SelfDecode™

Glutamate

Biohacker Report

REPORT CATEGORY

NUTRITION

Sample Client

Report date: 15 January 2026

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Table of Contents

Personal information

NAME

Sample Client

SEX AT BIRTH

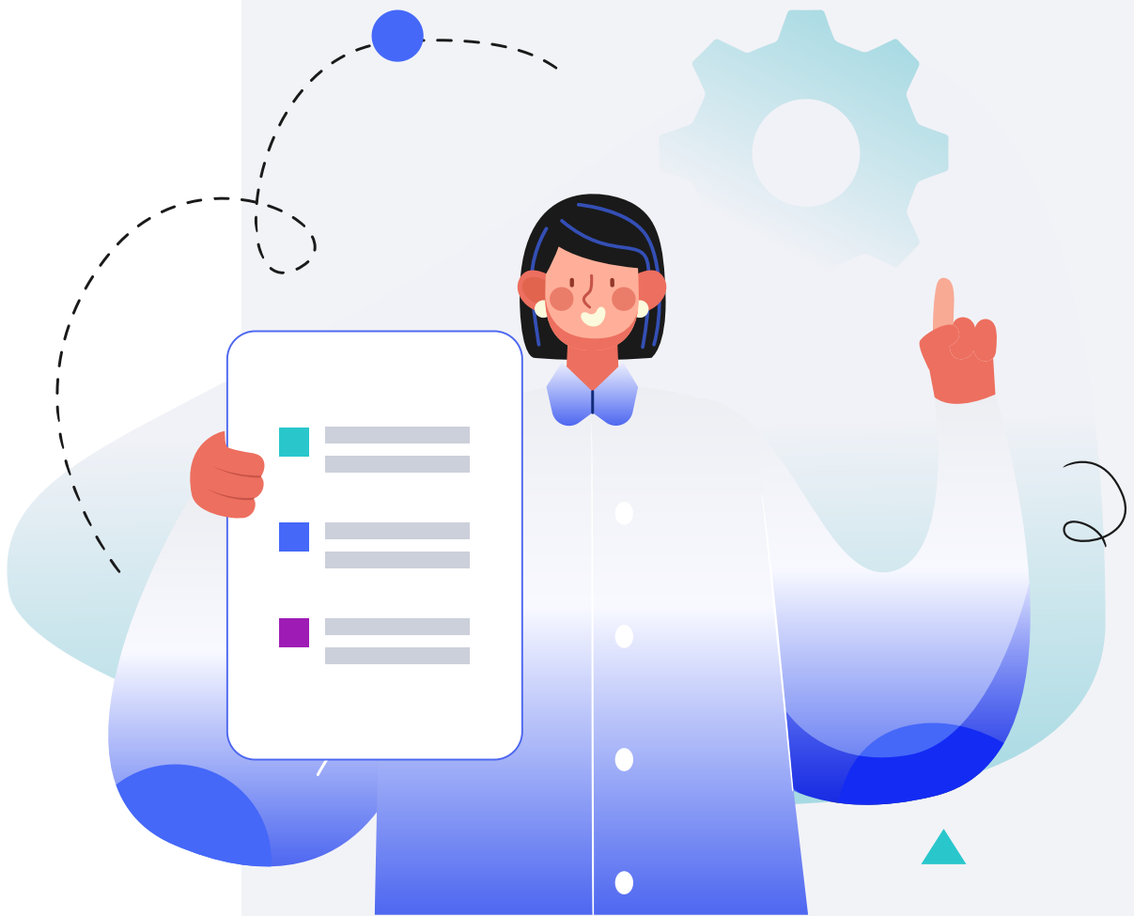
Male

HEIGHT

5ft 5" 165cm

WEIGHT

137lb 62kg

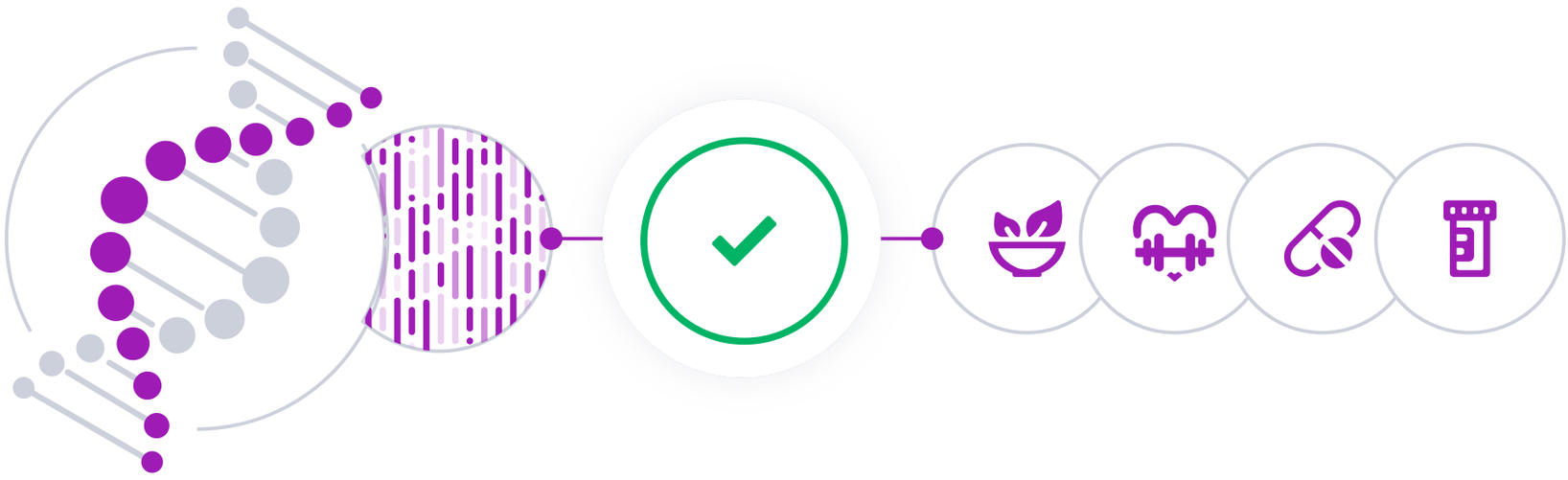


DISCLAIMER

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

