



L-NUTRA

L-Nutra's  
Fasting Mimicking Diets

Science and Clinical Application

# Let Me Introduce Myself

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(Herbalist), Ba (Hons)

 **L-NUTRA**





# Fasting: Rooted in Evolution, Proven by Science

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## Fasting: Part of Human Evolution

Fasting was part of traditions across cultures and time

Fasting is or was practiced by 5 major religions

Fasting was replaced by patterns of uninterrupted, daily food intake

# Fasting has returned



# Benefits of Fasting

## Brain and behavior

- Improved cognition
- Improved memory
- Generation of new neurons
- Reduced cognitive decline
- Reported improved in self-esteem and confidence

## Blood

- Elevated ketones
- Reduced blood glucose, insulin and leptin
- Reduced markers of inflammation and stress
- Reduced IGF-1

## Cardiovascular

- Reduced blood pressure
- Reduced total and LDL cholesterol
- Reduced triglycerides

## Skin

- Increased skin hydration
- Improved skin texture
- Reduced inflammation

## Liver

- Glycogen depletion
- Ketone production
- Increased insulin sensitivity
- Reduced lipid accumulation

## Fat tissue

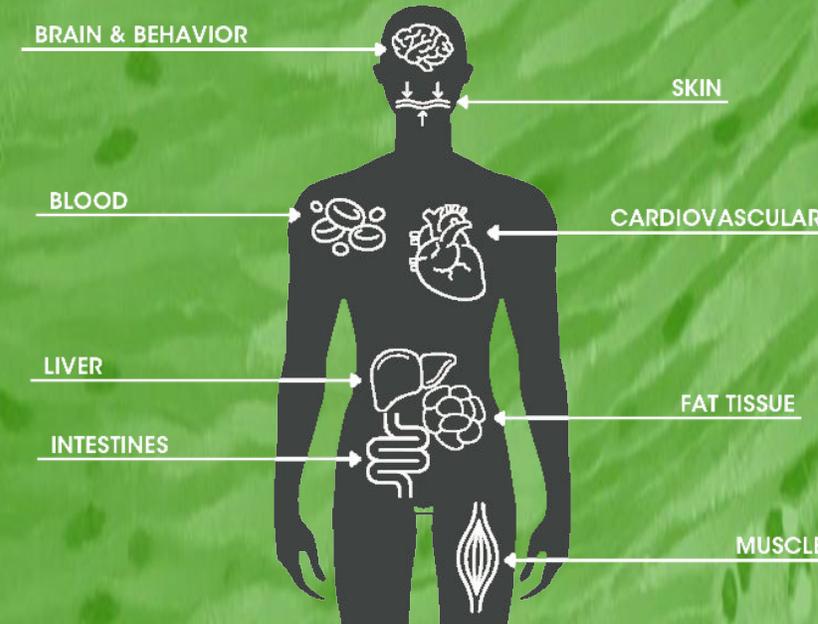
- Increased fat breakdown
- Loss of visceral fat
- Reduced inflammation

## Intestines

- Increased the number of stem cells
- Reduced inflammation
- Higher proportion of protective gut microbiota

## Muscle

- Increased insulin sensitivity
- Lean muscle mass and function maintenance



# What is Fasting?

## **Common Definition**

Abstinence from all or some kinds of food and drink.

## **Physiologic Definition**

The switch from burning external glucose for energy to burning internal fatty acids and ketones as main source of fuel; more efficient use of energy.

## **Cellular Definition**

The absence of triggers of nutrient sensing pathways; stimulation of stress resistance.



# Not All Fasting Is The Same



# Challenges Associated with Prolonged Water Fasting

1. Adherence
2. Safety
  - Gallstones
  - Dehydration
  - Hypotension
  - Hypoglycemia
3. Protection Muscle
4. Nutrient Deficiency

## Adherence Safety

Bolondi L et al., Gut. 1985; Wilhelmi de Toledo et al., PLoS One. 2019

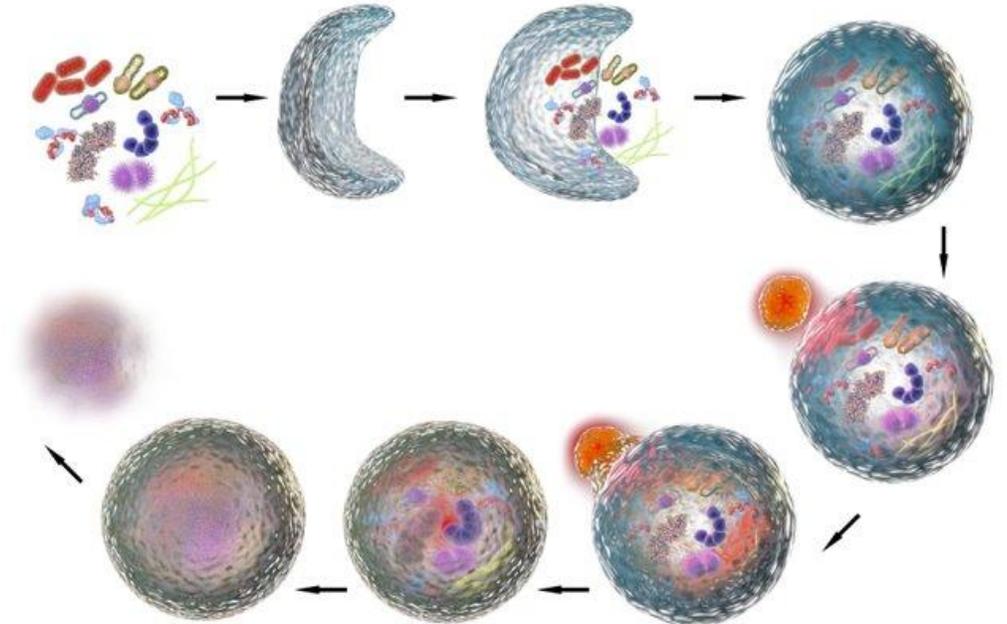


# Effect of Prolonged Fasting on the Cellular Level

## Autophagy

Poorly functioning organelles - such as mitochondria, and misfolded proteins - are targeted for destruction  
Body's way of cleaning house – innate recycling  
Important in inflammation, immune function and cellular rejuvenation

Triggered by prolonged fasting



2016 NOBEL PRIZE : Yoshinori Ohsumi

"Discovery of Mechanisms for Autophagy"

But How Can You Get The  
Benefits  
of Water-Only Fasting  
**Without the Risk?**

# Valter Longo, PhD

Biochemist and cell biologist, and Director of the Longevity Institute at USC.

