

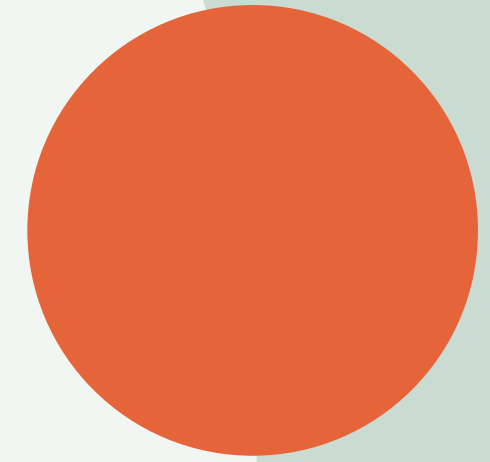
# GlycanAge

Personal Report

Jane Doe

GA019-0484

Date of sampling: Jan 4, 2023



## What is GlycanAge?

GlycanAge is a scientifically proven measurement tool. It responds quickly to lifestyle changes, allowing you to measure their impact.

It works by measuring **chronic inflammation** in your immune system at the molecular level – also known as **inflammaging**.

## What can it tell me?

Your biological ageing is influenced by your genes, age, and **lifestyle**. GlycanAge measures how your **lifestyle** choices affect the activity of your immune system.

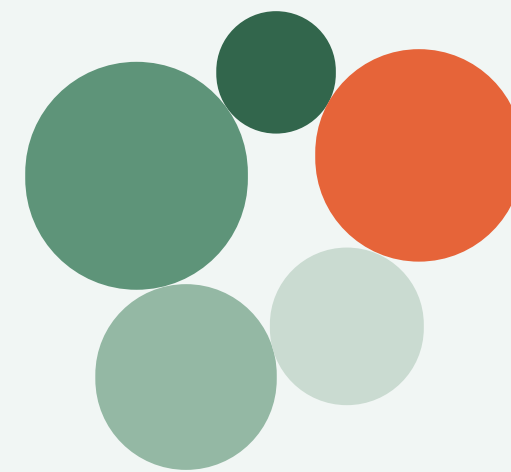
If you make changes and re-test, GlycanAge will help you understand whether the adjustments in your lifestyle and habits are moving you in the right direction.

### How do we analyse your profile?



#### Analyse composition

We look at 29 different glycan structures gathered from your blood sample to determine your unique glycan composition.



