SelfDecode™

Glycation

Biohacker Report

REPORT CATEGORIES

BLOOD SUGAR CONTROL

LONGEVITY

SKIN & BEAUTY

Sample Client

Report date: 15 January 2026

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Personal information

NAME

Sample Client

SEX AT BIRTH

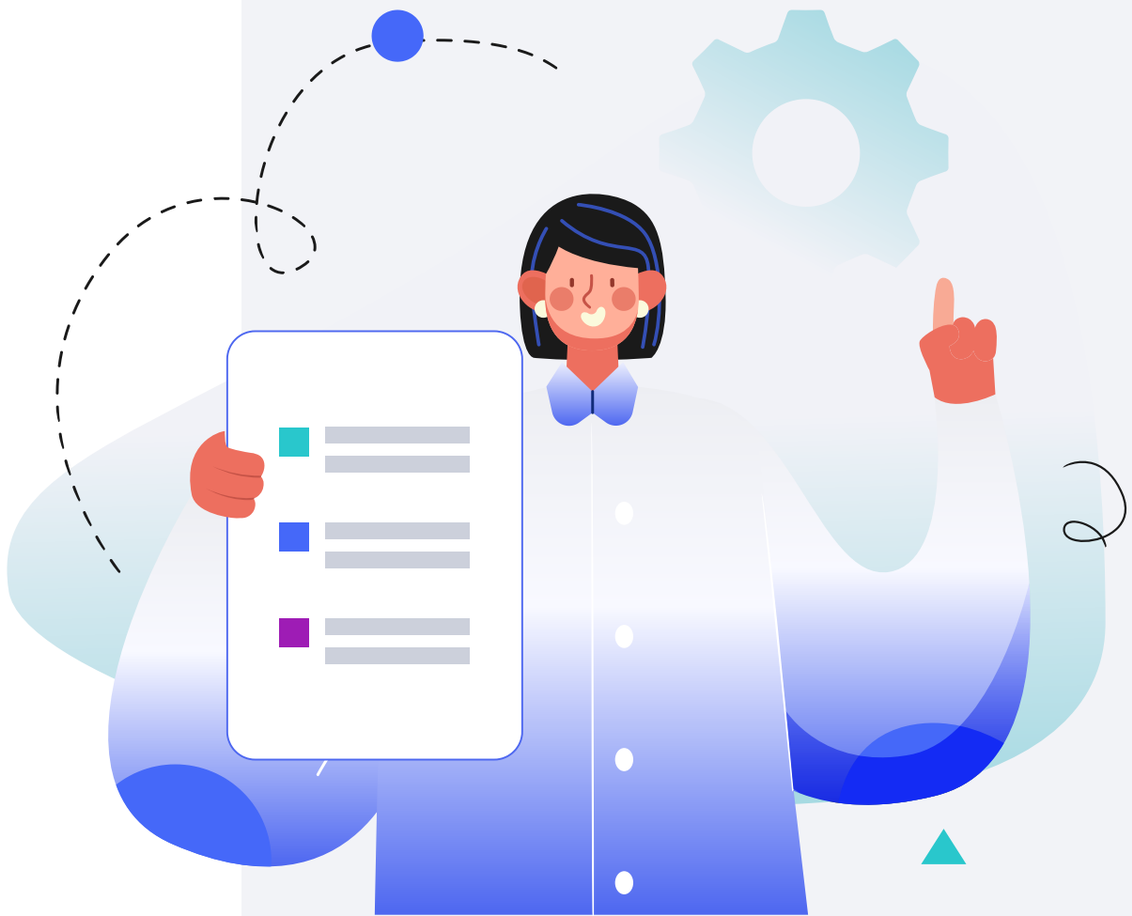
Male

HEIGHT

5ft 5" 165cm

WEIGHT

137lb 62kg

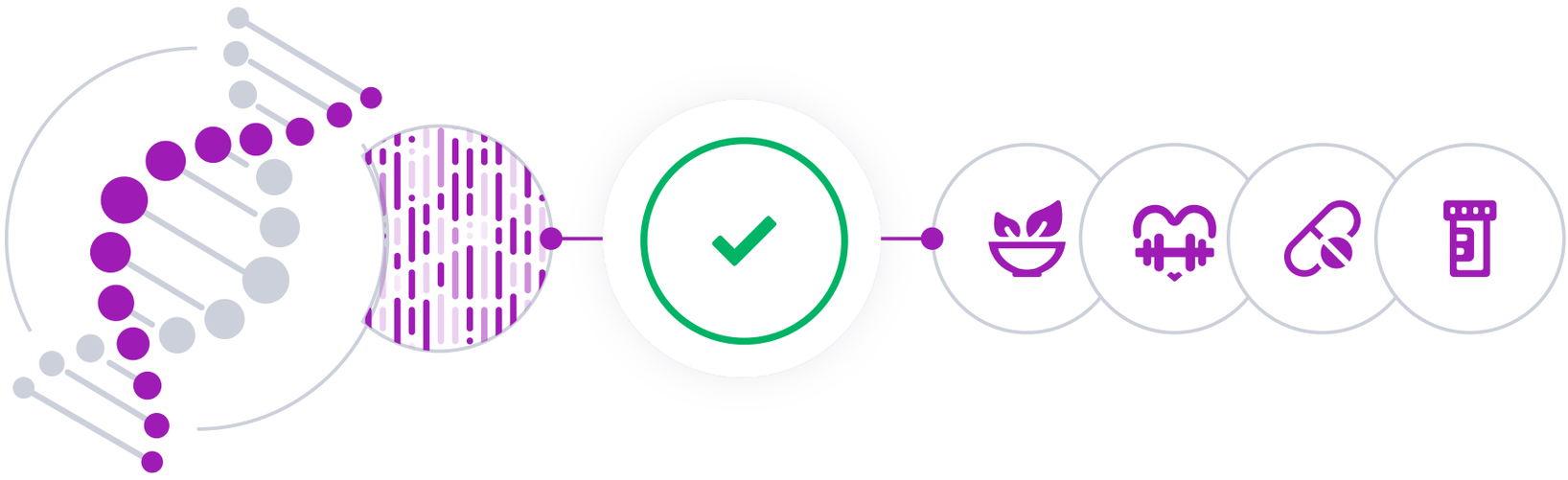


DISCLAIMER

