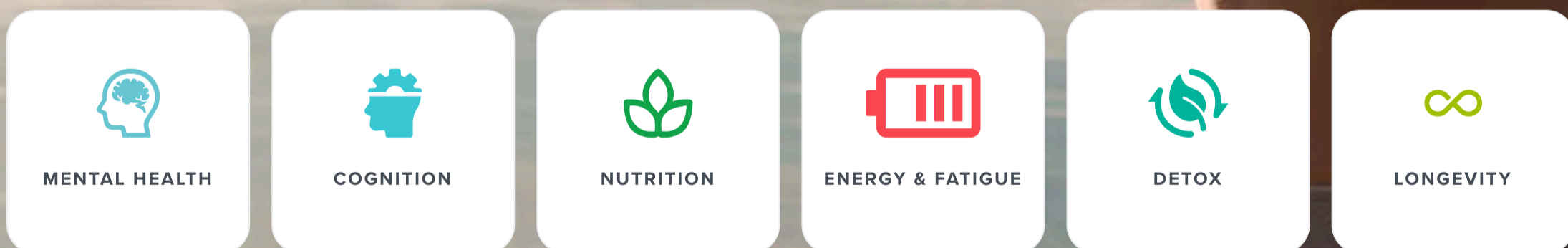


100X Toolkit Genomics Functional DNA Report

Health Report

REPORT CATEGORIES —



Sample Client

Report date: 30 April 2026

Table of Contents

03 Summary

04 Overview of Your Results

11 Recommendations Overview

12 Your Results in Details

- 12 Fitness & Longevity
- 21 Hormones
- 32 Immunity & Inflammation
- 46 Weight Control
- 57 Diet & Nutrition
- 94 Mood, Energy & Pain
- 113 Cellular Health
- 130 Gut Health
- 144 Cognition
- 154 Heart & Metabolism

178 Recommendations Details

188 Next Steps

- 188 Your lifestyle assessments

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.

Viewing this medical test requires a medical doctor or use one of our contracted genetic counselors. By accessing these results, you acknowledge and agree that you will consult with a licensed physician or one of our contracted genetic counselors to review and interpret the results, and you agree not to rely on this information as a substitute for professional medical advice, diagnosis, or treatment.

Personal information

NAME

Sample Client

SEX AT BIRTH

Male

HEIGHT

5ft 10" 178cm

WEIGHT

215lb 97.5kg

REPORT PROVIDED BY

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Summary

Your genes play a fascinating role in shaping every aspect of your health and well-being - from how you age and maintain fitness to how you think and feel. This comprehensive genetic analysis explores ten key areas that work together to influence your overall health and quality of life.

We'll examine genetic factors that affect your fitness potential and longevity, along with variations that influence your hormone balance and immune system function. The report delves into genes that impact weight management and how your body processes different nutrients.

We'll also explore genetic markers related to mood, energy levels, and pain sensitivity, as well as those affecting fundamental cellular processes and gut health.

Additionally, we investigate genes that influence cognitive function and how your body manages metabolism and cardiovascular health. Understanding these genetic predispositions can help you make more informed decisions about your lifestyle choices and health strategies.

Remember that your genes are just one part of your health story - they interact with your environment, diet, and lifestyle choices to influence your well-being.

This summary report contains:


103 Genetic Results

15 Recommendations


10 Lifestyle Assessments

Overview of Your Results


Fitness & Longevity

 **MORE LIKELY**
Disc Degeneration


More likely to have disc degeneration

 **TYPICAL**
Longevity


Predisposed to typical longevity

 **TYPICAL**
Power

Likely typical power performance

 **TYPICAL ACTIVITY**
ACTN3 (Power)

Likely typical ACTN3 activity

 **HIGHER**
Endurance

Predisposed to higher endurance


Hormones

 **LOWER LEVELS**
DHEAS


Predisposed to lower DHEAS levels

 **TYPICAL LEVELS**
Cortisol


Predisposed to typical cortisol levels

 **TYPICAL LEVELS**
Estradiol (M)


Predisposed to typical estradiol levels

 **TYPICAL**
**Estrogen Metabolism
(Functional)**


Predisposed to typical estrogen metabolism

 **TYPICAL LEVELS**
Progesterone

Predisposed to typical progesterone levels








 **LOWER ACTIVITY**
**FKBP5 (Stress/
HPA Axis)**

Likely lower FKBP5 activity







 **HIGHER LEVELS**
Testosterone

Predisposed to higher testosterone levels


















Immunity & Inflammation


<p> MORE LIKELY Psoriasis</p> <p>More likely to have psoriasis</p>	<p> TYPICAL LIKELIHOOD Hashimoto's Disease</p> <p>Typical likelihood of Hashimoto's disease</p>	<p> TYPICAL LIKELIHOOD Rheumatoid Arthritis</p> <p>Typical likelihood of rheumatoid arthritis</p>
<p> TYPICAL LIKELIHOOD Multiple Sclerosis</p> <p>Typical likelihood of multiple sclerosis</p>	<p> TYPICAL LEVELS Inflammation (CRP)</p> <p>Predisposed to typical CRP levels</p>	<p> TYPICAL LIKELIHOOD Underactive Thyroid</p> <p>Typical likelihood of hypothyroidism</p>
<p> LESS LIKELY Thyroid Inflammation</p> <p>Less likely to have thyroid inflammation</p>		

Weight Control


<p> LOWER ACTIVITY UCP1 (Weight)</p> <p>Likely lower UCP1 activity</p>	<p> TYPICAL LIKELIHOOD Tendency to Overeat</p> <p>Typical likelihood of overeating</p>	<p> LOWER Metabolic Rate</p> <p>Predisposed to lower metabolic rate</p>
<p> LESS LIKELY Overweight</p> <p>Less likely to be overweight or obese</p>	<p> BETTER FTO (Weight)</p> <p>Likely better FTO genetics</p>	<p> HIGHER ACTIVITY MC4R (Weight/ Blood Sugar)</p> <p>Likely higher MC4R activity</p>

Diet & Nutrition

 MORE LIKELY Snacking More likely to snack	 INCREASED NEED Calcium Likely increased need for calcium	 INCREASED NEED Folate (Functional) Predisposed to increased need for folate
 WORSE RESPONSE Protein Metabolism Predisposed to worse protein metabolism	 INCREASED NEED Vitamin B6 (Pyridoxine) Likely increased need for vitamin B6	 INCREASED NEED Zinc Likely increased need for zinc
 HIGHER Alcohol Sensitivity Likely higher sensitivity to alcohol	 TYPICAL NEED Vitamin B12 Likely typical need for vitamin B12	 TYPICAL NEED Vitamin D Likely typical need for vitamin D
 TYPICAL NEED Iron Likely typical need for iron	 TYPICAL RESPONSE Saturated Fat Predisposed to typical saturated fat response	 INTERMEDIATE ACTIVITY TAS2R38 (Bitter Taste Perception) Likely intermediate TAS2R38 activity
 TYPICAL NEED Vitamin A Likely typical need for vitamin A	 TYPICAL NEED Vitamin C Likely typical need for vitamin C	 TYPICAL NEED Magnesium Likely typical need for magnesium
 TYPICAL NEED Selenium Likely typical need for selenium	 TYPICAL NEED Choline Likely typical need for choline	 TYPICAL NEED Coenzyme Q10 Likely typical need for coenzyme Q10

 **TYPICAL NEED**
Omega-3


Likely typical need for omega-3s

 **TYPICAL GENETICS**
HLA-DQ (Gluten)


Likely typical HLA-DQ genetics

 **TYPICAL LIKELIHOOD**
Celiac Disease

Typical likelihood of celiac disease

 **BETTER**
Fat Metabolism


Predisposed to better fat metabolism

 **LOWER**
Caffeine Sensitivity


Predisposed to lower caffeine sensitivity

 **HIGHER ACTIVITY**
CYP1A2 (Detox)

Likely higher CYP1A2 activity


 **LIKELY TOLERANT**
Lactose Intolerance

Likely lactose tolerant


 **LESS LIKELY**
Sugar Cravings

Less likely to crave sugar


Mood, Energy & Pain

 **MORE LIKELY**
Low Mood


More likely to have chronically low mood

 **MORE LIKELY**
Fibromyalgia


More likely to have fibromyalgia

 **TYPICAL LIKELIHOOD**
Low Energy (Chronic Fatigue)


Typical likelihood of fatigue

 **TYPICAL RESPONSE**
Response to Stress (Functional)


Predisposed to typical response to stress

 **TYPICAL**
Sleep Quality


Predisposed to typical sleep quality

 **TYPICAL ACTIVITY**
CLOCK (Sleep & Weight)


Likely typical CLOCK activity

 **TYPICAL LIKELIHOOD**
Muscle Pain


Typical likelihood of having muscle pain

 **LESS LIKELY**
Stress


Less likely to feel stressed

 **LESS LIKELY**
Caffeine-Related Anxiety

Less likely to experience caffeine-related anxiety


 **LESS LIKELY**
Migraines

Less likely to have migraines


 **LESS LIKELY**
Joint Pain

Less likely to have osteoarthritis


Cellular Health

 **LOWER ACTIVITY**
MTHFR


Likely lower MTHFR activity

 **LOWER ACTIVITY**
SOD2 (Oxidative Stress)


Likely lower SOD2 activity

 **LOWER ABILITY**
Methylation


Predisposed to lower methylation ability

 **HIGHER LEVELS**
Homocysteine


Predisposed to higher homocysteine levels

 **TYPICAL**
Oxidative Stress


Likely typical oxidative stress

 **TYPICAL ABILITY**
Detox

Predisposed to typical detox ability

 **TYPICAL FUNCTION**
Glutathione


Predisposed to typical glutathione function

 **HIGHER ACTIVITY**
SULT1A1 (Detox)


Likely higher SULT1A1 activity

 **TYPICAL ACTIVITY**
NFE2L2/NRF2 (Detox)


Likely typical NFE2L2 activity

 **TYPICAL ACTIVITY**
COMT

Likely typical COMT activity

 **INTERMEDIATE**
NAT2 (Detox)

Likely an intermediate acetylator


 **HIGHER ACTIVITY**
UGT (Detox)

Likely higher UGT activity


Gut Health

 **MORE LIKELY**
Crohn's Disease







More likely to get Crohn's disease

 **MORE LIKELY**
Ulcerative Colitis







More likely to have ulcerative colitis

 **HIGHER ACTIVITY**
NLRP3 (Gut Inflammation)

Likely higher NLRP3 activity












<p> MORE LIKELY Irritable Bowel (IBS)</p> <p>More likely to have IBS</p>	<p> LOWER ACTIVITY HNF4A (Gut Inflammation)</p> <p>Likely lower HNF4A activity</p>	<p> TYPICAL ACTIVITY CRHR1 (Stress/HPA Axis)</p> <p>Likely typical CRHR1 activity</p>
<p> TYPICAL PTPN22 (Autoimmunity)</p> <p>Likely typical PTPN22 genetics</p>	<p> LESS LIKELY Gut Inflammation</p> <p>Less likely to have IBD</p>	<p> LOWER ACTIVITY JAK2 (Gut Inflammation)</p> <p>Likely lower JAK2 activity</p>

Cognition

<p> MORE LIKELY Parkinson's Disease</p> <p>More likely to get Parkinson's disease</p>	<p> SLIGHTLY LOWER LEVELS BDNF</p> <p>Slightly lower BDNF levels</p>	<p> TYPICAL LIKELIHOOD Alzheimer's Disease</p> <p>Typical likelihood of Alzheimer's disease</p>
<p> TYPICAL LIKELIHOOD Dementia</p> <p>Typical likelihood of dementia</p>	<p> LESS LIKELY Cognitive Decline</p> <p>Less likely to have cognitive decline</p>	<p> LESS LIKELY Concussion</p> <p>Less likely to have a concussion</p>

Heart & Metabolism

<p> MORE LIKELY Coronary Artery Disease</p> <p>More likely to have coronary artery disease</p>	<p> LOWER ACTIVITY CDKN2B (Blood Sugar)</p> <p>Likely lower CDKN2B activity</p>	<p> TYPICAL LIKELIHOOD Type 2 Diabetes</p> <p>Typical likelihood of type 2 diabetes</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

 <p>TYPICAL LIKELIHOOD High Blood Pressure</p> <p>Typical likelihood of hypertension</p>	 <p>TYPICAL Insulin Resistance</p> <p>Predisposed to typical insulin resistance</p>	 <p>TYPICAL ACTIVITY PPARG (Metabolism)</p> <p>Likely typical PPARG activity</p>
 <p>TYPICAL ACTIVITY GCKR (Blood Sugar)</p> <p>Likely typical GCKR activity</p>	 <p>TYPICAL LEVELS LDL Cholesterol</p> <p>Predisposed to typical levels of "bad" cholesterol</p>	 <p>TYPICAL LEVELS Triglycerides</p> <p>Predisposed to typical triglyceride levels</p>
 <p>TYPICAL LEVELS Lipoprotein(a)</p> <p>Predisposed to typical Lipoprotein(a) levels</p>	 <p>LESS LIKELY Metabolic Syndrome</p> <p>Less likely to have metabolic syndrome</p>	 <p>LOWER ACTIVITY ACE (Fitness/ Cardiovascular)</p> <p>Likely lower ACE activity</p>
 <p>LOWER ACTIVITY CETP (Cholesterol/ Longevity)</p> <p>Likely lower CETP activity</p>	 <p>HIGHER ACTIVITY FADS1/2 (Fatty Acid Metabolism)</p> <p>Likely higher FADS1/2 activity</p>	

Recommendations Overview

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

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

	DOSAGE		DOSAGE		
1	Aerobic Exercise (Cardio)	1 hour	2	Relaxation Techniques	30 minutes
3	Yoga	30 minutes	4	Methylfolate	400 mcg
5	Strength Training	1 hour	6	Mediterranean Diet	
7	Omega-3 (Fish Oil)	500 mg	8	Zinc	15 mg
9	Sleep for 7+ Hours		10	Dietary Omega-3 Fatty Acids	
11	Music Therapy	30 minutes	12	Tai Chi	1 hour
13	Maintain Optimal Vitamin D Levels	1000 iu	14	Practice Exercise Snacks	1 minutes
15	Meditation	30 minutes			

Your Results in Details



Fitness & Longevity

Your genes influence not just how long you might live, but also how your body responds to exercise and maintains itself over time. This section explores genetic factors that affect your natural athletic tendencies - from power and endurance capabilities to recovery patterns. We also examine genes that influence longevity and age-related conditions like disc degeneration. Understanding these genetic predispositions can help you optimize your fitness approach and support healthy aging, though remember that lifestyle choices play a crucial role in how these genes express themselves.



MORE LIKELY

Disc Degeneration

More likely to have disc degeneration



TYPICAL

Longevity

Predisposed to typical longevity



TYPICAL

Power

Likely typical power performance



TYPICAL ACTIVITY

ACTN3 (Power)

Likely typical ACTN3 activity



HIGHER

Endurance

Predisposed to higher endurance

Disc Degeneration

As disc degeneration progresses, individuals may experience chronic back pain, stiffness, or reduced mobility. In some cases, the narrowing of the disc space can lead to nerve compression, resulting in symptoms such as sciatica, which is characterized by radiating pain down one or both legs.

Moreover, the body may form bony growths called bone spurs in response to the instability, potentially exacerbating nerve compression and leading to further discomfort and disability.



MORE LIKELY

More likely to have disc degeneration based on 844,435 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ZEB1	rs2484990	CC
ZEB1	rs1250307	AA
ZEB1	rs2484992	CC
EYS	rs11754641	CC
DCT	rs9301951	TT
LRRN1	rs17034687	CC
CILP	rs2073711	GA
PSMB9	rs2187689	TC
ARL8B	rs11918654	TT
HIVEP1	rs1205863	TG
PSMB9	rs7744666	TC
PSMB9	rs11969002	GA
PSMB9	rs6457690	GA
PSMB9	rs1029296	TC
PSMB9	rs6936004	TC
PSMB9	rs3749982	TA
PSMB9	rs9469300	GA
PSMB9	rs10214886	TA
PSMB9	rs10046257	GA
PSMB9	rs1029295	TC
PRKN	rs926849	TC

GENE	SNP	GENOTYPE
MYH14	rs4802666	AG
PDGFD	rs12805875	AG
PDGFD	rs7103004	CT
PDGFD	rs4554859	GT
PDGFD	rs7118412	AG
STOX1	rs10998466	AA
MARCKS	rs9488238	AA
PFKP	rs7896691	TT
SLC26A7	rs2657195	AA
CSMD1	rs1154053	CC
CSMD1	rs4875102	AA
RAB40C	rs7204439	TT
PIGQ	rs1981483	GG
CSMD1	rs980238	AA
METTL26	rs2017567	TT

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

Longevity

Researchers have spent a lot of time trying to figure out why some people live exceptionally long lives. One of the answers is genetics.

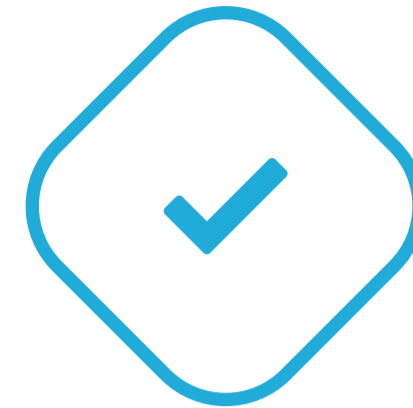
Our **genes are responsible for anywhere around 25-50% differences in our lifespans**. These genes influence a variety of processes within our bodies including [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Heart and blood vessel function
- Brain function
- Glucose and fat metabolism
- Oxidative stress

For example, the *APOE* gene has a well-known link to longevity. It affects cholesterol transport and plays an important role in brain and heart health. The e4 variant of this gene has been linked to a greater risk of heart disease and dementia and an overall shorter lifespan. However, diet and exercise can mitigate the effect of this allele in carriers [\[R\]](#), [\[R\]](#).

There are many things we can do to improve our odds of living longer and healthier lives:

- **Eat a healthy diet:** Most experts agree that a plant-based diet rich in vegetables, fruits, and healthy fats (such as omega-3s) is the way to go. Eating healthy may add up to a decade to your life [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).
- **Be physically active:** Exercising, often referred to as the “longevity drug”, can keep your weight under control, improves your physical and mental health, and can add years to your life [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).
- **Get enough sleep:** Sleep is when our bodies recover and regenerate [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).
- **Stay hydrated:** Drink plenty of water throughout the day. Research suggests that staying hydrated may slow down the aging process [\[R\]](#).
- **Minimize smoking and alcohol consumption:** Both smoking and alcohol increase the risk of certain diseases. If you are a smoker, quitting can add years to our life [\[R\]](#), [\[R\]](#), [\[R\]](#).
- **Build strong relationships:** Social connections with friends and family can improve your overall health and longevity [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).
- **Manage stress:** Stress has a negative impact on health, accelerates aging and shortens lifespan [\[R\]](#), [\[R\]](#), [\[R\]](#).
- **Find Purpose:** Engage in hobbies and activities that bring you a sense of purpose and joy [\[R\]](#), [\[R\]](#), [\[R\]](#).
- **Look on the bright side:** A positive attitude is linked to a longer and healthier life [\[R\]](#), [\[R\]](#).



TYPICAL

Predisposed to typical longevity based on 7,283,077 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
SIRT1	rs7895833	AA
STN1	rs10786775	CC
ZGPAT	rs755017	AA
TERT	rs2736100	CA
SIRT1	rs12778366	TC
SIRT1	rs7896005	GA
GSTO1	rs9420907	AA
TERT	rs7705526	AC
TERT	rs4449583	TC
PCSK7	rs5128	CC
TERT	rs2853677	GA
SIRT1	rs3758391	CT
FOXO3	rs4946936	CC
FOXO3	rs9398171	TT
FOXO3	rs12212067	TT
FOXO3	rs12202234	CC
FOXO3	rs17069665	AA
FOXO3	rs3800230	TT
ARMC2	rs6911407	AA
IGF1R	rs34516635	GG
FOXO3	rs2764264	TT
CETP	rs5882	GA
PON1	rs662	TT
CETP	rs708272	AA
STN1	rs11191865	AG
SIDT2	rs2854116	CT
TAS2R16	rs860170	TT
SOD2	rs4880	GG
TP53	rs1042522	CC

GENE	SNP	GENOTYPE
SOD3	rs2536512	AA
FOXO3	rs9400239	CC
FOXO3	rs479744	GG
SIDT2	rs2542052	AC
GHR	rs6873545	CT
SDHAF3	rs799605	GG
TAS2R16	rs978739	TC
TAS2R16	rs6466849	CT
IL1B	rs16944	GA
SLC12A1	rs9920281	GA
IL1A	rs1143623	CG
PARP1	rs1805415	TC
PARP1	rs3219090	TT
SOD3	rs1799895	CC
SOD3	rs13306703	CC
NICN1	rs3448	CT
/	rs9528753	AA
SPATA2L	rs445537	GG
IL1A	rs1143627	AG
/	rs923994	GA
TSPYL6	rs11125529	CC

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

Power

Power is the ability to produce a large amount of force in a short amount of time. This involves intense muscle movements over a short time interval (e.g., **sprinting, jumping, throwing**) [R].

Some people are better at power sports than others. **Up to 85% of people's differences in muscle power may be due to genetics.** Genes associated with power affect [R, R, R, R, R, R, R]:

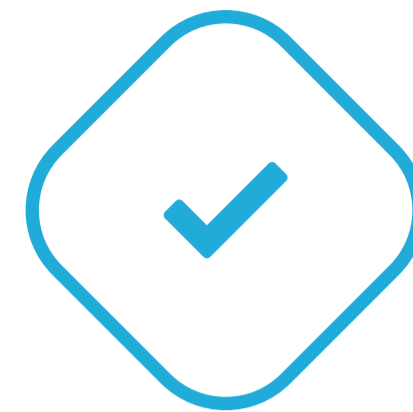
- Muscle composition and efficiency (fast-twitch vs. slow-twitch muscle fibers)
- Inflammation and recovery after exercise
- Energy metabolism
- Respiratory and cardiovascular fitness

However, fitness level and other lifestyle factors also strongly affect your muscle power.

Some tips that may help you build muscle power include:

- Doing regular resistance training to build up muscle strength
- Doing exercises that exert a lot of force in short time intervals. For example plyometrics (such as box jumps and burpees) or ballistic exercises (such as jumping with weights or throwing weights) increase explosive power.
- Focusing on maximum intent and quality rather than high repetition
- Eating a protein-rich diet to support muscle growth and repair
- Getting sufficient rest for muscle recovery

While general power training is beneficial, if you are training for a specific sport, you will need exercises that mimic the movements required in that sport.



TYPICAL

Likely typical power performance based on 14 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ACTN3	rs1815739	CT
ACVR1B	rs2854464	AA
ACE	rs4343	AA
CKM	rs8111989	TC
ADRB2	rs1042713	AG
PKDREJ	rs4253778	CG
ADRB2	rs1042714	CG
NOS3	rs2070744	CT
PPARGC1A	rs8192678	CT
VDR	rs1544410	CT
VDR	rs731236	AG
HIF1A	rs2301113	AA
IL6	rs1800795	GG
HIF1A	rs11549465	CC
AGT	rs699	GG
AMPD1	rs17602729	GG

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

ACTN3 (Power)

Power is the ability to produce short, intense movements (e.g., sprinting, jumping, throwing). Our muscles are made up of fibers. The type of fibers determines what a muscle is good at. **Fast-twitch fibers support rapid movements and are more common in power athletes** [R, R, R].

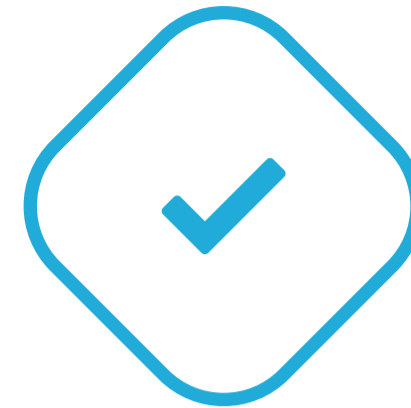
Fast-twitch muscle fibers contain higher amounts of a specific protein (alpha-actinin-3) that supports muscle power. The gene that helps make this protein is called [ACTN3](#) [R].

A specific *ACTN3* gene variant determines whether people produce this protein or not. People who produce this protein tend to have increased power performance. They are more likely to be elite power athletes [R, R, R].

On the other hand, people with more slow-twitch muscle fibers may be more suitable for endurance sports. They may also have better cold adaptation.

However, fitness level and other lifestyle factors have a strong effect on your power. The impact of genetics is more pronounced in elite athletes because they have improved all other factors [R].

Also, other gene variants not included in this report may influence power performance.



TYPICAL ACTIVITY

Likely typical ACTN3 activity based on the genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ACTN3	rs1815739	CT

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

Endurance

Endurance is the ability to produce low-intensity movements for a long period of time (e.g., cycling, running, swimming). It is made up of **cardiorespiratory endurance** (the ability of the heart and lungs to deliver enough oxygen to muscles during prolonged activity) and **muscular endurance** (the ability of muscles to contract over an extended period of time without fatigue) [R, R, R].

Some people have greater endurance than others. **Up to 70% of people's differences in endurance may be due to genetics.** Genes associated with endurance affect [R, R, R, R, R, R, R, R]:

- Muscle composition and efficiency (slow-twitch vs. fast-twitch muscle fibers)
- The body's ability to use oxygen
- Heart function

Some tips that may help you build endurance include:

- Getting at least 150 min of cardio per week
- Doing the same exercise regularly and letting your body adapt to it over time
- Slowly increasing the amount and intensity of your workouts over time
- Switching between periods of high-intensity training and resting. This is called high-intensity interval training (HIIT).

Great news is that **endurance can actually improve as we age!** For example, peak endurance age for ultra-marathoners often occurs in the late 30s and 40s, potentially even the 50s [R, R, R, R].



HIGHER

Predisposed to higher endurance based on 36 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
HFE	rs1799945	CC
GABPB1	rs7181866	AA
GABPB1	rs8031031	CC
ACTN3	rs1815739	CT
SLC16A1	rs1049434	TT
TTN	rs10497520	CC
KDR	rs1870377	TT
PRDM1	rs10499043	CC
ADRB3	rs4994	AA
CHRNA3	rs4950	AA
GSTP1	rs1695	AA
HIF1A	rs11549465	CC
TSHR	rs7144481	TT
NFE2L2	rs35652124	TT
DES	rs7564856	GA
SATB1	rs4973706	TC
PPARGC1A	rs8192678	CT
GALNTL6	rs558129	GA
ADRB2	rs1042713	AG
ADRB2	rs1042714	CG
COL5A1	rs12722	TC
GNB3	rs5443	CT
BDKRB2	rs1799722	TC
RBFOX1	rs7191721	GA
CNDP2	rs6566810	TA
PKDREJ	rs4253778	CG
AGTR2	rs11091046	C
CKM	rs8111989	TC
DEF6	rs2016520	CT

GENE	SNP	GENOTYPE
PPARGC1A	rs7665116	CT
PPARGC1A	rs2970869	CT
NR1H3	rs7120118	TT
ACE	rs4343	AA
GABPB1	rs12594956	AA
MYBPC3	rs1052373	CC
CYFIP1	rs8029108	AA
NFIA	rs1572312	GG
TTC23	rs1464430	AA
KCNA4	rs1323860	GG
PPARA	rs1800206	CC
PPARGC1A	rs3774923	CC
HIF1A	rs2301113	AA

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



Hormones

Think of hormones as your body's chemical messengers, orchestrating everything from stress response to metabolism. This section examines genes that influence your hormone balance, including how your body manages stress hormones like cortisol, sex hormones like estrogen and testosterone, and DHEA. We explore genetic variations that affect your HPA axis - your body's stress response system - and how efficiently you process various hormones. These insights can help you better understand your body's natural hormonal tendencies.

 **LOWER LEVELS**
DHEAS


Predisposed to lower DHEAS levels

 **TYPICAL LEVELS**
Cortisol


Predisposed to typical cortisol levels

 **TYPICAL LEVELS**
Estradiol (M)


Predisposed to typical estradiol levels

 **TYPICAL**
Estrogen Metabolism (Functional)


Predisposed to typical estrogen metabolism

 **TYPICAL LEVELS**
Progesterone

Predisposed to typical progesterone levels

 **LOWER ACTIVITY**
FKBP5 (Stress/ HPA Axis)

Likely lower FKBP5 activity

 **HIGHER LEVELS**
Testosterone

Predisposed to higher testosterone levels

DHEAS

DHEA is a steroid hormone produced primarily by the adrenal glands. The majority of DHEA gets quickly converted into **DHEA sulfate (DHEAS)**. Together with DHEA, DHEAS is the most abundant steroid hormone circulating in the blood. It helps make major sex hormones, testosterone and estradiol [\[R, R, R, R\]](#).

Factors linked to **lower DHEAS** include:

- Chronic stress [\[R, R\]](#)
- Autoimmune disease, such as lupus or Sjögren’s syndrome [\[R, R, R, R, R\]](#)
- Adrenal insufficiency (Addison’s disease) [\[R\]](#)
- Low pituitary function (hypopituitarism) [\[R, R\]](#)
- Serious illness or injury [\[R, R, R, R\]](#)
- Aging [\[R, R\]](#)

On the other hand, factors linked to **increased DHEAS** include:

- Acute stress [\[R, R, R, R, R\]](#)
- Cigarette smoking [\[R\]](#)
- DHEA supplementation [\[R\]](#)
- Polycystic ovary syndrome (PCOS) [\[R, R, R\]](#)

Genetically higher DHEAS levels may play a role in [\[R, R, R, R, R, R, R\]](#):

- Alzheimer’s disease
- HDL/LDL/Total Cholesterol
- ApoB
- Hair loss
- Muscle Mass
- Hematocrit

Up to 60% of differences in people’s DHEAS levels may be due to genetics [\[R\]](#).



LOWER LEVELS

Predisposed to lower DHEAS levels based on 48,348 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CABP5	rs2431830	TT
FGF9	rs615567	TA
BCL2L11	rs6738028	CC
PLEKHH2	rs77533229	GG
ZKSCAN5	rs77356530	GG
PILRB	rs13222543	CC
CYP3A7	rs80193476	AA
ZKSCAN5	rs10278040	GG
PUDP	rs5935876	G
PILRB	rs117430166	CC
ZKSCAN5	rs11761528	CC
ZKSCAN5	rs150507409	GG
ARPC1B	rs143524414	GG
SULT2A1	rs296360	TT
ZKSCAN5	rs10257273	AA
CMIP	rs57159061	TT
TRIM4	rs17277546	GG
SULT2A1	rs2637125	GG
SRP14	rs28620926	AA
HELLS	rs2185570	TT
HHEX	rs2497306	AA

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

Cortisol

Cortisol is a hormone produced by the adrenal glands — small glands on top of the kidneys. It is most widely known as a “**stress hormone**” that initiates the body’s “fight-or-flight” response. This helps the body react to stress by shifting into an “emergency mode” where non-critical functions are put on hold [R, R].

Genetics influence cortisol levels. Up to 60% of people’s differences in blood cortisol levels may be due to genetics. **Please note that this report is looking at your genetics of salivary cortisol**, which is closely related to blood cortisol [R, R].

Cortisol levels vary naturally throughout the day. They are generally highest in the morning after waking and gradually decrease throughout the day [R, R].

Cortisol levels also rise naturally:

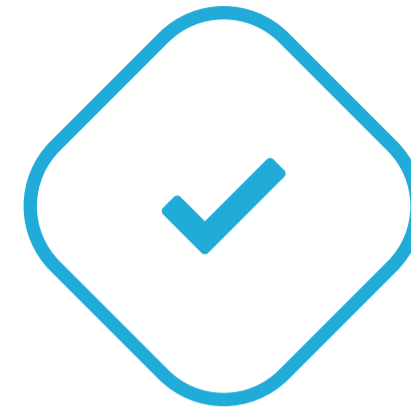
- After eating [R]
- After physical activity [R, R, R, R, R]
- In response to physical and psychological stress [R, R, R, R, R, R]

Very high or low cortisol levels may be indicative of chronic health conditions such as [R]:

- Hypercortisolism or high cortisol (e.g. Cushing syndrome)
- Hypocortisolism or low cortisol (e.g. Addison’s disease)

Genetically higher cortisol may be causally associated with:

- Depression [R]
- Heart disease [R, R, R]
- Atrial fibrillation [R, R]
- Muscle mass (women) [R]
- Strength (women) [R]
- Cognitive decline [R]
- Alzheimer’s (lower risk) [R]
- Parkinson’s (lower risk) [R]
- Overweight [R]
- High blood pressure [R]



TYPICAL LEVELS

Predisposed to typical cortisol levels based on 10 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CNTNAP5	rs11899245	CT
TULP1	rs9470080	CC
FKBP5	rs1360780	CC
FKBP5	rs7748266	CC
DGKH	rs1170109	TG
PDE10A	rs2983496	AG
LDLR	rs5927	GA
SPC24	rs11557092	CT
/	rs6768297	AA
ZFP42	rs6849009	CC
INHBA	rs10244501	CC
TFAP2C	rs6069930	GG
TMPRSS9	rs7248779	TT

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

Estradiol (M)

Estradiol is a type of estrogen. Estrogens are sex hormones that maintain sexual and reproductive health. In males, estradiol impacts sex drive, sperm production, and the ability to get an erection. The main sources of estradiol in men are the testes and the adrenal glands [R, R, R, R].

Your estradiol levels partially depend on your genetics, but factors other than genetics also influence your hormones [R].

The following lifestyle changes can help balance your estradiol [R]:

- Getting enough sleep
- Managing your stress
- Exercise
- Limiting alcohol
- Eating a healthy diet, low in sugar and processed foods, and high in healthy fats and fiber

Estradiol levels that are consistently low or consistently high can signal an underlying condition that may need medical attention. If you are concerned about your hormone levels, talk to your doctor.



TYPICAL LEVELS

Predisposed to typical estradiol levels based on 86 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CYP19A1	rs727479	AA
CYP19A1	rs28892005	AA
ABO	rs657152	AA
ESR1	rs728524	AA
ESR1	rs9340799	AG
ESR1	rs2234693	TC
ESR1	rs2077647	TC
CYP19A1	rs7173595	TT
/	rs34019140	GG
/	rs201687269	TT
XDH	rs559555	TT
GCKR	rs1260326	CT
EDA2R	rs12850857	G
SRD5A2	rs112881196	CC
FKBP4	rs56196860	CC
CYP3A7	rs45446698	TT
RBBP8	rs113047993	CC
AR	rs776715248	T
IGHV3-11	rs11160915	GG
FAM9A	rs5933688	A
BCL7B	rs188982745	GG
KCNV1	rs570754094	AA
TNP1	rs13387042	GG
ESR2	rs1256049	CC
UGT2B7	rs7662029	AA
SULT2A1	rs62129966	CC
IL7R	rs1073548	TT
AR	rs114255570	G
TNFSF12	rs62059839	CC

GENE	SNP	GENOTYPE
CELSR1	rs117826558	CC
TMOD2	rs3751591	AA
SULT2A1	rs10425629	TT
TNFSF12	rs727428	TT

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

Estrogen Metabolism (Functional)

Several genetic variants are associated with estrogen metabolism, impacting the body's ability to balance and regulate the levels of these hormones effectively.

CYP19A1 (rs10046, C>T): CYP19A1 encodes aromatase, an enzyme that converts androgens to estrogens. The rs10046 variant (C>T) can influence estrogen production, impacting hormone levels and balance.

CYP1A1 (rs1048943, Ile462Val A>G): This gene is involved in estrogen metabolism. The rs1048943 variant (Ile462Val A>G) can affect the conversion of estrogens, influencing hormonal balance and related health outcomes.

CYP1A1 (rs762551, rs4646422): These other CYP1A1 variants can influence estrogen metabolism, potentially altering estrogen breakdown and influencing hormone-related health outcomes, such as breast cancer risk or other estrogen-dependent conditions.

CYP1A2 (rs366631, -163C>A): CYP1A2 is involved in the metabolism of estrogens and other compounds. The rs366631 variant (-163C>A) can affect enzyme expression, influencing estrogen metabolism and potentially impacting hormone-related health outcomes such as breast cancer risk.

CYP17A1 (rs743572, 34 T>C): The CYP17A1 gene is involved in the production of steroid hormones, including estrogens. The rs743572 variant (34 T>C) can influence levels of these hormones, affecting hormone-related health outcomes.

CYP1B1 (rs1800440, Asn453Ser A>G): The CYP1B1 gene is involved in estrogen metabolism. The rs1800440 variant (Asn453Ser A>G) can affect estrogen breakdown efficiency, potentially influencing estrogen levels and impacting hormone-related health risks.

CYP1B1 (rs1056836, Leu432Val C>G): Another CYP1B1 variant, rs1056836 (Leu432Val C>G), may affect the breakdown of estrogen, potentially influencing estrogen levels and associated risks.

CYP1B1 (rs2606345): This SNP in the CYP1B1 gene may affect the efficiency of estrogen metabolism. Alterations in this gene's activity can influence estrogen breakdown, potentially contributing to estrogen-related diseases or conditions, such as hormone-driven cancers.

CYP3A4 (rs2740574, -392 A>G): CYP3A4 is involved in metabolizing estrogens and other hormones. The rs2740574 variant (-392 A>G) can influence hormone breakdown, affecting overall balance.

CYP3A4 (rs2470893): The rs2470893 SNP of CYP3A4 may alter the enzyme's activity, influencing estrogen clearance rates and hormone balance.

COMT (rs4680, Val158Met G>A): COMT is responsible for breaking down catecholamines, including estrogen metabolites. The rs4680 variant (Val158Met G>A) can affect estrogen metabolism, impacting hormonal balance and potentially influencing mood and stress response.

CYP2D6 (rs1065852): CYP2D6 is involved in the metabolism of estrogens and other compounds. The rs1065852 variant may alter the enzyme's function and thus influence estrogen levels and their associated health risks.



TYPICAL

Predisposed to typical estrogen metabolism based on 18 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CYP1B1	rs1056836	GG
CYP19A1	rs10046	AA
TRIM4	rs2740574	TT
SHBG	rs6258	CC
TNFSF12	rs6259	GG
CYP1A1	rs4646422	CC
CYP1B1	rs1800440	CT
/	rs366631	AG
COMT	rs4680	GA
BORCS7	rs743572	AG
CSK	rs2606345	AC
CSK	rs2470893	TC
UGT2B15	rs1902023	AC
CYP1A2	rs762551	AA
CYP1A1	rs4646903	AA
LMAN1L	rs2069514	GG
CYP1A1	rs1048943	TT
GSTP1	rs1695	AA
CYP2D6	rs1065852	GG

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

GSTP1 (rs1695, Ile105Val A>G): GSTP1 plays a role in detoxification. The rs1695 variant (Ile105Val A>G) can impact the body's capacity to manage oxidative stress, indirectly affecting estrogen metabolism.

SHBG (rs6259, Pro185Leu C>T; rs6258): SHBG encodes sex hormone-binding globulin, which regulates the availability of hormones like estrogen. The rs6259 (Pro185Leu C>T) and rs6258 variants can influence SHBG levels, affecting estrogen bioavailability and balance.

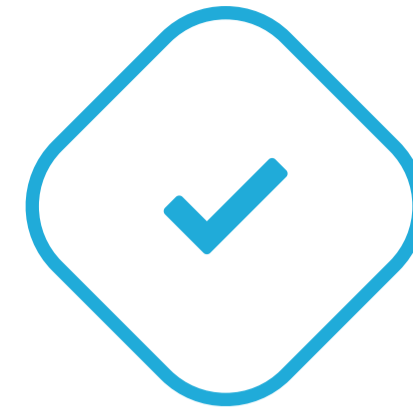
UGT2B15 (rs1902023, T>G): UGT2B15 is involved in the detoxification of steroid hormones such as estrogen. The rs1902023 variant (T>G) can influence hormone clearance rates, affecting balance.

UGT2B15 (rs4646903): The rs4646903 variant of UGT2B15 may affect the enzyme's activity, influencing the rate at which estrogen metabolites are cleared from the body. This could impact estrogen levels and associated risks for conditions such as breast cancer.

These genetic factors, along with lifestyle and environmental influences, play a crucial role in estrogen metabolism and balance. By understanding these genetic predispositions, individuals can adopt lifestyle and dietary strategies to support hormonal health and reduce the risk of estrogen-related conditions.

Progesterone

The following factors may affect progesterone levels:



TYPICAL LEVELS

- **Menstrual cycle:** Progesterone levels naturally fluctuate during the menstrual cycle, peaking after ovulation and falling if no pregnancy occurs.
- **Pregnancy:** Progesterone levels rise significantly during pregnancy and play a crucial role in maintaining the pregnancy.
- **Stress:** Chronic stress can impact the balance of hormones, including progesterone.
- **Age:** Progesterone levels typically decline with age, especially as women approach menopause.
- **Lifestyle Factors:** Lack of sleep, poor diet, and lack of exercise can affect hormone balance, including progesterone.
- **Medical Conditions:** Disorders of the ovaries, thyroid disease, and other hormonal imbalances can affect progesterone levels.
- **Genetics:** Scientists have identified a number of gene variants linked to changes in progesterone levels.