Discovered that reducing certain growth and metabolic signals can extend lifespan and protect against age-related diseases.

Applied this knowledge to develop the first diet that mimics fasting.



## 25+ Years of Research and Development

Foundational preclinical work, completed and pending clinical trials

18+ Prestigious Institutions: University of Southern California, Buck Institute, University of Genoa, IFOM

## \$48M+ in total research grants

\$36M from National Institutes of Health & European Union for aging, fasting, and FMD research

\$12M of additional funding for FMD clinical trials



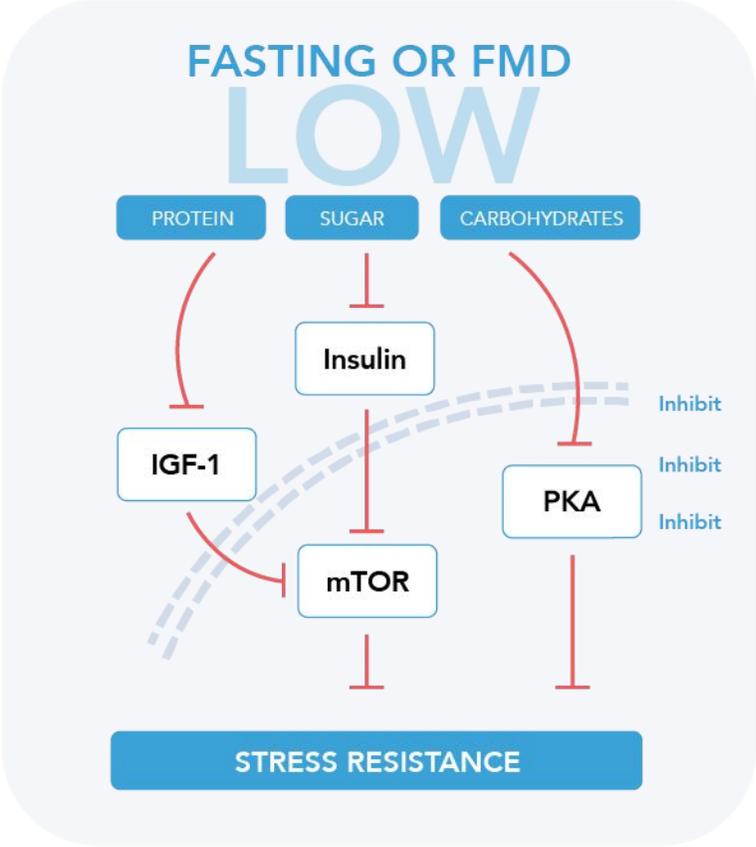
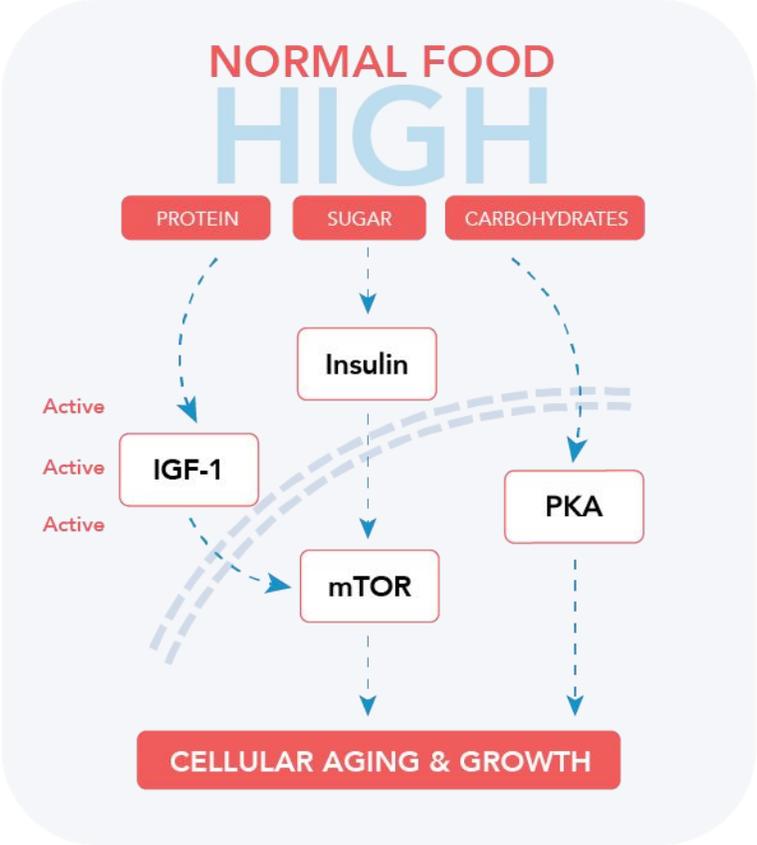
# What is the Fasting Mimicking Diet (FMD)

## Fasting... with Food

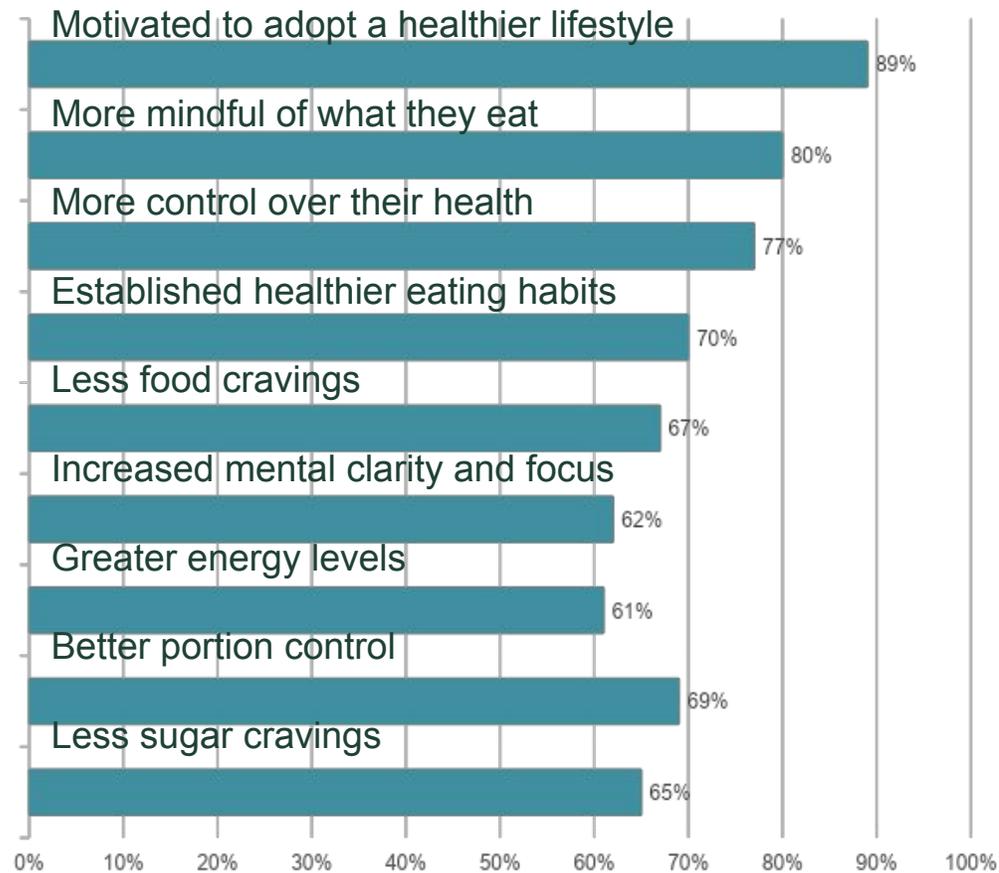
Plant-based food designed to nourish your body while keeping it in a fasted state



