SelfDecode™

Serotonin & Melatonin Pathway

Sample Client

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Personal information

NAME

Sample Client

SEX AT BIRTH

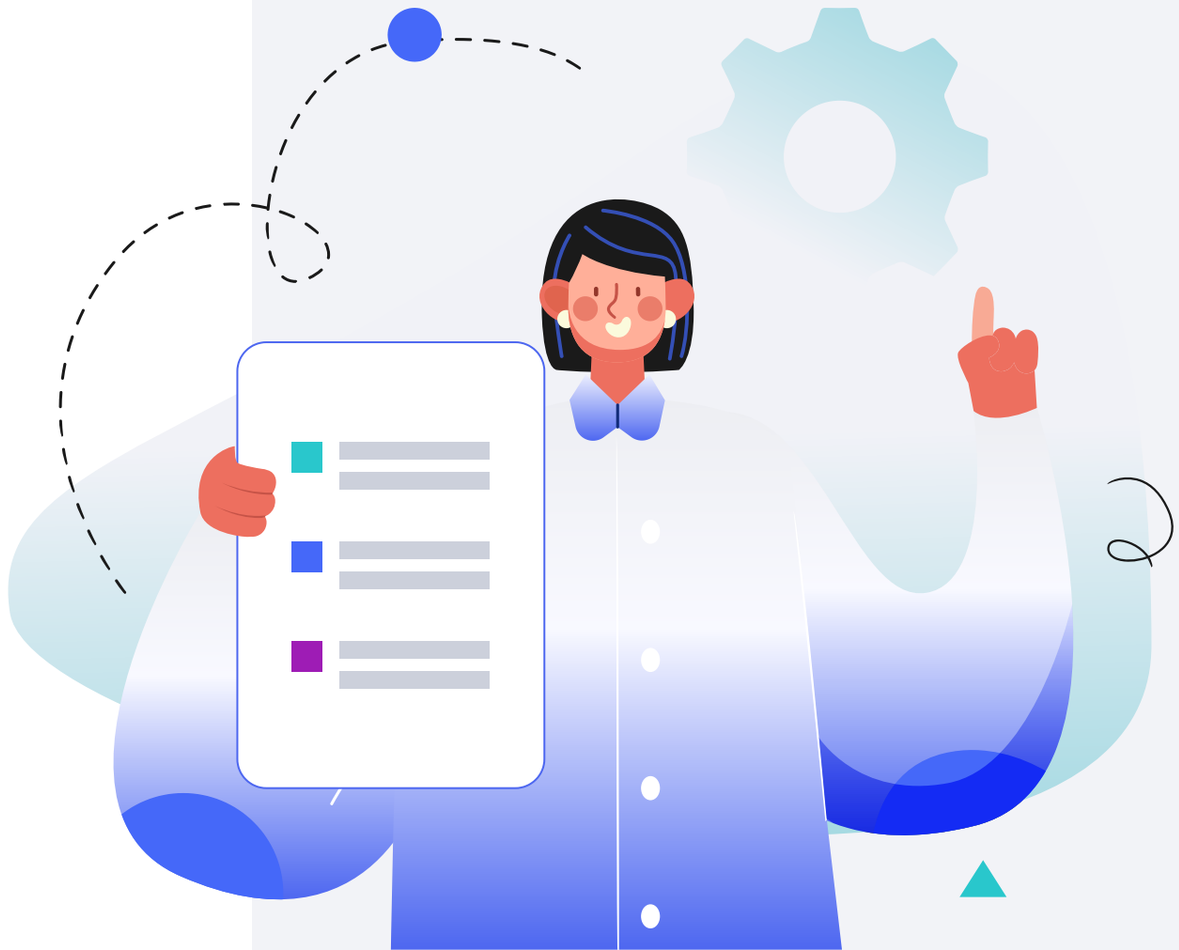
Male

HEIGHT

5ft 4" 163cm

WEIGHT

197lb 89.4kg



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

Serotonin and melatonin form an intricate biochemical axis that governs your **mood, sleep, digestion, and internal rhythms**. Serotonin shapes emotional stability, social behavior, appetite, and pain perception, while melatonin—its downstream counterpart—regulates your sleep-wake cycle and circadian alignment. These two molecules are tightly interwoven, with disruptions in one often echoing across the other.

The pathway begins with **tryptophan**, an essential amino acid derived from food. Through a series of enzyme-driven reactions involving **TPH2 and DDC**, tryptophan is first converted into **5-HTP,** and then into serotonin. Each step is modulated by genes encoding enzymes, transporters, and receptors—each susceptible to genetic variation that can shift your neurochemical balance for better or worse.

Once produced, serotonin must be effectively transported (via **SLC6A4**) and correctly received by a variety of **serotonin receptors (HTR family)**, all of which influence your emotional reactivity, anxiety levels, sensory sensitivity, and more.

Serotonin also gets further converted into **melatonin** with the help of genes like **ASMT and AANAT**. Melatonin signaling is mediated by **MTNR1A and MTNR1B** receptors, which directly impact your sleep quality, metabolic health, and glucose regulation.

The circadian clockwork, regulated by core genes such as **CLOCK, PER2, CRY2, and ARNTL**, serves as a timing system that synchronizes melatonin release with environmental light-dark cycles. Disruptions in these clock genes can uncouple your internal rhythms from the world around you, contributing to mood disorders, sleep disruption, and metabolic imbalance.

This report analyzes your genetic variants across the serotonin and melatonin pathways, shedding light on how your body produces, uses, and responds to these key neurochemicals. By understanding the specific SNPs that influence each stage—from synthesis to signaling—you can implement more personalized strategies to support emotional balance, restorative sleep, and metabolic resilience.

Serotonin Pathway

Protein-Rich Food Sources
(e.g. turkey, eggs, dairy, nuts, bananas)

Tryptophan

GG ↑ TPH2

Excessive conversion of tryptophan into 5-HTP and lower GABA levels

5-Hydroxytryptophan (5-HTP)

CT TC CC ○ DDC — Vitamin B6

Typical conversion of 5-HTP into serotonin, average mental and cognitive health risks

CONTINUES TO MELATONIN

SEROTONIN PRODUCTION

How serotonin (5-HT) is made from tryptophan. Bottlenecks in these enzymes affect serotonin levels and mood balance.

Serotonin / 5-HT

SEROTONIN BREAKDOWN & CLEARANCE

How excess serotonin is deactivated and removed. Slow clearance can heighten signaling, while faster breakdown can reduce mood support.

G ↑ MAOA C

Excessive serotonin breakdown, higher mental health risks

5-HIAL

GG ○ ALDH2 — Niacin

Typical detox of 5-HIA aldehyde, average risk of nerve damage

5-HIAA

Removed from body through Urine

TC ↓ BDNF

Lower activity, reduced support for serotonin signaling, mental resilience, and cognition

SEROTONIN RELEASE & RECEPTORS

Controls serotonin storage, release, and receptor activity. Variants affect mood regulation, anxiety, and sleep patterns.

TT ↓ SLC6A4 (5HTTLPR) AA

Impaired serotonin recycling, leading to lower levels and higher mental health risks

GG ↓ SLC18A1

Impaired serotonin loading, higher mental health risks

CC ○ SLC18A2 AG TT

Typical serotonin loading, average mental health risks

AG TT ○ GSK3B AG — Magnesium

Typical activity and serotonin receptor sensitivity; average mental health risks

Higher Activity:
Lower odds of anxiety, stress, depression, and ADHD
→ GG ↑ HTR1A

Typical Activity:
Average odds of anxiety, panic attacks, and chronic pain
→ GA ○ HTR2A CT

Lower Activity:
Higher odds of weight gain, ADHD, and addictions
→ G ↓ HTR2C C

Typical Activity:
Average odds of chronic pain and migraines
→ GC ○ HTR1B AC AA

Improved Activity:
Lower odds of weight gain, depression, and vomiting
→ AA ○ HTR1D GG

Improved Activity:
Lower odds of depression and mood swings
→ TT ○ HTR4 GA

Typical Activity:
Average odds of addictions and mental health disorders
→ CC ○ HTR6

Higher Activity:
Higher odds of IBS
→ CT ↑ HTR3A

Legend

- A A Gene - Altered
- A Gene - Typical
- A Gene - Better
- A Gene - Not determined
- ↑ Gene - Upregulating
- ↓ Gene - Downregulating
- ○ Gene - Neutral
- A A A Genotype
- ? Genotype not determined
- A Enhancers
- A Biological Compounds
- A A Gene Info

Lab Results:

- Significantly out of optimal
- Out of optimal
- Normal
- Optimal
- Missing lab result

Melatonin Pathway

FROM SEROTONIN

GG — Vitamin B5

AANAT

Typical enzyme activity and melatonin production, normal sleep-wake cycles

N-Acetylserotonin

G — SAM-e

G — ASMT

Typical enzyme activity and melatonin production, average sleep quality and mental health risks

Melatonin

MELATONIN PRODUCTION

How serotonin is converted into melatonin, the sleep-regulating hormone. Bottlenecks in these enzymes can affect circadian rhythm, mood, and recovery.

MELATONIN RELEASE & CIRCADIAN RHYTHM CONTROL

Controls melatonin signaling and release patterns that align the body's internal clock with the day-night cycle. Variants influence mood, recovery, and sleep timing.

MELATONIN BREAKDOWN & CLEARANCE

How melatonin is deactivated and removed. Slow clearance can heighten drowsiness, while faster breakdown may shorten melatonin's effects.

AA — Riboflavin

CYP1A2 — Iron

Typical enzyme activity, resulting in average melatonin clearance and overall detox ability

6-Hydroxymelatonin

CC — Sulfur

↑ SULT1A1

Higher enzyme activity, resulting in enhanced melatonin clearance; mixed effects on detox ability

6-Sulfatoxymelatonin

Removed from body through Urine

CIRCADIAN RHYTHM GENES

Regulate daily biological rhythms by controlling melatonin timing and feedback loops. Variants can alter sleep onset, metabolism, and emotional stability.

AG — CLOCK

Typical activity, average melatonin rhythm, average sleep quality, metabolic health, and dietary patterns

GG — PER2

Typical gene activity, circadian timing and melatonin signaling; normal diet habits and adherence to healthy diets

TC / CC / TA — ARNTL

Typical gene activity and normal control of other circadian genes; typical circadian rhythm and metabolic health

AC — CRY2

Typical circadian rhythm and metabolic health control; typical blood sugar levels and typical odds of diabetes

MELATONIN RECEPTORS

Regulate how melatonin signals the body to rest and recover. Variants can influence sleep onset, insulin balance, and circadian rhythm alignment.

Higher Activity:
Improved melatonin signaling, circadian rhythm & metabolic health

↑ MTNR1A — TT / AA / CC

Higher Activity:
Delayed melatonin release, higher blood sugar, higher odds of diabetes

↑ MTNR1B — CG

Legend

- Gene - Altered
- Gene - Typical
- Gene - Better
- Gene - Not determined
- Gene - Upregulating
- Gene - Downregulating
- Gene - Neutral
- Genotype
- Genotype not determined
- Enhancers
- Biological Compounds
- Gene Info

Lab Results:

- Significantly out of optimal
- Out of optimal
- Normal
- Optimal
- Missing lab result

Results Overview

Serotonin Pathway

Gene - SNP Summary

BDNF	rs6265	↓ TC
MAOA	rs6323	↑ G
	rs909525	↑ C
ALDH2	rs671	○ GG
GSK3B	rs334558	○ AG
	rs6438552	○ AG
	rs3755557	○ TT
HTR6	rs1805054	○ CC
HTR1A	rs6295	↑ GG
HTR4	rs1345697	↑ TT
	rs6889822	○ GA
HTR2C	rs518147	↓ G
	rs3813929	↓ C
SLC6A4	rs2129785	↓ TT
	rs11867581	↓ AA
HTR1B	rs6296	○ GC
	rs130060	↓ AA
	rs11568817	○ AC
SLC18A2	rs363276	○ CC
	rs363387	○ TT
	rs363371	↑ AG
HTR3A	rs1062613	↑ CT
SLC18A1	rs1390938	↓ GG
TPH2	rs4570625	↑ GG
DDC	rs921451	○ CT
	rs11575542	○ CC
	rs3735273	○ TC
HTR2A	rs6313	○ GA
	rs6311	○ CT
HTR1D	rs6300	○ AA
	rs676643	○ GG

Labs Summary

Glucose, Fasting · hs-CRP · Cortisol · Cortisol, Saliva · Gamma-Aminobutyric Acid (GABA), Plasma · HOMA-IR · Homovanillic Acid (HVA), Random Urine · IL-6 · Insulin, Fasting · Leptin · Norepinephrine, Plasma · Tryptophan, Plasma · Vanillylmandelic Acid (VMA), Random Urine · Vitamin B12 · Vitamin B6 · Vitamin D, 25-Hydroxy, Total · Zinc

Melatonin Pathway

Gene - SNP Summary

MTNR1B	rs10830963	↑ CG
ASMT	rs4446909	↓ G
	rs5989681	↓ G
PER2	rs2304672	↑ GG
MTNR1A	rs2119882	↑ TT
	rs12506228	↑ CC
	rs13140012	↓ AA

AANAT	rs28936679	o GG
CLOCK	rs1801260	o AG
CRY2	rs11605924	o AC
SULT1A1	rs1042028	↑ CC

ARNTL	rs2278749	o TC
	rs2290035	o TA
	rs6486122	↑ CC
CYP1A2	rs762551	o AA

Labs Summary

- HDL Cholesterol
- Triglycerides
- Glucose, Fasting
- Hemoglobin A1c (%)
- Cortisol, Saliva
- HOMA-IR
- Homocysteine
- Melatonin (Waking) (DUTCH)

Your recommendations

Your recommendations are prioritized according to the likelihood of it having an impact for you based on your lab results, 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	Aerobic Exercise (Cardio)	1 hour
2	Regular Sleep Schedule	
3	Avoid Meals 3-4 Hours Before Bedtime	
4	Avoid Pesticide Exposure	
5	Dietary Protein	
6	Mindfulness	30 minutes
7	Morning Bright Light Therapy	20 minutes
8	Strength Training	1 hour
9	5-HTP	100 mg
10	Antioxidant Supplements	
11	Ashwagandha	120 mg
12	Avoid Sugary Foods & Drinks	
13	Berberine	1000 mg
14	Curcumin	500 mg
15	Green Tea	400 mg
16	Intermittent Fasting	
17	L-Theanine	100 mg
18	Limit Caffeine Intake	
19	Low-FODMAP Diet	
20	Magnesium	350 mg
21	Magnesium Glycinate	200 mg
22	Maintain Optimal Vitamin D Levels	1000 iu
23	Melatonin	500 mcg
24	Methylfolate	400 mcg
25	Omega-3 (Fish Oil)	2000 mg
26	Peppermint Oil	180 mg
27	Probiotics	30 billion CFU
28	Pyridoxine (Vitamin B6)	50 mg
29	Resveratrol	150 mg
30	Rhodiola	500 mg

31	SAM-e	400 mg
32	Stress Management Therapy	1 hour
33	Tryptophan	500 mg
34	Yoga	30 minutes
35	Zinc	15 mg

Aerobic Exercise (Cardio)

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

How it helps

Cardiovascular exercise increases blood flow to the brain and triggers the release of serotonin, giving you that "runner's high" feeling. Regular cardio also promotes the growth of new brain cells and protects existing neurons, making it one of the most powerful brain health interventions available.