This report does not diagnose this or any other health conditions. Please talk to a healthcare professional if this condition runs in your family, you think you might have this condition, or you have any concerns about your results.

How this works

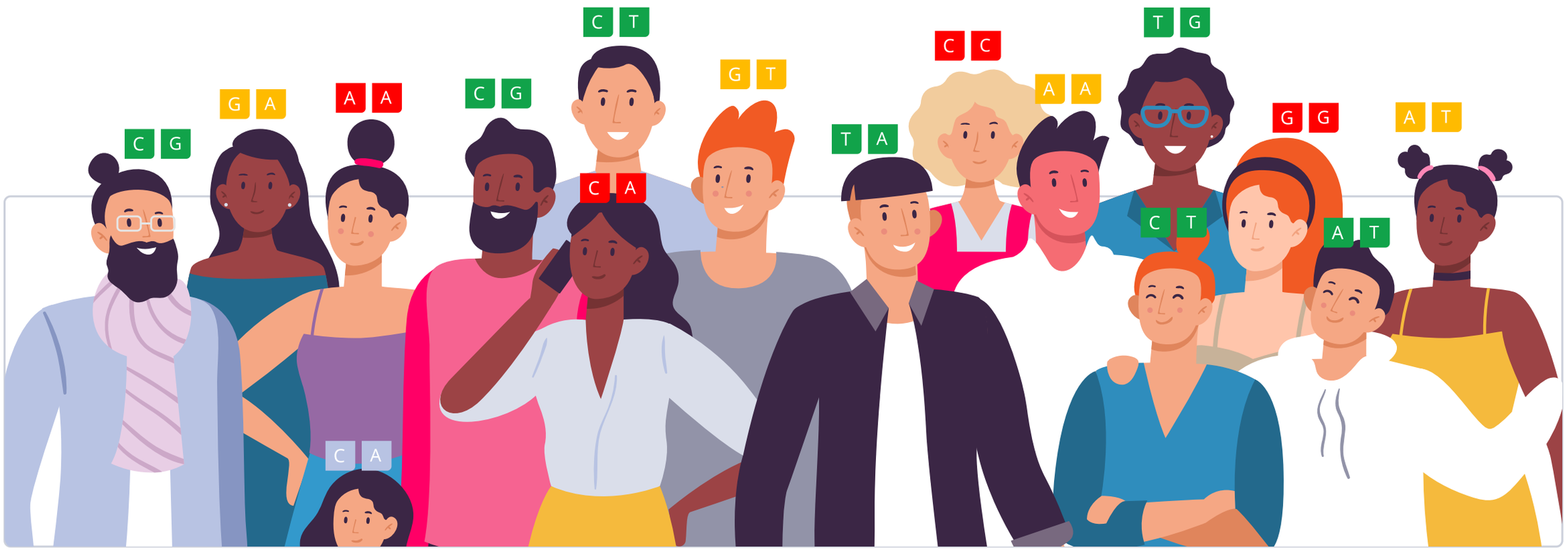
Our Wellness Reports analyze how your DNA influences your health.
We then use this analysis to give you personalized risk estimates and recommendations.