Predisposed to typical progesterone levels based on 16 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
DYNC211	rs2467806	CC
RASSF10	rs181121546	CC
KCNH1	rs79589801	CC
HSD17B12	rs142754737	CC
SESN3	rs139203625	CC
CD34	rs138621610	GG
ARNTL	rs77032081	CC
RBFOX1	rs144711998	CC
LYSMD3	rs139441768	TT
ARRDC3	rs140935700	GG
ZKSCAN5	rs34670419	GG
ZKSCAN5	rs148982377	TT
SKOR2	rs72906582	GG
SLC22A10	rs112295236	CC
PGR	rs608995	AA
PGR	rs10895068	CC
PGR	rs1042838	CC
SFXN2	rs10786714	GG

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

FKBP5 (Stress/ HPA Axis)

The following variants increase *FKBP5* expression and impair stress response. People carrying the risk alleles have a harder time recovering from childhood or early life traumas, leading to increased severity of PTSD [R, R, R]:

- ‘C’ at [rs3800373](#)
- ‘T’ at [rs1360780](#)
- ‘T’ at [rs9470080](#)

In contrast, these variants have also been associated with a reduced susceptibility to chronic pain, such as back pain and neuralgia [R, R, R].

Another variant believed to increase FKBP5 activity, ‘G’ at [rs9394314](#), was found to be protective against chronic neuralgia. However, this allele was associated with overall and neck pain after trauma [R, R].



LOWER ACTIVITY

Likely lower FKBP5 activity based on 4 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
FKBP5	rs9394314	AG
TULP1	rs9470080	CC
TULP1	rs3800373	AA
FKBP5	rs1360780	CC

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

Testosterone

Testosterone is the major male sex hormone. It is mainly produced in the testes and helps men develop masculine features like increased muscle mass and body hair. Males begin producing testosterone when they are still in the womb and lose 1% of their testosterone per year after the age of 30. Testosterone helps develop a normal male reproductive system and produces some of the changes males experience during puberty [R, R].

Up to 60% of differences in people’s testosterone levels may be due to genetics. Genes involved may influence testosterone metabolism [R, R, R, R].

Testosterone levels are also influenced by your environment and lifestyle habits. Ways to balance your testosterone include [R, R, R, R]:

- Exercising
- Maintaining a healthy weight
- Improving your sleep quality
- Eating a healthy diet that includes healthy fats. Testosterone is made from cholesterol, and low-fat diets have been linked to low testosterone levels



HIGHER LEVELS

Predisposed to higher testosterone levels based on 1,633 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
FKBP4	rs56196860	CC
SERPINA1	rs28929474	CC
XDH	rs77775907	GG
EDA2R	rs141086308	C
TNFSF12	rs727428	TT
PDE7B	rs7774640	GG
FAM9A	rs5934505	T
ATP1B2	rs11078694	CT
TDGF1P3	rs5942977	G
TNFSF12	rs12946520	TG
NR2F2	rs8023580	TT
MYPOP	rs35318830	TT
/	rs7097842	GG
NRBF2	rs7084569	AG
KANSL1	rs62062271	TT
UGT2B17	rs9884390	TT
HACE1	rs11156429	TT
SLCO1B1	rs4149056	TC
GNGT2	rs11655704	CT
GCKR	rs1260326	CT
DGKB	rs10278686	TC
STAT6	rs7484541	TA
SS18	rs600619	AG
SAT2	rs10468481	AG
CERS5	rs28849840	AG
JHY	rs11218882	TC
ZBTB4	rs12944954	AA
DNAH2	rs117387630	CC
TACR3	rs17289915	CC


GENE	SNP	GENOTYPE
WRAP53	rs183855978	GG
WDR72	rs79391862	AA
SHBG	rs6258	CC
TNFSF12	rs12150660	GG
ARL14EP	rs10835638	GG
LCMT2	rs143875230	GG
YIPF6	rs7052964	T
FAM214A	rs77255942	CC
UBQLN2	rs6651991	T
/	rs6484426	TT
BAIAP2L1	rs34785619	INS(T)INS(T)
PNPLA3	rs738409	GG
GPR139	rs2764772	AA
MRAS	rs7626388	AA
HSD17B13	rs6811902	TT

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




Immunity & Inflammation


Your immune system is your body's defense network, and genes play a key role in how it functions. This section explores genetic variations that influence inflammation responses and immune regulation, including factors affecting thyroid function. We examine genes like TNF and IL6 that help regulate immune responses, providing insights into your body's natural immune tendencies. Understanding these genetic factors can help you better support your immune system's optimal function.

 **MORE LIKELY**
Psoriasis


More likely to have psoriasis

 **TYPICAL LIKELIHOOD**
Hashimoto's Disease

Typical likelihood of Hashimoto's disease

 **TYPICAL LIKELIHOOD**
Rheumatoid Arthritis


Typical likelihood of rheumatoid arthritis

 **TYPICAL LIKELIHOOD**
Multiple Sclerosis


Typical likelihood of multiple sclerosis

 **TYPICAL LEVELS**
Inflammation (CRP)

Predisposed to typical CRP levels

 **TYPICAL LIKELIHOOD**
Underactive Thyroid

Typical likelihood of hypothyroidism

 **LESS LIKELY**
Thyroid Inflammation

Less likely to have thyroid inflammation

Psoriasis

Key Takeaways:

- Up to **90%** of differences in people's odds of developing psoriasis may be due to genetics.
- Psoriasis triggers include: infections, weather, skin injuries, stress, cigarette smoke, alcohol abuse, steroid withdrawal.
- About **2%** of Americans have psoriasis, mostly appearing in younger and older adults.
- Even though the condition is rare, people with high genetic risk should understand and be wary of potential triggers.
- Click the **Recommendations** tab for potential dietary and lifestyle changes.

Psoriasis is an autoimmune skin disease in which the body attacks its own skin cells. In response, skin cells begin to grow too quickly. New cells then begin to pile up on the skin's surface, forming plaques. The result is itchy, inflamed, scaly skin - the hallmark of psoriasis [R, R, R].

About 2% of Americans have psoriasis. It can appear at any age, but most cases develop between the ages of 15-20 or 55-60 [R].

People predisposed to psoriasis don't always have symptoms. In fact, **symptoms may only appear after contact with a "trigger"** [R].

Some common triggers include [R]:

- Throat and skin infections
- Dry and cold weather
- Skin injuries (like bug bites and sunburns)
- Stress
- Cigarette smoke
- Alcohol abuse
- Topical steroid withdrawal

Signs and symptoms of psoriasis include [R]:

- White scales covering patches of inflamed, itchy skin (often on the elbows, knees, scalp, and back)
- Joint stiffness
- Thickened or discolored nails

People with psoriasis also tend to have problems with their kidneys, heart, and joints. In fact, about 30% of patients have *psoriatic arthritis*. This painful condition mainly affects the fingers and toes [R].

As there is no cure for psoriasis, treatment aims to manage symptoms. Your doctor may suggest [R, R, R]:

- Light therapy
- Coal tar
- Medications that block the immune response
- Topical vitamin D
- Retinoids

Between 60-90% of differences in psoriasis may be attributed to genetics. Genes involved in psoriasis may influence [R, R, R]:

- Inflammation ([IL12B](#), [IL23A](#), [IL23R](#), [NFKBIZ](#))
- Immune response ([IFNLR1](#), [NOS2](#), [IFIH1](#), [HLA-C](#))

Genetically high neutrophil levels may be causally associated with a higher risk of psoriasis [R].



MORE LIKELY

More likely to have psoriasis based on 1,049,035 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
TYK2	rs34536443	GG
IL23R	rs9988642	TT
STAT2	rs2066819	CC
RNF145	rs2082412	GG
IL12B	rs7709212	TT
GCA	rs17716942	TT
LCE3C	rs4845459	AA
IFNLR1	rs10794648	CC
SLC22A5	rs1295685	GG
PPP2R3C	rs8016947	GG
ZNF816	rs9304742	TT
DDX58	rs11795343	TT
IL13	rs20541	GG
TSC22D1	rs9533962	CC
POLI	rs545979	TT
ELMO1	rs2700987	AA
TNFAIP3	rs643177	CT
COG6	rs34394770	TT
TP63	rs28512356	CC
LYRM9	rs28998802	GA
STX1B	rs13708	AG

GENE	SNP	GENOTYPE
CCDC88B	rs645078	AA
IFIH1	rs1990760	CT
PUS10	rs62149416	TC
POLI	rs3730682	AG
SLC44A2	rs892085	GA
REL	rs842625	GA
STX1B	rs12445568	TC
EXOC2	rs9504361	AG
TNFAIP3	rs582757	TC
RUNX1	rs8128234	TC
TNFSF8	rs6478109	GA
CARD11	rs4722404	TC
CLIC6	rs9305556	AG
ZMIZ1	rs1250546	GA
EXOC2	rs3799296	TA
AK8	rs1076160	CT
STAT3	rs744166	AA
ANXA6	rs2233278	GG
TNIP1	rs17728338	GG
TRAF3IP2	rs33980500	CC
STAT2	rs2066807	CC
RNF145	rs3213094	CC
LGALS9	rs4795067	AA
PARK7	rs417065	CC
CAVIN1	rs56364076	TT
SPATA2	rs1056198	TT
SPATA2	rs7352944	CC
MFSD4B	rs240993	CC
POU2F3	rs2847500	GG

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

Hashimoto's Disease

Key Takeaways:

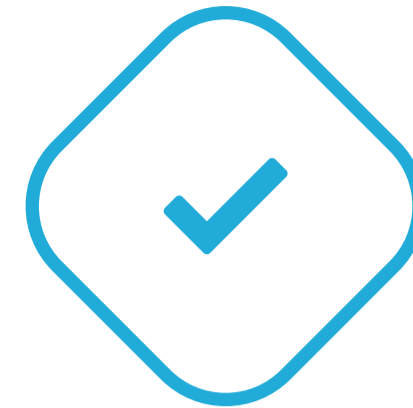
- Up to **65%** of differences in people's chances of having Hashimoto's disease may be due to genetics.
- Risk factors include being female, middle age, pregnancy, other autoimmune diseases, and excessive iodine intake.
- It affects 1 to 2 percent of people in the U.S., occurring more often in women than men.
- Click the **Recommendations** tab for potential dietary and lifestyle changes, and **next steps** for relevant labs.

Risk factors for Hashimoto's disease include [\[R\]](#):

- Being female
- Middle age
- Pregnancy
- Excessive iodine intake
- Radiation exposure
- Having another autoimmune disease
- **Genetics**

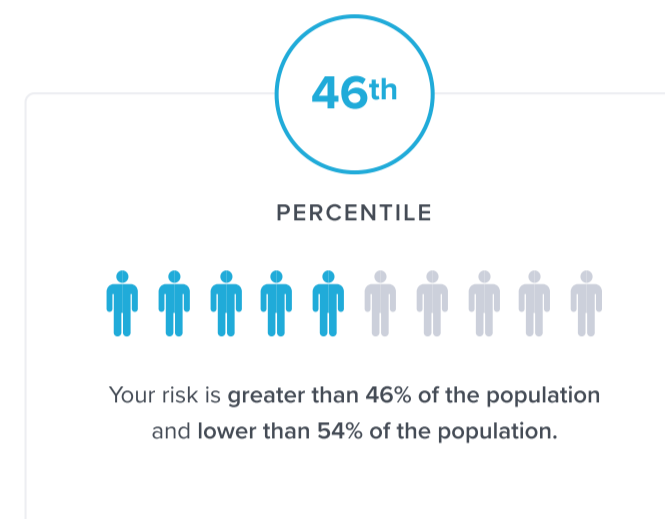
Up to **65%** of differences in people's chances of having Hashimoto's disease may be due to genetics [\[R\]](#).

Hashimoto's disease is typically treated with medications to help normalize thyroid hormone levels. **It's important for people with Hashimoto's disease to work closely with their healthcare provider** to manage their condition and prevent complications.



TYPICAL LIKELIHOOD

Typical likelihood of Hashimoto's disease based on 85 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CTLA4	rs3087243	GG
HLA-DPA1	rs9277768	TC
IL6	rs1800795	GG
CTLA4	rs34636506	AA
/	rs9271365	TG
VAV3	rs7537605	GA
TRIB2	rs1534422	GG
PDE8B	rs1993945	TA
SH2B3	rs653178	CT
STAT4	rs11889341	TC
TPO	rs11675434	CT
CTLA4	rs231775	GA
CD69	rs2110451	AG
RPS26	rs11611029	CT
NIPSNAP1	rs757024	CG
SESN3	rs4409785	TC
ZNF668	rs57348955	AG
TNFRSF14	rs2843403	CT
PTPN22	rs2476601	GG
SLC25A27	rs2270450	CC
VAV3	rs17020139	GG

GENE	SNP	GENOTYPE
TRMO	rs7030280	CC
PTPN22	rs1230666	GG
BACH2	rs10944479	GG
TNF	rs1799964	TT
AP4B1	rs12730735	TT
TNF	rs1800629	GG
CTLA4	rs11571297	TT
BACH2	rs7754251	GG
BACH2	rs72928038	GG
LPP	rs13093110	CC
IL2RA	rs706779	TC
GXYLT1	rs4768412	CC

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

Rheumatoid Arthritis

Key Takeaways:

- Up to 65% of differences in people's chances of developing rheumatoid arthritis may be due to genetics.
- Other risk factors include obesity and smoking.
- Rheumatoid arthritis affects about **1%** of people around the world. This means even a high genetic risk is still a low overall risk.
- Click the **Recommendations** tab for potential dietary and lifestyle changes and **next steps** for relevant labs.

Rheumatoid arthritis is an autoimmune condition in which the body attacks its own joints. This causes [inflammation](#), tissue damage, and pain [\[R\]](#).

Rheumatoid arthritis affects about 1% of people around the world. Researchers have found big differences between populations. North America has the highest rate, with the lowest rates in South America and Asia [\[R\]](#).

According to one estimate, about **1.3 million Americans** have this condition [\[R\]](#).

Rheumatoid arthritis usually affects small joints in the hands and feet. Its signs and symptoms include [\[R\]](#), [\[R\]](#):

- Joint pain and tenderness
- Heat and swelling in the affected joints
- Joint stiffness

Many people have periods of worsening symptoms called "flares." These flares may be triggered by [\[R\]](#):

- Stress
- Too much movement
- A change in medication

Rheumatoid arthritis may lead to complications outside the joints. They can include heart disease, nerve problems, and infections [\[R\]](#).

There is no cure for rheumatoid arthritis. Instead, patients and doctors work to control symptoms. Some ways to manage the condition include [\[R\]](#), [\[R\]](#):

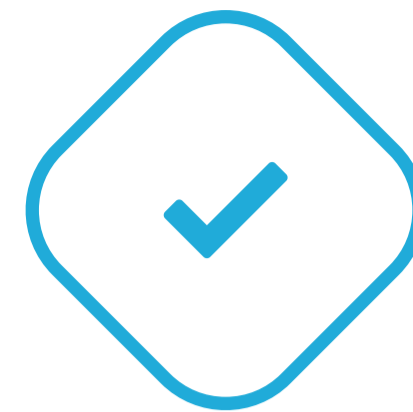
- Medications
- Surgery (e.g., joint replacement surgery)
- Exercise
- Supplements to reduce inflammation and support bone health

The exact cause of rheumatoid arthritis is unknown. Risk factors include [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Cigarette smoking
- Obesity
- **Genetics**

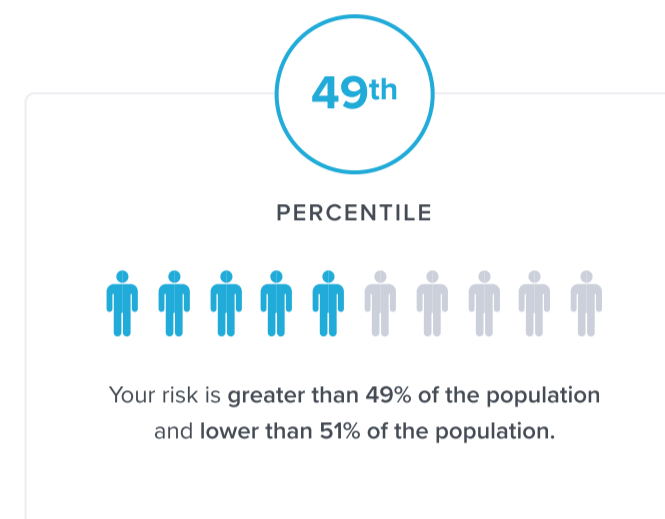
In fact, up to 65% of differences in people's chances of developing rheumatoid arthritis may be attributed to genetics. Genes involved in this condition may influence [\[R\]](#), [\[R\]](#):

- Immune function ([HLA-DRB1](#), [PSORS1C1](#))
- Inflammation ([STAT4](#), [IL10](#), [PTPN2](#))



TYPICAL LIKELIHOOD

Typical likelihood of rheumatoid arthritis based on 1,049,410 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
HLA-DQA2	rs6457617	CT
CTLA4	rs3087243	GG
ANKRD55	rs7731626	GG
UBASH3A	rs1893592	AA
ETS1	rs73013527	CC
WDFY4	rs2671692	AA
RASGRP1	rs8032939	CC
RUNX1	rs8133843	AA
COG6	rs9603618	CC
ZFP36L1	rs1950897	TT
/	rs6651252	TT
LBH	rs7579944	CC
PODXL	rs11761231	CC
HLA-DQA2	rs660895	AG
TLR3	rs3775291	CC
HLA-DQA2	rs9268839	AG
CXCL13	rs117605225	TT
TNFAIP3	rs17264332	AG
IL2RA	rs706778	TC
ARID5B	rs71508903	CT
TCTE1	rs2233424	TC

Genetically high testosterone and omega-3s levels may be causally associated with a high risk of rheumatoid arthritis [R, R].

GENE	SNP	GENOTYPE
IKZF3	rs2872507	GA
PADI4	rs2240335	CA
POU3F1	rs883220	CA
STAT4	rs11889341	TC
IRF5	rs4728142	GA
YDJC	rs2298428	TC
CD28	rs1980422	TC
REL	rs34695944	TC
CD40	rs4239702	TC
CD101	rs624988	TC
EOMES	rs3806624	AG
TNFAIP3	rs6920220	GA
ANAPC4	rs3816587	TC
REL	rs13031237	GT
STAT4	rs7574865	TG
RNASET2	rs3093024	GA
NCF4	rs729749	CT
HLA-DQA2	rs6910071	AG
CD40	rs4810485	TG
GTF2I	rs113066392	ADEL(C)
TREH	rs10892279	GA
NOS3	rs2070744	CT
PTPN22	rs6679677	CC
DCTN3	rs11574914	GG
TRAF1	rs10985070	AA
TLE3	rs8026898	GG
AFF3	rs9653442	TT
IRF8	rs13330176	TT
FCRL3	rs3761959	CC

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

Multiple Sclerosis

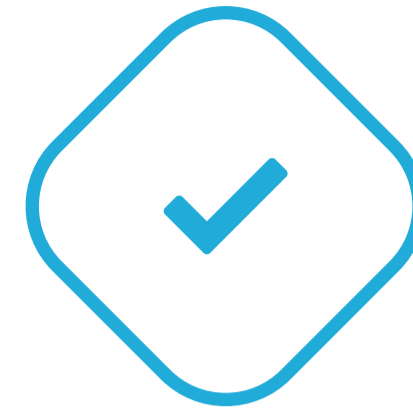
About **50%** of the differences in people’s MS rates may be due to **genetics** [R].

While no single gene has been identified as the cause of MS, certain genetic variants have been linked to an increased risk of the disease. Having a close family member with MS can increase one's risk, suggesting a hereditary component.

Moreover, a genetically high leukocyte count may be causally associated with MS susceptibility [R].

Other factors that might increase the risk of developing multiple sclerosis include:

- Age: MS is most commonly diagnosed in people between the ages of 20 and 50.
- Sex: Women are about two to three times more likely than men to develop MS.
- Certain infections, like Epstein-Barr virus.
- Climate: MS is more common in countries with temperate climates.
- Autoimmune diseases: If you have thyroid disease, type 1 diabetes, or inflammatory bowel disease, you might have an increased risk of developing MS.
- Smoking.



TYPICAL LIKELIHOOD

Typical likelihood of multiple sclerosis based on 1,019,187 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
HLA-DQA2	rs3129934	TC
HLA-DRB5	rs3135388	AG
EBPL	rs9591325	TT
IL2RA	rs2104286	TT
RBM17	rs11256593	TT
TYK2	rs34536443	GG
TAPBPL	rs12832171	CC
JAK1	rs72922276	GG
RGS1	rs1323292	AA
RTEL1-TNFRSF6B	rs6742	CC
RMI2	rs34947566	CC
MAF	rs17724508	TT
SP140	rs35540610	CC
CD58	rs10801908	CT
IL2RA	rs12722559	CC
IRF8	rs35703946	GG
TGFBR3	rs12133753	CC
SYPL1	rs73414214	CC
IL7R	rs6897932	CC
BCL10	rs35486093	GA
CD5	rs17824933	CG

GENE	SNP	GENOTYPE
TNFSF14	rs1077667	TC
POGLUT1	rs9843355	GA
EOMES	rs438613	CT
LTBR	rs1800693	CT
ELMO1	rs6060003	GT
PRXL2B	rs6670198	TC
TAGAP	rs1738074	CT
ETV7	rs1076928	TC
IMMP2L	rs868824	CT
STAT3	rs2293152	CG
TNFRSF1A	rs4149584	CC
CBLB	rs9657904	CC
APOA5	rs2727790	GG
ETV6	rs73277163	AA
PHGDH	rs12094392	TT
ERMP1	rs2150702	AA
BACH2	rs72928038	GG
PTGER4	rs11749040	GG
GTDC1	rs72855540	AA
IL22RA2	rs62420820	GG
RPAP2	rs58394161	TT
EVI5	rs11809700	CC
THRA	rs883871	GG
IL7R	rs10063294	AA
STAT3	rs744166	AA

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

Inflammation (CRP)

Key Takeaways:

- Chronic inflammatory diseases like diabetes and heart disease are responsible for **3 in 5** deaths worldwide.
- About **40-50%** of the differences in people's hs-CRP (inflammatory protein) levels may be due to genetics.
- Other factors are equally important. They include diet, exercise, and life satisfaction.
- Click the **next steps** tab for relevant labs.

Inflammation is an important biological process. It protects the body from disease and damage. When germs or other foreign substances enter the body, white blood cells rush to the site. The area then gets red, swollen, and warm. These changes help kill pathogens and prepare the tissue to heal [\[R, R\]](#).

A common marker that helps measure inflammation is **C-reactive protein (CRP)**. **High sensitivity CRP (hs-CRP)** in particular helps measure low-grade inflammation.

CRP is produced in the liver. It helps recognize disease-causing microbes and damaged cells that need to be removed from the body. However, it may also play a role in autoimmune disease [\[R, R\]](#).

Short-term inflammation is helpful. However, too much inflammation can be a bad thing [\[R, R, R, R\]](#).

Chronic inflammation is linked to many diseases, including:

- Autoimmune conditions [\[R, R\]](#)
- Heart disease [\[R, R, R\]](#)
- Obesity [\[R, R\]](#)
- Type 2 diabetes [\[R, R\]](#)
- Fibromyalgia [\[R, R\]](#)
- Mental health conditions [\[R, R, R, R\]](#)
- Cancer [\[R, R, R, R, R\]](#)

In 2014, an estimated **60%** of Americans were living with at least one chronic inflammatory condition [\[R\]](#).

Factors that may influence chronic inflammation include [\[R, R, R\]](#):

- Diet
- Exercise
- Life satisfaction
- **Genetics**

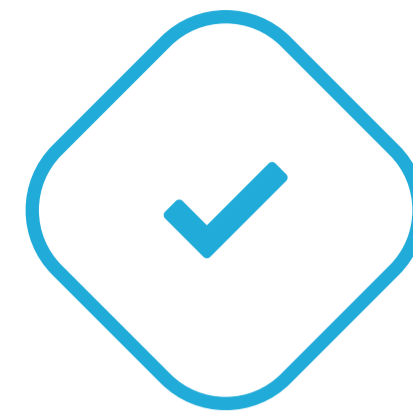
Common strategies for reducing low-grade inflammation include [\[R, R, R, R, R\]](#):

- Lifestyle changes
- Diet changes
- Weight management
- Drugs targeting the underlying condition

Genetics may play an important role in inflammatory conditions. Genes involved in inflammation may influence [\[R, R, R, R, R, R\]](#):

- Immune messengers ([STAT3](#), [IL6](#), [IL10](#))
- Immune cell function ([HLA-DRB1](#), [PTPN22](#))
- [Histamine](#) levels ([AOC1](#), [HNMT](#))

Genetically high free testosterone levels may be causally associated with lower C-reactive protein [\[R\]](#).



TYPICAL LEVELS

Predisposed to typical CRP levels based on 8,937 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CRP	rs1205	CC
IL6R	rs2228145	CC
FUT2	rs601338	GA
IL1B	rs16944	GA
CTLA4	rs231775	GA
IL19	rs1800872	GG
IL19	rs3024505	AG
IL4R	rs1805011	AA
IL1RN	rs419598	TT
ATG16L1	rs10210302	TT
ATG16L1	rs2241880	GG
STEAP1B	rs1554606	GG
IL13	rs20541	GG
KLC1	rs8702	GG
STAT4	rs10181656	GC
ADRB2	rs1042713	AG
IL19	rs1800896	CT
CYP1B1	rs1056836	GG
TIMP4	rs3755724	CC
AOC1	rs1049793	CG
IFIH1	rs1990760	CT

GENE	SNP	GENOTYPE
IL21	rs6822844	GT
IL6	rs1524107	CT
IL6	rs2066992	GT
LRP6	rs2160525	AG
LRP6	rs2302685	CT
FUT2	rs492602	AG
FUT2	rs281377	TC
FUT2	rs602662	GA
LEPR	rs4394621	AA
SIRT1	rs12778366	TC
MICB	rs361525	GG
CRP	rs3093059	AA
RAD50	rs2069812	AA
SLC22A5	rs1800925	CC
TNF	rs1800629	GG
HLA-DQA1	rs2187668	CC
APOE	rs429358	TT
SRA1	rs2569191	TT
IL6	rs1800795	GG
SLC20A1	rs1800587	GG
IL1A	rs17561	CC
FADS2	rs174546	CC
IL1B	rs1143634	GG
CRP	rs10494326	CC
CFH	rs6677604	GG
TLR4	rs4986790	AA
SOD2	rs4880	GG
LGALS9	rs2248814	AA
TOM1	rs2071746	AA

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

Underactive Thyroid

Key Takeaways:

- Up to **65%** of differences in thyroid hormone levels may be due to genetics.
- Other risk factors for underactive thyroid include: autoimmune conditions, too much/little iodine, and radiation treatment.
- It can cause fatigue, sensitivity to cold, constipation, goiter, weight gain, voice changes, dry skin, and puffy face.
- Up to **1 in 10** people may have an underactive thyroid, and half of those don't know they have it.
- Be aware of the factors and symptoms, even if your genetic risk is low.
- Click the **Recommendations** tab for potential dietary and lifestyle changes and **next steps** for relevant labs.

The thyroid is a gland found in the front of the neck. It produces hormones T3 and T4, which affect [\[R\]](#):

- Heart function
- Energy production
- Breathing rate
- Bone growth
- Alertness
- Reproductive health

If the thyroid does not produce enough of these hormones, the whole body may suffer ill effects. This condition is known as *hypothyroidism* (underactive thyroid) [\[R, R, R\]](#).

Up to 10% of people may have an underactive thyroid. Of these, about half don't know they have it [\[R\]](#).

Hypothyroidism can have a number of causes. These include [\[R, R, R\]](#):

- Autoimmune conditions like *Hashimoto's disease*
- Too much or too little iodine
- Thyroid inflammation (*thyroiditis*)
- Surgery that removes all or part of the thyroid gland
- Radiation treatment
- Some medications
- **Genetics**

If your doctor suspects hypothyroidism, they may look for signs and symptoms like [\[R, R, R\]](#):

- Fatigue
- Sensitivity to cold
- Constipation
- Enlarged thyroid gland (*goiter*)
- Weight gain
- Voice changes
- Dry skin
- Puffy face

Diagnosis is confirmed with blood tests. These tests check for hormone levels that indicate the thyroid is not as active as it should be [\[R\]](#).

If you have an underactive thyroid (hypothyroidism), treatment will depend on your hormone levels, medical history, and your signs and symptoms.

The standard treatment involves a daily dose of synthetic thyroid hormone medication that can restore thyroid hormone



TYPICAL LIKELIHOOD

Typical likelihood of hypothyroidism based on 875 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CTLA4	rs3087243	GG
PDE8B	rs4704397	AG
TPO	rs11675434	CT
VAV3	rs7537605	GA
FCRL3	rs7522061	TC
TSHR	rs12101261	TC
SH2B3	rs653178	CT
MICB	rs2517532	AG
TYK2	rs34536443	GG
/	rs9271365	TG
RASGRP1	rs12593201	AA
TPO	rs732609	AC
SESN3	rs4409785	TC
CLECL1	rs370475698	DEL(A)T
PDE8B	rs1479565	AG
ARID5B	rs71508903	CT
TPO	rs11675342	CT
SESN1	rs1364450	CA
PLGRKT	rs911760	CA
SASH1	rs9497965	TC
FAP	rs2111485	AG

levels and reverse the signs and symptoms. But keep in mind that it may take some time to adjust the dosage of thyroid hormones so they are right for you [R].

It is extremely important to treat hypothyroidism according to your doctor's instructions. Left untreated, hypothyroidism can lead to *myxedema coma*. This condition is a medical emergency. Even with treatment at a hospital, up to 60% of these cases can lead to death [R].

Up to 67% of differences in thyroid hormone levels may be attributed to genetics. Genes that may affect thyroid function include [R, R]:

- [PDE8B](#)
- [DIO1](#)
- [CAPZB](#)
- [TSHR](#)
- [FOXE1](#)

GENE	SNP	GENOTYPE
IL2RA	rs3118469	TA
TRMO	rs925489	CC
NBL1	rs10917477	AA
PTPN22	rs6679677	CC
PTPN22	rs2476601	GG
FOXE1	rs1867277	AA
TNF	rs1800629	GG
DPH5	rs77046277	CC
ADCY7	rs78534766	CC
FLT3	rs76428106	TT
/	rs187707293	TT
TRMO	rs7030280	CC
BACH2	rs6908626	GG
ACAP1	rs61759532	CC
C1QTNF6	rs229528	CC
CD44	rs736374	GG
CBLB	rs13090803	GG
TNFRSF14	rs2234167	GG
RAB5C	rs9902341	CC
RBPJ	rs7441808	AA
DIO1	rs2235544	CC

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

Thyroid Inflammation

The most common forms of thyroiditis include Hashimoto's thyroiditis, an autoimmune disease where the body's immune system mistakenly attacks the thyroid; postpartum thyroiditis, which can occur after childbirth; and subacute thyroiditis, which usually follows a viral infection. Diagnosis may involve blood tests to measure thyroid hormone levels, as well as antibody tests to detect autoimmune activity.

Treatment depends on the type and severity of thyroiditis, ranging from observation and symptom management to medications like levothyroxine for hypothyroidism or beta-blockers for hyperthyroidism symptoms.



LESS LIKELY

Less likely to have thyroid inflammation based on 348,866 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:







GENE	SNP	GENOTYPE
TRIB2	rs1534422	GG
SESN3	rs4409785	TC
ZNF668	rs57348955	AG
TNFRSF14	rs2843403	CT
PTPN22	rs2476601	GG
PTPN22	rs6679677	CC
CTLA4	rs11571297	TT
TNF	rs1800629	GG
TNF	rs1799964	TT
BACH2	rs72928038	GG
LPP	rs13093110	CC
IL2RA	rs706779	TC
GXYLT1	rs4768412	CC

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



Weight Control

Managing weight is a complex interplay between genes, diet, and lifestyle. This section examines genetic variations that influence your metabolic rate, eating behaviors, and how your body processes and stores nutrients. From genes affecting appetite control (like MC4R and LEPR) to those influencing metabolic efficiency (like UCP1), these insights can help explain your body's natural tendencies regarding weight management and help inform more personalized approaches to maintaining a healthy weight.

<p> LOWER ACTIVITY UCP1 (Weight)</p> <p>Likely lower UCP1 activity</p>	<p> TYPICAL LIKELIHOOD Tendency to Overeat</p> <p>Typical likelihood of overeating</p>	<p> LOWER Metabolic Rate</p> <p>Predisposed to lower metabolic rate</p>
<p> LESS LIKELY Overweight</p> <p>Less likely to be overweight or obese</p>	<p> BETTER FTO (Weight)</p> <p>Likely better FTO genetics</p>	<p> HIGHER ACTIVITY MC4R (Weight/ Blood Sugar)</p> <p>Likely higher MC4R activity</p>

UCP1 (Weight)

One of the best-studied SNPs in the *UCP1* gene is [rs1800592](#) (also known as the “-3826 A>G” polymorphism). It helps determine how your body uses and stores the energy that you get from food [\[R\]](#).

The 'T' allele is linked to increased activity of the *UCP1* gene. It's associated with a higher resting metabolic rate, higher body heat production, and less weight gain. According to some researchers, this variant helps turn more of the energy from food into heat instead of body fat (white fat) [\[R, R\]](#).

Conversely, the 'C' allele is linked to *decreased* activity of the *UCP1* gene. It's associated with a lower resting metabolic rate, lower body heat production, higher weight gain, and a higher BMI. If less of the energy acquired from food is turned into heat, then more of it would get stored as body fat [\[R, R\]](#).

According to several studies, the 'C' allele (and especially the 'CC' genotype) is associated with increased weight gain as well as a higher chance of being obese [\[R, R, R, R, R, R, R, R\]](#).

For example, people with the 'CC' genotype were found to have lower basal metabolic rates than people with the 'T' allele. In other words, they burned less energy when resting. In fact, one study reported that 'C' carriers may burn as much as 200 fewer calories per day than people with the 'TT' genotype [\[R, R\]](#)!

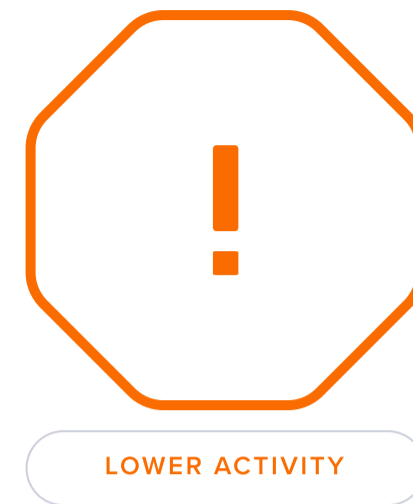
Apart from burning less energy when resting, people with the 'CC' genotype also produced less heat when exposed to cold [\[R, R\]](#).

We all lose brown fat as we age. However, in one study, people with the 'CC' genotype had less brown fat at a younger age than people with the 'T' allele [\[R\]](#).

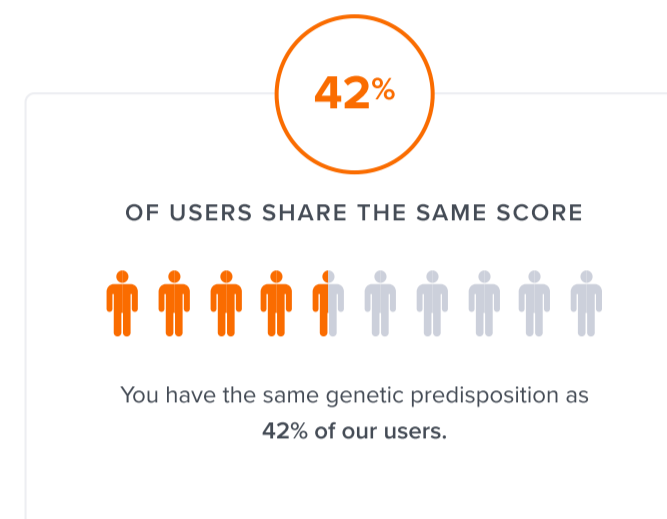
Several studies link the 'C' allele and the 'CC' genotype to metabolic disturbances commonly associated with being overweight. In various studies, the 'C' allele has been associated with elevated blood pressure, greater [insulin resistance](#), and higher [LDL cholesterol](#) and [triglycerides](#) [\[R, R, R, R, R, R\]](#).

Fun fact: worldwide, about 30% of people have the 'TT' genotype, which is associated with higher resting metabolism and increased heat production. But this genotype is much more frequent in Europe, where 58% of people have it! Many researchers believe that the *UCP1* gene and the rs1800592 SNP are in part responsible for human adaptation to colder climates [\[R\]](#).

However, although today we consider the 'T' allele beneficial in terms of its potential effect on body weight, this allele is essentially linked to lower metabolic efficiency. In other words, people with this allele may “waste” more of the energy that they get from food on generating body heat. It is plausible that the more efficient 'C' allele may be advantageous when food is scarce and the climate is warm [\[R\]](#).



Likely lower UCP1 activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
UCP1	rs1800592	TC

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

Tendency To Overeat

Several genetic variants are associated with overeating behaviors, appetite control, and sensitivity to hunger and satiety signals. These variants influence hormonal regulation, reward pathways, and metabolic processes that can contribute to individual differences in eating behavior.

FTO (rs9939609, 87653 T>A): The *FTO* gene is strongly associated with appetite and obesity risk. The rs9939609 variant (T>A) can influence hunger and satiety, with the A allele linked to increased appetite and a higher likelihood of overeating and weight gain [R].

FTO (rs6713532, A>G): Another *FTO* variant, rs6713532 (A>G), has been linked to increased risk of obesity and a tendency toward overeating. Individuals with the G allele may have a higher susceptibility to weight gain due to increased appetite and reduced satiety signals.

LEPR (rs1805094, Lys656Asn G>C): *LEPR* encodes the leptin receptor, which is crucial for regulating hunger and satiety. The rs1805094 variant (Lys656Asn G>C) may impact leptin sensitivity, potentially affecting how full one feels after eating, influencing portion sizes and eating frequency.

LEPR (rs1137101, Gln223Arg A>G): Another variant in the *LEPR* gene, rs1137101 (Gln223Arg A>G), affects leptin signaling. The G allele is associated with a reduced feeling of fullness, which may lead to larger meal sizes and frequent hunger cues [R, R, R].

TAS2R38 (rs713598, Ala262Val C>T): *TAS2R38* is a taste receptor gene that affects taste sensitivity, particularly to bitter flavors. The rs713598 variant (Ala262Val C>T) can influence food preferences and eating behavior, potentially impacting overeating tendencies, especially in response to sweet or fatty foods [R, R, R].

TAS2R38 (rs1726866, Ala49Pro G>A): Another *TAS2R38* variant, rs1726866 (Ala49Pro G>A), affects bitter taste perception. Individuals with the A allele may have a preference for bitter-tasting vegetables like cruciferous greens. This variant can influence dietary choices and eating behaviors, indirectly impacting overall nutrition and weight management.

APOA2 (rs5082, -492 T>C): *APOA2* is involved in lipid metabolism and satiety regulation. The rs5082 variant (-492 T>C) has been associated with higher intake of saturated fats and a tendency to overeat, especially in individuals with the CC genotype.

CLOCK (rs1801260, 3111 T>C): The *CLOCK* gene influences circadian rhythms, which affect eating patterns and metabolism. The rs1801260 variant (3111 T>C) can disrupt regular eating schedules, potentially leading to increased food intake during irregular hours and contributing to overeating [R, R, R].

DRD2 (rs1800497, Taq1A C>T): *DRD2* encodes a dopamine receptor, which is involved in reward and pleasure pathways in the brain. The rs1800497 variant (Taq1A C>T) can affect dopamine sensitivity, potentially leading to increased cravings and reward-seeking behaviors related to food [R, R, R, R].

FAAH (rs324420, Pro129Thr C>A): *FAAH* is involved in endocannabinoid signaling, which influences appetite and pleasure from eating. The rs324420 variant (Pro129Thr C>A) can increase the tendency to snack and overeat, particularly high-fat foods, due to heightened pleasure responses to food.

MC4R (rs17782313, T>C): The *MC4R* gene is associated with energy balance and appetite control. The rs17782313 variant (T>C) has been linked to increased appetite and a higher risk of



TYPICAL LIKELIHOOD

Typical likelihood of overeating based on 20 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
POMC	rs6713532	TT
NPY	rs16147	TT
ANKK1	rs1800497	GA
CLOCK	rs1801260	AG
CNR1	rs1049353	TT
LEPR	rs1805096	GG
LEPR	rs1137101	AG
TAS2R38	rs713598	GC
LEP	rs7799039	GG
COMT	rs4680	GA
FAAH	rs324420	AC
TAS2R38	rs1726866	GA
LEPR	rs1137100	AG
TCF7L2	rs7903146	TC
FTO	rs9939609	TT
MC4R	rs17782313	TT
MC4R	rs12970134	GG
SLC2A2	rs5400	GG
FCER1G	rs5082	AA
NPY	rs16139	TT
POMC	rs1042571	GG

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

obesity, as individuals with the C allele may feel less satiated after eating [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

MC4R (rs12970134, G>A): The rs12970134 variant (G>A) near the *MC4R* gene has been linked to increased hunger and a reduced feeling of fullness. Individuals with the A allele may be more prone to overeating and weight gain due to a diminished satiety response, making appetite control more challenging [\[R\]](#).

SLC2A2 (rs5400, Thr110Ile C>T): SLC2A2 plays a role in glucose transport and blood sugar regulation. The rs5400 variant (Thr110Ile C>T) can influence carbohydrate cravings and eating patterns, with certain alleles associated with a preference for high-carb foods.