#### Group data into indexes

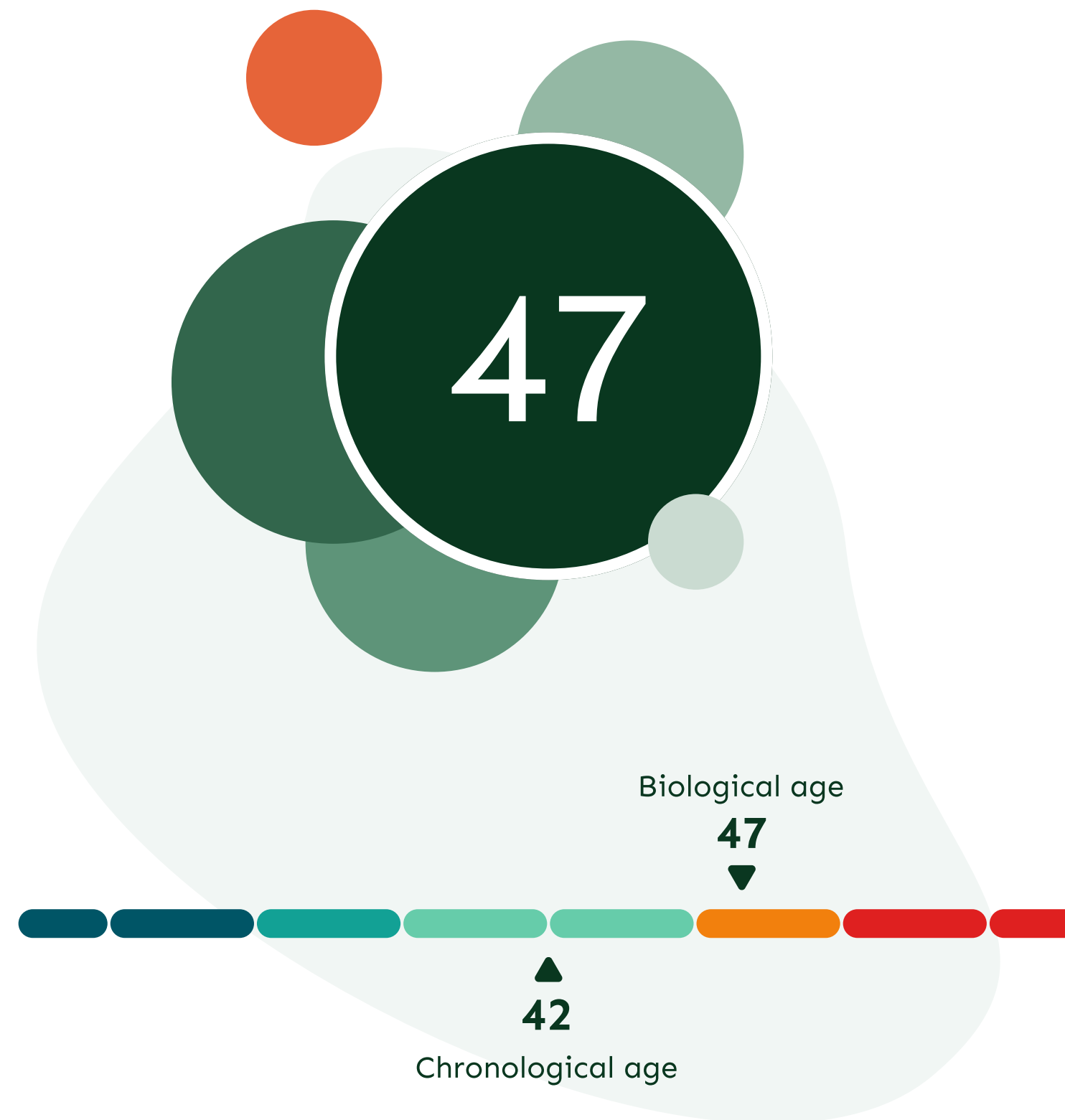
We group related structures into indexes. Some indexes promote chronic inflammation, while others shield you against it.



#### Calculate GlycanAge

We combine and weight your data to calculate your GlycanAge – a single number that represents the current age of your immune system.

## Your Biological Age



# Your results are in.

Your biological age is **5 years older** than your chronological age

Remember, you're no less healthy than you were yesterday.

Knowledge is power and you now have the knowledge and the power to improve this number. If you haven't already, don't forget to **fill in your health questions** and **book your free specialist consultation** to learn about areas you might want to investigate and improve.

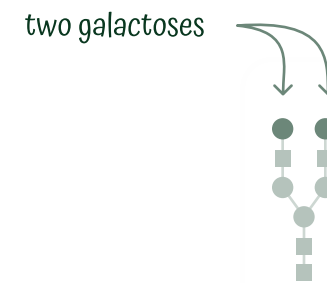
RESULT BREAKDOWN:

## Anti-inflammatory indexes

These indexes protect against chronic inflammation, so it is **better to have more** of them. Their main feature is containing **galactose** and **sialic acid**.

