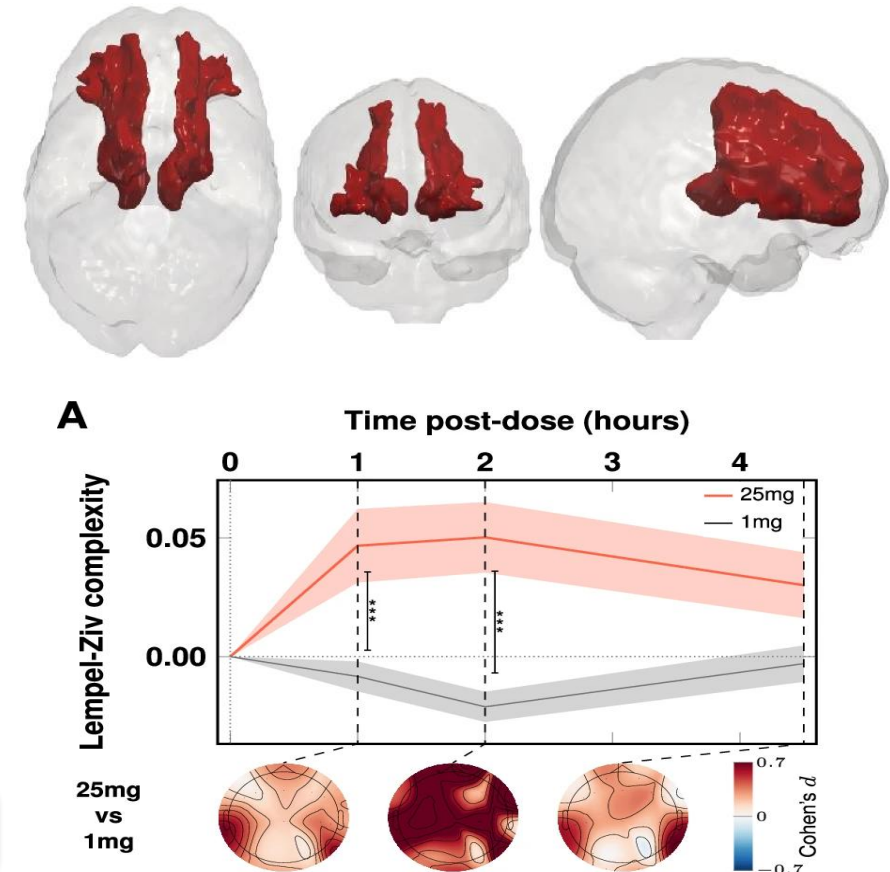
Study published in *Nature Communications* on May 6<sup>th</sup>, 2026

One dose (25 mg) of **psilocybin** given to 28 healthy people found:

Increased measures of brain signal complexity and flexibility.

Participants showed significant increases in **cognitive** flexibility, psychological insight, and **well-being** at the one-month follow-up...with *single* psilocybin dose (compared to **placebo**).

<https://www.nature.com/articles/s41467-026-71962-3>

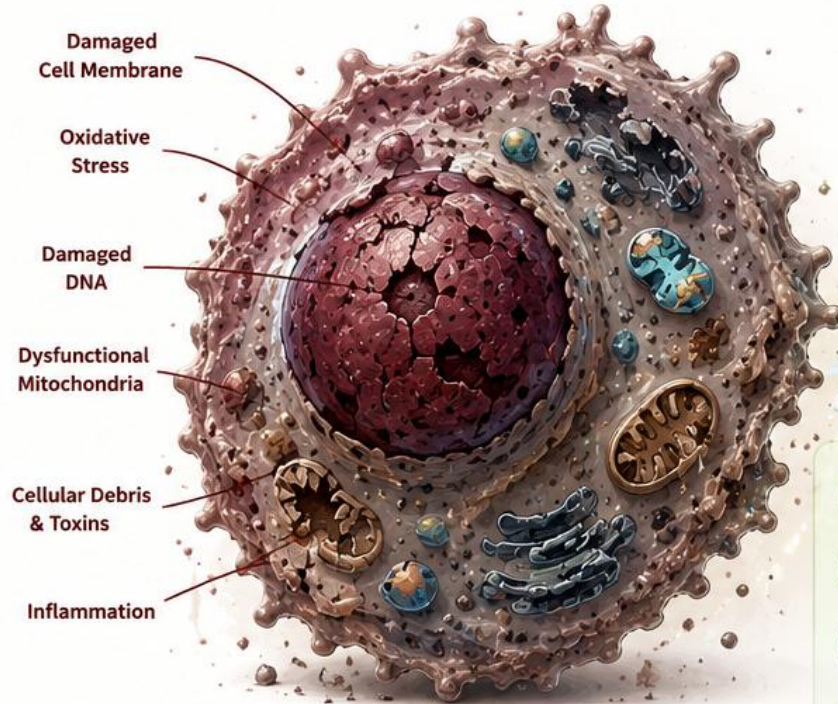




# CELLULAR REJUVENATION

Restoring Cells. Renewing Function. Revitalizing Life.

## OLD, DEGRADED CELL



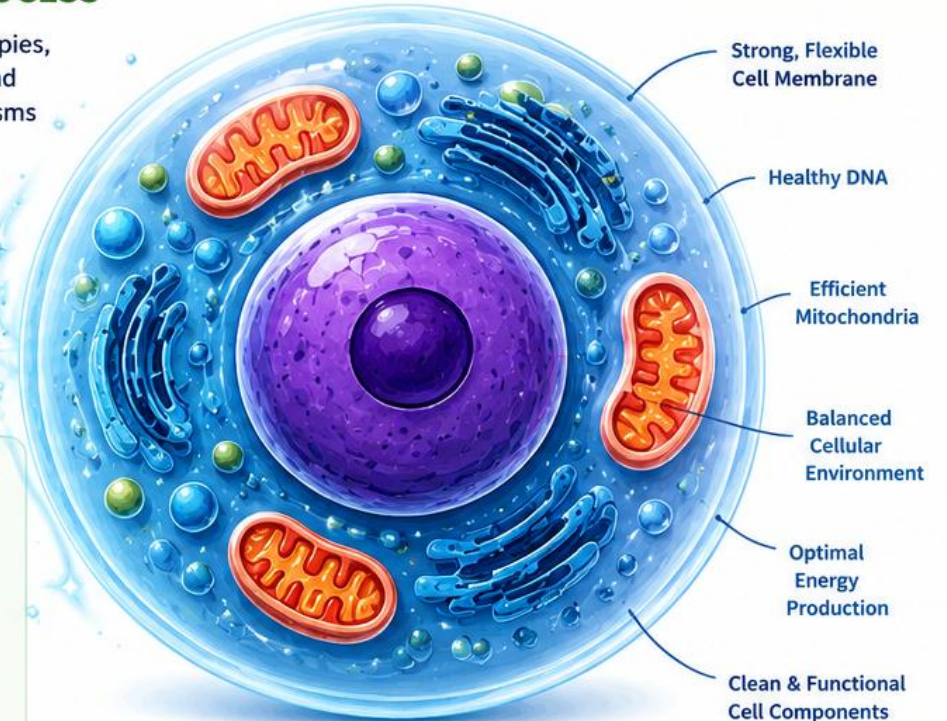
- Low Energy
- Impaired Function
- Accumulated Damage
- Signs of Aging

## REJUVENATION PROCESS

Through advanced therapies, nutritional support, and cellular repair mechanisms

-  **DNA REPAIR**  
Restores genetic integrity
-  **MITOCHONDRIAL SUPPORT**  
Boosts energy production
-  **REDUCED OXIDATIVE STRESS**  
Neutralizes free radicals
-  **CELLULAR CLEANUP**  
Removes damaged components
-  **ANTI-INFLAMMATORY EFFECTS**  
Restores healthy signaling

## YOUNG, HEALTHY CELL



- High Energy
- Optimal Function
- Regenerated Structures
- Youthful, Resilient Cell

## THE BENEFITS OF CELLULAR REJUVENATION



**MORE ENERGY**  
Cells produce energy efficiently



**BETTER HEALTH**  
Stronger cellular defenses



**ENHANCED FUNCTION**  
Improved cognitive and physical function



**SLOWER AGING**  
Reduces biological age at the cellular level



**LONG-TERM VITALITY**  
Supports longevity and quality of life



“Patient had been nonverbal with severe cognitive impairment for years before the two sessions”

## “WOMAN WITH **ADVANCED ALZHEIMER'S** REGAINED SPEECH AND MEMORIES AFTER TAKING MAGIC **MUSHROOMS**”

19 hours after an 80-year-old with advanced **Alzheimer's** was administered **one dose** of **psilocybin**, she began to have spontaneous autobiographical conversations, recalling personal memories that had been **inaccessible for years**, with further improvements after 2<sup>nd</sup> dose.



# Human Brain Changes After First Psilocybin Use

Study published in *Nature Communications* on May 6<sup>th</sup>, 2026

Why these structural brain changes matter:

This **physical reorganization of white matter architecture** correlates with the **psychological improvements** that persist after the drug has cleared the system.

Findings indicate potential **regenerative** structural properties on **myelination**, **axonal density**, or **fiber coherence**.

Provides the first controlled **anatomical** evidence that **psilocybin** produces **enduring brain structure changes** in healthy humans.

<https://www.nature.com/articles/s41467-026-71962-3>

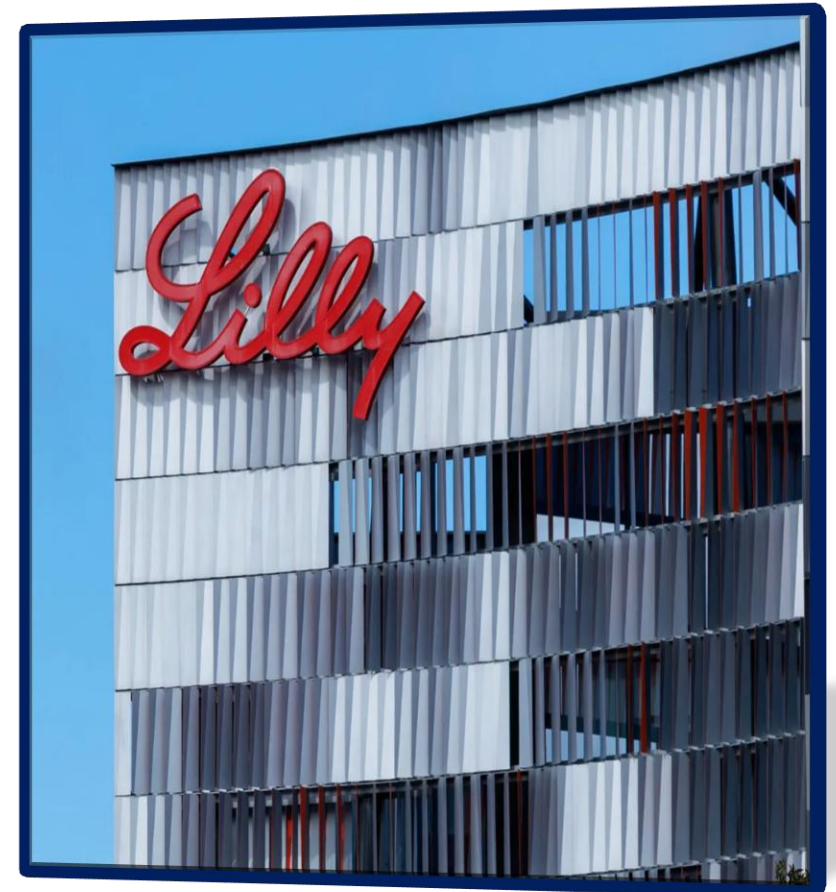




## Eli Lilly to buy psychedelics maker AtaiBeckley for \$2.8 billion as experimental treatments gain traction

<https://www.cnbc.com/2026/07/16/eli-lilly-to-buy-psychedelics-maker-ataibeckley-2point8-billion.html>

The transaction gives Lilly access to AtaiBeckley's experimental **DMT-based drug** that's being studied in Phase 3 clinical trials for **treatment-resistant depression**. AtaiBeckley is developing several other psychedelics for mental health conditions, including one related to **MDMA**, also known as **ecstasy**.



# Could lithium stave off Alzheimer's disease?

The metal is **depleted in brains** of people with disease and can reverse memory symptoms in mice, new study

Aug. 6<sup>th</sup>, 2025

<https://www.science.org/content/article/could-lithium-stave-alzheimer-s-disease>

 The  
Harvard  
Gazette

## Could lithium explain — and treat — Alzheimer's?

“In a mouse model of Alzheimer's disease, lithium deficiency dramatically increased amyloid beta deposits in the brain compared with mice that had normal physiological levels of lithium. The same was true for the Alzheimer's neurofibrillary tangle protein tau.”

Aug. 6<sup>th</sup>, 2025

<https://news.harvard.edu/gazette/story/2025/08/could-lithium-explain-and-treat-alzheimers/>



# Scientists say it may be possible to protect aging brains from Alzheimer's with an old remedy – **lithium**

August 6<sup>th</sup>, 2025

<https://www.cnn.com/2025/08/06/health/lithium-alzheimers-brain-study>

“In a series of experiments reported...in Nature, researchers...found that **depleting lithium** in the diet of normal mice caused their brains to develop **inflammation** and changes associated with **accelerated aging**.”

“In mice that were specially bred to develop the same kinds of brain changes as humans with Alzheimer's disease, a low lithium diet revved the buildup of sticky proteins that form plaques and tangles in the brains that are hallmarks of the disease. It also sped up **memory loss**.”

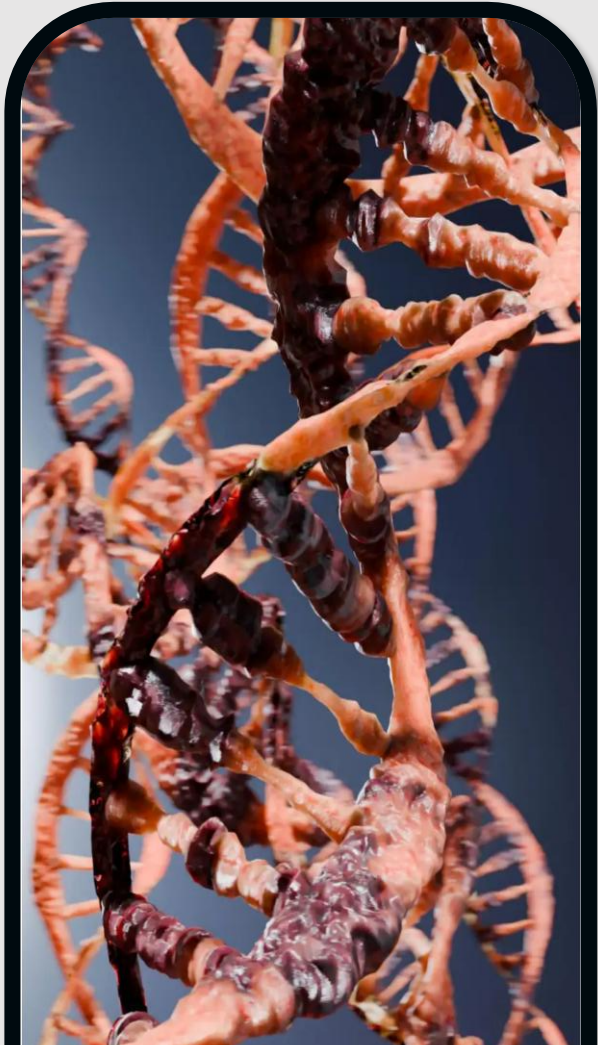




“How **fast you age** may be controlled by a **DNA repair** boss in your cells”

When a key protein regulator dials down **DNA repair** mechanisms, our cells accumulate more mutations.

A research team at Univ of CA-San Diego seeks to find drugs that boost lifespan by improving **DNA repair** levels.



One explanation for why we age is the accumulation of mutations in our DNA

“Bowhead whales may unlock the secrets to a long, healthy life”

Map of giant whale's **genome** could explain its **>200-year** lifespan.



Jan. 23<sup>rd</sup>, 2015

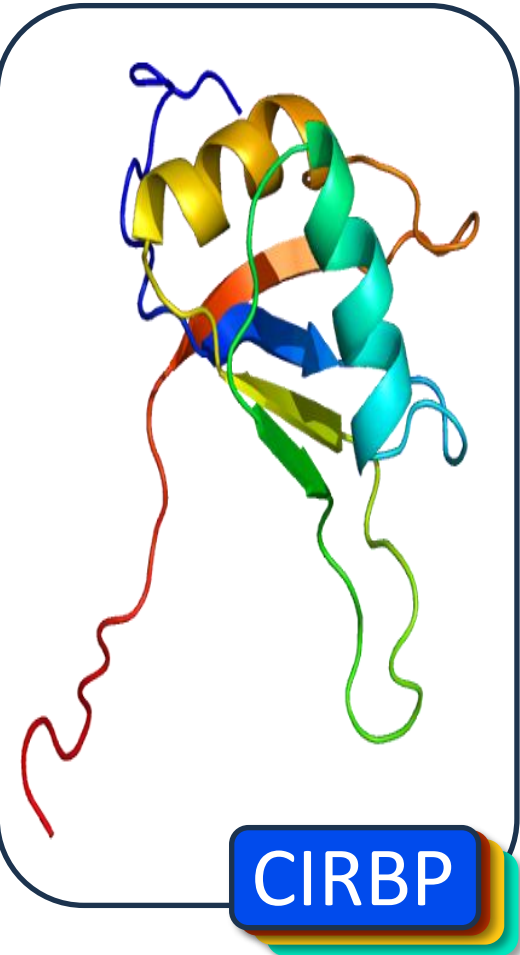
<https://www.sciencenews.org/article/bowhead-whales-may-unlock-secrets-long-healthy-life>

CIRBP is an acronym for:

## Cold-Inducible RNA Binding Protein

Bowhead whales produce extremely **high** levels of a **DNA-repair** protein known as **CIRBP**.

**CIRBP** promotes cell survival in conditions like cold shock, hypoxia, and UV radiation. It acts as a **DNA repair** modulator, with strong expression in bowhead whales that contributes to their longevity. CIRBP also regulates circadian rhythms and plays complex roles in cancer and inflammation.







# “Humans Could Live up to 200 Years, and The Secret May Lie in Whales...”

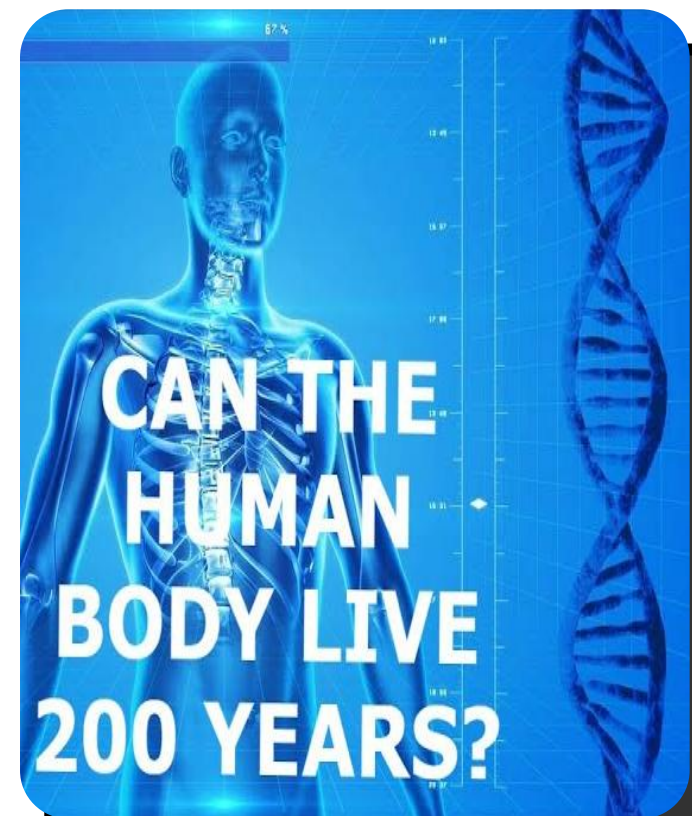
Mar. 11<sup>th</sup>, 2026

“Researchers found that **whale cells** are less likely to accumulate the genetic mutations that cause cancer...”

“...scientists introduced the whale version of the CIRBP protein into human cells and fruit flies. The results showed improved **DNA repair**, and the fruit flies **lived longer**.”

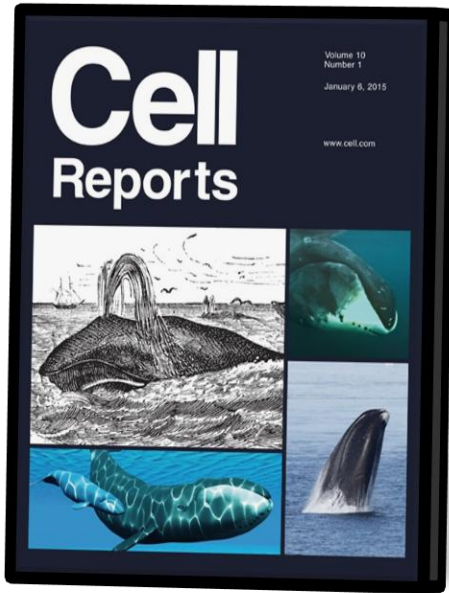
Lead scientist told our group on March 18, 2026:

*“We have generated mice with whale CIRBP and are breeding them to perform longevity study!”*



[ndtv.com/science/humans-could-live-up-to-200-years-and-the-secret-may-lie-in-whales-study-11200797](https://ndtv.com/science/humans-could-live-up-to-200-years-and-the-secret-may-lie-in-whales-study-11200797)

# Charitable Grants in 2015 period enabled 2025 Major Advance

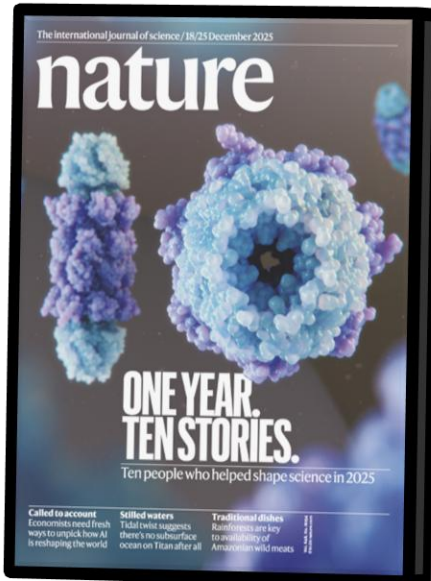


RESOURCE · Volume 10, Issue 1, P112-122, January 06, **2015** Open Access [Download Full Issue](#)

## Insights into the Evolution of Longevity from the Bowhead Whale Genome

<https://pmc.ncbi.nlm.nih.gov/articles/PMC4536333/>

Leads to favorable finding 10 years later ↓



The new Bowhead whale study published in *Nature*, 2025

Article | [Open access](#) | Published: 29 October **2025**

## Evidence for improved DNA repair in the long-lived bowhead whale

<https://www.nature.com/articles/s41586-025-09694-5>

Placeholder for video slide not uploaded



## China's Biotech Advances Threaten U.S. Dominance, Warns Congressional Report

Commission urges U.S. to invest at least **\$15 billion** in biotech research and other measures

“**China** is quickly ascending to biotechnology dominance, having made biotechnology a strategic priority for 20 years,” the commission said. Without prompt action, the U.S. risks ***“falling behind, a setback from which we may never recover.”***



<https://www.wsj.com/tech/biotech/china-biotech-industry-research-threat-e91ddddd6?>

## America Is Losing the Biotech Fight to China

The value of Chinese biotechnology companies has increased more than 100-fold over the past decade.

China's biotech industry, fueled by extensive government support and massive industrial espionage, has grown exponentially in the past decade. China now conducts nearly as many **clinical trials**—and already conducts more **cancer trials**—as we do.

“The value of **Chinese** biotech companies has increased more than **100-fold** over the past decade.”



<https://www.wsj.com/opinion/america-is-losing-the-biotech-fight-to-china-cbcaadda?>

## 2025 Research Leaders: Leading academic institutions

USA

China

USA

| Position | Institution                                                                                 | Share 2023 | Share 2024 | Count 2024 | Change in Adjusted Share 2023–2024 |
|----------|---------------------------------------------------------------------------------------------|------------|------------|------------|------------------------------------|
| 1        | <a href="#">Harvard University, United States of America (USA)</a>                          | 1206.87    | 1155.19    | 3915       | -17.5% ↓                           |
| 2        | <a href="#">University of Science and Technology of China (USTC), China</a>                 | 651.48     | 850.60     | 2609       | 12.5% ↑                            |
| 3        | <a href="#">Zhejiang University (ZJU), China</a>                                            | 598.53     | 819.57     | 2118       | 18.0% ↑                            |
| 4        | <a href="#">Peking University (PKU), China</a>                                              | 622.03     | 812.32     | 3080       | 12.5% ↑                            |
| 5        | <a href="#">University of Chinese Academy of Sciences (UCAS), China</a>                     | 647.09     | 793.59     | 3925       | 5.7% ↑                             |
| 6        | <a href="#">Tsinghua University, China</a>                                                  | 610.86     | 769.57     | 2526       | 8.5% ↑                             |
| 7        | <a href="#">Nanjing University (NJU), China</a>                                             | 618.74     | 755.20     | 1864       | 5.2% ↑                             |
| 8        | <a href="#">Shanghai Jiao Tong University (SJTU), China</a>                                 | 512.47     | 713.24     | 1936       | 19.9% ↑                            |
| 9        | <a href="#">Sun Yat-sen University (SYSU), China</a>                                        | 498.83     | 660.59     | 1646       | 14.1% ↑                            |
| 10       | <a href="#">Fudan University, China</a>                                                     | 467.35     | 659.69     | 1766       | 21.6% ↑                            |
| 11       | <a href="#">Sichuan University (SCU), China</a>                                             | 423.69     | 543.72     | 1053       | 10.6% ↑                            |
| 12       | <a href="#">Stanford University, United States of America (USA)</a>                         | 488.02     | 541.85     | 1998       | -4.3% ↓                            |
| 13       | <a href="#">Massachusetts Institute of Technology (MIT), United States of America (USA)</a> | 495.27     | 504.31     | 2111       | -12.3% ↓                           |



# Big Pharma Is Turning to China for the Newest Drug Ideas

“China’s biotechs are faster and have lower costs, and its drug research threatens to soon overtake the West’s”

“Most U.S. and European pharma companies are actively searching for Chinese new drugs now...Things are cheaper and **faster**.”

“**China** accounted for 30% of the world’s pipeline of experimental drugs last year.”