Similarly, our Trait Reports look at how your DNA influences your traits.

Your DNA is like an instruction manual — it contains a lot of information.
You can think of it as a blueprint for your body.

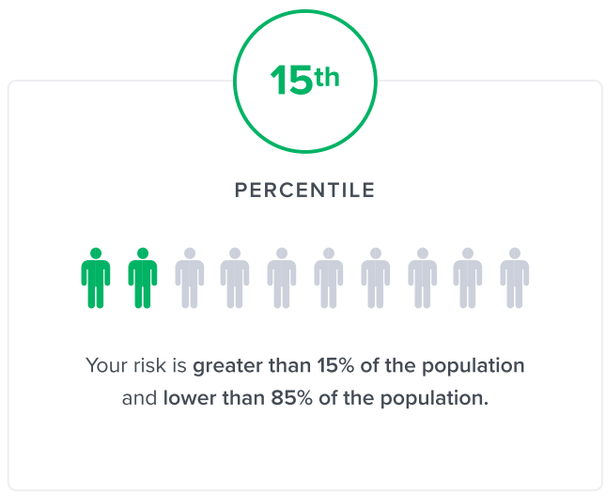
Genetic variants are parts of DNA that differ from person to person. Some can make you more vulnerable to certain health issues, while others may influence traits such as eye color.



We use artificial intelligence and machine learning to analyze all this information. We then summarize your results as a risk score or display it on a gauge.

When we give a risk score, the risk icon tells you if you are at a higher or lower risk compared to other people:

In total, we analyze up to 83 million genetic variants.



Genotype color info: AA You don't have any risk alleles | AA You have 1 risk allele | AA You have 2 risk alleles

Your risk is also displayed as a percentile. This will tell you how your risks compare to our sample population. The lower your percentile number, the lower your risk. The "50th percentile" would be an average risk.

Similarly, the gauge tells you your relative risk score compared to our sample population, or it indicates a specific trait or haplotype you are more likely to have based on your genetic variants.

When applicable, we also list top evidence-based recommendations that may help lower your risk. The focus is on recommendations that may be of benefit to you, based on your genetics.

Our recommendations come in four categories: lifestyle, diet, supplements and drugs.
The following icons tell you which category a recommendation falls into:

Our team of scientists also ranks each recommendation.
We rank based on impact and the strength of evidence in the medical literature.

Impact shows how strongly a recommendation will affect your health in a certain area.
Evidence is how much scientific support there is for the recommendation. Rankings are from 1 to 5 (low to high):

Impact

Impact scores range from 1-5. These scores reflect how much of an effect each recommendation can have. An impact score of 5 predicts the biggest effect.

When a recommendation affects something we can measure, we use those measurements to assign the impact score. For example, a recommendation that decreases cholesterol by 20% will have a higher impact score than one that decreases it by 5%.

Some recommendations affect things that we cannot directly measure, like stress or mood. For these, the impact score is based on how well they work relative to other recommendations and standard treatments. The best ones get the highest scores.

If there is a lot of research that shows a recommendation works especially well for your genotype, the impact score gets increased.

Recommendation Evidence

5 / 5

Recommendations that are considered effective and generally recommended by experts and medical bodies.

4 / 5

Recommendations that are considered likely effective and that have multiple independent meta-analyses and a great many studies supporting them.

3 / 5

Recommendations that are considered possibly effective and have many studies supporting them

2 / 5

Recommendations that have insufficient evidence, with two or several clinical trials supporting them, or many studies but with ambiguous results.

1 / 5

Recommendations that have insufficient evidence, with a single clinical trial, or with many studies most of which didn't find support for the recommendation.

0 / 5

No evidence in humans.

Genotype-specific Evidence

High-quality

Direct evidence that a recommendation helps more in people with your gene variant (many clinical trials, afew large clinical trials, or a meta-analysis).

Medium-quality

Direct evidence that a recommendation helps more in people with your gene variant (a few clinical trials or one large clinical trial).