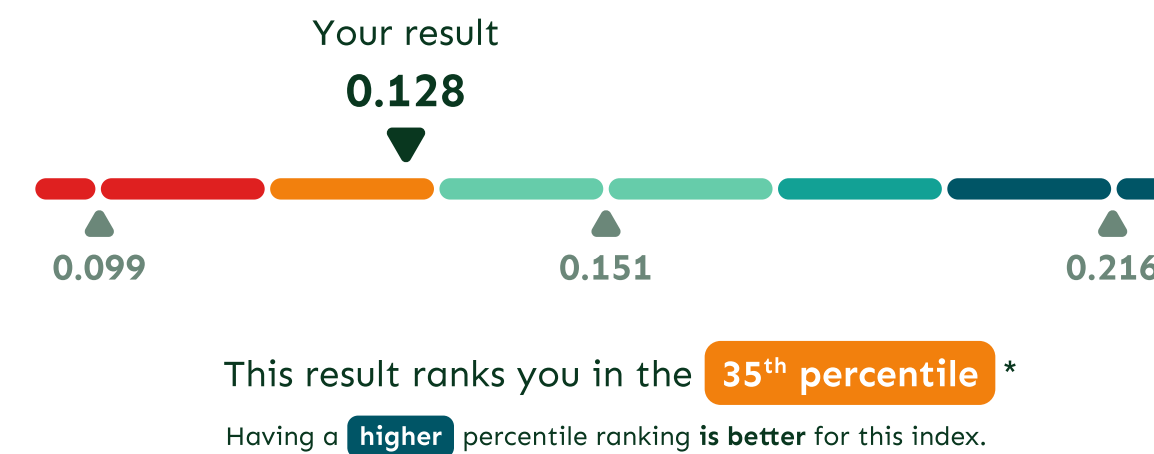
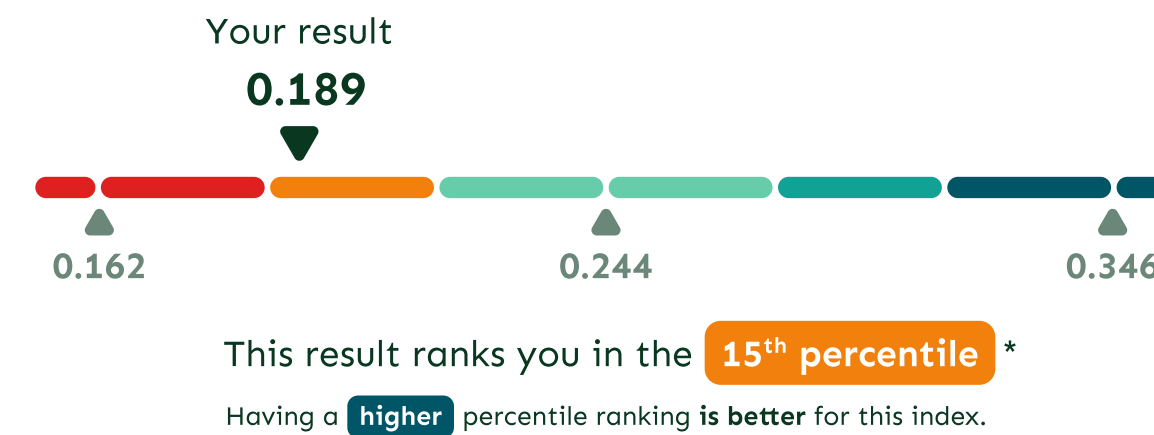
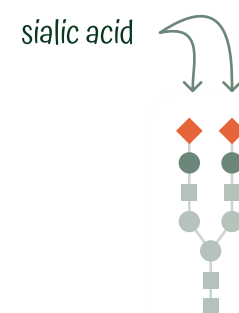
### Glycan Youth

Glycan Youth represents glycans with **two galactoses**. We call this index "Youth" because we're abundant in these glycans when we're young. Galactose allows an addition of sialic acid, but more on that below.



### Glycan Shield

Glycan Shield represents glycans with **sialic acid** — your best defense against chronic inflammation. Sialic acid helps your body reduce inflammation.



\* Your result is compared to people within your age group, biological sex, and ethnicity.

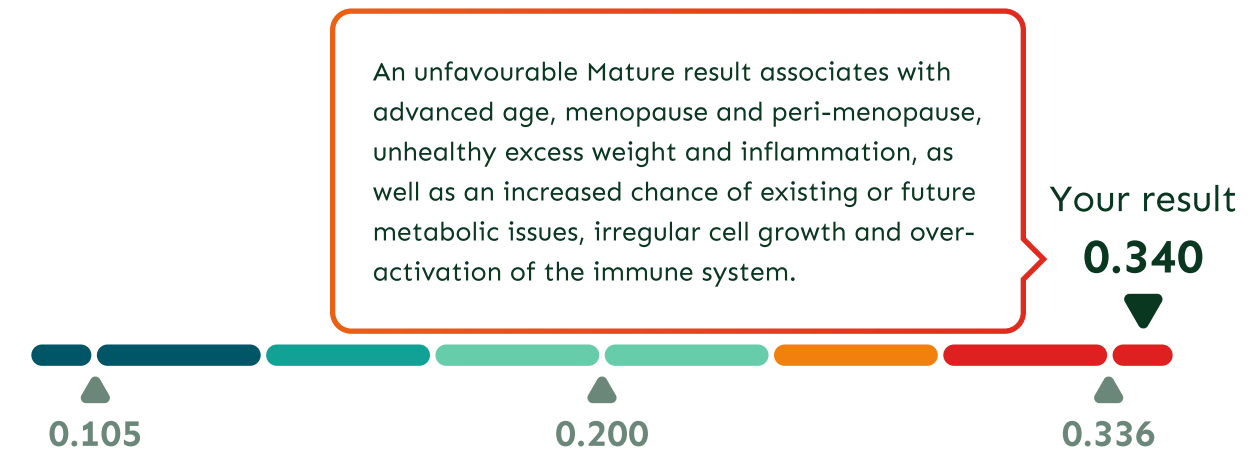
RESULT BREAKDOWN:

## Pro-inflammatory index

This index promote chronic inflammation, so it is **better to have less** of it. It's main feature is **missing galactoses**. The process of losing galactoses occurs naturally as we age, but also by having an unhealthy lifestyle.

### Glycan Mature

Glycan Mature represents glycans that are **missing galactoses**. As we get older, our glycans age with us. During that, glycans lose galactoses. This switches them from protecting us against chronic inflammation towards causing it.



This result ranks you in the **99<sup>th</sup> percentile** \*

Having a **lower** percentile ranking is **better** for this index.

\* Your result is compared to people within your age group, biological sex, and ethnicity.

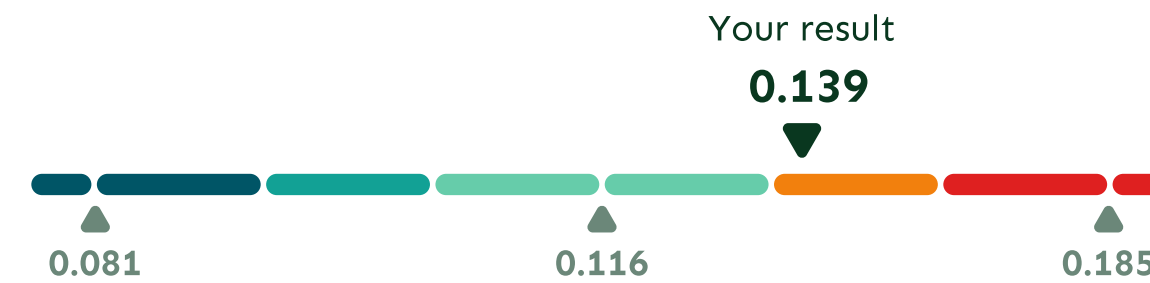
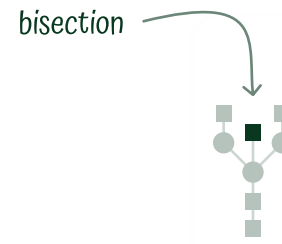
RESULT BREAKDOWN:

## Supportive indexes

These indexes aren't strictly pro- or anti-inflammatory. Instead, they are a special group of **complementary indexes** that provide an **additional layer of information**.

### Glycan Lifestyle

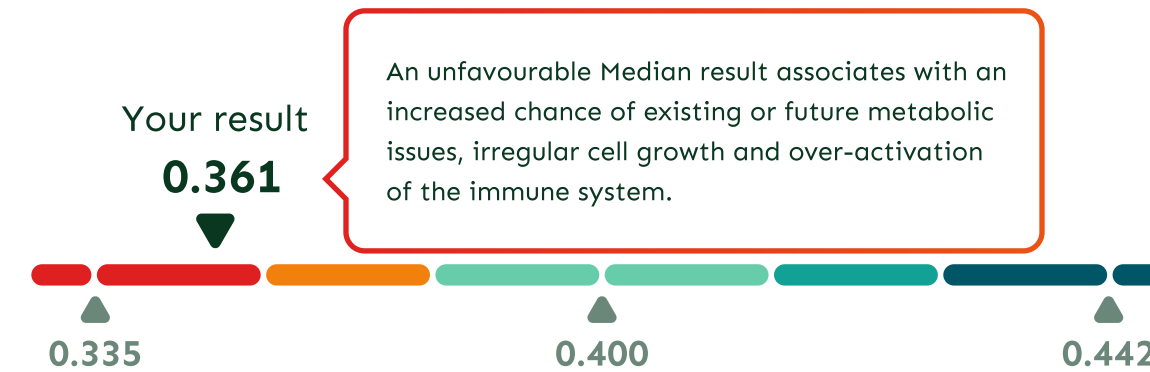
Glycan Lifestyle represents glycans that have a **bisection** modification. A good result in this index is an indicator of positive lifestyle, whereas a bad score is often related to smoking and obesity.