HADH (rs1042571, C>T): The *HADH* gene encodes hydroxyacyl-CoA dehydrogenase, an enzyme involved in fatty acid metabolism and energy regulation. The rs1042571 variant (C>T) has been associated with differences in metabolic efficiency and energy utilization.

NPY (rs16147, A>G): The *NPY* gene encodes the neuropeptide Y, which is involved in regulating stress response, appetite, and arousal. The rs16147 variant (A>G) has been associated with differences in appetite control and stress-induced eating behaviors. Individuals with the G allele may be more prone to overeating, especially in response to stress [\[R\]](#).

CNR1 (rs1049353, C>T): The *CNR1* gene encodes the cannabinoid receptor 1, which is involved in the endocannabinoid system that regulates appetite, mood, and reward pathways. Individuals with the T allele of rs1049353 may have an increased tendency to cravings and overeating, particularly for high-calorie or "comfort" foods, due to heightened activity in the brain's reward centers.

COMT (rs4680, Val158Met G>A): The *COMT* gene encodes an enzyme that breaks down dopamine in the brain, affecting mood, reward sensitivity, and impulse control. The rs4680 variant (Val158Met G>A) influences dopamine levels, with the A allele (Met) associated with slower dopamine breakdown. Individuals with the A allele may have heightened sensitivity to rewards, which can increase susceptibility to cravings and overeating.

ADRB3 (rs1805096, Trp64Arg T>C): The *ADRB3* gene encodes the beta-3 adrenergic receptor, which is involved in regulating fat breakdown and energy expenditure. The rs1805096 variant (Trp64Arg T>C) has been associated with reduced receptor function, leading to decreased fat metabolism and an increased risk of weight gain.

Metabolic Rate

Key Takeaways:

- Being high or low metabolism is not inherently problematic. Knowing what yours is allows you to adjust various diet, exercise, and lifestyle choices to properly manage it.
- Your metabolic rate influences movement, thinking, breathing, body temperature, and healing rate.
- High metabolic rate may be affected by being younger, being bigger, as well as more active. Low metabolic rate tends to be affected by the opposite of these. Your genetics may impact the influence of these factors.

Your metabolic rate is the number of calories you burn in a day to maintain bodily functions. A lower metabolic rate or a "slower metabolism" means your body needs fewer calories to do basic functions. Others may need to burn more calories to support these functions. These people have a higher metabolic rate or a "faster metabolism" [\[R,R,R\]](#).

Is metabolism related to body weight? If so, is it possible to burn more calories by boosting your metabolic rate?

Differences in metabolic rate may be due to both genetic and environmental factors. Factors that can contribute to a slower metabolism include [\[R, R, R, R, R\]](#):

- Being smaller
- Having less muscle mass
- Being older
- Being less active
- Not getting enough sleep

People with slower metabolism need fewer calories to get them through the day. They also tend to gain weight more easily.

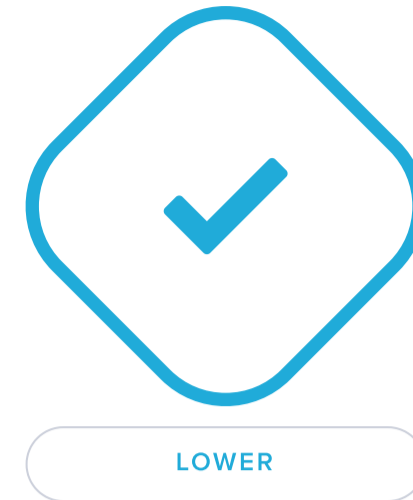
Factors that can contribute to a faster metabolism include [\[R, R, R, R\]](#):

- Being larger
- Having more muscle mass
- Being younger
- Being more active

People with faster metabolism need more calories to get them through the day. They also find it harder to gain weight.

Metabolic rate may not change much from age 20 to 60. While you may not change how many calories your body needs to perform automatic functions, **you can burn more calories by being more active**. Regular exercise can help maintain a healthy weight and support overall health [\[R, R, R, R, R\]](#).

If you're concerned about your weight or you think your metabolism is too slow or too fast, talk with your doctor.



Predisposed to lower metabolic rate based on 136,918 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
LEPR	rs1805096	GG
PPARGC1A	rs8192678	CT
LEPR	rs1137101	AG
ADRB2	rs1042713	AG
ADRB2	rs1042714	CG
CLOCK	rs1801260	AG
LEPR	rs1137100	AG
UCP1	rs1800592	TC
UCP2	rs659366	TC
CCND2	rs76895963	TT
TP53	rs78378222	TT
PARD3B	rs1470545	CC
SH3YL1	rs62106258	CT
L3MBTL3	rs7740107	AA
HMGA2	rs1351394	CC
DLG5	rs117543413	TC
ZNF628	rs147110934	GT
DCAF16	rs1472852	CA
TEFM	rs6505216	TG
FTO	rs9939609	TT
ADRB3	rs4994	AA
MC4R	rs17782313	TT
UCP3	rs1800849	GG
CCND3	rs33966734	CC
MGA	rs117183161	AA
MC4R	rs76227980	CC
ZBTB26	rs369508364	CC
CDKN1C	rs143840904	CC
FANCC	rs370727606	GG

GENE	SNP	GENOTYPE
ACAN	rs28584580	AA
PAM	rs78408340	CC
ADAMTS10	rs62621197	CC
COQ5	rs76929617	AA
PPA2	rs143847362	AA
ASPRV1	rs35986233	AA
RPS20	rs72656010	TT
IL11	rs4252548	CC
RAD9A	rs7952436	CC
ADAL	rs148076268	AA
DLEU7	rs3118914	GG
HCAR1	rs147730268	GG
MROH8	rs73094911	TT
LTBP1	rs116072427	GG
COPZ2	rs62064921	CC
WDR35	rs113386058	AA
ZNF469	rs76520574	CC
GALR1	rs74540285	AA
UVSSA	rs111391498	AA
DRAM1	rs17032220	TT
ZFHX4	rs61729527	CC

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

Overweight

Key Takeaways:

- Up to **70%** of people's differences in weight may be due to genetics.
- Up to **42% of adults** and **19% of children** in the US meet the medical criteria for obesity.
- Weight gain affects conditions like high blood sugar and heart disease. However, it is highly modifiable by diet and exercise. So, even if your genetic risk is high, there's a lot you can do to reduce its impact.
- Click the **Recommendations** tab for useful weight control tips and **next steps** for relevant labs.

People are finding it harder than ever to manage their weight. **Global obesity rates have skyrocketed** [R, R, R].

Some health experts even say we're in an "obesity epidemic." **Up to 42% of adults and 19% of children in the US meet the medical criteria for obesity** [R, R, R].

Doctors can use *body mass index* (BMI) to tell if someone is obese. To calculate your BMI, divide your weight by the square of your height (kg/m²). There are many online calculators that can help you do this [R, R].

In Western countries, people with a **BMI of 25 and over** are considered **overweight**. A **BMI of 30 or greater** is considered **obese**. In some Asian countries, a BMI of 25 and over is considered obese [R, R, R].

BMI isn't the only important measure of healthy weight, however. Body composition is also important because muscle is more dense than fat. Thus, a muscular athlete and an obese person can have similar BMIs [R, R].

For this reason, doctors and researchers often use other body weight measurements, including [R, R]:

- Waist circumference (WC)
- Waist-to-hip ratio (WHR)
- Percentage of body fat (%BF)
- Lean (muscle) mass

Some people worry about body weight because they value how they look. However, **body weight impacts both mental and physical health**. Obesity may increase the risk of [R, R]:

- High blood pressure
- High [cholesterol](#)
- Heart disease
- [High blood sugar](#)
- Reproductive issues and erectile dysfunction
- Breathing problems during sleep
- Joint and bone disorders
- Some cancers

In theory, you gain weight when you consume more calories than you burn. Your body stores the extra energy as fat [R, R, R].

In reality, it's more complicated than that. To stick to a healthy weight, you'll need to manage many factors, including [R, R, R]:

- **Diet.** Pay attention to the amount and type of food you eat, meal timing, and portion size.
- **Lifestyle.** It's better to live an "active" lifestyle than a "sedentary" one and to allow your body to get the sleep it



LESS LIKELY

Less likely to be overweight or obese based on 455,232 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
LEPR	rs1805096	GG
MC4R	rs2229616	CC
TCF7L2	rs7903146	TC
LPCAT2	rs2285053	CC
LEPR	rs1137101	AG
SEC16B	rs591120	CC
NPY	rs16147	TT
POMC	rs6713532	TT
NEGR1	rs3101336	CC
ADRB2	rs1042713	AG
PEX11A	rs894160	CT
CLOCK	rs1801260	AG
UCP1	rs1800592	TC
UCP2	rs659366	TC
ANKK1	rs1800497	GA
NEGR1	rs2815752	AA
GIPR	rs2287019	CC
CDKAL1	rs2206734	CC
GP2	rs12597579	CC
KLF9	rs11142387	CC
RFC4	rs17300539	GG

needs.

- **Environment.** What are your family habits? Do you have social support? What is your stress level? These things have a surprising effect on weight management.
- **Medical conditions.** Anything that changes your metabolism or ability to exercise can also affect body weight.
- **Genetics.** Some gene variants may make it easier or harder to manage your weight.

Doctors may recommend a variety of strategies to help reach and maintain a healthy weight. These include [\[R\]](#):

- Reducing how much food you eat
- Choosing low-calorie foods
- Choosing more plant-based foods
- Exercising
- Counseling or support groups

Your genes may help determine how well you respond to these strategies.

Rarely, obesity can become a serious health problem. In these cases, doctors may prescribe [weight loss](#) drugs or surgery [\[R\]](#).

Up to 70% of differences in weight may be attributed to genetics. Genes that may contribute to body weight influence [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Food choices ([FTO](#), [IRX4](#))
- Appetite ([LEP](#), [POMC](#), [MC4R](#), [NPY](#))
- Meal timing ([CLOCK](#))
- Fat and sugar metabolism ([FTO](#), [UCP2](#), [TCF7L2](#))

Genetically high bioavailable testosterone may be causally associated with a high risk of obesity (in women). In contrast, genetically high choline, omega-3 fatty acids, and DHA may be causally associated with a lower risk of obesity [\[R\]](#), [\[R\]](#).

GENE	SNP	GENOTYPE
TAS1R2	rs35874116	TT
NPC1	rs1808579	CT
MTCH2	rs10838738	AG
NPC1	rs1805081	TC
KCTD15	rs29941	AG
SH3YL1	rs6548238	TC
LEPR	rs1137100	AG
ADRB2	rs1042714	CG
GNB3	rs5443	CT
IL6R	rs4845623	GG
IL6R	rs2228145	CC
LEPR	rs11208659	TT
LEP	rs2167270	AA
LEP	rs3828942	GG
LEP	rs10244329	TT
SOCS3	rs9892622	AA
CRP	rs1205	CC
STEAP1B	rs10242595	GA
STAT3	rs9891119	AA
PYY	rs162431	GG
PGS1	rs4969170	GA
TMC8	rs4969168	GA
UCP2	rs2075577	AG
GNPDA2	rs16858082	TT
UCP2	rs647126	GA
RFC4	rs266729	GC
UCP2	rs660339	AG
STMN4	rs140901272	CC
IL1B	rs1143634	GG

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

FTO (Weight)

An SNP in this gene, [rs9939609](#), has shown a robust association with obesity across different ages and ethnic groups. Carriers of the minor 'A' allele tend to gain more weight and have higher rates of obesity [\[R, R, R, R\]](#).

Many human studies suggest that the 'A' allele at rs9939609 is associated with:

- Higher levels of [ghrelin](#) or the "hunger hormone" [\[R\]](#)
- Higher food intake [\[R, R, R\]](#)
- Increased preference for higher-calorie foods [\[R, R, R\]](#)
- Increased enjoyment of food [\[R\]](#)
- Not feeling full after meals [\[R, R, R\]](#)
- Eating in the absence of hunger [\[R, R\]](#)
- Food cravings [\[R\]](#)
- Emotional and binge eating [\[R\]](#)

In contrast, the 'T' allele is linked to normal body weight, more satiety after meals, and possibly healthier dietary choices [\[R, R, R\]](#).

In addition to its potential influence on appetite and hunger control, this *FTO* SNP may also have metabolic effects that affect how the body actually processes the food we eat. For example, several studies suggest that the 'A' allele of rs9939609 may be linked with higher [insulin resistance](#) and [blood sugar](#) [\[R, R, R\]](#).

Following on this, a meta-analysis of data from over 40,000 Scandinavians found that people diagnosed with type-2 diabetes were more likely to carry the 'A' allele for this SNP. The authors also concluded that having the 'A' allele may make a person more likely to develop type-2 diabetes over time. However, another meta-analysis of over 150,000 people found this association significant only in some populations [\[R, R\]](#).

The good news is that **healthy dietary choices may reduce and even cancel out the harmful effects of the 'A' variant!**

Multiple studies have associated an increased intake of [dietary fat](#), specifically saturated and trans fat, with obesity in carriers of the 'A' allele [\[R, R, R, R, R, R\]](#).

Carriers of this variant eating a low-fat diet or replacing saturated fat with healthy fats such as PUFA and MUFA may see greater reductions in [\[R, R, R, R\]](#):

- [Weight](#) and abdominal fat
- [Total cholesterol](#)
- [LDL](#)
- [CRP](#) (inflammation)
- Insulin resistance

Additionally, carriers of the 'A' variant may benefit from increasing their intake of [dietary protein](#). While a low-protein diet has been associated with higher BMI and waist circumference in people with the 'AA' genotype, 'A' carriers eating a high-protein diet may see greater improvements in their [\[R, R, R\]](#):

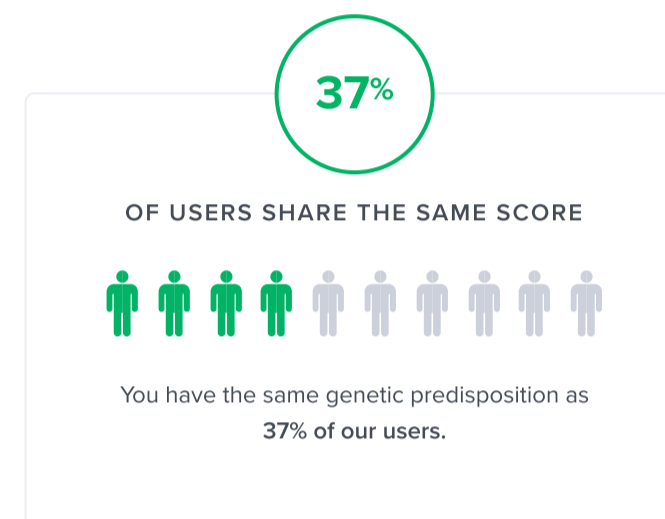
- Appetite and food craving control
- Total cholesterol
- Triglycerides
- LDL
- Insulin resistance

However, two meta-analyses failed to confirm these associations. One of them even came to the opposite conclusion: the link between *FTO* variants and BMI was **stronger**



BETTER

Likely better *FTO* genetics based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
FTO	rs9939609	TT

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

in those who consumed more protein. Further analysis of different populations confirmed this finding only in whites [\[R, R\]](#).

A 3-year-long study concluded that people with the 'AA' genotype may lose weight better on a [Mediterranean diet](#) compared to people with the 'TT' genotype. In addition, according to another study, this type of diet may protect people with the 'AA' genotype against diabetes [\[R, R\]](#).

MC4R (Weight/ Blood Sugar)

The most studied SNP near the *MC4R* gene is [rs17782313](#). The "C" allele is linked to:

- Higher BMI (8%) and obesity rates (12-30%) [\[R, R\]](#)
- Increased hunger, snacking, and overeating [\[R\]](#)
- Eating high-calorie foods high in fat [\[R, R\]](#)

Another important *MC4R* variant is [rs12970134](#). The "A" allele is linked to:

- Obesity, higher BMI, and waist circumference [\[R, R, R\]](#)
- Food cravings and increased beverage consumption [\[R\]](#)
- High blood sugar and insulin resistance [\[R, R, R, R\]](#)

Other *MC4R* variants like [rs6567160](#) and [rs663129](#) have shown similar associations, They are almost always inherited together with the two main variants, so they all represent a single genetic factor [\[R, R, R, R, R\]](#).

"Bad" *MC4R* variants likely **reduce gene expression or receptor activity**, thus increasing food intake and hindering glucose and fat metabolism.

[Learn more about the link between MC4R variants, weight, and food intake.](#)

[Learn more about the link between MC4R variants and blood sugar.](#)



HIGHER ACTIVITY

Likely higher MC4R activity based on the genetic variants we looked at

55%

OF USERS SHARE THE SAME SCORE



You have the same genetic predisposition as 55% of our users.

Your top variants that most likely impact your genetic predisposition:
















GENE	SNP	GENOTYPE
MC4R	rs17782313	TT
MC4R	rs12970134	GG


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




Diet & Nutrition

Your genes influence how efficiently you process and utilize various nutrients. This section explores genetic factors affecting how your body handles everything from essential vitamins and minerals to macronutrients like fats and proteins. We examine variations that impact nutrient absorption and metabolism, food sensitivities, and even how you process substances like caffeine and alcohol. Understanding these genetic predispositions can help you make more informed choices about your diet and nutritional needs.


<p> MORE LIKELY Snacking</p> <p>More likely to snack</p>	<p> INCREASED NEED Calcium</p> <p>Likely increased need for calcium</p>	<p> INCREASED NEED Folate (Functional)</p> <p>Predisposed to increased need for folate</p>
<p> WORSE RESPONSE Protein Metabolism</p> <p>Predisposed to worse protein metabolism</p>	<p> INCREASED NEED Vitamin B6 (Pyridoxine)</p> <p>Likely increased need for vitamin B6</p>	<p> INCREASED NEED Zinc</p> <p>Likely increased need for zinc</p>
<p> HIGHER Alcohol Sensitivity</p> <p>Likely higher sensitivity to alcohol</p>	<p> TYPICAL NEED Vitamin B12</p> <p>Likely typical need for vitamin B12</p>	<p> TYPICAL NEED Vitamin D</p> <p>Likely typical need for vitamin D</p>
<p> TYPICAL NEED Iron</p> <p>Likely typical need for iron</p>	<p> TYPICAL RESPONSE Saturated Fat</p> <p>Predisposed to typical saturated fat response</p>	<p> INTERMEDIATE ACTIVITY TAS2R38 (Bitter Taste Perception)</p> <p>Likely intermediate TAS2R38 activity</p>
<p> TYPICAL NEED Vitamin A</p> <p>Likely typical need for vitamin A</p>	<p> TYPICAL NEED Vitamin C</p> <p>Likely typical need for vitamin C</p>	<p> TYPICAL NEED Magnesium</p> <p>Likely typical need for magnesium</p>

 **TYPICAL NEED**
Selenium


Likely typical need for selenium

 **TYPICAL NEED**
Choline


Likely typical need for choline

 **TYPICAL NEED**
Coenzyme Q10

Likely typical need for coenzyme Q10

 **TYPICAL NEED**
Omega-3


Likely typical need for omega-3s

 **TYPICAL GENETICS**
HLA-DQ (Gluten)


Likely typical HLA-DQ genetics

 **TYPICAL LIKELIHOOD**
Celiac Disease

Typical likelihood of celiac disease

 **BETTER**
Fat Metabolism


Predisposed to better fat metabolism

 **LOWER**
Caffeine Sensitivity


Predisposed to lower caffeine sensitivity

 **HIGHER ACTIVITY**
CYP1A2 (Detox)

Likely higher CYP1A2 activity

 **LIKELY TOLERANT**
Lactose Intolerance

Likely lactose tolerant

 **LESS LIKELY**
Sugar Cravings

Less likely to crave sugar

Snacking

Some people snack more than others. This may partly be due to genetics. Genes involved in snacking are linked to **appetite, satiety, and the body’s internal clock** [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

Tips to support **good snacking habits** include [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Choosing snacks that are less processed, without added sugar and salt
- Choosing snacks that will keep you full for longer (i.e., snacks higher in protein, fiber, and healthy fats)
- Not eating when distracted, emotional, or bored
- Portioning your snack, rather than eating it straight from the package
- Placing unhealthy snacks in hard-to-reach places, and healthy snacks at eye level

Some **healthy snacking options** include [\[R\]](#), [\[R\]](#), [\[R\]](#):

- An apple or other fruit
- Nuts and seeds
- Sliced vegetables with hummus or nut butter
- Greek yogurt with fruits
- Air-popped popcorn

Note that avoiding unhealthy snacks like chips and ice cream might lead to over-indulging when you do eat them. Try to **snack in moderation, no matter what you’re snacking on** [\[R\]](#).



MORE LIKELY

More likely to snack based on 7,238,934 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
HES6	rs2304672	GG
LEP	rs791607	AA
LEPR	rs2025804	AG
MC4R	rs17782313	TT
LRRC4	rs4577902	AA
LIN7C	rs925946	GG
SH2B1	rs7498665	AA

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

Calcium

Key Takeaways:

- The amount of calcium in the blood at any given time is controlled by vitamin D and parathyroid hormone.
- Much of the world's population is at risk for low calcium.
- Beyond diet, it is important to maintain adequate vitamin D levels as well.
- Dairy and fortified foods are the easiest ways to ensure adequate calcium intake.
- Click the **next steps** tab for relevant labs.

Calcium is the most abundant mineral in the human body. Ninety-nine percent of the calcium in the body is stored in the bones and teeth, and only a small amount is in your bloodstream at any time. **Vitamin D** and **parathyroid hormone** closely control the amount of calcium in your blood [R,R,R].

The recommended daily intake of calcium is 1,000 mg for women who have not gone through menopause and 1,200 mg for women who have. The recommended daily intake for men is 1,000 mg [R].

Many people do not get enough calcium in their diet [R, R, R, R].

Eating more dairy products is an easy way to incorporate more calcium into your diet. You can also add non-dairy calcium sources and calcium-fortified foods like cereal and orange juice [R].

Compared to supplements, calcium from food is easier to absorb and may be better for bone building. It is also unlikely to cause side effects [R, R, R].

Your gut needs vitamin D to be able to absorb calcium. Higher vitamin D levels are linked to higher calcium levels in the body and better bone health [R, R, R, R].

[Sunlight](#) is our main source of vitamin D. Foods like fish, eggs, and fortified milk provide small amounts of vitamin D. People lacking vitamin D should consider taking a supplement [R, R, R].



INCREASED NEED

Likely increased need for calcium based on 49,653 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ALDH7A1	rs13182402	AG
FAM216B	rs9525667	CT
GAL	rs880610	GG
CDC42SE1	rs2864700	TT
CTNNB1	rs389264	CC
RSPO3	rs9482772	CC
AMT	rs34240317	DEL(CT)A
GALNT3	rs10204976	GG
CPED1	rs10242100	AA
MRPL20	rs12408050	AG
ARL4C	rs12151790	GG
DOK6	rs17184557	TT
FKBP11	rs3741619	GA
ETS2	rs11088458	AG
HBZ	rs10794639	GA
SMOC1	rs3742909	GA
HOXC6	rs7308105	TC
TNFRSF11B	rs2062375	GC
STK39	rs578031265	CC
MARCO	rs115242848	CC
PRSS3	rs10814041	GG
MN1	rs139959245	CC
NUDT2	rs307646	AA
ARRDC3	rs7733007	GG
CDH6	rs2173682	GA
IDH3A	rs2028548	CC
HLA-DQA1	rs2071805	CC
MECOM	rs784288	GG
VAR52	rs9262558	CC

GENE	SNP	GENOTYPE
SP7	rs144680237	CC
CPED1	rs3779381	AA
ZBTB40	rs34414754	AA
GAL	rs56154705	CC
WLS	rs2566755	TT
SEM1	rs4448201	GG
CCDC170	rs4869744	TT
/	rs12808199	AA

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

Folate (Functional)

Several genetic variants are associated with folate metabolism, affecting how the body processes, utilizes, and requires folate.

MTHFR (rs1801133, 677 C>T): MTHFR is essential for converting folate to its active form. The rs1801133 variant (677 C>T) can reduce enzyme activity, leading to higher homocysteine levels and an increased need for dietary folate to support healthy methylation [R].

MTHFR (rs1801131, 1298 A>C): Another variant in *MTHFR*, rs1801131 (1298 A>C), also impacts folate processing efficiency. This variant may compound the effects of the 677 C>T variant, further increasing folate needs for individuals with both mutations [R, R, R, R].

MTHFD1 (rs2236225, 1958 G>A): The *MTHFD1* gene is involved in folate metabolism, particularly in providing one-carbon units for methylation and DNA synthesis. The rs2236225 variant (1958 G>A) can affect enzyme efficiency, potentially impacting folate requirements for optimal metabolic function [R].

MTHFS (rs6495446, G482S): The *MTHFS* gene is involved in the folate cycle, specifically in converting folinic acid (a form of folate) into 5,10-methylenetetrahydrofolate, which is crucial for DNA synthesis and repair. The rs6495446 variant (G482S) may reduce enzyme activity and has been linked to kidney disease [R].

MTHFD1L (rs202676, 484 T>C): The *MTHFD1L* gene plays a role in the folate metabolism pathway, specifically in the conversion of folate derivatives needed for cellular methylation and DNA synthesis. The rs202676 variant (484 T>C) may reduce the efficiency of this enzyme, potentially leading to impaired methylation and homocysteine removal. This variant has been associated with Alzheimer's disease, Parkinson's disease, and depression [R, R, R, R, R].

SHMT1 (rs1979277, 1420 C>T): The *SHMT1* gene encodes serine hydroxymethyltransferase, an enzyme that converts serine to glycine while generating 5,10-MTHF, a key form of folate involved in DNA synthesis and repair. The rs1979277 variant (1420 C>T) seems to reduce the ability of SHMT to produce 5,10-MTHF, leading to lower levels of active folate. The minor allele has been linked to liver cirrhosis, congenital problems with blood vessels, and Down's syndrome [R, R].

DHFR (rs408626, 317 A>G): The *DHFR* gene encodes an enzyme called dihydrofolate reductase that converts dihydrofolate (DHF) into tetrahydrofolate (THF). THF is a methyl group shuttle required for the production of purines and thymidine, both of which are required for DNA synthesis and cell growth. The rs408626 variant (317 A>G) may increase gene expression [R].

DHFR (rs1650697, 473 T>C): Another *DHFR* gene variant, rs1650697 (473 T>C) may increase DHFR levels [R].



INCREASED NEED

Predisposed to increased need for folate based on 12 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
MTHFR	rs1801133	AA
SHMT1	rs1979277	AA
MTHFS	rs6495446	CC
FOLH1	rs61886492	GG
MTHFD1	rs2236225	GA
MTRR	rs1801394	GA
MSH3	rs408626	TT
MSH3	rs1650697	AA
MTHFR	rs1801131	TT
MTHFD1L	rs11754661	GG
FOLH1	rs202676	AA
MTR	rs1805087	AA

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

Protein Metabolism

Some people do better on low- and others on high-protein diets. Your genes may affect your response to protein. Specifically, genes that affect your response to protein may also influence [\[R, R, R\]](#):

- Body weight
- Food preference
- Metabolism

In people with a better response to dietary protein, higher amounts of protein in a diet may improve weight control and metabolism. On the other hand, high-protein diets may have adverse metabolic effects in people with a worse response [\[R, R, R\]](#).

However, other variants and environmental factors may also influence your dietary protein response. Try to get most of your protein from healthy sources such as legumes, poultry, and fish.



WORSE RESPONSE

Predisposed to worse protein metabolism based on 17 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
FTO	rs9939609	TT
FTO	rs1558902	TT
GLP1R	rs6923761	GG
ST6GAL1	rs1501299	GG
CNDP2	rs4891558	TT
NADSYN1	rs12785878	GG
MTNR1B	rs10830963	CG
APOA1	rs670	CC
FUCA1	rs3123554	GA
NTN5	rs838147	GA
CLOCK	rs3749474	TC
UCP3	rs1800849	GG
ADRB3	rs4994	AA
FABP2	rs1799883	CC
TFAP2B	rs987237	AA
CNDP1	rs7244647	TT
TNF	rs1800629	GG

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

Vitamin B6 (Pyridoxine)

Some people may have genetically higher vitamin B6 levels than others. Genes involved may influence vitamin B6 metabolism [\[R\]](#), [\[R\]](#), [\[R\]](#).



INCREASED NEED

Likely increased need for vitamin B6 based on 5 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
NBPF3	rs4654748	CC
ALPL	rs1256341	TT
NBPF3	rs1697421	CT
CBS	rs234706	GA
MTHFR	rs1801133	AA
PDXK	rs2010795	AG
ALPL	rs1772719	CA
PDXK	rs147242481	GG
ALPL	rs1256335	AA

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

Zinc

Some people have higher zinc levels than others. This may partly be due to genetics. Genes involved may influence zinc metabolism [R, R, R].

Genetically higher zinc levels may be causally associated with [R, R]:

- Gut inflammation (lower risk)
- Fasting glucose (improved)

However, it may also be causally associated with [R, R, R, R, R]:

- Kidney stones (increased risk)
- Longevity (reduced)
- Varicose veins (increased risk)
- Heart health (reduced)
- Joint pain (increased risk)



INCREASED NEED

Likely increased need for zinc based on 8 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
SLC30A8	rs13266634	CC
SLC30A8	rs11558471	AA
CA2	rs1532423	GG
SORBS3	rs4872479	GG
SLC5A6	rs11126936	GG
SLC39A8	rs233804	CC
SCAMP5	rs2120019	TC
NBDY	rs4826508	C

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

Alcohol Sensitivity

There are two enzymes involved in clearing alcohol from the body. They are coded by genes called [ADH1B](#) and [ALDH2](#). The first enzyme breaks down alcohol to toxic acetaldehyde, while the second one breaks down acetaldehyde into a less harmful substance [\[R\]](#).

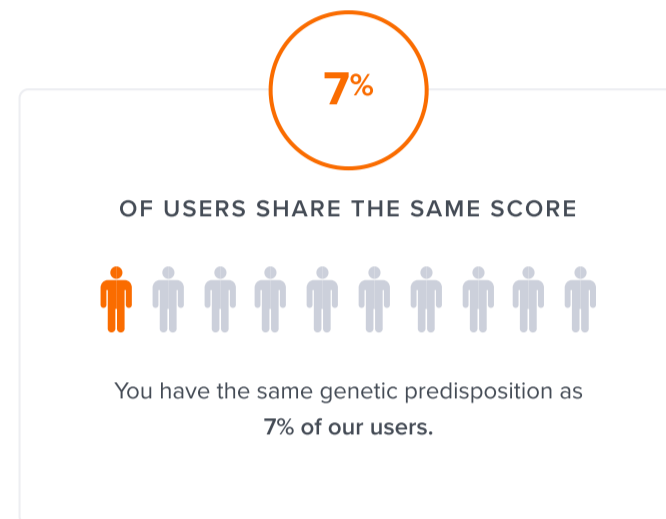
Genetic variants that speed up the first enzyme or slow down the second enzyme contribute to the buildup of acetaldehyde and increase alcohol sensitivity [\[R\]](#).

Variants that increase the buildup of acetaldehyde are common in East Asian populations but rare in other parts of the world [\[R\]](#).



HIGHER

Likely higher sensitivity to alcohol based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ADH1B	rs1229984	CT
ALDH2	rs671	GG

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

Vitamin B12

Key Takeaways:

- Vitamin B12 is important for making energy and red blood cells, building DNA, and nerve function.
- It is most easily obtained via animal products like meat, eggs, dairy, and fortified foods.
- If you have an increased need or you tested as deficient, you may want to examine your current diet. You should talk to your doctor before taking B12 supplements.
- Click the **next steps** tab for relevant labs.

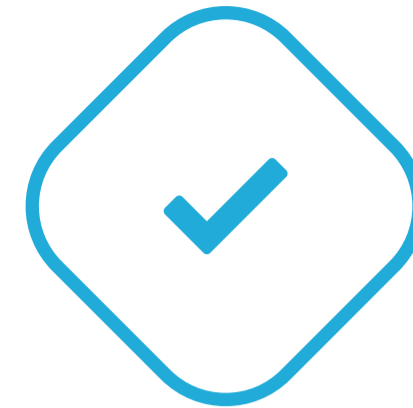
People more prone to low levels of vitamin B12 include [\[R\]](#):

- Vegetarians and vegans
- Older adults
- People with gut disorders (e.g., Crohn's disease, celiac disease)

A hallmark of vitamin B12 deficiency is a lack of healthy red blood cells (anemia). Anemia can cause symptoms like weakness and fatigue. A sign of long-term vitamin B12 deficiency is nerve damage [\[R, R, R, R\]](#).

Vitamin B12 deficiency can be detected with a blood test. After it is diagnosed, you may need to work with your doctor to figure out the cause. Your doctor may recommend oral supplements or injections of vitamin B12 to help correct the deficiency [\[R, R\]](#).

If you are not deficient, it is best to get vitamin B12 from food. Talk to your doctor before taking vitamin B12 supplements [\[R\]](#).



TYPICAL NEED

Likely typical need for vitamin B12 based on 1,018,082 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
TCN2	rs1801198	GG
FUT2	rs1047781	AA
FUT2	rs602662	GA
CUBN	rs11254363	GG
ADGRE1	rs62123070	CC
FUT2	rs601338	GA
MTRR	rs1801394	GA
ABCD4	rs4148077	CC
TCN1	rs526934	AG
FUT5	rs3760775	GT
FUT3	rs708686	CT
FUT2	rs516246	CT
CBS	rs234706	GA
MMAB	rs7134594	CT
CUBN	rs1801222	GG
TCN1	rs34324219	CC
RGS7	rs7544372	TT
/	rs1990193	AA
/	rs1513859	AA
FAM240C	rs12478296	CC
SLC25A2	rs3749779	AA
FOXK1	rs314590	AA
CFAP299	rs1385890	AA
LAMA4	rs76190642	GG
CHODL	rs34988353	AA
ARAP2	rs142554771	TT
LAMA4	rs144505878	GG
C1QL3	rs79770840	GG
RGS18	rs114973754	CC

GENE	SNP	GENOTYPE
ADGRL3	rs545255284	TT
C16ORF82	rs139645308	CC
POU3F3	rs188141458	GG
KCNK2	rs72761546	TT
KCNK2	rs189754522	AA
PCSK2	rs141477158	GG
TMEM179	rs79885401	CC
LRRC6	rs117429467	AA
STT3B	rs188968123	AA
SPATA18	rs142766122	CC
SRRM4	rs73215576	CC
MICA	rs556990455	GG
CADM2	rs188586547	AA
CENPF	rs72759663	GG
SMYD3	rs148487271	TT
HSPB7	rs144839376	AA
AKAIN1	rs7239302	CC
ST8SIA6	rs188363440	AA
DACT1	rs118119041	GG
MMUT	rs9473555	GG
TCN2	rs9606756	AA

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

Vitamin D

Key Takeaways:

- Vitamin D is an essential nutrient that you need outside sources of to achieve adequate levels. It is important for mood, immunity, heart health, and blood sugar control.
- Vitamin D levels can be impacted by intensity and amount of sun exposure, age, skin color, and your genetics.
- If you are genetically predisposed to needing more vitamin D, you may want to consider supplementation and addressing possible issues like sun exposure.
- Click the **next steps** tab for relevant labs.

[Vitamin D](#) is an essential nutrient. **Your body needs vitamin D for strong bones.** Our skin naturally makes vitamin D when exposed to [sunlight](#). We also get small amounts of vitamin D from foods such as fatty fish, egg yolks, beef liver, and mushrooms [\[R,R\]](#).

Around **20-40%** of differences in people's vitamin D levels may be due to genetics [\[R\]](#).

Genes that influence vitamin D levels may play a role in its [\[R\]](#):

- Production
- Activation
- Transport
- Breakdown

Besides genetics, the following factors also influence vitamin D levels [\[R\]](#):

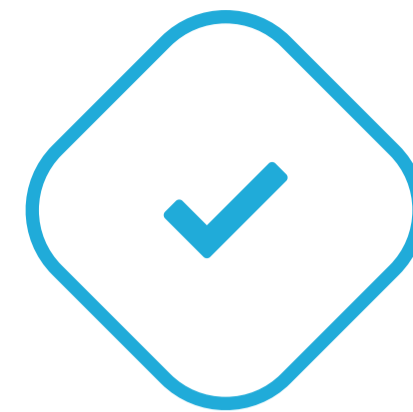
- Sun exposure
- Skin color
- Age

Genetically high vitamin D levels may be causally associated with positive outcomes for:

- Alzheimer's [\[R,R,R\]](#)
- COPD [\[R,R\]](#)
- Uterine fibroids [\[R\]](#)
- Migraines [\[R\]](#)
- Heart Failure [\[R,R\]](#)
- Psoriasis [\[R\]](#)
- Lupus [\[R\]](#)
- Delirium [\[R\]](#)
- Hypertension [\[R\]](#)
- Rosacea [\[R\]](#)
- Total Testosterone [\[R\]](#)
- Muscle loss [\[R,R\]](#)
- Muscle mass [\[R\]](#)
- CRP [\[R,R\]](#)
- Longevity [\[R,R\]](#)
- Lower cholesterol, lipoprotein particles, and phospholipids within VLDL and IDL [\[R\]](#)
- Higher HDL cholesterol [\[R\]](#)
- Lower triglycerides [\[R\]](#)
- Higher adiponectin [\[R\]](#)
- eGFR (lower) [\[R\]](#)
- Primary biliary cholangitis [\[R\]](#)

Genetically lower vitamin D levels may be causally associated with negative outcomes for:

- Multiple sclerosis [\[R,R,R,R,R,R,R,R,R\]](#)



TYPICAL NEED

Likely typical need for vitamin D based on 1,754 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
COPB1	rs2060793	GG
COPB1	rs12794714	AA
COPB1	rs10832289	TT
GC	rs2282679	GT
COPB1	rs10741657	GG
GC	rs7041	AC
CYP1B1	rs1800440	CT
VDR	rs1544410	CT
VDR	rs2228570	GA
/	rs189918701	GG
/	rs558560635	GG
/	rs375984409	GG
PDE3B	rs571484036	AA
COPB1	rs117913124	GG
GC	rs222026	TT
GC	rs4588	TG
VDR	rs731236	AG
GC	rs11723621	GA
PDE3B	rs201501563	TT
RRAS2	rs117206369	TT
/	rs201561609	TT
ADH1B	rs1229984	CT
GC	rs113938679	GG
CYP2R1	rs117576073	GG
/	rs561089663	GG
PSMA1	rs577185477	TT
/	rs557657187	GG
NADSYN1	rs12785878	GG
PSMA1	rs554808052	CC

- Pneumonia [\[R\]](#)
- Gut Inflammation: ulcerative colitis, non-infective colitis, and Crohn's disease [\[R\]](#)
- Lupus [\[R,R,R\]](#)
- Psoriasis [\[R,R\]](#)
- Longevity [\[R,R,R,R,R,R\]](#)

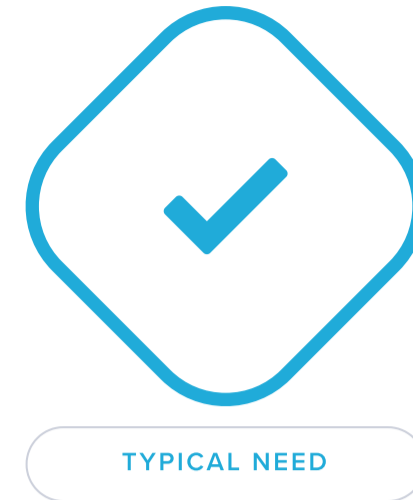
A blood test is the only reliable way to determine vitamin D status [\[R\]](#).

GENE	SNP	GENOTYPE
GC	rs565277381	TT
/	rs567415847	GG
/	rs529640451	CC
NADSYN1	rs536006581	AA
COPB1	rs148514005	CC
/	rs185433896	AA
PDE3B	rs188480917	CC
GC	rs3775150	TT
NPFFR2	rs143106299	AA

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

Iron

Key Takeaways:



- Iron is an essential mineral that your body needs to make hemoglobin, which is used by red blood cells. Women and vegetarians are more likely to be deficient.
- Iron-rich foods include meat, seafood, dark leafy greens, legumes, and fortified foods. You need about 18mg of iron per day.
- If your need is likely higher, you may want to make dietary changes to help ensure adequate intake. Speak to your doctor about supplementation, as high levels of iron can be toxic.
- Click the **next steps** tab for relevant labs.

Likely typical need for iron based on 444,172 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

Iron (Fe) is an essential mineral. It helps make [hemoglobin](#), a protein that red blood cells need to carry oxygen throughout the body. In this way, iron supports energy production and fights fatigue [\[R, R, R, R\]](#).

When iron levels are low, the body can't make enough red blood cells. This is called **iron-deficiency anemia**. Although mild cases may not lead to any signs or symptoms, people with more advanced iron-deficiency anemia may experience [\[R\]](#):

- Weakness and fatigue
- Pale skin
- Shortness of breath
- Dizziness
- Cold hands or feet
- Brittle nails

The following groups may be at a higher risk of iron deficiency [\[R, R\]](#):

- Women
- Children
- Routine blood donors
- Vegetarians

Iron from plant sources is harder to absorb than iron from animal sources. This makes vegetarians more prone to iron deficiency [\[R\]](#).

Iron-deficiency anemia can often be detected with a blood test. After it is diagnosed, your doctor may recommend supplementing with iron. Keep in mind that it may take several months of supplementation to help correct iron deficiency [\[R, R\]](#).