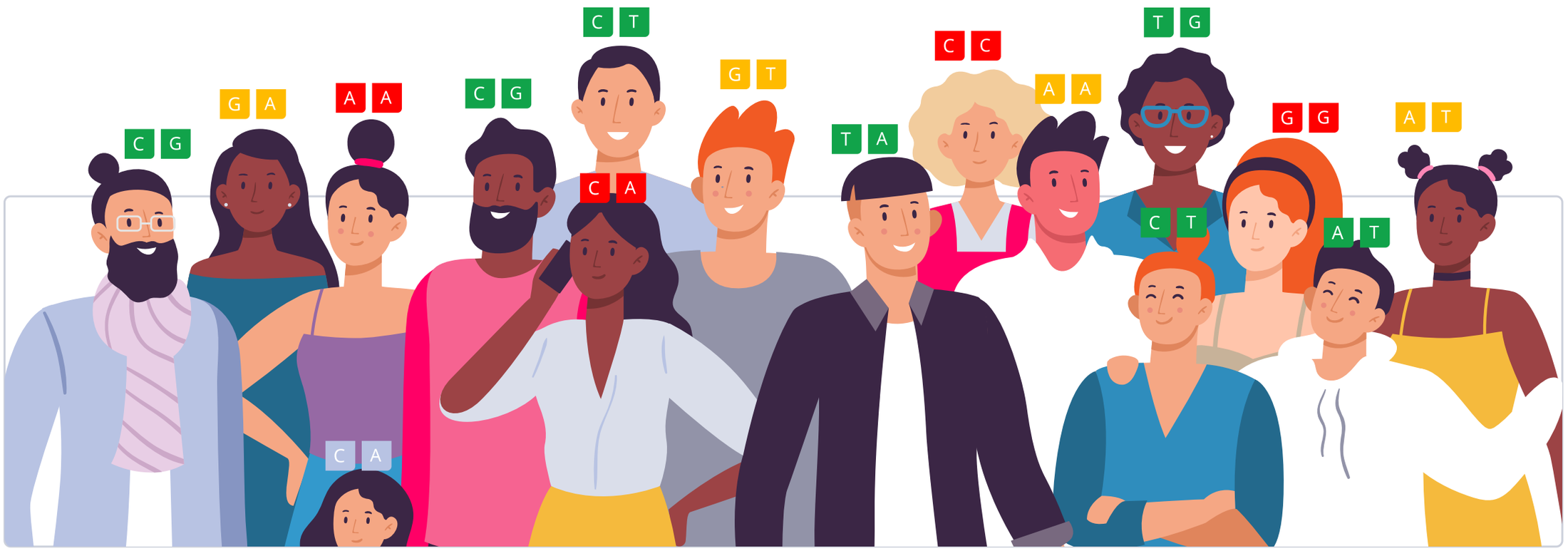
Our Wellness Reports analyze how your DNA influences your health.
We then use this analysis to give you personalized risk estimates and recommendations.



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.

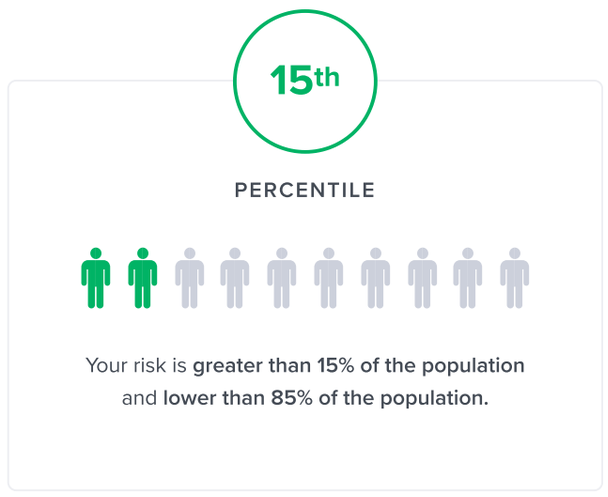
Genetic variants are parts of DNA that differ from person to person. Some can make you more vulnerable to certain health issues, while others may influence traits such as eye color.