Low-quality

Direct evidence that a recommendation helps more in people with your gene variant (a single clinical trial or more trials with inconsistent results).

Indirect

A recommendation may help more in people with your gene variant because it targets a specific gene or protein affected by your variant (e.g., MTHFR, dopamine).

In theory

A recommendation may help more in people with your gene variant because it targets a specific mechanism affected by your variant (e.g., inflammation, oxidative stress).

Some things to keep in mind:

- Genetics doesn’t play a considerable role in a condition or a trait.
- There is not enough research available to estimate a genetic predisposition.
- There are technical limitations to estimating or presenting a genetic predisposition.
- The topic is sensitive, and a genetic predisposition should only be estimated and presented by a healthcare professional.

Introduction

Glycation is a process where sugar molecules attach to proteins, forming harmful compounds called **advanced glycation end-products (AGEs)**. These AGEs build up naturally as we age, but the process can speed up due to factors like high blood sugar, smoking, or stress.

When AGEs accumulate, they damage different tissues and organs. They affect the skin in particular, making it less elastic, discolored, and more prone to **wrinkles**. They also play a role in serious health problems like **diabetes and heart disease**.

Scientists can measure AGEs in the skin using a simple test called **skin autofluorescence (SAF)**. This test shines ultraviolet (UV) light on the skin and measures the glow that AGEs produce. Higher SAF levels mean more AGEs are present. SAF is useful because it shows **long-term effects** on the skin that other tests, like blood sugar levels, might miss.

Things like smoking, coffee drinking, and overall diet can influence SAF, making it a good early warning sign for conditions like diabetes and heart issues. By studying both lifestyle factors and genetics, researchers are working to improve how we use SAF to predict health risks and personalize care.

Genetics of Glycation

A genetic study identified five variants (SNPs) associated with skin autofluorescence in non-diabetic individuals. These SNPs are located in or near genes such as ***FANCA***, ***MMP27***, ***CYP1A1/2***, ***ZNF276***, and ***NAT2***, each with distinct potential roles in glycation mechanisms [R].

1. **rs12931267 (*FANCA*, Chr16)**: This SNP lies in an intronic region of the *FANCA* gene, which is involved in DNA repair. The G allele is associated with higher SAF. This locus also includes the ***MC1R*** gene, known for its role in skin pigmentation. This suggests a potential interplay between pigmentation and glycation levels.
2. **rs2846707 (*MMP27*, Chr11)**: Located in the *MMP27* gene, this SNP encodes a missense variant (Met30Val) affecting matrix metalloproteinase activity. The T allele correlates with lower SAF, suggesting a protective role potentially linked to extracellular matrix remodeling.
3. **rs2470893 (*CYP1A1/2*, Chr15)**: This SNP lies between *CYP1A1* and *CYP1A2*, genes involved in xenobiotic metabolism. The T allele is linked to higher SAF, with attenuation of the SNP effect when adjusted for **coffee consumption**, indicating environmental interactions.
4. **rs3764257 (*ZNF276*, Chr16)**: Found upstream of *FANCA*, this SNP is associated with lower *SAF*. *ZNF276* encodes a zinc finger protein that may influence gene regulation in response to glycation stress.
5. **rs576201050 (*NAT2*, Chr8)**: Located near *NAT2*, a gene encoding N-acetyltransferase, this SNP affects acetylator status (detox ability). The minor allele A is associated with lower SAF, highlighting its role in metabolic processing of AGEs.

Overall, the authors estimated about **20%** of the differences in glycation may be due to genetics. These findings demonstrate that SAF levels are influenced by complex genetic and environmental interactions [R].

TYPICAL

Predisposed to typical glycation based on 5 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
NAT2	rs576201050	GG
ZNF276	rs3764257	CC
MMP27	rs2846707	TC
CSK	rs2470893	TC
FANCA	rs12931267	CC

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

Your Recommendations

Your recommendations are prioritized according to the likelihood of it having an impact for you based on your genetics, along with the amount of scientific evidence supporting the recommendation.

You'll likely find common healthy recommendations at the top of the list because they are often the most impactful and most researched.