Genetically higher iron may be causally associated with:

- Varicose veins [\[R, R\]](#)
- Deep vein thrombosis [\[R\]](#)
- Anemia (lower risk) [\[R, R\]](#)
- Low Mood (lower risk) [\[R\]](#)
- High Blood Sugar [\[R\]](#)
- Fatty liver [\[R, R\]](#)
- Back Pain [\[R\]](#)
- Total Cholesterol [\[R\]](#)
- LDL Cholesterol [\[R, R\]](#)
- Parkinson's Disease (lower risk) [\[R\]](#)
- Painful Periods (lower risk) [\[R\]](#)
- eGFR [\[R\]](#)
- Joint Pain (lower risk) [\[R\]](#)
- Heart Health (lower risk) [\[R\]](#)
- Artery Hardening (lower risk) [\[R\]](#)
- Atrial Fibrillation [\[R\]](#)
- Lung Health (improved function) [\[R\]](#)

GENE	SNP	GENOTYPE
TMPRSS6	rs228916	TT
ZDHHC14	rs181143083	TT
TMPRSS6	rs4820268	AG
TMPRSS6	rs855791	GA
MAPRE1	rs146680938	CC
CDH19	rs181670562	CC
MOSPD3	rs7385804	CA
TF	rs3811647	GA
TF	rs1799852	TC
CLDN11	rs113286612	GG
DTWD2	rs2442120	CC
SLC24A2	rs142401741	GG
IRX2	rs62330869	AA
ERG	rs117910189	TT
ZFAT	rs2315834	CC
HFE	rs1799945	CC
SCGN	rs115809796	AA
NOTCH4	rs41270472	AA
CNTN5	rs1398168	GA
GK2	rs12641027	TC
PLAAT1	rs9849045	TT
NCKAP5	rs7588567	TT
CARMIL1	rs111722075	TC
H3C6	rs113507773	GA
TF	rs8177240	TG
IGLV4-60	rs987710	GG
SHISA9	rs78138925	GG
ESM1	rs150548770	TT
FIG4	rs143130997	GG

- Longevity (reduced) [\[R\]](#)
- Gout/Uric acid [\[R\]](#)
- Joint Inflammation (lower risk) [\[R\]](#)

Note that it is best to get iron from food. A high dose of iron can lead to stomach pain and other unwanted gut issues. It can also be toxic. Talk to your doctor before taking iron supplements [\[R\]](#).

GENE	SNP	GENOTYPE
TMC5	rs4780797	GG
PROC	rs116946164	TT
RAD18	rs113839317	TT
PLCG2	rs9934030	AA
HFE	rs1800562	GG
BMP4	rs210368	GG

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

Saturated Fat

Some people may tolerate more saturated fat than others. This difference may be genetic. If they eat a lot of saturated fats, people who are sensitive to saturated fat may have a higher risk of [\[R, R, R\]](#):

- Elevated cholesterol
- Weight gain
- Reduced bone strength



TYPICAL RESPONSE

Predisposed to typical saturated fat response based on 42 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
TLR4	rs5030728	GG
PPARA	rs135549	TT
APOA1	rs670	CC
ABCA1	rs2230806	CC
TCF7L2	rs7903146	TC
SIDT2	rs5070	GG
FTO	rs1121980	GG
SIDT2	rs2854117	CC
APOE	rs429358	TT
ADAM10	rs2070895	GG
STAT6	rs1799986	CT
CETP	rs5882	GA
APOB	rs693	AG
FTO	rs1558902	TT
FTO	rs1421085	TT
FTO	rs17817449	TT
STAT3	rs2293152	CG
LPL	rs13702	CT
AHSG	rs4917	CT
CD36	rs1984112	GA
CLOCK	rs1801260	AG
CLOCK	rs4580704	CC
PKDREJ	rs4253778	CG
PEX11A	rs894160	CT
FCER1G	rs5082	AA
PPARG	rs1801282	CC
PCSK7	rs662799	AA
FTO	rs9939609	TT
AGT	rs699	GG

GENE	SNP	GENOTYPE
ACE	rs4343	AA
APOC1	rs405509	GG
ADAM10	rs1800588	CC
PPARA	rs1800206	CC
MED24	rs1568400	TT
PPARG	rs10865710	GG
SIDT2	rs964184	CC
STAT3	rs8069645	AA
STAT3	rs744166	AA
APOE	rs7412	CC
PPARG	rs3856806	CC
LPL	rs328	CC
MC4R	rs12970134	GG
LPL	rs1121923	GG
STAT3	rs1053005	TT

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

TAS2R38 (Bitter Taste Perception)

There are three main variants in the *TAS2R38* gene that are "linked", which means they are often inherited together:

- [rs713598](#): where 'G' is the "taster" and 'C' is the "non-taster"
- [rs1726866](#): where 'G' is the "taster" and 'A' is the "non-taster"
- [rs10246939](#): where 'C' is the "taster" and 'T' is the "non-taster"

These variants account for up to 85% of individual differences in the perception of bitterness [\[R\]](#)!

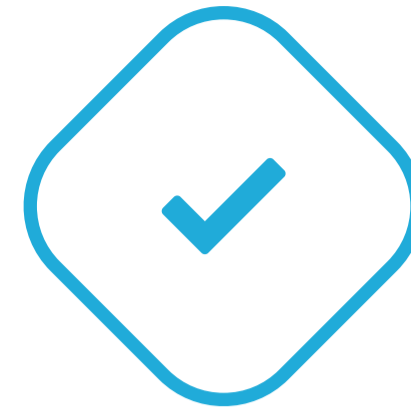
People who have two copies of the "taster" variant in each of these SNPs ('GG' for rs713598 + 'GG' for rs1726866 + 'CC' for rs10246939) are considered "super-tasters" [\[R, R, R\]](#).

On the other hand, people with two copies of the "non-taster" variant for each SNP ('CC' for rs713598 + 'AA' for rs1726866 + 'TT' for rs10246939) are considered "non-tasters" and are about 80% likely to not taste the bitterness of specific foods [\[R, R, R\]](#). This doesn't mean they don't taste bitterness at all; it means they have a lower sensitivity to it.

You may fall somewhere in between, in which case you'd have intermediate sensitivity to bitterness [\[R\]](#).

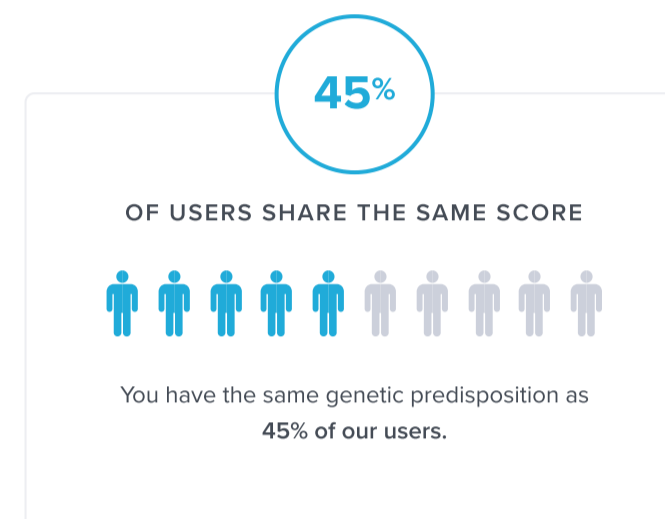
In addition to lower sensitivity to bitterness, non-tasters may have:

- Higher [tendency to overeat](#) or eat calorie-dense foods [\[R, R, R\]](#)
- Increased [body weight](#) and risk of obesity [\[R, R, R\]](#)



INTERMEDIATE ACTIVITY

Likely intermediate TAS2R38 activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
TAS2R38	rs713598	GC
TAS2R38	rs1726866	GA
TAS2R38	rs10246939	CT

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

Vitamin A

Some people may have higher blood levels of vitamin A after consuming vitamin A or provitamin A-rich foods or supplements.

This may partly be due to genetics. Genes involved may influence:

- Vitamin A transport in and out of cells [\[R\]](#)
- Vitamin A metabolism (i.e., the conversion of beta-carotene into vitamin A) [\[R, R\]](#)

To optimize vitamin A absorption in the gut, try to eat vitamin A-rich foods with meals that are higher in fat. This is because vitamin A is fat-soluble [\[R\]](#).

Genetically higher vitamin A levels may play a role in [\[R, R, R, R\]](#):

- Longevity
- Joint Pain
- Joint Inflammation
- High Blood Sugar



TYPICAL NEED

Likely typical need for vitamin A based on 6 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
BCO1	rs7501331	CT
C16ORF46	rs11645428	GG
FFAR4	rs10882272	TC
BCO1	rs12934922	AA
C16ORF46	rs6564851	TT
BCO1	rs6420424	GG
BCO1	rs4889294	TT

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

Vitamin C

Key Takeaways:

- Vitamin C supports a number of important body functions, like immunity, heart and lung health, wound healing, and collagen production.
- Being genetically predisposed to needing more vitamin C means you may want to consider supplementing with vitamin C.
- It is very difficult to get vitamin C deficiency in the modern, western world.
- Click the **next steps** tab for relevant labs.

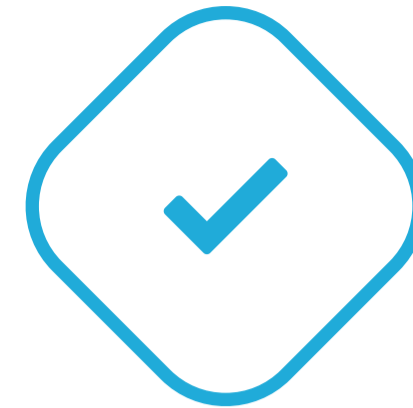
[Vitamin C deficiency](#) or *scurvy* is extremely rare in developed countries. Milder forms may cause [\[R\]](#):

- Poor wound healing
- Gum bleeding
- Skin lesions
- Joint pain

Genetically lower levels of vitamin C may be causally associated with an increased risk for high blood sugar [\[R\]](#).

In turn, genetically higher levels of vitamin C may be causally associated with:

- Lower risk of heart disease [\[R, R\]](#)
- Lower risk of Alzheimer's disease [\[R\]](#)
- Improved longevity [\[R\]](#)



TYPICAL NEED

Likely typical need for vitamin C based on 11 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
SLC23A1	rs4257763	GG
LTA4H	rs117885456	GG
GLB1L	rs13028225	CT
GSTO2	rs156697	GA
AKT1	rs10136000	GG
FADS2	rs174547	TT
SYCP3	rs2559850	GA
MAF	rs56738967	CG
SLC23A1	rs33972313	CC
TBX2	rs9895661	TT
RER1	rs6693447	TT
RGS14	rs10051765	CC
GSTA1	rs7740812	AA

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

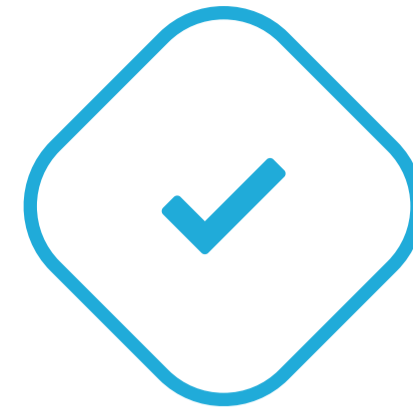
Magnesium

Some people may have higher magnesium levels than others. This may be partly due to genetics. Genes involved may influence:

- Magnesium transport in and out of cells [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#)
- Magnesium metabolism [\[R\]](#), [\[R\]](#)

Genetically higher magnesium levels may be causally associated with:

- Stroke [\[R\]](#)
- Bone health [\[R\]](#)
- Gout [\[R\]](#), [\[R\]](#)
- Uric acid [\[R\]](#)
- Cataracts. [\[R\]](#)
- Mood Swings [\[R\]](#)
- Joint Inflammation [\[R\]](#)
- Atrial fibrillation [\[R\]](#)
- Heart Health [\[R\]](#)



TYPICAL NEED

Likely typical need for magnesium based on 31 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
TRPM6	rs11144134	TT
MTMR7	rs3764796	TT
CSTA	rs1801725	GG
FGFR2	rs1219515	GG
RTL1	rs915364	CC
PAPSS2	rs1969821	GG
VIPR1	rs11718502	TC
THBS3	rs4072037	CT
PAPSS2	rs791888	GG
RALGDS	rs7032317	CT
CDKL2	rs6838240	CT
ALPK1	rs2074379	GA
C8ORF48	rs10888073	TC
CANT1	rs11891	GA
THBS3	rs4971100	GA
BORCS7	rs3740393	GC
CDKL2	rs6852678	TC
TRPM6	rs113607577	GG
HDHD2	rs117060920	GG
MPPED2	rs3925584	CC
SHROOM3	rs13146355	GG
SHROOM3	rs9993810	GA
MECOM	rs448378	AG
TRPM6	rs2274924	TT
ASAP1	rs72728275	AA
CAMK1D	rs2648708	CC
FGFR2	rs3135758	CC
CCDC136	rs1472147	TT
METTL21C	rs603894	CC

GENE	SNP	GENOTYPE
PHACTR2	rs2073214	CC
DLK1	rs4905994	CC
OR5BS1P	rs193153567	CC
PRMT7	rs7197653	GG
ATP2B1	rs7965584	AA

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

Selenium

Key Takeaways:

- Genes that influence selenium levels play a role in selenium transport, storage, and metabolism.
- Selenium deficiency affects anywhere from **500 million to 1 billion** people worldwide, due to inadequate intake.
- Other risk factors for a selenium imbalance include consuming too much selenium, certain health conditions and medications, as well as dialysis.
- If your genetic risk is high, your overall risk is still low unless you live in an area with inadequate selenium sources.
- Click the **next steps** tab for relevant labs.

Genes that influence selenium levels play a role in selenium transport, storage, and metabolism [\[R\]](#), [\[R\]](#).

The [DMGDH](#) and [BHMT](#) genes play a role in selenium and [homocysteine](#) metabolism. The following variants near these genes are linked to higher selenium levels [\[R\]](#), [\[R\]](#), [\[R\]](#):

- [rs921943-T](#)
- [rs11960388-A](#)

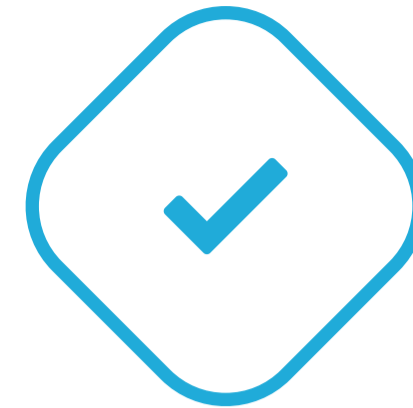
The [AGA](#) gene affects proteins that transport selenium. One variant near this gene, [rs1395479-A](#), is linked to higher selenium levels [\[R\]](#), [\[R\]](#).

People with the 'A' variant at [rs891684](#) may have lower selenium levels. This variant is near the [SLC39A11](#) gene, which may affect the amount of fat tissue. Selenium may be partly stored in fat tissue [\[R\]](#), [\[R\]](#), [\[R\]](#).

Genetically higher selenium levels may be causally associated with:

- Low Mood [\[R\]](#)
- Ldl/Hdl cholesterol [\[R\]](#)
- eGFR [\[R\]](#), [\[R\]](#)
- High Blood Sugar (higher for diabetes) [\[R\]](#)
- Bone health (higher bmd) [\[R\]](#)
- Prostate cancer [\[R\]](#)

Keep in mind that your diet, environment, and other genetic variants also influence your selenium levels.



TYPICAL NEED

Likely typical need for selenium based on 4 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ARSB	rs921943	TC
BHMT	rs7700970	TC
SELENOP	rs3877899	TC
COG1	rs891684	AG
AGA	rs1395479	CC
BHMT	rs11960388	TT
GPX1	rs1050450	GG

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

Choline

Some people have no symptoms despite their reduced choline intake, while others may need even more than usually recommended amounts. Genetics may be partly responsible for this.

The [PEMT](#) gene helps make an enzyme that produces [phosphatidylcholine](#) (PC) in the liver. PC can release choline and make up for lower amounts of this nutrient in a diet [R, R, R].

People with certain *PEMT* variants, such as [rs12325817-G](#), may benefit from getting more choline. Read [this post](#) for more details [R, R].

Fatty liver is usually the first clinical sign of choline deficiency. One *PEMT* variant, [rs7946-T](#), correlates with fatty liver and reduced choline supply. If you have this variant, you're more likely to experience liver damage due to poor choline intake, a sedentary lifestyle, and overeating. Read [this post](#) for more details [R, R].

The [CHDH](#) gene helps make an enzyme that turns choline into betaine. It may affect choline needs by 'spending' too much of this nutrient for betaine production. People with the following variants may be more sensitive to reduced choline intake [R]:

- [rs9001-T](#)
- [rs12676-A](#)

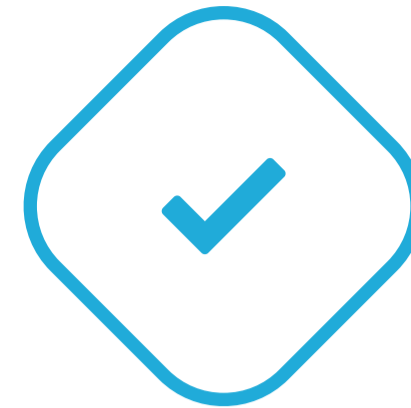
Read [this post](#) for more details.

The [CHKA](#) gene helps make an enzyme called 'choline kinase alpha' that turns dietary methionine into phosphatidylcholine. People with the [rs10791957-A](#) allele may need higher dietary choline since they don't convert dietary protein into choline well [R, R].

Choline helps remove homocysteine, along with [folate](#) and [vitamin B12](#). The [MTHFD1](#) and [MTRR](#) genes are involved in this process and may affect choline needs. People with the following variants may benefit from increasing their choline intake [R, R, R, R, R]:

- [rs2236225-A](#) (read [this post](#) for more details)
- [rs1801394-G](#) (read [this post](#) for more details)
- [rs1532268-T](#)

Please note: *The available research for this report is limited, so take your results with a grain of salt. We will update the report as soon as more research is available. Also, keep in mind that your diet, environment, and other genetic variants can influence your choline needs.*



TYPICAL NEED

Likely typical need for choline based on 12 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
MTRR	rs1532268	TC
CHDH	rs9001	TT
PEMT	rs7946	CT
ALDH3B1	rs10791957	CA
BHMT	rs3733890	AG
MTHFD1	rs2236225	GA
PEMT	rs4646343	GT
PEMT	rs3760188	CT
MTRR	rs1801394	GA
CHKA	rs7928739	CA
PEMT	rs12325817	CC
CHDH	rs12676	CC

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

Coenzyme Q10

In addition to the above factors, genetics may also play a role in CoQ10 needs. Involved genes may play a role in CoQ10 production and transport [R].

Brain cells spend a lot of CoQ10. Hence, it is no surprise that variants affecting CoQ10 are also linked to certain mental and cognitive problems [R].

However, keep in mind that your diet, environment, and other genetic variants also influence your coenzyme Q10 needs.



TYPICAL NEED

Likely typical need for coenzyme Q10 based on 23 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
BCR	rs77049423	GG
KLF12	rs76617118	GG
AGGF1	rs13155649	AA
BTG1	rs61745943	AA
USP14	rs9952641	GG
FUT8	rs7141874	AA
TTC39B	rs686030	AA
NDUFS4	rs41270301	GC
OR51A2	rs35996509	CC
SERINC3	rs12480807	GG
/	rs7081147	CC
SMC6	rs898838	TT
SLC27A4	rs41313321	GA
HSF2	rs150057671	GA
NEGR1	rs55927656	TT
DRD5	rs146799867	CC
DCC	rs74681568	CC
OLAH	rs12573070	GG
PRMT8	rs17769758	GG
/	rs11591201	GG
LUZP1	rs9426691	AA
GRIK2	rs283228	AA

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

Omega-3

Some people may have lower blood levels of omega-3s than others. This means that they may have an increased need for omega-3s [R, R, R, R, R, R].

This may be partly due to genetics. Genes involved may influence omega-3 metabolism [R, R, R, R, R, R].



TYPICAL NEED

Likely typical need for omega-3s based on 54 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
/	rs11235247	GG
TNFSF10	rs11914753	CC
FADS2	rs174579	CC
TMEM258	rs174532	GG
MACROD2	rs12481689	AA
KCNK17	rs6921231	AA
/	rs6553050	TT
MAP7	rs13191834	TT
ANKS1A	rs3800433	GG
WSB1	rs17703271	TT
PIK3C2A	rs7949405	AA
/	rs2129588	CC
ADRA1A	rs558455	GG
TMEM258	rs108499	TC
SNX17	rs4665972	CC
TSPAN31	rs2277324	AG
PRR11	rs2291193	AG
SYCP2L	rs953413	GA
MYOM1	rs949306	AG
WDR70	rs7736605	GG
CITED2	rs10499212	GG
FADS2	rs174583	CC
FADS2	rs174577	CC
FADS2	rs174576	CC
FADS2	rs174550	TT
FADS2	rs174547	TT
FADS2	rs174546	CC
TMEM258	rs174538	GG
TMEM258	rs174537	GG

GENE	SNP	GENOTYPE
TMEM258	rs174535	TT
COL11A1	rs11164689	GG
AHI1	rs2092556	TT
FADS1	rs2727270	CC
AHI1	rs4896151	CC
AHI1	rs1547079	TT
G2E3	rs7149414	GG
FADS2	rs1535	AA
TMEM258	rs102275	TT
MAU2	rs10401969	TT
TMEM132D	rs265603	GT
FADS1	rs99780	CC

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

HLA-DQ (Gluten)

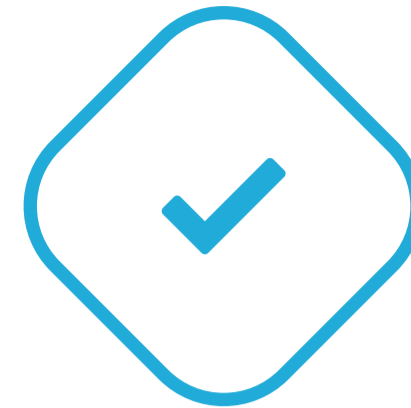
Different alleles in these genes can produce different types of HLA-DQ structures. The **DQ2** type (especially the DQ2.5 subtype) is present in up to 98% of celiac disease patients, depending on the population. That is among the strongest known links to autoimmunity in the entire HLA system [R, R].

Two alleles — DQA1*0501 and DQB1*0201 — form the DQ2.5 haplotype, which codes for the DQ2.5 receptor on white blood cells. The DQ2.5 receptor binds gluten and presents it to T-helper cells, initiating widespread gut inflammation [R, R].

The 'T' variant of [rs2187668](#) serves as a genetic marker — it tags the DQ2.5 haplotype with high precision. In other words, the vast majority of people with this allele will have this haplotype. A study of over 27,000 subjects identified this SNP as the primary genetic factor for celiac disease. People carrying the 'T' allele had over six times higher chances of being diagnosed with celiac disease. A smaller trial of 889 participants came to a similar conclusion [R, R].

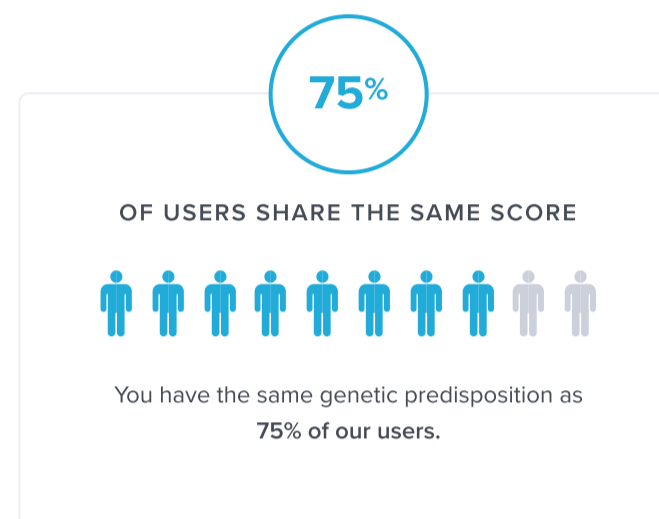
The 'C' variant of [rs74541084](#) tags the DQ8 haplotype, an additional marker for gluten sensitivity in people who don't carry DQ2.5.

Please note: this report only analyzes the HLA-DQ gene. Variants in many other genes have shown associations with gluten sensitivity.



TYPICAL GENETICS

Likely typical HLA-DQ genetics based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
HLA-DQB1	rs2858331	AA
HLA-DQA1	rs2187668	CC
HLA-DQA2	rs7454108	TT

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

Celiac Disease

Key Takeaways:

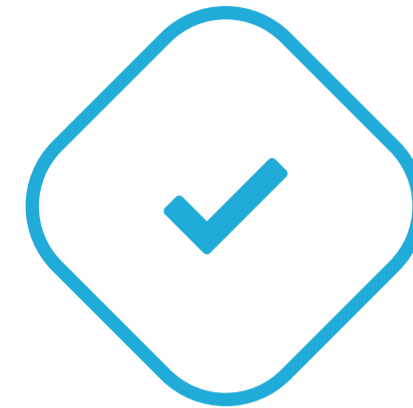
- It's estimated that 1-2% of the population has gluten sensitivity. The most likely risk factor is genetics.
- If you have symptoms, diet restriction may indicate whether you have the sensitivity or not. You should speak to a healthcare professional if symptoms persist.
- Symptoms include diarrhea/constipation, fatigue, weight loss, gut pain/bloating, and nausea.
- Celiac disease is rare, so even with high genetic risk, your overall risk is still low.
- Click the **next steps** tab for relevant labs.

Gluten is a protein found in grains such as wheat, rye, spelt, barley, and triticale. Some people cannot properly digest gluten. In fact, their immune systems may react to gluten as if it is dangerous. To make matters worse, gluten is similar to a normal protein in the intestine. Sometimes, the immune system will attack both. People with this type of reaction have celiac disease [R, R, R].

Researchers aren't completely sure why some people are sensitive to gluten. Infections in the gut may play a role. However, a major risk factor is probably genetic [R, R, R].

The most important genes involved in celiac disease are *HLA* genes. These genes help make HLA proteins, which sit on the surface of white blood cells. They help the immune system attack and remove dangerous invaders like bacteria and viruses. In people with celiac disease, HLA proteins may attack gluten by mistake and damage the gut barrier [R, R].

Moreover, genetically high testosterone levels may be causally associated with a lower risk of celiac disease in men [R].



TYPICAL LIKELIHOOD

Typical likelihood of celiac disease based on 1,019,187 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
HLA-DRB5	rs2395182	GT
HLA-DQA2	rs7454108	TT
HLA-DQA1	rs2187668	CC

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

Fat Metabolism

Your genes may affect your response to different levels of fat in a diet. Some people do better on a high-fat diet, and others on a low-fat diet, in terms of weight control and cholesterol levels [R, R].

Some of the genes responsible may also influence [R, R, R]:

- Fat metabolism
- Sugar metabolism
- Inflammation

Talk to your doctor before making big changes to your diet. Keto and other high-fat diets may increase the risk of some nutrient deficiencies. They may also affect the body's response to medication [R].



BETTER

Predisposed to better fat metabolism based on 53 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ADRB3	rs4994	AA
TCF7L2	rs7903146	TC
PPARA	rs135549	TT
APOA1	rs670	CC
ABCA1	rs2230806	CC
MC4R	rs2229616	CC
GIPR	rs2287019	CC
ACSL5	rs2419621	CC
STAT3	rs2293152	CG
STAT6	rs1799986	CT
CETP	rs5882	GA
MTTP	rs1800591	GT
AHSG	rs4917	CT
CD36	rs1984112	GA
CLOCK	rs1801260	AG
PEX11A	rs894160	CT
APOB	rs693	AG
IRS1	rs2943641	TC
CLOCK	rs3749474	TC
LPL	rs328	CC
LPL	rs1121923	GG
TLR4	rs5030728	GG
CLOCK	rs4580704	CC
APOA4	rs5110	CC
SIDT2	rs5070	GG
FABP1	rs2241883	TT
UCP3	rs1800849	GG
TCF7L2	rs12255372	TG
LPL	rs13702	CT

GENE	SNP	GENOTYPE
FCER1G	rs5082	AA
PPARG	rs1801282	CC
FTO	rs9939609	TT
PCSK7	rs662799	AA
FABP2	rs1799883	CC
RFC4	rs17300539	GG
APOC1	rs405509	GG
SIDT2	rs964184	CC
STAT3	rs8069645	AA
STAT3	rs744166	AA
APOE	rs7412	CC
CETP	rs708272	AA
AGT	rs699	GG
APOE	rs429358	TT
PPARG	rs3856806	CC
NSMAF	rs3808607	TT
MICB	rs361525	GG
ADAM10	rs2070895	GG
TNF	rs1800629	GG
ADAM10	rs1800588	CC
PPARA	rs1800206	CC

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

Caffeine Sensitivity

Genetic variants may explain about **70%** of the difference in caffeine sensitivity [R, R]. Genes associated with caffeine sensitivity impact how quickly caffeine is broken down and the strength of its effects in different parts of the body.

The **CYP1A2** gene is a **key enzyme responsible for caffeine breakdown**. The **rs762551** variant (-163 A>C) determines whether someone is a “fast” or “slow” caffeine metabolizer. Carriers of the “C” allele are slow metabolisers. This means they caffeine stays in their body for a longer time, increasing their caffeine sensitivity [R, R, R, R].

Other notable genes and variants include:

- **AHR (rs4410790)**: The AHR gene regulates the expression of **CYP1A2**, mentioned above. Certain variants at AHR slow down caffeine metabolism, prolonging the effects caffeine has on the body [R].
- **ADORA2A (rs5751876)**: This ADORA2A gene encodes the adenosine A2A receptor, a primary target of caffeine in the brain. Caffeine may make those with the “T” variant more anxious, especially women. Interestingly, this variant seems to have the opposite effects on sleep problems (“C” carriers may be more affected) [R, R, R, R].
- **COMT (rs4680)**: The COMT gene is involved in the breakdown of the neurotransmitter dopamine. The rs4680 variant (Val158Met G>A) may increase sensitivity to both positive and negative effects of caffeine [R].
- **NAT2 (R/S, rs1495741)**: NAT2 helps break down various substances, including caffeine. Individuals with a “slow” acetylator status in the NAT2 gene may break down caffeine more slowly, leading to prolonged effects and increased sensitivity [R].

These genetic variations collectively influence individual sensitivity to caffeine, determining both the intensity and duration of the response to caffeine in the body. Understanding these genetic factors can help tailor caffeine intake to avoid adverse effects and optimize performance and well-being.



LOWER

Predisposed to lower caffeine sensitivity based on 5 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
AHR	rs4410790	CT
ADORA2A	rs5751876	CT
NAT2	rs1495741	AG
COMT	rs4680	GA
CYP1A2	rs762551	AA

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

CYP1A2 (Detox)

CYP1A2 is an enzyme that helps break down caffeine, drugs, and certain toxins like mold. Variants in the *CYP1A2* gene affect how fast people break down those substances [R, R, R].

The "slow metabolizer" variants make a less efficient enzyme. People who carry these variants may be more **sensitive to caffeine**. Accordingly, they may be more likely to experience negative effects when drinking coffee [R, R, R].

In terms of detox, they may be more susceptible to the adverse effects of certain drugs and toxins. However, the link between CYP1A2 variants and environmental toxins is more complex and requires further investigation [R, R].

The "fast metabolizer" variant makes a protein that breaks down caffeine. People with these variants may be less sensitive to its effects [R, R, R, R].

Nevertheless, "fast metabolizers" may experience the benefits of caffeine supplementation on athletic performance after a short time while "slow metabolizers" may need a longer ingestion period [R, R].

The following factors and substances may **increase** CYP1A2 activity:

- Cigarette smoke: 1.72-fold for >20 cigarettes per day [R, R]
- Coffee consumption: 1.45-fold per liter of coffee drunk daily [R, R]
- Meat pan-fried at high temperatures: 1.4-fold [R]
- Chargrilled meat: 1.89-fold [R]
- Cruciferous vegetables [R, R, R]
- Green and black tea [R]
- Insulin [R]
- Being female: 0.90-fold [R]
- Heavy exercise [R]
- Omeprazole [R]
- Evodia
- Reishi
- Andrographis,
- Modafinil
- Glycyrrhizin (liquorice)

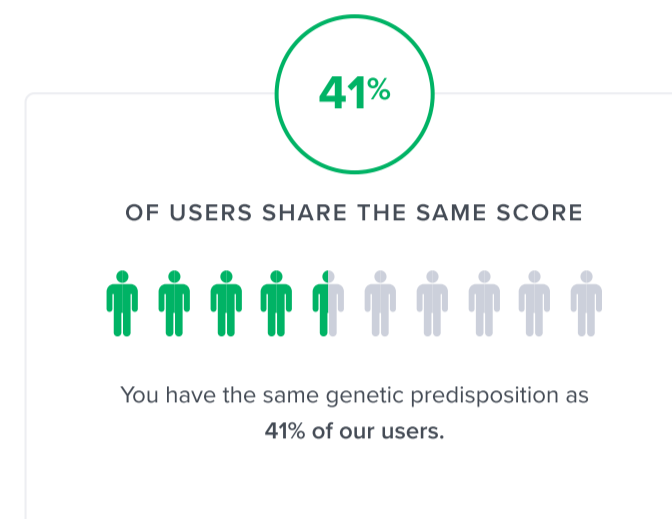
The following factors and substances may **decrease** CYP1A2 activity:

- Apiaceous vegetables (carrots, parsnips, celery, and parsley) [R]
- Curcumin [R]
- Grapefruit juice and its component naringenin [R]
- Echinacea [R]
- Quercetin [R]
- Antibiotic fluoroquinolones [R]
- Fluvoxamine, an antidepressant [R]
- Peppermint, [chamomile](#), and [dandelion](#) tea [R]
- Garlic
- Berberine
- Chamomile
- Lactoferrin
- Hops
- Galangin (galangal root)
- Scutellaria baicalensis,
- Tangeritin
- Trans-resveratrol



HIGHER ACTIVITY

Likely higher CYP1A2 activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CYP1A2	rs762551	AA
LMAN1L	rs2069514	GG

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

Lactose Intolerance

Lactose intolerance means a person cannot digest lactose, a sugar found in dairy. To be able to digest lactose, you need an enzyme called *lactase*. People with lactose intolerance may experience symptoms such as diarrhea, stomach cramps, nausea, bloating, and gas after eating dairy [R, R].

In people who are lactose intolerant, the gene that makes the enzyme lactase—*LCT*—gets "turned off" in adulthood. Without this enzyme, people may have trouble digesting dairy as adults [R, R].

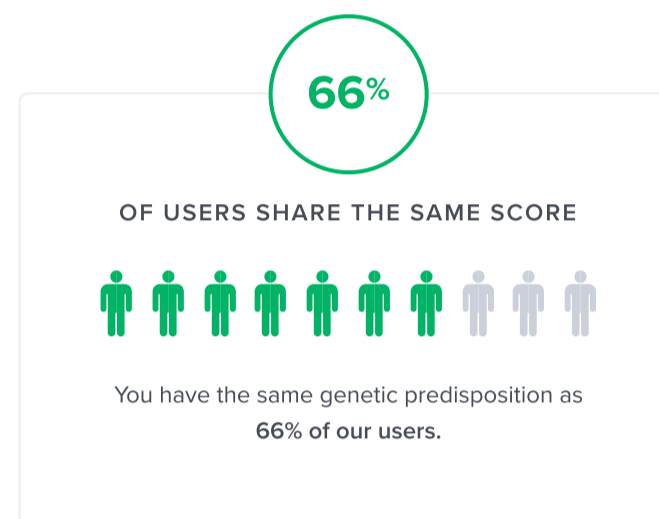
A common variant near the *LCT* gene (rs4988235 'A') is responsible for keeping the lactase enzyme "turned on." This variant is responsible for lactose tolerance in most people who are able to digest milk as adults. The 'T' allele of rs182549 has the same effect. Because these variants are usually inherited together, you will most likely have both variants or neither of them [R, R].

It's important to note that there are also other less common variants linked to lactose tolerance that we are not including in this report [R, R]. In addition, the way people respond to dairy may also depend on factors like diet, gut bacteria, and certain health conditions.



LIKELY TOLERANT

Likely lactose tolerant based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
LCT	rs4988235	GA

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

Sugar Cravings

Do you have a sweet tooth? Or do you find some foods unpleasantly sweet? Genes, including those that code for our taste receptors, may help explain some of these differences [\[R, R\]](#).

People who have **less sensitive sweet receptors** may have a “sweet tooth.” They **may prefer sweet foods and may eat more of them** [\[R, R, R\]](#).

Other factors that may affect sugar cravings include [\[R, R, R, R, R, R, R\]](#):

- **Hormonal changes.** Hormones that fluctuate during the menstrual cycle or spikes in the stress hormone cortisol can increase sugar cravings.
- **Nutritional deficiencies.** In some cases, sugar cravings can be a sign of deficiency in essential vitamins and minerals.
- **Lack of sleep.** Poor sleep can knock hunger hormones off balance, making energy-dense sugary foods especially appealing.
- **Stress and mood issues.** When we are stressed, sad or bored, we may reach for sugar as a coping mechanism.
- **Habits.** Regularly getting dessert or sweet drinks after meals can create a habit.

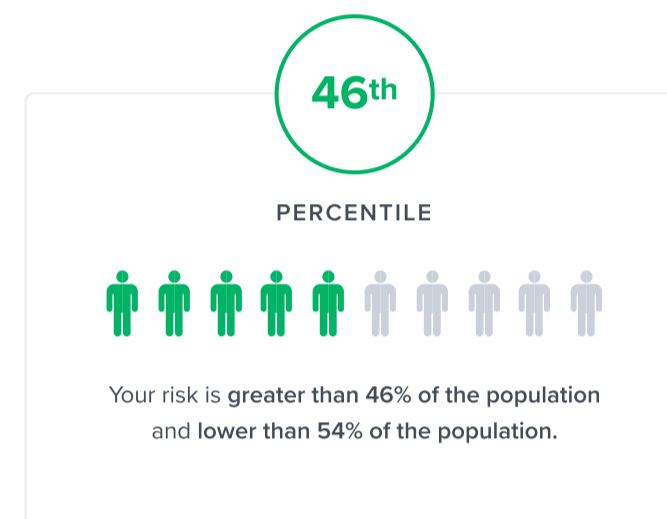
To control sugar cravings [\[R, R, R, R, R, R, R\]](#):

- **Eat regular, balanced meals.** When your body gets enough food, it won't go through energy dips and sugar crashes.
- **Get enough sleep.** Enough of quality sleep reduces sugar cravings.
- **Manage Stress:** Incorporate stress-reducing activities and strategies into your routine. Find healthy ways to cope with stress, such as exercise, meditation, or other hobbies. **Exercise Regularly:** Regular physical activity can decrease sugar cravings.
- **Identify Triggers:** Pay attention to what makes you reach out for a sugary treat.
- **Find Healthy Swaps:** Replace sugary foods with healthier alternatives.



LESS LIKELY

Less likely to crave sugar based on 7,277,500 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
TAS1R2	rs35874116	TT
TAS1R2	rs3935570	GG
FGF21	rs838133	GA
/	rs56404116	AA
ATP10B	rs4552669	AA
ATP10B	rs10037124	TT
SERPINA1	rs11568814	CC
ORC5	rs10953405	AA
WSCD1	rs35253088	TT
NOTCH1	rs710411	AA
DNAJA4	rs4887033	TT
FSCB	rs537022264	AA
AGMO	rs12699747	TC
KISS1R	rs350132	AT
/	rs13347339	TC
/	rs13182470	CT
GOLGA8B	rs2433267	AG
CLMP	rs17127163	TA
RELN	rs62485870	TA
CST7	rs62215296	GA
/	rs2815675	C












GENE	SNP	GENOTYPE
RARB	rs7619139	TA
SLC2A2	rs5400	GG
ALDH2	rs671	GG
ITGA4	rs13029040	CC
TMEM63C	rs74340145	GG
DCC	rs55940710	CC
PNLIPRP3	rs2033397	CC
MTDH	rs2448140	CC
CDH20	rs1497980	CC
HTR5A	rs7795216	AA
BHLHE23	rs138884670	TT
/	rs145221345	CC
LRIT3	rs142911827	CC
N6AMT1	rs139744648	TT
HACE1	rs116683943	GG
OR51T1	rs142576658	GG
PTPRZ1	rs78017114	TT
SEC24D	rs569450439	AA
TMEM248	rs185288219	CC
DSEL	rs184797377	AA
MTX3	rs139896719	TT

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



Mood, Energy & Pain

Your genes influence how you experience and respond to stress, fatigue, and physical discomfort. This section explores genetic variations that affect your mood patterns, energy levels, and pain sensitivity. From factors influencing sleep quality and stress response to those affecting different types of pain - including migraines and joint pain - understanding these genetic tendencies can help explain your natural responses to life's challenges. We also examine genes that affect how your body handles inflammation and oxidative stress, which can impact both energy levels and pain sensitivity.