**Jimmy Ren, PhD**

## **Relavia Consulting LLC-Owner and President**

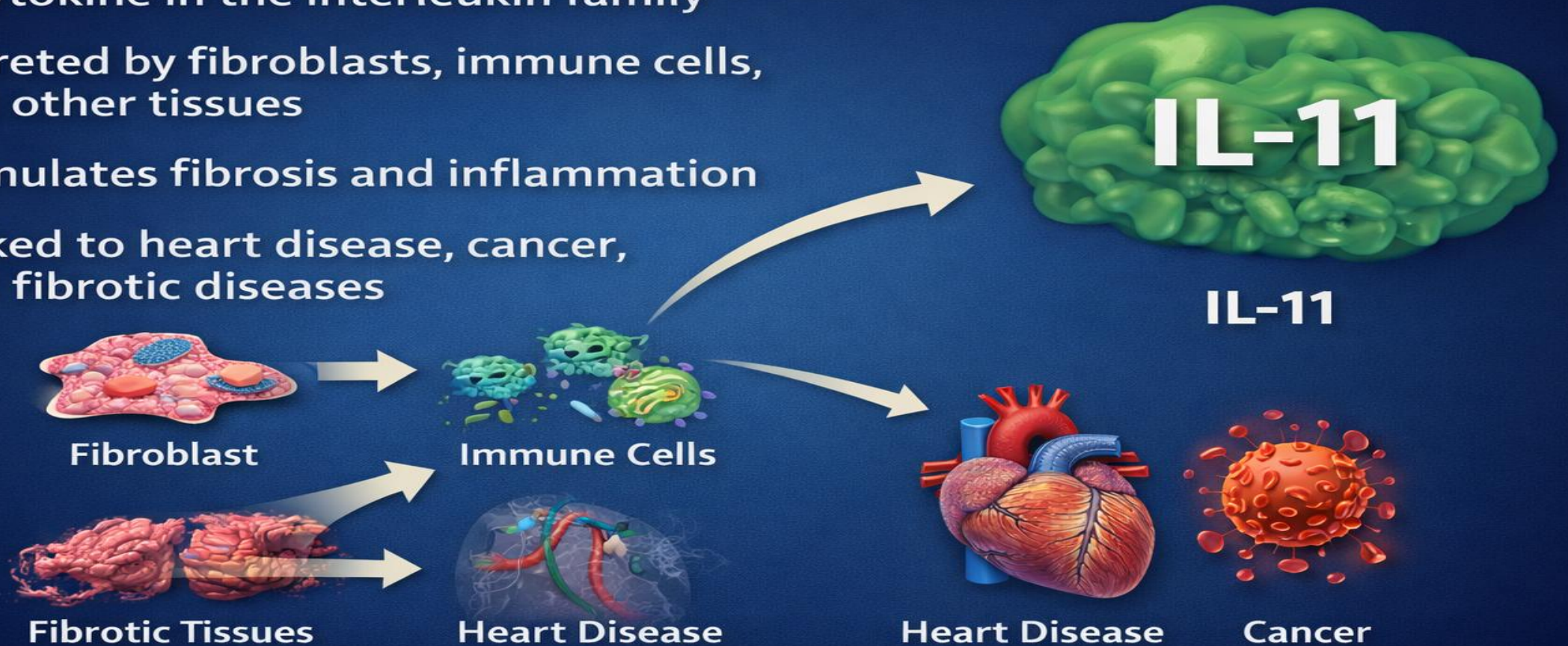
JIMMY REN obtained his PhD in Clinical Chemistry and Physiology from KAROLINSKA INSTITUTE, Sweden. Then he worked as Adjunct Professor of Medicine at YALE University, USA. Over the past 29 years, he worked in Global Pharma companies including JANSSEN, MERCK, BRISTOL - MYERS SQUIBB & BAYER, focusing on Cardiovascular Diseases, Metabolic/Endocrine Diseases, Neuroscience & Oncology. He published more than 50 original papers in peer reviewed journals.



# New drug class: **Interleukin-11 Inhibitor**

## Interleukin-11 (IL-11)

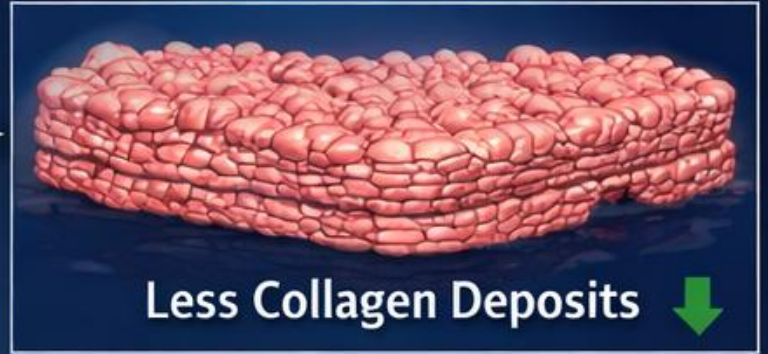
- A cytokine in the interleukin family
- Secreted by fibroblasts, immune cells, and other tissues
- Stimulates fibrosis and inflammation
- Linked to heart disease, cancer, and fibrotic diseases





# Actions of an IL-11 Inhibitor

## Reduces Fibrosis



## Decreases Inflammation

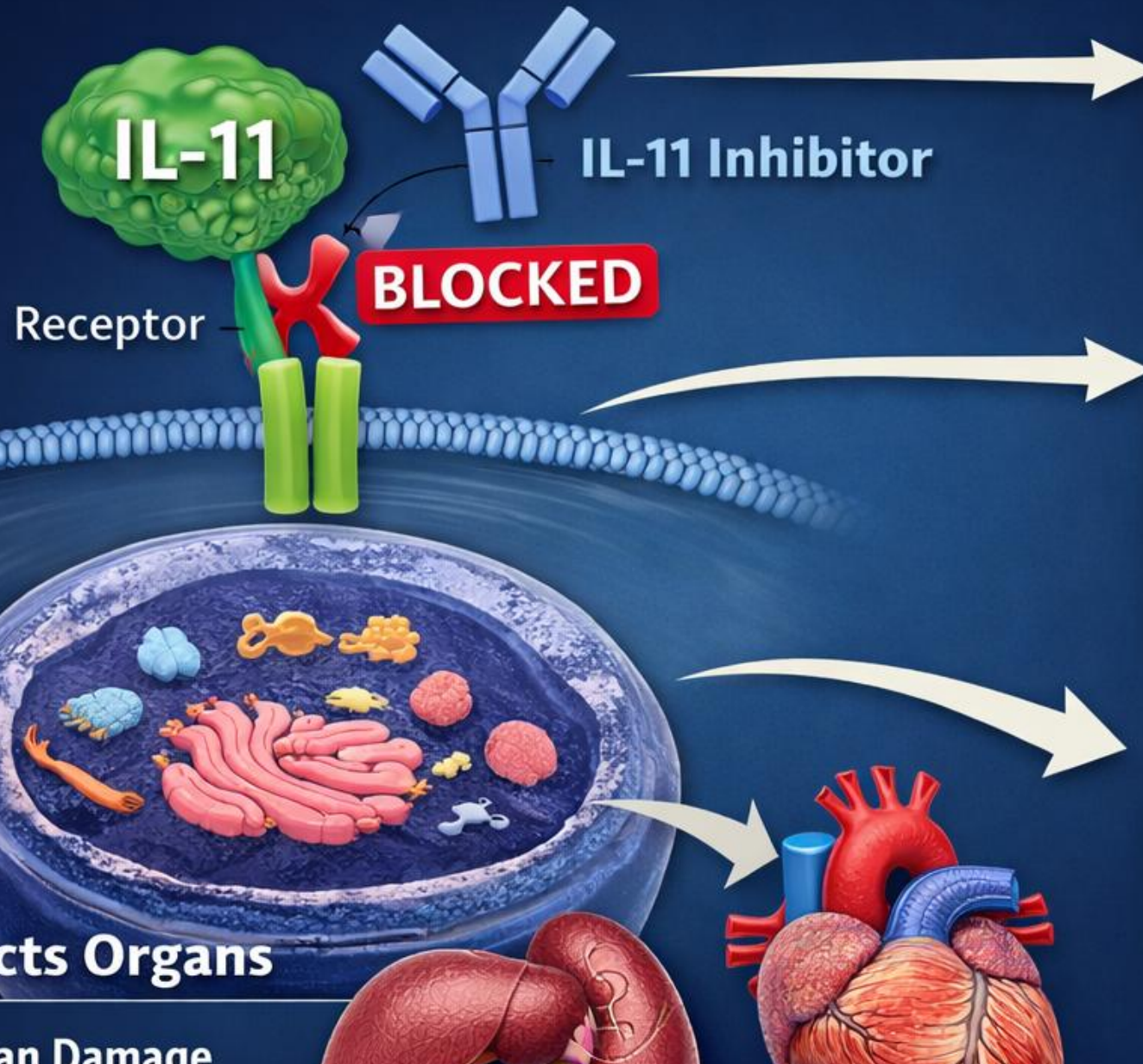


## Improves Heart Function



## Protects Organs

↓ Organ Damage

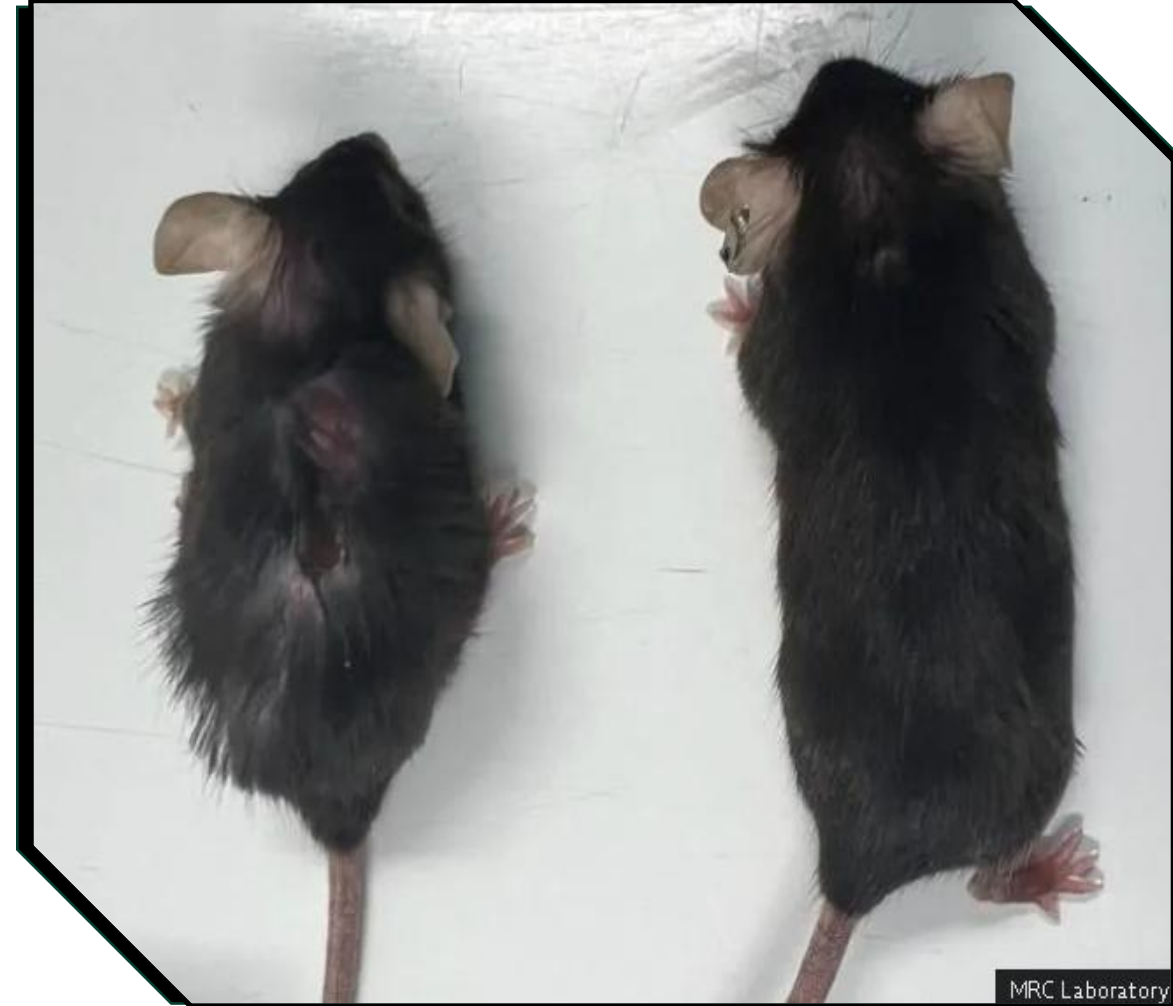


**B B C** | July 17th, 2024

“A drug has increased the lifespans of laboratory animals by nearly **25%**, in a discovery scientists hope can slow **human** aging too.”

<https://www.bbc.com/news/articles/cv2gr3x3xkno>

These mice are the same age!

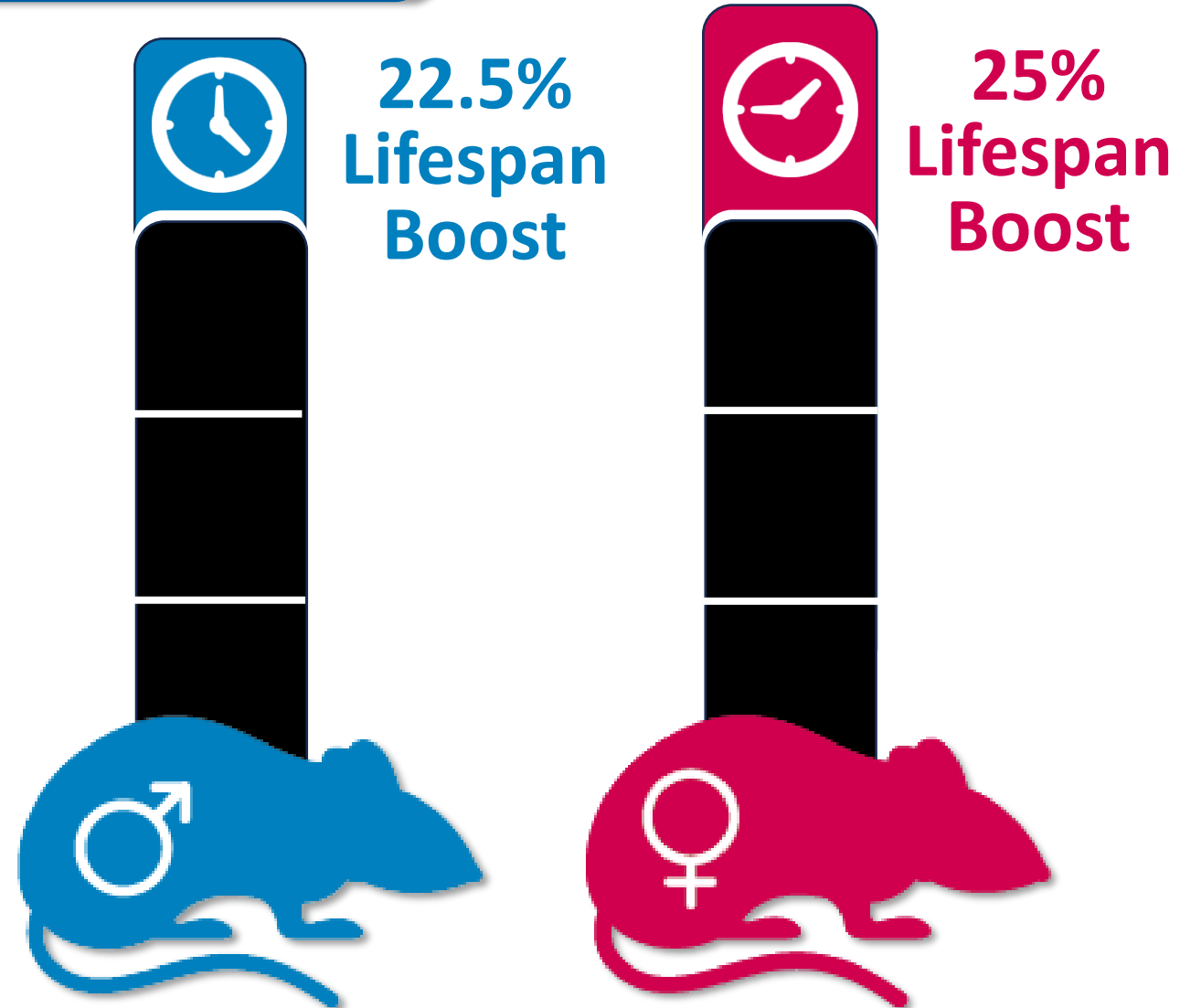


The one on the right given an *IL-11 inhibitor*.

# IL-11 inhibition extends lifespan by **22-25%** in mice

Study published in *Nature* on July 17<sup>th</sup>, 2024

- IL-11 involved in **inflammation-fibrosis**. IL-11 increases with age.
- IL-11 inhibition **extended lifespan** in male and female mice
- Effective in *young* and *older* mice
- Survival curves note that **40-50%** of the treated mice alive at study end compared to **10%** of controls.





# What does IL-11 inhibition accomplish?

Researchers reported effects seen from other life-extending interventions:

1. Inhibition of mTORC1
2. Increased AMPK activity
3. Reduced markers of senescence (p16 & p21)
4. Decreased liver fibrosis
5. Upregulated brown adipose tissue
6. Reduced fat mass, cholesterol, & triglycerides
7. Improved insulin sensitivity



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**FOREVER  
YOUNG**

# Google's Calico Labs Anti-Aging Drug Extends Mouse Lifespan by **25%**

“Calico bet **\$600 million** on this drug last summer. Now it's in **human** trials—and the race to turn a mouse longevity breakthrough into a pill you might actually take has officially begun.

On **December 29, 2025**, a patient in Shanghai **China** received the first dose of an experimental drug that scientists hope could slow **human** aging.”



**Jan. 7<sup>th</sup>, 2026**

<https://foreveryoungfilm.substack.com/p/googles-calico-labs-has-an-anti-aging>



# Rapid Fire Progress!

- In 2024, **IL-11 inhibition** was a fascinating life extending mouse study.
- Today, it's in human trials backed by more than **\$600 million** in funding.
- A timeline that would have been unthinkable a decade ago.
- Advances in **AI-driven** drug discovery, **computational** biology, and streamlined **clinical trial** design are compressing what used to take **15-20 years** into **a fraction of that**.

**Jan. 7<sup>th</sup>, 2026**

<https://foreveryoungfilm.substack.com/p/googles-calico-labs-has-an-anti-aging>

# “Chinese scientists achieve breakthrough in reversing aging in primates”

qazinform.com/news/chinese-scientists-achieve-breakthrough-in-reversing-aging-in-primates-5327ca

SEPT. 2025

New type of human stem cell called **senescence-resistant mesenchymal progenitor cells**

Engineered by **reprogramming** longevity-linked pathways (including the **FOXO3** gene).



<https://pubmed.ncbi.nlm.nih.gov/40516525/>



# Monkeys Treated with **Senescence-Resistant Mesenchymal Progenitor Cells** showed **improvements** in:

✓ **Cognition**

✓ **Bone health**

✓ **Brain structure**

✓ **Reproductive function**

✓ **Preserved Genomic Integrity**

**50%+ of tissues showed a reversal of aging-associated gene expression!**

Foxo3 enhanced  
human mesenchymal  
progenitor cells

i.v injection to  
aged primate

Secreted  
exosomes

Anti-inflammatory  
miRNA  
Longevity proteins



Cognitive  
function



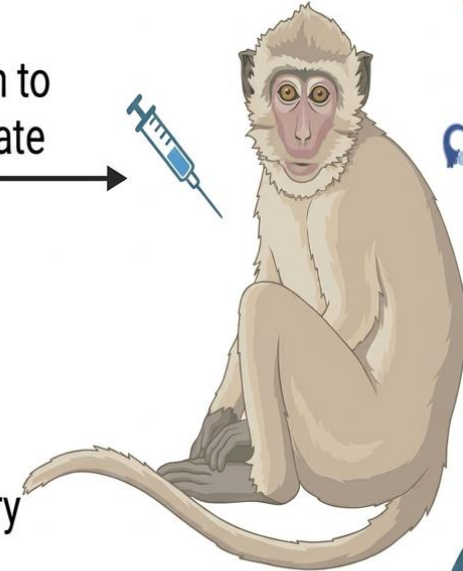
Reproductive  
health



Bone loss



Fibrosis



September 4<sup>th</sup>, 2025

<https://pubmed.ncbi.nlm.nih.gov/40516525/>

**Research Done  
in China!**





# CNN Original Series Kara Swisher wants to “Live Forever” premieres April 11<sup>th</sup> at 9pm ET

April 11, 2026

“The six-episode series follows legendary journalist Kara Swisher as she embarks on a deeply personal and sharply reported journey into the rapidly expanding world of **longevity science** and **humanity’s enduring quest to cheat death.**”



<https://cnnpressroom.blogs.cnn.com/2026/03/12/cnn-original-series-kara-swisher-wants-to-live-forever-premieres-saturday-april-11-at-9pm-et-pt/>

# “The Billionaires Fueling the Quest for Longer Life”

“Investors including Peter Thiel and Sam Altman are making big bets on where longevity science is headed”

“Silicon Valley giants **Peter Thiel**, **Sam Altman**, **Yuri Milner** and **Marc Andreessen** are among the boldface names behind the influx of money in the longevity industry. **Thiel’s** quest for longer life spans nearly a dozen companies—some of which were funded by his venture firm and others by a nonprofit foundation he backed—that raised more than **\$700 million...**”



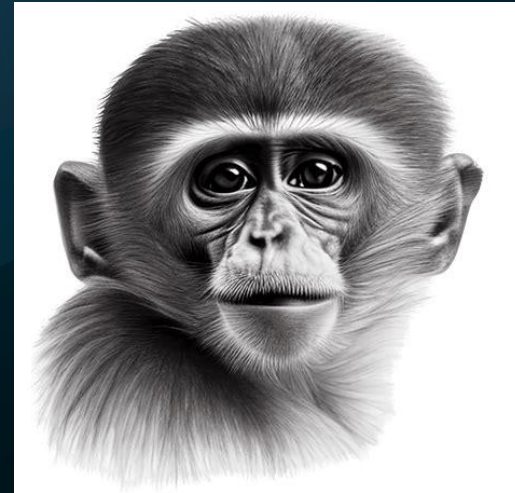
<https://www.wsj.com/health/wellness/billionaires-longevity-health-04dd205c?>

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# Primate (African green monkey) Age Reversal Research Project

*In vivo* Cellular  
Reprogramming  
Using OSK  
Yamanaka Factors



**Preliminary results:**

- 1) DNA Methylation Epigenetic Age**
- 2) Immune functions**
- 3) Metabolic Health**

***Transcription factors*** are DNA-binding proteins that control **gene expression**.

## **Yamanaka (OSK) transcription factors**

Reprogram old cells into young adult cells that may allow tissues to be **repeatedly** regenerated.



**Cells-2006**



**Mice-2022-2024**



**Monkeys-2025**



**Humans-2027?**

# Original 4 Yamanaka Factors that Reversed Cell Aging Back in 2006

## Yamanaka Transcription Factors

OCT4

SOX2

KLF4

cMYC

Acronym “**OSKM**”:

❑ Octamer-binding factor 4

❑ SRY-box factor 2

❑ Kruppel-like factor 4

❑ c-Myelocytomatosis



# Just 3 Yamanaka Factors Reverse Aging in Live Mice in 2024

## Yamanaka Transcription Factors

OCT4

SOX2

KLF4

cMYC

Acronym “**OSK**”:

❑ Octamer-binding factor 4

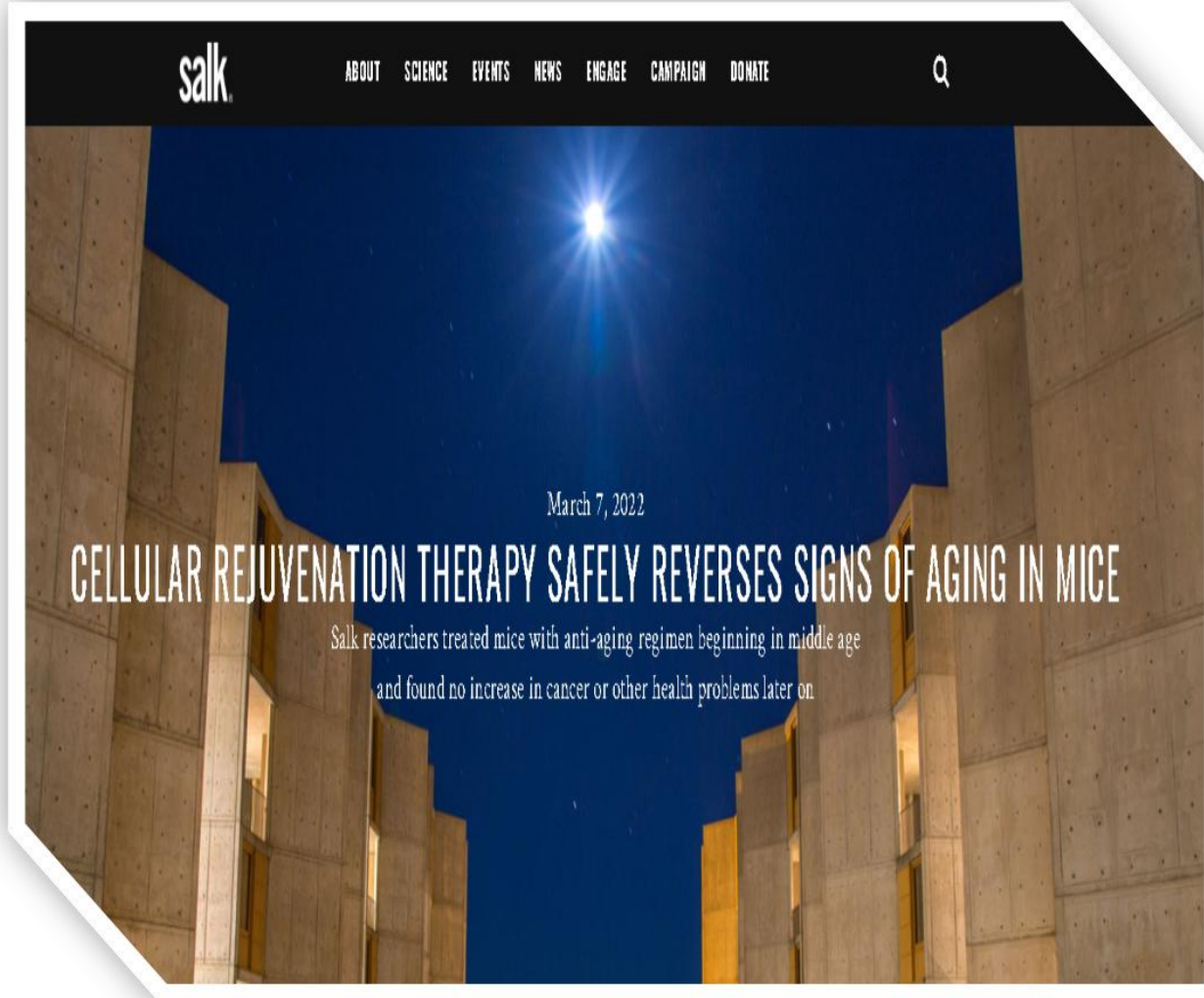
❑ SRY-box factor 2

❑ Kruppel-like factor 4

❑ ~~c-Myelocytomatosis~~

# Salk Scientists Reverse Aging in Mice

March 7, 2022



“Scientists safely and effectively reverse the **aging process** in middle-aged and **elderly** mice by partially resetting their cells to more **youthful** states.”