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

Glutamate, also known as glutamic acid, is a non-essential amino acid. This means that our bodies can make it from other amino acids such as glutamine. We can also get glutamate from foods, such as [R, R, R]:

- Grains
- Red meat and poultry
- Dairy
- Eggs

Glutamate gives food "umami" taste. Hence, it is added to food as monosodium glutamate (MSG), a common flavor-enhancing additive [R].

Glutamate is a crucial building block for protein production and plays important roles in [R, R, R, R, R, R]:

- Cognition, memory, and learning
- Digestion
- Gut health
- Bone health
- Immunity

Glutamate is also an important chemical messenger in the brain. Moreover, it helps make another chemical messenger, GABA, and the main body's antioxidant glutathione [R, R, R].

Factors Influencing Glutamate Levels

Up to 40% of differences in people's glutamate levels may be due to genetics [R, R].

However, the exact genetic variants are largely unknown. One *HNF1A* gene variant, **rs7979478-G**, is linked to higher glutamate levels [R].

High glutamate levels may result from excessive glutamate consumption or rare genetic disorders [R, R, R].

Keep in mind that this report is not about the rare genetic disorders mentioned above. They are very rare and usually diagnosed in infancy.

High glutamate levels may be linked to [R, R, R, R, R]:

- Depression
- Autism
- Epilepsy
- Alzheimer's disease

However, researchers aren't sure if dietary glutamate plays any role in the above conditions [R, R].

Please note: The available genetic research for this report is limited, so take your results with a grain of salt. We will update the report as soon as more research is available.

TYPICAL LEVELS

Predisposed to typical glutamate levels based on the genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
HNF1A	rs7979478	AA

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	Pyridoxine (Vitamin B6)	50 mg
2	N-acetylcysteine (NAC)	1200 mg
3	Pyridoxal-5-Phosphate (PLP)	20 mg
4	Zinc	15 mg
5	Lithium Orotate	5 mg
6	Omega-3 (Fish Oil)	2000 mg
7	Glycine	3 g
8	Vitamin C	2000 mg
9	Niacin Supplements	20 mg
10	Sleep for 7+ Hours	
11	Bacognize (Bacopa monnieri)	300 mg
12	Mindfulness-Based Stress Reduction (MBSR)	2 hours
13	Magnesium	350 mg
14	Myo-inositol	4 g
15	Lemon Balm	500 mg
16	Saffron	20 mg
17	Lactobacillus Rhamnosus	10 billion CFU
18	Lactobacillus Helveticus	10 billion CFU
19	Taurine	500 mg
20	Aerobic Exercise (Cardio)	1 hour

1

Pyridoxine (Vitamin B6)

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Take a pyridoxine (vitamin B6) supplement daily. Requirements range from 1.3 to 1.7 milligrams per day for adults, but supplement doses usually start from 50 mg. Consult with a healthcare provider for higher doses or specific medical conditions that might benefit from increased supplementation.

TYPICAL STARTING DOSE

50 mg

Description

A **vitamin B6 supplement** of up to 1.3-1.7 mg per day can be taken to meet needs not achieved through diet. Long term supplementation of vitamin B6 can be problematic, so talk to your doctor before using.

How it helps

Studies have shown that individuals with low vitamin B6 levels are more likely to experience CRS symptoms when exposed to monosodium glutamate (MSG). Supplementing with vitamin B6 can prevent these symptoms, suggesting a link between vitamin B6 deficiency and glutamate sensitivity [R, R].

Research indicates that marginal vitamin B6 deficiency can lead to increased ratios of glutamine/glutamate and 2-oxoglutarate/glutamate in plasma. This suggests that vitamin B6 plays a role in regulating glutamate metabolism [R].

In cases of vitamin B6-dependent seizures, elevated glutamic acid levels and reduced GABA concentrations were observed in the brain. This implies that vitamin B6 deficiency can lead to an imbalance in neurotransmitter levels, including glutamate [R].

2

N-acetylcysteine (NAC)

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Take 600 mg of N-Acetylcysteine (NAC) supplement daily with water. It can be taken at any time of the day, but try to take it at the same time each day for best results.

TYPICAL STARTING DOSE

1200 mg

Description

NAC is a supplement that contains a form of the amino acid cysteine, a protein building block that your body uses to make the antioxidant glutathione. It is used for its potential antioxidant properties and its ability to support lung, gut, and mental health.