<p> MORE LIKELY Low Mood</p> <p>More likely to have chronically low mood</p>	<p> MORE LIKELY Fibromyalgia</p> <p>More likely to have fibromyalgia</p>	<p> TYPICAL LIKELIHOOD Low Energy (Chronic Fatigue)</p> <p>Typical likelihood of fatigue</p>
<p> TYPICAL RESPONSE Response to Stress (Functional)</p> <p>Predisposed to typical response to stress</p>	<p> TYPICAL Sleep Quality</p> <p>Predisposed to typical sleep quality</p>	<p> TYPICAL ACTIVITY CLOCK (Sleep & Weight)</p> <p>Likely typical CLOCK activity</p>
<p> TYPICAL LIKELIHOOD Muscle Pain</p> <p>Typical likelihood of having muscle pain</p>	<p> LESS LIKELY Stress</p> <p>Less likely to feel stressed</p>	<p> LESS LIKELY Caffeine-Related Anxiety</p> <p>Less likely to experience caffeine-related anxiety</p>
<p> LESS LIKELY Migraines</p> <p>Less likely to have migraines</p>	<p> LESS LIKELY Joint Pain</p> <p>Less likely to have osteoarthritis</p>	

Low Mood

Key Takeaways:

- About 40% of differences in people's odds of developing depression may be due to genetics.
- It is more likely for young adults and the elderly but can affect people of all ages.
- Other risk factors include traumatic and stressful events, serious medical conditions, and substance use problems.
- If you have high genetic risk, you may want to consider optimizing your stress management.
- Click the **next steps** tab for relevant labs and lifestyle factors.

Depression is more than just a low mood. People with depression tend to have [\[R\]](#):

- Low motivation
- Problems with concentration
- Changes in appetite
- Poor sleep quality
- Aches and pains
- Thoughts of self-harm or suicide

If any of these symptoms resonate with you, you can work with your doctor to improve them. **Psychotherapy and medication are the most effective treatments for depression.** Strategies such as [exercise](#) may also boost your mood [\[R\]](#), [\[R\]](#).

The strategies most likely to work for you may depend on your genetics. This is because genetic factors account for roughly 40% of differences in depression [\[R\]](#).

Gene variants linked to this condition may cause [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- An exaggerated stress response ([CRHR1](#), [COMT](#))
- Low levels or activity of brain chemicals ([COMT](#), [OPRM1](#), [SLC6A4](#), [DRD2](#))
- Impaired brain function ([BDNF](#), [VRK2](#))
- Inflammation ([IL6](#), [VRK2](#))
- Sleep disturbances ([CLOCK](#), [TIMELESS](#))

Genetically high white blood cell count and testosterone and low DHA may be causally associated with a higher risk of depression. Moreover, depression may also lead to increased white blood cells [\[R\]](#), [\[R\]](#), [\[R\]](#).

It's important to note that **genetics is only one piece of the puzzle.** Other risk factors for depression include [\[R\]](#):

- Stressful or traumatic events
- Serious medical conditions, such as cancer
- Heavy drug and alcohol use



MORE LIKELY

More likely to have chronically low mood based on 84,172 genetic variants we looked at

85th

PERCENTILE



Your risk is greater than 85% of the population and lower than 15% of the population.

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
MTHFR	rs1801133	AA
NEGR1	rs1993709	GG
MICB	rs1150757	GG
MEF2C	rs409645	GG
TCF4	rs1452787	GA
TTC12	rs1554929	CC
NOX4	rs10047486	AA
ZCCHC7	rs6476606	GG
FKBP4	rs2302729	CC
RNF180	rs878567	GG
TULP1	rs9296158	GG
FAM53B	rs35936514	CC
ANKK1	rs1800497	GA
OXTR	rs2254298	AG
TERT	rs2736100	CA
SH3YL1	rs6548238	TC
FAAH	rs324420	AC
TPH1	rs1799913	TG
PUM3	rs7044150	CT
MAOA	rs909525	C
TTC12	rs2283265	CA

GENE	SNP	GENOTYPE
CES1	rs1566652	TG
TTC12	rs1079727	TC
TTC12	rs1079597	CT
TTC12	rs1076560	CA
ANK3	rs10761482	CT
CRHR2	rs3779250	TC
CNR1	rs806371	TT
CNR1	rs1049353	TT
SLC25A21	rs17105696	AA
PTPRR	rs4760933	AA
UGT2B4	rs6832167	AA
ARNTL	rs7107287	TT
CHRM2	rs1824024	CC
ATG9A	rs7596956	TT
HCN4	rs12905211	TT
TMEM263	rs10861683	TA
BHLHE40	rs9311395	AA
TPH2	rs1843809	TT
CHRM2	rs2061174	GG
EHD3	rs590557	GA
CNIH4	rs11579964	CC
GNB3	rs5443	CT
VPS8	rs7647854	GG
VGLL4	rs6781822	TC
GYPE	rs7676614	AG
CHST11	rs1344677	CT
PHACTR3	rs8122984	GA
UGGT2	rs17767562	CT
LHFPL2	rs12651937	TC

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

Fibromyalgia

Factors that might increase the risk of developing fibromyalgia include:

- Gender, with women being diagnosed far more often than men
- Other diseases, such as lupus or rheumatoid arthritis
- Traumatic events or injuries
- Repetitive injuries due to certain jobs or activities
- Viral infections
- Genetics

There is evidence to suggest that fibromyalgia has a genetic component. People with a family history of fibromyalgia are more likely to develop the condition. Studies have pointed to genes involved in the way the body processes pain signals, brain chemicals, and stress.



MORE LIKELY

More likely to have fibromyalgia based on 1,457,592 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ELOVL6	rs180804111	CC
GALNT17	rs112477646	CC
ERBB4	rs200556109	GG

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

Low Energy (Chronic Fatigue)

Key Takeaways:

- Up to **40%** of differences in people's chances of having chronic fatigue may be due to genetics.
- Other risk factors include: serious infections, thyroid and liver problems, and nutrient deficiencies.
- Chronic fatigue is a rare condition, so even if your genetic risk is high, your actual risk is low.
- Chronic fatigue can cause poor sleep, brain fog, weakness, pain, gut issues, and flu-like symptoms.
- Click the **next steps** tab for relevant labs and lifestyle factors.

Fatigue is our body's way of telling us it's time to rest and recover. But what happens when that signal is sent too often, or all the time? What happens when normal, everyday activity is enough to drain you?

When fatigue goes on for more than 6 months, it's called *chronic fatigue* [R].

Chronic fatigue is often associated with [R, R, R, R, R, R, R, R]:

- Nutrient deficiency ([iron](#), [vitamin B12](#), [folate](#), [vitamin D](#))
- Thyroid problems
- Liver problems
- A recent serious infection

Chronic fatigue can lead to a decrease in social and physical activity. It can happen on its own or alongside chronic health conditions [R, R, R].

Some people can never seem to get their energy back, no matter how much they rest. This condition is known as *chronic fatigue syndrome*. It is a disabling condition that affects less than 1% of people [R, R].

Chronic fatigue can affect all parts of your body and may cause [R, R, R]:

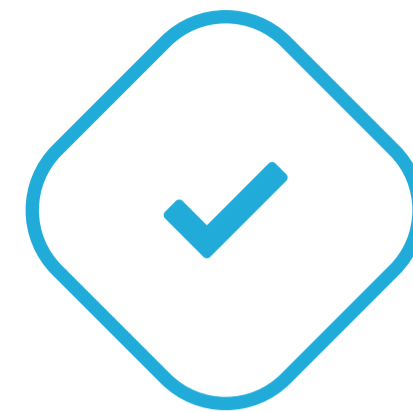
- Poor sleep
- Brain fog
- Weakness
- Pain
- Gut issues
- Flu-like symptoms

Unfortunately, there are no standard treatments for chronic fatigue. Many people try to manage their symptoms with alternative strategies [R, R].

Chronic fatigue seems to run in families. **Up to 40% of differences in people's chances of having chronic fatigue may be attributed to genetics** [R, R, R, R].

Genes that contribute to fatigue tend to influence [R]:

- The immune system ([TNE](#), [IL1B](#), [IL4](#), [IL6](#))
- Stress response ([NR3C1](#), [POMC](#))
- Sleep cycles ([NPAS2](#))
- Brain chemistry ([TPH2](#), [GRIK2](#), [MAOA](#), [MAOB](#), [COMT](#))



TYPICAL LIKELIHOOD

Typical likelihood of fatigue based on 7,870 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
MAPT	rs242924	TT
IL17F	rs763780	TT
DRD2	rs6277	GG
DRD3	rs6280	TT
BLMH	rs2066713	GG
COMT	rs4680	GA
ADRB2	rs1042714	CG
NR3C1	rs852977	AG
MAOA	rs1137070	T
MAPKAPK3	rs12492113	AG
SPATA32	rs117228037	AA
SHISA4	rs2279681	CG
ARSA	rs1858756	AA
HTR2A	rs6313	AG
EPHA7	rs72914217	CA
SLC25A15	rs11147812	CT
CFB	rs4151667	TA
MAOB	rs3027452	G
MEGF9	rs10985013	TT
TCF4	rs651350	AA
NTM	rs4937651	CC

GENE	SNP	GENOTYPE
NMUR2	rs34299746	GG
KCTD10	rs6606710	TC
EXD2	rs4902704	CG
GRIA1	rs4644006	CT
NLGN1	rs529200	AG
/	rs4265114	CA
TNF	rs1800629	GG
TPH2	rs4570625	GG
CFH	rs1061170	TT
GLRX3	rs148723539	GG
KRT32	rs139894014	GG
SKAP1	rs7221416	AA
ZKSCAN8	rs62620225	CC
/	rs185907577	TT
EXD3	rs73581580	GG
NRXN1	rs79927354	AA
CELF4	rs948536	AA
DCC	rs7233123	GG
HTT	rs61348208	TT
CADM2	rs818215	CC
IPO9	rs2820309	AA

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

Response To Stress (Functional)



TYPICAL RESPONSE

Predisposed to typical response to stress based on 30 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

The [COMT](#) gene encodes an enzyme that helps break down the chemical messengers [dopamine](#), [epinephrine](#), and [norepinephrine](#) [R, R, R].

A SNP in the [COMT](#) gene ([rs4680](#)) may affect COMT enzyme activity. The 'A' variant has been nicknamed the “worrier” variant. This variant makes an enzyme that breaks down stress-related chemical messengers more slowly. People who carry this variant may have a harder time adapting to stress. They may do well on cognitive tasks until they experience stress, at which point they tend to perform worse [R, R, R].

The 'G' variant of has been nicknamed the “warrior” variant. This variant makes an enzyme that breaks down stress-related chemical messengers more quickly. People who carry this variant may recover more quickly from periods of stress. They may do worse on cognitive tasks than people with the 'A' variant, but this is reversed under stress [R, R, R].

The [MAOA](#) gene codes for [monoamine oxidase](#), an enzyme that helps break down the chemical messengers such as [dopamin](#), [serotonin](#), and [epinephrine](#) [R].

Research suggests that emotional stress during childhood and adolescence further increases the risk of antisocial, aggressive, and hyperactive behavior, in carriers of low-activity [MAOA](#) variants such as 'T' at [rs6323](#) [R, R, R, R, R, R, R, R, R, R].

The [CRHR1](#) gene encodes a receptor for [CRH](#), the first hormone of the [HPA axis](#). This receptor promotes anxiety, arousal, and depression upon activation. Several variants with increased [CRHR1](#) activity have been associated with PTSD, depression, chronic fatigue, and IBS-related anxiety [R, R, R, R, R, R, R].

The [CRHR2](#) gene encodes another receptor for CRH. Contrary to [CRHR1](#), the activation of [CRHR2](#) receptors *reduces* anxiety, arousal, and depression. Two variants with presumably lower [CRHR2](#) activity have been associated with PTSD [R, R, R, R].

The [FKBP5](#) encodes an immune system protein that also regulates the sensitivity of glucocorticoid receptors, meaning that it may alter the way stress hormones affect the body. Variants with excess [FKBP5](#) activity may reduce your ability to recover from stressful events and have been associated with stress-related psychiatric disorders like PTSD, depression, and bipolar disorder [R, R, R, R, R, R].

The [NR3C1](#) gene codes for the [glucocorticoid receptor](#). Upon activation by [cortisol](#), this protein is able to regulate the production of stress-related, inflammatory proteins. Excess cortisol release may lead to continuous stimulation of the glucocorticoid receptor, which may ultimately lower the sensitivity of the receptor to glucocorticoids. This is called *glucocorticoid resistance*. Several variants causing a reduced sensitivity of the glucocorticoid receptor have been associated with chronic fatigue syndrome [R, R, R, R, R, R].

The [HTR1A](#) gene helps produce a [serotonin](#) receptor, 5HT1A. The most widely-investigated [HTR1A](#) variant is [rs6295](#). Its minor 'C' allele has been associated with higher susceptibility to anxiety and depression from stressful events [R, R, R].

The [HTR2A](#) gene helps produce another serotonin receptor, 5HT2A. The most widely investigated variant is [rs6313](#). Its minor 'A' allele increases the number of active receptors. This variant has been associated with a decreased risk of suicide attempts

GENE	SNP	GENOTYPE
COMT	rs4680	GA
CNR1	rs1049353	TT
OXTR	rs53576	GG
TPRA1	rs604300	GG
CNR1	rs2180619	GG
BDNF	rs6265	CT
ARHGAP27	rs4792887	CC
RGS2	rs4606	CC
MAPT	rs12944712	GG
CRHR1	rs17689882	GG
CRHR2	rs2267715	AA
CRHR2	rs2190242	AA
NR3C1	rs2918419	TT
NR3C1	rs6196	AA
HTR2A	rs6313	AG
HTR2A	rs6311	TC
FAAH	rs324420	AC
OXTR	rs2254298	AG
MAPT	rs12938031	AG
NR3C1	rs852977	AG
NR3C1	rs1866388	AG
NR3C1	rs6188	CA
MAOA	rs6323	G
HTR2C	rs6318	G
RNF180	rs6295	GG
MAPT	rs110402	AA
TULP1	rs9470080	CC
TULP1	rs3800373	AA
SPACA1	rs1406977	TT

and chronic fatigue. 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 [[R](#), [R](#), [R](#), [R](#), [R](#)].

The [HTR2C](#) gene encodes a serotonin receptor, [5-HT2C](#), present mostly in the brain that plays crucial roles in mental health, metabolism, and pain control. The 'C' allele of [rs6318](#) has been associated with increased reactivity to stress [[R](#), [R](#), [R](#), [R](#), [R](#), [R](#), [R](#)].

The [BDNF](#) gene helps produce BDNF, a protein that promotes the production of new brain cells and the growth of new connections between them. A crucial [BDNF](#) gene variant is [rs6265](#), also known as "[Val66Met](#)". It may affect BDNF production, storage, and release in brain cells. This variant may play a role in multiple cognitive and mental health aspects, including stress and anxiety [[R](#), [R](#), [R](#), [R](#)].

The [RGS2](#) gene encodes a protein called 'regulator of G protein signaling 2'. Some variants produce less RGS2 protein. As a result, fewer G protein-coupled receptors will turn off and your brain becomes more active than normal, leading to anxiety [[R](#), [R](#)].

The [FAAH](#) gene helps create an enzyme called fatty acid amide hydrolase (FAAH). The main function of the FAAH enzyme is to break down certain compounds in the body, including endocannabinoids. A variant associated with reduced activity, [rs324420](#), has been linked to lower anxiety in response to stressful situations [[R](#), [R](#)].

[OXTR](#) encodes the receptor for oxytocin, an important signalling molecule in the brain. Two variants, 'G' at [rs53576](#) and 'A' at [rs2254298](#), have been associated with increased emotional reactivity to stress [[R](#), [R](#), [R](#), [R](#)].

[MGLL](#) acts like a cleanup crew for your body's natural stress-calming molecules, particularly one called 2-AG. When MGLL is very active, it quickly breaks down these calming molecules, potentially making it harder for your body to maintain its natural calm. A variant in this gene ([rs604300](#)) can affect how long these stress-relief molecules stay active in your system, influencing your recovery from stressful situations.

[CNR1](#) creates receptors for your body's natural stress-relieving molecules (cannabinoids) in the brain. When these molecules dock at CNR1 receptors, they help reduce anxiety and promote relaxation. Different variants of CNR1 can affect how many receptors you have and how well they respond to these calming signals, ultimately influencing your ability to recover from stress.

GENE	SNP	GENOTYPE
FKBP5	rs1360780	CC

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

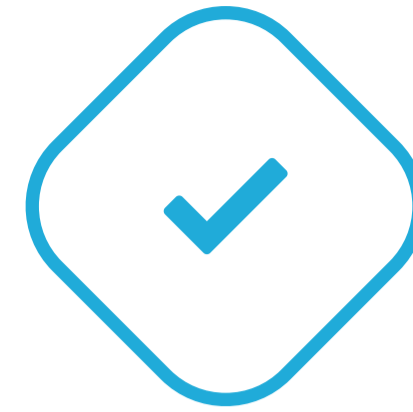
Sleep Quality

The quality of your sleep can have a big impact on how much energy you have during the day [R, R].

Many genetic variants influence sleep [R]. However, your environment and your habits also affect sleep quality.

Some strategies that may improve sleep quality include [R]:

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



TYPICAL

Predisposed to typical sleep quality based on 576,285 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
/	rs71365296	AA
KANSL1	rs1107820	TT
VGLL2	rs4946246	TG
RALYL	rs118149821	CC
CHRM2	rs146885652	GG
FOXO6	rs2226263	TT
/	rs184060364	GG
TENM4	rs117191802	AA
TCF21	rs13201465	AA
RALYL	rs191939331	GG
FBN2	rs115375165	GG
TJP2	rs7030480	AA
COQ8A	rs113207574	CT
PRICKLE1	rs11829548	GT
ADCY1	rs79209880	CC
CHRM2	rs74757156	CC
/	rs111921861	AA
/	rs140707667	GG
FUT9	rs142123475	CC
UFL1	rs75842709	CC
COX7C	rs2964898	CC
ERCC4	rs74321030	TT
VRK1	rs78807545	GG
/	rs147738873	CC
MSX2	rs28450080	CC
RFX4	rs11610873	GG
CDH13	rs111702115	GG
CASP3	rs7695597	AA
TNF	rs1800629	GG

GENE	SNP	GENOTYPE
NREP	rs140529718	GG
EPB41L4A	rs146128029	TT
RBMS3	rs17023449	TT
SASH1	rs112390069	GG
FAM107B	rs74122981	AA
PLK2	rs76395602	GG
RGS6	rs36032616	AA
PIGZ	rs4916588	CC
PLK2	rs170741	TT
ENC1	rs76768179	TT
ZNF626	rs6511152	CC
CD36	rs4437584	TT
LAMA2	rs11962701	CC

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

CLOCK (Sleep & Weight)

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 [\[R\]](#):

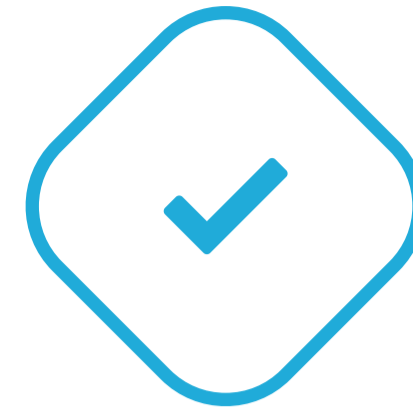
- Abnormal and less stable circadian rhythms [\[R, R\]](#)
- Shorter sleep duration (≤ 6 h per day) [\[R, R, R\]](#)
- Being an evening person [\[R, R, R\]](#)
- Less activity overall, being active later in the day, and being sleepier during the morning [\[R, R\]](#)

This variant has also been linked to:

- Higher prevalence of obesity (mixed findings) [\[R, R\]](#)
- 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 [\[R, R, R\]](#)

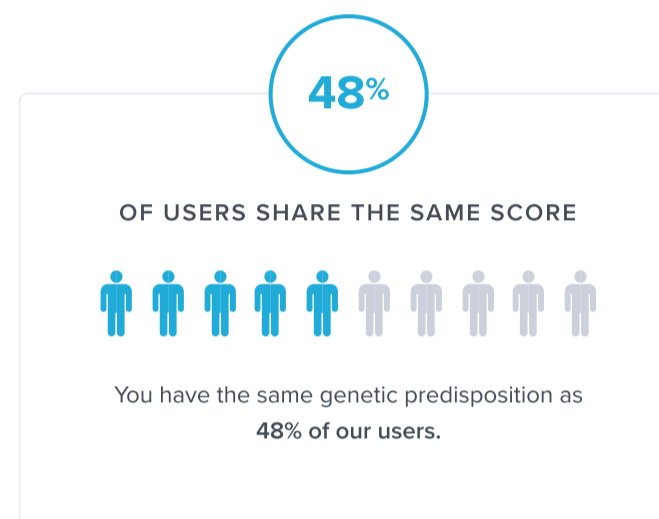
There is a link between how the *CLOCK* gene affects circadian rhythms and sleep on one hand, and metabolic balance and eating behavior on the other [\[R, R\]](#).

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 [\[R, R, R, R, R, R\]](#).



TYPICAL ACTIVITY

Likely typical *CLOCK* activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CLOCK	rs1801260	AG

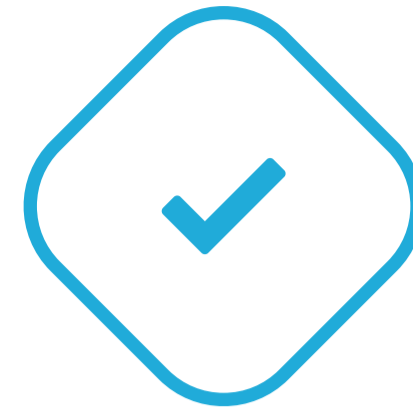
The number of "risk" variants in this table doesn't necessarily reflect your overall result.

Muscle Pain

Factors that might increase the risk of experiencing muscle pain include:

- Overuse, strain, or injury to a muscle or muscle group
- Tension or stress
- Viral infections, like the flu
- Certain medications, like statins
- Autoimmune disorders, like lupus or polymyositis
- Fibromyalgia, a condition characterized by widespread musculoskeletal pain
- Systemic infections, like Lyme disease
- Hormonal imbalances, such as hypothyroidism
- Genetics

Genetics can play a role in one's susceptibility to muscle pain or disorders that manifest as muscle pain. There may also be genetic factors that influence pain perception, pain tolerance, and the likelihood of developing chronic pain conditions.



TYPICAL LIKELIHOOD

Typical likelihood of having muscle pain based on 1,672 genetic variants we looked at



Stress

Not everybody responds to stress in the same way. Some people seem to thrive under pressure. Others need a much calmer environment to be at their best [R].

Up to 45% of differences in the way we perceive stress may be attributed to genetics. Genes involved influence [R, R, R]:

- Stress hormones like cortisol ([NR3C1](#), [ACE](#), [ZNF366](#))
- Calming brain chemicals ([GABRA6](#), [OPRM1](#))
- Brain function ([BDNF](#))

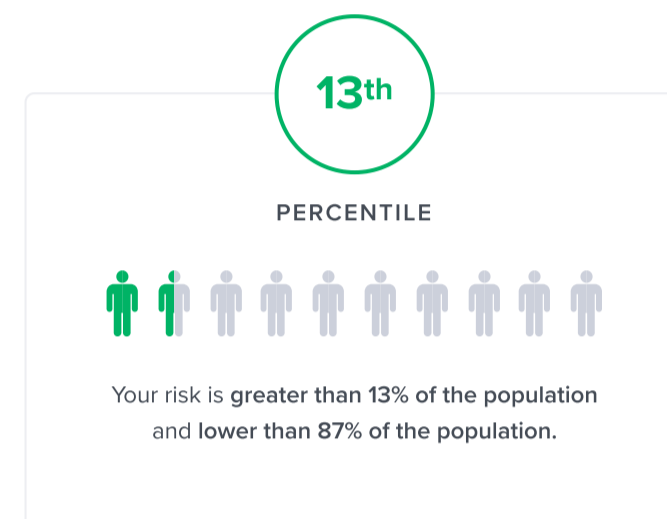
There are many effective ways to reduce stress, including:

- **Physical activity.** Exercise boosts mood and lowers stress hormones [R].
- **Relaxation techniques.** Deep breathing, mindfulness or massage can help calm down your nervous system [R, R, R].
- **Time in nature.** Being in nature helps calm down our nervous system [R, R, R].
- **Connecting with others.** Having a social support network makes us more resilient to stress [R, R].
- **Hobbies.** Doing something you enjoy can improve your well-being [R].
- **Positive thinking.** Seeing the world through a more positive lens is linked to less chronic stress and may even help people live longer [R, R, R].



LESS LIKELY

Less likely to feel stressed based on 7,226,795 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
SPG7	rs2292954	GG
OXTR	rs2254298	AG
MROH2A	rs7606893	CA
PDCD6IP	rs2053425	AC
LMCD1	rs114122346	CC
STAC	rs112766131	GG
/	rs76192797	CA
KCTD12	rs674041	CC
DPYSL5	rs12474330	GG
PSMD7	rs7193343	TT
CDH12	rs1545967	AT
BDNF	rs6265	CT
RBM17	rs1073646	CA
MPPED1	rs9614176	GG
SMARCA2	rs10965522	CC
HLA-DPB1	rs2064479	CC
/	rs2650673	CT
RASGEF1B	rs10033652	TT
PTGS2	rs20417	GG
/	rs137970858	TT
OXTR	rs53576	GG

GENE	SNP	GENOTYPE
/	rs150429966	AA
CHRM3	rs10925907	GG

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

Caffeine-Related Anxiety

People drink coffee for an energy and mood boost. Caffeine is the main ingredient responsible for these effects. However, caffeine can make some people feel jittery and have trouble falling asleep. Caffeine may also increase the risk of anxiety and other mental health problems [R, R, R].

A gene called [ADORA2A](#) may change the way caffeine affects your body [R].

The *ADORA2A* gene makes a protein that allows the brain to use a compound called adenosine. This compound helps make you sleepy and calm. Caffeine works by blocking the *ADORA2A* protein. Then adenosine can't work on your brain, and you feel more awake [R].

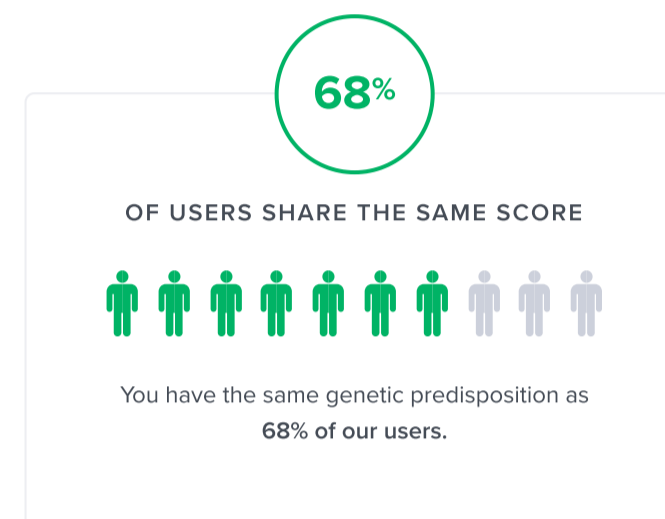
For example, one *ADORA2A* gene variant may change the way you respond to caffeine. Caffeine may make people with this variant more anxious. Women tend to be affected more strongly than men [R, R, R].

People with this variant may be able to build up a kind of tolerance to caffeine. If they drink caffeinated drinks every day, it may not trigger anxiety anymore [R].



LESS LIKELY

Less likely to experience caffeine-related anxiety based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ADORA2A	rs5751876	CT

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

Migraines

Key Takeaways:

- Up to **64%** of differences in people's chances of developing migraine may be due to genetics.
- Risk factors include: obesity, depression, stress, being female, blood vessel issues, brain chemical imbalances.
- If you have a high genetic risk, take action on modifiable risk factors to help reduce overall risk.
- About **16%** of Americans regularly have migraines. So, even if your genetic risk is low, you don't want to ignore this condition.
- Click the **Recommendations** tab for potential dietary and lifestyle changes and **next steps** for relevant labs.

About 16% of Americans regularly have migraines [R](#).

For a long time, researchers thought migraines were only caused by widening blood vessels in the brain. However, new research suggests that it's more complicated. Possible causes include [R](#), [R](#):

- Blood vessel problems
- Changes in nerve pathways linked to pain
- Imbalances in serotonin or other brain messengers

Risk factors for migraines include [R](#):

- Obesity
- Depression
- Stress
- Being female

Migraines aren't just headaches, and pain isn't the only symptom. People with migraines also commonly experience [R](#), [R](#):

- Nausea
- Sensitivity to bright light or loud sounds
- Fatigue
- Neck stiffness
- Dizziness
- Aura (flashing lights, moving lines, blind spots, etc.)

Migraine attacks can last from hours to days. They can even be bad enough to cause people to miss work. In fact, migraine is one of the most common causes of disability in people under 50 years old [R](#), [R](#), [R](#).

People sometimes go through periods with several migraines and then stretches with none [R](#).

Unfortunately, there is no "cure" for chronic, severe migraines. Instead, people with migraines are often prescribed medications to [R](#):

- Relieve symptoms during an attack
- Prevent the next attack

Up to 64% of differences in people's chances of developing migraine may be attributed to genetics. Genes involved in migraine may influence [R](#):

- Nerve cell activity ([COMT](#), [CACNA1A](#), [SCN1A](#))
- Sleep-wake cycles ([CLOCK](#), [CSNK1D](#))
- [DNA methylation](#) ([MTHFR](#))



LESS LIKELY

Less likely to have migraines based on 108,952 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
TRPM8	rs10166942	TT
TRIM32	rs6478241	AA
MTHFR	rs1801133	AA
AOC1	rs2052129	GG
IRAG1	rs4910165	GC
BDNF	rs6265	CT
NOS3	rs2070744	CT
IFT43	rs75002882	GG
DHX36	rs13078967	AA
CARF	rs138556413	CC
AOC1	rs1049793	CG
HPSE2	rs12260159	GG
LY6G5C	rs74434374	CC
SLC24A3	rs4814864	CC
NOC3L	rs2274224	GG
ITPK1	rs11624776	AA
TNFSF12	rs34914463	TT
PNPLA7	rs4278223	TT
UFL1	rs11153082	GA
C12ORF4	rs2160875	CT
MRPS6	rs28451064	AG

GENE	SNP	GENOTYPE
MLXIPL	rs13235543	TC
RABGAP1L	rs11487328	CG
PHACTR1	rs9349379	GG
STAT6	rs11172113	CC
NAXE	rs2274316	AA
PRDM16	rs2651899	TT
NOS2	rs2297518	GG
AOC1	rs10156191	CC
AOC1	rs1049742	CC
SERPINA1	rs28929474	CC
PRDM16	rs10218452	AA
TSPAN2	rs2078371	TT
HTR2C	rs3813929	C
SUGCT	rs10234636	CC
HOXD10	rs72923449	AA
NAXE	rs2274319	CC
GJA1	rs28455731	GG
MAU2	rs74182632	GG
TRIM32	rs3891689	TT
MTHFR	rs1801131	TT
ROBO1	rs950570	CC
KCNK5	rs10456100	CC
COL4A1	rs2000660	GG
TSPYL5	rs1835740	CC
PPIC	rs246326	CC
HMGXB3	rs4705403	GG
LIN7C	rs2049046	AA

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

Joint Pain

Key Takeaways:

- Osteoarthritis will affect the majority of people over the age of 55. So, even with low genetic risk, the overall risk is still high for older people.
- About **50%** of the differences in people's chances of getting osteoarthritis may be due to genetics.
- Higher genetic risk may mean earlier onset and a greater impact from potential risk factors.
- Risk factors include: being female, joint injury or overuse, obesity, bone deformities, and diabetes.
- Click the **next steps** tab for relevant labs and lifestyle factors.

Osteoarthritis tends to affect knees, hands, and hips. People with this condition may experience [\[R, R\]](#):

- Joint pain and stiffness
- Difficulty moving
- Weakness and balance problems

Most people with osteoarthritis are over the age of 55. In fact, older age is the number one risk factor for this condition. Other risk factors include [\[R, R\]](#):

- Being a woman
- Joint injury or overuse
- Obesity
- Bone deformities
- Diabetes
- **Genetics**

About 50% of the differences in people's chances of getting osteoarthritis can be attributed to genetics. Genes that contribute to osteoarthritis may influence [\[R, R, R\]](#):

- [Collagen](#) production in the joints ([COL2A1](#), [COL11A1](#), and [COL1A1](#))
- Inflammation ([IL1B](#), [IL4R](#), [IL17A](#), [IL17F](#) and [IL6](#))
- Activity of joint cells ([ESR1](#))
- Bone formation ([FRZB](#), [VDR](#))
- Bone strength ([IGF1](#), [TGFB1](#), [TIMP3](#), and [ADAM12](#))

Genetically high levels of the following markers may be causally associated with a high risk of hip and knee osteoarthritis:

- IGF-1 [\[R, R\]](#)
- Testosterone [\[R\]](#)

In contrast, genetically high ApoB levels may be associated with a lower risk [\[R\]](#).



LESS LIKELY

Less likely to have osteoarthritis based on 377,865 genetic variants we looked at

1st

PERCENTILE



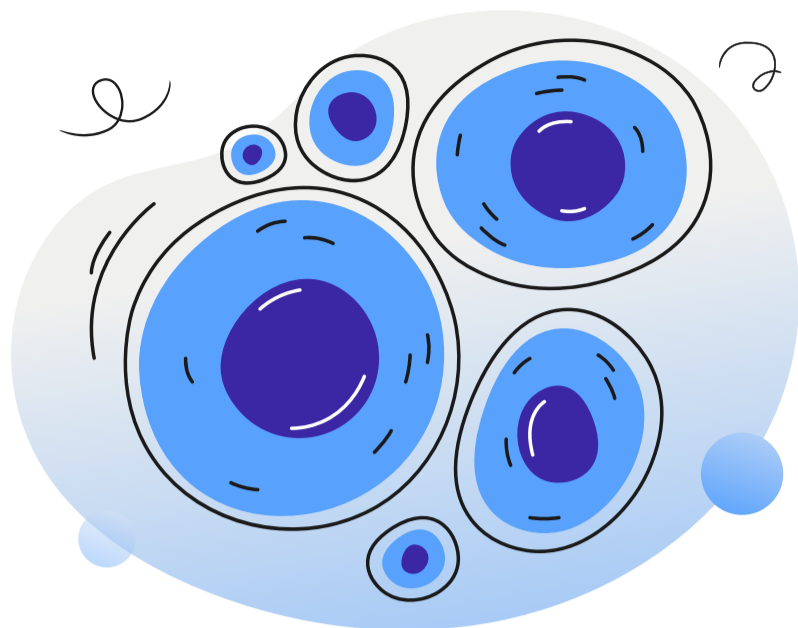
Your risk is greater than 1% of the population and lower than 99% of the population.

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
EPHA5	rs201194999	CC
COL11A1	rs2622873	TT
ICA1L	rs62182810	AA
SRR	rs216175	AA
ERI1	rs330050	GG
LYZ	rs317630	TT
HLA-DPB1	rs2856821	TT
CPNE1	rs2248393	CC
RAB28	rs1913707	AA
DPEP1	rs1126464	GG
FAM53A	rs798726	CT
CSK	rs35206230	TC
ANAPC4	rs34811474	AG
TGFB2	rs2785988	AC
LTBP1	rs2061027	GA
SLC44A2	rs1560707	GT
TSKU	rs1149620	TA
KIF26B	rs10218792	TG
SLC44A2	rs10405617	GA
PRDM5	rs11729628	GT
TGFB2	rs2820436	AC

GENE	SNP	GENOTYPE
SOCS2	rs2171126	TC
CDC5L	rs12154055	AG
GLIS3	rs10974438	CA
TMEM241	rs10502437	GA
SGO1	rs62242105	GA
PAR6G	rs1039257158	CC
SCUBE1	rs528981060	GG
SLC39A8	rs13107325	CC
TGFB1	rs75621460	GG
TGFA	rs3771501	GG
H4C8	rs115740542	TT
COL27A1	rs919642	AA
MPPED2	rs11031191	GG

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



Cellular Health

At the microscopic level, your cells are constantly working to maintain balance and protect against damage. This section examines genes involved in crucial cellular processes like detoxification and methylation. We explore variations in genes that produce protective compounds like glutathione and those that help manage oxidative stress. Understanding these fundamental cellular processes can provide insights into how to best support your body's natural maintenance and repair systems.

<p>LOWER ACTIVITY MTHFR</p> <p>Likely lower MTHFR activity</p>	<p>LOWER ACTIVITY SOD2 (Oxidative Stress)</p> <p>Likely lower SOD2 activity</p>	<p>LOWER ABILITY Methylation</p> <p>Predisposed to lower methylation ability</p>
<p>HIGHER LEVELS Homocysteine</p> <p>Predisposed to higher homocysteine levels</p>	<p>TYPICAL Oxidative Stress</p> <p>Likely typical oxidative stress</p>	<p>TYPICAL ABILITY Detox</p> <p>Predisposed to typical detox ability</p>
<p>TYPICAL FUNCTION Glutathione</p> <p>Predisposed to typical glutathione function</p>	<p>HIGHER ACTIVITY SULT1A1 (Detox)</p> <p>Likely higher SULT1A1 activity</p>	<p>TYPICAL ACTIVITY NFE2L2/NRF2 (Detox)</p> <p>Likely typical NFE2L2 activity</p>
<p>TYPICAL ACTIVITY COMT</p> <p>Likely typical COMT activity</p>	<p>INTERMEDIATE NAT2 (Detox)</p> <p>Likely an intermediate acetylator</p>	<p>HIGHER ACTIVITY UGT (Detox)</p> <p>Likely higher UGT activity</p>

MTHFR

Key Takeaways:

- MTHFR is an enzyme that helps your body process folate, an important nutrient for many body functions and processes.
- If you have lower MTHFR activity due to genetics, make sure you include folate-rich foods in your diet, like fruits and vegetables or other fortified foods. This is even more important with pregnancy.

The most common *MTHFR* SNP is **rs1801133** (C677T). The **'A' variant** of this SNP decreases the activity of the MTHFR enzyme. People with two 'A' variants may have about 16% lower blood folate levels ('A' equals 'T' on the opposite DNA strand) [R].

The **'G' variant*** of another SNP, **rs1801131** (A1298C), also decreases MTHFR enzyme activity, but less so than rs1801133. The effects of this variant may only be meaningful in people who also have the other low-activity variant, rs1801133-AA ('G' equals 'C' on the opposite DNA strand) [R, R, R, R, R].

Read [this blog post](#) for more details about MTHFR variants and potential ways to reduce their impact.

If you carry a lower-activity variant, make sure your diet is healthy, well-balanced, and contains plenty of folate-rich food sources. These include [R, R, R]:

- Spinach
- Black-eyed and green peas
- Asparagus
- Lettuce
- Avocado
- Broccoli
- Citrus fruits
- Fortified rice, bread, and pasta

Some sources recommend methylfolate supplements instead of folic acid. Methylfolate supplements would in theory bypass the MTHFR enzyme, which converts folic acid to methylfolate. However, even if you have lower-activity *MTHFR* variants, experts say you can still process folic acid without any issues [R].

Importantly, CDC notes that folic acid is the only folate supplement proven to reduce neural tube defects. Methylfolate supplements have not been properly studied [R].

In addition to folate, there is some evidence that people with *MTHFR* variants may do better if they get more [riboflavin](#) (vitamin B2). This vitamin helps MTHFR work properly [R, R, R, R, R, R, R, R].

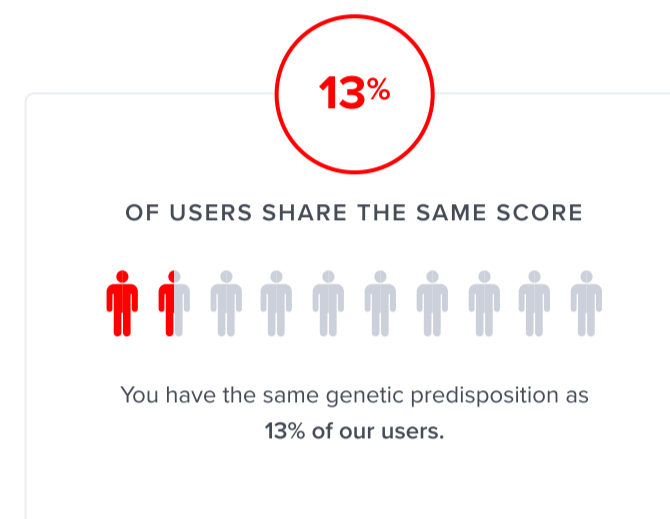
Good sources of riboflavin include [R, R]:

- Eggs
- Dairy (milk, cheese, yogurt)
- Lean and organ meats
- Green vegetables
- Fortified cereals
- Mushrooms
- Almonds



LOWER ACTIVITY

Likely lower MTHFR activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
MTHFR	rs1801133	AA
MTHFR	rs1801131	TT

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

SOD2 (Oxidative Stress)

The [SOD2](#) gene has many described polymorphisms. Among them, [rs4880](#) has got most of the spotlight in SOD2 research. Its minor allele 'G' is associated with decreased activity and worse protection against oxidative stress. However, some cell research suggests that this variant can cross the mitochondrial membrane more easily [\[R\]](#).

Owing to its decreased antioxidant activity, this variant has been associated with diseases such as [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Breast, prostate, and colorectal cancer
- Hypertension
- Sporadic motor neuron disease
- Alzheimer's disease
- Parkinson's disease
- Noise-induced hearing loss
- Cisplatin-induced ear toxicity
- Infertility
- Phthalate-induced lung damage

In contrast, the major 'A' variant is more common among people with [\[R\]](#):

- Cardiomyopathy
- Atherosclerosis
- Lung cancer

The association of this variant with [longevity](#) isn't straightforward either. While a study found the 'G' variant was more common among very elderly Danish people, the 'A' variant was prevalent among very elderly Ashkenazi Jewish men in another study. Nevertheless, **the growing consensus is that 'G' is the risk allele of rs4880** [\[R\]](#), [\[R\]](#).