# How Fasting Mimicking Works



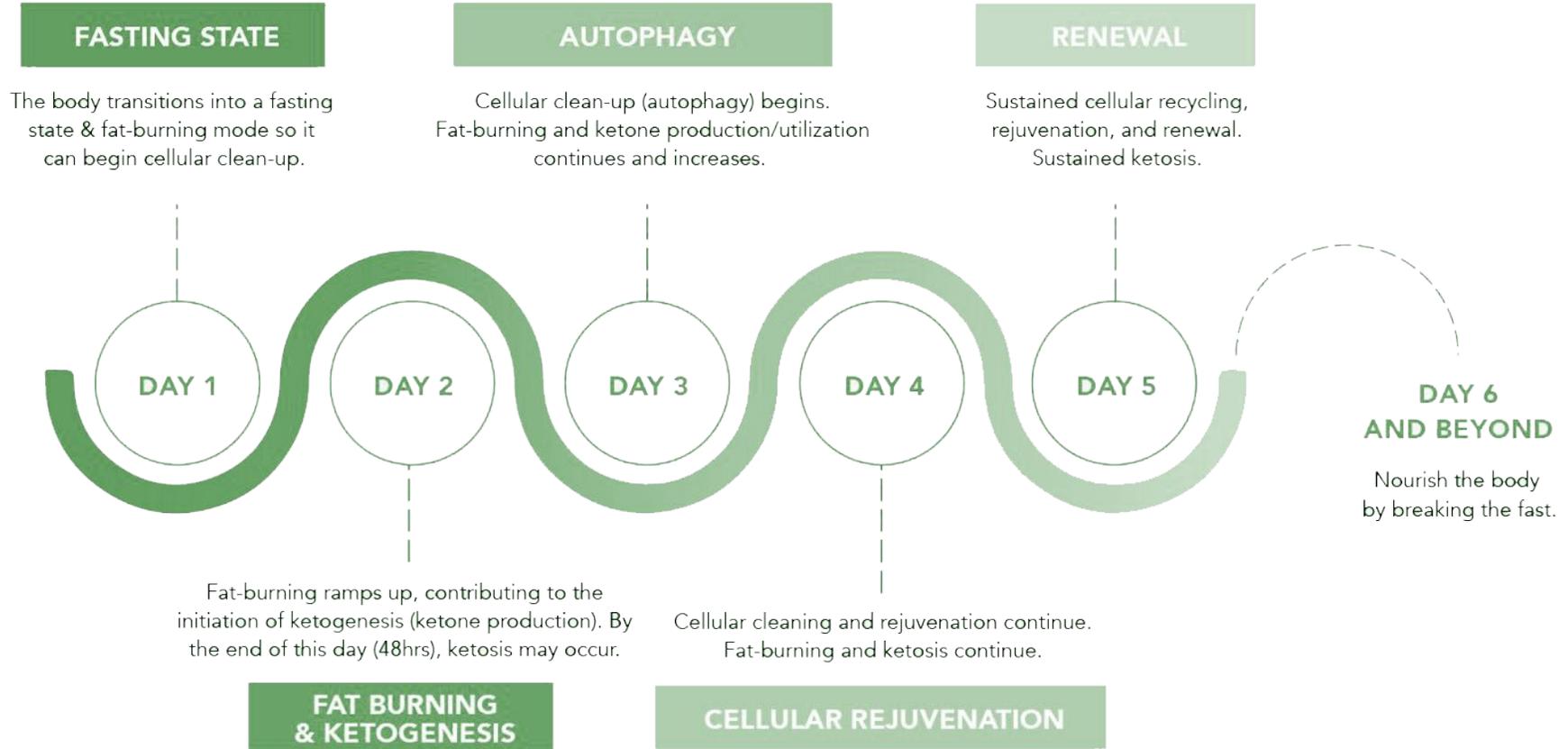
# IMPACT ON BEHAVIORAL AND EMOTIONAL WELLBEING