		DOSAGE
1	Alpha-Lipoic Acid	600 mg
2	Avoid Refined Sugar	
3	Topical Glycolic Acid	
4	Topical Hyaluronic Acid	
5	Glutathione supplements	
6	Mango Extract	
7	Gamma-Linolenic Acid (GLA) & Alpha Lipoic Acid	200 mg
8	Topical Coffee Extract	
9	Topical Beta Glucans	
10	Avoid Sugary Foods & Drinks	
11	Topical Alpha-Lipoic Acid	
12	Grape Polyphenols	150 mg
13	Grape Seed Extract	100 mg
14	Topical Adenosine	
15	Dietary Polyphenols	
16	Dietary Antioxidants	
17	Antioxidant Supplements	
18	Avoid Artificially Sweetened Beverages	

1

Alpha-Lipoic Acid

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take 600-1800 mg of alpha-lipoic acid daily, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

600 mg

Description

Alpha-lipoic acid is a natural antioxidant found in almost every cell in your body. People use alpha-lipoic acid to help with issues like skin aging, weight loss, and high blood sugar [R, R, R].

People use alpha-lipoic acid to help with [R, R, R, R]:

- Complications of high blood sugar
- Skin aging
- Weight loss
- Carpal tunnel syndrome

How it helps

Alpha-Lipoic Acid helps mitigate glycation by acting as a potent antioxidant, reducing oxidative stress that contributes to the formation of advanced glycation end-products (AGEs). This mechanism not only preserves skin health but also supports overall metabolic functions.

2

Avoid Refined Sugar

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Eliminate foods and beverages high in refined sugars, such as sodas, candies, pastries, and white bread, from your diet. Replace them with natural sugars found in fruits and whole grains. Implement this change immediately and maintain it indefinitely for long-term health benefits.

Description

Reducing the consumption of refined sugar and high-sugar foods can help prevent dental problems, manage blood sugar levels, and support weight management.

How it helps

Avoiding refined sugar mitigates the formation of advanced glycation end products (AGEs), which are harmful compounds that can damage proteins and tissues in the body. This reduction is critical for preventing complications associated with glycation, such as inflammation and oxidative stress.

3

Topical Glycolic Acid

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Apply a thin layer of glycolic acid product to the affected area after cleansing and drying the skin, usually once or twice a day depending on the product's strength and your skin's sensitivity. Avoid sun exposure without sunscreen on the treated areas.

Description

Glycolic acid is a type of alpha hydroxy acid (AHA) obtained from sugar cane. AHAs are easily absorbed by the skin and cause its exfoliation. They also stimulate collagen production [R, R].

Glycolic acid is a very popular ingredient in skincare products. People use topical glycolic acid to improve acne, skin wrinkles, age spots, and stretch marks [R].

How it helps

Topical glycolic acid aids in reducing glycation-related skin damage by exfoliating dead skin cells and promoting collagen synthesis, improving skin texture and elasticity. This rejuvenation effect counteracts aging signs linked to glycation, enhancing overall skin appearance.

4

Topical Hyaluronic Acid

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Apply a few drops of hyaluronic acid serum directly to your clean, damp skin twice a day, in the morning and before bedtime. Gently massage it into your face and neck until fully absorbed. Follow up with your regular moisturizer to seal in the hydration.

Description

Hyaluronic acid is a naturally occurring substance in the skin that is used topically to enhance skin hydration, reduce fine lines, and improve overall skin texture. It can be derived from various sources, including microbial fermentation.

Hyaluronic acid is a compound naturally found in the body. It helps the skin, eyes, connective tissues, and joints retain water [R, R].

By doing so, hyaluronic acid can help keep the [R]:

- Joints moving smoothly
- Skin and eyes moist
- Skin flexible

Hyaluronic acid is popular as a topical serum. It is also available as an injection, supplement, and eye drop.

How it helps

Topical hyaluronic acid aids in mitigating the effects of glycation by enhancing skin hydration and texture, thereby reducing the appearance of fine lines and promoting a more youthful complexion.

5

Glutathione supplements

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take glutathione supplements orally, usually in pill or powder form, with a recommended dose ranging from 500mg to 1000mg daily, divided into two doses. It's best taken on an empty stomach or as directed by a healthcare professional. Continuous use is advised for sustained benefits, but consulting with a healthcare provider for personalized advice and duration is important.

Description

Glutathione (GSH) is your body's strongest antioxidant. It has an enormous capacity to combat oxidative stress and neutralize harmful free radicals. Chemically speaking, glutathione is a tripeptide made up of 3 amino acids [R]:

- Glutamate
- **Cysteine**
- Glycine

Low glutathione levels have been linked to cognitive decline, age-related disease, and general mortality among the elderly [R, R].