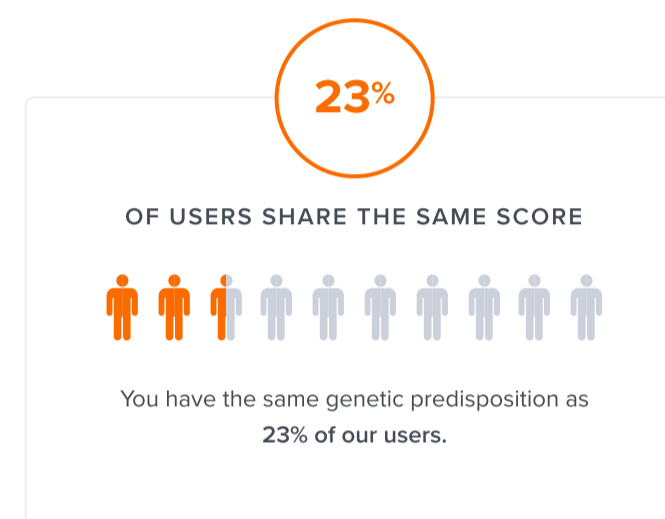
A second SNP, [rs2758331](#), has also been associated with lifespan. In one study of exceptionally long-lived people in New England, the 'C' allele of rs2758331 was significantly more common in the oldest old than in the general population [\[R\]](#).

This SNP is nowhere near as well-studied as rs4880, and only a single study has investigated its effect on lifespan so far. Furthermore, while the 'A' allele of rs2758331 has been associated with prostate cancer (thereby supporting the idea of a beneficial 'C' allele), the 'C' allele has been associated with liver damage after bisphenol A (BPA) exposure [\[R\]](#), [\[R\]](#).



LOWER ACTIVITY

Likely lower SOD2 activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
SOD2	rs4880	GG
TCP1	rs2758331	AA

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

Methylation

Optimal function of the pathways discussed above depends on a number of enzymes that enable chemical reactions. Gene variants in some of those enzymes can alter their function and potentially compromise methylation.

Please note: Methylation is a complex process that goes way beyond the pathways and enzymes discussed in this report. There is insufficient evidence that any of the gene variants analyzed in this report impair methylation and its vital roles in the human body.

Image source: [Pan S, et al. 2020](#)

MTHFR

The [MTHFR](#) gene helps make an enzyme called methylenetetrahydrofolate reductase (MTHFR). It produces the active form of folate, [methylfolate](#) [R].

The whole methylation cycle depends on MTHFR, which is why it is called a “rate-limiting enzyme”. Low MTHFR activity can make methylation as a whole much less productive [R].

Two of the most widely studied variants—[rs1801133](#) and [rs1801131](#)—reduce MTHFR enzyme activity [R, R, R, R].

Studies found links between these variants, higher homocysteine, and [R, R, R, R, R]:

- [Cognitive problems](#)
- Heart disease and stroke
- [Asthma and allergies](#)
- Fertility and pregnancy issues
- Mental health issues
- [Migraines](#)

Read [this blog post](#) for more details about MTHFR variants and potential ways to reduce their impact.

Other Genes

The [PEMT](#) gene encodes an enzyme that produces phosphatidylcholine (PC) in the liver. This pathway supplies choline and thus plays a key role in the methylation cycle [R, R].

[PEMT](#) gene variants like [rs7946](#) and [rs12325817](#) are linked to:

- [Choline deficiency](#)
- [Fatty liver](#)
- [Heart disease](#)

The [MTHFD1](#) gene encodes an enzyme that helps produce active folate and supports homocysteine methylation. A variant in this gene, [rs2236225](#), is linked to increased [choline and folate needs](#) [R, R, R].

The [MTRR](#) gene encodes an enzyme that helps turn homocysteine into methionine, using [vitamin B12](#) and [riboflavin](#). [MTRR](#) variants like [rs1801394](#) have been linked to [R, R]:

- [Higher homocysteine levels](#)
- Congenital disorders (mixed evidence) [R, R, R]
- Some types of cancer [R, R]
- Male fertility issues (mostly in Asians) [R, R]
- ADHD in children [R]

The [CHDH](#) codes for choline dehydrogenase, an enzyme that turns choline into betaine or TMG. Betaine then supplies a methyl group needed for homocysteine clearance. CHDH gene



LOWER ABILITY

Predisposed to lower methylation ability based on 45 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
MTHFR	rs1801133	AA
MTHFR	rs2066470	GG
BHMT	rs3733890	AG
GNMT	rs9296404	TT
SHMT1	rs1979277	AA
MTR	rs2275565	GG
COMT	rs4680	GA
JMY	rs3797546	TC
MTRR	rs1801394	GA
PEMT	rs7946	CT
MTHFD1	rs2236225	GA
BHMT	rs651852	CT
CBS	rs234706	GA
CHDH	rs9001	TT
MTR	rs1805087	AA
FOLH1	rs61886492	GG
CPS1	rs1047891	AC
MTRR	rs1532268	TC
MAT1A	rs3851059	AG
TRDMT1	rs12780845	GA
BHMT2	rs625879	AC
SLC19A1	rs1051266	TC
PEMT	rs4646343	GT
PEMT	rs12936587	GA
MAT1A	rs7087728	GA
MS4A6A	rs558660	GG
MAT1A	rs2993763	AA
FOLR3	rs651933	GA
MTRR	rs1802059	AG

variants like [rs9001](#) are linked to [choline deficiency](#) and may thus affect methylation [\[R, R\]](#).

Variants in the following genes may also affect methylation and play a role in related health issues:

- [CBS](#): a key component of the transsulfuration pathway [\[R, R, R\]](#)
- [BHMT](#): helps turn homocysteine into methionine (betaine pathway)
- [COMT](#): methylates important chemicals with the help of SAM-e [\[R\]](#)
- [SHMT1](#), [DHFR](#), and [FOLH1](#): involved in folate metabolism [\[R, R, R, R\]](#)
- [GNMT](#) and [DNMT3B](#): play a role in SAM-e metabolism [\[R, R\]](#)
- [MTR](#): helps turn homocysteine into methionine (folate pathway) [\[R\]](#)
- [MAT1A](#): helps turn methionine into SAM-e [\[R\]](#)
- [TRDMT1](#): plays a role in DNA methylation [\[R\]](#)
- [PDXK](#): plays a role in vitamin B6 metabolism [\[R\]](#)
- [AHCY](#): involved in homocysteine and SAM-e metabolism [\[R, R\]](#).
- [TYMS](#): supports DNA methylation with the help of methyl-folate [\[R, R\]](#)

GENE	SNP	GENOTYPE
TCN1	rs526934	AG
COMT	rs4633	CT
BHMT	rs567754	CT
MTHFD1L	rs17349743	CT
MMAB	rs7134594	CT
CBS	rs2851391	CT
MAT1A	rs4934028	GA
MTHFR	rs1801131	TT
CHMP4B	rs819171	TT
ITCH	rs819147	TT
MTHFR	rs3737965	GG
FOLH1	rs202676	AA
PDXK	rs147242481	GG
TYMS	rs2853533	GG
DHFR	rs1643649	TT
AHCY	rs13043752	GG
PEMT	rs12325817	CC
GNMT	rs10948059	CC
NQO1	rs1800566	GG
OGG1	rs1052133	CC
MTHFD1L	rs6922269	GG

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

Homocysteine

Key Takeaways:

- About 55% of differences in people's homocysteine levels may be due to genetics.
- High homocysteine is usually caused by the lack of vitamins B12, B9 (folate), and B6.
- People with heart disease and cognitive problems tend to have higher homocysteine.
- High homocysteine may not be a risk factor for heart disease.

[Homocysteine](#) is a metabolic byproduct linked to heart disease and cognitive decline. It's cleared out of our bodies with the aid of **vitamins B12, B9 (folate), and B6** [\[R\]](#).

A deficiency of vitamins B12, B9 (folate), or B6 is the most common cause of high homocysteine levels [\[R\]](#).

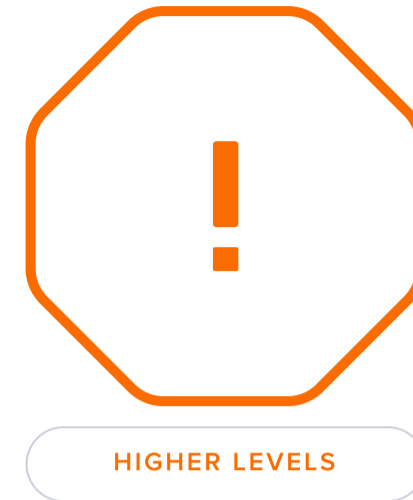
Homocysteine can also be increased by:

- Stress [\[R\]](#), [\[R\]](#), [\[R\]](#)
- Cigarette smoke [\[R\]](#), [\[R\]](#)
- Alcohol [\[R\]](#), [\[R\]](#)
- Certain medications [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#)

About 55% of differences in people's homocysteine levels may be due to genetics. Unsurprisingly, involved genes like [MTHFR](#) play a role in the metabolism of folate and other B vitamins [\[R\]](#).

Gene variants that increase homocysteine levels may also play a role in schizophrenia and some types of cancer [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

If you are worried about your genetic results, make sure to check your homocysteine lab marker to see your actual levels. It may also be a good idea to check your genetics and levels of folate and other B vitamins.



Predisposed to higher homocysteine levels based on 24 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
MTRR	rs1801394	GA
MTHFR	rs1801133	AA
NOX4	rs7130284	CC
SPATA2L	rs154657	AA
MTR	rs2275565	GG
C12ORF43	rs2251468	CC
C1ORF167	rs12134663	CA
CPS1	rs1047891	AC
GTPBP10	rs42648	GG
CBS	rs234709	TC
SLC19A1	rs1051266	TC
TRDMT1	rs12780845	GA
MTR	rs28372871	TG
NOX4	rs957140	AG
FGF21	rs838133	GA
ZDHHC20	rs17356983	AG
COLEC12	rs621636	CT
CBS	rs2851391	CT
RNF175	rs2404916	AG
FANCA	rs12921383	TT
H2BC5	rs548987	GG
TCN2	rs1801198	GG
CUBN	rs1801222	GG
MMUT	rs9369898	GG
AKR1A1	rs4660306	CC
SYT6	rs79079833	TT
CSMD1	rs17394429	GG
TAF5	rs13054085	GG
EDNRA	rs1429107	GG

GENE	SNP	GENOTYPE
NOX4	rs10830265	GG

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

Oxidative Stress

The causes of oxidative stress can be multifaceted, including environmental factors such as pollution, radiation, and toxins, as well as lifestyle factors like dietary choices, smoking, alcohol consumption, and chronic stress. The body's metabolism also naturally produces free radicals as byproducts. Oxidative stress is implicated in the pathogenesis of numerous diseases, including neurodegenerative diseases like Alzheimer's and Parkinson's, cardiovascular diseases, diabetes, and inflammatory conditions.

It is also involved in the aging process itself. Therefore, maintaining a balance between oxidative stress and antioxidants is critical for health, and enhancing antioxidant defenses through diet and lifestyle changes is often suggested as a preventive strategy.



TYPICAL

Likely typical oxidative stress based on 60 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
SOD2	rs4880	GG
SOD3	rs2536512	AA
CAT	rs769217	CC
FOXO3	rs12212067	TT
FOXO3	rs4946936	CC
PON1	rs662	TT
FOXO3	rs12202234	CC
FOXO3	rs17069665	AA
FOXO3	rs9398171	TT
FOXO3	rs3800230	TT
FOXO3	rs9400239	CC
FOXO3	rs479744	GG
SIRT1	rs7895833	AA
CAT	rs7943316	AT
GPX4	rs713041	CT
CAT	rs1001179	CT
APEX1	rs1130409	GG
NOS3	rs2070744	CT
GCLC	rs1555903	CT
UGT1A6	rs1105879	AA
NOS1	rs1879417	TC
SIRT1	rs12778366	TC
GSTO2	rs156697	GA
UCP2	rs659366	TC
TFAM	rs1937	GC
PPARGC1A	rs8192678	CT
CDKN2A	rs10811661	TT
UCP1	rs1800592	TC
HNRNPA3	rs13001694	GG

GENE	SNP	GENOTYPE
GPX1	rs1050450	GG
MVD	rs9932581	CT
SOD1	rs2234694	AA
NQO1	rs1800566	GG
GSTP1	rs1695	AA
PON1	rs854560	TA
ARMC2	rs6911407	AA
MRPS31	rs4581585	CC
GCLM	rs41303970	GG
FOXO3	rs2802292	GG
MPO	rs2333227	CC
TOM1	rs2071746	AA
OGG1	rs1052133	CC
ARMC2	rs768023	GG
ALDH2	rs671	GG
APOE	rs429358	TT
SLC23A1	rs33972313	CC
FOXO3	rs2802288	AA
NOS2	rs2297518	GG
FOXO3	rs2253310	CC
FOXO3	rs1935952	CC

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

Detox

Some people might have genetics that make crucial detox components work differently. Recognizing that each of us might detoxify differently because of our unique genetic makeup is an important step towards personalized healthcare and keeping ourselves healthy.

Variants in the genes encoding different **CYP enzymes** can greatly influence [phase I](#) detox ability. Examples include [CYP1A1](#), [CYP2E1](#), [CYP1B1](#), [CYP2A6](#), [CYP2B6](#) and [CYP2D6](#). Variants in these genes are linked to:

- Harmful effects of cigarette smoke [\[R, R, R, R, R\]](#)
- Pesticide sensitivity [\[R, R, R\]](#)
- Air pollution sensitivity [\[R\]](#)

A variant in the [CYP1A2](#) gene may impair **caffeine metabolism** and contribute to its adverse effects [\[R\]](#).

The [GSTP1](#) gene codes for a [phase II](#) detox enzyme that helps eliminate toxins using the “master antioxidant” [glutathione](#). Studies have linked its variants to harmful effects of **air pollution, cigarette smoke, mercury**, and more [\[R, R, R, R, R\]](#).

The UGT enzymes encoded by genes like [UGT1A1](#) and [UGT2A1](#) are also vital for [phase II](#) detox. They help produce glutathione and remove toxins found in **plastics, cigarette smoke**, and more [\[R, R\]](#).

Other genes that help make glutathione and support its detox function include [GCLC](#), [GSTA1](#), and [GPX1](#). Variants in these genes may influence the detox of **mercury, mold**, and more [\[R, R, R\]](#).

The [NAT2](#) codes for another major enzyme in phase II detox. Due to the variants in this gene, people can be “**slow acetylators**”, which means they may have a harder time detoxing **cigarette smoke and some chemicals and drugs** [\[R, R, R, R\]](#).

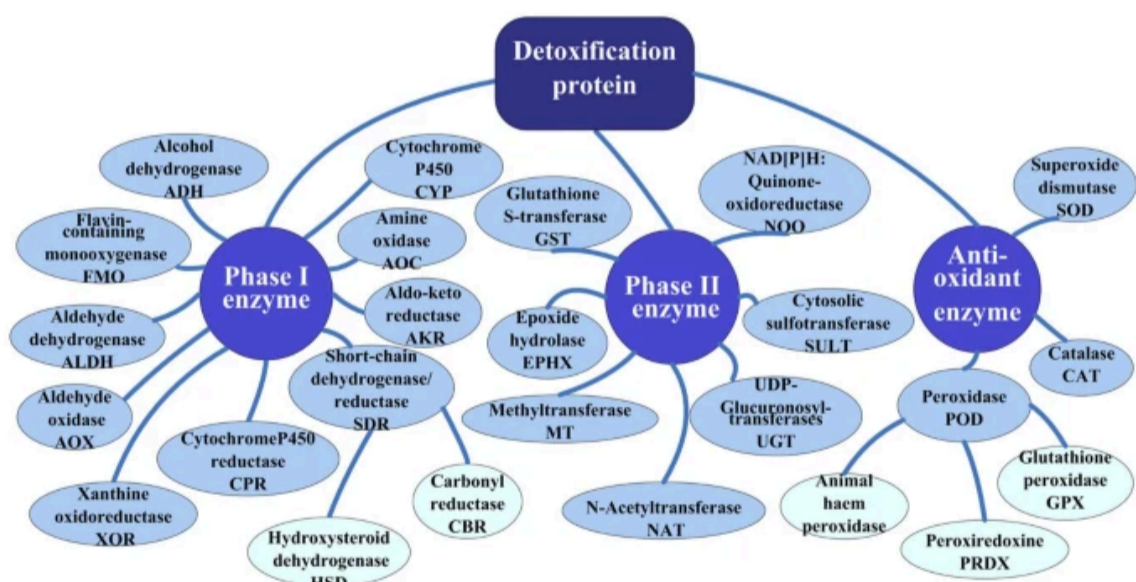


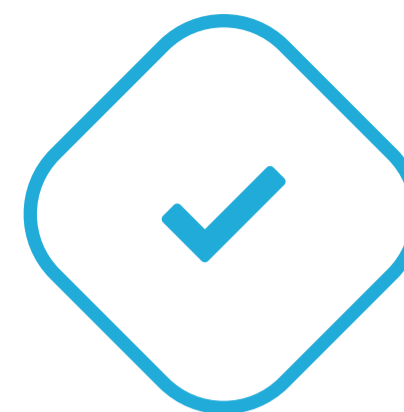
Image source: [Yang et al. 2011](#)

The [NFE2L2](#) gene helps make **NRF2**, a “master” protein that activates a range of antioxidant and detox genes. Its variants may affect the toxicity of alcohol, heavy metals, drugs, and more [\[R, R, R, R\]](#).

Alcohol detox is crucial to minimize its side effects, especially if consumed in higher amounts. Two genes, [ADH1B](#) and [ALDH2](#), help make enzymes that process alcohol, and their variants can greatly affect detox potential [\[R\]](#).

Variants in the following genes also play a role in detox:

- [NQO1](#): fighting oxidative stress, DNA damage, and **benzene** toxicity [\[R, R, R\]](#)



TYPICAL ABILITY

Predisposed to typical detox ability based on 61 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
PON1	rs662	TT
SOD2	rs4880	GG
XPC	rs2228001	GT
UGT2A1	rs10518065	GA
ADH1B	rs1229984	CT
NFE2L2	rs35652124	TT
MTHFR	rs1801133	AA
CYP1B1	rs1056836	GG
NAT2	rs1495741	AG
PON1	rs854560	TA
GSTA1	rs3957357	AA
CYP1B1	rs1800440	CT
GSTO2	rs156697	GA
/	rs72547513	CC
COMT	rs4680	GA
BORCS7	rs743572	AG
NAT2	rs1041983	TC
NAT2	rs1799930	AG
ASAH1	rs4271002	GC
/	rs366631	AG
XRCC1	rs1799782	GG
PTGS2	rs5277	CC
/	rs12228069	GG
MLLT3	rs76878079	GG
MTG1	rs2031920	CC
EGLN2	rs28399433	AA
CYP2D6	rs16947	AG
/	rs2279343	AG
CYP2E1	rs2070673	AT

- [SULT1A1](#): processing toxins found in **cigarette smoke and well-done meat** [[R](#), [R](#), [R](#)]
- [PON1](#): detoxing **pesticides** and other toxins [[R](#), [R](#)]
- [SOD2](#) and [CAT](#): reducing oxidative stress and detoxing **BPA and pesticides** [[R](#), [R](#)]
- [COMT](#): detoxing **endocrine disruptors** by methylation [[R](#)]
- [MTHFR](#): supporting methylation and influencing **air pollution** sensitivity [[R](#)]
- [XPC](#), [XRCC1](#), [XRCC4](#): repairing DNA damage caused by **pesticides, air pollution, and mold** [[R](#), [R](#), [R](#), [R](#)]

GENE	SNP	GENOTYPE
GSDMB	rs7216389	TC
CSK	rs2606345	AC
UGT2B7	rs7439366	CT
CYP1B1	rs1056827	CA
ITCH	rs819147	TT
GSTM1	rs1056806	CT
CTH	rs1021737	TG
GSTP1	rs1695	AA
ALDH2	rs671	GG
GSTP1	rs1138272	CC
CYP1A1	rs1048943	TT
COX15	rs717620	CC
NFE2L2	rs6721961	GG
NAT1	rs4986782	GG
CYP2D6	rs3892097	CC
TRIM4	rs2740574	TT
NQO1	rs1800566	GG
NQO1	rs1131341	GG
EPHX1	rs1051740	TT
GPX1	rs1050450	GG
CYP1A2	rs762551	AA

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

Glutathione

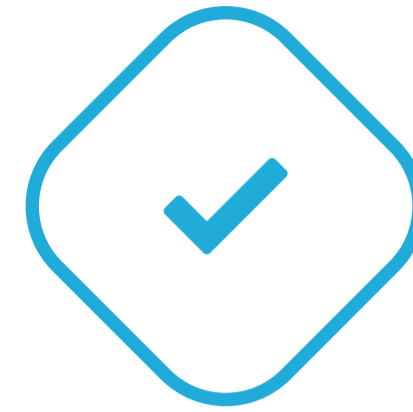
The following factors may affect glutathione levels [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Age: Natural glutathione production decreases with age.
- Diet: Consuming foods rich in sulfur-containing amino acids (like garlic, onions, and cruciferous vegetables) can boost glutathione levels.
- Lifestyle Factors: Smoking, alcohol consumption, and chronic stress can deplete glutathione levels.
- Health Conditions: Certain diseases, including liver and heart diseases, can lower glutathione levels.

Genetics can also play a role. Variants in genes that encode enzymes involved in glutathione synthesis (such as [GCLC](#) and [GCLM](#)) or activity (such as [GSTP1](#), [GSTM1](#), and [GSTT1](#)) may affect its levels [\[R\]](#).

In addition, the following strategies may help raise glutathione levels [\[R\]](#), [\[R\]](#):

- Dietary Changes: Eating foods high in sulfur-containing amino acids, vitamins C and E, selenium, and alpha-lipoic acid can support glutathione synthesis.
- Supplements: Glutathione supplements are available, although their effectiveness in increasing cellular glutathione levels varies. N-acetylcysteine (NAC) and whey protein are also known to boost glutathione.
- Lifestyle Modifications: Regular exercise, adequate sleep, and stress reduction can help maintain healthy glutathione levels.



TYPICAL FUNCTION

Predisposed to typical glutathione function based on 14 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
GSR	rs2551715	CC
GCLC	rs761142	CA
TRPC4AP	rs6060124	CA
GSTA1	rs3957357	AA
CTH	rs1021737	TG
GSTM1	rs1056806	CT
/	rs366631	AG
UGT2A1	rs10518065	GA
UGT1A6	rs34983651	CC
GSTP1	rs1695	AA
GSTP1	rs1138272	CC
GPX1	rs1050450	GG
GSTM3	rs7483	CC
UGT1A6	rs6742078	GG
UGT1A1	rs4148323	GG
GSTM5	rs3754446	AA
CTH	rs12723350	TT

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

SULT1A1 (Detox)

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 [\[R\]](#).

As mentioned, **SULT1A1 is a double-edged sword when it comes to detox.**

In theory, **lower** SULT1A1 activity may increase the toxicity of some compounds present in smoke, like polycyclic aromatic hydrocarbons (PAHs). On the other hand, it should be protective against some other toxins, like heterocyclic amines (HAs) [\[R\]](#), [\[R\]](#).

In line with this, some studies have linked the lower-activity variant, **SULT1A1*2 (rs1042028-T)**, to:

- Higher odds of stomach, lung, and colon cancers in smokers [\[R\]](#), [\[R\]](#), [\[R\]](#)
- Higher odds of breast cancer in those who eat more smoked meat [\[R\]](#)

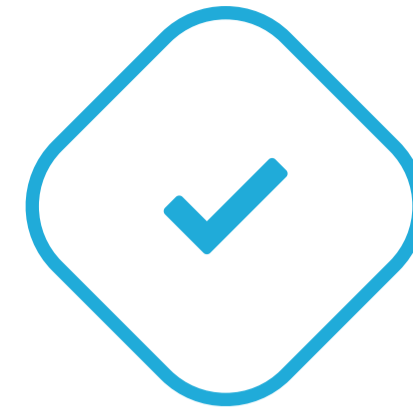
However, other studies have linked this variant to **lower odds** of prostate, bladder, colon, and oral cancers in smokers [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

Some studies failed to confirm any link between this variant and detox [\[R\]](#), [\[R\]](#).

Researchers have found other SULT1A1 variants that influence the activity of this gene [\[R\]](#), [\[R\]](#), [\[R\]](#):

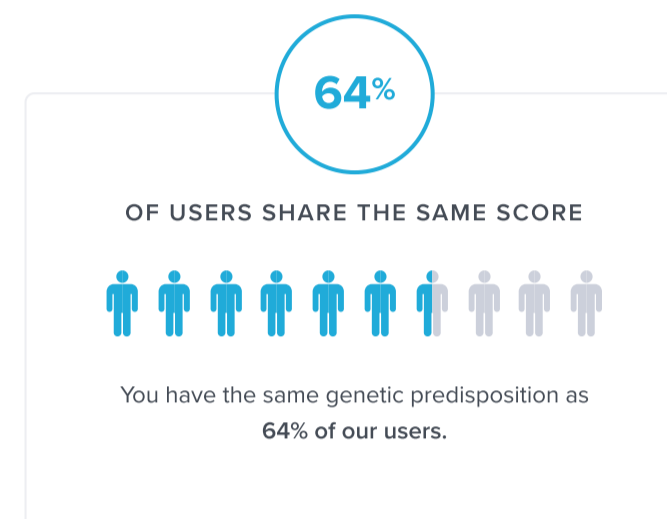
- [rs6839](#)
- [rs1042157](#)
- [rs1801030](#)

However, the impact of these variants is much lower compared with the main one, and their relevance for detox is unclear.



HIGHER ACTIVITY

Likely higher SULT1A1 activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
SULT1A1	rs1042028	CC

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

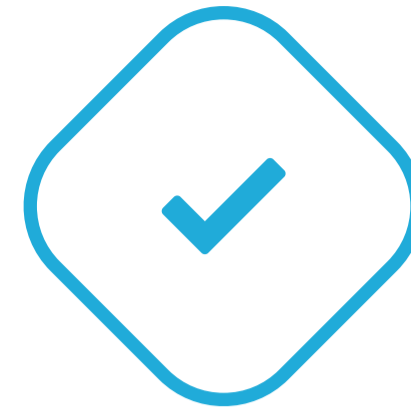
NFE2L2/NRF2 (Detox)

Research has identified several variations in the NFE2L2 gene that can reduce the expression and activity of NRF2. Some researchers have claimed that reduced NRF2 impairs the body’s ability to detox and defend itself from oxidative stress, which can ultimately lead to various health problems [R, R].

NFE2L2 gene variants may be linked to:

- Liver damage due to alcohol and other toxins [R, R]
- Drug and arsenic toxicity [R, R]
- Parkinson’s disease (mixed evidence!) [R, R, R]
- Cancer [R, R, R, R, R, R]

The exact links between NFE2L2 variants and these conditions have not been fully explained. Future research will clarify whether those variants have a causal role in health conditions.



TYPICAL ACTIVITY

Likely typical NFE2L2 activity based on 8 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
NFE2L2	rs35652124	TT
NFE2L2	rs6726395	AA
NFE2L2	rs1806649	CC
NFE2L2	rs6721961	GG
AGPS	rs2364723	GG
AGPS	rs1962142	GG
HNRNPA3	rs13001694	GG
AGPS	rs10497511	AA

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

COMT

One common variant of the *COMT* gene, [rs4680](#), may affect COMT enzyme activity. Some people call rs4680 the “worrier or warrior” variant [\[R, R\]](#).

The “G” allele of this variant is linked to a higher COMT enzyme activity. People with two copies of this allele (GG) have been nicknamed the “warriors.” They break down stress-related chemical messengers more quickly. This may help improve their performance under stress [\[R\]](#).

On the negative side, “warriors” may have lower cognitive performance under relaxed conditions [\[R, R, R\]](#).

People with two copies of the “A” allele (AA) may have lower COMT enzyme activity. They have been nicknamed the “worriers.” They break down stress-related chemical messengers more slowly in the brain. For this reason, they may be more vulnerable to stress. This includes an increased susceptibility to heart disease, possibly due to the effects of these chemical messengers on blood pressure and heart rate [\[R, R, R, R\]](#).

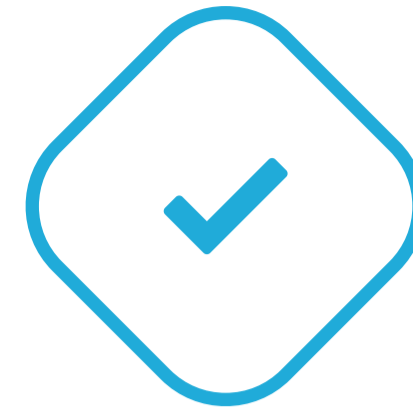
The good news is that “worriers” may become more emotionally resilient with age. They also tend to have enhanced cognitive performance under relaxed conditions. Interestingly, “worriers” seem to have a more pronounced placebo response due to higher dopamine levels [\[R, R, R, R, R\]](#).

People carrying both alleles (AG) tend to be in between the described extremes [\[R, R\]](#).

Did you know? People with “warrior” genetics may be more likely to engage in combat sports, justifying the nickname of this variant [\[R\]](#).

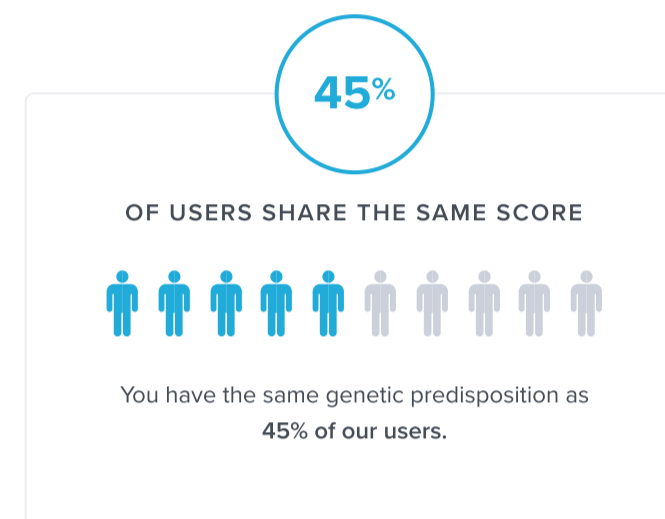
However, keep in mind that your cognitive function and response to stress are also influenced by other factors, such as:

- Other variants in the *COMT* gene
- Many other genes
- Environmental factors



TYPICAL ACTIVITY

Likely typical COMT activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
COMT	rs4680	GA

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

NAT2 (Detox)

NAT2 activity or status varies widely among individuals due to **genetic differences**. This status influences how one's body processes a range of environmental toxins.

Research has linked a lot of NAT2 gene variants to changes in enzyme activity, but most resources use 7 main variants to determine the acetylator status. The frequency of this status varies widely between different ethnicities. Roughly **45%** of the overall population and **60%** of European descendants are **slow acetylators** [R].

Being a slow NAT2 acetylator may be linked to higher odds of different types of cancer, especially bladder cancer. This link tends to be stronger in people exposed to **cigarette smoke and chemical dyes** [R, R, R, R, R].

The link between the slow NAT2 status and other types of cancer and other chronic conditions like asthma and diabetes is weaker [R, R, R].

Slow acetylators may also have a harder time detoxing certain drugs, which may put them at higher odds of side effects. For example, they tend to have higher rates of liver injury from the anti-tuberculosis drug isoniazid [R].

On the other hand, fast acetylators may be more prone to colon cancer, especially if they consume **well-done meat** frequently. This may be due to activation (O-acetylation) of certain toxins by NAT2 in the colon [R, R].

NAT2 also indirectly affects **histamine metabolism** by acetylating compounds that influence histamine levels. "Slow acetylators" with reduced NAT2 activity may experience more pronounced histamine intolerance symptoms due to difficulty processing dietary histamine or histamine-releasing substances.



INTERMEDIATE

Likely an intermediate acetylator based on 7 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
NAT2	rs1041983	TC
NAT2	rs1799930	AG
ASAH1	rs4271002	GC
NAT2	rs1801280	TT
NAT2	rs1801279	GG
NAT2	rs1799931	GG
NAT2	rs1799929	CC
NAT2	rs1208	AA

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

UGT (Detox)

Certain genetic variations in [UGT1A1](#) reduce the enzymatic activity of UGT, which [impairs the body's ability to detox](#) and results in a buildup of toxic substances in the body. The normal version of [UGT1A1](#) (the one with normal detox activity) is called [UGT1A1*1](#), or the “wild” type allele [\[R\]](#).

One of the most important and well-studied genetic variants is [UGT1A1*28 \(rs34983651\)](#). This variant causes an “insertion” mutation, which means it adds an extra ‘TA’ into the gene where there should be none. According to some reports, [UGT1A1*28 causes a 70% reduction in enzyme activity \[R\]](#).

Other variants include [UGT1A1*6 \(rs4148323\)](#) and [UGT1A1*27 \(rs6742078\)](#), which also lower enzyme activity, leading to a reduced ability to detox. All of these variations in [UGT1A1](#) can lead to toxicity disorders. The minor variants of [UGT1A1*27](#) and [UGT1A1*28](#) are usually inherited together [\[R\]](#).

Other, less well-researched [UGT1A1](#) variants with reduced enzyme activity include:

- ‘A’ at [rs10929302 \(UGT1A1*93\) \[R, R, R, R\]](#)
- ‘T’ at [rs887829 \(UGT1A1*80\) \[R, R, R\]](#)
- ‘G’ at [rs4124874 \(UGT1A1 *60\) \[R, R, R\]](#)
- ‘T’ at [rs4148325 \[R, R\]](#)
- ‘T’ at [rs199539868 \[R\]](#)
- ‘T’ at [rs114982090 \[R\]](#)

A [UGT2A1](#) variant, ‘G’ at [rs10518065](#), has been associated with poorer [cognitive performance](#). The negative effects of this allele are likely due to decreased production of glutathione, leading to increased oxidative stress in the brain [\[R, R, R\]](#).

The low-activity [UGT1A6](#) variants ‘G’ at [rs2070959](#) and ‘C’ at [rs1105879](#) have been associated with higher bilirubin levels and increased risk of toxicity from aspirin, benzene, and vinyl chloride [\[R, R, R, R\]](#).

Finally, two [UGT2B7](#) variants, ‘G’ at [rs7438135](#) and ‘T’ at [rs7439366](#), have been associated with increased enzyme activity and decreased effectiveness of opioids [\[R, R, R, R, R\]](#).



HIGHER ACTIVITY

Likely higher UGT activity based on 11 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:


GENE	SNP	GENOTYPE
UGT2A1	rs10518065	GA
UGT2B7	rs7439366	CT
USP40	rs4124874	GT
UGT1A6	rs34983651	CC
UGT1A6	rs887829	CC
UGT1A6	rs6742078	GG
UGT1A6	rs4148325	CC
UGT1A1	rs4148323	GG
UGT2B7	rs7438135	GG
UGT1A6	rs2070959	AA
UGT1A6	rs1105879	AA
UGT1A6	rs10929302	GG
UGT1A1	rs199539868	CC
UGT1A1	rs114982090	CC

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




Gut Health


Your gut is more than just a digestive system - it's a complex environment that influences your overall health. This section explores genetic factors that affect gut inflammation and function. We examine variations in genes that influence inflammatory responses in the digestive system and factors that may contribute to gut sensitivity. Understanding these genetic predispositions can help explain your digestive tendencies and inform strategies for maintaining optimal gut health.

 **MORE LIKELY**
Crohn's Disease


More likely to get Crohn's disease

 **MORE LIKELY**
Ulcerative Colitis


More likely to have ulcerative colitis

 **HIGHER ACTIVITY**
NLRP3 (Gut Inflammation)


Likely higher NLRP3 activity

 **MORE LIKELY**
Irritable Bowel (IBS)


More likely to have IBS

 **LOWER ACTIVITY**
HNF4A (Gut Inflammation)

Likely lower HNF4A activity

 **TYPICAL ACTIVITY**
CRHR1 (Stress/HPA Axis)

Likely typical CRHR1 activity

 **TYPICAL**
PTPN22 (Autoimmunity)

Likely typical PTPN22 genetics

 **LESS LIKELY**
Gut Inflammation

Less likely to have IBD

 **LOWER ACTIVITY**
JAK2 (Gut Inflammation)

Likely lower JAK2 activity

Crohn's Disease

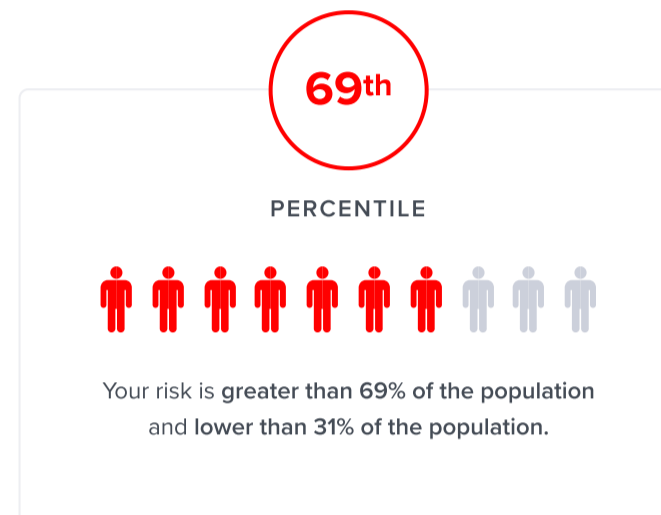
Aside from gastrointestinal symptoms, Crohn's Disease can also have systemic effects on the body, leading to issues such as anemia, skin rashes, arthritis, and eye inflammation. The cause of Crohn's Disease is not fully understood, but it involves an abnormal immune response to the microorganisms in the intestine, in genetically susceptible individuals.

There's no known cure for Crohn's Disease, but therapies can greatly reduce its signs and symptoms and even bring about long-term remission and healing of inflammation.



MORE LIKELY

More likely to get Crohn's disease based on 1,031,499 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
SLC23A1	rs10063949	CC
ATG16L1	rs2241880	GG
STAT3	rs744166	AA
SLC22A5	rs12521868	TT
JAK2	rs10758669	CA
IL23R	rs11465804	TT
IRGM	rs1000113	CT
PPM1M	rs5743836	GG
NKX2-3	rs10883365	GG
AGT	rs5051	TT
CUL1	rs7807268	GG
IL23R	rs11805303	CT
PTPN22	rs2476601	GG
IRGM	rs4958847	GA
IRGM	rs13361189	TC
ATG16L1	rs3828309	GG
LRRK2	rs11175593	TC
BTBD8	rs34856868	GG
SLC22A5	rs17622378	GG
NKX2-3	rs11190140	TT
IRF8	rs2361755	GG

GENE	SNP	GENOTYPE
PTGER4	rs1992660	TC
KLF6	rs6601764	CC
SLC22A5	rs2188962	TT
IRGM	rs11741861	AG
NRIP1	rs2823286	GG
ITLN1	rs2274910	CC
MFSD4B	rs3851228	AA
ADO	rs10995271	GC
IRGM	rs11747270	AG
RNASET2	rs2301436	CT
ADO	rs10761659	AG
IL12B	rs56167332	AC
CARD9	rs13300218	GA
CARD9	rs10781499	AG
CACNA1S	rs11584383	TC
IL19	rs3024505	AG
INAVA	rs7554511	CA
CUL2	rs17582416	TG
GPX4	rs2024092	AG
ICAM5	rs11879191	AG
CCL13	rs3091315	GA
CUL2	rs11010067	CG
HLA-DQB1	rs9469220	GA
IKZF3	rs2872507	GA
C1ORF141	rs17375018	GA
CDKAL1	rs6908425	CT
UBLCP1	rs10045431	CA
TRIB1	rs1551398	AG
NOD2	rs2066844	CC

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

Ulcerative Colitis

The exact cause of ulcerative colitis is not fully understood, but it is believed to be the result of an overactive immune system response that leads to inflammation in the colon. It can affect individuals at any age, though it often begins during adolescence and early adulthood.

The impact of the disease can range from mild to severe, with some patients experiencing life-threatening complications. Managing ulcerative colitis often requires a combination of medication, lifestyle changes, and potentially surgery to control symptoms and improve quality of life.