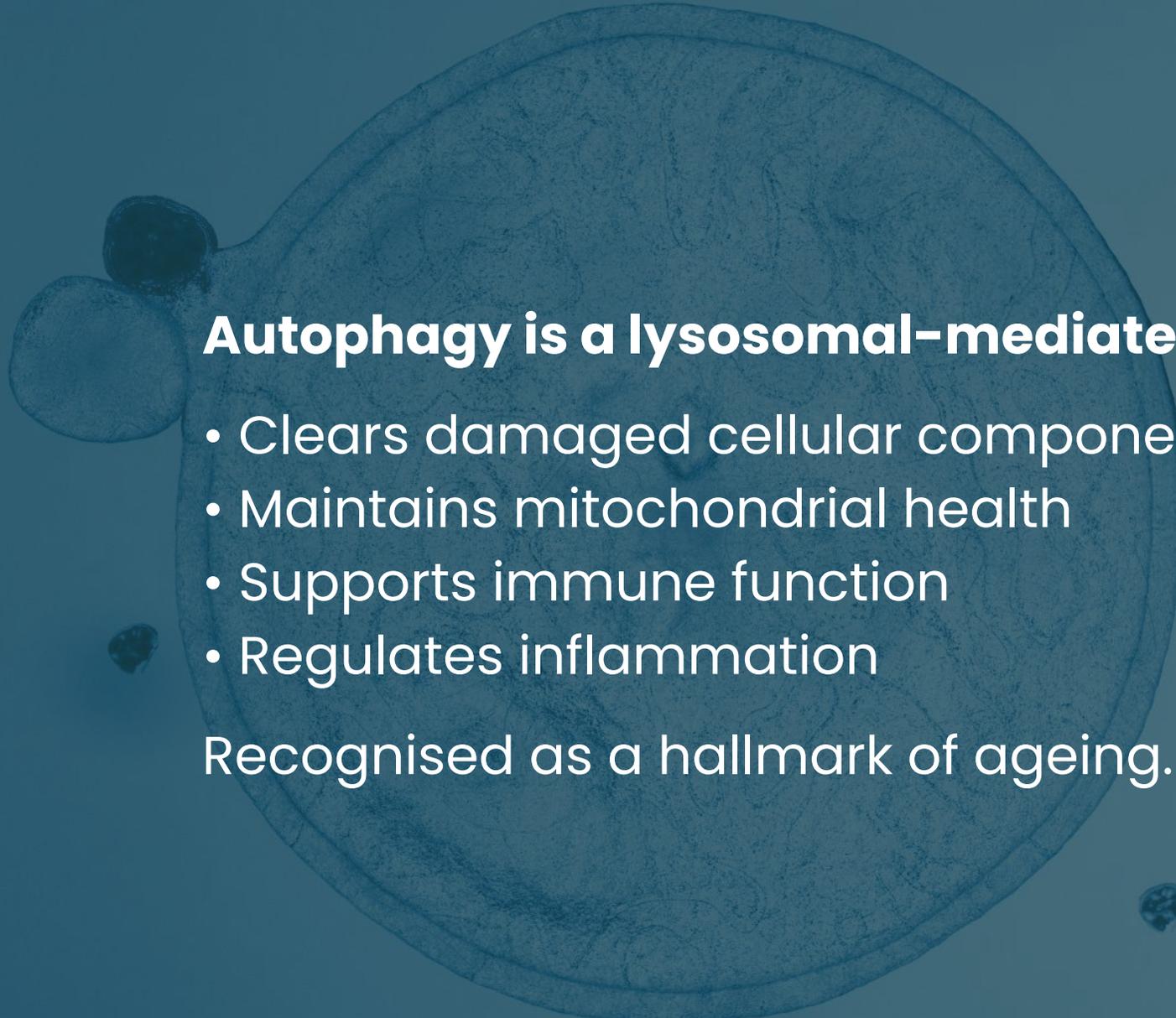


\*Based on survey of >2000 customers after 1 cycle, conducted by L-Nutra June 2019



# The Prolon 5-Day Journey





**Autophagy is a lysosomal-mediated process that**

- Clears damaged cellular components
- Maintains mitochondrial health
- Supports immune function
- Regulates inflammation

Recognised as a hallmark of ageing.

When autophagy  
declines,  
**cellular dysfunction**  
increases.



## **Autophagy dysfunction has been implicated in**

- Neurodegenerative disease
- Cancer
- Autoimmune conditions
- Metabolic disease

Until now, we've measured autophagy primarily in animals.

# THE FIRST HUMAN CLINICAL TRIAL

A randomised clinical trial  
measuring autophagy in humans

# Primary Measurements

Autophagic flux  
in peripheral blood mononuclear cells

Measured using LC3B-II / LC3B-I ratio  
with chloroquine modulation.

Also assessed:

- Fasting glucose
- Insulin
- IGF-1
- $\beta$ -hydroxybutyrate – Ketones
- HOMA-IR – Insulin

# From baseline to Day 6

↓ Body weight

↓ Fasting glucose

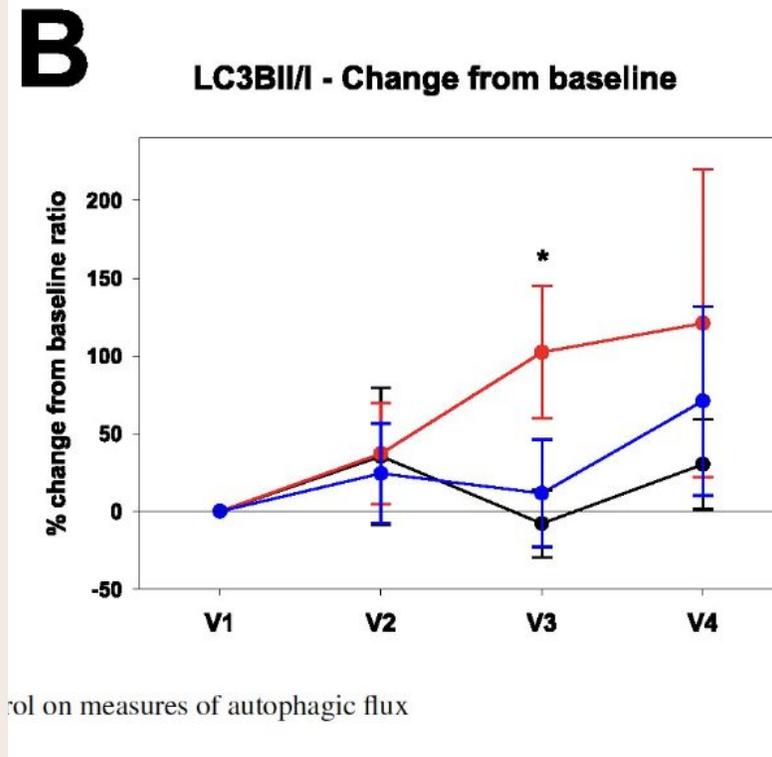
↓ Insulin

↓ HOMA-IR

↑  $\beta$ -hydroxybutyrate

Compared to control.