N-acetylcysteine (NAC) is converted to cysteine in the body. Cysteine is a protein building block (amino acid) that helps make the antioxidant glutathione [R].

People take NAC to potentially support [R, R]:

- Mental health
- Ovarian health and pregnancy outcomes
- Lung health
- Gut health

How it helps

NAC supplementation may increase glutathione levels in the brain while reducing glutamate and its excitotoxicity. This may help with the following conditions [R, R, R, R, R, R, R]:

- Schizophrenia
- Cocaine addiction
- Depression
- Hair pulling disorder

NAC increases glutathione, reducing oxidative stress that can trigger glutamate release. More directly, it modulates the cystine-glutamate antiporter (system xc-) on cell membranes, thus lowering extracellular glutamate in the brain.

3

Pyridoxal-5-Phosphate (PLP)

IMPACT 2 / 5

EVIDENCE 1 / 5

How to implement

Take 20-50 mg of pyridoxal-5-phosphate daily, with or without food, preferably at the same time each day. Swallow with water, and if you experience stomach discomfort, take it with a meal. Consult your healthcare provider for personalized dosing, especially if pregnant, breastfeeding, or on medications, and avoid exceeding the recommended dose unless advised.

TYPICAL STARTING DOSE

20 mg

Description

Pyridoxal-5-phosphate (PLP) is a form of vitamin B6 that is essential for many bodily functions, including the metabolism of proteins, carbohydrates, and fats. It is also involved in the production of neurotransmitters, such as serotonin and dopamine, which play a role in mood, sleep, and behavior.

How it helps

PLP may affect cerebrospinal fluid levels of glutamate in patients with pyridoxine-dependent epilepsy, indicating a potential role in modulating glutamate levels in specific neurological conditions [R].

In cases of vitamin B6-dependent seizures, elevated glutamic acid levels and reduced GABA concentrations were observed in the brain. This implies that vitamin B6 deficiency can lead to an imbalance in neurotransmitter levels, including glutamate [R].

Studies have shown that individuals with low vitamin B6 levels are more likely to experience CRS symptoms when exposed to monosodium glutamate (MSG). Supplementing with vitamin B6 can prevent these symptoms, suggesting a link between vitamin B6 deficiency and glutamate sensitivity [R, R].

Research indicates that marginal vitamin B6 deficiency can lead to increased ratios of glutamine/glutamate and 2-oxoglutarate/glutamate in plasma. This suggests that vitamin B6 plays a role in regulating glutamate metabolism [R].

4

Zinc

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take a 15 mg zinc supplement daily, ideally with a meal to enhance absorption.

TYPICAL STARTING DOSE

15 mg

Description

Zinc is an essential mineral found in various foods, including meat, dairy, and nuts. It is crucial for immune function, wound healing, DNA synthesis, and maintaining healthy skin and nails. Zinc supplements are sometimes used to support immune health and manage zinc deficiencies.

Zinc is an essential mineral. Your body needs it to [R, R]:

- Defend against disease
- Protect DNA from damage
- Heal wounds
- Control blood sugar

Some of the best sources of zinc include **shellfish, pork, beef, and beans**. It is also available as a supplement [R].

Adults should get **8-11 mg of zinc** per day [R].

How it helps

Zinc influences the binding of glutamate to its receptors. In vitro studies have shown that zinc can inhibit the binding of glutamate and aspartate to hippocampal membranes, suggesting that zinc modulates glutamate receptor activity [R].

Zinc affects the uptake of glutamate by transporters. It has been observed that zinc can decrease the uptake of glutamate and dopamine by their respective transporters, influencing extracellular glutamate concentrations. Zinc also acts as a modulator of glutamate receptors, including NMDA receptors. Proper zinc levels are essential for neuronal functioning, and dysregulation can lead to excitotoxicity. Maintaining adequate zinc levels may help prevent glutamate-induced neurotoxicity [R].

In conditions like anorexia nervosa, zinc deficiency has been linked to elevated glutamate levels, which may contribute to neurotoxicity. Zinc supplementation in such cases may help normalize glutamate levels and mitigate associated risks [R].

5

Lithium Orotate

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take 5 mg of lithium orotate supplement daily, preferably with a meal to enhance absorption. It is recommended to consult with a healthcare provider prior to starting the supplement, particularly for long-term use.

TYPICAL STARTING DOSE

5 mg

Description

Lithium orotate is a mineral supplement that has been studied for its potential to support mood stability and mental health. It is sometimes used as an alternative to prescription lithium for certain mood disorders.

Lithium is a chemical element found in very low levels in the body. It helps support the immune system and protect the brain [R, R, R, R].

Lithium is naturally occurring and can be found in drinking water in some areas. Food sources of lithium include [R]:

- Fruits
- Vegetables
- Grains
- Seafood

Lithium orotate is a form of lithium commonly found in supplements [R].