People take glutathione supplements to help with:

- Oxidative stress and detox
- Immune system support
- Skin aging and damage
- Exercise recovery
- Chronic diseases such as type 2 diabetes, Alzheimer's disease, Parkinson's disease, or COPD

How it helps

Glutathione supplements enhance the body's antioxidant defenses, which can mitigate oxidative stress caused by glycation. By neutralizing free radicals, glutathione helps protect tissues from damage, thereby potentially reducing the adverse effects of glycation on cellular health.

6

Mango Extract

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take 100-150mg of mango extract supplement daily, preferably with meals to enhance absorption. Continue this supplementation for at least 4-6 weeks to potentially start noticing benefits, such as improved digestion or healthier skin. It's essential to look for a high-quality extract to ensure efficacy.

Description

Mango extract, derived from the fruit, is often used in supplements and skincare products for its potential to provide antioxidant protection and promote skin health. It may help reduce oxidative stress and support a youthful complexion.

How it helps

Mango extract can help mitigate oxidative stress associated with glycation by providing antioxidants that protect skin cells. This may contribute to healthier skin and potentially reduce the visible effects of glycation-related aging.

7

Gamma-Linolenic Acid (GLA) & Alpha Lipoic Acid

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take a supplement containing 200-500 mg of gamma-linolenic acid (GLA) and 300-600 mg of alpha-lipoic acid daily, preferably with meals to enhance absorption. This regimen should be followed daily for at least 3-6 months to assess its effectiveness.

TYPICAL STARTING DOSE

200 mg

Description

GLA is an omega-6 fatty acid found in certain plant oils, such as evening primrose oil and borage oil. It may have anti-inflammatory properties and can potentially benefit skin health, hormonal balance, and overall well-being. Alpha-lipoic acid is a natural antioxidant found in almost every cell in your body. People use alpha-lipoic acid to help with issues like skin aging, weight loss, and high blood sugar.

How it helps

Gamma-Linolenic Acid (GLA) and Alpha Lipoic Acid may reduce inflammation and combat oxidative stress, which are key contributors to glycation. By supporting cellular health and enhancing antioxidant defenses, this combination can help mitigate glycation-related damage.

8

Topical Coffee Extract

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Apply a thin layer of coffee extract cream or gel directly onto the clean, affected area of the skin. Use once or twice daily, depending on the product's instructions or a healthcare provider's advice. Continue this routine for a minimum of six to eight weeks to observe potential benefits.

Description

Coffee extract is derived from coffee beans and is often used in skincare products for its antioxidant properties, which can help protect the skin from free radical damage and reduce the appearance of fine lines and wrinkles.

People drink coffee for an energy and mood boost. Caffeine is the main ingredient responsible for these effects [R, R].

Caffeine may also help [R, R, R]:

- Support heart health
- Improve mood
- Maintain healthy blood sugar
- Improve skin health

How it helps

Topical coffee extract provides antioxidant protection, which can reduce oxidative stress and free radical damage associated with glycation, potentially improving skin quality and resilience. This may help mitigate the adverse effects of glycation on skin aging.

9

Topical Beta Glucans

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Apply a topical cream or serum containing beta-glucans to the affected area of the skin once or twice daily, as per the product instructions. Continue this routine consistently for at least 8 weeks to observe potential improvements in skin hydration, elasticity, and healing.

Description

Beta-glucans, often derived from yeast or oats, are used topically in skincare products for their moisturizing and soothing effects. They can help alleviate dryness, reduce redness, and promote overall skin hydration and comfort.

Beta-glucan is a type of soluble fiber with antioxidant properties. It is abundant in [R, R]:

- Baker's yeast
- Cereals (e.g., oats, barley)
- Mushrooms (e.g., maitake)
- Seaweeds

People use beta-glucans to [R, R, R, R, R]:

- Improve immunity (e.g., fight infections)
- Reduce blood sugar
- Reduce cholesterol

How it helps

Topical beta-glucans help mitigate the inflammatory response associated with glycation-induced skin damage, enhancing skin barrier function and promoting healing. Their hydrating properties further improve skin texture and comfort, supporting a healthier appearance.

10

Avoid Sugary Foods & Drinks

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

To avoid sugary foods, eliminate or significantly reduce consumption of foods and beverages high in added sugars such as sodas, candies, baked goods, and sugary cereals from your diet. Instead, opt for natural sugar sources like fruits. Aim to do this daily for ongoing health benefits.