MORE LIKELY

More likely to have ulcerative colitis based on 1,049,227 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
STAT3	rs744166	AA
HNF4A	rs6017342	CC
HLA-DQA2	rs2395185	GT
IL23R	rs76418789	GG
IL23R	rs11805303	CT
/	rs113653754	CC
MFSD4B	rs3851228	AA
NR5A2	rs2816958	GG
IL19	rs1800872	GG
FCGR2A	rs1801274	AA
IRF5	rs4728142	GA
RORC	rs4845604	GG
KIAA1841	rs7608910	GG
OTUD3	rs6426833	AG
SLC39A11	rs17780256	AA
ETS2	rs2836878	AG
IL19	rs3024505	AG
INAVA	rs7554511	CA
IL23R	rs2201841	AG
TNFAIP3	rs6920220	GA
IL12B	rs56167332	AC

GENE	SNP	GENOTYPE
TNFSF15	rs11554257	CT
CARD9	rs13300218	GA
CARD9	rs10781499	AG
IRGM	rs11741861	AG
ADO	rs10761659	AG
NCR3	rs3749946	CC
IL23R	rs80174646	GG
TLR4	rs4986790	AA
IL19	rs1800896	CT
JAK2	rs1830610	CC
LRRK2	rs12422544	CT
DLD	rs2158836	GG
MST1	rs3197999	GG
TMCO4	rs3806308	CC
MDM1	rs7134472	GG
NKX2-3	rs4409764	TT
TYK2	rs12720356	AA
CELSR3	rs9868809	CC
GPR35	rs3749171	CT
CIITA	rs4781011	GG
PDGFB	rs2413583	CC
PARK7	rs3766606	GG
GPR12	rs17085007	TT
IKZF3	rs12946510	CT
DLD	rs4380874	CC
GALC	rs8005161	CC
HSPG2	rs12568930	TT
CCR1	rs113010081	TT
NXPE4	rs561722	TT

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

NLRP3 (Gut Inflammation)

One of the main *NLRP3* variants is [rs10754558](#). People with the “**GG**” genotype were about **2.5 times** more likely to have **ulcerative colitis** in one study. Interestingly, this variant has also been linked to severe food allergies [\[R, R, R\]](#).

Another well-researched variant is [rs35829419](#). Its “**C**” allele is linked to higher odds of **IBD** and other inflammatory conditions like rheumatoid arthritis and eczema [\[R, R\]](#).

Other *NLRP3* variants linked to higher odds of IBD (Crohn’s) include [\[R\]](#):

- [rs3806265-C](#)
- [rs4925648-T](#)
- [rs3738447-G](#)

These variants likely increase *NLRP3* activity, contributing to excess inflammation [\[R, R\]](#).



HIGHER ACTIVITY

Likely higher NLRP3 activity based on 5 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
NLRP3	rs35829419	CC
NLRP3	rs10754558	CG
NLRP3	rs3806265	CC
NLRP3	rs3738447	GG
NLRP3	rs4925648	CC

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

Irritable Bowel (IBS)

Key Takeaways:

- Up to **60%** of IBS differences may be due to genetic factors.
- Other risk factors include young age, female sex, stress, and gut infections.
- IBS affects **1 in 10** people in the US. Symptoms include cramping, vomiting, rectal bleeding, diarrhea, and constipation.
- If you have high genetic risk or symptoms, look to improve modifiable factors like stress, sleep, and diet.
- Click the **Recommendations** tab for potential dietary and lifestyle changes and **next steps** for relevant labs.

There is no known cure for IBS. If you have IBS, **doctors can help you manage symptoms and prevent flare-ups** so that you can live a normal life [\[R, R\]](#).

The main IBS management strategies include [\[R\]](#):

- Eating foods high in dietary fiber
- Drinking lots of water
- Regular exercise
- A healthy & regular [sleep](#) schedule
- Avoiding stress
- Avoiding triggering foods

The strategies most likely to work for you may be written into your genes. Up to 60% of IBS differences may be due to genetic factors [\[R\]](#).

Genes involved in IBS may play a role in [\[R, R\]](#):

- [Bile](#) production and release ([KLB](#))
- Gut movement ([HTR3E](#))
- Pain perception ([HTR3E](#))
- Immune system activity ([TLR9](#))

Moreover, genetically high betaine levels may be causally associated with a high risk of Crohn's disease [\[R\]](#).

It's important to remember that **genetics is only one piece of the puzzle**. You are also more likely to develop IBS if you are [\[R\]](#):

- Under the age of 50
- Experiencing a lot of mental [stress](#)
- Female or taking [estrogen](#)
- [Anxious](#) or [depressed](#)
- Recovering from a gut infection
- Related to other people with IBS



MORE LIKELY

More likely to have IBS based on 1,671 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
TRPM8	rs10166942	TT
NXPH1	rs2349775	AA
NNMT	rs1062613	CT
PPM1M	rs5743836	GG
TNFSF15	rs4263839	GA
MAPT	rs7209436	TC
TNFSF8	rs7848647	CT
IL6	rs1800795	GG
TNFSF15	rs6478108	TC
TNFSF8	rs6478109	GA
SI	rs9290264	AA
/	rs17112758	AA
LSR	rs10424110	AG
BDNF	rs6265	CT
KDELR2	rs12702514	TC
IL19	rs1800896	CT
KLB	rs17618244	AG
PHF2	rs10156602	GA
PRRC2A	rs2736155	GC
NCAM1	rs7947502	TC
NCAM1	rs7106434	CT

GENE	SNP	GENOTYPE
DOCK9	rs9513519	AG
ABCC5	rs56109847	GG
MAPT	rs242924	TT
TNF	rs1800629	GG
ZFP90	rs16260	CC
FGFR4	rs1966265	GG
SPATA5	rs9999118	AA
SI	rs79717168	AA
SI	rs121912615	AA
EXTL2	rs72987295	GG
PCDH15	rs10825269	CC
HES6	rs4663866	AA
/	rs2366846	CC
STK17A	rs7802995	AA
TGFBR2	rs7427882	CC
MAPT	rs110402	AA
PON2	rs6973126	TT
CADM2	rs1248825	CC

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

HNF4A (Gut Inflammation)

Several studies suggest that certain genetic variants of *HNF4A* may increase the risk of developing ulcerative colitis (UC) [R, R, R].

A genome study including over 7,000 people with European ancestry found that **the 'C' allele in rs6017342 is associated with greater rates of UC** [R].

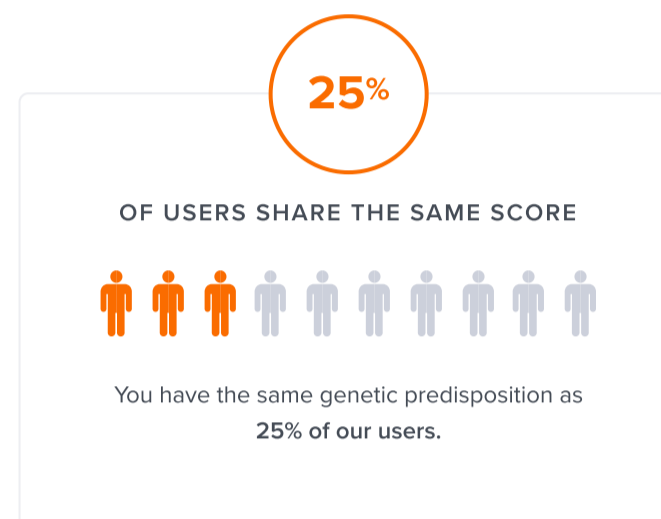
Likewise, two more studies of over 2,000 Dutch and 1,900 Korean patients also found that those carrying a 'C' allele were significantly more likely to have UC [R, R].

The HNF4A protein helps maintain the [mucosal barrier in the intestines](#). This barrier is responsible for protecting the lining of the intestines while allowing nutrients to be absorbed. Variants resulting in lower levels of this protein may disrupt this mucosal barrier [R, R, R].



LOWER ACTIVITY

Likely lower HNF4A activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
HNF4A	rs6017342	CC

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

CRHR1 (Stress/HPA Axis)

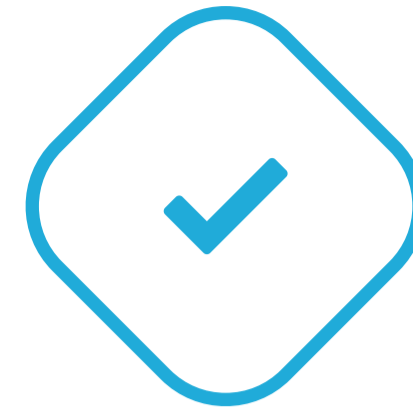
Two variants, 'A' at [rs12938031](#) and 'C' at [rs4792887](#), have been associated with increased odds and severity of [PTSD](#). These variants are believed to increase *CRHR1* expression or activity [\[R, R\]](#).

Another variant believed to increase *CRHR1* activity, 'G' at [rs12944712](#), has been associated with acute PTSD symptoms in children. However, the 'A' allele at this polymorphism is the one associated with [depression](#) [\[R, R\]](#).

The 'G' variant of [rs17689882](#), which may also increase *CRHR1* activity, has been associated with depression due to childhood trauma in young adulthood [\[R\]](#).

The 'A' variant of [rs110402](#) is believed to decrease *CRHR1* expression. This variant has been associated with relatively higher rates of [chronic fatigue](#). However, this variant may protect from depression linked to childhood abuse and [IBS](#). In IBS patients, the 'A' variant is associated with predomination of diarrhea in men and constipation or mixed symptoms in women [\[R, R, R, R, R, R\]](#).

Finally, the 'G' allele of [rs242924](#), which may increase *CRHR1* activity, has been associated with higher IBS rates and associated anxiety. This variant has also been associated with major depression in adults who suffered from childhood abuse. However, this variant may be protective against chronic fatigue [\[R, R, R\]](#).



TYPICAL ACTIVITY

Likely typical *CRHR1* activity based on 6 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ARHGAP27	rs4792887	CC
MAPT	rs12944712	GG
CRHR1	rs17689882	GG
MAPT	rs12938031	AG
MAPT	rs242924	TT
MAPT	rs110402	AA

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

PTPN22 (Autoimmunity)

According to a study of almost 40,000 people, two *PTPN22* variants—[rs2476601](#) and [rs6679677](#)—are crucial genetic contributors to [hypothyroidism](#). Carriers of minor 'A' alleles on one of these variations have a 36% higher risk of hypothyroidism, compared with people who carry major alleles (G and C, respectively). These variants are almost always inherited together, so you will most likely carry either both or neither of them [\[R\]](#).

The rs2476601 variant also showed a significant connection with [Graves' disease](#). In two British studies of 2,700 participants, the 'A' allele was associated with 43-88% higher rates. Two studies of over 900 Polish subjects confirmed this link and found that people with the 'A' allele get diagnosed younger. The same allele correlated with 85% higher rates of Graves' disease in a Chinese meta-analysis [\[R, R, R, R, R\]](#).

The 'A' variants of these polymorphisms have also been associated with an increased risk of:

- [Rheumatoid arthritis](#) [\[R, R, R, R, R, R, R, R, R\]](#)
- [Lupus](#) [\[R, R, R, R, R, R, R\]](#)

Other conditions associated with the 'A' allele include [\[R, R, R, R, R, R\]](#):

- Juvenile idiopathic arthritis
- Type 1 diabetes
- Vitiligo
- Myasthenia gravis
- Alopecia areata
- Drug-induced liver injury
- Addison's disease
- Idiopathic inflammatory myopathies
- Immune thrombocytopenia
- Anti-neutrophil cytoplasmic antibody-associated vasculitis

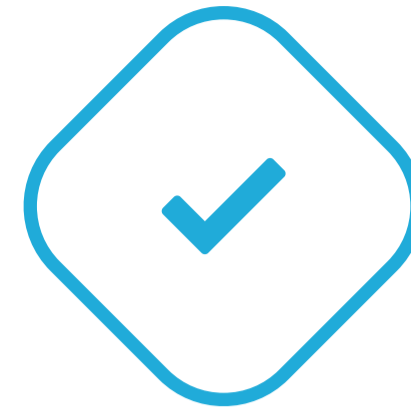
However, this allele showed a protective effect (around 16% lower odds) in the case of [Crohn's disease](#) [\[R\]](#).

Other *PTPN22* variants such as [rs2488457](#) and [rs33996649](#) are also associated with autoimmune diseases, especially rheumatoid arthritis, type 1 diabetes, and ulcerative colitis.

Scientists haven't figured out the exact mechanism by which these variations cause harm. The key may lie in defective PTP synthesis, which disables the protein and prevents the removal of self-attacking [lymphocytes](#) (T and B cells) [\[R, R\]](#).

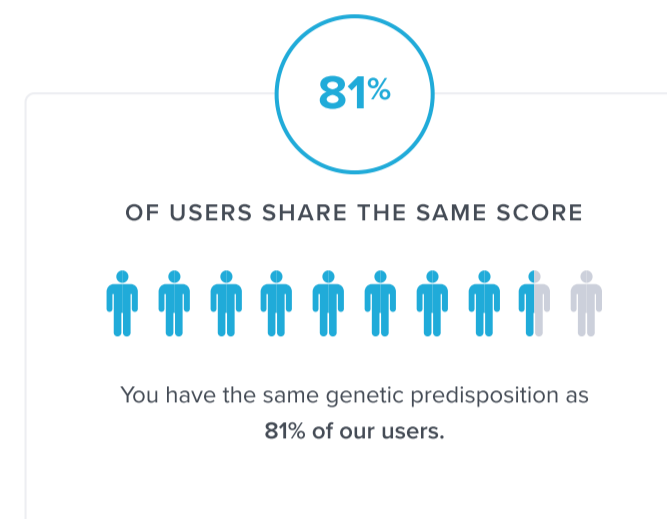
Risk variants may contribute to autoimmunity by:

- Being less capable of fighting infections
- Increasing T cell, Th1 and Th17 activity
- Suppressing regulatory T cells (Tregs)
- Activating B cells and self-attacking B cells



TYPICAL

Likely typical *PTPN22* genetics based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
PTPN22	rs6679677	CC
PTPN22	rs2476601	GG

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

Gut Inflammation

Key Takeaways:

- Up to **75%** of differences in people's chances of developing IBD may be due to genetics.
- Risk factors include being under age 30, European ancestry, and smoking.
- IBD may cause: diarrhea, fatigue, abdominal pain, bloody stool, weight loss, inflammation, liver damage, and colon cancer.
- IBD only affects about **3 in 1000** people worldwide. So, even with high genetic risk, your overall risk is actually low.
- Click the **Recommendations** tab for potential dietary and lifestyle changes and **next steps** for relevant labs.

Our intestines do much more than absorb food. They can impact our immune system, mood, and more [\[R\]](#)!

[Inflammatory bowel disease](#) (IBD) is a group of gut diseases affecting **about 0.3% of people worldwide**. It's most common in North America, Europe, and Australia [\[R\]](#).

The exact causes of IBD are unknown. Possible risk factors include [\[R\]](#):

- Age (most people develop IBD before the age of 30)
- European ancestry
- Cigarette smoking
- **Genetics**

There are two major types of IBD: [ulcerative colitis](#) and Crohn's disease. Ulcerative colitis involves [inflammation](#) in the large intestine, while Crohn's disease often affects both the large and small intestines [\[R, R, R\]](#).

In both types of IBD, the immune system reacts to normal gut bacteria as if they're dangerous. These immune reactions cause inflammation and damage to the gut lining [\[R\]](#).

This gut damage can cause signs and symptoms like [\[R, R, R\]](#):

- Diarrhea
- Fatigue
- Abdominal [pain](#) and cramping
- Blood in the stool
- Low appetite
- [Weight loss](#)

Untreated IBD can have serious complications, including [\[R\]](#):

- Skin, eye, and joint inflammation
- Bile duct and liver damage
- Blood clots
- Colon cancer

People with IBD typically need anti-inflammatory medications to control their disease [\[R, R\]](#).

Many people with IBD take supplements because their damaged guts have trouble absorbing certain nutrients. Some people may need to adhere to special diets as well [\[R, R\]](#).

IBD can be a disabling condition, and many turn to alternative and complementary strategies to help them manage their symptoms. Your DNA may help determine which of these strategies is likely to work best for you.



LESS LIKELY

Less likely to have IBD based on 1,671 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
FCGR2A	rs1801274	AA
ATG16L1	rs2241880	GG
STAT3	rs744166	AA
SLC22A5	rs12521868	TT
JAK2	rs10758669	CA
ADO	rs10761659	AG
HNF4A	rs6017342	CC
IL23R	rs11465804	TT
IL23R	rs11209026	GG
HLA-DQA2	rs2395185	GT
IL23R	rs10889677	CA
IRGM	rs1000113	CT
ATG16L1	rs10210302	TT
PPM1M	rs5743836	GG
TNFSF15	rs6478108	TC
IL23R	rs76418789	GG
IRGM	rs10065172	CT
NKX2-3	rs10883365	GG
TNF	rs1799724	CT
AGT	rs5051	TT
STAT3	rs4796793	CC

Up to 75% of differences in people's chances of developing IBD may be attributed to genetics. Genes involved in IBD may influence [\[R, R, R, R\]](#):

- Inflammation ([JAK2](#), [TNFSF15](#), [SLAMF8](#))
- Immune response ([TLR9](#), [UBE2L3](#), [BCL3](#))

Moreover, genetically high betaine levels may be causally associated with a high risk of Crohn's disease. In contrast, genetically high levels of omega-3s may be causally associated with a lower risk [\[R, R, R, R\]](#).

GENE	SNP	GENOTYPE
CUL1	rs7807268	GG
STAT3	rs2293152	CG
IL23R	rs11805303	CT
CLEC4G	rs4804803	GG
PTPN22	rs2476601	GG
TNFSF8	rs6478109	GA
GLYCTK	rs352140	TT
IRGM	rs4958847	GA
NLRP3	rs10754558	CG
IRGM	rs13361189	TC
ATG16L1	rs3828309	GG
LRRK2	rs11175593	TC
IL23R	rs7517847	TT
GLYCTK	rs352139	CC
STAT3	rs9891119	AA
PDGFB	rs2413583	CC
NKX2-3	rs11190140	TT
PTGER4	rs1992660	TC
IL19	rs1800872	GG
IRF5	rs4728142	GA
NKX2-3	rs4409764	TT
ZNF365	rs7076156	AG
TNFSF15	rs4263839	GA
KLF6	rs6601764	CC
SLC22A5	rs2188962	TT
NRIP1	rs2823286	GG
TNFSF15	rs3810936	CT
IRF8	rs10521318	CC
LRRK2	rs11564258	AG

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

JAK2 (Gut Inflammation)

The most widely-studied [JAK2](#) polymorphism is [rs10758669](#). Its minor variant “C” increases the production and activity of the JAK2 protein, leading to an enhanced immune response and inflammation [R].

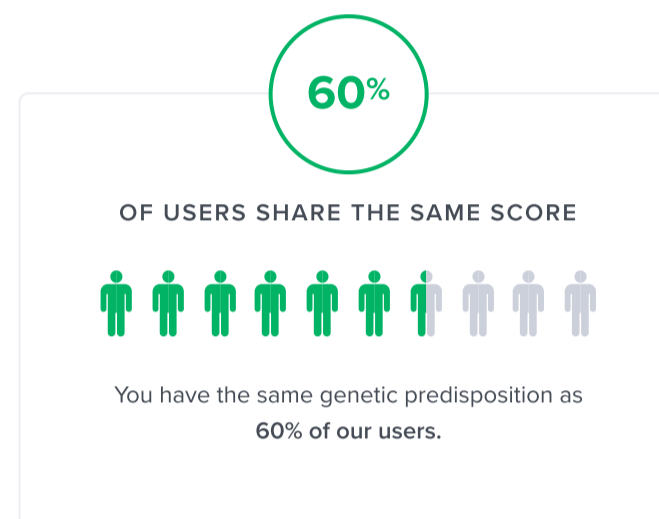
As a result, it’s linked to higher odds of [IBD — both Crohn’s disease and ulcerative colitis](#). The link may be stronger for Crohn’s disease, especially in people of European ancestry [R, R, R, R, R, R, R, R].

Another important JAK2 variant, [rs12340895-G](#), has shown similar associations. It’s often inherited with rs10758669-C, meaning that many people will either have none or both of them [R, R, R].



LOWER ACTIVITY

Likely lower JAK2 activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
JAK2	rs10758669	CA
JAK2	rs12340895	CC

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



Cognition

Your genetic makeup influences how your brain functions and maintains itself over time. This section examines genes that affect cognitive health, including factors related to memory, learning, and brain recovery. We explore variations that influence cognitive resilience and how your brain responds to various stressors. While genes play a role in cognitive function, they work together with lifestyle factors to influence brain health throughout life.

 **MORE LIKELY**
Parkinson's Disease


More likely to get Parkinson's disease

 **SLIGHTLY LOWER LEVELS**
BDNF


Slightly lower BDNF levels

 **TYPICAL LIKELIHOOD**
Alzheimer's Disease


Typical likelihood of Alzheimer's disease

 **TYPICAL LIKELIHOOD**
Dementia

Typical likelihood of dementia

 **LESS LIKELY**
Cognitive Decline

Less likely to have cognitive decline

 **LESS LIKELY**
Concussion

Less likely to have a concussion

Parkinson's Disease

Key Takeaways:

- About **20-40%** of the differences in people's chances to develop Parkinson's disease may be due to genetics.
- Other risk factors include age (over 60), being male, and toxin exposure.
- PD is an underdiagnosed disease, with about **90,000** diagnosed each year in the U.S.
- PD has no cure, but is managed better the earlier it is diagnosed.
- If you are at high genetic risk be aware of symptoms and talk to your doctor immediately if you notice any.

The causes of Parkinson's disease are not fully understood, but it likely involves a combination of **genetic and environmental factors**. These factors reduce the brain's ability to produce certain chemicals, mainly **dopamine** [R].

About **20-40%** of the differences in people's chances of developing Parkinson's disease may be due to **genetics**. Approximately **15%** of cases have a **family history** of the condition [R, R, R].

Genetically high betaine and choline levels may be causally associated with Parkinson's disease, while genetically high levels of DHA may be causally associated with a lower risk [R, R].

Beyond genetics, other risk factors for Parkinson's include [R]:

- Age: typically over 60
- Sex: men are at a higher risk
- Exposure to toxins like pesticides



MORE LIKELY

More likely to get Parkinson's disease based on 1,031,982 genetic variants we looked at

70th

PERCENTILE



Your risk is greater than 70% of the population and lower than 30% of the population.

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
MAPT	rs17649553	CC
LINGO2	rs10812774	TC
HLA-DQA2	rs9275326	CC
MCCC1	rs12637471	GG
SNCA	rs356182	AG
TMEM175	rs34311866	TC
FYN	rs943437	AA
FDFT1	rs2740594	AA
TMEM229B	rs1555399	TT
COQ8A	rs4653767	TT
MED13	rs6416935	GG
LRRK2	rs76904798	TC
NDUFAF2	rs2694528	AC
NUCKS1	rs823118	TC
TMEM163	rs6430538	TC
VPS37B	rs11060180	GA
RIT2	rs12456492	GA
ZDHHC2	rs591323	AG
GPNMB	rs199347	AG
GCH1	rs11158026	CT
IGSF9B	rs329648	TC

GENE	SNP	GENOTYPE
FAM47E	rs6812193	TC
SH3GL2	rs13294100	TG
GALC	rs8005172	TC
LSM7	rs62120679	CT
BCKDK	rs14235	AG
DLG2	rs3793947	GA
DRD1	rs686	GA
ADAM15	rs35749011	GG
LINGO2	rs7033345	TT
BAG3	rs117896735	GG
ITIH1	rs143918452	GG
STK39	rs1474055	CC
CAMK2D	rs78738012	TT
ANKK1	rs12364283	AA
SIPA1L2	rs10797576	CC
BST1	rs11724635	AA
ZSCAN31	rs9468199	GG
ZSCAN31	rs17767294	AA
TBC1D5	rs4073221	TT
C2CD4A	rs2414739	GG
TOX3	rs4784227	CC
GBF1	rs2296887	TT
MAP4K4	rs34043159	TT

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

BDNF

The [BDNF](#) gene helps produce BDNF and strongly impacts its levels and activity [\[R\]](#).

A crucial [BDNF](#) gene variant is [rs6265](#), also known as "[Val66Met](#)". It may affect BDNF production, storage, and release in brain cells [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

As a result, the "**T**" ("**Met**") allele is linked to reduced cognitive function, including [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Learning difficulties
- Poor memory
- Dementia

Besides cognitive effects, this variant may also play a role in [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- [Stress and anxiety](#)
- [PTSD](#) and [OCD](#)
- [Weight control](#)
- [Migraines](#)
- [Fatigue](#)

Moreover, the "T" variant may impair response to the antidepressant effects of low-dose ketamine. Nevertheless, this variant may not affect the effectiveness of ketamine for treatment-resistant depression [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

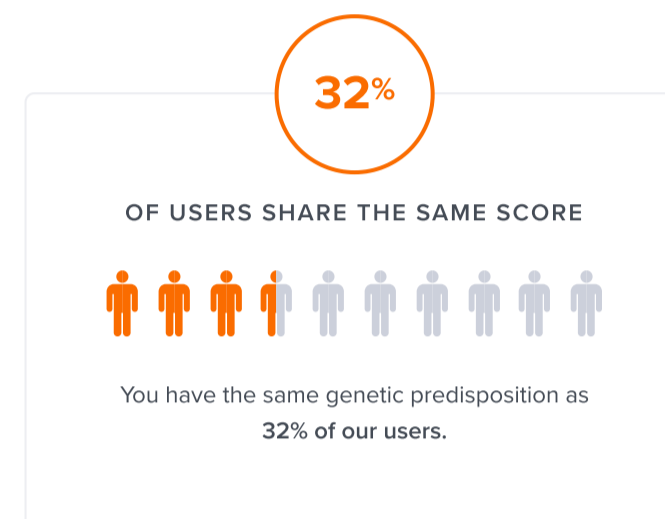
However, you should keep in mind some **important limitations** [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- The effects of this variant on some traits are conflicting.
- Many studies looking into the cognitive effects of this variant are limited to people with mental health problems.
- The link between this variant and some conditions, such as OCD and dementia, may be significant only in women.
- **Your other genetic variants, lifestyle, and environment may also influence your BDNF levels and activity.**



SLIGHTLY LOWER LEVELS

Slightly lower BDNF levels based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
BDNF	rs6265	CT

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

Alzheimer's Disease

Key Takeaways:

- About **60-80%** of differences in people's chances of getting Alzheimer's disease may be due to genetics.
- Alzheimer's disease can wipe out cognitive abilities.
- **5.8 million** Americans have Alzheimer's disease, the vast majority of them being over 75 years of age.
- Other risk factors include old age, female sex, air pollution, alcohol abuse, and obesity.
- **This report doesn't take into account the APOE-e4 variant.**

Some of the risk factors for Alzheimer's include [\[R\]](#):

- Being over the age of 75
- Being female
- High exposure to air pollution
- Poor sleep patterns
- Alcohol abuse
- Sedentary lifestyle
- Low social interaction
- Low involvement in mentally stimulating activities

The following conditions may contribute to Alzheimer's disease [\[R\]](#):

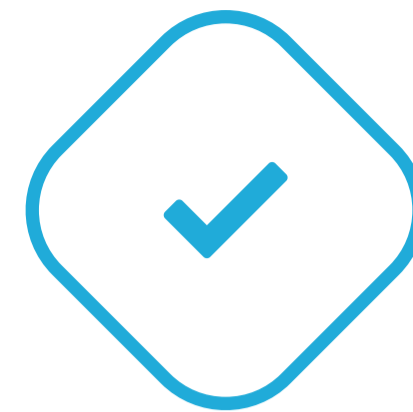
- Mild cognitive impairment
- Head trauma
- Obesity
- Diabetes
- High cholesterol
- Down syndrome

About **60-80%** of differences in people's chances of getting Alzheimer's disease may be due to genetics [\[R\]](#).

Genetically high fasting insulin, ApoB, and neutrophil levels may be causally associated with a higher risk of Alzheimer's disease [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

In contrast, genetic predisposition to high total testosterone and glucosamine supplement use may be causally associated with a lower risk [\[R\]](#), [\[R\]](#).

Please note: Genetic models analyzing a lot of variants (PRS models) usually don't take into account variants with large effects, such as **APOE-e4**. This variant is by far the strongest genetic factor for Alzheimer's disease. If you carry it, your predisposition to Alzheimer's disease is higher, regardless of your result for this report.



TYPICAL LIKELIHOOD

Typical likelihood of Alzheimer's disease based on 1,049,157 genetic variants we looked at

66th

PERCENTILE



Your risk is greater than 66% of the population and lower than 34% of the population.

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CHRM2	rs6962027	TT
PICALM	rs3851179	TT
GSK3B	rs334558	GA
CD55	rs3818361	GA
POLR2E	rs12151021	AA
HLA-DRB1	rs9271192	CA
CD55	rs679515	CT
ECHDC3	rs7912495	GG
SORT1	rs11102972	CT
CLNK	rs6846529	CT
COX7C	rs62374257	CT
CPSF3	rs72777026	AG
WDR81	rs35048651	DEL(GAG)T
IGHG3	rs7157106	GA
LILRB5	rs587709	CT
SNX1	rs3848143	AG
GC	rs2282679	GT
CLU	rs11136000	CC
APOE	rs429358	TT
TREM2	rs75932628	CC
PTGS2	rs20417	GG

GENE	SNP	GENOTYPE
RELN	rs528528	CC
SETD7	rs535347112	CC
BDNF	rs56164415	GG
SYPL2	rs17646665	AA
NGFR	rs2072446	CC
SLC20A1	rs1800587	GG
TREML1	rs60755019	AA
SORL1	rs11218343	TT
NCK2	rs143080277	TT
TREM2	rs143332484	CC
SORT1	rs141749679	TT
GPX4	rs3764650	TT
ABI3	rs616338	CC
WWC1	rs17070145	TT
ATP8B4	rs138799625	CC
PILRB	rs1476679	TT
BIN1	rs744373	AA
SORL1	rs74685827	TT
BIN1	rs6733839	CC
MME	rs61762319	AA
SHARPIN	rs34173062	GG
FOXF1	rs16941239	TT
C1QTNF4	rs10838725	TT
DBNDD1	rs56407236	GG
APH1B	rs117618017	CC
CD2AP	rs9349407	GG
STYX	rs17125924	AA
RASGEF1C	rs113706587	GG
OTULIN	rs112403360	TT

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

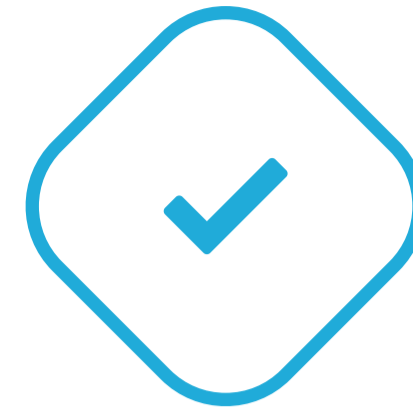
Dementia

Symptoms of dementia may include:

- **Memory loss:** Particularly problems with short-term memory, such as forgetting conversations, appointments, or recent events.
- **Communication difficulties:** Trouble with finding the right words, following conversations, or understanding instructions.
- **Mood changes:** Shifts in mood and personality, including increased confusion, anxiety, and depression.
- **Cognitive impairment:** Difficulty in reasoning, complex tasking, organizing, planning, and handling complex tasks.
- **Disorientation:** Losing track of dates, seasons, and the passage of time.
- **Impaired visual and spatial abilities:** Difficulty judging distance or distinguishing color or contrast, which can affect driving.

While most types of dementia are progressive and incurable, some therapeutic approaches and medications can manage symptoms and improve quality of life. These include:

- **Medications:** Such as cholinesterase inhibitors and memantine to manage symptoms.
- **Therapeutic strategies:** Cognitive therapy, physiotherapy, occupational therapy, and speech therapy.
- **Lifestyle changes:** Regular physical activity, a healthy diet, cognitive training, and social engagement have been shown to help delay the onset or slow the progression of symptoms.
- **Support services:** Support for both patients and caregivers, including counseling and caregiver education, is crucial.



TYPICAL LIKELIHOOD

Typical likelihood of dementia based on 1,674 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
RFX4	rs11610873	GG
ZNF334	rs202380	CC
CDH4	rs34197461	AG
HFE	rs1799945	CC
TFAP2A	rs116443000	CC
LHX6	rs181518405	GG
CFAP46	rs146777408	CC
PCSK5	rs73650172	AA

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

Cognitive Decline

Mild cognitive decline is a normal part of aging that can affect cognitive functions such as memory, attention, and problem-solving.

About **60-70%** of the differences in people’s cognitive decline may come from genetics. For example, genetically high total and bioavailable testosterone may be causally associated with larger gray matter volume in men [R, R, R].

Other risk factors for cognitive decline include [R]:

- Older age
- Female sex
- Lifestyle factors like smoking and being inactive
- Lower education level

Different health conditions may play a role in cognitive decline, including high cholesterol and blood pressure [R].



LESS LIKELY

Less likely to have cognitive decline based on 272,168 genetic variants we looked at

2nd

PERCENTILE



Your risk is greater than 2% of the population and lower than 98% of the population.

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CDCA7	rs182734936	CC
ANXA5	rs141005242	CC
/	rs200668351	GG
TEK	rs147486058	AA
DUSP15	rs6089150	CC
CTBP2	rs61869228	CC
HHEX	rs60320343	AA
CRP	rs1205	CC
FOXO3	rs4946936	CC
APOE	rs7412	CC
CLU	rs11136000	CC
KIF11	rs6583817	CC
MS4A6A	rs610932	GG
TRIM32	rs7852872	CC
LHFPL6	rs9315702	AA
DPP4	rs6741949	GG
/	rs11706133	TT
WDFY2	rs9535753	TT
LAMP3	rs630527	GG
FOXJ2	rs7138264	GG
OPCML	rs11606197	TT

GENE	SNP	GENOTYPE
/	rs72956174	TT
B3GALNT1	rs4455332	CC
C3ORF56	rs11716691	AA
IRX2	rs72720951	AA
ZNF799	rs4804181	AA
/	rs57169846	GG
BDNF	rs6265	CT
ALCAM	rs34476301	AG
SIRT1	rs3758391	CT
TNF	rs1799724	CT
SNRPB	rs2076650	TC
A2M	rs11609582	TA
APBB2	rs13133980	GC
BCHE	rs1803274	CT
PRR16	rs3991625	CT
CEMIP2	rs12237894	GC
SALL1	rs2075199	CT
MRPS18C	rs10004897	AG
SALL3	rs7231688	AG
CHD6	rs6072411	GA
HSD11B1	rs60686175	TC
/	rs10457441	TT
TMEM106B	rs1990622	AG
APOE	rs429358	TT
TNS1	rs13013766	GG
/	rs62477365	TT
BCL11A	rs6545794	GG
IFNL3	rs73050457	CC
ABCA2	rs908832	GG

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

Concussion

Factors that might increase the risk of getting a concussion include:

- Participation in high-impact or collision sports such as football, hockey, soccer, or boxing.
- Having had a previous concussion.
- Falling, especially in young children and older adults.
- Being involved in a motor vehicle accident.
- Being a pedestrian or cyclist struck by a vehicle.
- Being involved in military combat.
- Being a victim of physical abuse.

While the primary cause of a concussion is a physical trauma, **genetics can play a role in how an individual responds and recovers from a concussion.** Certain genetic factors might influence the brain's structural resilience to injury, susceptibility to inflammation following trauma, and the efficiency of neural repair mechanisms.



LESS LIKELY

Less likely to have a concussion based on 341,035 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
APOE	rs7412	CC
BDNF	rs6265	CT
PLXNA4	rs117985931	AA
SPATA5	rs144663795	GG
APOE	rs429358	TT

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



Heart & Metabolism

Your cardiovascular and metabolic health are closely interconnected, influenced by multiple genetic factors. This section explores genes affecting heart function, blood sugar regulation, and lipid metabolism. From variations influencing blood pressure and cholesterol levels to those affecting insulin sensitivity, understanding these genetic factors can provide valuable insights into your body's natural tendencies in maintaining cardiovascular and metabolic health.

<p>MORE LIKELY</p> <p>Coronary Artery Disease</p> <p>More likely to have coronary artery disease</p>	<p>LOWER ACTIVITY</p> <p>CDKN2B (Blood Sugar)</p> <p>Likely lower CDKN2B activity</p>	<p>TYPICAL LIKELIHOOD</p> <p>Type 2 Diabetes</p> <p>Typical likelihood of type 2 diabetes</p>
<p>TYPICAL LIKELIHOOD</p> <p>High Blood Pressure</p> <p>Typical likelihood of hypertension</p>	<p>TYPICAL</p> <p>Insulin Resistance</p> <p>Predisposed to typical insulin resistance</p>	<p>TYPICAL ACTIVITY</p> <p>PPARG (Metabolism)</p> <p>Likely typical PPARG activity</p>
<p>TYPICAL ACTIVITY</p> <p>GCKR (Blood Sugar)</p> <p>Likely typical GCKR activity</p>	<p>TYPICAL LEVELS</p> <p>LDL Cholesterol</p> <p>Predisposed to typical levels of "bad" cholesterol</p>	<p>TYPICAL LEVELS</p> <p>Triglycerides</p> <p>Predisposed to typical triglyceride levels</p>
<p>TYPICAL LEVELS</p> <p>Lipoprotein(a)</p> <p>Predisposed to typical Lipoprotein(a) levels</p>	<p>LESS LIKELY</p> <p>Metabolic Syndrome</p> <p>Less likely to have metabolic syndrome</p>	<p>LOWER ACTIVITY</p> <p>ACE (Fitness/ Cardiovascular)</p> <p>Likely lower ACE activity</p>



LOWER ACTIVITY

**CETP (Cholesterol/
Longevity)**

Likely lower CETP activity



HIGHER ACTIVITY

**FADS1/2 (Fatty Acid
Metabolism)**

Likely higher FADS1/2 activity

Coronary Artery Disease

Key Takeaways:

- Over **18 million** people have heart disease in the U.S. A third of deaths from heart disease are preventable.
- Up to **40%** of differences in people's chances of getting coronary artery disease may be due to genetics.
- Other risk factors include excess weight, stress, sedentary lifestyle, smoking, and more.
- If you have a high genetic risk, take action on modifiable risk factors. Even with a low genetic risk, having other risk factors will still make you prone to heart disease.
- Click the **next steps** tab for relevant labs and lifestyle factors.

In the US, 1 in 3 deaths from heart disease could be prevented. That's about 92,000 deaths each year. **Imagine if we could save all those lives by striving to prevent heart disease** [\[R\]](#)!

Coronary artery disease is the most common type of heart disease. It affects the coronary arteries -- the large blood vessels that feed the heart. When these vessels become narrowed or blocked, they can't deliver as much oxygen to the heart. Because of this, heart muscle tissue can start to die off [\[R\]](#), [\[R\]](#).

If a coronary artery is blocked suddenly, it can cause a heart attack. If the artery narrows slowly over a long period of time, it can cause chest pain and other problems [\[R\]](#).

Many factors can increase your risk of heart disease. These include [\[R\]](#), [\[R\]](#):

- Excess weight
- Unhealthy diet
- Stress
- Lack of exercise
- Smoking
- Air pollution
- Age
- High blood pressure
- High cholesterol
- Diabetes
- Genetics

According to the CDC, **over 18 million adults in the US have coronary artery disease**, and the rates keep increasing. However, death rates have been going down. This is likely due to improved diagnosis and treatment [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#)!

Medications that doctors often prescribe for coronary artery disease include [\[R\]](#):

- Low doses of aspirin, to help prevent blood clots
- Statins, to reduce cholesterol and slow down fat buildup in blood vessels
- Beta-blockers, to lower blood pressure and relax the heart

It's much easier to prevent heart disease than to treat it. To avoid heart disease, experts recommend a "heart-healthy" lifestyle, which includes [\[R\]](#):

- Not smoking cigarettes
- Eating a healthy diet
- Staying physically fit
- Getting good-quality sleep



MORE LIKELY

More likely to have coronary artery disease based on 1,049,366 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
NOS3	rs2070744	CT
PEMT	rs12936587	GA
COMT	rs4680	GA
PCSK9	rs11591147	GG
ATG16L1	rs10210302	TT
NKX2-3	rs10883365	GG
FHL3	rs190569784	GG
SERPINA1	rs112635299	GG
ANGPTL4	rs116843064	GG
APOE	rs7412	CC
IRGM	rs1000113	CT
LDLR	rs6511720	GG
IL23R	rs11805303	CT
/	rs72711827	GG
SORT1	rs12740374	GG
PHACTR1	rs9349379	GG
FBXL20	rs72823390	CC
PLPP3	rs17114046	AA
/	rs2457480	AA
ADO	rs10761659	AG
MCTP2	rs28607113	TT

Up to 40% of differences in people's chances of getting coronary artery disease may be attributed to genetics. Genes that may contribute to coronary artery disease influence [\[R\]](#):

- Fat metabolism ([APOE](#), [APOB](#), [LPL](#), [LPA](#), [PCSK9](#))
- Inflammation ([IL5](#), [IL6R](#))
- Blood clotting ([SERPINA1](#))
- Blood vessel function ([NOS3](#), [TGFB1](#), [VEGFA](#), [ANGPTL4](#))

Genetically higher levels of the following markers are causally associated with a higher risk of heart disease [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- White blood cells
- Fasting insulin
- IGF-1
- ApoB
- Neutrophils
- L-carnitine

In contrast, genetically high total testosterone and EPA may be causally associated with a lower risk of coronary heart disease [\[R\]](#), [\[R\]](#).