How it helps

Lithium inhibits the uptake of glutamate into presynaptic nerve endings, leading to increased extracellular glutamate levels. This effect is primarily due to lithium's action on glutamate transporter proteins in the brain [R].

Chronic lithium treatment has been shown to protect neurons from glutamate-induced excitotoxicity. This protection is associated with lithium's modulation of glutamate receptor activity, particularly the NMDA receptor [R].

Lithium affects the balance between excitatory (glutamate) and inhibitory (GABA) neurotransmitters. Subchronic lithium administration has been observed to decrease levels of glutamine and glutamate (Glx) in certain brain regions, which may contribute to mood stabilization. Lithium has also been reported to increase GABA neurotransmission, which can counteract the excitatory effects of glutamate. This modulation supports neuronal stability and may contribute to lithium's therapeutic effects [R].

6

Omega-3 (Fish Oil)

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take 1-2 g of omega-3 (fish oil) supplement daily, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

2000 mg

Description

Omega-3 fatty acids are essential fats found in fatty fish like salmon, flaxseeds, and walnuts. They are known for their potential cardiovascular and brain health benefits, including reducing the risk of heart disease and supporting cognitive function.

Omega-3 fatty acids are some of the healthiest fats we can eat. They help lower inflammation and protect the heart, brain, and eyes. Our bodies produce less omega-3s than we need for optimal health, so it's important to get enough through food or supplements [R, R, R].

There are three major types of omega-3s: ALA, EPA, and DHA [R, R].

Fatty fish are rich in EPA and DHA. They include [R]:

- Salmon
- Tuna
- Herring
- Sardines

For optimal protection, try to get at least **two servings of fatty fish per week.** Fish oil supplements are available for those who don't eat fish regularly [R].

How it helps

In a placebo-controlled trial of 24 first-episode psychosis patients, supplementation with the omega-3 fatty acid ethyl-EPA for 12 weeks increased glutathione levels in the whole brain and the glutamate/glutamine ratio in the left hemisphere. This correlated with an improvement in negative symptoms and metabolic brain changes [R].

Importantly, the beneficial effects of omega-3 fatty acids on memory performance and glutamate levels may be observed only in *APOE* e4 non-carriers according to a study of 122 middle-aged adults [R].

Animal studies show that omega-3 fatty acids help preserve glutamate neurotransmission (even during seizures) and protect from monosodium glutamate toxicity [R, R, R, R].

7

Glycine

IMPACT 1 / 5

EVIDENCE 0 / 5

How to implement

Take 3 to 5 grams of glycine supplement per day with water, preferably before bedtime for sleep improvement or spread throughout the day for general health benefits. Continue indefinitely as needed, but consult a healthcare provider for long-term use beyond three months.

TYPICAL STARTING DOSE

3 g

Description

Glycine is an amino acid that may have calming and anti-inflammatory effects, potentially benefiting sleep quality and joint health.

If you can't get enough glycine from food sources, glycine supplements are available. Daily doses of up to **6 g** have been safely used for up to **4 weeks**. Consult your doctor before supplementing.

How it helps

A review found glycine reduces glutamate-driven excitotoxicity in epilepsy and trauma models [R].

Glycine acts as an inhibitory neurotransmitter via glycine receptors and modulates NMDA receptors (glutamate's main target). High doses can inhibit glutamate's excitatory effects by competing at NMDA sites or enhancing inhibition, balancing the excitatory-inhibitory scale.

8

Vitamin C

IMPACT 1 / 5

EVIDENCE 0 / 5

How to implement

Take 500-2000 mg of vitamin C supplement daily. It can be taken at any time of the day, with or without food, according to personal preference or tolerance.

TYPICAL STARTING DOSE

2000 mg

Description

Vitamin C is an essential nutrient. This means that our bodies can't produce it on their own, so we have to get it from food or supplements [R].

Foods rich in Vitamin C include: [R]

- Citrus Fruits
- Peppers
- Brussel sprouts
- Kiwi
- Broccoli
- Tomato
- Cantaloupe
- Cauliflower
- Spinach

Vitamin C has antioxidant properties. It supports immunity, heart health, and wound healing [R, R].

Vitamin C deficiency is called *scurvy.* In the past, many sailors suffered from it [R].

How it helps

A study showed that high-dose vitamin C protects against glutamate excitotoxicity in stroke models by boosting antioxidant status [R].

9

Niacin Supplements

IMPACT 1 / 5

EVIDENCE 0 / 5

How to implement

Take a 20 mg niacin supplement daily, preferably with a meal to aid in absorption and minimize potential stomach upset.

TYPICAL STARTING DOSE

20 mg

Description

Niacin is an essential B vitamin that plays a vital role in metabolism, supporting heart health, maintaining healthy cholesterol levels, and promoting overall cellular function when included in a balanced diet or as a supplement.

Niacin (vitamin B3) is found in many foods. It supports your nervous system, skin, gut, and more [R].

Adults should get **16 mg** of niacin a day, and most people get enough from their diets [R].