Description

High-sugar foods like baked goods, sweets, and sugary drinks, can spike your blood sugar levels. Consuming a lot of these types of foods can contribute to to health issues like diabetes, obesity, insomnia, and heart disease.

High-sugar foods and refined carbs have a high glycemic index (GI). This means they tend to spike your blood sugar levels. They include [R, R, R]:

- Sugary drinks
- Baked goods
- Sweets
- White bread
- White rice
- Pasta

Eating a lot of sugary foods can contribute to:

- Diabetes [R, R, R]
- Weight gain and obesity [R, R]
- Insomnia [R]
- Heart disease [R]

You may also want to avoid processed sugars and sugary drinks. They may have a role in increasing IL-1B [R, R].

How it helps

Avoiding sugary foods and drinks helps mitigate glycation by preventing abrupt rises in blood glucose levels. This reduction in glucose spikes minimizes the formation of advanced glycation end-products (AGEs), thereby supporting overall metabolic health.

11

Topical Alpha-Lipoic Acid

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Apply a thin layer of alpha-lipoic acid cream, gel, or serum to the affected area of the skin once or twice daily, after cleansing and drying the skin thoroughly. Ensure to avoid contact with eyes and mucous membranes. Use consistently for at least 1-2 months to observe potential benefits.

Description

Alpha-lipoic acid is an antioxidant compound that can be applied topically to protect the skin from oxidative stress and promote a more youthful appearance. It may help reduce signs of aging and improve skin texture.

Alpha-lipoic acid is a natural antioxidant. It's found in almost every cell in your body [R, R, R].

People use alpha-lipoic acid to help with [R, R, R]:

- Complications of high blood sugar
- Skin aging
- Weight loss

How it helps

Topical Alpha-Lipoic Acid helps mitigate glycation by neutralizing free radicals and reducing oxidative stress, thereby preventing the formation of advanced glycation end-products (AGEs) that contribute to skin aging. This results in improved skin texture and a more youthful appearance.

12

Grape Polyphenols

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take a grape polyphenol supplement with a dose of 150-300 mg daily, ideally with a meal to enhance absorption. This practice should be consistent for at least 3 to 6 months to observe benefits.

TYPICAL STARTING DOSE

150 mg

Description

Grape polyphenols, found in grape skin and seeds, have antioxidant properties that can help protect cells from oxidative damage and support cardiovascular health. They are a key component of red wine and grape-derived supplements, offering potential benefits for overall well-being.

How it helps

Grape polyphenols help mitigate glycation by reducing oxidative stress, thereby protecting proteins and lipids from harmful modifications. This antioxidant activity supports cellular health and may help maintain proper metabolic function.

13

Grape Seed Extract

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take 100-300 mg of grape seed extract daily, preferably with a meal to enhance absorption. This can be done either through a single dose or split into multiple doses throughout the day. Continue this regimen for at least 3 months to observe potential benefits.

TYPICAL STARTING DOSE

100 mg

Description

Grape seed extract is rich in antioxidants called polyphenols, which may help protect against oxidative stress and support cardiovascular health. It's also believed to have potential benefits for skin health and overall well-being.

Grape seed extract is made from the seeds of wine grapes. It contains antioxidant compounds that may help support [R, R]:

- Blood circulation
- Heart health
- Blood sugar control
- Healthy weight

How it helps

Grape seed extract's high polyphenol content helps mitigate oxidative stress, which is crucial in managing glycation. By protecting collagen and elastin in the skin, it may reduce the formation of advanced glycation end-products (AGEs), thus supporting skin health.

14

Topical Adenosine

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Apply a topical adenosine solution or cream to the affected area of the skin once or twice daily. Ensure the skin is clean and dry before application. Continue use as per the product's instructions or as advised by a healthcare professional.

Description

Adenosine is a natural compound found in the cells of the human body and is used topically in skincare products for its potential to reduce the appearance of fine lines and wrinkles. It can also support skin elasticity and promote a more youthful complexion.

Adenosine is a compound found in all cells of the body. It plays an important role in sleep, heart health, and metabolism [R, R, R].

Topical adenosine may help support hair growth [R].

How it helps

Topical adenosine may counteract the effects of glycation by promoting skin elasticity and enhancing cellular energy, thus potentially mitigating the appearance of fine lines and wrinkles associated with glycation-related aging processes.

15

Dietary Polyphenols

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Incorporate foods rich in dietary polyphenols into your daily diet. This can include consuming a variety of fruits like berries, apples, and grapes; vegetables such as onions and broccoli; nuts and seeds; as well as beverages like green tea and coffee. Aim for at least five servings of fruits and vegetables per day to achieve a beneficial intake of polyphenols.