This result ranks you in the **31<sup>st</sup> percentile** \*  
Having a **lower** percentile ranking is **better** for this index.

### Glycan Median

Glycan Median represents glycans with **one galactose**. This index is largely impacted by your genes. It describes how well your body is set up to correctly produce glycans.



This result ranks you in the **9<sup>th</sup> percentile** \*  
Having a **higher** percentile ranking is **better** for this index.

An unfavourable Median result associates with an increased chance of existing or future metabolic issues, irregular cell growth and over-activation of the immune system.

\* Your result is compared to people within your age group, biological sex, and ethnicity.

# What's next?

## CONTINUE READING

### Learn what affects our glycan composition

We'll review these major areas of interest:

- Genetics
- Natural ageing
- Lifestyle

**These are not personally tailored to you.**

Exploring this chapter might give you some ideas of what to discuss with your specialist.

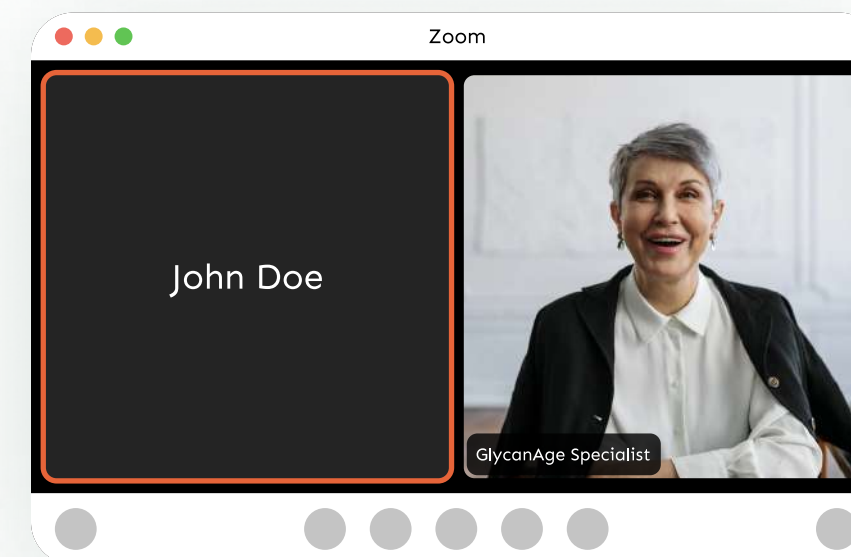


## TAKE ACTION

### Book your **free** 30 minute consultation with a specialist

It is confidential and gives you the opportunity to discuss your health, lifestyle and any medical conditions in conjunction with your results to help you decide what you'd like to do next.

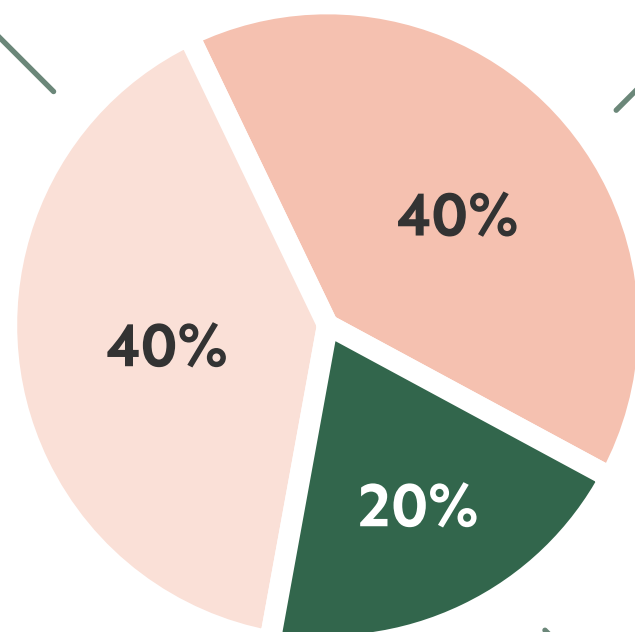
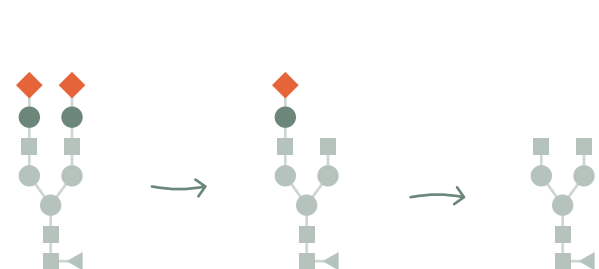
[glycanage.com/consultations](https://glycanage.com/consultations)