Experts recommend getting niacin from food rather than supplements [R, R].

How it helps

A study on brain injury suggests niacin's neuroprotective effects involve glutamate modulation via NAD+ pathways [R].

Niacin boosts NAD+, supporting neuronal energy metabolism and resilience. This can reduce stress-induced glutamate release. It may also enhance GABA receptor function indirectly and lower inflammation, a glutamate trigger.

10

Sleep for 7+ Hours

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Ensure you allocate enough time in your schedule to achieve a minimum of 7 hours of sleep each night. This might involve going to bed earlier or adjusting your evening routine to promote relaxation and make it easier to fall asleep.

Description

Optimizing sleep involves adopting healthy sleep habits and creating a sleep-conducive environment to ensure restorative and sufficient sleep duration. It supports cognitive function, mood stability, and overall physical health. Most experts recommend getting **at least 7 hours of good-quality sleep each night**.

Sleep supports your body and mind [R, R]. More precisely, sleep helps:

- Support brain health [R, R]
- Maintain a healthy weight and appetite [R, R, R]
- Regulate blood pressure [R, R]
- Balance blood sugar [R, R]

Ways to sleep better include [R]:

- Reducing your bright light exposure (screen time) in the evenings
- Sticking to a regular sleep schedule
- Avoiding hunger or large meals before bed
- Avoiding nicotine, caffeine, and alcohol before bed
- Maintaining a sleep area that's cool, dark, and quiet

How it helps

Proper sleep helps regulate glutamate levels in the brain, reducing risks of neurotoxicity and promoting overall brain health.

11

Bacognize (Bacopa monnieri)

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Take bacopa as a supplement in a dose of 300-450 mg per day, ideally with food to enhance absorption. It should be taken daily for at least 4-6 weeks to begin noticing benefits in cognitive function and stress reduction.

TYPICAL STARTING DOSE

300 mg

Description

Bacopa, also known as Brahmi, is an herb traditionally used in Ayurvedic medicine to support cognitive function and memory. It is believed to have neuroprotective properties and is used in herbal supplements for mental well-being.

Bacopa (*Bacopa monnieri*) grows as a weed in the rice fields of East Asia and the US [R].

Bacopa is used in Ayurveda (Indian traditional medicine) to support cognition [R].

Note that bacopa is fat-soluble. This means that **taking it with a fatty meal should help you absorb it better** [R].

How it helps

In animal studies, Bacopa treatment led to a significant reduction in the expression of the NMDA receptor subunit NMDA R1 in the hippocampus, suggesting a modulatory effect on glutamatergic neurotransmission [R].

A study demonstrated that Bacopa extract prevented glutamate-induced cell death in HT22 cells by alleviating oxidative and endoplasmic reticulum stress, highlighting its neuroprotective properties [R].

Bacopa supplementation has also been associated with reduced glutamate-induced nociception and brain mitochondrial toxicity in worms [R].

12

Mindfulness-Based Stress Reduction (MBSR)

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Enroll in an 8-week MBSR course, which includes a weekly 2.5-hour class, one all-day class after the sixth week, and 45 minutes of daily home practice guided by assignments and instructional recordings.

TYPICAL STARTING DOSE

2 hours

Description

Mindfulness-Based Stress Reduction (MBSR) is a structured program that teaches mindfulness techniques to reduce stress and improve overall mental and emotional health. MBSR has been shown to help individuals cope with chronic pain, anxiety, and other stress-related conditions.

How it helps

MBSR is an evidence-based program that combines mindfulness and stress reduction techniques to help lower stress and improve emotional balance. Lower stress can help regulate glutamate levels in the brain, contributing to improved neurological health.

13

Magnesium

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Take up to 350 mg of magnesium daily as a supplement, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

350 mg

Description

Magnesium is an essential mineral involved in various bodily functions, including muscle contractions, nerve signaling, and bone health. Maintaining adequate magnesium levels through diet or supplements can support overall well-being and reduce the risk of magnesium deficiency-related health issues.

Magnesium is an essential mineral. Your body needs it for [R, R, R]:

- Muscle, nerve, and bone function
- Blood sugar and blood pressure control
- DNA and protein production
- Strong immunity

Women need **310-320 mg** of magnesium per day, while men need **400-420 mg** [R].

Foods rich in magnesium include **nuts, seeds, and leafy greens**. Magnesium is also available as a supplement [R].

How it helps

Magnesium can help regulate neurotransmitter levels, including glutamate. It also acts as a natural inhibitor of NMDA receptors, which can prevent excessive glutamate activity and excitotoxicity [R, R].

14

Myo-inositol

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Take 2 grams of myo-inositol supplement orally twice a day, preferably with meals to enhance absorption. This regimen should be followed daily for at least 6 months to observe significant benefits.

TYPICAL STARTING DOSE

4 g

Description

Myo-inositol is a naturally occurring compound that plays a role in various cellular functions. It is used in dietary supplements and is believed to have potential benefits for mental health, hormone regulation, and insulin sensitivity.