# Remarkable > 100% Extension in Median Remaining Life in OSK Treated Mice!

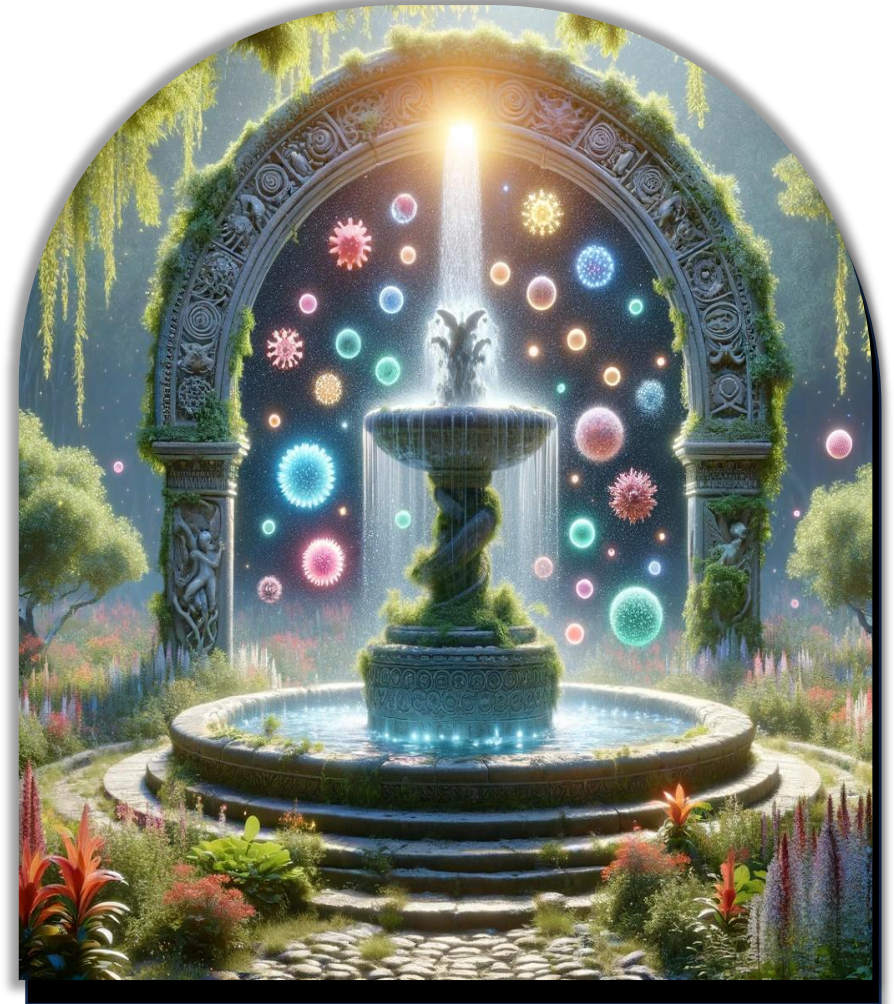
February 15<sup>th</sup>, 2024

Two-part AAV viral vector for **systemic** intracellular **OSK** delivery.

Old mice equivalent to **77-year-old** people used to enhance human translatability.

Partial **OSK** reprogramming increased **lifespan** and improved **frailty** scores in old mice.

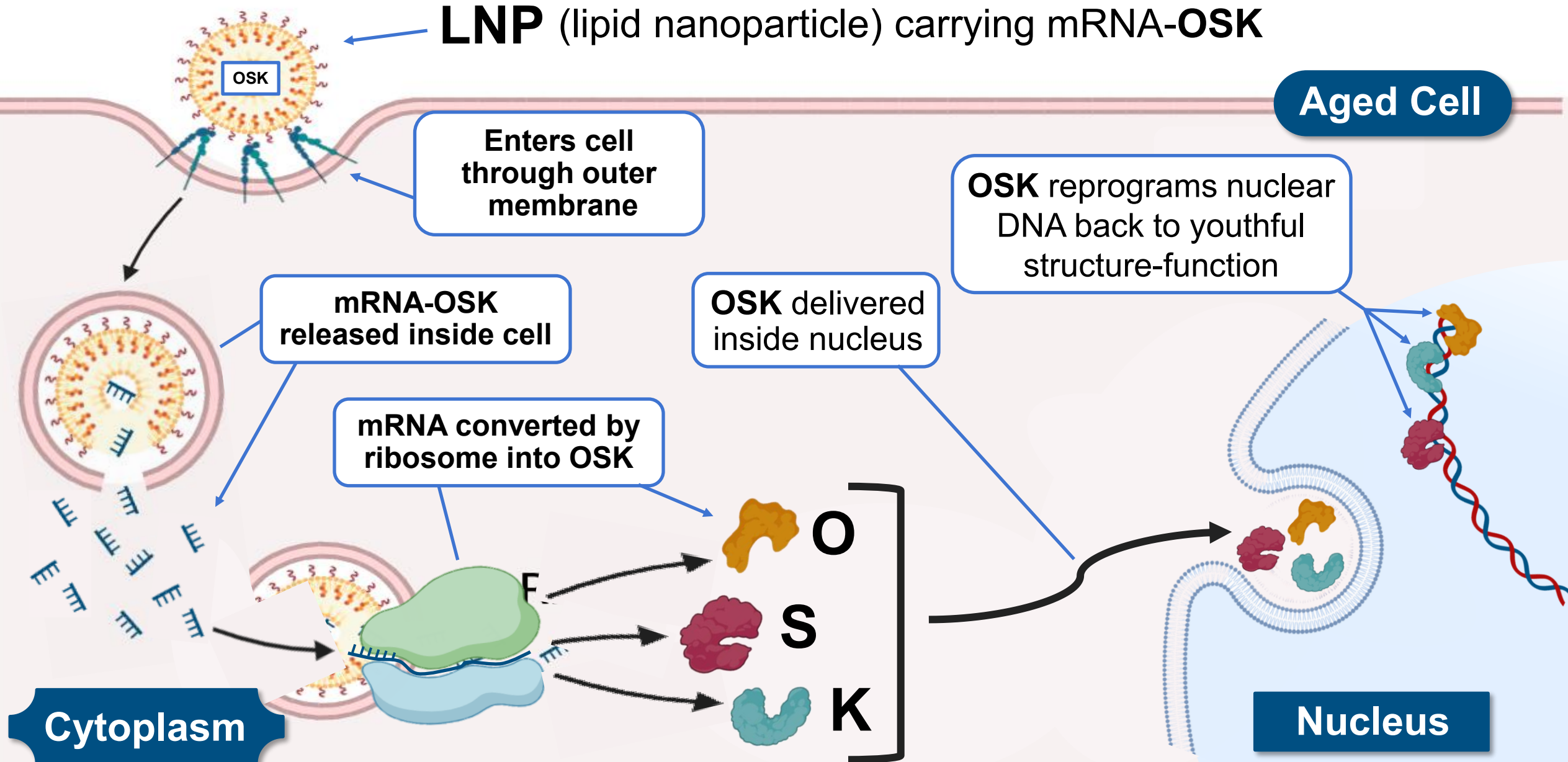
Control mice had **8.86 weeks** of life remaining versus **18.5 weeks** in **OSK-treated** group.



<https://www.liebertpub.com/doi/10.1089/cell.2023.0072>



# *In Vivo* Age Reversal using LNP delivered OSK Yamanaka factors



# November 2025:

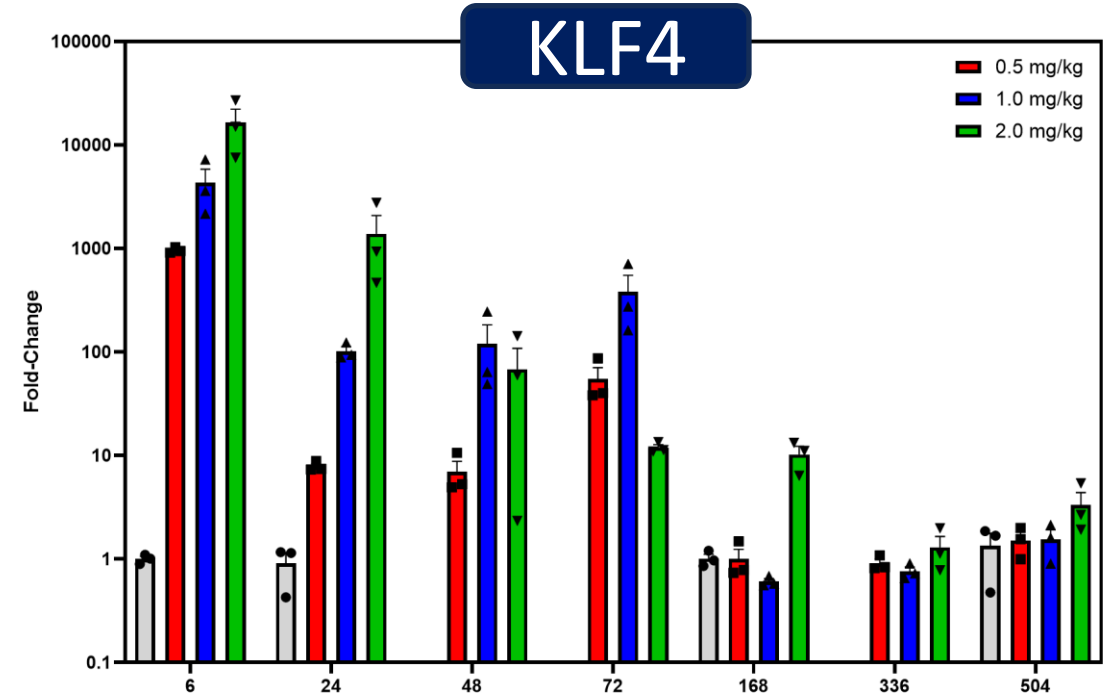
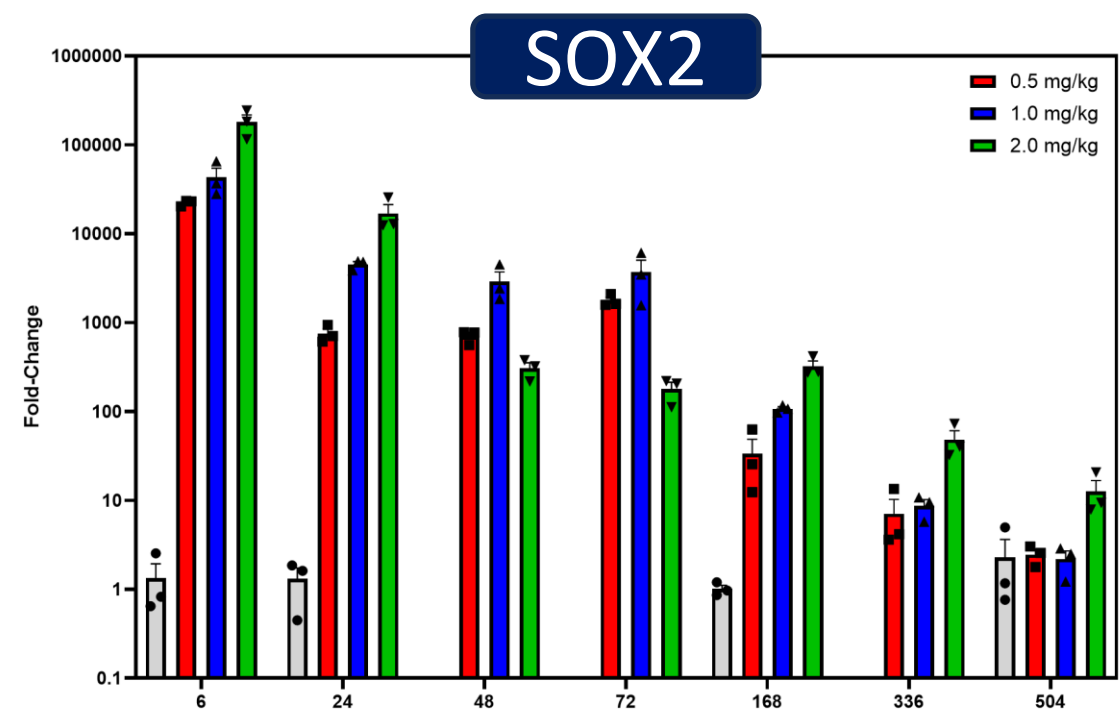
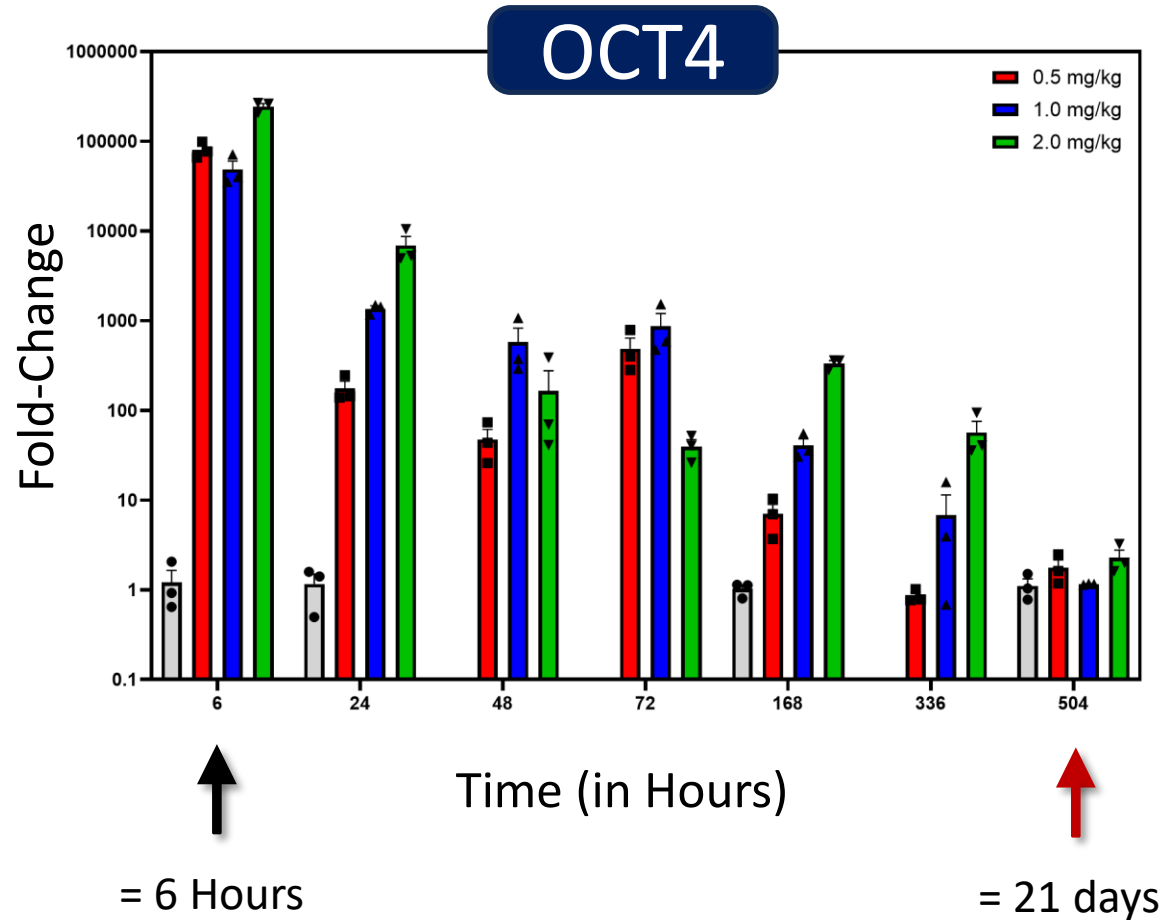
**LNP-delivered OSK mRNA produces sustained OSK expression, including in mouse brains.**

Original Research



# Liver- OSK Transfer Achieved

Robust-Sustained Delivery of OSK by encasing OSK in lipid nano particles.

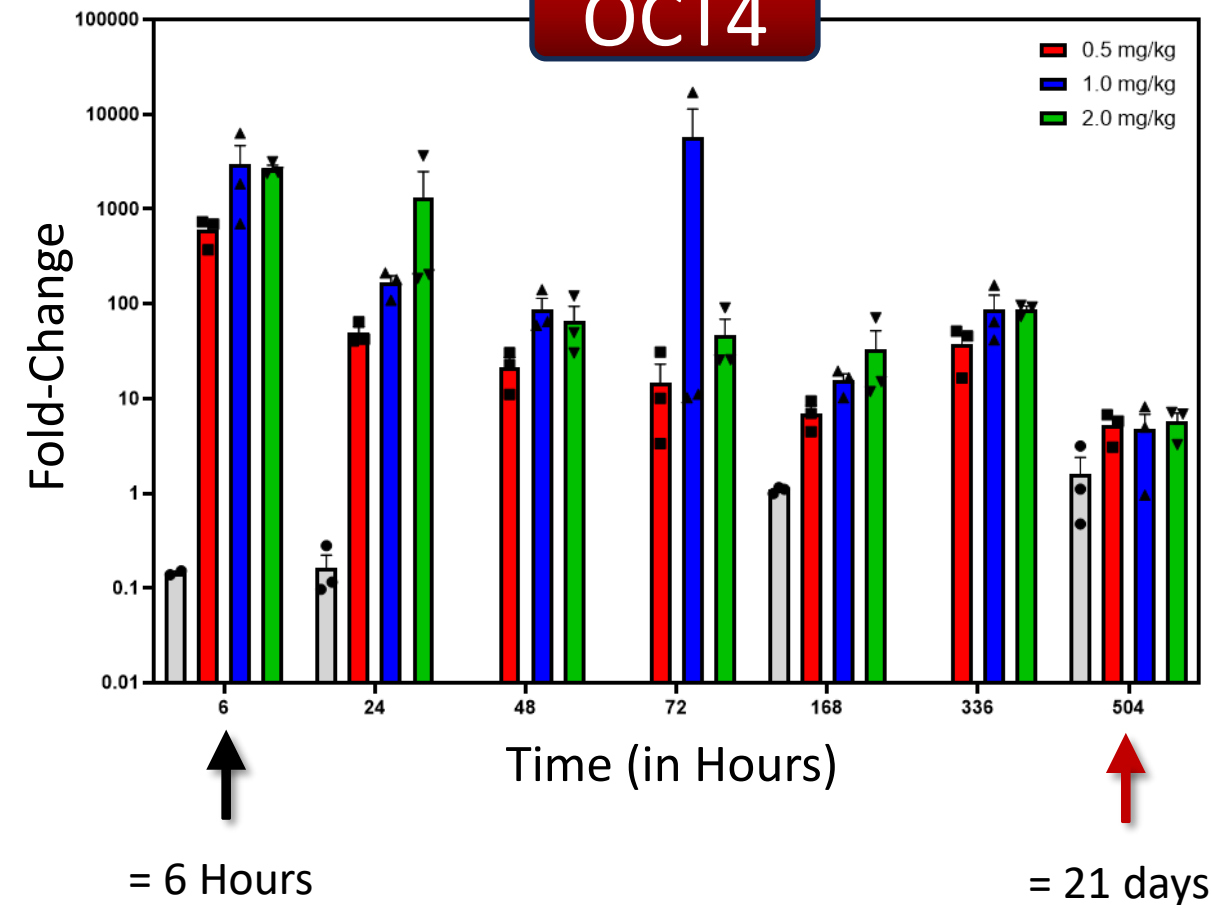




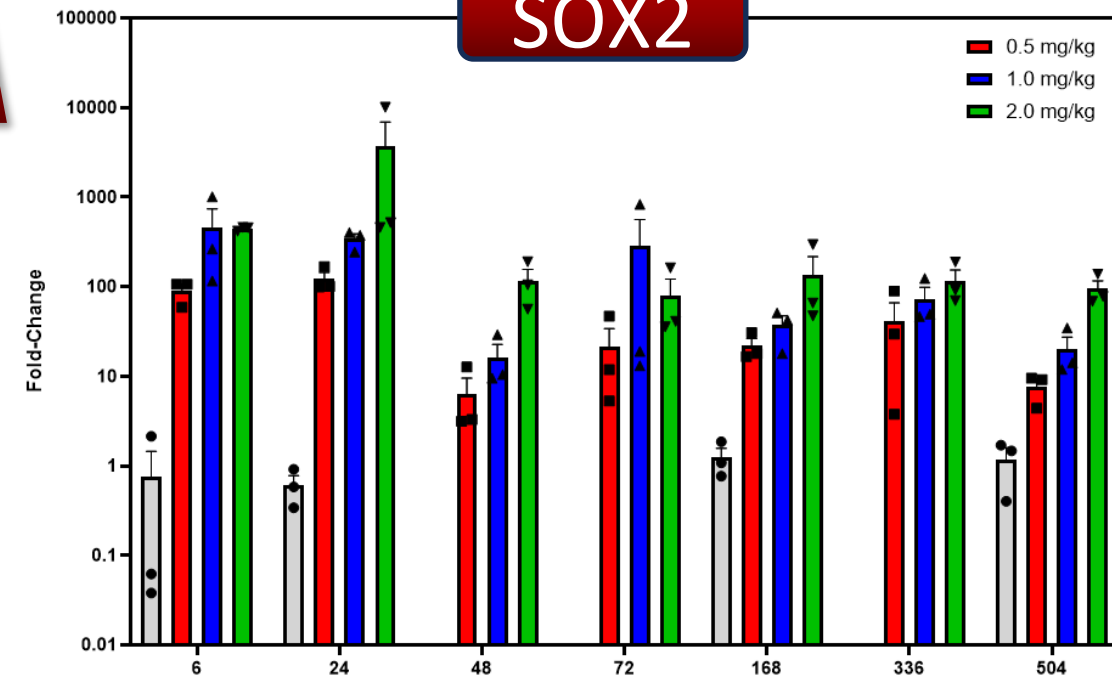
# Heart- OSK Transfer Achieved!

Robust-Sustained Delivery of OSK by encasing OSK in lipid nano particles.

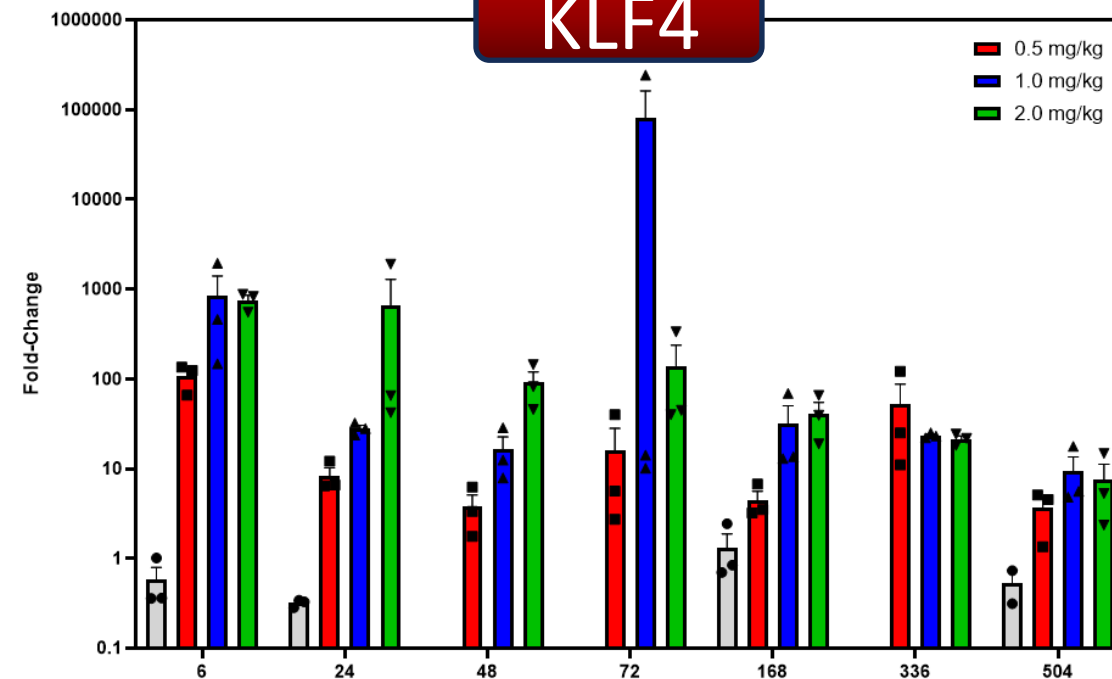
## OCT4



## SOX2

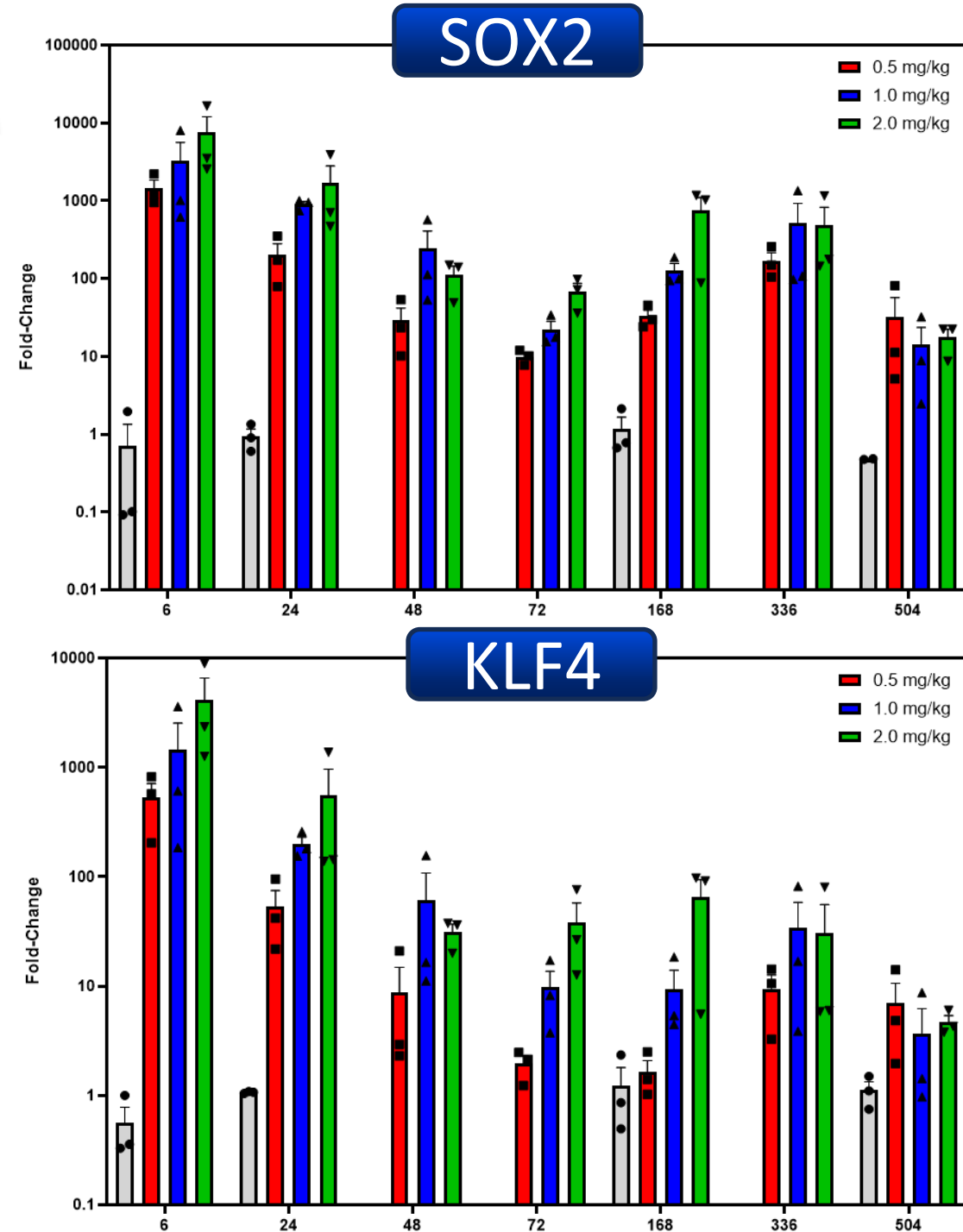
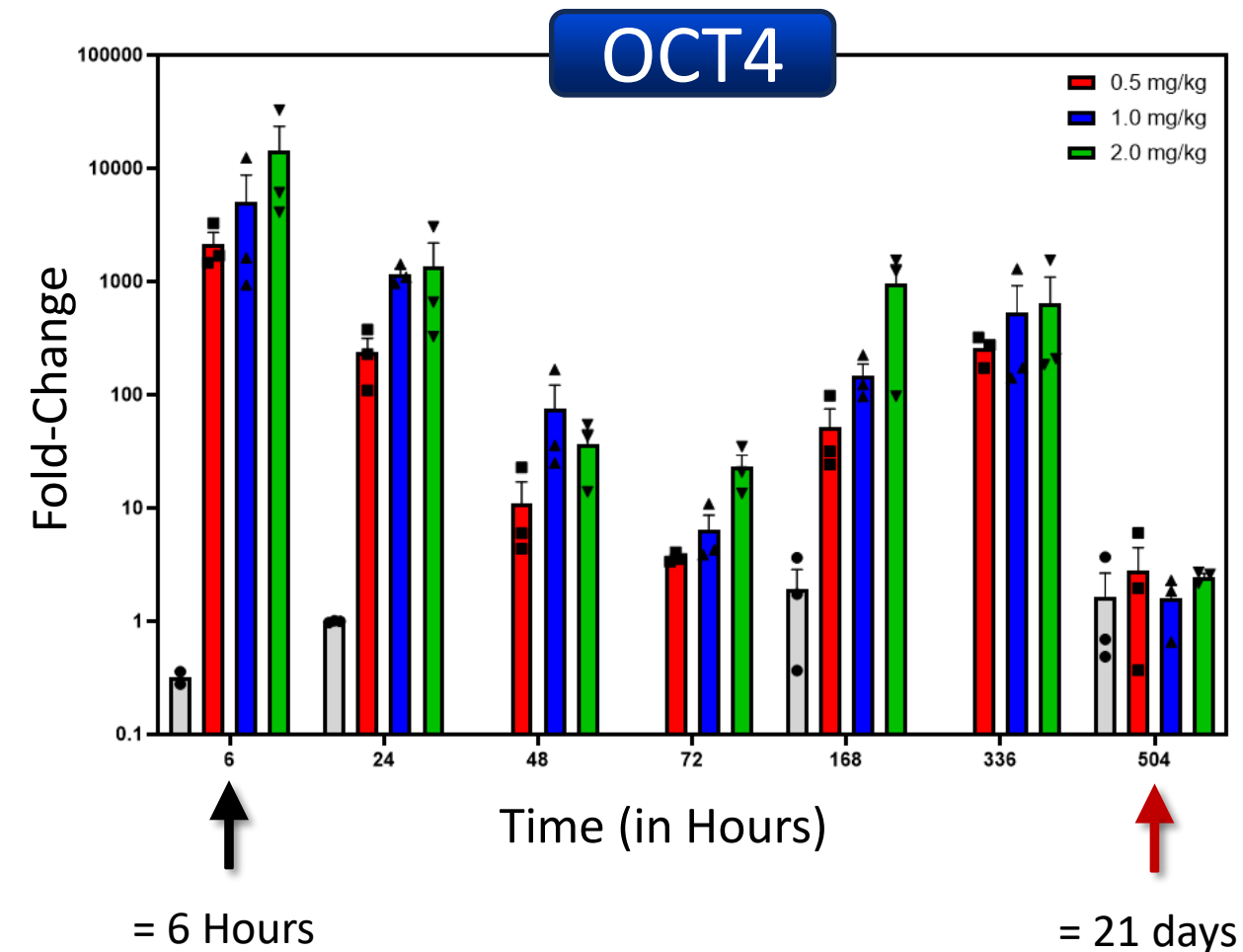