# Prolon FMD increased autophagic flux by Day 6

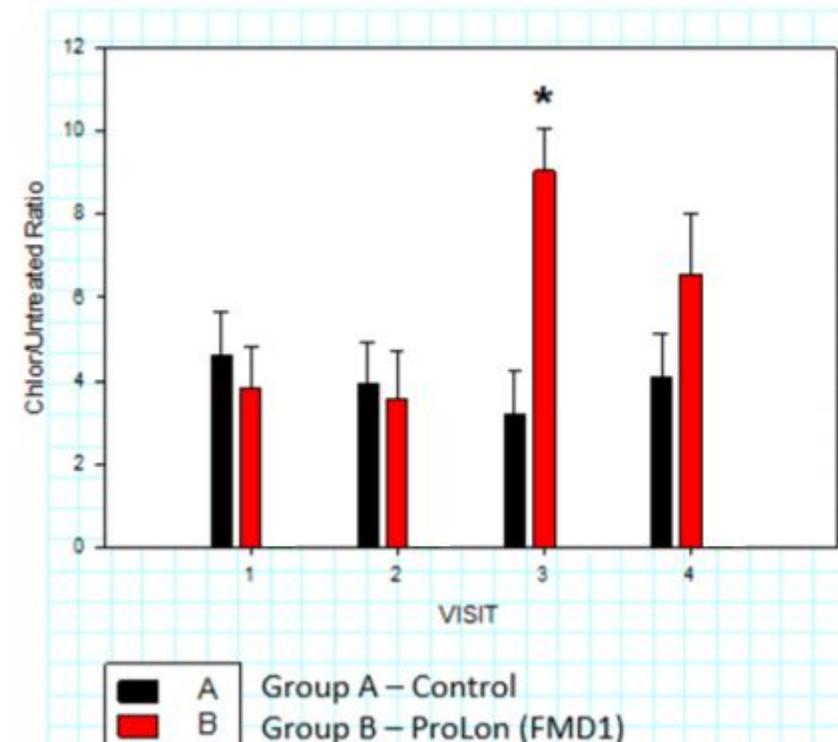


# Prolon & Autophagy

## STUDY DESIGN: WESTERN BLOT OF LC3II/I RATIO

After 4 days there was a significant increase in autophagy measured in Prolon, as opposed to control

Autophagy continued through day 7!





## **Fasting-mimicking diet causes hepatic and blood markers changes indicating reduced biological age and disease risk**

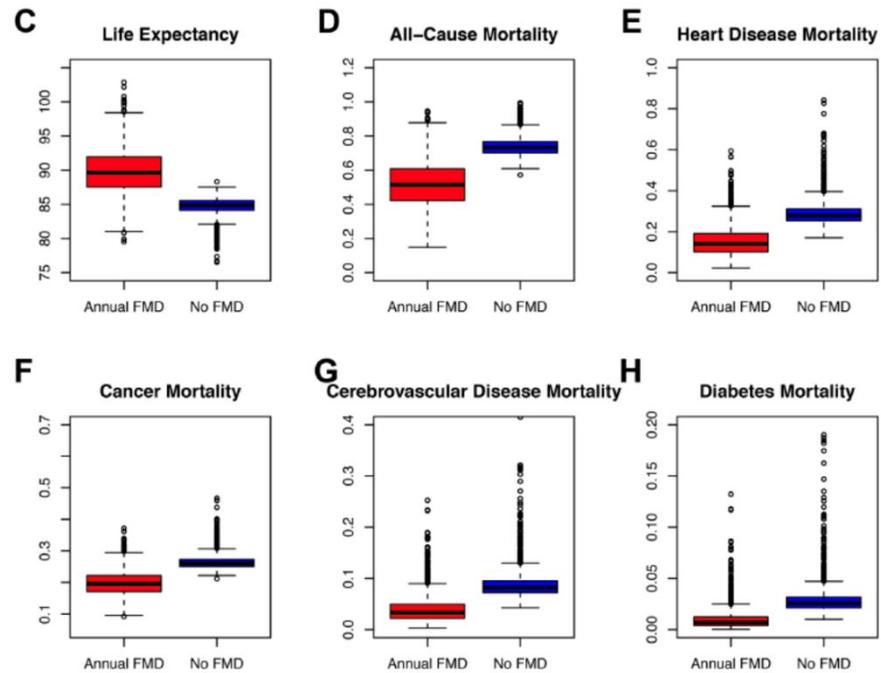
**2.5yrs Biological Age Score Reversal in 1 Year (3 Cycles)**

**11yrs Biological Age Reversal in 20 Years (3 Cycles/Yr)**

Simulated data from NHANES model



# 3 CYCLES OF PROLONG/YEAR FOR 20 YEARS IMPROVES DISEASE RISK (SIMULATED)



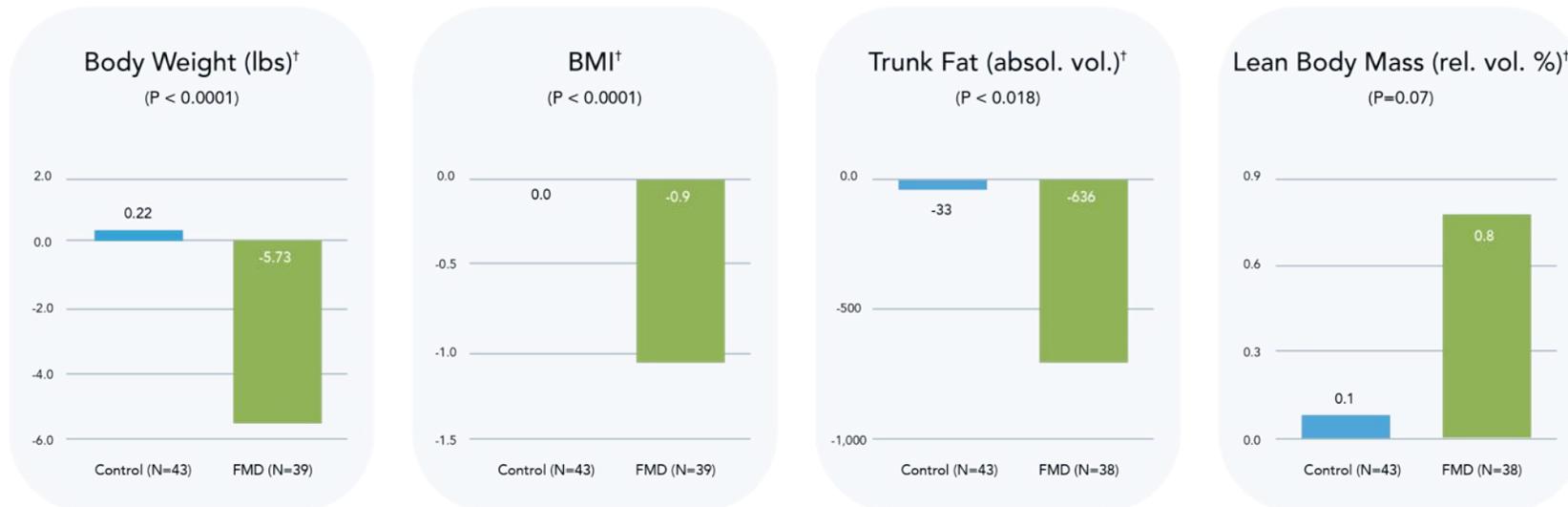
	Adjusting for BMI (N=51)		
	BL	3 FMD	Relative Reduction (%)
All Cause Risk	11.38	10.18	10.54
Heart Risk	2.35	1.96	16.60
Cancer Risk	4.60	4.31	6.30
Cerebrovascular Risk	0.49	0.38	22.45
Diabetes Risk	0.24	0.18	25.00