Inositol is a type of sugar that our bodies need to function. It was considered a vitamin (vitamin B8) until it was discovered that our bodies can make it from another common sugar, glucose [R].

Myo-inositol is the most common form of inositol. It plays a role in [R, R, R, R]:

- Heart health
- Normal blood sugar levels
- Mental health
- Cognitive function
- Reproductive health

Myo-inositol can convert to D-chiro-inositol in the body. These two forms of inositol are often combined in supplements. People use them to improve blood sugar control and PCOS [R, R, R].

How it helps

A study measuring brain metabolites found reduced myo-inositol and glutamate levels in the prefrontal cortex of patients with major depressive disorder. These findings highlight the complex relationship between inositol and glutamate in mood disorders [R].

Research indicates that elevated myo-inositol levels in the brain are associated with glial activation, which may disrupt glutamatergic neurotransmission. This dysregulation could influence the positive symptoms observed in schizophrenia [R].

Inositol influences neurotransmitter receptor densities, including those for serotonin, dopamine, and glutamate. By enhancing receptor sensitivity, inositol may indirectly affect glutamate neurotransmission.

15

Lemon Balm

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Take a 500 mg lemon balm supplement daily. This dosage can be consumed at once or divided into smaller doses throughout the day, according to personal preference or the guidance of a healthcare provider.

TYPICAL STARTING DOSE

500 mg

Description

Lemon balm is an herb known for its calming and soothing properties. It is often used in herbal teas and aromatherapy to reduce stress and anxiety, promote relaxation, and improve sleep quality.

Lemon balm (*Melissa officinalis*) is an herb used in gardening and traditional medicine. **It's rich in antioxidants and relaxing components** [R, R].

People use lemon balm as a tea or supplement to [R, R, R, R]:

- Relieve anxiety
- Improve sleep quality
- Reduce stress

How it helps

Lemon balm has been shown to inhibit the enzyme GABA transaminase (GABA-T), leading to increased levels of gamma-aminobutyric acid (GABA) in the brain. Elevated GABA levels can counteract excessive excitatory neurotransmission mediated by glutamate, promoting a calming effect on the nervous system. Studies suggest that lemon balm supplementation may reduce anxiety and depression symptoms, improve sleep quality, and enhance cognitive performance. These effects are thought to result from the modulation of GABAergic, cholinergic, and serotonergic systems [R].

Its active component rosmarinic acid can suppress the release of glutamate from nerve terminals. In rat cerebrocortical synaptosomes, rosmarinic acid reduced 4-aminopyridine-induced glutamate release in a concentration-dependent manner. This effect is associated with the activation of GABA_A receptors and the inhibition of calcium/calmodulin-dependent kinase II (CaMKII), leading to decreased synapsin I phosphorylation [R, R].

16

Saffron

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Take 20 mg of saffron supplement daily. This can be taken at any time of the day, with or without food.

TYPICAL STARTING DOSE

20 mg

Description

Saffron is a spice derived from the stigma of the saffron crocus flower, and is native to the Mediterranean and Asia. Its main compounds include crocin, picrocrocin, and safranal, which may contribute to its antioxidant properties and potential mood-enhancing effects.

Saffron is a yellow spice praised for its color, taste, and potential health benefits [R].

Saffron is rich in antioxidants such as *crocin*. Researchers are looking into its potential benefits for [R, R, R, R]:

- Gut conditions
- Heart health
- Mental health

How it helps

Administration of saffron extract has been shown to elevate brain glutamate concentrations in animal studies. For instance, a study reported that administering a 250 mg/kg dose of saffron extract to rats increased brain glutamate levels without affecting other neurotransmitters like serotonin or norepinephrine [R].

Saffron components, particularly crocin, have been found to influence the activity of N-methyl-D-aspartate (NMDA) receptors, which play a crucial role in regulating glutamate levels. Crocin has been shown to counteract the inhibitory effects of ethanol on NMDA receptor-mediated responses in rat hippocampal slices, suggesting a modulatory effect on glutamate receptor activity [R].

Saffron extract has demonstrated neuroprotective properties by inhibiting glutamate-induced membrane depolarization and reducing postsynaptic potentials, which are indicative of decreased excitotoxicity. These effects suggest that saffron may help mitigate glutamate-induced neuronal damage [R].

17

Lactobacillus Rhamnosus

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Take a probiotic supplement containing Lactobacillus rhamnosus. Typically, the suggested dose is 10 billion CFUs (colony-forming units) per day. This can be taken as a single daily dose or divided into two doses, morning and evening, with or without food. Continue this regimen for at least 4 weeks to observe benefits.

TYPICAL STARTING DOSE

10 billion CFU

Description

Lactobacillus rhamnosus is a beneficial probiotic strain that can support digestive health and contribute to a balanced gut microbiome. It may help improve gut function, enhance nutrient absorption, and bolster the immune system, promoting overall well-being.