## KLF4



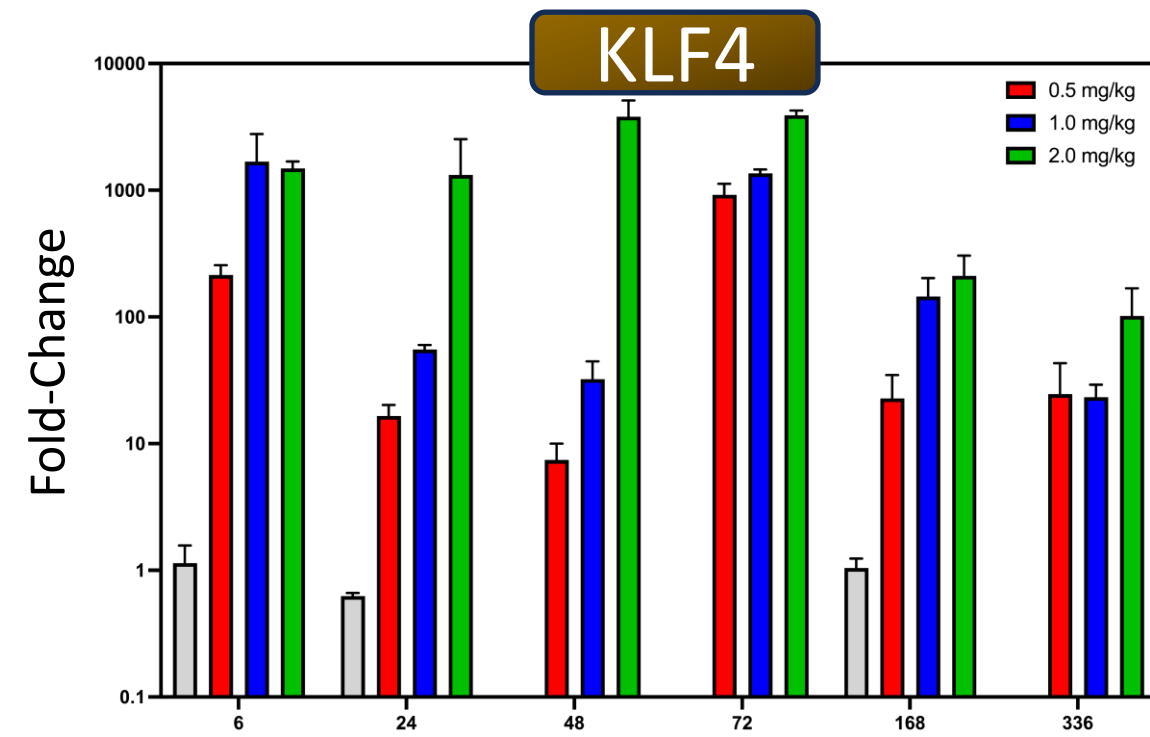
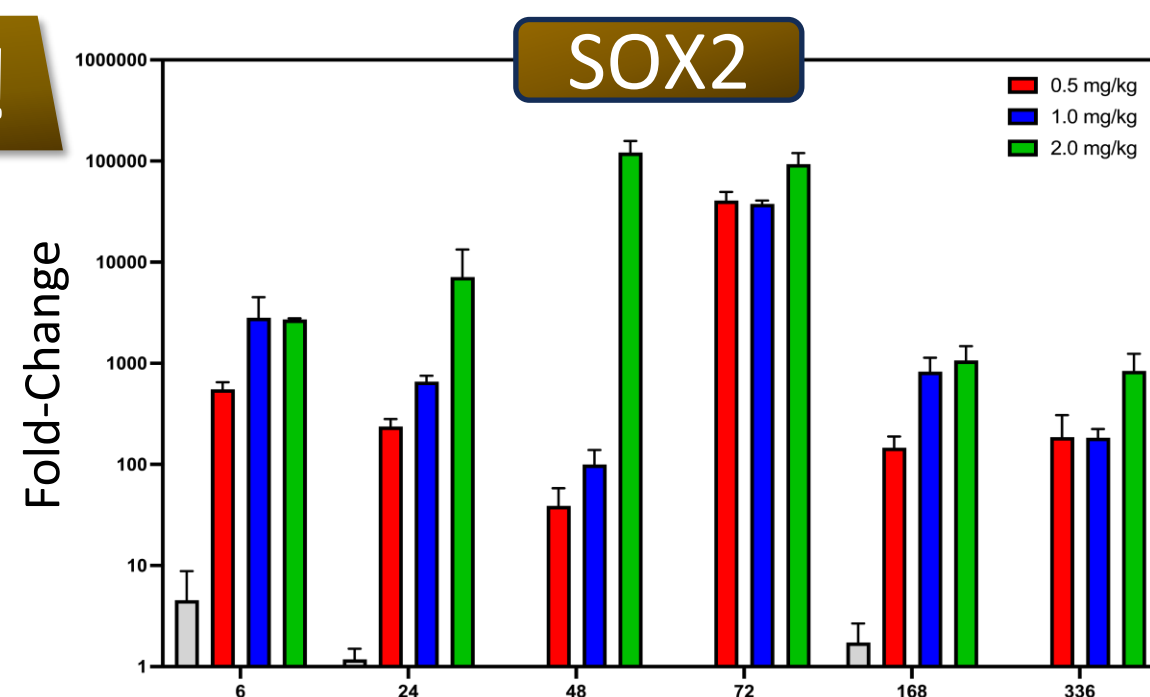
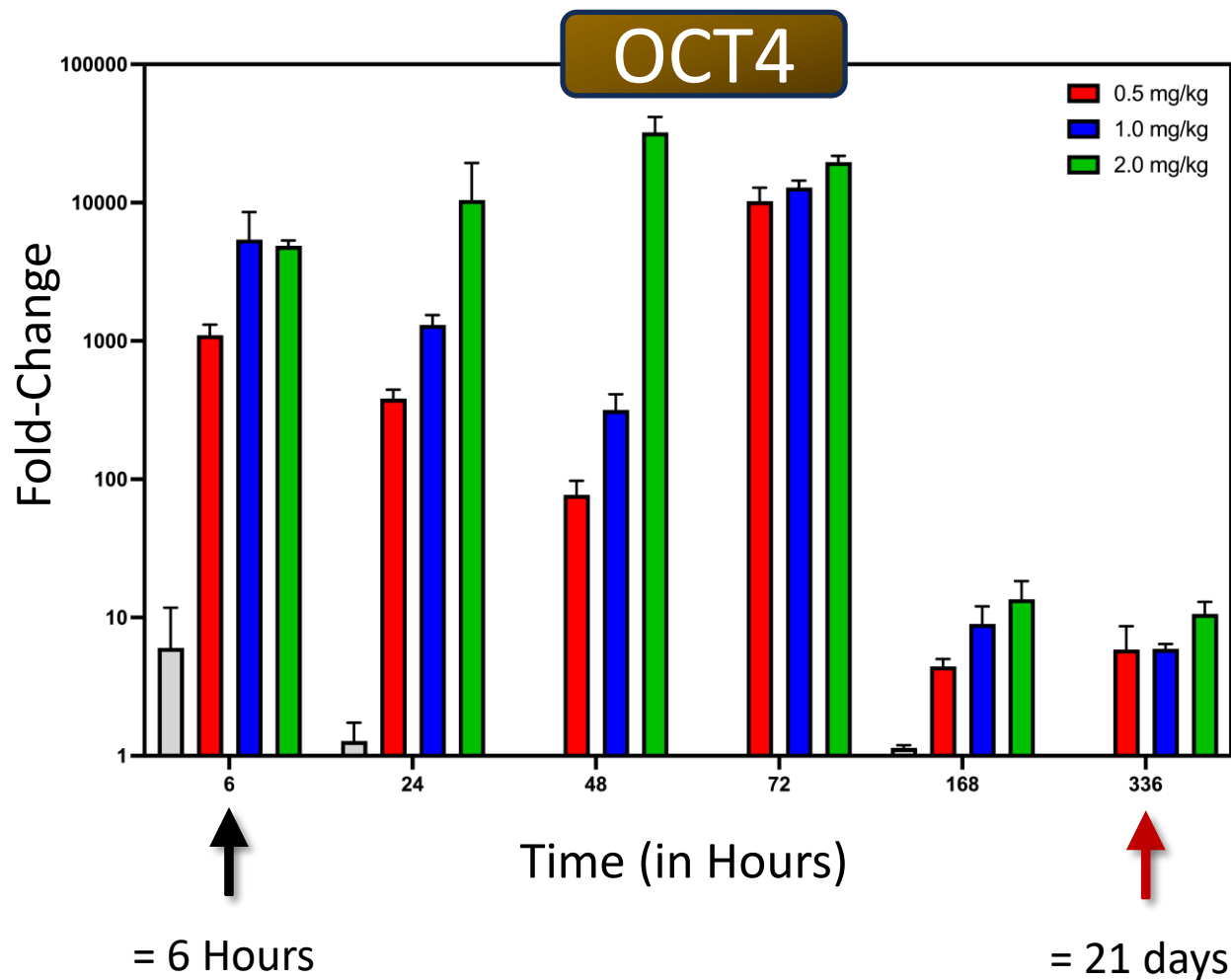
# Lung- OSK Transfer Achieved!

Robust-Sustained Delivery of OSK by encasing OSK in lipid nano particles.



# Spleen- OSK Transfer Achieved!

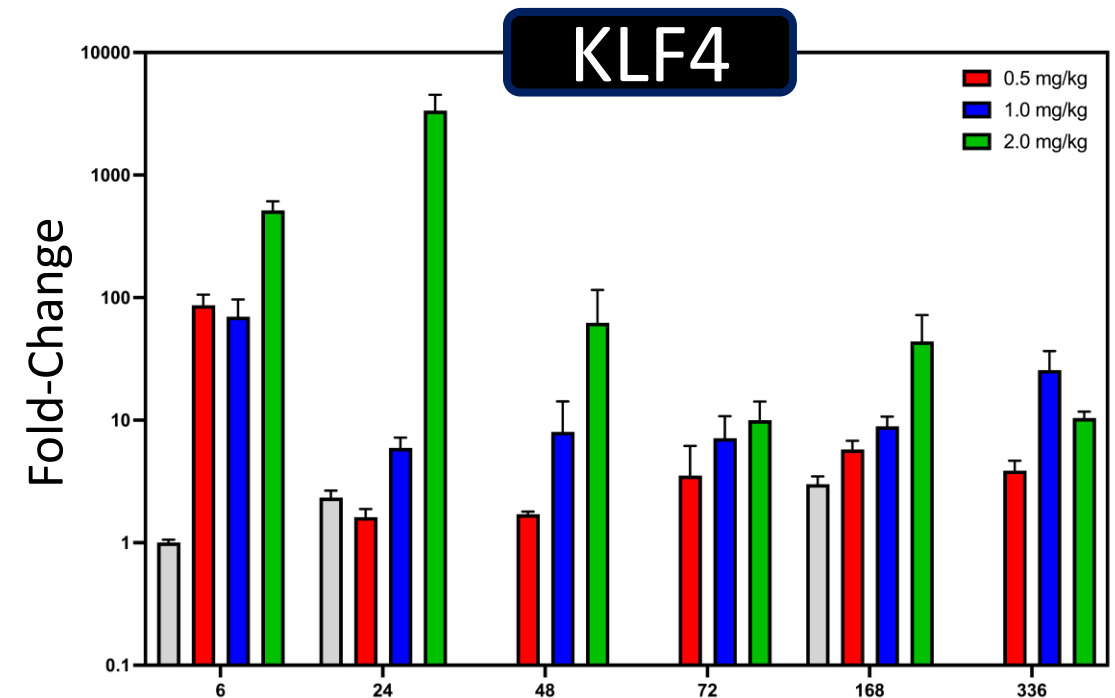
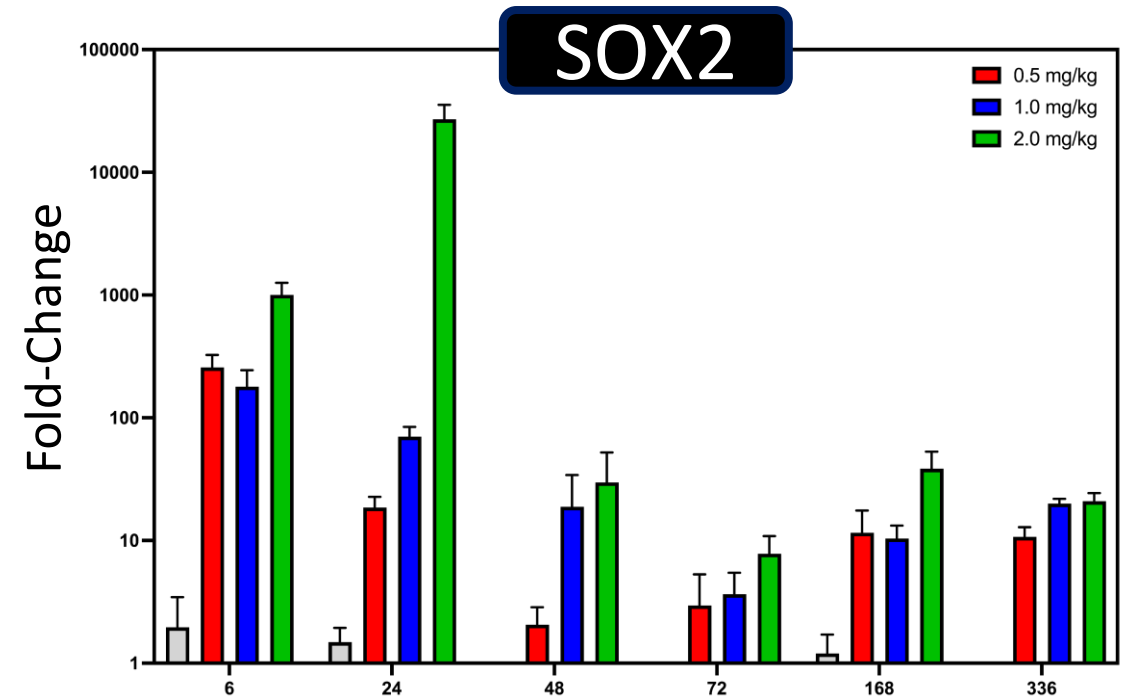
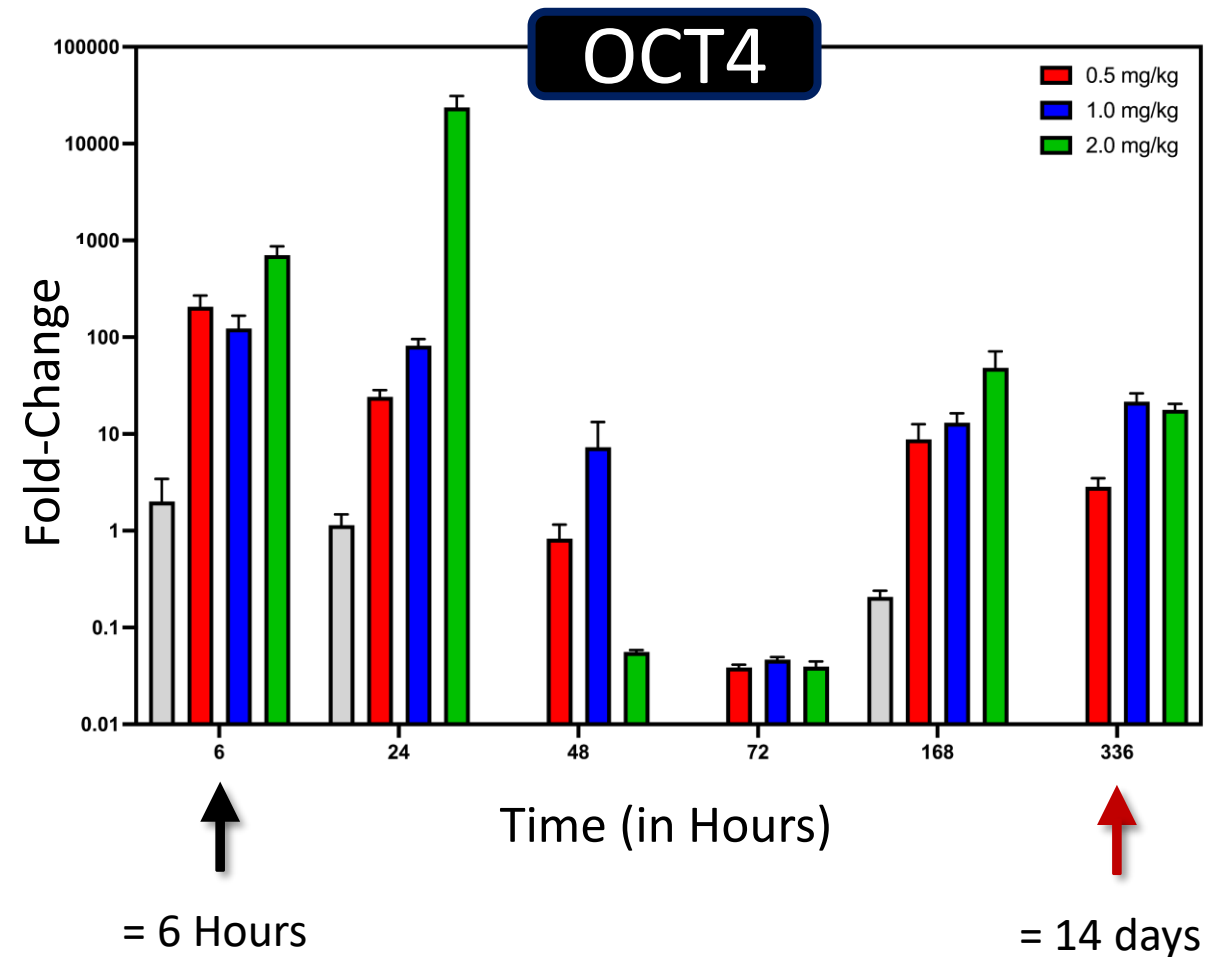
Robust-Sustained Delivery of OSK by encasing OSK in lipid nano particles.





# Skeletal Muscle - OSK Transfer Achieved!

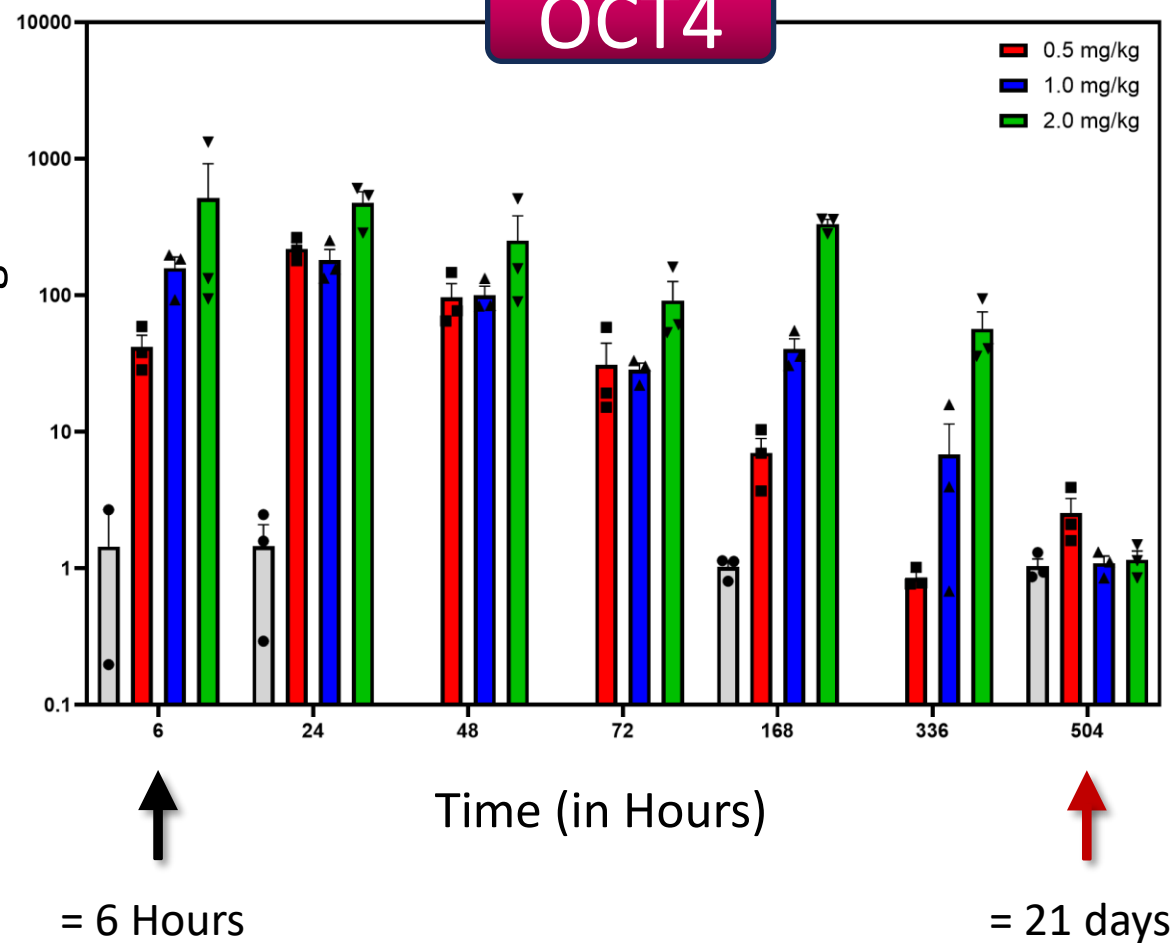
Robust-Sustained Delivery of OSK by  
encasing OSK in lipid nano particles.



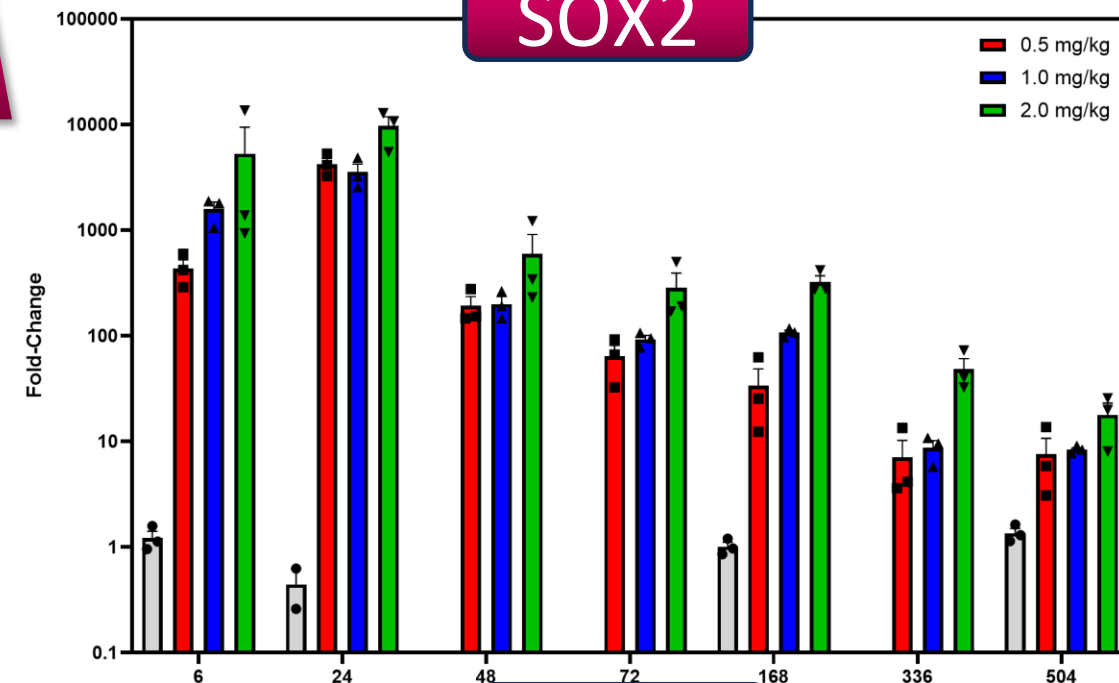
# Kidney- OSK Transfer Achieved!

Robust-Sustained Delivery of OSK by encasing OSK in lipid nano particles.