	≥ 1 risk factor (N=30)		
	BL	FMD	Relative Reduction (%)
All Cause Risk	15.4	13.3	13.64
Heart Risk	3.4	2.7	20.59
Cancer Risk	5.9	5.3	10.17
Cerebrovascular Risk	0.77	0.58	24.68
Diabetes Risk	0.34	0.23	32.35

Brandhorst, S. et al. (2024). Fasting-mimicking diet causes hepatic and blood markers changes indicating reduced biological age and disease risk. Nature communications, 15(1), 1309. <https://doi.org/10.1038/s41467-024-45260-9>

# STUDY DESIGN: HEALTHY INDIVIDUALS UNDERGOING 3 MONTHLY CYCLES OF PROLON

**Anthropometrics 5.7lb Weight loss,  
Decreased BMI, Abdominal Fat Reduction,  
Maintain Lean Body Mass**

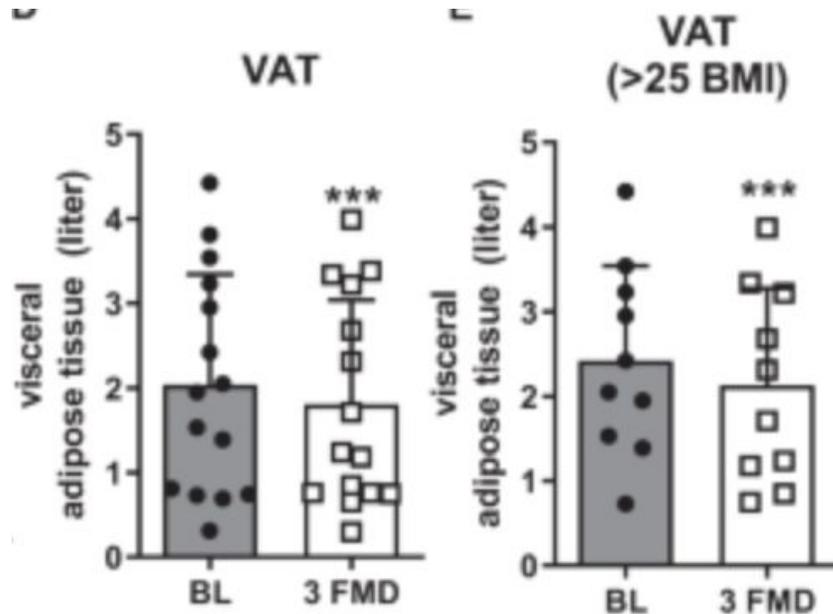


“Wei, M., et al. (2017). Fasting-mimicking diet and markers/risk factors for aging, diabetes, cancer, and cardiovascular disease. *Science translational medicine*, 9(377), eaai8700. <https://doi.org/10.1126/scitranslmed.aai8700>”

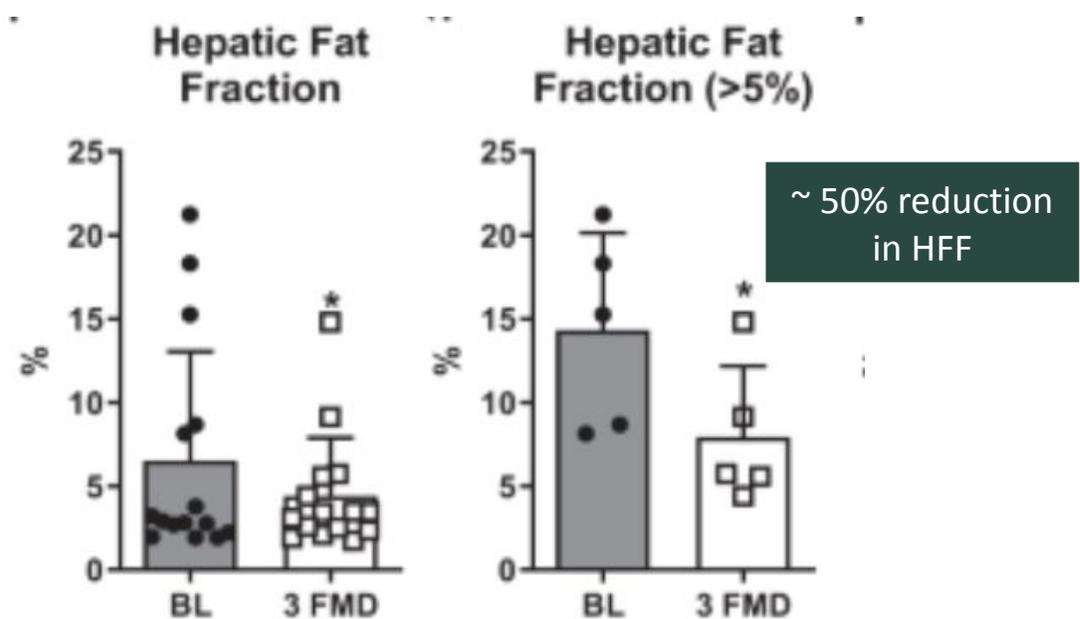
# HEALTHY INDIVIDUALS UNDERGOING 3 CYCLES OF FMD