Personalized to Your Genes

↓ BDNF

Implement consistent **aerobic exercise (e.g., brisk walking, cycling)** most days of the week. Exercise robustly increases BDNF release, which can improve mood, stress resilience, and cognitive function [R, R].

↑ MAOA

Moderate aerobic exercise can increase catecholamine production and release.

↓ SLC6A4

Engage in consistent **aerobic exercise**, as it can boost synaptic serotonin acutely and improve transporter function over time. Exercise reduces competing amino acids and increases tryptophan availability to the brain, thereby raising serotonin synthesis [R].

Engage in regular **aerobic exercise**, as it can boost synaptic serotonin acutely and improve transporter function over time. Exercise reduces competing amino acids and increases tryptophan availability to the brain, thereby raising serotonin synthesis [R].

Regular Sleep Schedule

How to implement

Go to bed and wake up at the same time every day, even on weekends and holidays. This helps regulate your body's internal clock, leading to better sleep quality. Aim for 7-9 hours of sleep per night.

How it helps

Consistent sleep-wake times synchronize your body's circadian rhythm, optimizing serotonin production and release patterns. Quality sleep allows your brain to replenish neurotransmitter stores and clear metabolic waste. Regular sleep schedules enhance mood stability, cognitive function, and help maintain the delicate balance of brain chemicals essential for well-being.

Personalized to Your Genes

↓ BDNF	Prioritize consistent, adequate sleep (7–9 hours). Deep sleep supports brain repair and BDNF production, whereas sleep deprivation can lower BDNF and cognitive function [R, R].
ARNTL	Regular sleep and a daily schedule reinforce ARNTL's control of rhythms.
ASMT	Maintain a **regular sleep-wake schedule** to reinforce your circadian rhythm and counteract ASMT imbalance.

Avoid Meals 3-4 Hours Before Bedtime

How to implement

Finish your last meal of the day at least 3 to 4 hours before you go to sleep. For example, if you usually go to bed at 10 pm, aim to have dinner no later than 6 pm to 7 pm.

How it helps

Late-night eating disrupts your body's natural circadian rhythm and interferes with growth hormone release and neurotransmitter cycling during sleep. When digestion competes with brain restoration processes, serotonin regulation suffers. Allowing 2-3 hours between your last meal and bedtime optimizes sleep quality, metabolic health, and morning neurotransmitter balance.

Personalized to Your Genes

↓ HTR2C	Establish regular meal times and **avoid eating late in the evening**. With low 5-HT_2C activity, the body struggles with satiety signals, especially at night.

ARNTL

There's evidence that eating more in the evening (when BMAL1 is winding down) leads to poorer glucose handling and weight gain, especially in those predisposed [R].

Avoid Pesticide Exposure

How to implement

Purchase organic produce when possible, wash fruits and vegetables thoroughly under running water, and peel them if not organic. Use natural pest control methods instead of chemical pesticides at home and garden. Limit the use of non-organic lawn and garden chemicals.

How it helps

Many pesticides can damage the neurons that produce serotonin, with some pesticides linked to increased risk of Parkinson's disease and other brain disorders. Reducing exposure by choosing organic produce when possible and avoiding pesticide use in your home can help protect these vulnerable brain cells from toxic damage.

Personalized to Your Genes

↓ SLC18A1

Pesticides disrupt VMAT/SLC18A1 and impair brain chemistry.

↓ SLC6A4

Because low SERT is associated with greater vulnerability to stress-induced depression, prioritizing stress reduction is critical. Engage in **regular relaxation practices**. These techniques lower cortisol and prevent stress from depleting serotonin [R, R].

Dietary Protein

How to implement

Include a variety of protein sources such as meat, fish, eggs, dairy, beans, and nuts in your diet every day, aiming for at least 0.8 grams of protein per kilogram of body weight. For more active individuals or those looking to build muscle, increase intake to 1.2 to 2.0 grams per kilogram of body weight daily, spread out over all meals to maximize absorption.

How it helps

Protein provides the amino acid building blocks (like tryptophan) that your brain needs to manufacture serotonin. Without adequate protein intake, your brain simply can't produce enough of these neurotransmitters, which can lead to low motivation, poor focus, and mood issues.

Personalized to Your Genes

↓ HTR2C — Emphasize foods that promote fullness to compensate for weaker satiety signaling. Each meal should include **plenty of protein (e.g. eggs, fish, legumes)** and soluble fiber (oats, beans, vegetables, chia seeds) [R].

↑ MAOA — Ensure adequate dietary protein to supply precursor amino acids for neurotransmitter synthesis (tryptophan).

Mindfulness

How to implement

Set aside 5-10 minutes each day to practice mindfulness meditation. Find a quiet place, assume a comfortable seated position, close your eyes, focus on your breathing, and observe your thoughts and sensations without judgment.

TYPICAL STARTING DOSE
30 minutes

How it helps

Mindfulness meditation helps regulate the brain's stress response and can increase serotonin release in reward centers while promoting better balance. Regular practice may actually change the structure of brain regions involved in attention and emotion regulation, supporting healthier neurotransmitter function and reducing the wear-and-tear that chronic stress causes on these systems.

Personalized to Your Genes

↓ BDNF — Engage in **mindfulness meditation or enjoyable social activities** regularly. Such activities lower stress hormones and have been linked to increased BDNF expression. Mindfulness practices also improve mental resilience, countering the low resilience associated with BDNF deficits [R].

↑ MAOA — Mindfulness may help alleviate the drops in neurotransmitters due to high MAO-A and boost mood.

Morning Bright Light Therapy

How to implement

Expose yourself to a light therapy box, which mimics natural sunlight, for about 20-30 minutes each morning within the first hour of waking up. It's important to do this daily, especially during months with less natural sunlight, to help manage symptoms of Seasonal Affective Disorder (SAD) or other conditions influenced by light exposure.

TYPICAL STARTING DOSE

20 minutes

How it helps

Bright light exposure, especially in the morning, helps regulate your circadian rhythm and can boost serotonin production, which is why light therapy is effective for seasonal affective disorder. Light influences the brain regions that control mood and alertness, and getting adequate bright light during the day (while avoiding it at night) helps maintain healthy neurotransmitter patterns.

Personalized to Your Genes

↑ MAOA

Light therapy may help alleviate the drops in neurotransmitters due to high MAO-A and boost mood, especially during the winter.

↓ SLC6A4

Start the day with **bright light (natural sunlight) in the morning**. Light therapy activates serotonin systems and can improve mood and energy, which is especially useful given the lower baseline serotonin activity [R].

Strength Training

How to implement

Engage in strength training exercises, such as weight lifting or bodyweight exercises, for 60 minutes per session, 2 to 3 times per week. Ensure you work all major muscle groups and rest each muscle group for at least 48 hours before exercising it again.

TYPICAL STARTING DOSE

1 hour

How it helps

Resistance exercise increases growth factors that support brain cell health and neurotransmitter receptor sensitivity. It reduces inflammation, improves insulin sensitivity, and enhances mood through multiple pathways, including serotonin regulation. Regular strength training creates lasting improvements in mental health, cognitive function, stress resilience, and overall brain chemistry balance.

Personalized to Your Genes

↓ HTR2C

Strength training not only burns calories but also **improves insulin sensitivity and leptin signaling** (which interacts with 5-HT_2C pathways for appetite).

↑ MTNR1B

Strength training builds muscle, which acts as a “sink” for glucose, making it an ideal choice for people with MTNR1B issues.

5-HTP

How to implement

Take 100 mg of 5-HTP as a supplement daily, ideally with a glass of water. It can be taken at any time of the day but taking it at the same time each day may help establish a routine.

TYPICAL STARTING DOSE

100 mg

How it helps

This compound is one step closer to serotonin than tryptophan, crossing the blood-brain barrier more easily. Your brain converts 5-HTP directly into serotonin, making it a potent supplement for supporting mood, sleep, and appetite control. It bypasses some metabolic steps, potentially offering more direct neurotransmitter support for those with deficiencies.

Personalized to Your Genes

↓ HTR2C

Consider **5-HTP supplements (50–100 mg)** before meals, as tolerated. By increasing serotonin, 5-HTP can enhance the activation of whatever 5-HT_2C receptors are present, promoting satiety and reducing appetite [R].

Consider 5-HTP supplements (50–100 mg) before meals, as tolerated. By increasing serotonin, 5-HTP can enhance the activation of whatever 5-HT_2C receptors are present, promoting satiety and reducing appetite [R].

Antioxidant Supplements

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.

How it helps

Antioxidants help protect brain cells from damage caused by unstable molecules called free radicals, which can harm the neurons that produce serotonin. By reducing this cellular stress, antioxidants may help preserve healthy brain function and neurotransmitter production over time.

Personalized to Your Genes

↓ BDNF

Consume foods high in antioxidants (polyphenols) and consider supplementing – these combat inflammation and may indirectly support higher BDNF.

Ashwagandha

How to implement

Take 250-600 mg of ashwagandha supplement daily. It can be consumed with water or a meal, depending on your preference or as advised by a healthcare provider.

TYPICAL STARTING DOSE

120 mg

How it helps

This adaptogenic herb helps regulate the body's stress response by lowering cortisol levels, which can interfere with healthy sleep-wake cycles. By calming the nervous system and supporting hormonal balance, ashwagandha promotes better sleep quality and may help normalize disrupted circadian rhythms. It works through multiple pathways to reduce anxiety and promote relaxation, creating conditions favorable for natural melatonin production.

Personalized to Your Genes

ARNTL

Ashwagandha in late afternoon/evening can lower evening cortisol and anxiety and help balance your internal clock.

Avoid Sugary Foods & Drinks

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.

How it helps

Foods with a low glycemic index provide steady blood sugar levels, preventing the energy crashes and mood swings associated with spikes and drops. Stable glucose supports consistent neurotransmitter production and brain function. This eating pattern enhances tryptophan's ability to enter the brain, promotes sustained serotonin synthesis, and supports overall metabolic health.

Personalized to Your Genes

↑ MTNR1B

Avoiding sugar and refined cabs is crucial for people with your MTNR1B variant due to its link with diabetes.

Berberine

How to implement

Take 500 mg of berberine two times a day before meals. Continue this regimen for up to three months, then evaluate its effects with your healthcare provider.

TYPICAL STARTING DOSE

1000 mg

How it helps

This plant compound improves metabolic health by regulating blood sugar and insulin sensitivity, which indirectly supports circadian rhythm stability. Metabolic balance is crucial for maintaining healthy sleep-wake cycles, as blood sugar fluctuations can disrupt nighttime rest and melatonin patterns.

Personalized to Your Genes

↑ MTNR1B

Berberine is a natural compound that can lower blood glucose, which is crucial for your MTNR1B variant.

Curcumin

How to implement

Take a 500 mg curcumin supplement daily with food. To enhance absorption, take it with a meal that contains fats or oils since curcumin is fat-soluble.

TYPICAL STARTING DOSE

500 mg

How it helps

This powerful compound from turmeric reduces brain inflammation and may enhance serotonin and dopamine levels. It crosses the blood-brain barrier to support neuroprotection and neurotransmitter balance. Curcumin's anti-inflammatory and antioxidant properties help create an optimal environment for healthy brain function, mood regulation, and cognitive performance.

Personalized to Your Genes

↓ BDNF

Consume foods high in antioxidants – these combat inflammation and may indirectly support higher BDNF. Curcumin can be used in cooking or as a supplement to leverage its BDNF-elevating effect [R].