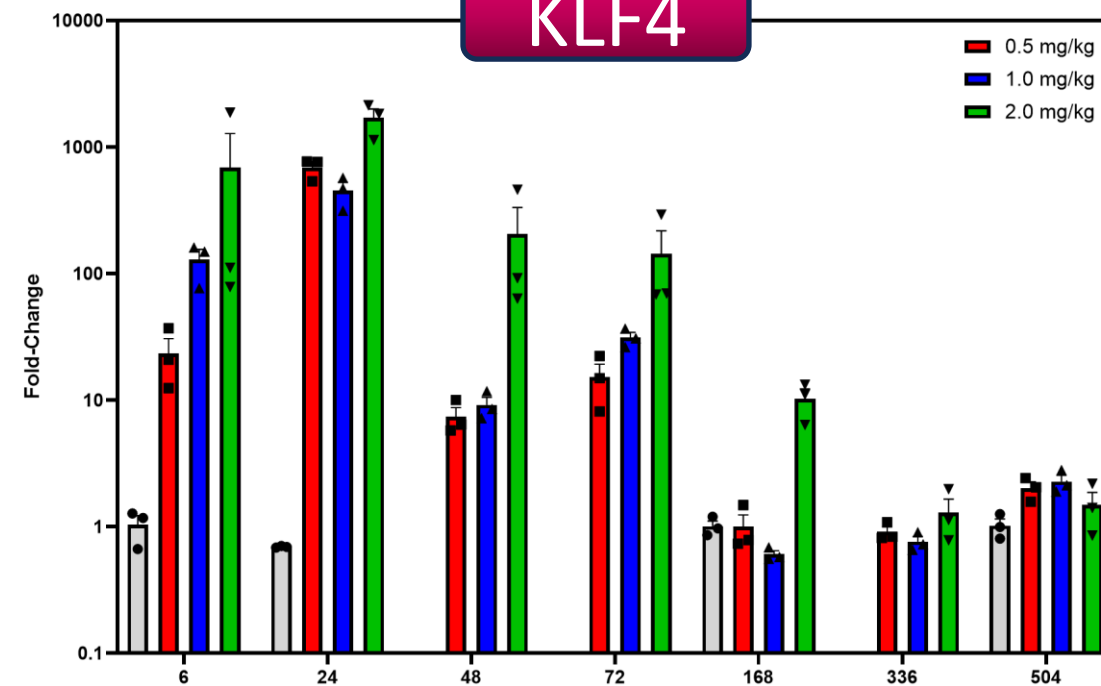
## OCT4



## SOX2

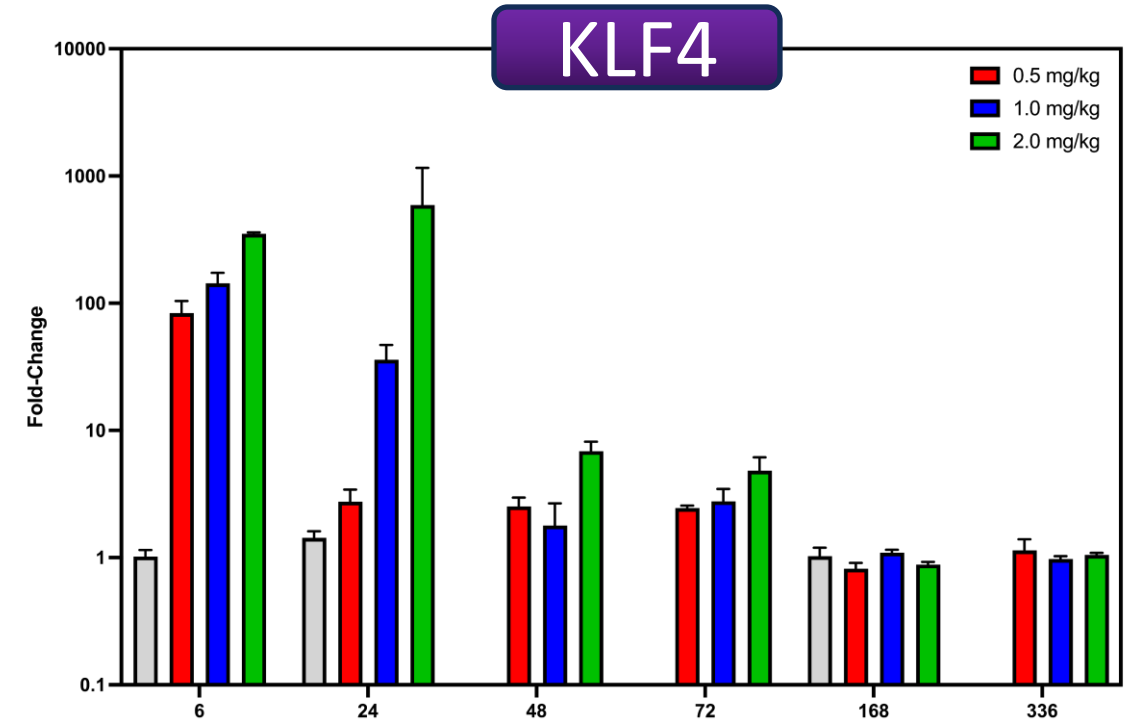
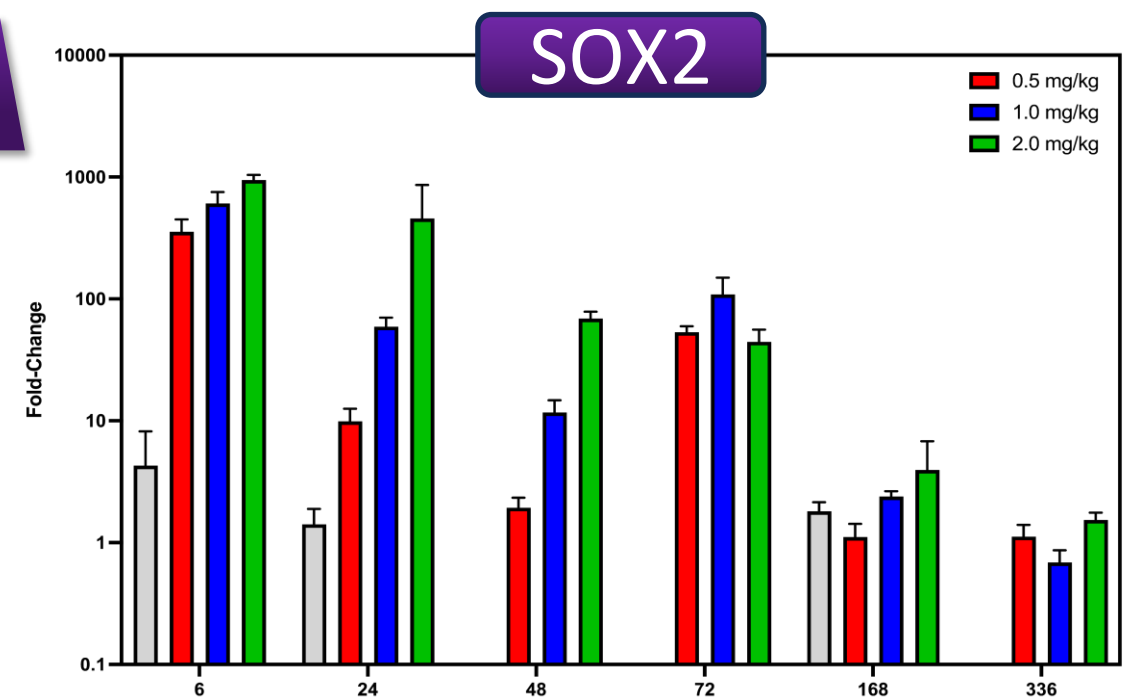
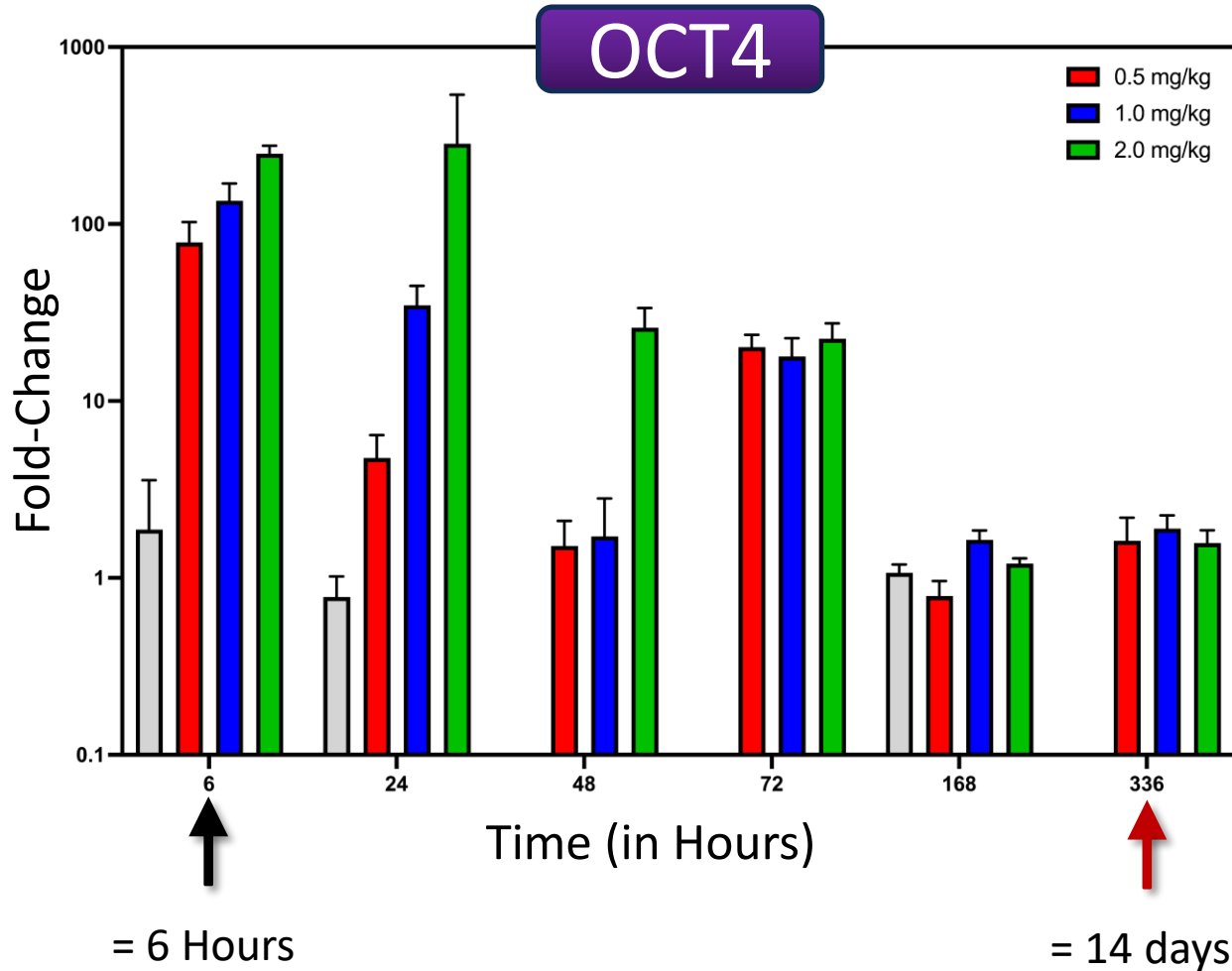


## KLF4



# Brain - OSK Transfer Achieved!

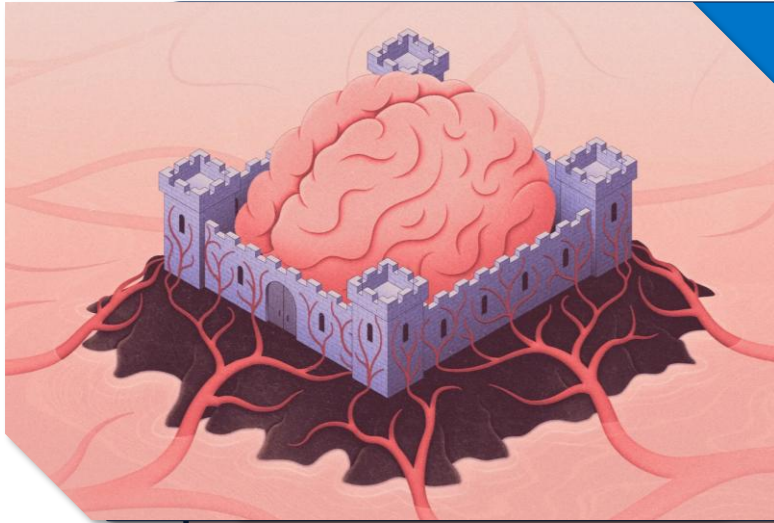
Robust-Sustained Delivery of OSK by encasing OSK in lipid nano particles.



**KLF4** is a **Yamanaka** factor produced by cells in **blood-brain barrier** (BBB).

**Aging** reduces **KLF4** production, weakening BBB & impairing brain function.

**Blood-brain barrier** dysfunction is a causal driver of **cognitive aging**.



Loss of **endothelial KLF4** major contributor to **brain aging**, impaired **brain vasculature** and **cognitive decline** in middle-aged mice, mimicking much older brains.



# First injection of mRNA-OSK in Live Monkeys at moderate doses December 9-12<sup>th</sup>, 2025



**Objective: Systemic Biological Age Reversal**

# OSK Primate Update



**Our researchers recently performed the first DNA methylation studies on African Green Monkeys' blood and tissue.**

Preliminary analysis is consistent with our investigational gene therapies showing **favorable methylation** patterns correlated with aging relative to untreated primates.

Given the potential significance of this finding, **confirmatory** experiments and analyses are underway.

Functional studies, including careful analysis of **immune** function and **metabolic** health measures, are also underway.

[www.age-reversal.net/primates](http://www.age-reversal.net/primates)

[www.lifeextension.com/magazine/2026/9/longevity-research-tsunami](http://www.lifeextension.com/magazine/2026/9/longevity-research-tsunami)

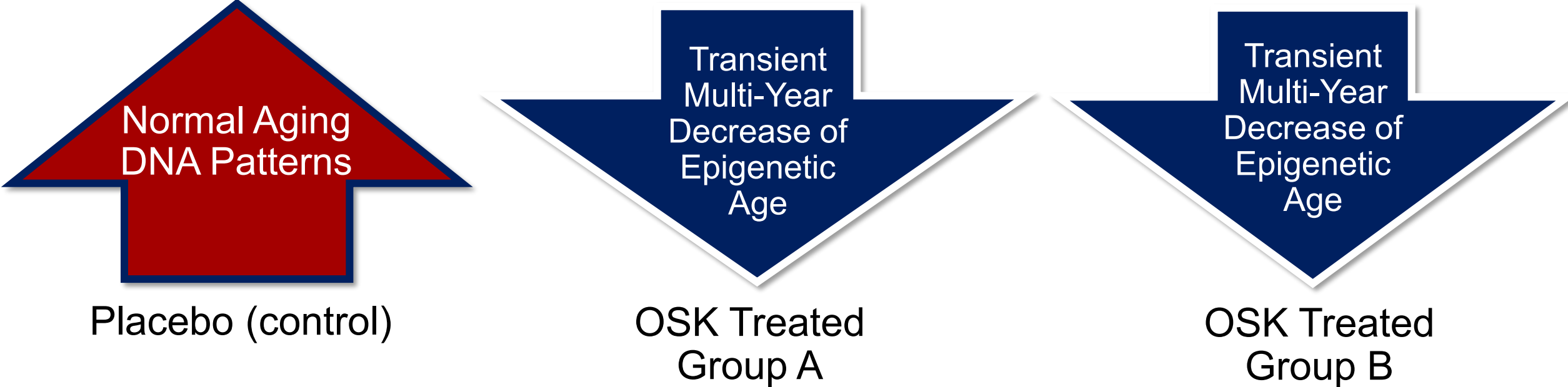
# Primate OSK Research: Preliminary DNA Methylation Results

## Study Method:

African Green Monkeys (Vervet) injected with OSK constructs tested at baseline with **immune/metabolic** panels + **epigenetic age** (DNA methylation scores)

## Key Findings:

- 1) **No OSK-related toxicity** (demonstrates **safety** of *in vivo* OSK transfection).
- 2) Preliminary **Vervet Blood Age DNA Clock** after two mRNA-OSK treatments:



Normal Aging  
DNA Patterns

Placebo (control)

Transient  
Multi-Year  
Decrease of  
Epigenetic  
Age

OSK Treated  
Group A

Transient  
Multi-Year  
Decrease of  
Epigenetic  
Age

OSK Treated  
Group B

(Additional and confirmatory results expected over next 30-60 days)\*

# Researchers Develop a System that Identifies Single **Transcription Factors** that Drive Cellular and Tissue Rejuvenation

Overexpressing the *transcription factors* **E2F3** or **EZH2**, and repressing STAT3 or ZFX, reversed cellular **hallmarks of aging**—increasing proliferation, proteostasis, and mitochondrial activity, while decreasing senescence.

At the tissue level, it was demonstrated that overexpression of **EZH2 alone** is sufficient to rejuvenate the **liver** in aged mice, significantly reducing **fibrosis** and **steatosis**, and improving **glucose tolerance**.

**PNAS** January 9<sup>th</sup>, 2026

<https://www.pnas.org/doi/10.1073/pnas.2515183123>





# “Inside Putin’s \$26 Billion Quest for Longevity”

*Major Government Figures Publicly Voice Support*

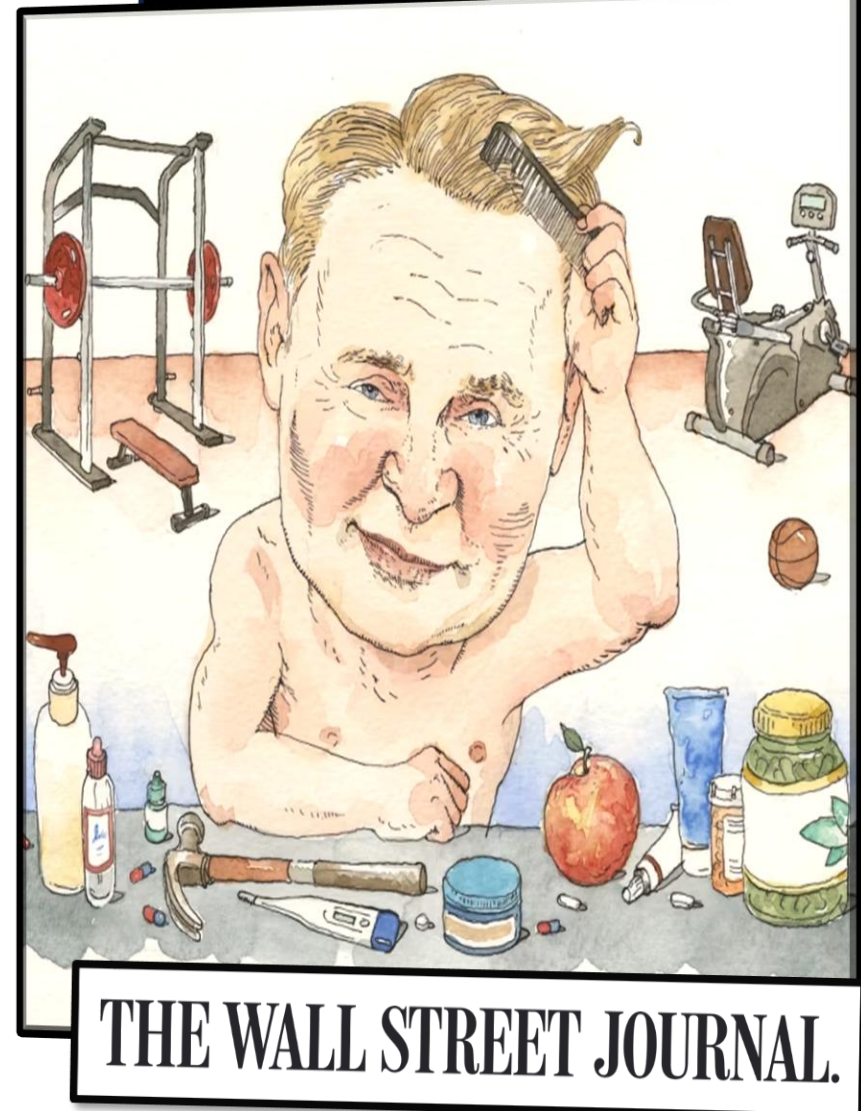
The drug “represents one of the most promising avenues in the **fight against aging**,” Deputy Science Minister Denis Sekirinsky said on April 23.

Physicist and head of Russia’s nuclear research institute, Mikhail Kovalchuk, who is closely connected to Putin “**has argued that science will soon allow humans to repair and replace body parts indefinitely.**”

WSJ

<https://www.wsj.com/world/russia/putin-longevity-antiaging-92dee6e8>

May 28<sup>th</sup>, 2026



# Hot mic catches Putin and Xi discussing organ transplants and immortality

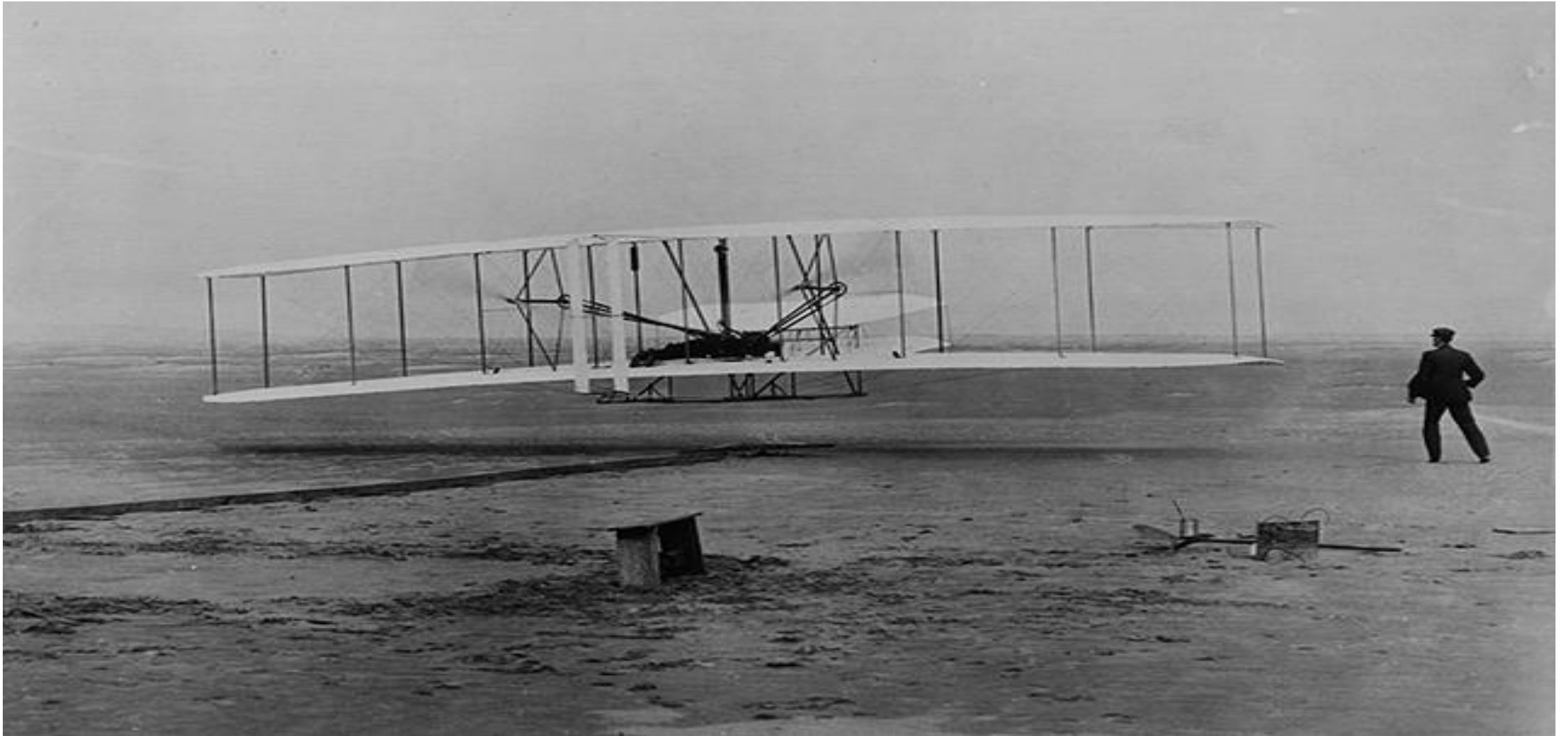
Xi, who was off camera, could be heard responding in Chinese: “Some predict that in this century humans may live to **150 years old.**”

“Putin confirmed later to reporters he had discussed **prospects for significantly increasing human life expectancy** with Xi.”



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# A Kitty Hawk Moment?



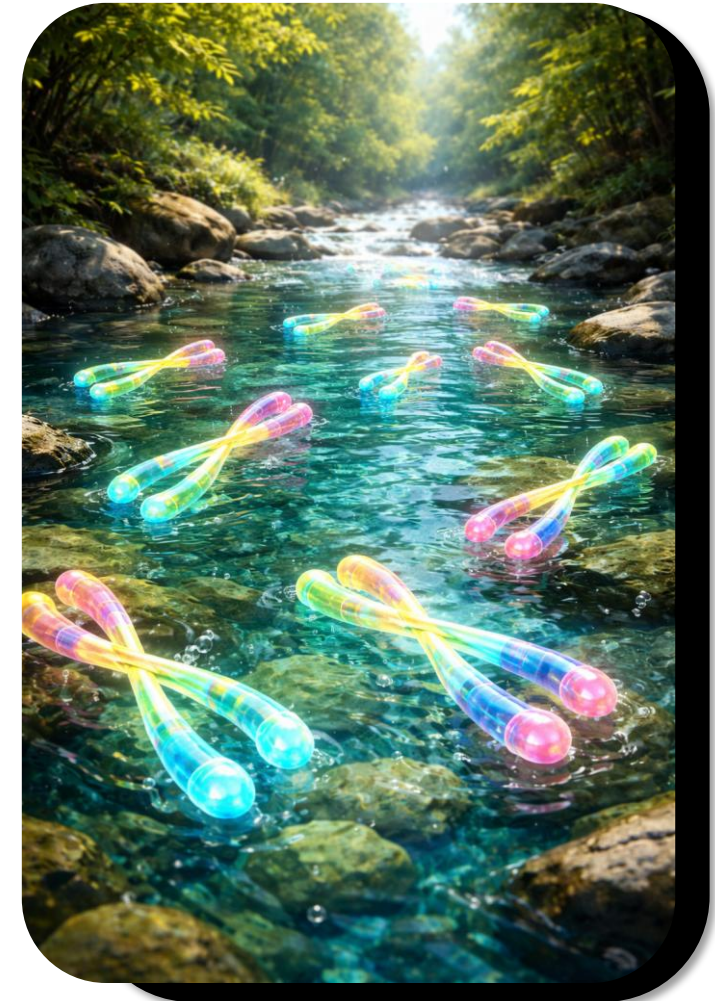
**Dec 17, 1903:** Wright Brothers launch heavier than air Flying Machine



# CD4<sup>+</sup> T cells confer **transplantable rejuvenation** via “**Rivers of telomeres**”

Researchers found that **young/reprogrammed** CD4<sup>+</sup> T cells release “**Telomere Rivers**” into circulation after acquiring telomeres from antigen-presenting cells. These Rivers circulate throughout the body and **rejuvenate old** tissues.

- ▶ “River therapy extended median lifespan by **~17 months**, with several mice surviving to nearly **five years**.”
- ▶ This **telomere transfer** pathway may define “the first systemic, transplantable **program of youth**.”



# CD4<sup>+</sup> T cells confer **transplantable rejuvenation** via “**Rivers of telomeres**”

T-cells were made to secrete extracellular vesicles with **telomere**-modulating DNA

The telomere-inducing **vesicles** were given to **older** mice (20 months old).

Lifespans of some recipient mice among the **longest** *ever* recorded (nearly **5 years**).

This treatment (1) didn't use cells, and (2) was effective with a single treatment, (3) at old age.