Anthropometrics Decreased Visceral Fat, Decreased Hepatic Fat

### Visceral Fat

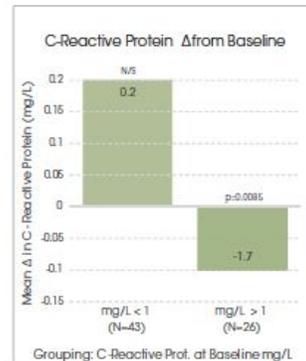
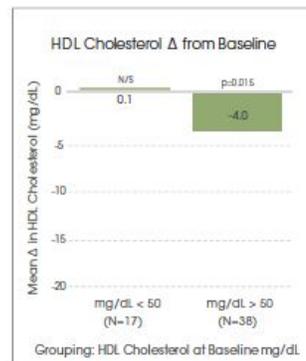
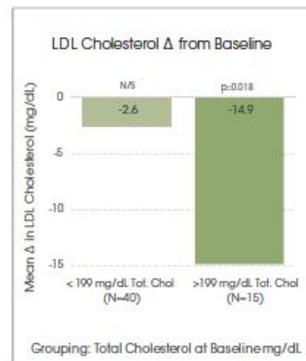
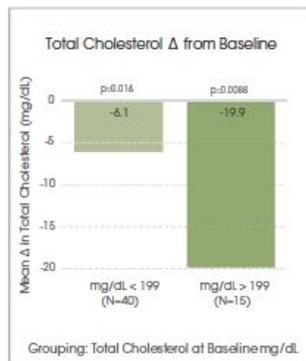
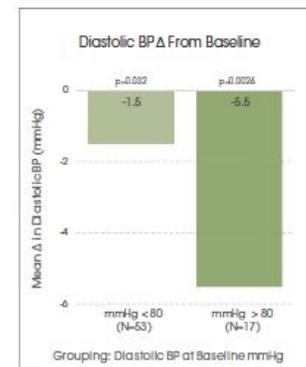
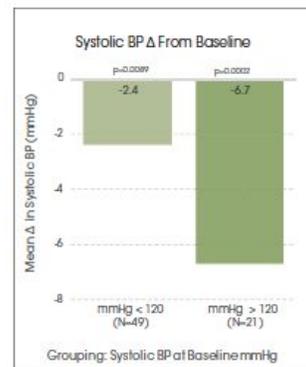
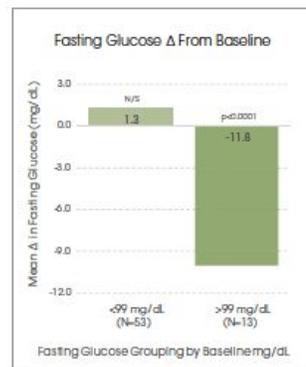
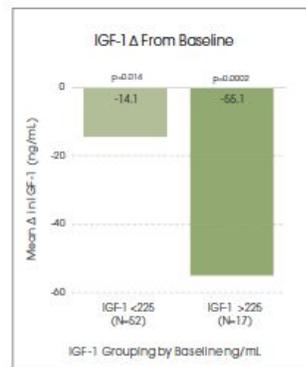
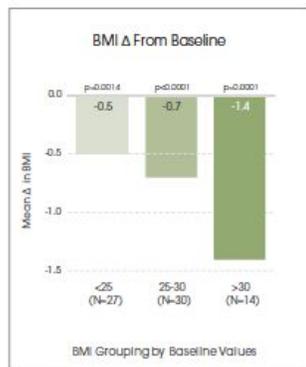


### Hepatic Fat



\*Brandhorst, S., et al. (2024). Fasting-mimicking diet causes hepatic and blood markers changes indicating reduced biological age and disease risk. Nature communications, 15(1), 1309. <https://doi.org/10.1038/s41467-024-45260-9>

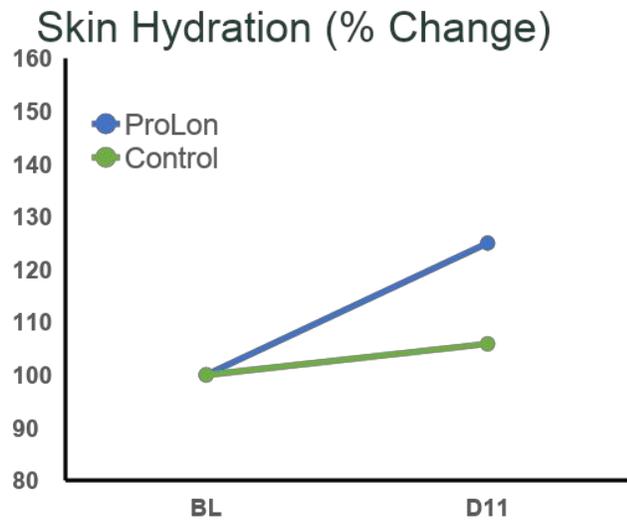
## Post-hoc Analysis on Participants Segmented by Marker Levels