Lactobacillus rhamnosus is a probiotic bacterium, part of the normal gut microflora. Various foods may have added *L. rhamnosus*, including yogurt, cheese, and fermented legumes [R, R].

People take *L. rhamnosus* supplements to balance their immune system and help with infections, allergies, and dermatitis [R].

How it helps

Studies in mice and rats found that supplementation with L. rhamnosus lowers glutamate-related anxiety [R, R, R].

This probiotic influences the gut-brain axis, reducing inflammation and stress signals that amplify glutamate release. It may boost GABA via gut microbiota, shifting the balance away from glutamate excitation.

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Lactobacillus Helveticus

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Take a supplement containing Lactobacillus helveticus, usually available in capsule or powder form. Follow the manufacturer's instructions, commonly involving taking one to two capsules daily, preferably with a meal or as directed by a healthcare provider. Continue this regimen daily for at least 8 to 12 weeks to potentially see benefits.

TYPICAL STARTING DOSE

10 billion CFU

Description

Lactobacillus helveticus is a beneficial probiotic strain that can support digestive health and contribute to a balanced gut microbiome. It may help improve gut function, enhance nutrient absorption, and bolster the immune system, promoting overall well-being.

How it helps

In human studies using the Simulator of the Human Intestinal Microbial Ecosystem (SHIME), *L. helveticus* R0052 supplementation led to significant changes in gut microbiota composition. Notably, there was an increase in the abundance of *Lactobacillus* species and a decrease in potentially harmful bacteria such as *Escherichia-Shigella*. Additionally, the supplementation resulted in increased production of gamma-aminobutyric acid (GABA), a neurotransmitter that plays a crucial role in reducing neuronal excitability [R].

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Taurine

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Take 1-4 g of taurine supplement daily, divided into two or three doses with meals for optimal absorption. It can be taken continuously, with periodic evaluations of its effects and benefits.

TYPICAL STARTING DOSE

500 mg

Description

Taurine is an amino acid found in various foods and often used in energy drinks and supplements. It plays a role in neurological and cardiovascular health and can help support energy metabolism.

Taurine is the most abundant free amino acid in humans. It's not essential, which means we can produce it. We can also get it from protein-rich foods, such as [R]:

- Seafood
- Meat
- Dairy

Taurine is a popular additive in energy drinks and can also be taken as a supplement [R].

Taurine plays an important role in [R, R]:

- Bile production
- Calcium metabolism

It is also well-known for its antioxidant and anti-inflammatory properties [R].

How it helps

Research measuring neurotransmitter amino acids in the cerebrospinal fluid (CSF) of patients with meningitis, acute multiple sclerosis, and myelopathy observed significantly elevated levels of taurine, glutamate, and aspartate. This elevation points to glutamate-mediated toxicity and implicates taurine in the neurochemical alterations associated with these conditions [R].

Taurine effectively reduces glutamate-induced calcium influx in neurons by interacting with ionotropic glutamate receptors and voltage-dependent calcium channels. This modulation helps prevent excitotoxicity, a process where excessive glutamate leads to neuronal injury. It achieves this by stabilizing neuronal membranes, reducing intracellular calcium levels, and mitigating apoptotic pathways activated by glutamate excitotoxicity [R, R].

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Aerobic Exercise (Cardio)

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Engage in at least 150 minutes of moderate-intensity aerobic exercise or 75 minutes of vigorous-intensity activity each week. Distribute this time over at least 3 days per week, avoiding consecutive days of vigorous exercise to allow for recovery.

TYPICAL STARTING DOSE

1 hour

Description

Engaging in regular aerobic exercise, such as running, swimming, or cycling, offers numerous health benefits, including improved cardiovascular fitness, weight management, and mood enhancement. It supports overall physical and mental well-being while reducing the risk of chronic diseases.

Cardio, short for cardiovascular exercise, is any type of physical activity that temporarily increases your heart rate. Examples include **running, cycling, swimming, and brisk walking**.

Regular cardio exercise has many benefits for your overall health. It can help lower your risk of heart disease and diabetes, support weight loss, and improve your mood and energy levels. To get the most out of cardio, try to do it for at **least 30 minutes, 3-5 times a week**.

Interval training is a type of cardio that combines periods of high-intensity training with brief rest periods.

How it helps

Regular aerobic exercise has been shown to help regulate glutamate levels in the brain, potentially supporting brain health and reducing symptoms of neurological conditions. It also promotes overall mental well-being through increased blood flow and the release of beneficial neurochemicals.

Next Steps

Remember, your genes only tell one important part of your health story!

Now that you've seen your DNA-based results for this health topic, let's take a look at other contributing factors.

Your lab results

Your lab results are impacted by the combined effect of your genes, environment and lifestyle.

Lab tests will give you the best picture of your current health status, while your genes provide insight into your health predispositions and which recommendations are best for you.