Green Tea

How to implement

Consume 400 mg of green tea extract daily. This can be taken in the form of capsules or tablets available that specify the amount of green tea extract. Ensure the supplement is taken according to the product's specific instructions, usually once a day with water.

TYPICAL STARTING DOSE

400 mg

How it helps

Green tea contains L-theanine and a moderate amount of caffeine, which work together to support focus and calm alertness by influencing serotonin activity. The antioxidants in green tea, particularly EGCG, also help protect brain cells from damage and may support healthy aging of the serotonin system.

Personalized to Your Genes

↑ MAOA — Green tea is a mild natural MAO-A inhibitor, which may help with your high-activity variant and boost mood.

Intermittent Fasting

How to implement

Limit your daily eating to a specific window of time, typically within an 8-hour period such as from 12 pm to 8 pm, and fast for the remaining 16 hours of the day. Repeat this daily or for at least 3-4 days per week.

How it helps

Intermittent fasting may boost brain-derived neurotrophic factor (BDNF) and trigger cellular cleanup processes called autophagy, which help remove damaged components from brain cells, including those that produce serotonin. Fasting periods can also increase serotonin receptor sensitivity and may help reset reward pathways, though it's important to maintain adequate nutrition during eating windows.

Personalized to Your Genes

↑ MTNR1B — IF makes sure your blood sugar and melatonin rises don't overlap, lessening the impact of your MTNR1B variant.

L-Theanine

How to implement

Take 100-400 mg of L-theanine supplement daily. It can be consumed at any time of the day, with or without food.

TYPICAL STARTING DOSE

100 mg

How it helps

This calming amino acid from green tea promotes relaxation without drowsiness by modulating brain chemistry, including serotonin pathways. It helps reduce stress and anxiety while supporting focus and mental clarity. L-theanine works synergistically with the brain's natural calming systems to create a balanced, alert state of mind.

Personalized to Your Genes

↑ TPH2

With TPH2 overactive, more tryptophan converts to 5-HTP and less to GABA. Use calming supplements like L-theanine to boost GABA activity and counter anxiety. Likewise, theanine elevates brain GABA for relaxation [R].

Limit Caffeine Intake

How to implement

Limit your caffeine consumption to less than 200 milligrams per day, equivalent to about two 6-ounce cups of coffee. Aim to avoid caffeine-containing foods and beverages such as tea, chocolate, and some soft drinks, especially in the late afternoon and evening to minimize sleep disturbances.

How it helps

While moderate caffeine can boost serotonin to improve focus and alertness, excessive intake can lead to tolerance, dependence, and eventual depletion of this neurotransmitter. Limiting caffeine helps prevent the cycle of overstimulation followed by crashes, allowing your brain's natural serotonin system to function more optimally without relying on constant external stimulation.

Personalized to Your Genes

↑ TPH2

Caffeine and other stimulants can further lower GABA and raise stress hormones, exacerbating an overactive TPH2's effects. Opt for herbal teas (e.g. chamomile) in the evening to promote relaxation instead of caffeine.

Low-FODMAP Diet

How to implement

Eliminate foods high in FODMAPs (fermentable oligosaccharides, disaccharides, monosaccharides, and polyols) from your diet for 4 to 6 weeks. This includes certain fruits, vegetables, dairy products, grains, and sweeteners. After the elimination phase, gradually reintroduce foods one at a time to identify triggers.

How it helps

Since approximately 90% of your body's serotonin is produced in the gut, digestive health directly impacts mood and brain function. This diet reduces fermentable carbohydrates that trigger gut inflammation and discomfort, supporting a healthier gut-brain axis. By calming intestinal irritation, it may optimize serotonin production in gut cells and improve communication between your digestive system and brain.

Personalized to Your Genes

↑ HTR3A

If experiencing IBS symptoms, implement a **low-FODMAP diet** for 4–6 weeks to see if the symptoms improve. This personalized approach prevents overactivation of 5-HT_3A receptors by dietary means.

Magnesium

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

How it helps

Magnesium plays a crucial role in regulating the nervous system and helps calm brain activity by supporting the balance of neurotransmitters. It can help reduce stress and anxiety while supporting healthy serotonin function, and many people don't

get enough from their diet alone.

Personalized to Your Genes

↓ SLC18A1 Magnesium is needed for ATP and vesicular pumps; deficiency can impair vesicle loading by VMAT/SLC18A1.

Magnesium Glycinate

How to implement

Take 200-400 mg of magnesium glycinate daily, preferably in the evening or divided into two doses with meals to enhance absorption. Continue this supplementation routine daily for at least one month to evaluate its benefits on your health.

TYPICAL STARTING DOSE
200 mg

How it helps

Magnesium is crucial for over 300 bodily processes, including neurotransmitter production and regulation. This highly absorbable form supports serotonin synthesis, reduces nervous system excitability, and promotes relaxation. It helps convert tryptophan to serotonin and supports healthy sleep patterns, mood stability, and stress resilience.

Personalized to Your Genes

↑ TPH2 With TPH2 overactive, more tryptophan converts to 5-HTP and less to GABA. Use calming supplements like magnesium glycinate to boost GABA activity and counter anxiety. Magnesium is a cofactor for glutamate decarboxylase (making GABA) and has natural anxiolytic effects [R].

Maintain Optimal Vitamin D Levels

How to implement

Check your vitamin D levels, they should ideally be in the 30-66 ng/mL range. If your levels are lower than that, take a vitamin D supplement, 1000-4000 IU daily, to reach an optimal range.

TYPICAL STARTING DOSE
1000 iu

How it helps

Often called the "sunshine vitamin," vitamin D regulates genes involved in serotonin synthesis and function. Deficiency is strongly linked to mood disturbances and cognitive issues. This hormone-like nutrient supports neurotransmitter production, brain cell growth, and inflammatory regulation, making it essential for mental health and neurological function throughout life.

Personalized to Your Genes

↓ SLC6A4

Vitamin D sufficiency is important for serotonin production in the brain. Maintain 25(OH)D levels in the optimal range (through sunlight or supplements) to maximize TPH2-driven serotonin synthesis that can offset low recycling [R, R].

Vitamin D sufficiency is important for serotonin production in the brain. Maintain 25(OH)D levels in the optimal range (through sunlight or supplements) to maximize TPH2-driven serotonin synthesis that can offset low recycling [R, R].

Melatonin

How to implement

Take 500 mcg of melatonin orally, about 30 minutes before bedtime, to help with sleep. It can be taken daily as needed.

TYPICAL STARTING DOSE

500 mcg

How it helps

This "sleep hormone" is your body's primary signal for nighttime, regulating circadian rhythms and promoting restorative sleep. Produced by the pineal gland in response to darkness, melatonin controls sleep-wake cycles, body temperature, and hormonal patterns. Supplemental melatonin can help reset disrupted circadian rhythms, reduce sleep onset time, and improve sleep quality, particularly for shift workers or jet lag.

Personalized to Your Genes

ASMT

With reduced ASMT, your melatonin production is likely suboptimal. Taking a **melatonin supplement** is a direct way to bypass this bottleneck.

Methylfolate

How to implement

Take an L-methyl folate supplement (400-800 micrograms daily), ideally with a meal, to improve absorption. This dosage is recommended for adults, including pregnant women, to support overall health, especially to reduce the risk of neural tube defects in developing fetuses. Continue daily use as part of your regular supplement routine.

TYPICAL STARTING DOSE

400 mcg

How it helps

This active form of folate (vitamin B9) is essential for methylation reactions that produce neurotransmitters, including the conversion pathways for serotonin and melatonin. Unlike regular folic acid, methylfolate is immediately usable by the body and supports the biochemical processes that regulate circadian rhythms. It's particularly important for individuals with genetic variations affecting folate metabolism, ensuring optimal neurotransmitter synthesis.

Personalized to Your Genes

ASMT

By supporting methylation, active folate (methylfolate) indirectly promotes ASMT activity and healthy melatonin production.

Omega-3 (Fish Oil)

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

How it helps

These essential fatty acids, particularly EPA and DHA, form the structural foundation of brain cell membranes and enhance serotonin receptor function. They reduce inflammation, improve neurotransmitter signaling, and support mood regulation. Omega-3s help serotonin move more efficiently between brain cells, enhancing emotional well-being and cognitive performance.

Personalized to Your Genes

↓ BDNF

Increase intake of **omega-3s** (e.g., fatty fish, flaxseed) to provide DHA/EPA, which have been shown to raise BDNF and improve brain health [R].

Peppermint Oil

How to implement

Take 180-400 mg of peppermint oil in capsule form daily before meals. It is recommended to continue this regimen for at least 4 weeks to evaluate its effects.

TYPICAL STARTING DOSE

180 mg

How it helps

This natural remedy soothes digestive discomfort by relaxing intestinal muscles and reducing gut inflammation. Since gut health profoundly affects serotonin production—with 90% manufactured in the digestive tract—calming gastrointestinal distress supports the gut-brain axis. By improving digestive comfort and reducing gut-related stress signals, peppermint oil may indirectly support neurotransmitter balance and overall mood regulation.

Personalized to Your Genes

↑ HTR3A

Peppermint oil has been shown in meta-analyses to be **safe and effective for global IBS symptom relief**. It works by relaxing smooth muscles and possibly blocking calcium channels in the gut, which calms hyperactive neurotransmitter release [R, R].

Probiotics

How to implement

Take a probiotic supplement containing 10 billion or more live cultures once daily, preferably with a meal or as directed by the packaging or a healthcare provider.

TYPICAL STARTING DOSE

30 billion CFU

How it helps

These beneficial bacteria colonize your gut and support the production of serotonin and other neurotransmitters through the gut-brain axis. Certain strains help manufacture precursors to serotonin, reduce inflammation, and improve the intestinal environment where 90% of your body's serotonin is made. A healthy gut microbiome communicates directly with your brain, influencing mood, cognition, and stress responses.

Personalized to Your Genes

↑ HTR3A

Introduce a high-quality **probiotic supplement** or probiotic-rich foods. Certain strains like *Bifidobacterium infantis 35624* have shown benefit in IBS for reducing bloating and bowel movement irregularities – presumably by modulating gut neurotransmitters including serotonin.

Pyridoxine (Vitamin B6)

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

How it helps

This essential vitamin acts as a cofactor in converting tryptophan into serotonin and other neurotransmitters. Without adequate B6, your brain cannot efficiently produce mood-regulating chemicals. It supports cognitive function, emotional balance, and helps reduce symptoms of low mood by enabling proper neurotransmitter synthesis throughout the nervous system.

Personalized to Your Genes

↑ TPH2

Vitamin B6 is required to decarboxylate 5-HTP to serotonin and to synthesize GABA. Supplementing active B6 may balance neurotransmitters by facilitating GABA production while preventing 5-HTP buildup [R].

Resveratrol

How to implement

Take 150-500 mg of resveratrol as a supplement daily, preferably with meals to enhance absorption. This dosage range is based on studies for various health benefits, and it's advised to not exceed 500 mg per day without medical supervision.

TYPICAL STARTING DOSE

150 mg

How it helps

Resveratrol is an antioxidant compound found in red grapes and berries that may protect serotonin-producing neurons from age-related damage and oxidative stress. It appears to have neuroprotective properties and may help maintain healthy serotonin levels, though most research has been in animals, and more human studies are needed.

Personalized to Your Genes

↑ MAOA

Resveratrol is a mild natural MAO-A inhibitor, which may help with your high-activity variant and boost mood.

Rhodiola

How to implement

Take 500 mg of rhodiola supplement daily, preferably in the morning to avoid potential interference with sleep.

TYPICAL STARTING DOSE

500 mg

How it helps

Rhodiola is an adaptogenic herb that may help increase the sensitivity of neurons to serotonin, allowing your brain to make better use of this neurotransmitter. It's particularly known for reducing mental fatigue and improving focus during stressful periods.

Personalized to Your Genes

↑ MAOA

Rhodiola is a mild natural MAO-A inhibitor, which may help with your high-activity variant and boost mood.

SAM-e

How to implement

Take 400-1600 mg of SAM-e as a supplement daily, preferably on an empty stomach to enhance absorption. It is often recommended to start with low dosage and observe how your body responds over a few weeks, adjusting as necessary under the guidance of a healthcare provider.

TYPICAL STARTING DOSE

400 mg

How it helps

This naturally occurring compound supports methylation processes crucial for neurotransmitter production, including both serotonin and melatonin synthesis. SAM-e acts as a methyl donor in numerous brain chemistry pathways, helping convert serotonin into melatonin and supporting mood regulation. It enhances the body's ability to produce and regulate these interconnected neurotransmitters, promoting both emotional wellbeing and healthy sleep-wake cycles.

Personalized to Your Genes

ASMT

SAM-e is a methyl group donor required for proper ASMT function.

Stress Management Therapy

How to implement

Engage in stress management therapy sessions, such as cognitive-behavioral therapy (CBT), for at least 1 hour per week over a course of 8 to 12 weeks. Techniques can include mindfulness, deep breathing exercises, and identifying stressors to develop coping strategies.

TYPICAL STARTING DOSE

1 hour

How it helps

Chronic stress depletes serotonin and disrupts neurotransmitter balance. Evidence-based therapies like cognitive-behavioral therapy teach coping skills that reduce stress hormone production, allowing serotonin systems to function optimally. These

approaches create lasting changes in brain patterns, improving emotional regulation, resilience, and overall mental health through both psychological and neurochemical pathways.