# What affects our glycan composition?

## Natural ageing

When we're young, our glycan composition is rich in glycans with sialic acid. As we get older, the glycans tend to lose "arms". More precisely — they lose sialic acids and galactoses. This causes them to transition from preventing chronic inflammation to promoting it.



## Genetics

Our glycan composition is partly inherited. We've conducted research on cohorts across the world which demonstrate that different ethnic groups age differently.

## Lifestyle

Our lifestyle choices play a major role in shaping us. Nutrition, exercise, stress and medical interventions, all affect our glycan composition. This is great news as it gives us a way to influence our glycans.

## Important note

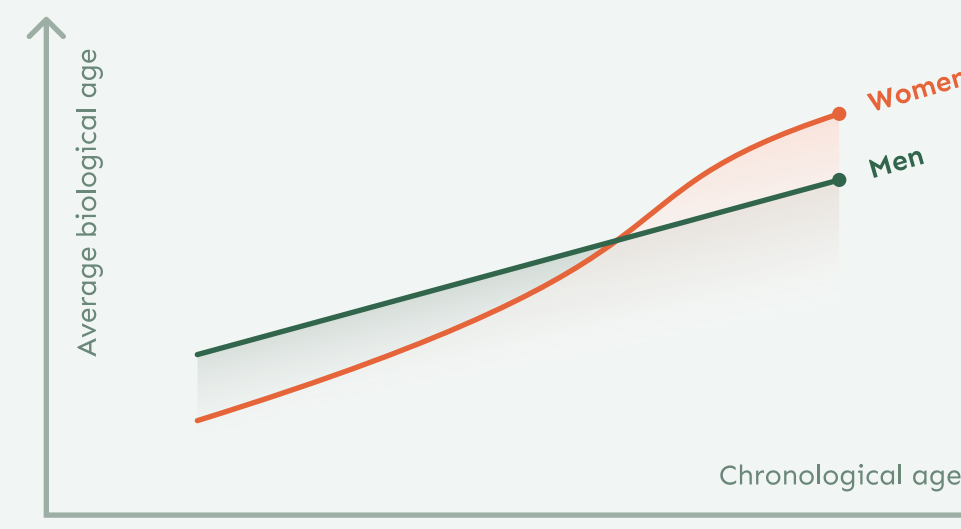
### Before you continue...

Content on this and next page is for informational purposes only. It is derived from scientific research.

It is NOT personally tailored to you.

## Men and women age differently

Men and women exhibit slightly different biological ageing curves. Women tend to have a greater amount of glycans that prevent chronic inflammation BEFORE perimenopause and menopause. During and after — there is usually a strong shift towards pro-inflammatory glycans. Men on the other hand have a much more linear change in glycan profile.



## Menopause & Perimenopause

Menopause is when a woman stops having periods and is no longer able to get pregnant naturally. Perimenopause is the period leading up to menopause.

During this life-stage there are drastic changes in women's glycan composition. Pro-inflammatory glycans increase, and anti-inflammatory are reduced.

## Andropause

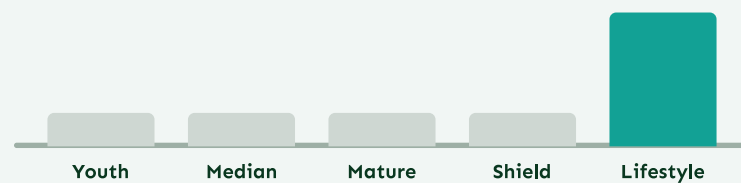
Andropause describes the steady changes (decline) in male's hormone levels, which usually relates to other age-related issues. This steady change is why men have a more linear ageing curve.