Reference: <https://www.biorxiv.org/content/10.1101/2025.11.14.688504v1>



# Telomere Rejuvenating Recipe

Antigen-presenting cells (APCs) can be induced to **actively donate** telomere-containing vesicles to T cells (apparently in an effort to rejuvenate them.)

Researchers first induced antigen-presenting cells to create/donate telomeric DNA to T cells.

The T cells then used that telomeric DNA to rejuvenate its own telomeres, then secreted any excess, unused telomeric DNA into the telomere Rivers, which are apparently taken up by **other cells** in the body, thereby **rejuvenating** them.

Telomeric DNA from the APCs seem to rejuvenate the T cells, which then distribute excess telomeric DNA to cells around the body, rejuvenating them as well.

APCs **first** donate telomeric DNA to T cells, which rejuvenates the T cells. The T cells then release telomere Rivers using unused telomeric DNA they received from APCs



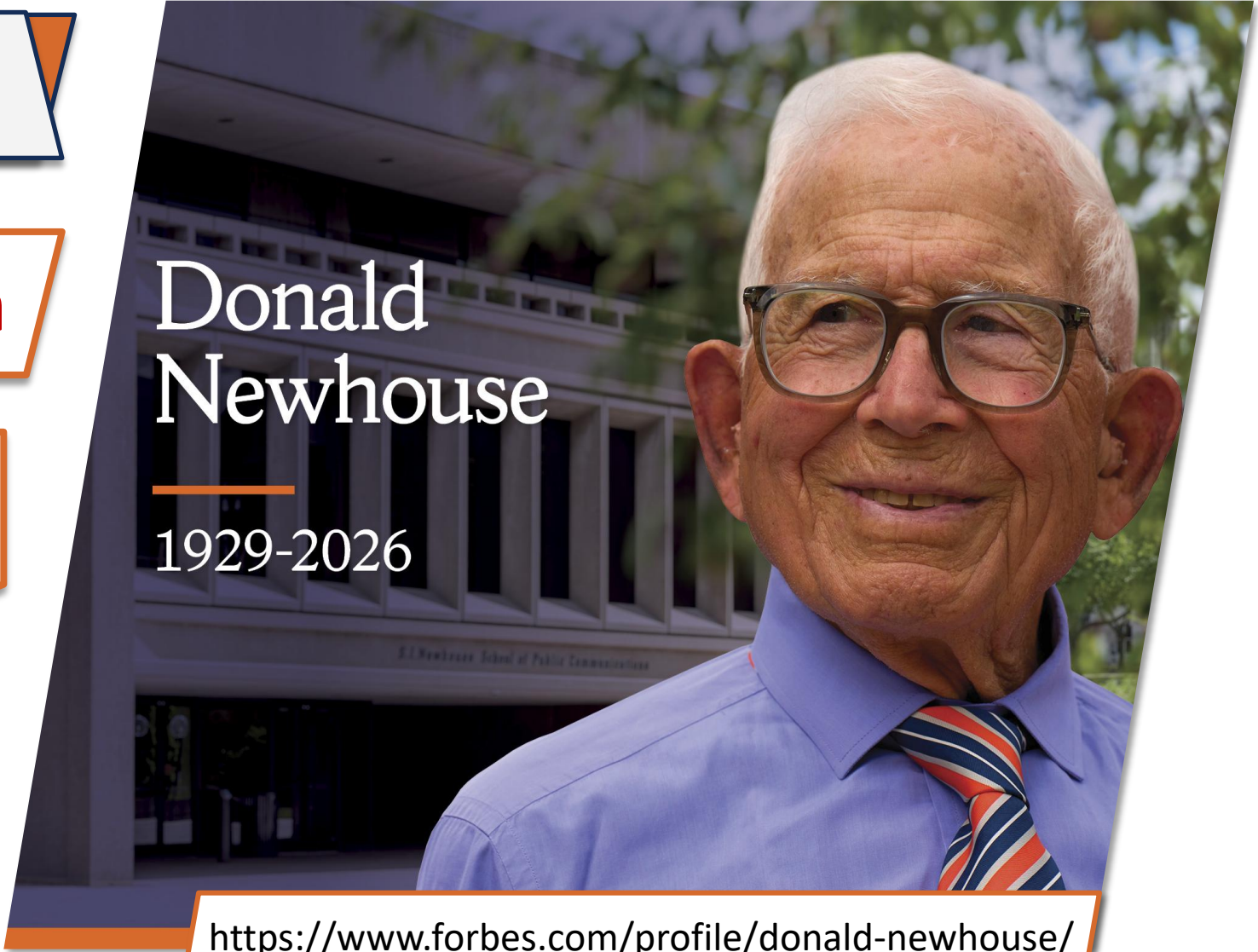
Donald Newhouse...Famous Publisher... **Dead** at **age 96** on May 26<sup>th</sup>, 2026

## Donald Newhouse

Net Worth: **\$15.4 billion**

Donated **\$20 million** for  
dementia research.

No known funding of  
**age reversal research**

A portrait of Donald Newhouse, an elderly man with white hair and glasses, wearing a blue shirt and a striped tie. He is smiling slightly. The background is a blurred image of a building with the text "Donald Newhouse School of Public Communications" visible.

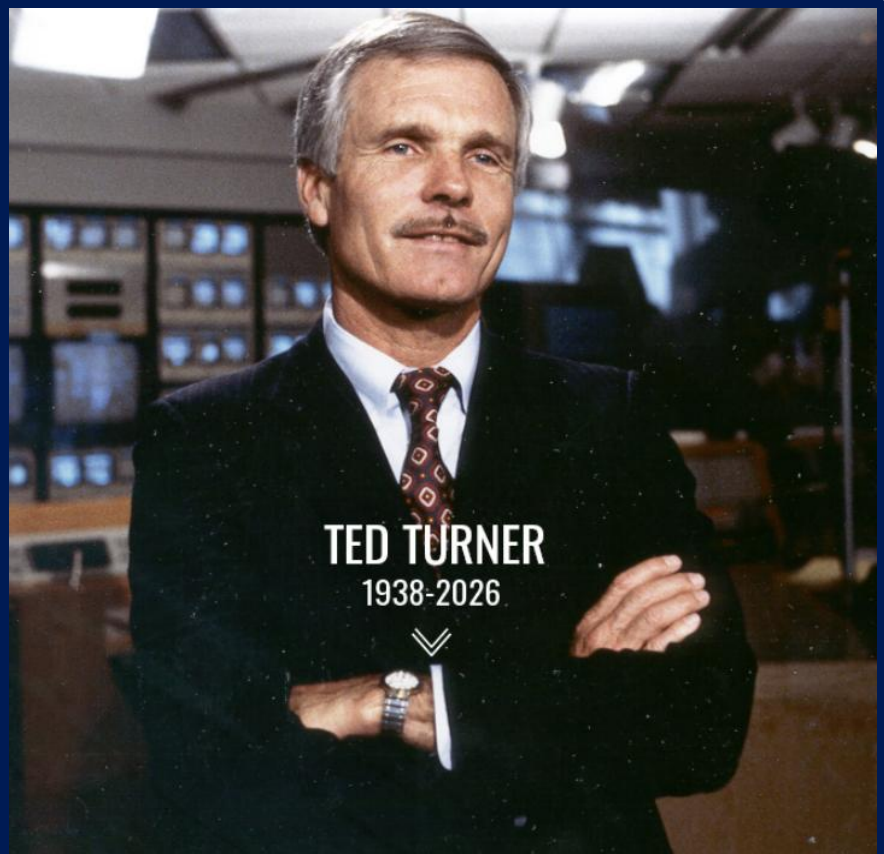
Donald  
Newhouse

1929-2026

<https://www.forbes.com/profile/donald-newhouse/>



# Who Missed the Longevity Boat



**TURNER**  
FOUNDATION, INC.

- Generous philanthropist, but not primarily known as a donor to:
- • **anti-aging research**
- • **cancer institutes**
- • **major biomedical laboratories**

**Ted Turner (1938-2026)**  
Expiration date: **May 6, 2026**  
Net worth > **\$2.8 billion**

**Dead at Age 87**

<https://www.forbes.com/profile/ted-turner/>

Owner of the Indianapolis Colts, dead at Age 65: May 2025

# James Irsay

Net Worth: **\$4.8 billion**

What he spent his money on:  
Guitar World once reported  
Irsay was offered **\$1 billion**  
for what they dubbed the  
greatest guitar collection on  
Earth.



<https://www.forbes.com/profile/james-irsay/>

**Mediacom Founder & CEO Dies at Age 76 on January 16<sup>th</sup>, 2026**

**Rocco Commisso**

Net Worth: **\$5.6 billion**

Spent ~**\$200 million** on a soccer team in 2019.  
No known public contributions to medical or **aging** research.





# Billionaire Mall Magnate **David Simon** Dies at **64** on March 22<sup>nd</sup>, 2026

Net Worth: **\$11.6 billion**

Simon's empire spanned 206 malls in 37 states, including 60 Premium Outlets. **Dead at 64** after battling **pancreatic cancer** for 2 years.

Donated a few million to hospitals but no known donations for aging research.



<https://www.realtor.com/news/trends/david-simon-mall-ceo-dies-malls-he-owned/>



# How Much Have Billionaires Contributed?

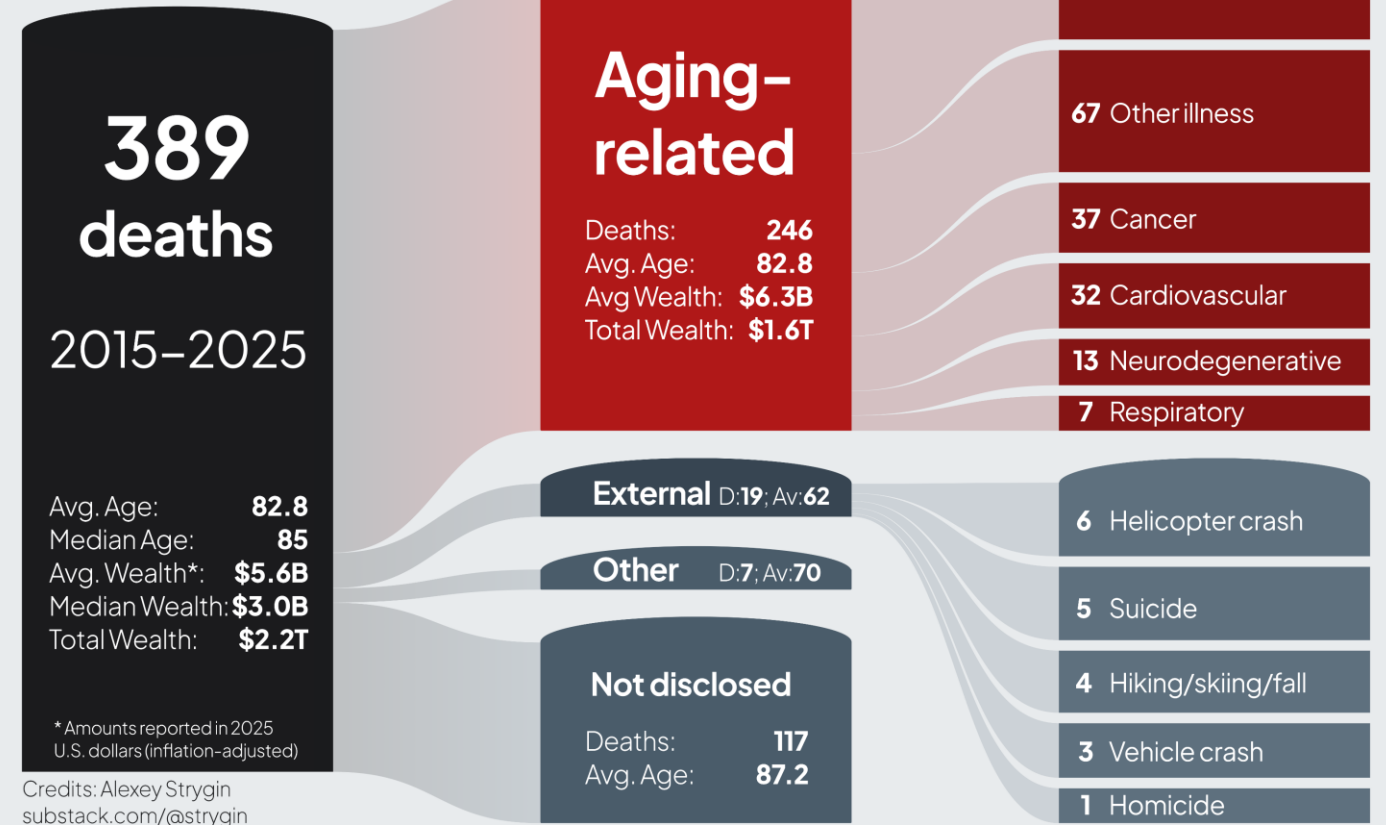
Over the past decade, **246 billionaires** worth **\$1.56 trillion** died of **aging-related** causes.

Yet the WSJ estimates that the entire **ultra-wealthy** class have put *only* **\$5 billion** into **longevity ventures** over the past **25 years** (about ~\$200M/year).

The average billionaire **dying of aging** had **\$6.3 Billion** ...

A **single** additional commitment at that scale could materially change the pace of progress.

## How billionaires die







# **The Power of Reinforcement**

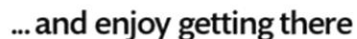
**Mitigate deadly lifestyles while  
bolstering healthy practices.**

## WEEKLY 20 September 2025

## NEANDERTHALS' DARING MOUNTAIN-SIDE HUNTS

## HAS NASA FINALLY FOUND LIFE ON MARS?

SPECIAL ISSUE



**PLUS** SQUASHED JUPITER / **SAVING THE SLOW LORIS** / **DNA CASSETTE TAPE** / NO REALLY, WHERE'S MY JETPACK?

<https://www.newscientist.com/issue/3561/>

# How to Live to 100

## .... And enjoy getting there

**September 20<sup>th</sup>, 2025**

## Features

## The exercises you need to do to reach 100 in great shape

## The science revealing how the right diet can add a decade to your life

## Why caring for your microbiome is crucial if you want to live to 100

## How to nurture the right mindset for living to 100

## What's the secret to living well beyond the average life expectancy?

## The real scientific insights from Bryan Johnson's immortality quest





New Scientist | Health | September 16, 2025

## The exercises you need to do to reach 100 in great shape

To be truly fit in older age, you need to work on specific aspects of your **fitness** – and research shows that it's never too late to reap the benefits

<https://www.newscientist.com/article/2494852-the-exercises-you-need-to-do-to-reach-100-in-great-shape/>



New Scientist | Health | September 16, 2025

## The science revealing how the right diet can add a decade to your life

Evidence shows that eating a **longevity diet** can dramatically lengthen your lifespan – and the sooner you start, the more of a difference it makes

<https://www.newscientist.com/article/2494953-the-science-revealing-how-the-right-diet-can-add-a-decade-to-your-life/>



**New Scientist | Health | September 16, 2025**

## **How to nurture the right mindset for living to 100**

It's not just diet and exercise that governs how well you age. Your mindset, social connections and sense of purpose make a big difference...

<https://www.newscientist.com/article/2495108-how-to-nurture-the-right-mindset-for-living-to-100/>



**New Scientist | Health | September 16, 2025**

## **Why caring for your microbiome is crucial if you want to live to 100**

Our friendly – and not so friendly – gut bacteria lie at the core of healthy ageing. Research is now revealing what it takes to maintain a youthful microbiome

<https://www.newscientist.com/article/2494981-why-caring-for-your-microbiome-is-crucial-if-you-want-to-live-to-100/>



**New Scientist | Health | September 16, 2025**

## **What's the secret to living well beyond the average life expectancy?**

It's not just diet and exercise that governs how well you age. Your mindset, social connections and sense of purpose make a big difference...

<https://www.newscientist.com/article/2495136-whats-the-secret-to-living-well-beyond-the-average-life-expectancy/>



**New Scientist | Health | September 16, 2025**

## **The real scientific insights from Bryan Johnson's immortality quest**

Tech millionaire turned longevity pioneer Bryan Johnson devotes more than 6 hours a day to trialling different methods to turn back the clock. Can the rest of us learn anything from his radical approach?

<https://www.newscientist.com/article/2495156-the-real-scientific-insights-from-bryan-johnsons-immortality-quest/>

# The Most Sedentary Have a **Massively** Higher Mortality Rate than even just the **Lightly Active**.

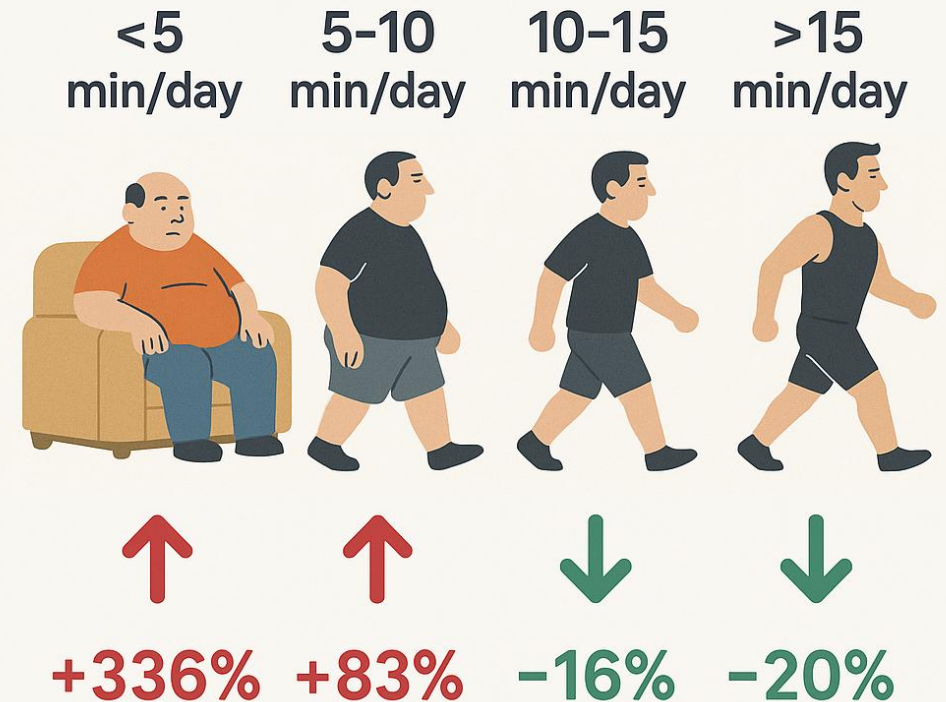
People were put into categories that represent the following **maximum** daily walking activity levels: **< 5 min**, **5-10 min**, **10-15 min**, and **>15 minutes**.

Cumulative all-cause **mortality** decreased sharply as **walking** bouts **lengthened**.

Oct. 28<sup>th</sup>, 2025

<https://doi.org/10.7326/ANNALS-25-01547>

## Peak Continuous **Walking** Sessions Per Day and **Mortality**





# The Most Sedentary Have a **Massively** Higher Mortality Rate than even just the **Lightly Active**.

Relative to the under **5-minute** group, participants who sustained bouts of walking for greater than **10 minutes** had roughly an **80% lower mortality** and **65%–70% lower CVD incidence**

The findings suggest that continuous, sustained **walking** confers higher cardiometabolic benefit than **fragmented**, **short bursts** of movement, even when total daily steps are similar



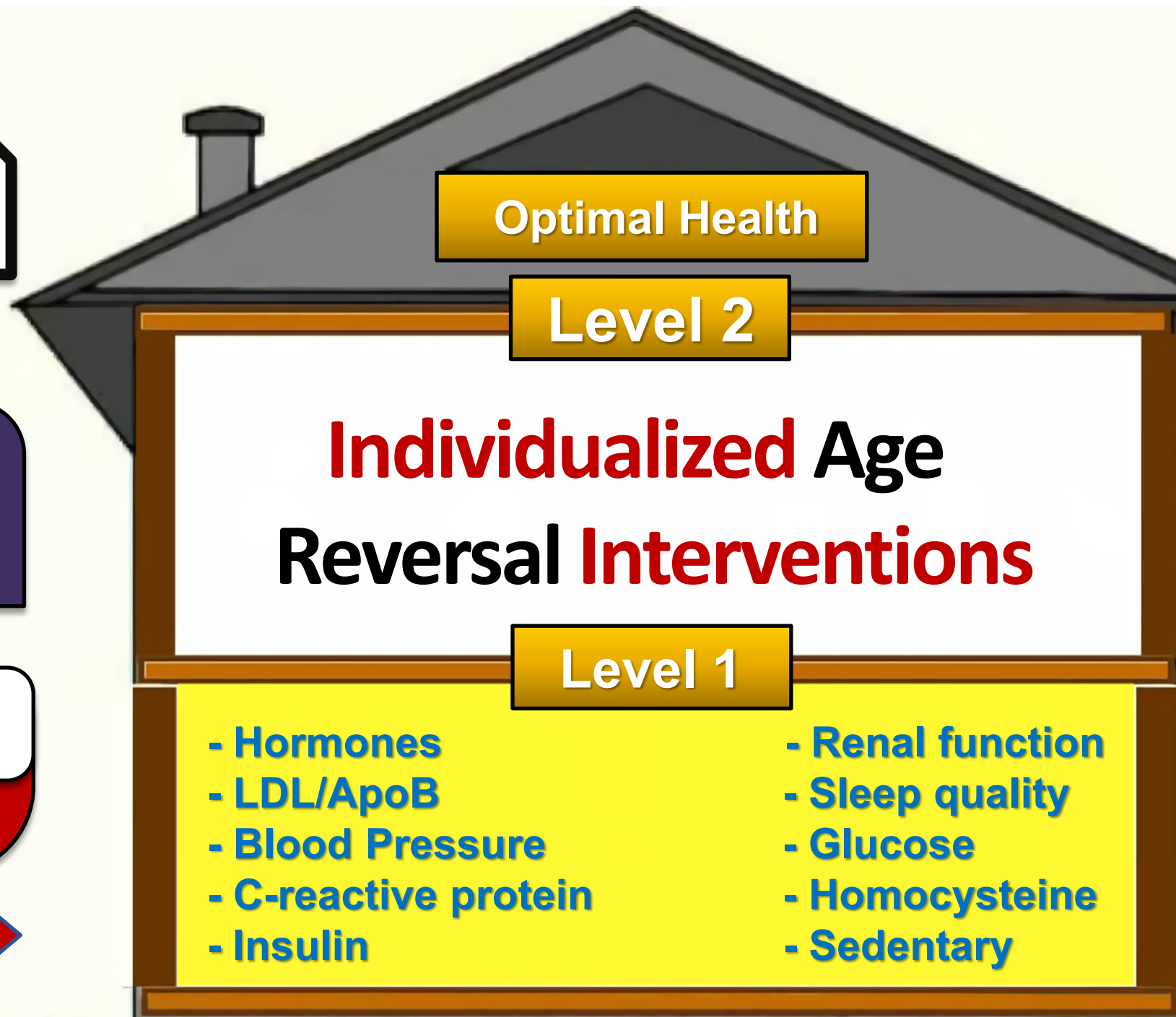
Oct. 28<sup>th</sup>, 2025

<https://doi.org/10.7326/ANNALS-25-01547>

# House of Optimal Health

Level 1 is essential to  
progress to Level 2

**Correct Your  
Underlying Risk Factors**



# House of Optimal Health

Optional Approaches

Failure to optimize **Level 1**, preclude benefits of **Level 2**.

Healthy Aging

## Level 2

- Senolytics
- OSK reprogramming
- Young Plasma/Blood filtering
- Mesenchymal Stem Cells
- Hyperbaric
- mTOR-inhibition
- Perinatal tissues
- Exosomes
- Mitochondria Transfer
- Gene therapies

## Level 1

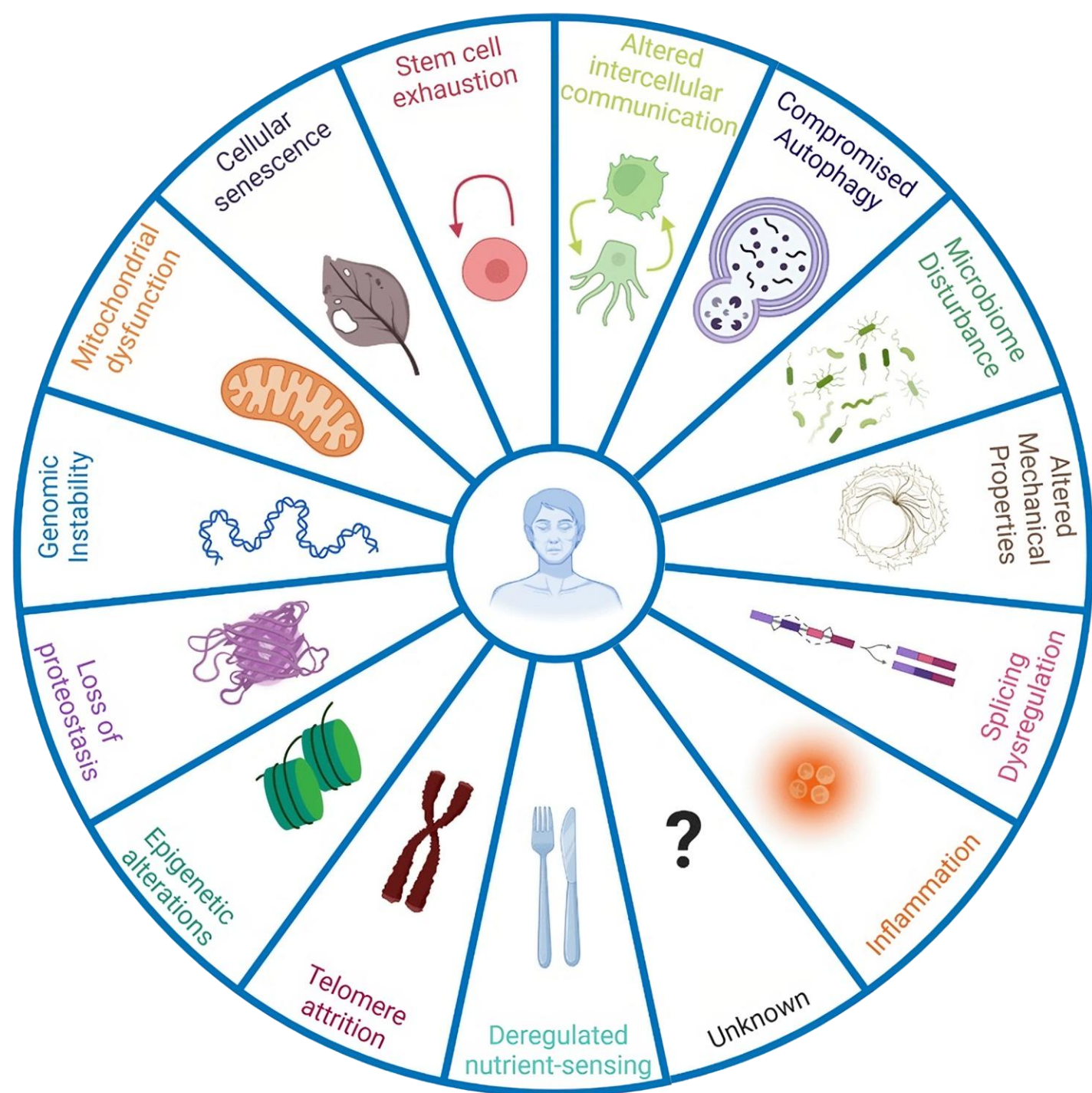
- Hormones
- LDL/ApoB
- Blood Pressure
- C-reactive protein
- Insulin
- Kidney function
- Sleep quality
- Glucose
- Homocysteine
- Sedentary



# The Hallmarks of Aging

An Expanding Biomedical Universe

[https://www.cell.com/cell/fulltext/S0092-8674\(22\)01377-0#:~:](https://www.cell.com/cell/fulltext/S0092-8674(22)01377-0#:~:)







# Circumvent **Hallmarks of Degenerative Aging** using Existing **Medications**

## Ranking of FDA Approved Drugs Repurposed to Fight Aging

| Gerotherapeutic         | Hallmarks of aging | Preclinical healthspan | Preclinical lifespan | Human healthspan | Human mortality | Score (out of 12) |
|-------------------------|--------------------|------------------------|----------------------|------------------|-----------------|-------------------|
| SGLT2 inhibitors        | 2                  | 2                      | 2                    | 3                | 3               | 12                |
| Metformin               | 2                  | 2                      | 1                    | 3                | 3               | 11*               |
| Bisphosphonates         | 2                  | 2                      | 1                    | 3                | 3               | 11                |
| GLP1 receptor agonists  | 2                  | 2                      | 0                    | 3                | 3               | 10*               |
| Acarbose                | 2                  | 2                      | 2                    | 3                | 0               | 9*                |
| Rapamycin               | 2                  | 2                      | 2                    | 3                | 0               | 9                 |
| Methylene blue          | 2                  | 2                      | 2                    | 3                | 0               | 9                 |
| ACE inhibitors/ARBs     | 2                  | 2                      | 1                    | 3                | 0               | 8                 |
| Dasatinib + (quercetin) | 2                  | 2                      | 1                    | 3                | 0               | 8                 |
| Aspirin                 | 2                  | 2                      | 2                    | 1                | 0               | 7                 |
| Beta blockers           | 1                  | 2                      | 1                    | 0                | 3               | 7                 |
| N-acetyl cysteine       | 2                  | 2                      | 1                    | 0                | 0               | 5*                |

**Table 1** Ranking of FDA-approved drugs as potential gerotherapeutics based on scoring (out of 12) for preclinical and clinical evidence. Circumvent **Hallmarks of Degenerative Aging** with repurposed drugs.