Personalized to Your Genes

↓ SLC6A4

Because low SERT is associated with greater vulnerability to stress-induced depression, prioritizing stress reduction is critical. Engage in **regular relaxation practices**. These techniques lower cortisol and prevent stress from depleting serotonin [R, R].

Tryptophan

How to implement

Take 500 mg of tryptophan supplement daily. This dosage can be taken all at once, preferably before bedtime to support sleep, or as directed by a healthcare professional.

TYPICAL STARTING DOSE

500 mg

How it helps

This essential amino acid is the direct precursor to serotonin—your brain converts it into 5-HTP, then serotonin. Found in protein-rich foods, adequate tryptophan intake ensures your brain has the raw materials for neurotransmitter production. It supports mood, sleep quality, and appetite regulation through serotonin pathways.

Personalized to Your Genes

↓ SLC6A4

Ensure ample **tryptophan intake** (turkey, chicken, eggs, dairy, nuts) or consider supplementing **L-tryptophan** to support serotonin levels. Dietary tryptophan supplementation is shown to improve mood by increasing serotonin synthesis [R].

Yoga

How to implement

Practice yoga for at least 20 to 30 minutes a day, most days of the week. Choose a style that matches your fitness level and goals, and consider attending a class or using online resources to guide your practice.

TYPICAL STARTING DOSE

30 minutes

How it helps

Yoga combines physical movement, breath control, and meditation to reduce stress hormones while supporting healthy serotonin balance. Regular practice can increase GABA (a calming neurotransmitter), reduce inflammation in the brain, and help regulate the nervous system's stress response, creating an environment where neurotransmitter systems can function optimally.

Personalized to Your Genes

↑ TPH2

Regular mind-body practices can increase brain GABA levels and reduce stress-induced serotonin imbalances. For example, yoga sessions have been shown to raise brain GABA by ~27%, helping calm the nervous system and offset low GABA issues from high TPH2 activity [R].

Zinc

How to implement

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

TYPICAL STARTING DOSE

15 mg

How it helps

This trace mineral modulates neurotransmitter function and supports serotonin receptor activity in the brain. Zinc deficiency is linked to mood disturbances and impaired cognitive function. It acts as a cofactor in numerous enzymatic processes that regulate brain chemistry, supporting emotional balance, immune function, and overall neurological health.

Personalized to Your Genes

↓ BDNF

Zinc is a trace mineral important for neurotrophic signaling. Zinc deficiency is associated with decreased BDNF and neurogenesis [R].

BDNF

BDNF Report

BDNF (brain-derived neurotrophic factor) is a component produced mainly in brain cells. It plays many key roles that support your brain's ability to grow and learn [R, R].

More precisely, BDNF helps stimulate [R, R, R, R]:

- Neurogenesis: the production of new nerve cells
- Synaptic plasticity: growing new connections between brain cells

In the brain, BDNF is most active in regions responsible for **cognitive function**, including learning and memory. In line with this, **low BDFN levels are linked to reduced cognitive function and Alzheimer's disease** [R, R, R, R, R].

Besides cognition, BDNF is involved in [R, R, R, R, R, R]:

- Mental health
- Stress response
- Heart health
- Sleep
- Weight Control

Natural ways to boost BDNF levels include:

- Exercise [R, R]
- Sleep [R]
- Stress reduction [R, R]
- Sun exposure [R]

Blockers:

Stress | Excess sugar

Enhancers:

Exercise | Omega-3 | Curcumin

SNP

rs6265 Val66Met

Alleles

C: Typical BDNF activity

T: Reduced BDNF activity

Your Genotype

↓TC

Your genotype is linked to reduced BDNF activity and higher odds of cognitive problems

Intro and Health Effects

A crucial *BDNF* gene variant is **rs6265**, also known as "**Val66Met**". It may affect BDNF production, storage, and release in brain cells. As a result, the **"T" ("Met") allele is linked to reduced cognitive function**, including [R, R, R, R]:

- Learning difficulties
- Poor memory
- Dementia

This variant may also play a role in [R, R, R, R, R, R, R]:

- Stress and anxiety
- PTSD and OCD
- Weight control
- Migraines
- Fatigue

HTR2C

HTR2C Report

The *HTR2C* gene encodes a serotonin receptor, 5-HT2C, present mostly in the brain. Changes in this receptor's activity play a role in [R, R, R, R]:

- Mental health
- Weight and metabolism
- Pain management

Serotonin is a crucial signaling molecule found throughout the brain and body. It is commonly known as the "happiness neurotransmitter" or the "happiness hormone" due to its prominent role in regulating mood and behavior [R, R].

Importantly, increased activity of serotonin receptors typically decreases appetite and weight gain. In line with this, antipsychotics that block serotonin receptors like 5-HT2C are strongly associated with weight gain in some patients [R, R, R, R].

Blockers:

Excess sugar | Processed foods

Enhancers:

Exercise | Sleep

SNP

rs518147

Alleles

G: Reduced HTR2C activity

C: Increased HTR2C activity

Your Genotype

↓G

Your genotype is linked to reduced HTR2C activity and altered serotonin signaling

Intro and Health Effects

Another allele increasing *HTR2C* expression, 'C' at **rs518147**, has been associated with:

- Lower weight gain in response to antipsychotics [R]
- Decreased risk of ADHD [R]
- Lower likelihood of smoking [R]

SNP	Your Genotype
rs3813929 Alleles **C:** Reduced HTR2C activity **T:** Increased HTR2C activity	↓C **Your genotype is linked to reduced HTR2C activity and altered serotonin signaling**

Intro and Health Effects

The main *HTR2C* polymorphism is **rs3813929**. Its minor ‘T’ allele may increase gene expression, leading to a higher density of 5-HT2C receptors. This allele has been associated with [R]:

- **Lower weight gain** in response to antipsychotics [R, R]
- **Decreased risk** of ADHD [R]

On the other hand, it’s linked to higher odds of depression and metabolic problems [R, R].

HTR3A

HTR3A Report

The *HTR3A* gene encodes a part of a serotonin receptor, 5HT3A. This is considered to be one of the three most important types of serotonin receptor in the gut (the others being 5-HT1b and 5-HT4) [R].

The 5-HT3 receptor is scientifically interesting because it has a different structure from all other types of serotonin receptor. When the 5-HT3 receptor is activated, it causes nausea, vomiting, and anxiety. Increased activation of these receptors also appears to predispose people to seizures [R, R, R, R].

These receptors are present throughout the nervous system, both inside and outside the brain. It is also found in non-neuronal cells, especially white blood cells [R].

Many IBS patients have abnormal serotonin systems. Specifically, people with IBS tend to secrete more serotonin, which results in increased movement of the gut tissues, increased inflammation, and more white blood cells in the intestine [R, R].

Some IBS medications block 5-HT3 receptors and prevent the action of serotonin in the gut. In this way, they reduce excess movement of gut muscles and slow down the rate at which food passes through the intestines [R].

SNP

rs1062613

Alleles

C: Typical HTR3A activity

T: Increased HTR3A activity

Your Genotype

↑CT

Your genotype is linked to increased HTR3A activity and higher IBS rates.

Intro and Health Effects

In theory, variants in the 5-HT3 receptor that increase its activity could increase movement in the gut and increase susceptibility to IBS.

One variant in the *HTR3A* gene has been directly linked to IBS. At **rs1062613**, the minor 'T' allele was associated with increased rates of IBS and increased receptor activation [R, R].

MAOA

MAOA Report

The MAOA gene codes for monoamine oxidase, an enzyme that helps break down the following chemical messengers [R]:

- Dopamine
- Serotonin
- Norepinephrine (noradrenaline)

Collectively, these chemicals are called monoamine neurotransmitters. Monoamine oxidase also breaks down other compounds with a monoamine structure, such as phenethylamine and tyramine [R].

Monoamine neurotransmitters control multiple biological processes such as cognition, mood, and behavior. Their activity and rapid breakdown are essential for the correct functioning of the brain. Alternatively, their breakdown by MAOA produces toxic byproducts that cause oxidative stress and inflammation. Hence, the importance of maintaining a balanced MAOA activity [R, R].

By deaminating monoamines, MAOA controls the turnover of dopamine and norepinephrine; high MAOA activity accelerates breakdown, leading to lower neurotransmitter levels.

SNP	Your Genotype
rs6323	↑G
Alleles **G:** Increased MAOA activity **T:** Typical MAOA activity	**Your genotype is linked to increased MAOA activity and lower monoamine levels**

Intro and Health Effects

There are multiple MAOA variants affecting enzyme activity. While low-activity variants lead to increased levels of the monoamine neurotransmitters dopamine, serotonin, and norepinephrine, variants with high activity decrease them. The main one is rs6323, and its “**G” allele** encodes a MAO-A protein with **higher activity** [R].
Variants with high activity lead to reduced dopamine, serotonin, and norepinephrine levels. These variants have been associated with the following conditions:

- Depression [R, R, R, R]
- Panic disorder [R, R]
- Obsessive-compulsive disorder [R, R]
- ADHD [R, R, R, R, R]
- Tourette syndrome [R, R]
- Heavy smoking [R, R, R]

- Parkinson’s disease [R, R]
- Migraines [R, R]
- Chronic fatigue syndrome [R]

Drugs that block MAOA can improve several of these conditions and are commonly prescribed for mood disorders [R, R].

In contrast, traits associated with lower MAOA activity include:

- Aggression [R, R, R, R]
- Autism [R, R, R]
- Schizophrenia [R, R, R]
- Suicidal behavior [R, R, R]
- Alcoholism [R, R, R]
- Substance use disorder [R, R]
- Obesity [R, R, R]

SNP	Your Genotype
rs909525 Alleles **C:** Increased MAOA activity **T:** Typical MAOA activity	↑C **Your genotype is linked to increased MAOA activity and lower monoamine levels**

Intro and Health Effects

Another important variant is rs909525 (C=higher activity), but it's often inherited together with rs6323, so it may not be an independent genetic factor.

Variants with high activity lead to reduced dopamine, serotonin, and norepinephrine levels. These variants have been associated with the following conditions:

- Depression [R, R, R, R]
- Panic disorder [R, R]
- Obsessive-compulsive disorder [R, R]
- ADHD [R, R, R, R, R]
- Tourette syndrome [R, R]
- Heavy smoking [R, R, R]
- Parkinson’s disease [R, R]
- Migraines [R, R]
- Chronic fatigue syndrome [R]

Drugs that block MAOA can improve several of these conditions and are commonly prescribed for mood disorders [R, R].

In contrast, traits associated with lower MAOA activity include:

- Aggression [R, R, R, R]
- Autism [R, R, R]
- Schizophrenia [R, R, R]
- Suicidal behavior [R, R, R]
- Alcoholism [R, R, R]
- Substance use disorder [R, R]
- Obesity [R, R, R]

MTNR1B

MTNR1B Report

The *MTNR1B* gene provides instructions for making a receptor that responds to melatonin, a hormone that helps regulate our internal body clock, also known as the circadian rhythm. This rhythm controls our sleep-wake cycle and many other processes, including how our bodies manage blood sugar.

In addition to its role in the brain, the MTNR1B receptor is found in the pancreas, where it influences how much insulin is released. Insulin is the hormone that helps control blood sugar levels. If melatonin signaling is disrupted—due to irregular sleep, stress, or changes in light exposure—it can throw off the body's ability to manage blood sugar.

Scientists have found that changes in the MTNR1B gene can affect how well this system works, potentially leading to higher blood sugar levels and an increased risk of type 2 diabetes. Learning about these genetic differences can help us better understand how sleep, lifestyle, and metabolism are connected.

SNP	Your Genotype
rs10830963	↑CG
Alleles	**Your genotype is linked to increased MTNR1B activity, delayed melatonin release, and higher blood sugar.**
G: Increased MTNR1B activity	
C: Reduced MTNR1B activity	

Intro and Health Effects

Recent years have brought fascinating insights into how our internal clock affects metabolism, particularly through the melatonin receptor gene MTNR1B. One genetic variant in this gene - **rs10830963** - has emerged as a key player in the connection between sleep timing and blood sugar control.

The **minor "G" allele** has one of the strongest links with **high blood sugar and type 2 diabetes**. It increases the expression of melatonin receptors in pancreatic beta cells. These beta cells release insulin, and when they have more melatonin receptors, they become more sensitive to melatonin's signals [R, R].

Here's where timing becomes crucial: **Melatonin naturally suppresses insulin release** - a useful feature during our normal sleeping hours when we're not eating. However, people carrying the G allele have heightened sensitivity to this effect. For these individuals, **eating late at night can lead to a reduced insulin response and higher blood sugar levels** [R].

New research has uncovered something unexpected: carriers of this variant produce melatonin for about 41 minutes longer than non-carriers, and their melatonin offset (when melatonin levels drop in the morning) is **delayed by about 80 minutes** [R].

This finding has important implications, particularly for early risers. If you carry this variant and wake up early, you might still have elevated melatonin levels when you eat breakfast. Since melatonin suppresses insulin release, this could lead to **higher blood sugar levels during your morning meal**, contributing to diabetes [R].

Taken together, these studies suggest that people with rs10830963-G may benefit from **intermittent fasting** in particular. By avoiding late dinners and early breakfasts, you lessen the negative impact of melatonin on blood sugar control [R].

SLC18A1

SLC18A1 Report

The SLC18A1 gene encodes the vesicular monoamine transporter 1 (VMAT1), which acts to accumulate monoamines, such as norepinephrine, epinephrine, dopamine, and serotonin, into sacs (vesicles). By doing so, it helps ensure the correct functioning of the monoaminergic system [R, R].

