

# Personal Report

# GA-HR-013494

Date of birth: 17/07/1991 Date of sampling: 04/02/2024 dd mm yyyy



# 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



# Great news!

Your biological age is 12 years younger than your chronological age.

> We'd love to hear more about your lifestyle and what you've done to achieve such a great result. Get in touch and tell us about your success. If you haven't already, don't forget to fill in your health questions and book your free specialist consultation.

# GlycanAge reflects the levels of **chronic inflammation** in the body



important hallmark of aging and a catalyst to a wide range of chronic diseases.

# Higher biological age

#### Higher risk of future diseases

- Some individuals are genetically predisposed towards inflammatory
- Family history of chronic diseases

#### Further investigation

- You may investigate further for signs of chronic inflammation:
- Check for lack of nutrition
- Check hormone levels
- Assess cardiovascular risk
- Blood tests
- Check of unusual symptoms

# Result Breakdown

We analyse 29 different glycan structures gathered from your blood sample. We group related structures into 5 indexes.

### **Primary indexes**

These glycan index have a pro- or anti-inflammatory function. By looking at a ratio between these indexes, we're able to determine your biological age.

### Supportive indexes

These indexes can help narrow down associations with specific disease types, genetic traits, and/or some lifestyle habits. They don't influence your overall biological age.





# Glycan Shield (S) Anti-inflammatory

Sialic acid

Glycan Shield represents glycans with sialic acid (S) – your best defense against chronic inflammation. Sialylated glycans protect against cell damage resulting from overactive natural killer cell activation.



### **Glycan Shield Associations**

As this index has a primarily anti-inflammatory function, having **low amounts** of it is associated with the following:



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

# Tips to improve this index Maintain your protein intake Make sure you're consuming enough proteins and healthy fats. They are vital for a healthy functioning immune system. This is especially important if you're on a vegan or vegetarian diet because animal products tend to have a richer source of nutrients compared to plants. Check for basic nutrient deficiencies 2 Consider doing some basic blood tests to identify potential vitamin and mineral deficiencies. For example, vitamin D, which is a common deficiency, plays a vital role in modulating our immune responses, including inflammation. **Consider supplements** 3 Supplements can be beneficial for various reasons. They can help you meet your nutritional needs, enhance body function and improve well-being. Start by assessing basic nutrient deficiencies which might need supplementation, and then you can explore additional ones.

# Glycan Youth (G2)



Glycan Youth represents glycans with two galactoses (G2). Glycan Youth prevents unwanted pro-inflammatory effects of the C5a component of the complement pathway. Galactose is crucial in suppressing the proinflammatory pathways that lead to autoimmunity.



### **Glycan Youth Associations**

As this index has a primarily anti-inflammatory function, having low amounts of it is associated with the following:

Accelerated aging	Imr	nune system dysregulation
Metabolic health decli	ne	Obesity

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



Galactoses

# Tips to improve this index

Regular moderate exercise positively affects this index. However, constant **overexercising can have a negative impact** by increasing inflammation in the body, resulting in a higher GlycanAge.

This is why professional athletes tend to have higher GlycanAge results compared to people who exercise moderately.

This index is associated with hormonal balance. Consider a check up on sex hormones, estrogen and testosterone, as suboptimal amounts of them could be a driver of higher GlycanAge results.

3

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#### Embrace a more active lifestyle

Today's sedentary lifestyle can't be compensated by a couple of gym sessions per week. One thing centenarians from blue zones have in common is they engage in moderate daily activities such as standing up from sitting on the floor because of cultural habits, or walking uphill because of the position of their homes.

So try to embrace a generally active lifestyle which can greatly improve your cardiovascular and metabolic health. For example, aim for around 10k steps a day and try switching from elevators to stairs.

#### Review your workout routine

#### Consider checking your hormones

# Glycan Mature (G0) Pro-inflammatory



Glycan Mature represents glycans without galactoses. It is structurally and functionally opposite to Glycan Youth. Too many glycans without galactose can over-activate the complement system, leading to cellular damage and inflammation.



### **Glycan Mature Associations**

As this index has a primarily pro-inflammatory function, having high amounts of it is associated with the following:

Accelerated aging Metabolic health decline		
Female reproductive health decline Cardiovascular health decline		
Immune system dysregulation	Obesity	

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



## Tips to improve this index

#### Consider caloric restriction

Caloric restriction has shown to improve this index. If you're not struggling with weight management, try exploring some fasting methods, such as intermittent or alternate day fasting.