# Nutrition

Changing nutrition can yield long-term benefits, but optimising it often requires a personalised approach. In our studies, the only plan that had a consistently beneficial effect was a low-calorie diet that removed overly processed foods.

Removing overly processed foods rich in hidden sugars and empty calories improves Glycan Lifestyle index, but doesn't have a significant effect on other indexes.

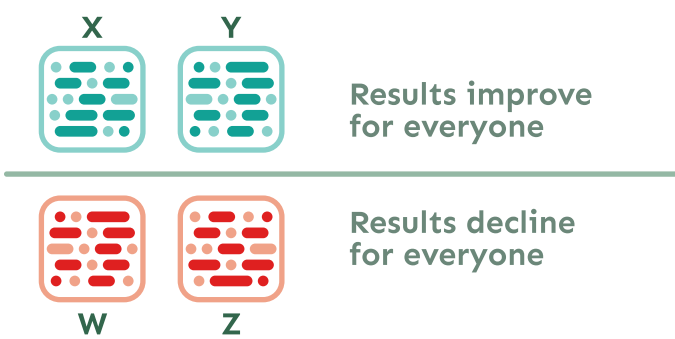


# There's no "magic diet"

We've conducted a research to determine whether there's a diet that is beneficial to **everyone**.

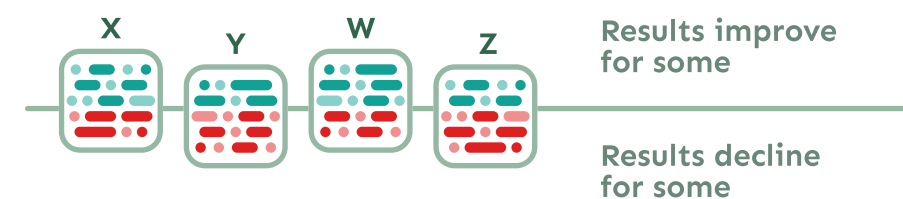
## What we expected:

- Clear improvement with diet X and Y
- Clear decline with diet W and Z



## What we actually learned:

- No clear indication of benefits for different diets
- **Diet needs to be tailored for your unique metabolism.**



# Managing obesity

There are various types of fat our bodies tend to accumulate over the years. Not all fat is considered "bad". However, accumulation of a large amount of excess abdominal fat causes metabolic stress and inflammation.



In context of managing obesity, **low calorie diet** yields positive improvements across all indexes.

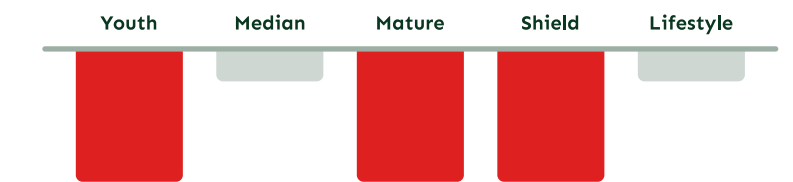


**Extensive weight loss** has been proven to positively affect almost all indexes.

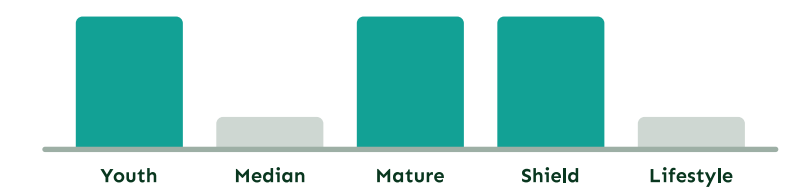
# Exercise

Exercise has many positive effects on health, but over-exercise will have a negative effect.

High intensity training when combined with caloric restriction depletes the natural capacity of our immune system. It has a negative impact on most indexes.



However, high intensity training can be beneficial for your glycan profile when combined with a good recovery period and proper nutrition.





## Thank you for choosing GlycanAge

Glycans are complex carbohydrate molecules and one of the four primary components of the cell (alongside DNA, proteins, and lipids).

Glycans perform numerous tasks and play a major role in all essential functions of the human body, including our immune system. They participate in virtually all our body's processes; therefore, it is not surprising that molecular defects in glycan synthesis are recognised as a direct cause of an increasing number of diseases.