The gene is primarily expressed in the brain, especially in the pituitary gland and the adrenal glands [R].

VMAT1 also plays an important role in the uptake and secretion of serotonin in the gut, which is critical for digestive function [R].

Variants in this gene disrupt the levels of monamine neurotransmitters and have been associated with psychiatric disorders such as schizophrenia and bipolar disorder [R].

SNP	Your Genotype
rs1390938 Alleles **A:** Increased SLC18A1 activity **G:** Reduced SLC18A1 activity	↓GG **Your genotype is linked to reduced SLC18A1 activity and monoamine levels**

Intro and Health Effects

The main SLC18A1 polymorphism is rs1390938, commonly referred to as Thr136Ile. Its minor 'A' allele has been linked to higher VMAT1 and monoamine transport activity. This variant has been associated with a **decreased risk** of [R]:

- Autism spectrum disorder [R]
- Anxiety, affective, and alcohol use disorders [R, R]
- Severe alcohol withdrawal [R]
- Damaging neurological changes in alcoholics [R]
- Bipolar disorder [R]
- Low sperm motility [R]

SLC6A4

SLC6A4 Report

5HTTLPR is the most well-researched polymorphism of the *SLC6A4* gene, which encodes a serotonin transporter protein. Once serotonin has been released by brain cells, SLC6A4 becomes active and moves the serotonin back into those cells to reduce the length of serotonin signals. This gene has mainly been associated with psychiatric conditions and how a person responds to selective serotonin reuptake inhibitor (SSRI) antidepressants like citalopram [R, R, R, R].

Serotonin is a crucial chemical messenger throughout the brain and body. It's sometimes called the "happiness hormone" due to its prominent role in mood and mental health. It helps control [R, R, R, R, R, R, R]:

- Mood and emotions
- Movement
- Sleep
- Appetite
- Digestion
- Blood vessel function
- Immunity
- Reproductive health

However, more serotonin is not necessarily better. Excessive levels can cause serotonin syndrome, a serious medical condition, and worsen some mental health problems [R, R].

Blockers:

Stress

SNP

rs2129785

Alleles

C: More likely to carry the "long" 5-HTTLPR allele

T: More likely to carry the "short" 5-HTTLPR allele

Your Genotype

↓TT

Your genotype is linked to the "short" 5-HTTLPR allele, which may imply lower serotonin levels

Intro and Health Effects

Depending on the presence or absence of a specific sequence, the 5HTTLPR variant can originate two different alleles [R]:

- Short (S): lower activity of the gene
- Long (L) allele: 3-fold higher activity of the gene compared to the S allele

The S allele reduces the rate at which serotonin is recycled after a signal, ultimately lowering the circulating levels of this chemical [R].

This polymorphism has been widely investigated in psychiatry. Although the evidence is mixed in some cases, the S allele has been associated with an increased risk of:

- Major depressive disorder [R, R]
- Postpartum depression [R]
- Depression in Parkinson's disease [R]
- Depression in coronary heart disease [R]
- Post-stroke depression [R, R]
- Geriatric depression [R]
- PTSD [R]
- Bipolar disorder [R, R]
- Alcohol abuse and dependence [R, R]
- Anorexia nervosa [R]
- Suicide attempts [R, R, R]
- Premature ejaculation [R, R]
- Migraines [R]
- Canker sores [R]
- Antidepressant-induced mania [R]
- Failure of SSRI treatment [R]

Different combinations of the rs2129785 and rs11867581 polymorphisms of this gene are usually inherited together with the S and L alleles and can be used to predict the genotype of this variant. **Carrying the 'T' variant at rs2129785 and 'A' at rs11867581 predicts the S allele in 91% of cases** [R].

SNP

rs11867581

Alleles

A: More likely to carry the "short" 5-HTTLPR allele

G: More likely to carry the "long" 5-HTTLPR allele

Your Genotype

↓AA

Your genotype is linked to the "short" 5-HTTLPR allele, which may imply lower serotonin levels

Intro and Health Effects

Depending on the presence or absence of a specific sequence, the 5HTTLPR variant can originate two different alleles [R]:

- Short (S): lower activity of the gene
- Long (L) allele: 3-fold higher activity of the gene compared to the S allele

The S allele reduces the rate at which serotonin is recycled after a signal, ultimately lowering the circulating levels of this chemical [R].

This polymorphism has been widely investigated in psychiatry. Although the evidence is mixed in some cases, the S allele has been associated with an increased risk of:

- Major depressive disorder [R, R]
- Postpartum depression [R]
- Depression in Parkinson's disease [R]
- Depression in coronary heart disease [R]
- Post-stroke depression [R, R]
- Geriatric depression [R]
- PTSD [R]
- Bipolar disorder [R, R]
- Alcohol abuse and dependence [R, R]
- Anorexia nervosa [R]
- Suicide attempts [R, R, R]
- Premature ejaculation [R, R]
- Migraines [R]
- Canker sores [R]
- Antidepressant-induced mania [R]
- Failure of SSRI treatment [R]

Different combinations of the rs2129785 and rs11867581 polymorphisms of this gene are usually inherited together with the S and L alleles and can be used to predict the genotype of this variant. **Carrying the 'T' variant at rs2129785 and 'A' at rs11867581 predicts the S allele in 91% of cases** [R].

TPH2

TPH2 Report

The *TPH2* gene codes for tryptophan hydroxylase 2, an enzyme that helps transform the amino acid tryptophan into the chemical messenger (neurotransmitter) serotonin in the brain [R].

Serotonin is a crucial chemical messenger throughout the brain and body. It's sometimes called the "happiness hormone" due to its prominent role in mood and mental health. It helps control [R, R, R, R, R, R, R]:

- Mood and emotions
- Movement
- Sleep
- Appetite
- Digestion
- Blood vessel function
- Immunity
- Reproductive health

However, more serotonin is not necessarily better. Excessive levels can cause serotonin syndrome, a serious medical condition, and worsen some mental health problems [R, R].

SNP	Your Genotype
rs4570625	↑ GG
Alleles **G:** Increased TPH2 activity **T:** Typical TPH2 activity	**Your genotype is linked to higher TPH2 activity, lower GABA levels, and altered serotonin production**

Intro and Health Effects

The rs4570625 variant has been most widely investigated. Its minor 'T' allele is believed to reduce TPH2 production, resulting in lower serotonin levels. Carriers of this variant show higher activity in the part of the brain responsible for stress and fear processing (the *amygdala*) in response to emotional stimuli [R, R, R, R].

The 'T' variant has also been associated with higher GABA levels. GABA is the main inhibitory neurotransmitter, preventing over-stimulation of neurons. An abnormal GABA decrease can produce mental illness and symptoms such as anxiety, depression, insomnia, convulsions, and epilepsy [R, R, R].

The link of this variant with both low serotonin and high GABA levels may explain its complex association with anxiety, mood, and fatigue. This variant has been associated with a decreased risk of:

- Anxiety disorders such as panic disorder [R]
- Severe ADHD symptoms and poor sustained attention in healthy individuals [R]
- Early-onset OCD [R]
- Depression [R]
- Suicide attempts [R]
- Schizophrenia [R]
- Failure of placebo treatments to improve anxiety [R]

However, it increases fatigue in women with IBS [R].

AANAT

AANAT Report

Melatonin is a hormone responsible for your **sleep-wake cycle (circadian rhythm)**. It is made in the pineal gland in response to the absence of light.

After the sun sets, the pineal gland starts releasing melatonin into the bloodstream. As melatonin levels increase, you begin to feel sleepy. Levels remain high throughout the night, for about 12h, and decrease to barely detectable during the day [R].

In addition to the sleep-wake cycle, melatonin also works as an antioxidant and affects the mood, immune system, and other hormone levels. Abnormal melatonin production can cause issues with sleep, mood, and energy [R].

The *AANAT* gene encodes an enzyme called 'aralkylamine N-acetyltransferase' that catalyzes the second-to-last step in melatonin synthesis. By doing so, the AANAT enzyme is a key regulator of the circadian rhythm [R].

Blockers:

Excess caffeine

Enhancers:

Sleep

Omega-3

SNP

rs28936679

Alleles

A: Altered AANAT activity

G: Typical AANAT activity

Your Genotype

GG

Your genotype is linked to typical AANAT activity and melatonin production.

Intro and Health Effects

A study of 211 participants associated the rare 'A' allele of **rs28936679** (G619A) with an increased risk of delayed sleep phase disorder, a condition in which individuals have a sleep/wake cycle delayed by 2 hours or more from usual sleep patterns [R].

This variant has also been associated with abnormal biological rhythms in patients with bipolar disorder [R].

ALDH2

ALDH2 Report

The ALDH2 gene encodes for part of an enzyme named aldehyde dehydrogenase (ALDH), which is involved in the breakdown of alcohol in the liver.

ADH enzymes are responsible for the first step of alcohol metabolism, where alcohol is converted to potentially toxic acetaldehyde. **ALDH** enzymes are responsible for the second step, breaking down acetaldehyde to acetic acid.

Certain ALDH2 variants produce fewer or less active ALDH enzymes, and may reduce the enzyme activity to zero, largely reducing the rate at which acetaldehyde is converted to acetic acid. This can lead to a build-up of acetaldehyde following alcohol consumption. Acetaldehyde build-up is toxic and bad for your health, and can result in negative effects such as [R, R, R]:

- Flushing
- Sweating
- Nausea
- Accelerated heart rate
- Vomiting

Low ALDH2 activity reduces clearance of aldehyde metabolites from dopamine and norepinephrine, leading to accumulation of reactive aldehydes that can damage neurons and contribute to oxidative stress.

Enhancers:

Vitamin B3 (Niacin)

SNP

rs671

Alleles

A: Reduced ALDH2 activity

G: Typical ALDH2 activity

Your Genotype

GG

Your genotype is linked to typical ALDH2 activity and aldehyde clearance

Intro and Health Effects

A study of 251 Japanese people found that carriers of an ‘A’ allele at the ALDH2 rs671 variant were more likely to experience a hangover. As a result, carriers drink less and are less likely to be alcohol-dependent than non-carriers [R].

Carriers of the ‘A’ allele have been reported to get drunk faster and are more likely to experience a hangover, especially if they have a vitamin B12 deficiency. Vitamin B12 can assist in acetaldehyde breakdown. Variant carriers who drink alcohol with this

deficiency may be more at risk of the negative health effects associated with acetaldehyde buildup [R, R].

Besides acetaldehyde, ALDH2 helps clear other aldehyde metabolites, such as those formed by dopamine and norepinephrine breakdown.

The rs671 SNP is most prevalent in Asian populations and is almost non-existent in other populations. Enzyme activity is completely reduced in those who carry two copies of the 'A' allele, and by 50-70% for those who carry one [R, R].

ARNTL

ARNTL Report

The *ARNTL* gene, also known as *BMAL1*, encodes a protein called '*aryl hydrocarbon receptor nuclear translocator-like*' that binds to CLOCK to form a complex that activates the expression of multiple genes. This complex is a key regulator of the circadian rhythm by activating the expression of genes such as *PER1*, *PER2*, *PER3*, *CRY1*, and *CRY2* [R].

Disruptions to the circadian rhythm, often due to shift work, jet lag, light exposure at night, or chronic sleep deprivation, can have significant negative effects on health. They have been linked to health problems such as [R, R, R, R, R, R]:

- **Sleep disorders:** individuals with circadian rhythm disturbances often experience insomnia, poor-quality sleep, or excessive sleepiness during the day.
- **Mood disorders:** disruptions in the circadian rhythm have been associated with an increased risk of depression, anxiety, and other mood disorders. This may be due to the impact of circadian misalignment on neurotransmitter systems that regulate mood.
- **Metabolic disorders:** circadian misalignment is linked to an increased risk of obesity, insulin resistance, and metabolic syndrome. The timing of food intake and energy expenditure plays a crucial role in maintaining metabolic health.
- **Cardiovascular health issues:** chronic circadian rhythm disturbances, particularly those seen in shift workers, have been linked to an increased risk of heart disease and stroke.
- **Cognitive decline and neurodegenerative disorders:** disruptions to the circadian rhythm, particularly in older adults, can contribute to cognitive decline, dementia, and Parkinson's disease.
- **Cancer:** circadian rhythm disruption may increase the risk of some cancer types, especially breast, prostate, and colorectal cancer [R].

In line with this, mutations in the *ARNTL* gene have been associated with infertility, problems with gluconeogenesis and lipogenesis, altered sleep patterns, depression, heart disease, diabetes, and cancer [R, R, R, R].

Blockers:

Stress

Enhancers:

Omega-3 Sleep

SNP

rs2278749

Alleles

C: Typical ARNTL activity

T: Altered ARNTL activity

Your Genotype

TC

Your genotype is linked to altered ARNTL activity and circadian rhythm.

Intro and Health Effects

The best-researched *ARNTL* polymorphism is **rs2278749**. Its minor 'T' allele has been associated with:

- Increased risk of disturbing dreams [R]
- Increased risk of miscarriages [R]
- Increased risk of Alzheimer's disease (in *APOE* ε4 non-carriers) [R]
- Decreased seasonal variation of energy levels [R]
- Decreased risk of breast cancer in night shift workers [R]

SNP

rs2290035

Alleles

A: Altered ARNTL activity

T: Normal ARNTL activity

Your Genotype

o TA

Your genotype is linked to typical ARNTL activity and normal metabolic health.