# FDA Approved SGLT2 Inhibitor Drugs



# Conclusions from Study:

- The use of metformin, ACEi/ARBs, aspirin, and beta-blockers showed a significant protective effect from **mortality** in geriatric rehabilitation inpatients
- The survival benefit of **metformin** and ACEi/ARBs may be causal effect
- Using **3** or more potential gerotherapeutic drugs showed a *higher* protective effect than a **single** drug
- Personalized intervention needed and **clinical trials** are warranted



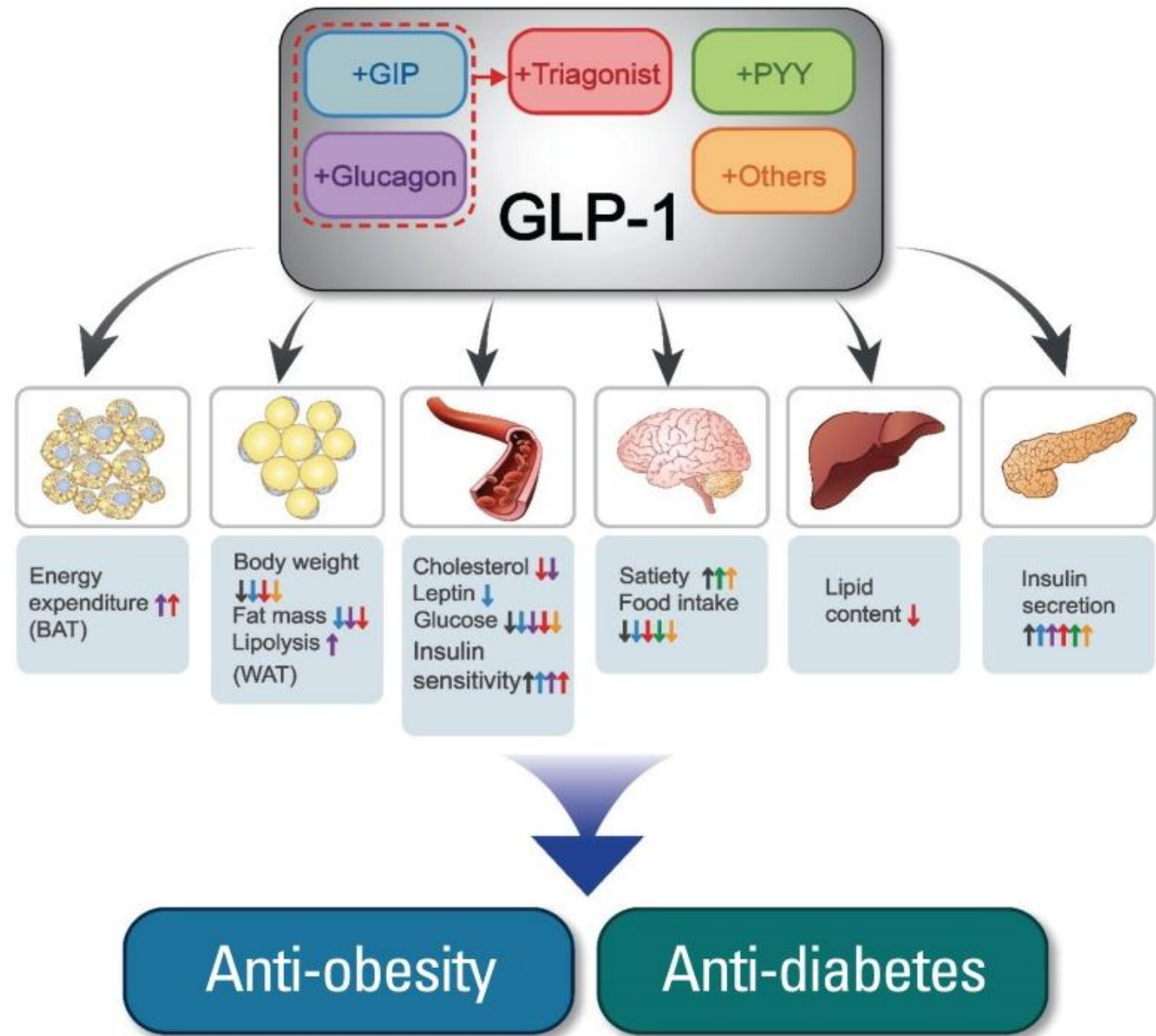
<https://www.youtube.com/watch?v=MIMYzVmPZSE>



# GLP-1 Agonist Drugs

Glucagon-like peptide-1 (GLP-1) agonist drugs function via multiple mechanisms to:

- Reduce body **fat**.
- Improve **cardiovascular** risk factors.
- Combat metabolic disorders like **type II diabetes** & fatty liver disease





# Metformin Protects Against Cardiovascular Disease

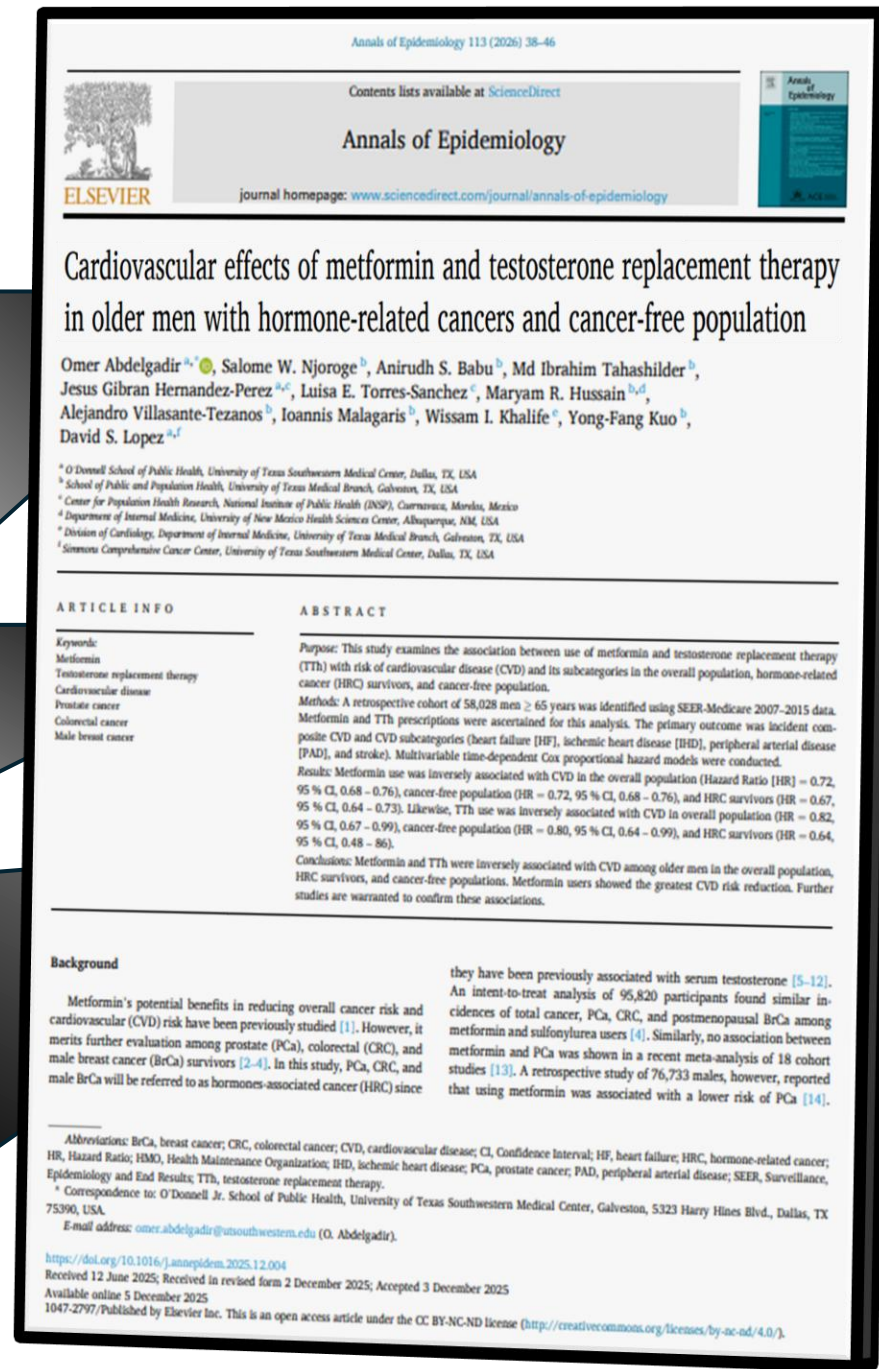
A **2026** study analyzed SEER-Medicare data from 58,028 men aged 65+ to assess the association of **metformin** and **testosterone** replacement therapy with cardiovascular disease.

**Metformin** was associated with a **28%** lower risk of **cardiovascular disease** in overall population.

Metformin reduced risk across all subcategories, including **heart failure**, **ischemic heart disease**, **peripheral arterial disease**, **stroke**. Testosterone was associated primarily with reduced **heart failure** risk.

Jan. 2026

<https://www.sciencedirect.com/science/article/pii/S1047279725003527>



## Metformin reported **to reduce shoulder stiffness** after surgery (October 2025)

- Researchers tested 500 mg of **metformin** twice per day after rotator cuff shoulder surgery in 146 patients
- Metformin administration was associated with a **60% reduction** in the likelihood of experiencing shoulder **stiffness** after surgery
- The researchers suspected that metformin might have **anti-fibrotic effects** in recovery from surgery, preventing excessive stiffness
- Metformin did not negatively affect healing

Reference: <https://pubmed.ncbi.nlm.nih.gov/41105117/>



# Metformin Attenuates Neurodegeneration in an Alzheimer's Rat Model

June 15<sup>th</sup>, 2026

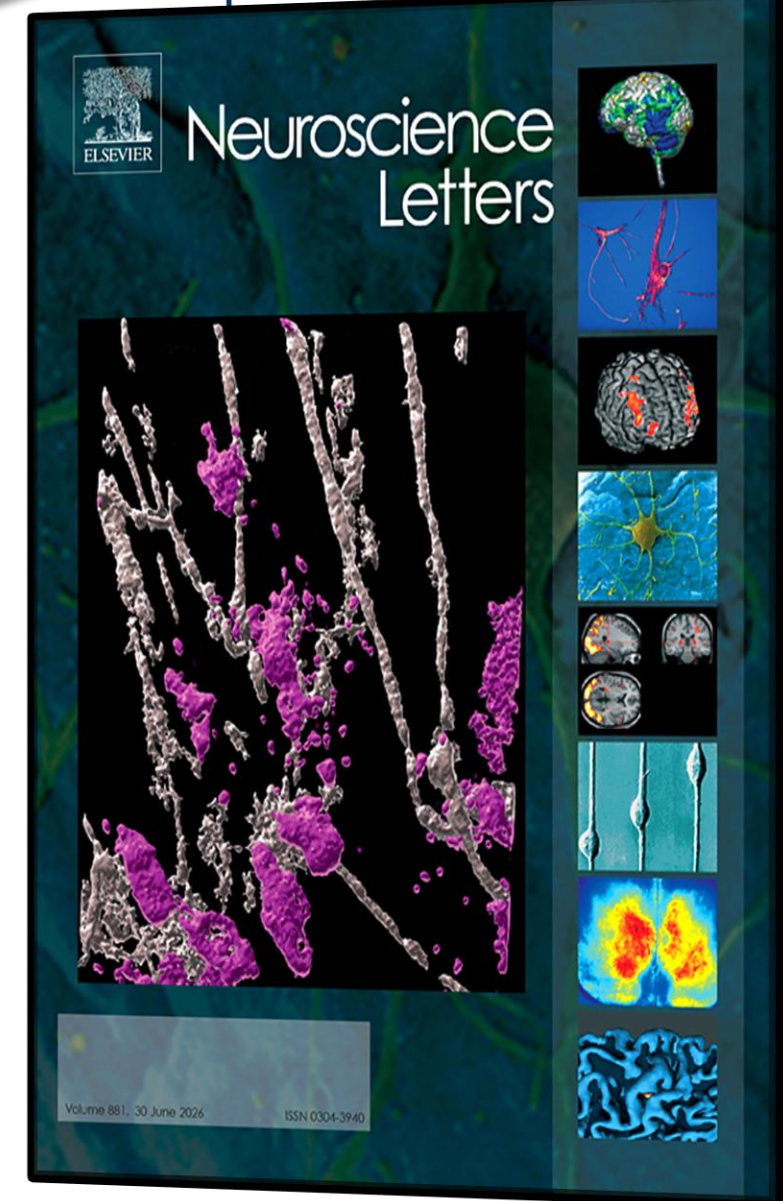
## Metformin Administration resulted in:

**Reduced brain oxidative damage:** Increased hippocampal catalase activity while lowering oxidative stress markers (MDA and TOS) in both brain tissue and blood.

**Lowered neuroinflammation:** Significantly decreased hippocampal IL-1 $\beta$ , a key inflammatory cytokine linked to Alzheimer's pathology and cognitive decline.

**Brain-specific effects observed:** Inflammation decreased in the hippocampus without corresponding reductions in blood IL-1 $\beta$ , suggesting direct central nervous system activity.

**Potential disease-modifying mechanism:** Benefits were linked to reduced oxidative stress and neuroinflammation, supporting metformin's potential as a neuroprotective intervention rather than merely symptomatic treatment.



[sciencedirect.com/science/article/abs/pii/S0304394026001163?](https://www.sciencedirect.com/science/article/abs/pii/S0304394026001163?)



# Deadly Delays!

England approves metformin: 1958

FDA approves metformin: 1994

**36-year delay** caused millions of American deaths.

**68-years** later most people don't know metformin is anti-aging drug.

**Spread the word about these delays!**





# Extra-Virgin Olive Oil *reduces* Cardiovascular Disease Risk

Sep. 2<sup>nd</sup>, 2025

<https://www.sciencedirect.com/science/article/abs/pii/S0002870325003217>

The *highest* decile of **Extra-Virgin Olive Oil** intake (60.9 Grams Per Day) was associated with **48%** lower **cardiovascular** disease risk compared to the bottom 10%.

## Major Takeaway

EVOO lowered the risk of **stroke**, **peripheral artery disease**, and **atrial fibrillation**.

Common olive oil showed weaker associations compared to EVOO.





The  
Harvard  
Gazette

# “Daily Multivitamin May Slow Biological Aging”

Greatest gains for participants who were **biologically older**, researchers say

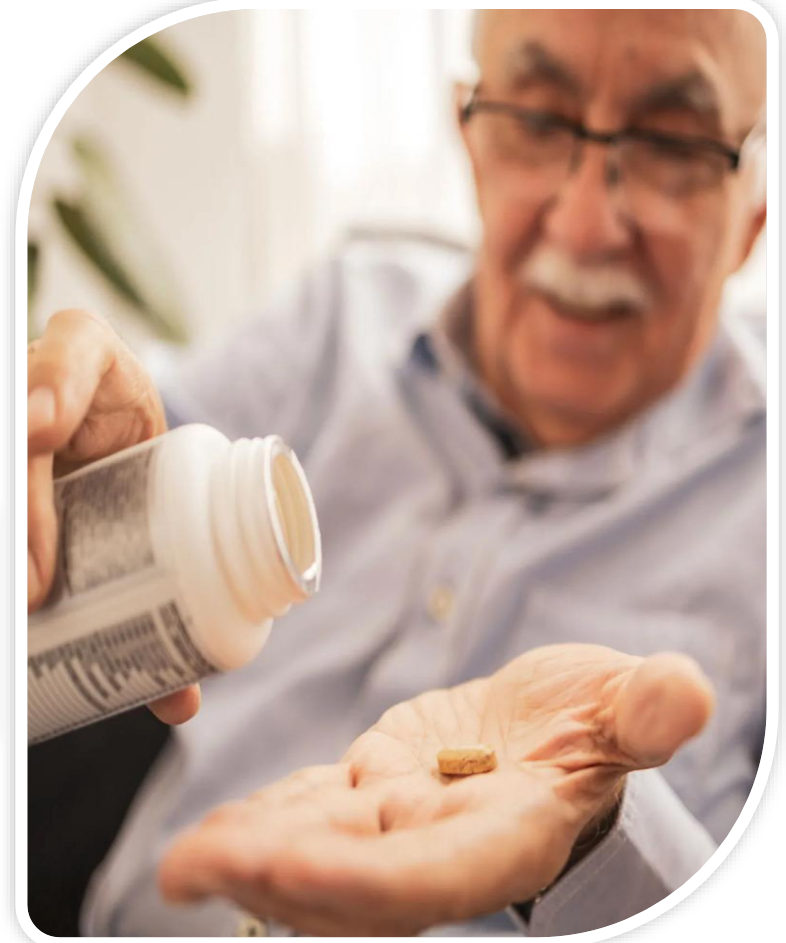
“Using data from a large randomized **clinical trial** of older adults, researchers from Harvard and Mass General Brigham evaluated the effects of taking a daily **multivitamin** over the course of two years on five measures of biological aging and found a slowing equivalent to about four months of aging.”

Compared to the placebo group, people in the multivitamin group had **slowing** in all five **epigenetic clocks**, including statistically significant slowing in two clocks that are predictive of **mortality**.

**nature medicine**

March 9<sup>th</sup>, 2026

<https://www.nature.com/articles/s41591-026-04239-3>



# Micronutrient Deficiency Linked to **Cancer Development** and **Poor Prognosis**

October 8th, 2025

<https://link.springer.com/article/10.1186/s12916-025-04370-x>

In a study on 1257 hospitalized cancer patients:

**Vitamin deficiency prevalence in the cancer arm:**

---

**Vitamin D (89.4%)**

**Vitamin B1 (80.9%)**

**Folic acid (53.5%)**

**Vitamin C (41.4%)**



# Micronutrient Deficiency Linked to **Cancer Development** and **Poor Prognosis**

October 8th, 2025

<https://link.springer.com/article/10.1186/s12916-025-04370-x>

Vitamin deficiency was found more prevalent in the cancer cohort than in the healthy controls.

Patients with **Vitamin C** deficiency had a **41%** reduced **over-all survival** than those with normal Vitamin C levels

In Stage 4 cancer patients, Vitamin C **deficiency** was associated with a **45%** increased **mortality** rate than those with normal Vitamin C levels.

# Vitamin C Lowers Biological Age in Non-human Primates

 Cell Metabolism

April 7<sup>th</sup>, 2026

Vitamin C supplementation was linked to lower **epigenetic age**, moderated iron and oxidative stress markers, and better liver function and insulin response.

Dose in **monkeys** was 30 mg/kg of body weight/day. In humans, this equates to an achievable ~10 mg/kg of weight, or about **700 mg /day** for a 70 kg (154 lb.) person

[https://www.cell.com/cell-metabolism/abstract/S1550-4131\(26\)00054-9](https://www.cell.com/cell-metabolism/abstract/S1550-4131(26)00054-9)



**Life Extension®**  
published and  
advocated for  
FDA approval of  
**thymosin alpha-1**  
in **1981**.

**81 THYMOSIN: THE IMMUNITY HORMONE**

A new therapy that may be able to keep your immune system youthful and vigorous throughout your life.

**84 AGING AND THE MAINTENANCE OF HEALTH: SOURCES OF INFORMATION  
-- PART II**

by **DURK PEARSON & SANDY SHAW**

More valuable books to aid you in developing your own life extension program.

**86 VITAMIN C & PECTIN REDUCES CHOLESTEROL LEVELS**

How the combination of these two natural agents can produce a remarkable anti-cholesterol effect.

**88 IS THYMOSIN AN ANTI-AGING THERAPY?**

More research is needed to answer this important question.

## Thymosin: The Immunity Hormone

The thymus gland is a small organ located behind the breastbone and below the neck. It is called the "master gland" of immunity because it controls the activity of the immune system. Thymosin is the name given to a family of hormones secreted by the thymus gland that "instruct" cells from the bone marrow, lymph nodes, and spleen to reject foreign tissue and combat attacking organisms.

Thymosin was first isolated by Allan Goldstein and Abraham White in the 1960s. Since then, Dr. Goldstein has been studying its effects in both animals and humans. The following interview with Dr. Goldstein was conducted by ANTI-AGING NEWS Editor/Publisher Saul Kent at George Washington University School of Medicine in Washington, D.C., where Dr. Goldstein is Chairman of the Dept. of Biochemistry.





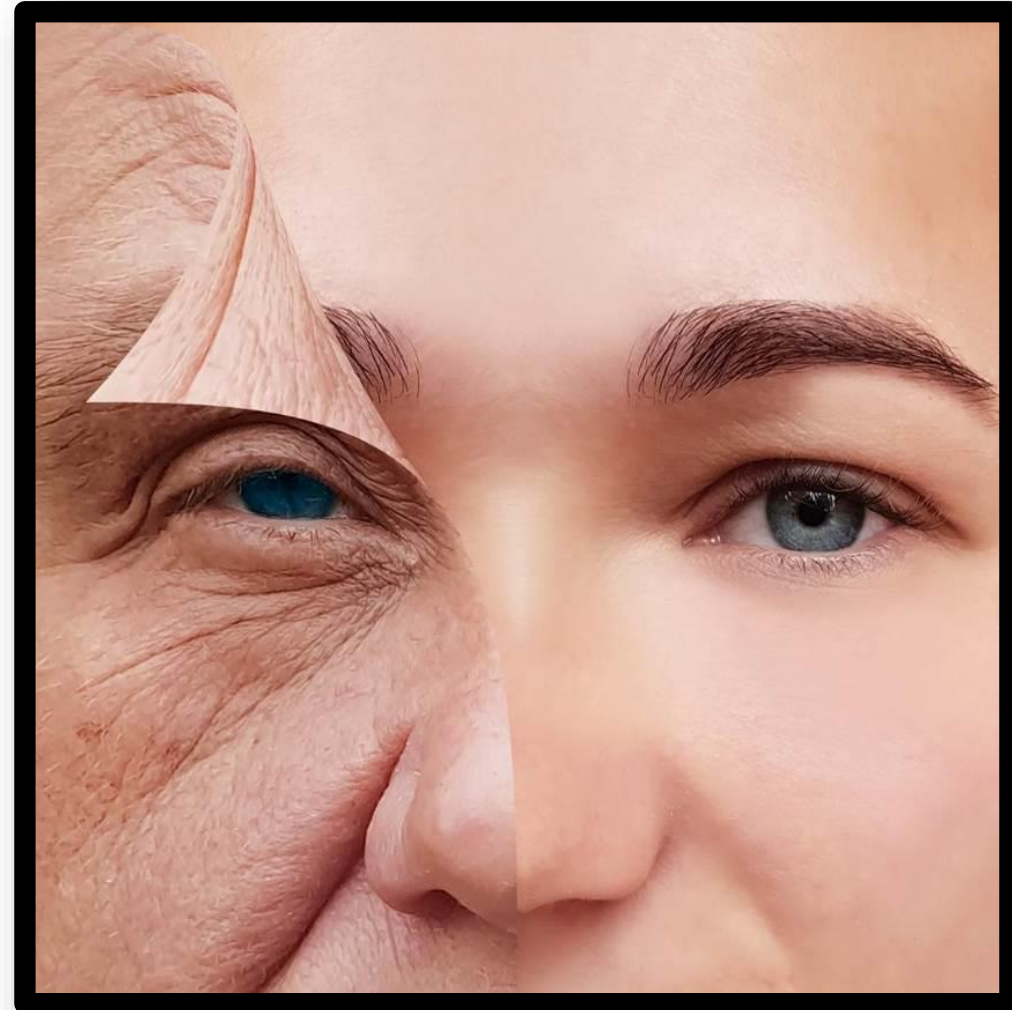
Primary mechanisms through which **thymosin alpha 1** boosts immunity:

- 1. Activation of T Cells**
- 2. Boosting Natural Killer (NK) Cell Activity**
- 3. Modulation of Cytokine Production**
- 4. Enhancement of Antigen Presentation**
- 5. Regulation of Immune Cell Apoptosis**
- 6. Anti-Viral Effects**
- 7. Immune Surveillance Against Cancer**
- 8. Regulation of Innate Immunity**

“Scientists at Intervene Immune and Stanford Medical Center have proven that ‘epigenetic aging can be reversed in humans’...