Safety:  
Not associated with dangerous drops in biomarkers

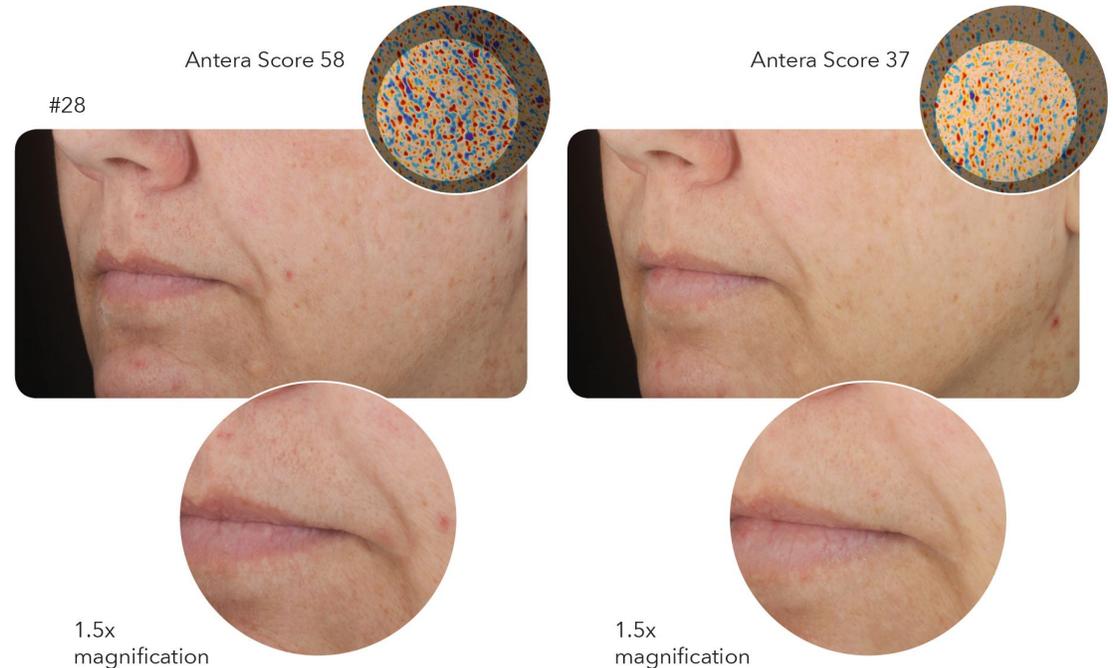
# SKIN IMPROVEMENT WITH ANTERA + VISIA & SELF ASSESSMENTS

After 1 Cycle: 25% improvement in skin hydration



25% improvement in hydration after just 1 cycle

Baseline to Day 71: Antera score improvement of 21

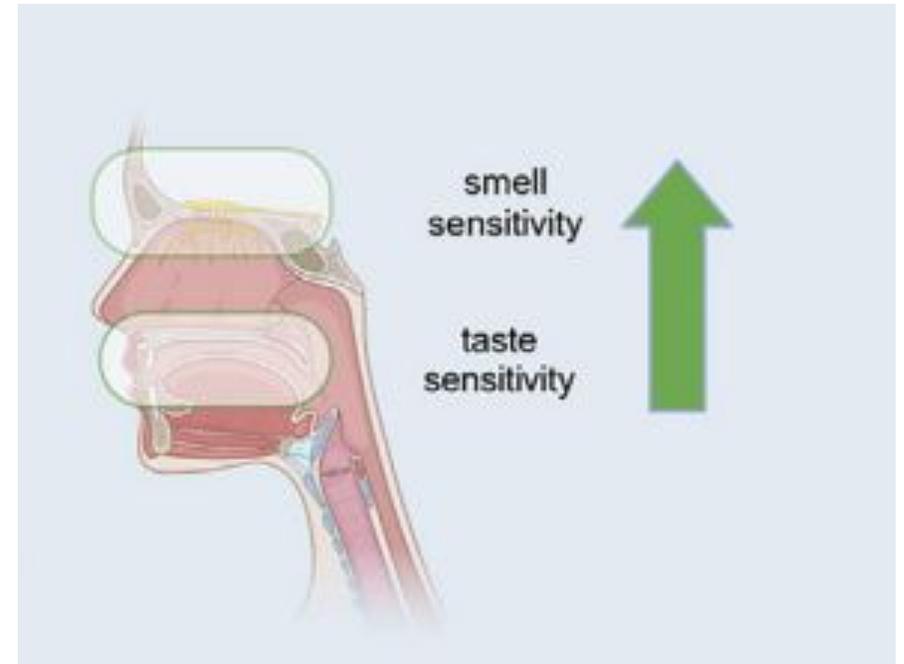


# CHEMOSENSORY AND CARDIOMETABOLIC

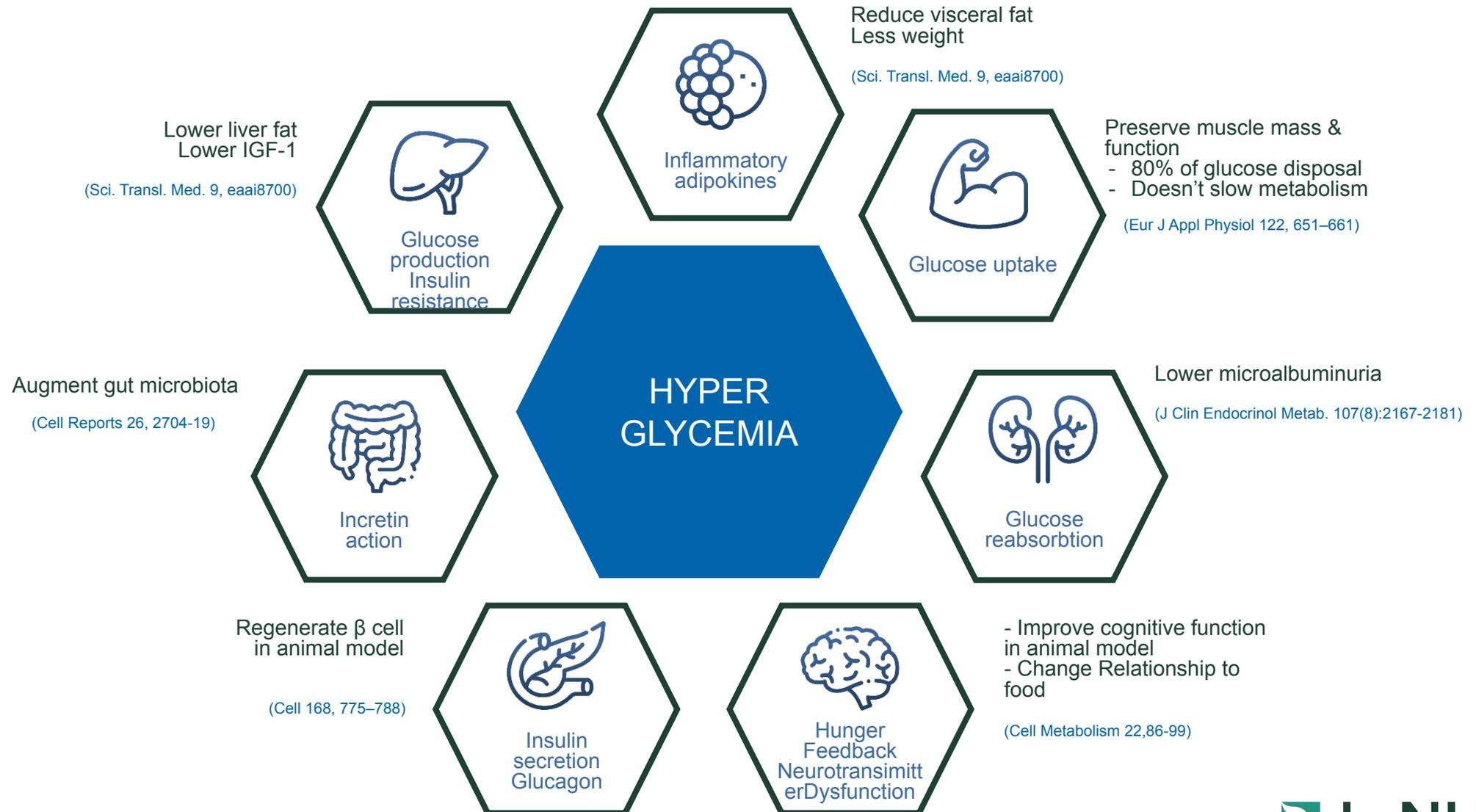
- Portion of patients with hyposmia was reduced by nearly 6-fold
- Improvements not simply by causing weight loss.
- Suggest a multi-systemic “reset” caused by FMD cycles that may involve autophagy as well as stem cell activation and/or cellular epigenetic reprogramming

**A fasting-mimicking diet reduces the number of hyposmic subjects from 38.1% to 6.4%**

Micarelli, A. (2025). Chemosensory and cardiometabolic improvements after a fasting-mimicking diet: A randomized cross-over clinical trial. *Cell reports. Medicine*, 6(2), 101971. <https://doi.org/10.1016/j.xcrm.2025.101971>



# FMD holistically targets root cause, going beyond A1C reduction





Reference List and Clinical Trials

<https://drive.google.com/drive/folders/16xJsTfXCiwO8oaekffa9ACFBiUgb2HB>

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