Intro and Health Effects

The minor 'A' allele of **rs2290035** has been associated with an increased risk of lung cancer and night shift-associated breast cancer [R, R].

SNP

rs6486122

Alleles

C: Normal ARNTL activity

T: Altered ARNTL activity

Your Genotype

↑CC

Your genotype is linked to improved ARNTL activity and normal metabolic health.

Intro and Health Effects

The 'T' allele of **rs6486122** has been associated with an increased risk of coronary artery disease and type 2 diabetes, as well as with higher levels of CRP, triglycerides, and testosterone [R, R, R, R].

ASMT

ASMT Report

Tryptophan is an amino acid the body can use to make 5-HTP, serotonin, and melatonin. These brain chemicals are important for mood and sleep. In line with this, **low levels of tryptophan are associated with sleep and mood disorders** [R, R, R, R].

The *ASMT* gene encodes an enzyme called 'acetylserotonin O-methyltransferase' that catalyzes the last step in the synthesis of melatonin from tryptophan. By doing so, the AANAT enzyme is a key regulator of the circadian rhythm [R, R].

In addition, ASMT is involved in 5-HTP production by catalyzing the conversion of 5-HIAA to 5-methoxy-indoleacetate [R].

Enhancers:

SAMe | Magnesium | Folate | Sleep | Vitamin B12

SNP	Your Genotype
rs4446909 Alleles **A:** Increased ASMT activity **G:** Reduced ASMT activity	↓G **Your genotype is linked to reduced ASMT activity and lower melatonin and 5-HTP production.**

Intro and Health Effects

The main ASMT polymorphisms are **rs4446909** and **rs5989681**. Their minor alleles, 'A' and 'C' respectively, may increase ASMT activity, resulting in higher melatonin and 5-HTP production [R, R].

These variants have been associated with a **decreased risk** of:

- Autism spectrum disorder [R]
- Bipolar disorder [R]

The minor rs4446909-A allele has also been associated with a decreased risk of recurrent depressive disorder and milder depressive symptoms in people with delayed sleep disorder [R, R].

This may be due to a higher sleep quality and more balanced melatonin signaling [R].

SNP	Your Genotype
rs5989681 Alleles **G:** Reduced ASMT activity **C:** Increased ASMT activity	↓G **Your genotype is linked to reduced ASMT activity and lower melatonin and 5-HTP production.**

Intro and Health Effects

The main ASMT polymorphisms are **rs4446909** and **rs5989681**. Their minor alleles, 'A' and 'C' respectively, may increase ASMT activity, resulting in higher melatonin and 5-HTP production [R, R].

These variants have been associated with a decreased risk of:

- Autism spectrum disorder [R]
- Bipolar disorder [R]

On the other hand, the rs5989681-G variant is associated with a decreased risk of recurrent depressive disorder [R, R].

CLOCK

CLOCK Report

The *CLOCK* ('Circadian Locomotor Output Cycles Kaput') gene is a core component of the biological clock. It is one of the main genes responsible for human daily rhythms, also known as circadian rhythms [R].

Many processes in the body follow a daily rhythm, which is why *CLOCK* has many and varied effects. To name a few, mutations in this gene have been linked to:

- Being an evening person [R, R, R]
- Sleep patterns and insomnia [R, R]
- Obesity and weight loss [R, R, R, R]
- ADHD [R, R]
- Schizophrenia [R]
- Insulin levels, metabolic syndrome, and diabetes [R, R, R]
- Alzheimer's [R]

SNP	Your Genotype
rs1801260 Alleles **A:** Reduced CLOCK activity **G:** Increased CLOCK activity	AG **Your genotype is linked to typical CLOCK activity, sleep quality, and metabolic health.**

Intro and Health Effects

The **rs1801260** polymorphism is the most studied SNP in the *CLOCK* gene. Its minor 'G' allele increases CLOCK activity and has been associated with many sleep-related traits, such as [R]:

- Abnormal and less stable circadian rhythms [R, R]
- Shorter sleep duration (≤6 h per day) [R, R, R]
- Being an evening person [R, R, R]
- Less activity overall, being active later in the day, and being sleepier during the morning [R, R]

This variant has also been linked to:

- Higher prevalence of obesity [R, R]
- Higher ghrelin (hunger hormone) levels and lower satiety [R, R]
- Higher insulin and insulin resistance [R]
- Low compliance with dietary programs, such as the Mediterranean diet [R]
- More difficulty losing weight from diets or bariatric surgery [R, R, R]

There is a link between how the *CLOCK* gene affects circadian rhythms and sleep on one hand, and metabolic balance and eating behavior on the other [R, R].

Studies have found that sleep deprivation disrupts metabolism by increasing the levels of the stress hormone cortisol and decreasing insulin sensitivity. Furthermore, a lack of sleep increases the levels of the hunger hormone ghrelin, which increases hunger and appetite -- thereby increasing the risk of obesity [R, R, R, R, R, R].

CRY2

CRY2 Report

Cryptochrome 2 (CRY2) plays a crucial role in our circadian rhythms - the daily cycles that govern everything from sleep to metabolism. This gene helps regulate our master biological clock and influences how our bodies process nutrients throughout the day.

CRY2 functions by suppressing other clock genes, particularly during the night, helping to maintain proper timing of our internal processes. What makes CRY2 particularly interesting from a nutritional perspective is its involvement in glucose metabolism and insulin sensitivity.

Research has shown that CRY2 also responds to changes in our diet and eating patterns. This two-way relationship means that our dietary choices can influence our circadian rhythms, while our internal clock affects how we process the nutrients we consume.

SNP	Your Genotype
rs11605924 Alleles **A:** Altered CRY2 activity **C:** Normal CRY2 activity	AC **Your genotype is linked to typical CRY2 activity and blood sugar control.**

Intro and Health Effects

The main CRY2 variant is rs11605924. Its **“A” allele** is associated with **higher blood sugar and diabetes** [R, R, R].

On the bright side, this variant may be linked to enhanced fat burning and higher HDL or “good” cholesterol [R, R, R].

Circadian rhythm has a well-established role in diet, metabolism, and blood sugar control. However, researchers are not entirely sure how this variant affects sugar and fat metabolism [R].

DDC

DDC Report

The *DDC* gene encodes the aromatic l-amino acid decarboxylase (AADC) enzyme. This enzyme takes part in the pathway that produces dopamine and serotonin. Both neurotransmitters are produced in two-step processes. First, other enzymes control the reactions that convert tyrosine to L-DOPA and tryptophan to 5-hydroxytryptophan [R].

The AADC enzyme converts L-DOPA and 5-hydroxytryptophan to dopamine and serotonin, respectively. To do this, it removes a molecular structure called a carboxyl group, consisting of a carbon atom, two oxygen atoms, and a hydrogen atom [R].

Variants in the *DDC* gene result in reduced activity of the AADC enzyme and decreased dopamine and serotonin levels. Changes in the levels of these neurotransmitters contribute to the developmental delay, intellectual disability, abnormal movements, and autonomic dysfunction seen in people with AADC deficiency [R].

Enhancers:

Vitamin B6 (Pyridoxin)

SNP	Your Genotype
rs921451	CT
Alleles **C:** Reduced DDC activity **T:** Typical DDC activity	**Your genotype is linked to typical DDC activity and L-DOPA metabolism**

Intro and Health Effects

The most widely researched *DDC* SNP is **rs921451**. Its minor 'C' allele has been associated with lower DDC activity. This variant has been associated with [R]:

- Increased risk of Parkinson's disease [R]
- Worse motor response to L-DOPA in patients with Parkinson's disease [R, R, R, R, R]
- Reduced risk of orthostatic hypotension in patients with Parkinson's disease [R]
- Greater nicotine dependence [R]

SNP	Your Genotype
rs11575542 Alleles **C:** Typical DDC activity **T:** Reduced DDC activity	CC **Your genotype is linked to typical DDC activity and L-DOPA metabolism**

Intro and Health Effects

The minor ‘T’ allele of **rs11575542**, also linked to lower DDC enzymatic activity, has been associated with [R]:

- Worse somatic symptoms [R]
- Heavier drinking [R]

SNP	Your Genotype
rs3735273 Alleles **C:** Reduced DDC activity **T:** Increased DDC activity	TC **Your genotype is linked to typical DDC activity and L-DOPA metabolism**

Intro and Health Effects

The ‘T’ allele of **rs3735273** may increase DDC activity based on its opposite effects to the two previous variants. It has been associated with:

- Better response to L-DOPA in patients with Parkinson’s disease [R, R]
- Increased risk of orthostatic hypotension in Parkinson’s disease patients [R]
- Increased risk and severity of ADHD [R, R]
- Reduced nicotine dependence [R]

GSK3B

GSK3B Report

The *GSK3B* gene encodes a protein that plays a role in many different pathways and is highly active in the brain. This protein plays a role in energy metabolism, brain cell development, immune system regulation, and body pattern formation, among others [R, R, R].

Some early research has also implicated the GSK3β protein in the development or progression of various health conditions such as diabetes, inflammation, cancer, Alzheimer's and bipolar disorder [R].

The *GSK3B* gene is turned off by Akt (also called protein kinase B). Since serotonin activates the Akt pathway, it follows that increasing serotonin levels should cause less GSK3β. This is the same mechanism used by certain drugs (SSRIs) that are used to treat depression and anxiety [R, R].

Enhancers:

Magnesium

SNP	Your Genotype
rs334558	AG
Alleles	Your genotype is linked to typical GSK3B activity and serotonin receptor sensitivity
A: Increased GSK3B activity	
G: Typical GSK3B activity	

Intro and Health Effects

The 'A' allele of rs334558 increases the activity of the *GSK3B* gene by 40%. Carriers of this variant may have a higher risk of [R, R]:

- Major depressive disorder [R, R]
- Alzheimer's disease [R]

However, this variant may protect against:

- Insomnia [R]
- Multiple sclerosis [R]
- Colorectal cancer [R]

SNP

rs6438552

Alleles

A: Increased GSK3B activity

G: Typical GSK3B activity

Your Genotype

AG

Your genotype is linked to typical GSK3B activity and serotonin receptor sensitivity

Intro and Health Effects

The ‘A’ at rs6438552 encodes an alternative form of the protein that may have increased activity. This variant has been associated with an increased risk of [R, R]:

- Major depressive disorder [R]
- Alzheimer’s disease [R]
- Colorectal cancer [R]
- Parkinson’s disease [R, R]

SNP

rs3755557

Alleles

A: Increased GSK3B activity

T: Typical GSK3B activity

Your Genotype

TT

Your genotype is linked to typical GSK3B activity and serotonin receptor sensitivity

Intro and Health Effects

The minor ‘A’ allele of rs3755557 may produce twice the levels of GSK3β than ‘T’. This variant has been associated with an increased risk of [R]:

- Schizophrenia [R, R, R]
- ADHD [R]

HTR1B

HTR1B Report

The *HTR1B* gene helps produce the serotonin receptor 5-HT1B [R].

5-HT1B receptors are widely distributed throughout the brain, and their function depends on the brain region. In the frontal cortex, it may inhibit the release of dopamine. In the basal ganglia and the striatum, 5-HT signaling may act on an autoreceptor to inhibit the release of serotonin. In the hippocampus, it promotes excitatory synaptic transmission. Outside the brain, 5-HT1B receptor activation constricts the vessels in the lungs (which cause pulmonary hypertension and a higher heart rate) [R, R, R, R].

Activation of this receptor can also relieve headaches and chronic pain by shrinking the blood vessels and blocking pain signals. In fact, some drugs for migraine attacks activate 5-HT1B receptors in the brain [R, R, R].

Blockers:

Nitrites/nitrates (processed meat)

Enhancers:

Magnesium | Riboflavin | Coenzyme Q10

SNP

rs6296

Alleles

G: Reduced HTR1B activity

C: Increased HTR1B activity

Your Genotype

GC

Your genotype is linked to typical HTR1B activity and typical pain predisposition

Intro and Health Effects

Variants in the *HTR1B* gene with impaired 5-HT1B receptor activity have been associated with chronic pain, migraine attacks, and increased painkiller use. They include 'G' of **rs6296** [R, R, R].

SNP

rs130060

Alleles

A: Reduced HTR1B activity

C: Increased HTR1B activity

Your Genotype

↓AA

Your genotype is linked to reduced HTR1B activity and higher pain predisposition

Intro and Health Effects

Variants in the *HTR1B* gene with impaired 5-HT1B receptor activity have been associated with chronic pain, migraine attacks, and increased painkiller use. They include 'A' of **rs130060** [R, R].

SNP

rs11568817

Alleles

A: Reduced HTR1B activity

C: Increased HTR1B activity

Your Genotype

AC

Your genotype is linked to typical HTR1B activity and typical pain predisposition

Intro and Health Effects

Variants in the *HTR1B* gene with impaired 5-HT1B receptor activity have been associated with chronic pain, migraine attacks, and increased painkiller use. They include 'A' of **rs11568817** [R, R, R].

HTR2A

HTR2A Report

The *HTR2A* gene helps produce a serotonin receptor, 5HT2A [R].

5HT2A receptors are commonly found in brain cells, platelets, the heart, joints, immune cells (monocytes), and the vagus nerve. In the brain, these receptors are concentrated in the prefrontal cortex, amygdala, and hippocampus--areas implicated in learning, memory, and overall cognitive ability [R, R, R, R, R, R, R].

Some researchers hypothesize that 5HT2A receptors decrease with age. The activity of these receptors may also follow the circadian rhythm, becoming more or less active during certain parts of the sleep-wake cycle [R].