*...they are optimistic that a person's biological age can be reversed.”*

Age markers reversed by **2.5 years!**



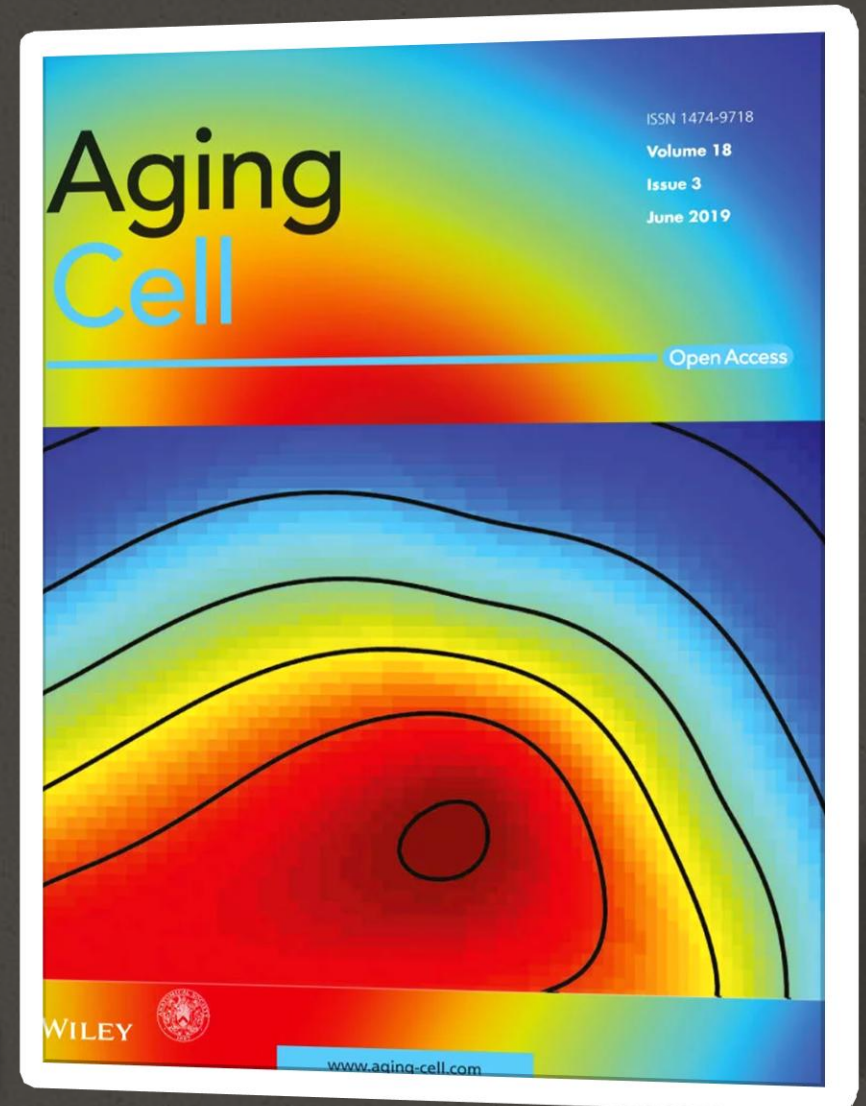
# Thymic Regeneration Therapy - Sept 2019

Study conducted by **Dr. Greg Fahy** in collaboration with researchers from **Stanford University** and **UCLA** consisted of individualized doses of:

- 1) **Human growth hormone**
- 2) **DHEA**
- 3) **Metformin**

*Study subjects also provided with daily **vitamin D3** and **zinc**.*

“Reversal of epigenetic aging and immunosenescent trends in humans.” *Aging Cell*; Sept 2019.

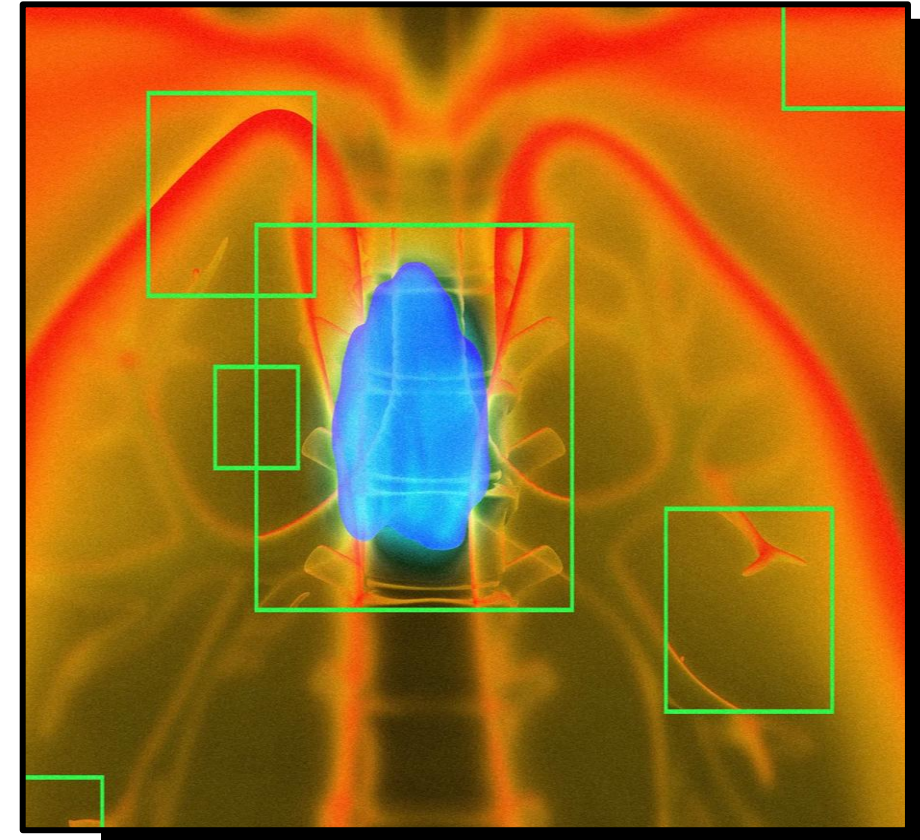




# New research reveals that thymus health may be one of the strongest predictors of lifespan, cardiovascular survival, and cancer outcomes ever found

“Using AI to analyze routine CT scans from more than 25,000 adults, the team found... People with the *highest thymic health* scores had a **50% lower risk of death** from *any cause*, a **63% lower risk of dying** from **cardiovascular disease**, and a **36% lower risk** of developing **lung cancer** compared to those with the lowest scores.”

“A second study extended these findings into cancer treatment, finding that thymic health predicted whether immunotherapy would work, cutting **cancer progression** risk by **37%** and death risk by **44%**”



1 | <https://www.nature.com/articles/s41586-026-10242-y>

2 | <https://www.nature.com/articles/s41586-026-10243-x>

3 | [thesciverse.org/new-research-reveals-that-thymus-health-may-be-one-of-the-strongest-predictors-of-lifespan-cardiovascular-survival-and-cancer-outcomes-ever-found/](https://thesciverse.org/new-research-reveals-that-thymus-health-may-be-one-of-the-strongest-predictors-of-lifespan-cardiovascular-survival-and-cancer-outcomes-ever-found/)

**Forbes**

**January 23<sup>rd</sup>, 2026**

# **Elon Musk and Larry Fink** **Discuss Probability of** **Age Reversal**

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**- World Economic Forum  
Davos, Switzerland**

**[youtube.com/watch?v=U4OaSbWmdkQ](https://www.youtube.com/watch?v=U4OaSbWmdkQ)**



**<https://www.weforum.org/podcasts/meet-the-leader/episodes/conversation-with-elon-musk-davos-2026/>**

Placeholder for video slide not uploaded



# Atherogenic Risks of Elevated Apolipoprotein B (ApoB)

*Higher **ApoB** levels strongly associated with an increased risk of **heart attacks** and **strokes** because they indicate a greater number of circulating **atherogenic particles** (LDL, VLDL, IDL, Lp(a)) that can penetrate artery walls and form occlusive plaque.*



# High ApoB = Huge Increases in Heart Attack and Stroke Risks

June 11, 2024



<https://pubmed.ncbi.nlm.nih.gov/16629855/>

This review article goes through data, including from the AMORIS and INTERHEART studies, which show that the ApoB/ApoA-1 ratio is a powerful risk predictor. It noted **107% increase in strokes** in the **upper 10<sup>th</sup> percentile of the ApoB ratio** compared to the **bottom 10 percentile**.



AMERICAN  
COLLEGE of  
CARDIOLOGY

<https://pubmed.ncbi.nlm.nih.gov/38839200/>

In a study that examined the effect of specific levels of **ApoB** excess on **atherosclerotic cardiovascular disease**, researchers highlighted the risks very clearly.

## Combined Excess ApoB Risk Table

| Excess ApoB (mg/dL)   | Women: Risk Increase | Men: Risk Increase |
|-----------------------|----------------------|--------------------|
| <11 mg/dL (reference) | Baseline             | Baseline           |
| 11–25 mg/dL           | +8% risk             | +14% risk          |
| 26–45 mg/dL           | +30% risk            | +41% risk          |
| 46–100 mg/dL          | +34% risk            | +41% risk          |
| >100 mg/dL            | +75% risk            | +52% risk          |

# High CRP in Women Increases Coronary Heart Disease 123%



August 29, 2025

Data from **Women's Health Study** found over a **30-year** period each incremental elevation in **C-reactive protein** (CRP) increased cardiovascular risks.

Comparing *highest* vs *lowest* **CRP** (in women without other risk factors):

Median **CRP** initial blood levels for **CV disease** group was **2.22 mg/L** compared to 1.50 mg/dL of those without.

Women should target CRP **<1.50 mg/L**  
(Men should target **<0.55 mg/L**).

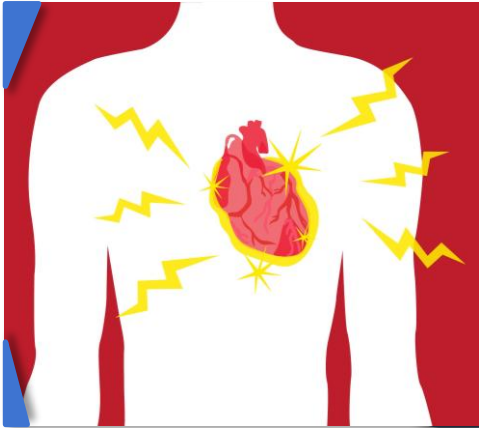
**69%↑** in **ischemic stroke**

**74%↑** in **cardiovascular** events

**123%↑** in **coronary artery** disease



## **C-Reactive Protein** and **ApoB** better in identifying **Cardiovascular Risk** than Traditional Lipid Markers



Standard blood tests measure **cholesterol**, **LDL**, and **triglycerides**.

Marker of **inflammation** (**CRP** > 2 mg/L ) and marker of high **LDL particle** number (**ApoB** > 130 mg/dL) conferred a **69%** *higher* **cardiovascular risk** than conventional lipid components.

### **Conclusion:**

“A *single* combined measure of **ApoB** with **CRP** was a better **predictor** of **cardiovascular risk** in healthy individuals *beyond* traditional lipid panel measurements in a 15-year follow-up.”

[https://www.ahajournals.org/toc/atvb/45/Suppl\\_1](https://www.ahajournals.org/toc/atvb/45/Suppl_1)

# Bill Faloon's CRP and ApoB Results

## LAB RESULTS

| Last Name  | Lab ID         | Specimen Number | Time Collected    | Date Entered   | Time Reported        |
|------------|----------------|-----------------|-------------------|----------------|----------------------|
| FALOON     | 1488877        | 281-216-2719-0  | 10/8/2025 8:14 AM | 10/8/2025      | 10/11/2025 1:35 AM   |
| First Name | Middle Initial | Phone           | Control Number    | Account Number | Account Phone Number |
| BILL       |                |                 |                   | 9134075        | 954-766-8433         |

| Test                     | Result     | Reference Test |
|--------------------------|------------|----------------|
| Apolipoprotein B (ApoB)  | 24 mg/dL   | <90 mg/dL      |
| C-reactive protein (CRP) | <0.15 mg/L | 0.00-3.00 mg/L |

Ask Your Doctor to include **CRP** and **ApoB** in Your Next **Blood Test Panel**

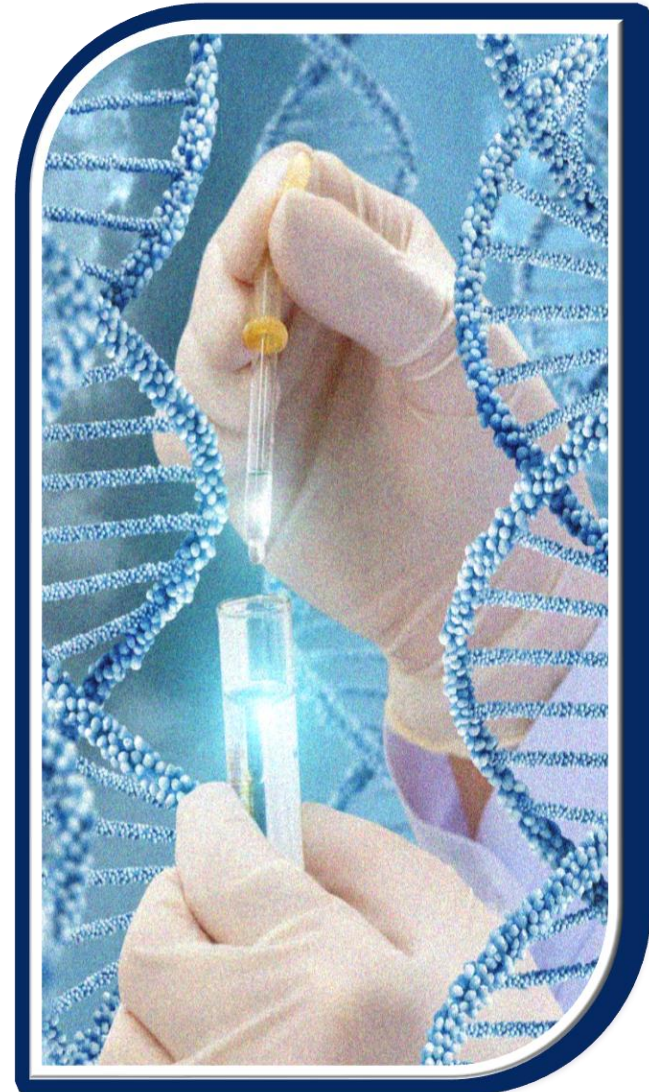
# Vitality in Aging **Research Group**

Is Enrolling Participants for a New Study:

**Assessing the Effects of Regenerative Treatments on Biological Aging: An Observational Ambispective Case Series**

**Objective:**

To evaluate the **effects** of regenerative **treatments** on **biological aging**.





To Join The

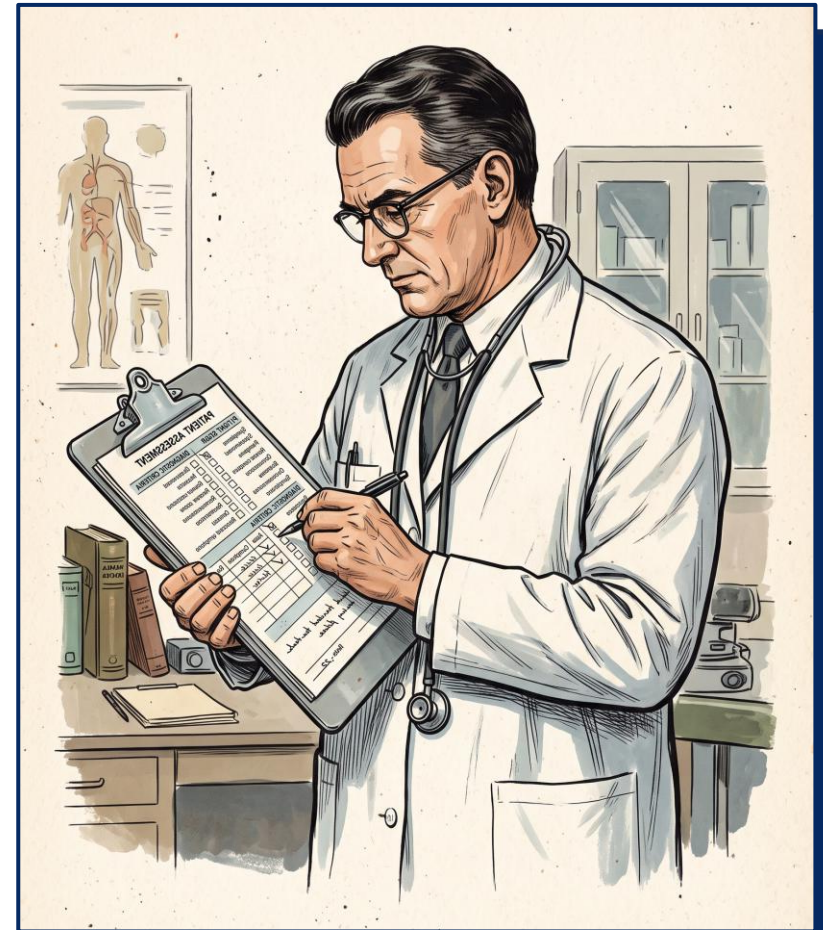
# Assessing Regenerative Treatments Study

Visit:

**[VitalityinAging.org](http://VitalityinAging.org)**

Or:

**[Age-Reversal.net](http://Age-Reversal.net)**



May 13, 2024

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2819335>

**23%** death reduction with highest adherence to Mediterranean diet:

Reduced death risks were associated with:

- ✓ Lower **homocysteine, triglycerides** (other lipids)
- ✓ Lower **C-reactive protein** (other inflammatory markers)
- ✓ Lower **creatinine** (kidney)
- ✓ Lower **insulin resistance** (diabetic markers)
- ✓ Lower **body mass**
- ✓ Higher **alanine & citrate** (mitochondria & protein synthesis)

# In-Depth Blood Tests

Expected price at

Commercial labs >\$3000

**\$295** at

**RAADfest**

or [age-reversal.net](http://age-reversal.net)

Includes calculation of biological age!

## Cardiac/Inflammatory

- Homocysteine
- C-Reactive Protein
- Apolipoprotein B

## Hormones

- DHEA-S
- Free Testosterone
- Total Testosterone
- Estradiol
- \*Progesterone (women)
- Vitamin D 25-Hydroxy
- TSH (thyroid)
- Cortisol
- SHBG

## Minerals

- Calcium
- Magnesium (serum)
- Potassium, Sodium
- Phosphorus, Chloride
- Iron & Ferritin

## Liver/Kidney

- Creatinine
- Uric Acid
- BUN
- eGFR
- BUN/Creatinine
- Protein, Total
- Alk Phosphatase
- LDH
- AST
- ALT
- GGT
- Albumin
- Globulin
- Bilirubin

## Conventional Lipids

- Cholesterol, Total
- Triglycerides
- HDL Cholesterol
- LDL Cholesterol
- Non-HDL Cholesterol
- T. Chol/HDL Ratio

## Insulin Resistance Markers

- Glucose
- Insulin
- HbA1C

## Prostate

- \*PSA (prostate men)

+ **Immune/Blood Cells**

# Basic Blood Tests

Expected price at

Commercial labs ~\$800

**\$95** at

**RAADfest**

or [age-reversal.net](http://age-reversal.net)

**Includes calculation of biological age!**

## Cardiac/Inflammatory

- C-Reactive Protein

## Minerals

- Calcium
- Magnesium (serum)
- Potassium
- Sodium
- Phosphorus
- Chloride
- Iron

## Blood Cell Counts

Red blood cells  
Hemoglobin  
Hematocrit  
MCV, MCH, MCHC, RDW  
Platelets, MPV

## Immune Cells

White blood cells  
Lymphocytes  
Neutrophils + others

## Liver/Kidney

|                  |            |
|------------------|------------|
| •Creatinine      | •LDH       |
| •Uric Acid       | •AST       |
| •BUN             | •ALT       |
| •eGFR            | •GGT       |
| •BUN/Creatinine  | •Albumin   |
| •Protein, Total  | •Globulin  |
| •Alk Phosphatase | •Bilirubin |

## Conventional Lipids

- Cholesterol, Total
- Triglycerides
- HDL Cholesterol
- LDL Cholesterol
- Non-HDL Cholesterol
- T. Chol/HDL Ratio

## Insulin Resistance Markers

- Insulin
- HbA1C
- Glucose

**ApoB** can be added to this panel for **\$15** bringing total to **\$110**.



# Blood Tests Include Calculation of Biological Age

## Biological Age Report

Subject: JOHN ADAMS | Collection Date: 6/16/2026

**Your Chronological Age:**  
**76.50 Years Old**

**Your Biological Age (Phenotypic Age)\*:**  
**65.74 Years Old**

**LIFE EXTENSION** LAB TEST  
LIFE Extension Diagnostics, Inc., 5950 North Federal Highway, Ft. Lauderdale, FL 33308  
1-800-298-3444 • LIFEextension.com

**LAB RESULTS**

| Last Name     | Lab ID         | Specimen Number | Time Collected                                                                                      | Date Entered   | Time Reported        |
|---------------|----------------|-----------------|-----------------------------------------------------------------------------------------------------|----------------|----------------------|
| First Name    | Middle Initial | Phone           | Control Number                                                                                      | Account Number | Account Phone Number |
| Date of Birth | Age            | Sex             | Fasting                                                                                             | Physician Name | Physician ID         |
| 12/17/1949    |                | M               | Yes                                                                                                 | Ramos C        | 1447451323           |
| Address       |                |                 | Account Address                                                                                     |                |                      |
|               |                |                 | LIFE EXTENSION / NATIONAL DIAGNOSTICS, INC.<br>5950 NORTH FEDERAL HIGHWAY, FT. LAUDERDALE, FL 33308 |                |                      |

**Tests Ordered**  
CMP12+LP+6AC+CBC/D/PR+PSA+...; NMR LipidProfile+Lipids+Graph; Hemoglobin A1c; Thyroxine (T4) Free, Direct, S; Testosterone, Serum; TSH; IGF-1;

ADAMS, JOHN - ID#: 961462

| Tests                                                                                                                                                                                                                           | Result    | Flag        | Units       | Reference Interval | Lab |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|-------------|--------------------|-----|
| <b>CMP12+LP+6AC+CBC/D/PR+PSA+...</b>                                                                                                                                                                                            |           |             |             |                    |     |
| Glucose                                                                                                                                                                                                                         | 92        |             | mg/dL       | 65-99              | SO  |
| Uric Acid                                                                                                                                                                                                                       | 3.8       |             | mg/dL       | 3.8-8.4            | SO  |
| BUN                                                                                                                                                                                                                             | 22        |             | mg/dL       | 8-27               | SO  |
| Creatinine                                                                                                                                                                                                                      | 0.89      |             | mg/dL       | 0.76-1.27          | SO  |
| eGFR If NonAfrican Am                                                                                                                                                                                                           | 86        |             | mL/min/1.73 | >59                | SO  |
| eGFR If African Am                                                                                                                                                                                                              | 99        |             | mL/min/1.73 | >59                | SO  |
| **Laboratory currently reports eGFR in compliance with the current**<br>recommendations of the National Kidney Foundation. Laboratory will<br>update reporting as new guidelines are published from the NKF-AASN<br>Task Force. |           |             |             |                    |     |
| <b>BUN/Creatinine Ratio</b>                                                                                                                                                                                                     | <b>25</b> | <b>High</b> |             | 10-24              | SO  |
| Sodium                                                                                                                                                                                                                          | 136       |             | mmol/L      | 134-144            | SO  |
| Potassium                                                                                                                                                                                                                       | 4.9       |             | mmol/L      | 3.5-5.2            | SO  |
| Chloride                                                                                                                                                                                                                        | 100       |             | mmol/L      | 96-106             | SO  |
| Calcium                                                                                                                                                                                                                         | 9.8       |             | mg/dL       | 8.6-10.2           | SO  |
| Phosphorus                                                                                                                                                                                                                      | 3.3       |             | mg/dL       | 2.8-4.1            | SO  |
| Protein, Total                                                                                                                                                                                                                  | 7.3       |             | g/dL        | 6.0-8.5            | SO  |
| Albumin                                                                                                                                                                                                                         | 4.8       | <b>High</b> | g/dL        | 3.7-4.7            | SO  |
| Globulin, Total                                                                                                                                                                                                                 | 2.5       |             | g/dL        | 1.5-4.5            | SO  |
| A/G Ratio                                                                                                                                                                                                                       | 1.9       |             |             | 1.2-2.2            | SO  |

Name: [REDACTED] **FINAL REPORT** 8/9/2021 8:57:54 AM Pick: \*71134647\*  
LIFE EXTENSION / NATIONAL DIAGNOSTICS, INC.  
This document contains private and confidential health information protected by state and federal law. If you have received this document in error, please call 800-298-3444.  
p.1 of 5  
Ship Method: USPS First-Class  
Order No: 87125576

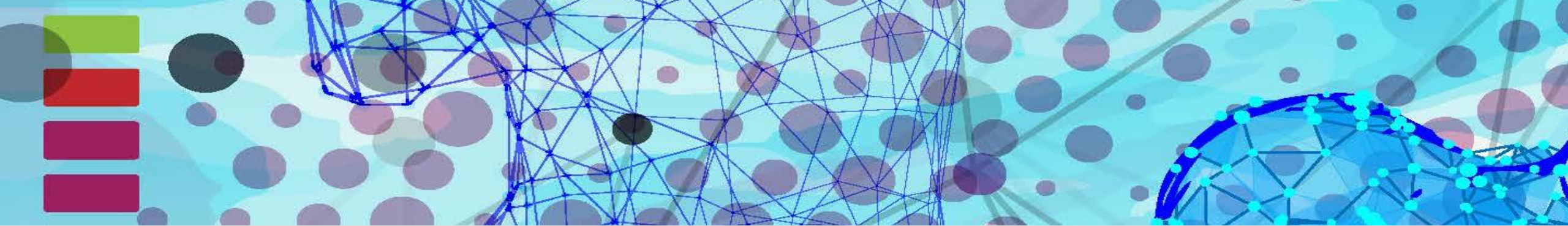
\*This report and associated calculation(s) do not constitute laboratory results and are not to be treated as such. Please consult the corresponding specimen ID for laboratory biomarker results. Phenotypic Age is calculated from the formula<sup>1</sup> described in the following publications:

Liu Z, Kuo P-L, Horvath S, Crimmins E, Ferrucci L, Levine M (2019) **Correction: A new aging measure captures morbidity and mortality risk across diverse subpopulations from NHANES IV: A cohort study.** PLoS Med 16(2): e1002760. <https://doi.org/10.1371/journal.pmed.1002760>  
Liu Z, Kuo PL, Horvath S, Crimmins E, Ferrucci L, et al. (2018) **A new aging measure captures morbidity and mortality risk across diverse subpopulations from NHANES IV: A cohort study.** PLOS Medicine 15(12): e1002718. <https://doi.org/10.1371/journal.pmed.1002718>  
Levine ME, Lu AT, Quach A, Chen BH, Assimes TL, Bandinelli S, Hou L, Baccarelli AA, Stewart JD, Li Y, Whitsel EA, Wilson JG, Reiner AP, et al. **An epigenetic biomarker of aging for lifespan and healthspan.** Aging (Albany NY). 2018 Apr 18;10(5):573-591. <https://doi.org/10.18632/aging.10141>

# This Does Not Work!

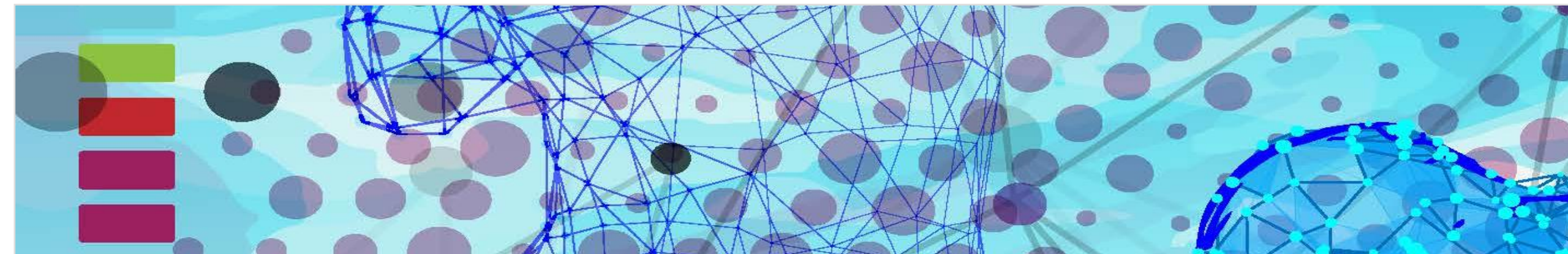
Ignoring a sign/symptom of a disease...or avoiding diagnostics/treatment does not prevent the onset and progression of degenerative illnesses.





View this entire presentation at:

**[age-reversal.net](http://age-reversal.net)**





# Age Reversal Update

**William Faloon**

**Life Extension<sup>®</sup>**

*September 4, 2026*

**RAADfest – Scottsdale, AZ**

**[www.age-reversal.net](http://www.age-reversal.net)**