The study of glycans is still in its infancy. However, it is already providing useful and unique insights into how our bodies age at a molecular level.

GlycanAge provides you access to the most advanced information available. Created by the world's leading authority on glycoscience, Professor Gordan Lauc and fulfilled at his laboratory, Genos — world leaders in the extraction and analysis of glycans.

Our combined research team has studied ageing for over 25 years, publishing our findings in more than 200 scientific papers.

GlycanAge is proven to respond to lifestyle changes, in both scientific trials and personal tests spanning over 150k individuals.

# List of references

1. [Glycosylation Profile of Immunoglobulin G Is Cross-Sectionally Associated With Cardiovascular Disease Risk Score and Subclinical Atherosclerosis in Two Independent Cohorts](#)
2. [Decreased Immunoglobulin G Core Fucosylation, A Player in Antibody-dependent Cell-mediated Cytotoxicity, is Associated with Autoimmune Thyroid Diseases](#)
3. [Molecular Pathways Mediating Immunosuppression in Response to Prolonged Intensive Physical Training, Low-Energy Availability, and Intensive Weight Loss](#)
4. [Association between Galactosylation of Immunoglobulin G and Improvement of Rheumatoid Arthritis during Pregnancy Is Independent of Sialylation](#)
5. [Prediction of neoadjuvant chemotherapeutic efficacy in patients with locally advanced gastric cancer by serum IgG glycomics profiling](#)
6. [Agalactosyl IgG and Antibody Specificity in Rheumatoid Arthritis, Tuberculosis, Systemic Lupus Erythematosus and Myasthenia Gravis](#)
7. [Plasma N-Glycans as Emerging Biomarkers of Cardiometabolic Risk: A Prospective Investigation in the EPIC-Potsdam Cohort Study](#)
8. [Supplementation With the Sialic Acid Precursor N-Acetyl-D-Mannosamine Breaks the Link Between Obesity and Hypertension](#)
9. [Association of Systemic Lupus Erythematosus With Decreased Immunosuppressive Potential of the IgG Glycome](#)
10. [Glycomic Signatures of Plasma IgG Improve Preoperative Prediction of the Invasiveness of Small Lung Nodules](#)
11. [Inflammatory Bowel Disease Associates with Proinflammatory Potential of the Immunoglobulin G Glycome](#)
12. [Afucosylated IgG characterizes enveloped viral responses and correlates with COVID-19 severity](#)
13. [Precision medicine that transcends genomics: Glycans as integrators of genes and environment](#)
14. [Intense Physical Exercise Induces an Anti-inflammatory Change in IgG N-Glycosylation Profile](#)
15. [Changes in Antigen-specific IgG1 Fc N-glycosylation Upon Influenza and Tetanus Vaccination](#)
16. [IgG glycan patterns are associated with type 2 diabetes in independent European populations](#)
17. [Sialylated IgG-Fc: a novel biomarker of chronic inflammatory demyelinating polyneuropathy](#)
18. [Glycosylation Alterations in Multiple Sclerosis Show Increased Proinflammatory Potential](#)
19. [Raised agalactosyl IgG and antimycobacterial humoral immunity in Takayasu's arteritis](#)
20. [The N-glycosylation of immunoglobulin G as a novel biomarker of Parkinson's disease](#)
21. [Zinc supplementation decreases galactosylation of recombinant IgG in CHO cells](#)
22. [Extensive weight loss reduces glycan age by altering IgG N-glycosylation](#)
23. [Glycans Are a Novel Biomarker of Chronological and Biological Ages](#)
24. [Hypogalactosylation of serum IgG in patients with coeliac disease](#)
25. [Heterogeneity of IgG Glycosylation in Adult Periodontal Disease](#)
26. [Estrogens regulate glycosylation of IgG in women and men](#)
27. [Glycosylation of plasma IgG in colorectal cancer prognosis](#)
28. [Immunoglobulin G glycosylation in aging and diseases](#)
29. [IgG Glycome in Colorectal Cancer](#)



Glycans are directly involved in the pathophysiology of every major disease...

Additional knowledge from glycoscience will be needed to realize the goals of personalized medicine and to take advantage of the substantial investments in human genome and proteome research and its impact on human health.

— US National Academies, 2012