Serotonin is a crucial chemical messenger throughout the brain and body. It's sometimes called the "happiness hormone" due to its prominent role in mood and mental health. It helps control [R, R, R, R, R, R, R]:

- Mood and emotions
- Movement
- Sleep
- Appetite
- Digestion
- Blood vessel function
- Immunity
- Reproductive health

However, more serotonin is not necessarily better. Excessive levels can cause serotonin syndrome, a serious medical condition, and worsen some mental health problems [R, R].

SNP

rs6313

Alleles

A: Increased HTR2A activity

G: Reduced HTR2A activity

Your Genotype

GA

Your genotype is linked to typical HTR2A activity and serotonin levels

Intro and Health Effects

The most widely investigated variant is rs6313. Its minor 'A' allele increases the number of active receptors. This variant has been associated with an increased risk of [R, R]:

- Chronic pain, including hip and low back pain [R, R]
- Panic disorder [R]

However, it may be protective against:

- Fatigue disorders such as chronic fatigue syndrome and fibromyalgia [R]
- Headaches [R]
- IBS [R]

SNP	Your Genotype
rs6311	CT
Alleles **C:** Reduced HTR2A activity **T:** Increased HTR2A activity	**Your genotype is linked to typical HTR2A activity and serotonin signaling**

Intro and Health Effects

Another well-researched variant is rs6311. Its minor 'T' variant is usually inherited together with the 'A' variant at rs6313 and also increases the number of active 5HT2A receptors. This variant has been associated with [R, R]:

- Increased odds of chronic pain, including hip and low back pain [R, R]
- Greater depressive symptoms [R]
- Increased risk of IBS [R]

However, this variant may be protective against:

- Headaches [R]
- Rheumatoid arthritis [R]

Interestingly, this variant has been associated with decreased aggressiveness and social dominance. This was linked to being a worse speed dater in men but better in women [R].

HTR6

HTR6 Report

The *HTR6* gene helps produce a serotonin receptor, 5-HT6. This gene is a member of the family of human serotonin receptors, which are G protein-coupled receptors that stimulate cAMP production in response to serotonin (5-hydroxytryptamine) [R].

The gene is expressed almost exclusively in the brain, in regions such as the olfactory tubercle, cerebral cortex (frontal and entorhinal regions), nucleus accumbens, striatum, caudate nucleus, hippocampus, and the molecular layer of the cerebellum [R, R, R].

The blockade of this receptor enhances glutamate, choline, dopamine, and norepinephrine neurotransmission, while its activation enhances GABA neurotransmission [R, R, R, R, R].

In line with its effects on neurotransmission, this receptor plays a role in cognition (especially memory), emotionality, and motor control [R, R, R, R].

SNP	Your Genotype
rs1805054 Alleles **C:** Typical HTR6A activity **T:** Improved HTR6A activity	CC **Your genotype is linked to typical HTR6 activity and typical risk of mental health disorders.**

Intro and Health Effects

The most widely investigated *HTR6* variant is **rs1805054** (C267T). Its minor 'T' allele has been associated with:

- Decreased risk of affective bipolar disorder [R]
- Better response to risperidone and clozapine in schizophrenic patients [R, R]
- Decreased risk of suicide (in males) [R]
- Decreased risk of smoking initiation in women who have experienced trauma [R]
- Increased risk of haloperidol-induced tremor and rigidity [R]
- Worse cognitive performance in Alzheimer's patients [R]

PER2

PER2 Report

PER2, short for PERIOD2, is a core component of the biological clock. It is one of the main genes responsible for human daily rhythms, also known as circadian rhythms [R, R, R].

A lot of what happens in the body follows a daily rhythm, so it's not surprising that PER2 has many and varied roles. To name a few, mutations in this gene have been linked to:

- Being either a morning lark or a night owl [R, R, R, R, R]
- Advanced sleep phase syndrome, an inherited abnormal sleep pattern where people are sleepy early in the evening and wake up very early in the morning [R, R, R]
- Melatonin levels [R]
- Depression, bipolar disorder, seasonal variations in mood, and winter depression [R, R, R, R]
- Insomnia [R]
- Reward circuitry and dopamine levels in the brain [R, R]
- Body weight [R, R]
- Fasting blood glucose, cholesterol levels, and metabolic syndrome [R, R, R, R]

Blockers:

Alcohol

Enhancers:

Exercise Sleep

SNP

rs2304672

Alleles

G: Increased PER2 activity

C: Reduced PER2 activity

Your Genotype

↑GG

Your genotype is linked to increased PER2 activity and better diet habits.

Intro and Health Effects

Scientists put 454 overweight and obese Spanish people on a Mediterranean diet. They found that people who were carrying the minor **“C” allele** for the **rs2304672** variant in the PER2 gene were more likely to [R]:

- Drop out of the diet/study
- Experience stress when dieting
- Be extreme snackers
- Eat when bored
- Skip breakfast

SLC18A2

SLC18A2 Report

The SLC18A2 (‘solute carrier family 18 member 2’) gene encodes a protein called VMAT2 (‘vesicular monoamine transporter 2) that is a member of the toxin-extruding antiporter family [R].

VMAT2 is mainly located in neurons, where it acts as a pump for the release of neurotransmitters such as dopamine, norepinephrine (noradrenaline), epinephrine (adrenaline), serotonin, histamine, and GABA [R, R].

Due to its role in neurotransmitter release, VMAT2 is essential for cognitive processes such as motor control, stable mood, and autonomic function. Moreover, it protects the neurons from both internal and external toxins. In fact, it was first identified for its ability to protect from the Parkinsonism-inducing dopamine neurotoxin MPP+ [R, R, R].

Variants with decreased VMAT2 activity have been associated with:

- PTSD [R]
- Alcohol and nicotine dependence [R]
- Schizophrenia [R]
- Bipolar disorder [R]
- Parkinson’s disease [R]
- Tardive dyskinesia [R]

SNP

rs363276

Alleles

C: Typical SLC18A2 activity

T: Reduced SLC18A2 activity

Your Genotype

CC

Your genotype is linked to typical SLC18A2 activity and typical odds of PTSD

Intro and Health Effects

Several SLC18A2 polymorphisms resulting in decreased VMAT2 levels have been associated with different mental health issues. These include:

- The ‘T’ allele of rs363276: associated with an increased risk of PTSD [R, R].

SNP	Your Genotype
rs363387 Alleles **G:** Increased SLC18A2 activity **T:** Typical SLC18A2 activity	○ TT **Your genotype is linked to typical SLC18A2 activity and typical odds of addiction**

Intro and Health Effects

Several SLC18A2 polymorphisms have been associated with different mental health issues. These include:

- The ‘G’ allele of rs363387: associated with a **lower risk** of alcohol and nicotine dependence, as well as with better inhibitory control [R, R, R].

SNP	Your Genotype
rs363371 Alleles **A:** Increased SLC18A2 activity **G:** Reduced SLC18A2 activity	↑ AG **Your genotype is linked to increased SLC18A2 activity and better mental health**

Intro and Health Effects

Several SLC18A2 polymorphisms resulting in decreased VMAT2 levels have been associated with different mental health issues. These include:

The ‘G’ allele of rs363371: associated with an increased risk of Parkinson’s disease and schizophrenia but a decreased risk of ALS [R, R, R, R].

SULT1A1

SULT1A1 Report

The *SULT1A1* gene encodes an enzyme known as sulfotransferase 1A1. SULT1A1 plays a crucial role in the phase II metabolism of drugs, foreign substances, hormones, and more [R].

This enzyme is primarily involved in sulfation, an important detoxification pathway. It helps eliminate certain toxins and metabolites by making them water-soluble. On the other hand, it may turn some toxins into even more toxic metabolites [R].

SULT1A1 is also involved in the metabolism of numerous medications, influencing their efficacy and toxicity. One example is minoxidil, a substance that promotes hair growth. SULT1A1 helps activate minoxidil and increase its effectiveness [R].

SNP	Your Genotype
rs1042028 Alleles **C:** Increased SULT1A1 activity **T:** Reduced SULT1A1 activity	↑CC **Your genotype is linked to increased SULT1A1 activity and relatively higher melatonin clearance.**

Intro and Health Effects

A variant in this gene, known as **SULT1A1*2,** may reduce its activity. People with the **“T” allele at rs1042028** (previously named rs9282861) carry this variant [R].

In theory, **lower** SULT1A1 activity may impair melatonin clearance. However, this variant hasn’t been linked to changes in melatonin levels or signaling.

CYP1A2

CYP1A2 Report

The CYP1A2 gene codes for a crucial liver enzyme. It detoxifies several common dietary and pollutant-based toxins, including [R, R]:

- **Caffeine** – from coffee, tea, and energy drinks
- **Aflatoxins** – found in moldy peanuts, corn, grains, and spices
- Heterocyclic Amines – from well-done meat and cigarette smoke
- Acrolein – from cigarette smoke, vehicle exhaust, and fried foods
- Aldehydes – from alcohol, frying oils, and cigarette smoke
- Food Dyes – present in snacks, candies, and beverages

Higher enzyme activity supports **faster clearance of toxins** like caffeine and acrolein, though it might increase activation of certain carcinogens like heterocyclic amines in the absence of robust antioxidant defense [R, R].

Enhancers:

Riboflavin Iron

SNP	Your Genotype
rs762551 CYP1A2*1F	AA
Alleles	
A: Typical CYP1A2 activity	**Your genotype is linked to typical CYP1A2 activity and melatonin clearance.**
C: Reduced CYP1A2 activity	

Intro and Health Effects

The "slow metabolizer" CYP1A2 variant makes a less efficient enzyme. People who carry this variant may be **more sensitive to caffeine**. Accordingly, they may be more likely to experience negative effects when drinking coffee [R, R, R].
CYP1A2 is the main enzyme that breaks down melatonin. In theory, people with reduced activity may have higher melatonin levels. However, this variant hasn't been linked to changes in melatonin levels or signaling.

HTR1A

HTR1A Report

The *HTR1A* gene helps produce a serotonin receptor, 5HT1A [R, R].

This receptor is tricky in terms of its mechanism, because it depends on where it's activated. For a signal to be sent in the brain, two neurons are involved: one that sends the signal and one that receives it. The first is the presynaptic neuron; the second is the postsynaptic neuron. In serotonin signalling, both the presynaptic and postsynaptic neurons have 5-HT1A receptors; the presynaptic receptors are also called autoreceptors [R, R].

If the postsynaptic receptors are activated, they have all of the anti-anxiety and mood-boosting benefits that you would expect. However, increased autoreceptor activity causes a reduction in serotonin [R].

Serotonin is a crucial chemical messenger throughout the brain and body. It's sometimes called the "happiness hormone" due to its prominent role in mood and mental health. It helps control [R, R, R, R, R, R, R]:

- Mood and emotions
- Movement
- Sleep
- Appetite
- Digestion
- Blood vessel function
- Immunity
- Reproductive health

However, more serotonin is not necessarily better. Excessive levels can cause serotonin syndrome, a serious medical condition, and worsen some mental health problems [R, R].

Blockers:

Stress

Enhancers:

Magnesium Omega-3 Zinc

SNP

rs6295

Alleles

G: Increased HTR1A activity

C: Reduced HTR1A activity

Your Genotype

↑GG

Your genotype is linked to increased HTR1A activity and higher serotonin levels

Intro and Health Effects

The most widely investigated *HTR1A* variant is rs6295. Its minor 'C' allele leads to **a lower expression of 5HT1A postsynaptic receptors**, and decreased overall activity in serotonin neurons [R, R].

This variant has been associated with:

- Decreased self-awareness or emotional intelligence (*alexithymia*), especially in males with early-life stress [R, R]
- Decreased comfort with close relationships and lower odds of being in a romantic relationship [R]
- Higher susceptibility to anxiety and depression from stressful events [R]
- Increased impulsiveness and aggression [R]
- Higher odds of ADHD [R]
- Impaired working memory in premenstrual women [R]
- Increased pain perception in response to intense stimuli (but decreased perception of mild pain) [R]

HTR1D

HTR1D Report

The *HTR1D* gene helps produce a serotonin receptor, 5-HT1D. This receptor is a G-protein-coupled receptor that inhibits adenylate cyclase, resulting in reduced cyclic AMP production. Upon binding to serotonin, 5-HT1D affects locomotion, anxiety, brain vasoconstriction, and intestinal smooth muscle contraction [R, R].

Dysregulation of the 5-HT1D receptor has been associated with conditions like migraine and certain cancers, such as pancreatic and gastric cancer [R].

Blockers:

Nitrites/nitrates (processed meat)

Enhancers:

Coenzyme Q10 Riboflavin Vitamin B6 (Pyridoxin)

SNP	Your Genotype
rs6300 Alleles **A:** Typical HTR1D activity **G:** Altered HTR1D activity	AA **Your genotype is linked to normal HTR1D activity and serotonin signaling**

Intro and Health Effects

The most widely investigated *HTR1D* variant is **rs6300**. Its minor 'G' allele may alter serotonin signaling and has been associated with [R]:

- Antipsychotic-induced weight gain [R]
- Cyclic vomiting syndrome [R]

SNP	Your Genotype
rs676643 Alleles **A:** Altered HTR1D activity **G:** Typical HTR1D activity	GG **Your genotype is linked to normal HTR1D activity and serotonin signaling**

Intro and Health Effects

Another allele, ‘A’ of **rs676643,** has been associated with a 7-fold higher risk of depression in patients with cyclic vomiting syndrome [R].