One of the goals of fasting is to induce **autophagy** – the body's mechanism for recycling old and damaged cellular parts which plays a crucial role in modulating inflammation and promoting anti-aging effects.

2

This index in a way counterbalances the Glycan Youth Index and is also affected by hormone health. Consider doing a self check by assessing your fatigue, mood, and sexual health.

If you suspect some areas might be causing you health problems, consider checking hormones in those areas:

- **Cortisol** for stress

3

**Prioritise recovery** 

While physical activity is profound for our health, we often tend do overdo it. Both cardio exercises and muscle training are beneficial for our cardiovascular and metabolic health, but it's important to take adequate rest between workouts because too much stress on our body can elevate inflammation.

#### Consider checking your hormones

• Estrogen and testosterone for reproductive health • Thyroid hormones for metabolic health

# Glycan Median (G1)

Supportive index

Only one galactose

Glycan Median represents glycans with one galactose. This index has a prominent genetic component. Glycans within this index have a unique way of binding to endothelial cells, therefore having a significant impact on cardio-vascular health, especially in women.



This index doesn't influence your overall biological age. However, It can help narrow down associations with specific disease types, genetic traits, and/or some lifestyle habits.

### **Glycan Median Associations**

Either extremes (low/high) of this index in conjunction with the other primary indexes may be associated with:



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

# Tips to improve this index Work on your metabolic health 1 2 lipid profile, including cholesterol levels. 3 Weight management struggling with weight management).

A lower score in this index is associated with poor metabolic health. Try to avoid food that causes digestive system issues.

For some it's gluten, dairy, or even certain plants. There is no one size-fits-all diet, and what might be generally considered healthy could be causing inflammation for you.

#### Consider checking your heart health

This index is associated with cardiovascular health. If your score isn't optimal, try checking your **blood pressure** and

This index shows improvement when introducing a lowcalorie diet and upon general weight loss (in individuals

# Glycan Lifestyle (B) Supportive index

Glycan Lifestyle represents glycans that have a bisecting modification. Bisection often occurs as a result of smoking, obesity, and ultraprocessed foods. It also has a prominent genetic component, indicating familial longevity.



This index doesn't influence your overall biological age. However, It can help narrow down associations with specific disease types, genetic traits, and/or some lifestyle habits.

### **Glycan Lifestyle Associations**

High results in this index in conjunction with the other primary indexes may be associated with:



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



Bisecting modification

# Tips to improve this index



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3

Manage your S's

**Stress** management and guality **sleep** are vital for a healthy immune system. Chronic stress can cause elevated levels of cortisol, a hormone that can promote inflammation.

Cortisol has an inverse relationship with melatonin, "the sleeping hormone", so elevated levels of cortisol can disrupt your sleeping patterns.

#### Avoid smoking

Smokers tend to have high score in this index so reducing, or ideally stopping smoking, can have a positive impact on this index. This includes classic tobacco and vaping products.

This index can also be elevated in people with childhood asthma.

Omega-3 fatty acids offer a wealth of health benefits and experimental data shows that consumption of omega-3 enriched foods has a positive effect on this index.

#### **Consider omega-3 supplementation**

# Find out how to improve your results

GlycanAge can be reversed. Explore how you can reduce chronic inflammation and turn back the clock.



# Book your **free** online consultation

Don't forget to book your **free 30 minute** consultation with one of our specialists.

If your results are higher than expected, our specialists will help you understand possible reasons why and discuss steps for improving your results.

However, if your results are favourable, you can use this opportunity to learn more about different health areas of your interest and how to further optimise your results!

Book your consultation  $\rightarrow$ 



# 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.



### Important note

#### Before you continue...

Content you're about to see is for informational purposes only. It is derived from scientific research. It is NOT personally tailored to you.

### 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.

### Men and women age differently



### Menopause & Perimenopause

up to menopause.

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

#### 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.

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

# Nutrition

Changing nutrition can yield longterm 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 is 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



**Results** improve for everyone

#### 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 30 years, publishing our findings in more than 300 scientific papers.

GlycanAge is proven to respond to lifestyle changes, in both scientific trials and personal tests spanning over 200K+ individuals.



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"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