Description

Polyphenols are antioxidants found in foods like fruits, vegetables, and tea, which may offer various health benefits, including reduced inflammation and improved heart health.

Polyphenols are plant components with antioxidant properties. They help reduce oxidative stress [R].

High levels of oxidative stress can damage our cells. Oxidative stress plays a role in many health conditions, including [R]:

- High blood sugar
- Type 2 diabetes
- Heart disease

You can get most polyphenols and other antioxidants from fresh fruits and vegetables [R, R].

How it helps

Dietary polyphenols mitigate oxidative damage by neutralizing free radicals, thus reducing the formation of advanced glycation end-products (AGEs), which are detrimental in conditions linked to glycation. This contributes to improved cellular health and decreased inflammation.

16

Dietary Antioxidants

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Incorporate foods rich in antioxidants, such as fruits (berries, oranges, plums), vegetables (spinach, kale, bell peppers), nuts (walnuts, almonds), and seeds (flaxseeds, chia seeds) into your daily meals. Aim for at least 5 servings of fruits and vegetables per day, ensuring a variety of colors to cover different antioxidants.

Description

Dietary antioxidants are compounds found in foods that help neutralize harmful molecules called free radicals, potentially reducing the risk of oxidative stress-related diseases and supporting overall health. Examples include vitamins C and E, beta-carotene, and polyphenols.

Our cells sometimes produce molecules called **reactive oxygen species (ROS)** [R].

High levels of ROS can cause oxidative stress and damage our cells. Oxidative stress plays a role in many health conditions, including [R]:

- High blood sugar
- Type 2 diabetes
- Heart disease

Antioxidants are substances that help combat ROS [R].

Antioxidants are found in many plants. Good sources include [R, R, R]:

- Fruits like tomatoes, berries, and pomegranates
- Vegetables like onions, spinach, and celery
- Chocolate
- Olive oil
- Wine

How it helps

Dietary antioxidants help mitigate oxidative stress, which is linked to the formation of advanced glycation end-products (AGEs). By reducing AGEs, these compounds support skin health and may slow the aging process associated with glycation.

17

Antioxidant Supplements

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take an antioxidant supplement daily with a meal to enhance absorption. The specific dose may vary depending on the type of antioxidant (e.g., vitamin C, vitamin E, selenium), but a common multivitamin or antioxidant blend can be used as directed on the product label. Consult with a healthcare provider for personalized advice and dosage.

Description

Antioxidant supplements are dietary supplements that provide concentrated doses of antioxidants, such as vitamins C and E or coenzyme Q10, to help combat oxidative stress and reduce the risk of chronic diseases.

Our cells sometimes produce molecules called **reactive oxygen species (ROS)** [R].

High levels of ROS can cause oxidative stress and damage our cells. Oxidative stress plays a role in many health conditions, including [R]:

- High blood sugar
- Type 2 diabetes
- Heart disease

Antioxidants are substances that help combat ROS [R].

Some common antioxidants include vitamin C and vitamin E. You can get most antioxidants from fresh fruits and vegetables. **Antioxidants are also available as supplements** [R, R].

How it helps

Antioxidant supplements help reduce oxidative stress associated with glycation by neutralizing free radicals, thereby potentially lowering the formation of advanced glycation end-products (AGEs) and supporting overall metabolic health.

18

Avoid Artificially Sweetened Beverages

IMPACT 1 / 5

EVIDENCE 1 / 5

Description

Artificially sweetened beverages (ASBs) are drinks sweetened with non-caloric or low-calorie synthetic sweeteners instead of sugar. These beverages are often marketed as healthier alternatives to sugar-sweetened beverages, potentially aiding in weight management and reducing sugar intake.

However, their health benefits are contentious, with studies suggesting potential risks, including associations with increased appetite, weight gain, and aging. They are also associated with a heightened risk for certain metabolic disorders, including [R, R, R].:

- Obesity
- Type 2 diabetes
- High blood pressure
- Heart disease

These beverages are also linked to a higher risk of death from any cause. Consequently, their long-term health impact remains a subject of ongoing research and debate [R, R].

How it helps

Avoiding artificially sweetened beverages can reduce the risk of excessive sugar consumption and promote better metabolic health, thereby potentially decreasing the formation of advanced glycation end-products (AGEs) which are linked to increased oxidative stress and inflammation.