HTR4

HTR4 Report

The *HTR4* gene helps produce a serotonin receptor, 5-HT4. This gene is a member of the family of human serotonin receptors, which are G protein-coupled receptors that stimulate cAMP production in response to serotonin (5-hydroxytryptamine) [R].

The gene is expressed in the brain (mainly in the putamen, caudate nucleus, nucleus accumbens, globus pallidus, and substantia nigra, and to a lesser extent in the neocortex, raphe, pontine nuclei, and some areas of the thalamus), as well as in the gastrointestinal tract, urinary bladder, heart, and adrenal gland [R].

Blockers:

Stress

Enhancers:

Choline

SNP

rs1345697

Alleles

C: Altered HTR4 activity

T: Normal HTR4 activity

Your Genotype

↑ TT

Your genotype is linked to improved HTR4 activity and better mood

Intro and Health Effects

A study of 492 depressed patients associated the major 'C' allele of **rs1345697** with lower depressive symptom improvement and remission rates after a 6-month antidepressant treatment [R].

SNP

rs6889822

Alleles

A: Altered HTR4 activity

G: Normal HTR4 activity

Your Genotype

○ GA

Your genotype is linked to typical HTR4 activity and typical mood

Intro and Health Effects

Another variant, the major ‘A’ allele of **rs6889822**, has been associated with an increased risk of mood swings [R].

MTNR1A

MTNR1A Report

The *MTNR1A* gene codes for melatonin receptor 1A (MT1). This receptor is activated by the hormone melatonin. Melatonin is best known to induce sleep [R, R].

MT1 may influence [R]:

- Sleep conditions
- Mood disorders
- Learning and memory
- Drug abuse
- Cancer

Blockers:

Excess caffeine | Alcohol

Enhancers:

Sleep | Omega-3 | Vitamin B3 (Niacin)

SNP

rs2119882

Alleles

C: Lower MTNR1A activity

T: Higher MTNR1A activity

Your Genotype

↑ TT

Your genotype is linked to higher MTNR1A activity and better melatonin signaling and metabolic health.

Intro and Health Effects

The main *MTNR1A* variant is rs2119882. Its 'C' allele may prevent the binding of proteins that activate gene expression, resulting in a lower number of MT1 receptors. This variant has been associated with an increased risk and severity of:

- PCOS [R]
- Gestational diabetes [R]
- Liver cancer metastasis [R]

However, this allele has also been associated with a decreased risk of:

- Breast cancer in shift workers [R]
- Graves' disease [R]

SNP

rs12506228

Alleles

A: Lower MTNR1A activity

C: Higher MTNR1A activity

Your Genotype

↑CC

Your genotype is linked to higher MTNR1A activity and better melatonin signaling and cognitive health.

Intro and Health Effects

The ‘A’ allele of rs12506228 reduces the number of MT1 melatonin receptors in the brain. This variant as been associated with:

- Job-related exhaustion in shift workers [R]
- Alzheimer’s disease in old age [R]
- Slower cognitive development in infants [R]

SNP

rs13140012

Alleles

A: Lower MTNR1A activity

T: Higher MTNR1A activity

Your Genotype

↓AA

Your genotype is linked to lower MTNR1A activity and worse melatonin signaling and metabolic health.

Intro and Health Effects

Another allele believed to prevent the binding of proteins that activate *MTNR1A* expression is ‘A’ at rs13140012. This allele has been associated with

- Oral cancer and worse prognosis in betel quid chewers [R]
- Kidney stones [R]

Lab markers to check

HDL Cholesterol 42 mg/dL

29 Aug 2025

Personalized to Your Genes

ARNTL

ARNTL is heavily involved in metabolic gene transcription. If you succeed in improving your circadian alignment, you should see improvements in metabolic markers like HDL.

Triglycerides 1.91 mmol/L

14 Oct 2025

Personalized to Your Genes

ARNTL

ARNTL is heavily involved in metabolic gene transcription. If you succeed in improving your circadian alignment, you should see improvements in metabolic markers like triglycerides.

Glucose, Fasting 4.2 mmol/L

12 Sep 2025

Personalized to Your Genes

↓ HTR2C

Low 5-HT_2C activity can contribute to weight gain and metabolic issues. Track fasting blood glucose, fasting insulin, and HOMA-IR.

↑ MTNR1B

Helps detect blood sugar problems due to disrupted MTNR1B activity.

Hemoglobin A1c (%) 5.5 %

14 Oct 2025

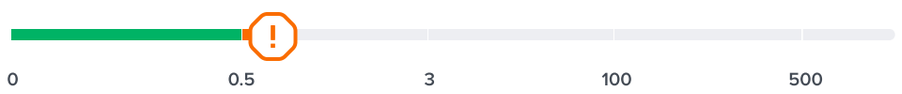
Personalized to Your Genes

↑ MTNR1B

Helps detect blood sugar problems due to disrupted MTNR1B activity.

hs-CRP

0.9 mg/L



29 Aug 2025

Personalized to Your Genes

↓ BDNF

A marker of systemic inflammation. Chronically elevated CRP suggests inflammation is suppressing BDNF.

↓ SLC6A4

Because inflammation can exacerbate serotonin dysregulation, track hs-CRP or IL-6. For instance, ongoing low-grade inflammation might explain heightened depressive symptoms in a 5-HTTLPR carrier.

Iron

9.6 umol/L

14 Oct 2025

LDL Cholesterol

3.34 mmol/L

14 Oct 2025

TSH

2.06 mIU/L

29 Aug 2025

8-Hydroxy-2-deoxyguanosine, Urine

Cortisol

Personalized to Your Genes

↓ SLC6A4

Given the gene–stress interaction, measuring **AM cortisol** is useful. Elevated cortisol could indicate why a low-SERT individual is experiencing anxiety/depression.

Cortisol, Saliva

Personalized to Your Genes

↓ BDNF

Measuring cortisol can identify chronic stress exposure contributing to low BDNF. A high cortisol/DHEA ratio might indicate the need for stress reduction strategies to allow BDNF recovery.

↓ SLC6A4

Given the gene–stress interaction, measuring **AM cortisol** is useful. Elevated cortisol could indicate why a low-SERT individual is experiencing anxiety/depression.

○ ARNTL

With ARNTL issues, checking a **diurnal cortisol curve** can be crucial. One might find the timing of cortisol is off.

DHEA Sulfate

Gamma-Aminobutyric Acid (GABA), Plasma

Personalized to Your Genes

↑ TPH2

Although not a standard test, some specialized labs measure GABA. Low GABA would corroborate the “lower GABA” effects of this variant.

HOMA-IR

Personalized to Your Genes

↓ HTR2C

Low 5-HT_2C activity can contribute to weight gain and metabolic issues. Track fasting blood glucose, fasting insulin, and HOMA-IR.

↑ MTNR1B

Helps detect blood sugar problems due to disrupted MTNR1B activity.

Homocysteine

Personalized to Your Genes

ASMT

Since ASMT methylation support, checking plasma homocysteine is wise.

Homovanillic Acid (HVA), Random Urine

Personalized to Your Genes

↑ MAOA

Reflects the changes in dopamine levels due to high MAO-A

IL-6

Personalized to Your Genes

↓ SLC6A4

Because inflammation can exacerbate serotonin dysregulation, track hs-CRP or IL-6. For instance, ongoing low-grade inflammation might explain heightened depressive symptoms in a 5-HTTLPR carrier.

Insulin, Fasting

Personalized to Your Genes

↓ HTR2C

Low 5-HT_2C activity can contribute to weight gain and metabolic issues. Track fasting blood glucose, fasting insulin, and HOMA-IR.

Leptin

Personalized to Your Genes

↓ HTR2C

In the context of difficult weight control, measuring **leptin** can be insightful. High leptin with high weight suggests leptin resistance (often present when 5-HT_2C is low, since leptin works partly via 5-HT_2C neurons).

Magnesium, RBC

Malondialdehyde

Melatonin (Waking) (DUTCH)

Personalized to Your Genes

↑ MTNR1B

Crucial to check if MTNR1B is delaying melatonin signaling.

○ ASMT

This test gives a quantitative measure of your melatonin production overnight, which may be affected by your ASMT variant.

Nicotinamide (Vitamin B3)

Norepinephrine, Plasma

Personalized to Your Genes

↑ MAOA

High MAO-A may mildly reduce NE levels.

Total Glutathione

Tryptophan, Plasma

Personalized to Your Genes

↑ TPH2

Evaluating tryptophan levels helps ensure the body isn't depleted (since TPH2 "Up" can overconsume tryptophan).

Vanillylmandelic Acid (VMA), Random Urine

Personalized to Your Genes

↑ MAOA

Reflects the changes in NE levels due to high MAO-A

Vitamin B12

Personalized to Your Genes

↓ SLC6A4

Vitamin B12 supports serotonin synthesis and neural health. Low levels are common in those with depression or fatigue. If suboptimal, supplementing can aid overall treatment strategies.

Vitamin B2 (Riboflavin), Plasma

Vitamin B5 (Pantothenic Acid)

Vitamin B6

Personalized to Your Genes

↑ TPH2

To ensure sufficient cofactor for 5-HTP decarboxylation and GABA synthesis. A functional B6 test or plasma PLP can detect deficiencies that might worsen neurotransmitter imbalances.

Vitamin D, 25-Hydroxy, Total

Personalized to Your Genes

↓ BDNF

Vitamin D insufficiency may contribute to mood issues. Ensure vitamin D is in optimal range, as it supports overall brain health and possibly BDNF regulation.

↓ SLC6A4

Vitamin D supports serotonin synthesis and neural health. Low levels are common in those with depression or fatigue. If suboptimal, supplementing can aid overall treatment strategies.

Vitamin D 25(OH)D: Vitamin D supports serotonin synthesis and neural health. Low levels are common in those with depression or fatigue. If suboptimal, supplementing can aid overall treatment strategies.

Zinc

Personalized to Your Genes

↓ BDNF

Check levels of **zinc** since low zinc is linked to reduced BDNF and depression. Deficiency can exacerbate mental health symptoms.

Glossary

5-HIAA
A main breakdown product of serotonin, cleared from the body through urine and used as a marker of serotonin activity.

5-HIAL
An intermediate compound formed as serotonin is broken down; quickly processed to prevent buildup of toxic byproducts.

5-HT
Short for serotonin, a neurotransmitter that affects mood, sleep, appetite, and overall emotional balance.

5-Hydroxytryptophan (5-HTP)
A direct precursor to serotonin, made from tryptophan. Supplementing 5-HTP can help boost serotonin production.

6-Hydroxymelatonin
A breakdown product of melatonin processed in the liver before being excreted from the body.

6-Sulfatoxymelatonin
The main metabolite of melatonin found in urine, reflecting total melatonin output and sleep rhythm activity.

BH4 (Tetrahydrobiopterin)
A vital cofactor that helps enzymes convert amino acids like tryptophan into neurotransmitters such as serotonin and dopamine.

Biological Compounds
Naturally occurring molecules (e.g., amino acids, neurotransmitters, metabolites) involved in essential physiological pathways.

Circadian Rhythm
The body’s 24-hour biological clock that regulates sleep, hormone release, metabolism, and other daily cycles.

Circadian Rhythm Genes
Genes that help regulate the body's 24-hour sleep–wake and metabolic cycles.

Downregulating (Gene Activity Label)
Indicates a gene variant associated with decreased expression or activity of an enzyme or receptor.

Enhancers
Nutrients or cofactors that support normal enzyme or receptor function.

Enzyme
A protein that speeds up chemical reactions in the body, allowing processes like neurotransmitter synthesis and detoxification to occur efficiently.

Higher Activity (Functional Classification)
A functional state where an enzyme or receptor operates above typical population activity levels.

IBS (Irritable Bowel Syndrome)
A digestive condition often linked to serotonin imbalance, affecting bowel movements, pain sensitivity, and stress response.

Melatonin
A hormone made from serotonin that regulates sleep-wake cycles, mood, and nighttime recovery.

Melatonin Receptors
Cell receptors that bind melatonin to help regulate sleep timing and circadian signaling.

N-Acetylserotonin
An intermediate compound formed when serotonin is converted into melatonin; also supports antioxidant and neuroprotective effects.

Neuronal Plasticity
The brain’s ability to adapt, strengthen, or reorganize neural connections in response to learning, experience, or stress.

Neuron
A nerve cell that sends and receives electrical and chemical signals, forming the communication network of the brain and nervous system.

Neutral (Gene Activity Label)
Indicates a gene variant that does not increase or decrease gene or enzyme activity.

OCD (Obsessive-Compulsive Disorder)
A mental health condition often associated with serotonin imbalance, leading to repetitive thoughts and behaviors.

Receptor
A protein on a cell's surface that binds to neurotransmitters or hormones like serotonin or melatonin, triggering specific cellular responses.

Serotonin
A neurotransmitter that regulates mood, appetite, digestion, and sleep. Imbalances can contribute to anxiety, depression, and insomnia.

Synthesis
The process by which the body creates complex molecules like neurotransmitters from simpler precursors.

Tryptophan
An amino acid from dietary protein that serves as the starting material for serotonin and melatonin production.

Typical Activity (Functional Classification)
A functional state reflecting normal, population-average enzyme or receptor activity.

Upregulating (Gene Activity Label)
Indicates a gene variant associated with increased expression or activity of an enzyme or receptor.

Vesicles
Tiny storage bubbles inside neurons that hold neurotransmitters like serotonin until they're released for signaling.