GENE	SNP	GENOTYPE
PHOSPHO1	rs191896574	TC
FAM177B	rs17465982	AA
NOS3	rs3918226	TC
MRPS6	rs28451064	AG
LPA	rs73596816	AG
PEMT	rs7946	CT
TWIST1	rs2107595	GA
EDNRA	rs17612693	AT
TCF21	rs1966248	AT
DDI1	rs2128739	AC
FGD5	rs148880716	GG
LPA	rs140570886	TT
LPA	rs147555597	GG
PTGER4	rs17234657	TT
LPA	rs55730499	CC
SEH1L	rs2542151	TT
NOD2	rs17221417	CC
BSN	rs9858542	GG
MAP3K4	rs145099029	AA
CDKN2B	rs145542470	GG
NBEAL1	rs72934535	TT
SCAF11	rs1291621	GG
MTRNR2L7	rs4934855	AA
LPL	rs7011846	GG
SOX11	rs79576311	GG
SMIM11A	rs149487184	CC
BMP1	rs73225842	CC
BAG2	rs223290	CC
LRRC25	rs11670056	CC

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

CDKN2B (Blood Sugar)

Two studies (the largest one with 62,892 type 2 diabetes cases and 596,424 controls) done in individuals of European ancestry identified the minor 'C' allele of [rs10811661](#) as decreasing fasting glucose and the risk of type 2 diabetes. Another study on 48,437 individuals of South Asian ancestry and 20,298 of European descent confirmed these associations. In line with this, the major variant has been associated with impaired insulin release and glucose tolerance [\[R, R, R, R\]](#).

Moreover, people with the 'C' allele may experience a far greater benefit to blood sugar when they exercise than people without it [\[R, R\]](#).

This variant has also been associated with a decreased risk of:

- Obesity [\[R\]](#)
- Breast cancer [\[R\]](#)
- Intracranial aneurysm [\[R\]](#)

One of the above-mentioned meta-analyses also identified the minor 'G' allele of [rs1063192](#) among those decreasing fasting glucose and the risk of type 2 diabetes [\[R\]](#).

This variant has also been linked to a reduced risk of:

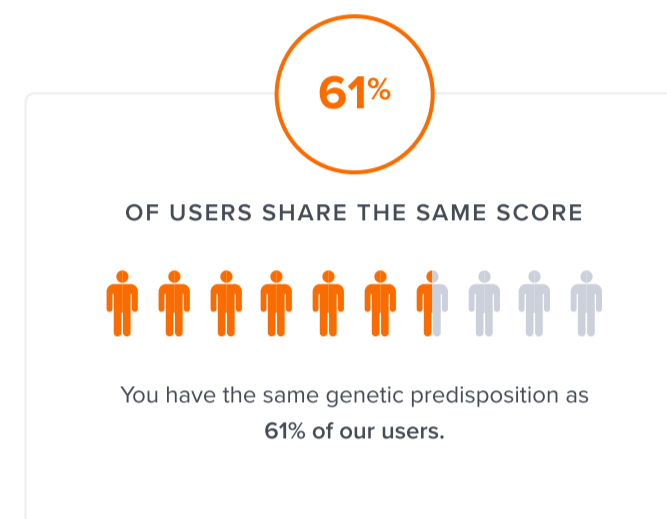
- Glaucoma [\[R\]](#)
- Myocardial infarction [\[R\]](#)

Based on their association with lower blood sugar and risk of diabetes, these variants may increase *CDKNB2* activity.



LOWER ACTIVITY

Likely lower CDKN2B activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CDKN2A	rs10811661	TT
CDKN2B	rs1063192	AA

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

Type 2 Diabetes

Key Takeaways:

- Almost **1 in 3 Americans** are at risk of developing type 2 diabetes.
- Up to **80%** of the differences in people's risk for getting type 2 diabetes may be due to genetics.
- Even with high genetic risk, blood sugar issues are highly modifiable through diet, exercise, and lifestyle changes.
- Risk factors include: obesity, high sugar diet, lack of exercise, age over 45, smoking, and family history. Even with low genetic risk, these factors can raise your overall risk, so take action now!
- Click the **Recommendations** tab for potential dietary and lifestyle changes and **next steps** for relevant labs.

You've probably heard about the dangers of high [blood sugar](#) (glucose). It puts **almost 1 in 3 Americans at risk of developing type 2 diabetes** [R].

Type 2 diabetes is a common and dangerous disease. In older adults, it can cause heart disease, stroke, kidney damage, and more. If diabetes isn't treated, it can be fatal [R].

If you're at risk of diabetes, your doctor may recommend weight loss and diet changes. **Eating less sugar is usually the first step.** If your [blood sugar](#) (glucose) is very high, your doctor may also prescribe medications [R, R].

To understand how blood sugar rises and falls, we first need to understand how insulin works.

When blood sugar is high, the pancreas releases insulin. Insulin is responsible for lowering blood sugar. It signals your liver and muscles to store sugar [R, R].

Insulin levels rise when you eat sugary foods. If insulin stays high for a long time, your body can stop responding to it. This is called [insulin resistance](#) [R].

Insulin resistance often leads to higher than normal blood sugar levels, or *prediabetes*. **If you don't take steps to fix it, prediabetes can develop into type 2 diabetes** [R].

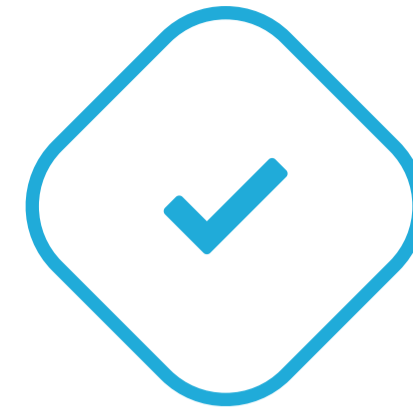
Prediabetes is hard to spot because it doesn't have obvious symptoms. However, blood tests can help diagnose it [R].

A doctor might order [blood sugar tests](#) if any of the following risk factors apply to you [R]:

- Obesity
- A diet high in sugar and refined carbs
- Lack of exercise
- Age over 45
- Polycystic ovary syndrome (PCOS)
- Smoking
- Family history of diabetes
- Black, Hispanic, Asian, or Native American ethnicity

Up to 80% of the differences in people's chances of getting type 2 diabetes can be attributed to genetics. Genes that may contribute to high blood sugar influence [R]:

- Sensitivity to insulin ([TCF7L2](#), [FTO](#), [PPARG](#))
- Insulin production & release ([KCNJ11](#), [SLC30A8](#))
- Liver function ([HNF4A](#))



TYPICAL LIKELIHOOD

Typical likelihood of type 2 diabetes based on 1,048,858 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
TCF7L2	rs7903146	TC
SLC30A8	rs13266634	CC
GCKR	rs780093	CC
CDKN2A	rs10811661	TT
ADCY5	rs11708067	AA
BCL2	rs12454712	TT
HMGA2	rs2261181	CT
IMPDH1	rs791595	AG
TNF	rs2857605	CT
SLC38A11	rs10195252	CT
TSPAN3	rs7177055	GA
DGKB	rs2191349	GT
IGF2BP2	rs1470579	CA
CCND2	rs76895963	TT
TCF7L2	rs4506565	TA
PEMT	rs12325817	CC
WSB2	rs7973260	GA
IGF2BP2	rs11927381	CT
IGF2BP2	rs11705701	AG
MC4R	rs12970134	GG
JAZF1	rs1635852	CC

Genetically high levels of the following markers may be causally associated with a higher risk of type 2 diabetes [R, R, R, R, R]:

- IGF-1
- Neutrophils
- Leucine

In contrast, genetic predisposition to the following high markers may be causally linked to a lower risk of type 2 diabetes [R, R, R, R, R, R]:

- Testosterone (in men)
- Betaine
- Choline
- Alpha-linolenic acid

GENE	SNP	GENOTYPE
TAP2	rs2071479	CC
GIPR	rs10423928	TT
KCNJ11	rs5215	TT
CDKAL1	rs7756992	AA
/	rs184660829	TT
/	rs569511541	AA
/	rs562386202	AA
/	rs543786825	CC
/	rs759111467	GG
CCDC68	rs76197067	AA
RNASEH2A	rs755734872	CC
NEDD1	rs557027608	GG
/	rs533172266	CC
CDKAL1	rs9465871	TT
QSER1	rs528122639	GG
BPTF	rs558308082	GG
ZC3H11B	rs553014999	TT
ABCC8	rs67254669	AA
INS	rs571342427	TT
FAM13A	rs576406049	CC
/	rs745903616	GG
FTO	rs9939609	TT

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

High Blood Pressure

Key Takeaways:

- About 50% of people's differences in blood pressure may be due to genetics.
- Risk factors include age, ethnicity, diet, weight, activity levels, and stress which are all highly modifiable.
- If your genetic risk is high or you already have high blood pressure, you can take steps now to help reduce overall risk and improve your health.
- High blood pressure rarely causes symptoms, but it raises the risk for stroke and heart attack. Nine out of 10 Americans develop high blood pressure at some point in their lives.
- Click the **next steps** tab for relevant labs and lifestyle factors.

There are two major types of high blood pressure.

The first one is slow-developing and without an underlying cause. Doctors call this *primary* or *essential hypertension*. The majority of people will develop this type of high blood pressure.

Several factors can contribute to primary hypertension [R]:

- Age
- Being overweight or obese
- Not getting enough physical activity
- Tobacco use
- A diet high in salt (sodium)
- A diet low in potassium
- Alcohol abuse
- Stress
- Ethnicity (African ancestry)
- **Genetics**

Sometimes, high blood pressure is the result of a known underlying cause. Doctors call this *secondary* hypertension. Some examples of things that can cause secondary hypertension include [R]:

- Abuse of recreational drugs, such as cocaine and amphetamines
- Some medications, such as birth control pills and painkillers
- Conditions such as obstructive sleep apnea, kidney disease, and blood vessel defects

High blood pressure usually doesn't produce any symptoms. Most people don't realize they have it until they visit their doctor for a routine checkup [R]!

The danger is that high blood pressure increases your chances of heart attack and stroke. In 2018, high blood pressure contributed to the death of almost 500,000 Americans [R, R].

The good news is that high blood pressure is easy to detect and treat. Your doctor will work with you to reduce your blood pressure. They may recommend medication, a low-sodium diet, exercise, and other lifestyle changes [R].

Some strategies and recommendations may work better for some people than others. This is partly due to genetics, which may account for up to 50% of differences in blood pressure [R, R].

Genes that influence blood pressure can affect:

- Blood volume ([SCNN1A](#), [NPR3](#), [CSK](#), [AGT](#), and [ACE2](#)) [R, R, R, R, R]



TYPICAL LIKELIHOOD

Typical likelihood of hypertension based on 1,035,787 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
AGT	rs699	GG
ADRB1	rs1801253	CC
BCL2	rs12454712	TT
APOE	rs7412	CC
ACE2	rs1978124	T
NPR3	rs1173771	GA
SH2B3	rs3184504	TC
TWIST1	rs2107595	GA
ULK3	rs6495122	CA
TNNT3	rs4980379	TC
ARHGAP42	rs633185	CG
TCF7L2	rs34872471	CT
PRKAG2	rs10224002	GA
TNNT3	rs1973765	CC
FGF5	rs10857147	TA
FGF5	rs16998073	TA
FGF5	rs11099098	TG
KCNK3	rs35021474	CG
FGF5	rs1458038	TC
CASZ1	rs880315	TC
NT5C2	rs112913898	GA

- Blood vessel width ([AGT](#), [ACE2](#), and [NOS3](#)) [[R](#), [R](#), [R](#)]
- Stress response ([ADRB1](#) and [ADRB2](#)) [[R](#), [R](#)]
- Breakdown of blood pressure-raising compounds, such as caffeine ([CYP1A2](#)) [[R](#), [R](#)]

AGT and *ACE2* genes raise your blood pressure. They do this by increasing the amount of blood and making your blood vessels smaller. ACE inhibitors are blood pressure-lowering drugs that can counteract this [[R](#), [R](#), [R](#)].

Moreover, genetic predisposition to high levels of the following markers may be causally associated with high blood pressure [[R](#), [R](#), [R](#), [R](#), [R](#)]:

- Free testosterone
- Lymphocyte count
- Neutrophil count
- L-carnitine
- Alpha-linolenic acid

In contrast, genetically high IGF-1 and EPA levels may be causally associated with lower blood pressure [[R](#), [R](#)].

It's important to remember that genetics isn't everything. Your lifestyle and environment account for about 50% of blood pressure differences [[R](#)].

GENE	SNP	GENOTYPE
NT5C2	rs11191593	TC
FES	rs17514846	AC
PRDM8	rs1902859	CT
NT5C2	rs11191580	TC
FGF5	rs13149993	AG
NT5C2	rs11191548	TC
NT5C2	rs12219304	GC
ACE	rs4343	AA
ABO	rs579459	CC
ULK3	rs2472299	GG
ACE2	rs2285666	C
NGF	rs11466111	CC
EPAS1	rs10168349	CC
RPTOR	rs139293840	GG
BMP3	rs17004869	AA
CACNA1D	rs3774427	CC
CACNA1D	rs9814480	CC
ST7L	rs10776752	GG
ST7L	rs3790604	CC
EML6	rs72806698	CC
ST7L	rs12129649	GG
EML6	rs17046380	TT

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

Insulin Resistance

Insulin resistance is the reduction of the body’s ability to control blood sugar levels. It happens when the muscles, liver, and fat cells no longer respond to insulin and have trouble taking sugar up [R].

In response, the pancreas is forced to produce more insulin than normal to keep blood sugar in balance. Hence, people with insulin resistance may have high insulin levels. Blood sugar levels may also rise eventually, paving the way for diabetes [R, R].

Homeostatic model assessment ([HOMA-IR](#)) helps measure insulin resistance. It is calculated using your fasting glucose and fasting insulin. The higher your HOMA-IR, the more insulin resistant you are [R, R].

Insulin resistance is commonly caused by two factors: **overeating and lack of physical activity**. These can cause a buildup of fat in the liver and muscles that lead to insulin resistance [R, R, R].

Insulin resistance is associated with overweight and obesity, especially due to the accumulation of belly fat. However, normal-weight people may also have insulin resistance. Other health conditions may also lead to insulin resistance, including [R]:

- Sleep apnea [R]
- Thyroid disorders [R, R, R]
- Polycystic ovary syndrome (PCOS) [R, R]
- Pancreas disease [R, R]
- Acromegaly (too much growth hormone) [R]
- Cushing’s syndrome (excess of cortisol) [R]
- Rare genetic diseases [R, R, R, R]

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

The risk of insulin resistance may also increase due to:

- Aging [R, R]
- Stress [R, R]
- Fasting [R, R, R]
- Western diet [R]
- Too little sleep [R, R, R, R]
- Pregnancy [R]
- Exposure to toxins (e.g., herbicides) [R, R, R]
- Some drugs (e.g., corticosteroids) [R, R]

Genetics also influences insulin resistance. Up to **65%** of differences in people’s insulin resistance may be due to genetics [R, R].

Insulin resistance may increase the risk of:

- Diabetes
- Liver disease
- Metabolic syndrome

Interestingly, insulin resistance may occur up to 15 years before diabetes develops. Read [this post](#) for a detailed list of tips to reduce insulin resistance [R].



TYPICAL

Predisposed to typical insulin resistance based on 2,420 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
GAS1	rs9792548	AA
PPARG	rs1801282	CC
IRS1	rs2943641	TC
PPARG	rs3856806	CC
FOXO3	rs13217795	TT
FOXO3	rs2802288	AA
IGF1	rs35767	GG
NAT2	rs1208	AA
TIMP4	rs13081389	AA
KLHL2	rs17046216	AA
LEPR	rs1137101	AG
MRPS31	rs4581585	CC
ZC3H12C	rs475338	AA
FBXO21	rs2036313	GG
HAPLN1	rs1457105	CC
/	rs12969333	AA
DAAM2	rs4345393	GG
ME1	rs11967452	CC
KCNK17	rs10456469	GG
ORMDL3	rs939345	CC
ZIC2	rs7338383	GG

GENE	SNP	GENOTYPE
CSNK2A1	rs6053042	CC
RAB28	rs1197712	AA
ATP8B1	rs10439020	AA
MPC1	rs2281056	AA
MROH8	rs11698899	GG
RUNX3	rs803323	AA
TLR4	rs13290714	CC
SORCS1	rs7088188	CT
MDGA1	rs17589516	AA
CACNA1D	rs1401492	CC
SLC10A2	rs16962638	AA
ATP10A	rs6576507	TT
/	rs7043482	AC
CSMD1	rs2407314	CC
FTO	rs9939609	TT
TCERG1L	rs7077836	GG
ADRB3	rs4994	AA
FABP2	rs1799883	CC
FTO	rs1421085	TT
FTO	rs1121980	GG
BRD1	rs13057821	CC
KL	rs9535766	TT
UBR1	rs17776090	AA
BMP8A	rs710912	CC
/	rs2873975	GG
POLL	rs3730464	AA
RUNX1	rs17227476	GG
NINL	rs11698267	GG
FAM135B	rs10088248	CC

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

PPARG (Metabolism)

Out of the different SNPs in the *PPARG* gene, researchers have mostly focused on [rs1801282](#) (*Pro12Ala*, referred to as rs1805192 in some studies). Its 'G' allele changes one amino acid in the PPAR-γ structure, reducing its ability to activate target genes [R, R].

In a large meta-analysis of 75 studies and 49,000 subjects, the 'G' allele correlated with a slightly higher BMI. The link was more robust in European populations. A 2015 meta-analysis of 56 trials came to a similar conclusion. Another meta-analysis associated the 'G' allele with 55% higher obesity rates [R, R, R].

However, some studies failed to confirm a relationship between this variant and body weight, and some even observed a protective effect of the 'G' allele [R, R, R, R, R].

Among 978 elderly subjects, rs1801282-G correlated with 66% higher obesity rates. The lack of physical activity and increased intake of carbs amplified this genetic effect [R].

Interestingly, three studies found that people with rs1801282-G respond better to physical activity when it comes to metabolic improvements [R, R, R].

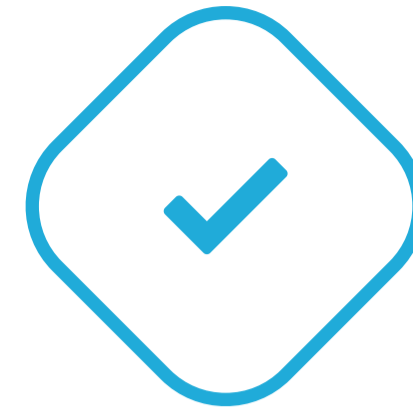
This variant may also affect [weight loss from the Mediterranean diet](#). Several studies found that 'G' carriers lost more weight when eating a [Mediterranean diet](#) rich in MUFAs, PUFAs, and extra virgin [olive oil](#) but lost less or even gained it when eating a diet low in these and high in saturated fats [R, R, R, R, R].

PPAR-γ can be a double-edged sword when it comes to regulating [blood sugar levels](#). While its activity in the liver and pancreas enhances glucose metabolism and insulin sensitivity, excess PPAR-γ activity in fat cells can accumulate fatty acids and other factors that contribute to [insulin resistance](#) and elevated blood sugar [R, R, R, R].

This may explain why the 'C' variant has been associated with higher blood sugar and increased rates of type 2 diabetes. In one of the studies, obesity further increased the risk of type 2 diabetes associated with this variant [R, R, R, R].

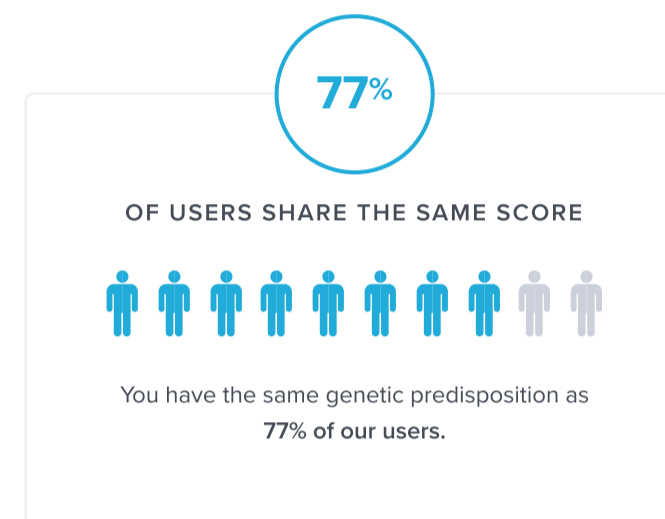
Two other variants, 'C' at [rs1899951](#) and 'C' at [rs17036160](#), have also been associated with high blood sugar and type 2 diabetes. However, they act as a single genetic factor because the three variants are usually inherited together [R, R].

Finally, the 'G' variant of rs1801282 has also been associated with reduced rates and severity of [acne](#) [R, R].



TYPICAL ACTIVITY

Likely typical PPARG activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
PPARG	rs1801282	CC

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

GCKR (Blood Sugar)

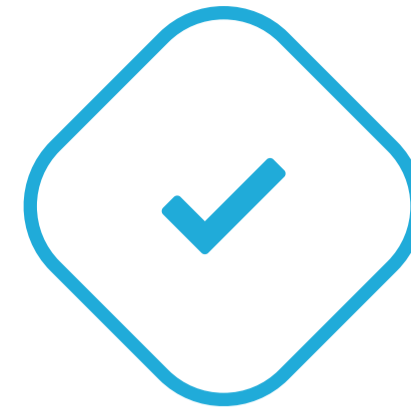
The main [GCKR](#) variants are:

- [rs1260326](#)
- [rs780093](#)
- [rs780094](#)

They are almost always inherited together, meaning you will most likely have either all or none of them. Their “**C**” alleles may be linked to **higher blood sugar levels and diabetes** [\[R, R, R\]](#).

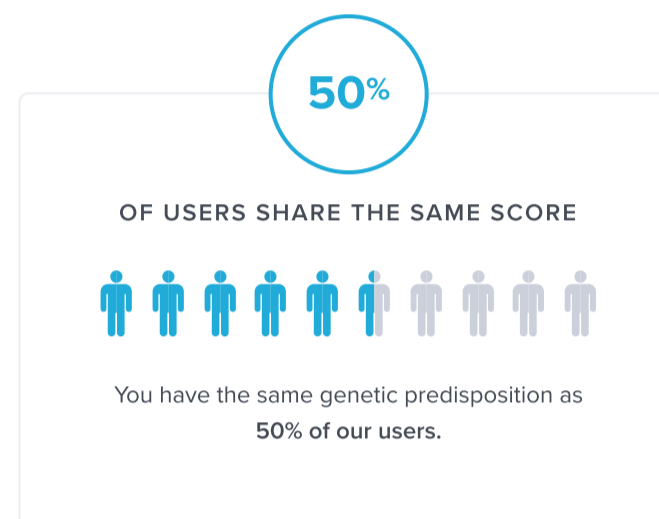
On the positive side, these variants are linked to lower levels of cholesterol and other blood lipids [\[R\]](#).

These variants may **increase** the production or activity of the glucokinase regulator, and thus inhibit the actions of glucokinase. This can result in elevated blood sugar levels — and lower blood lipids — by **decreasing insulin release** in response to meals [\[R, R\]](#).



TYPICAL ACTIVITY

Likely typical GCKR activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
GCKR	rs780093	CC
GCKR	rs1260326	CT
GCKR	rs780094	CT

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

LDL Cholesterol

Cholesterol in the blood is carried by proteins, mainly LDL, HDL, and VLDL. We call cholesterol carried by LDL “bad” cholesterol because it can stick to your blood vessels. This can cause heart problems [\[R, R\]](#).

Some risk factors for high LDL cholesterol include [\[R, R\]](#):

- A diet high in saturated fat
- Obesity
- Lack of exercise
- Older age
- **Genetics**

If your cholesterol levels rise, your doctor will recommend strategies for lowering them. These may include [\[R\]](#):

- A diet low in saturated fat (such as the Mediterranean diet)
- Exercise
- Losing excess weight
- Cholesterol-lowering medication

How well you respond to these strategies may depend on your genes.

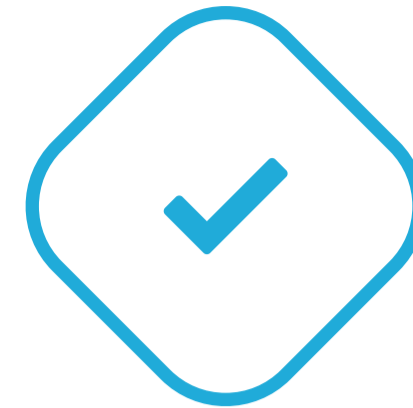
Genetically higher LDL cholesterol levels may play a role in:

- Heart Health [\[R, R, R, R, R, R, R, R, R, R, R, R, R\]](#)
- High Blood Sugar [\[R, R, R, R, R, R, R\]](#)
- Stroke [\[R, R, R, R\]](#)
- Kidney Health/eGFR/Artery Hardening [\[R\]](#).
- Bone Health [\[R, R, R\]](#)
- Joint Pain [\[R\]](#)
- Parkinson’s Disease [\[R\]](#)
- Longevity [\[R, R, R, R\]](#)
- High Blood Pressure [\[R\]](#)

Up to 65% of differences in cholesterol levels may be attributed to genetics. Genes that may contribute to high cholesterol influence [\[R, R, R, R, R, R\]](#):

- Cholesterol production ([HMGCR](#))
- Cholesterol transport ([APOB](#))
- HDL and LDL cholesterol balance ([CETP](#), [LPL](#), [LIPC](#))

Genetically high testosterone levels may be causally associated with a high risk of increased LDL-cholesterol [\[R\]](#).



TYPICAL LEVELS

Predisposed to typical levels of "bad" cholesterol based on 1,339,388 genetic variants we looked at

28th

PERCENTILE



Your risk is greater than 28% of the population and lower than 72% of the population.

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
APOE	rs7412	CC
APOE	rs141622900	GG
APOE	rs7254892	GG
PCSK9	rs11591147	GG
APOE	rs12721109	GG
APOE	rs62117160	GG
CEACAM20	rs200628672	GG
BCAM	rs28399654	GG
APOB	rs693	AG
LDLR	rs688	TC
CETP	rs5882	GA
LDLR	rs6511720	GG
NECTIN2	rs365653	AA
USP24	rs72660594	TT
NECTIN2	rs11668327	GG
LDLR	rs72658867	GA
SLCO1B1	rs4149056	TC
SIDT2	rs964184	CC
NLRC5	rs1800775	AA
/	rs12713559	GG
/	rs151135411	GG

GENE	SNP	GENOTYPE
APOC4	rs140526515	AA
NECTIN2	rs138914864	CC
NECTIN2	rs117310449	CC
APOE	rs769449	GG
/	rs150401285	AA
NECTIN2	rs144261139	CC
NECTIN2	rs76366838	GG
CLPTM1	rs490243	CC
APOE	rs4420638	AA
ABCG5	rs141828689	CC
CLPTM1	rs12691088	GG
APOB	rs5742904	CC
OLR1	rs12316150	AA
APOE	rs429358	TT
NECTIN2	rs34095326	GG
TOMM40	rs394819	GG
NECTIN2	rs41289512	CC
NECTIN2	rs138607350	TT
SNX8	rs144787122	AA
SLC22A3	rs3918291	TT
APOC1	rs389261	GG
LPA	rs3798220	TT
PVR	rs139267469	CC
LDLR	rs73015030	GG
MAFB	rs2207132	GG
APOC1	rs60049679	GG
BCL3	rs114036675	GG

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

Triglycerides

Triglycerides are the most common type of fat in the body. Some triglycerides are needed for the body to function. However, high levels can lead to health problems like artery hardening, stroke, heart disease, and pancreas inflammation [R, R, R, R, R].

About 1 in 3 adults in the US may have high triglycerides. This estimate is slightly higher in older adults. Over 4 in 10 people over 60 may be affected [R].

Many health conditions can lead to high triglycerides. These include [R, R]:

- Overweight or obesity
- Low thyroid hormones (*hypothyroidism*)
- Metabolic syndrome
- Diabetes
- Chronic kidney disease
- Autoimmune diseases like lupus
- HIV infection

To help lower triglycerides, doctors may recommend [R, R]:

- Diet changes
- Avoiding alcohol
- Exercise
- Weight loss
- Omega-3s
- Medication

Genetically higher triglyceride levels are likely causally associated with:

- Heart health [R, R, R, R]
- High blood pressure [R]
- Heart attack [R]
- Low mood [R, R]
- Gout [R]
- Kidney Health [R, R, R]
- Parkinson's (lower risk) [R]
- Bone health [R]
- Pancreas inflammation [R, R]
- Fatty liver [R]
- Age-related macular degeneration (lower risk) [R, R]
- Joint pain [R]
- Psoriasis [R]

Up to 45% of differences in people's triglyceride levels may be attributed to genetics. Genes involved in high triglycerides may influence fat metabolism. They include [R, R]:

- [BUD13](#)
- [APOC3](#)
- [APOA5](#)
- [GCKR](#)
- [LPL](#)
- [ZPR1](#)

Genetically higher fasting insulin may be causally associated with high triglycerides [R].



TYPICAL LEVELS

Predisposed to typical triglyceride levels based on 17,693 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
APOC3	rs147210663	GG
CETP	rs5882	GA
ACACB	rs149793040	AA
ANGPTL4	rs116843064	GG
APOA4	rs12721043	CC
PAFAH1B2	rs186808413	CC
LPL	rs75218485	CC
LPL	rs17091905	GG
LPL	rs117604010	GG
MAU2	rs58542926	CC
MLXIPL	rs113296769	AA
APOB	rs533617	TT
DNAJC30	rs13242693	CC
WSB2	rs7973260	GA
MLXIPL	rs71556711	TC
LPL	rs17489373	AG
SIDT2	rs964184	CC
PCSK7	rs662799	AA
NLRC5	rs1800775	AA
/	rs201079485	GG
/	rs149808404	GG

GENE	SNP	GENOTYPE
/	rs118204057	GG
PCSK7	rs5128	CC
FADS2	rs174546	CC
LPL	rs268	AA
APOA5	rs3135506	GG
PLA2G12A	rs41278045	AA
APOA4	rs12721041	CC
BACE1	rs116987336	GG
LPL	rs1801177	GG
MAP1A	rs55707100	CC
LPL	rs186868868	CC
BUD13	rs117794084	GG
APOE	rs141622900	GG
A1CF	rs41274050	CC
APOE	rs7412	CC
EIF3J	rs151291132	AA
APOE	rs7254892	GG
SOST	rs76868109	AA
SLC30A3	rs116170113	GG
CLPTM1	rs483082	GG
GTF3C2	rs149117895	CC
BUD13	rs114594921	TT
NECTIN2	rs138607350	TT
APOE	rs429358	TT

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

Lipoprotein(A)

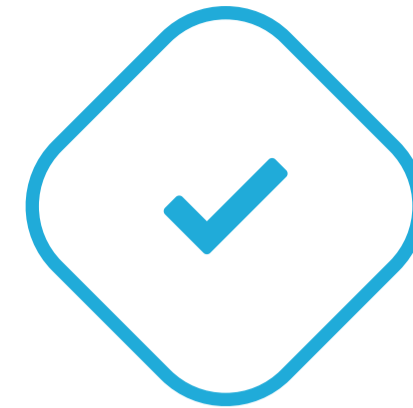
Lipoprotein(a), or Lp(a), is a type of LDL. It is made in the liver and carries fats such as cholesterol around the body. **Lp(a) may deposit on the artery walls.** This may lead to the formation of plaques that narrow the arteries. In line with this, higher Lp(a) levels have been associated with heart disease and stroke [R, R, R, R, R, R, R].

Genetics strongly influence Lp(a) levels. Up to **90%** of differences in people's Lp(a) levels may be due to genetics [R, R].

Genetically higher Lp(a) levels may be causally associated with:

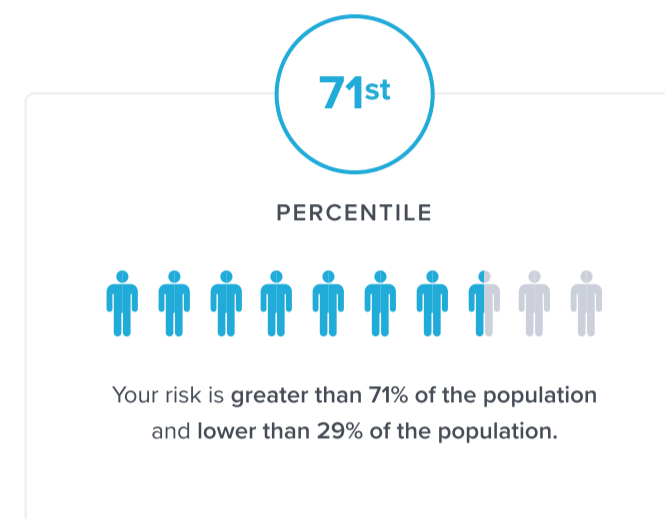
- Heart health (cardiovascular diseases) [R, R, R, R, R]
- Stroke [R, R, R]
- Longevity (reduced) [R]
- Atrial fibrillation [R, R]
- Anemia [R]
- Prostate cancer [R]

The effect of diet on Lp(a) is still a matter of research [R].



TYPICAL LEVELS

Predisposed to typical Lipoprotein(a) levels based on 831 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
LPA	rs41267819	GG
FADS2	rs1535	AA
LPA	rs76144756	GG
LPA	rs143431368	TT
SLC22A1	rs182980975	CC
LPA	rs41267809	AA
LPA	rs73596816	AG
PLG	rs145535174	AA
LPA	rs41272114	CC
LPA	rs4708871	TT
CETP	rs5882	GA
APOB	rs693	AG
TCF7L2	rs7903146	TC
GCKR	rs780094	CT
SLC22A3	rs6919346	CT
LPA	rs74617384	AA
SLC22A3	rs3918291	TT
/	rs151135411	GG
LPA	rs142720914	GG
SLC22A3	rs117446263	GG
LPA	rs3798220	TT

GENE	SNP	GENOTYPE
AGPAT4	rs61735260	GG
MRPL18	rs146888147	GG
SIDT2	rs964184	CC
PCSK7	rs662799	AA
APOA5	rs3135506	GG
LPA	rs10455872	AA
SLC22A1	rs146534110	GG
SLC22A3	rs118133674	GG
PLG	rs4252152	TT
/	rs200865946	CC
LPA	rs41272112	CC
LPA	rs200376184	GG
SLC22A3	rs8187722	AA
PLG	rs41272078	CC
LPA	rs41264848	GG
SLC22A3	rs3127573	AA
PLG	rs4252128	CC
SLC22A1	rs2282143	CC
LPA	rs140306630	CC
IGF2R	rs12207188	CC
MRPL18	rs73020718	AA

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

Metabolic Syndrome

Factors that might increase the risk of developing metabolic syndrome include:

- Age: Risk increases with age.
- Obesity, particularly abdominal obesity.
- Insulin resistance.
- A history of diabetes in one's family.
- A history of gestational diabetes or having given birth to a baby weighing more than 9 pounds.
- Other diseases: A history of nonalcoholic fatty liver disease, polycystic ovary syndrome, or having had a cardiovascular disease or stroke.
- Hormonal imbalance, like low testosterone in men.
- Lack of physical activity.
- An unhealthy diet high in fats and sugars.
- Genetics

Genetics plays a significant role in metabolic syndrome. Specific genetic factors might make certain individuals more susceptible to the conditions that contribute to metabolic syndrome. Family history, particularly if parents or siblings have had diabetes, heart disease, or a stroke, can be an indicator of increased risk.



LESS LIKELY

Less likely to have metabolic syndrome based on 636,870 genetic variants we looked at

5th

PERCENTILE



Your risk is greater than 5% of the population and lower than 95% of the population.

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
TCF7L2	rs7903146	TC
MTNR1B	rs10830963	CG
LPL	rs328	CC
WSB2	rs7973260	GA
MLXIPL	rs12056034	GA
TRIB1	rs2980888	CT
GALNT2	rs2281721	CT
INO80E	rs3814883	TT
GSR	rs10954772	TT
VEGFA	rs998584	CA
C1QTNF4	rs7124681	CA
GCKR	rs1260326	CT
ATP1B2	rs1143015	AG
HLA-C	rs9378248	GA
NAT2	rs4921913	TC
HLA-DQA2	rs5021727	AG
NCKAP5L	rs7138803	GA
ADRB3	rs4994	AA
MC4R	rs17782313	TT
SIDT2	rs964184	CC
CD300LG	rs72836561	CC

GENE	SNP	GENOTYPE
PCSK7	rs662799	AA
SIDT2	rs651821	TT
ADAL	rs139974673	TT
ARAP2	rs73123462	CC
ZDHHC18	rs114165349	GG
HNF4A	rs1800961	CC
RSPO3	rs577721086	TT
CLPTM1	rs483082	GG
ILRUN	rs11754773	AA
PPP1R3B	rs9987289	GG
HMGA1	rs76376137	TT
FADS2	rs1535	AA
SLC39A8	rs13107325	CC
FTO	rs56094641	AA
MC4R	rs66922415	AA
PABPC4	rs11206374	GG
PLG	rs11751347	CC
CMIP	rs2925979	CC
KLF14	rs10260148	CC
SEC16B	rs10913469	TT
BPTF	rs11871285	GG
SNX15	rs35661464	CC
TUBG2	rs12945575	CC
LIN7C	rs56133711	GG
SNX10	rs1534696	AA
RPL17	rs1105654	AA
TRPS1	rs3808439	GG
GAD1	rs12472667	CC
MLLT10	rs9971210	CC

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

ACE (Fitness/ Cardiovascular)

The two main ACE gene variants, [rs4341](#) and [rs4343](#), influence gene and enzyme activity. Their “**G**” alleles may increase ACE activity and levels. In line with this, they are linked to **high blood pressure and heart disease** [\[R, R, R, R\]](#).

Regarding athletic performance, higher ACE activity may favor short, high-intensity bursts of activity. This makes it advantageous for **power-based sports** [\[R, R, R\]](#).

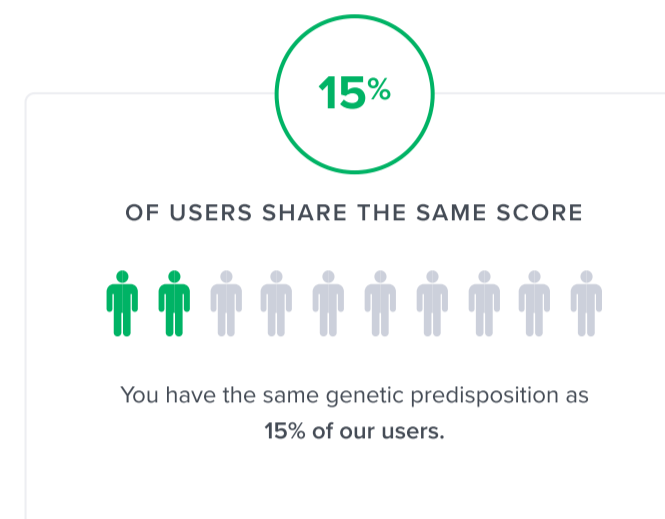
Conversely, **rs4341-C and rs4343-A** are linked to lower ACE activity, which may offer some protection against hypertension and cardiovascular conditions. Lower ACE activity can enhance **endurance** by improving blood flow and oxygen delivery to muscles during prolonged physical activity [\[R, R, R, R\]](#).

Please note: Some people's genetic files don't contain the rs4341 variant, so we didn't include it in the model. However, this variant is almost always inherited with rs4343, so one of them is sufficient to estimate your ACE genetics.



LOWER ACTIVITY

Likely lower ACE activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ACE	rs4343	AA

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

CETP (Cholesterol/ Longevity)

Certain variants in *CETP* are associated with longevity in some studies. According to researchers, this life-extending effect may be due to improved cholesterol levels, which may help prevent a number of heart conditions [R].

Longevity research has focused on two particular variants. The 'GG' genotype in [rs5882](#) (also known as the "I405V" polymorphism) and the 'AA' genotype in [rs708272](#) (also called the "TaqIB" polymorphism) have each been associated with lower CETP activity and longer lifespan [R].

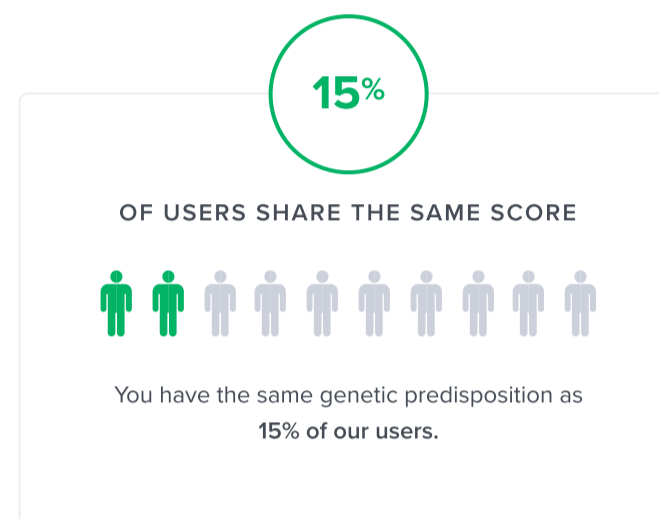
These variants have also been associated with a more favorable blood lipid profile characterized by [R, R, R, R, R, R]:

- Higher HDL
- Larger HDL and LDL particle size
- Higher apolipoprotein A-I
- Lower triglycerides



LOWER ACTIVITY

Likely lower CETP activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CETP	rs5882	GA
CETP	rs708272	AA

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

FADS1/2 (Fatty Acid Metabolism)

A number of studies suggest that specific variants in *FADS1/2* may cause [fat metabolism issues](#).

Using data from 426 individuals from Spain, one genome-wide study found that the 'T' allele of [rs174546](#) is associated with lower levels of PUFAs, such as the omega-6 fatty acid [arachidonic acid](#) (AA) and the omega-3s EPA and DHA. This may be because this variant impairs the conversion of ALA from plant sources into EPA and DHA [\[R\]](#).

Another study of 224 people from an isolated island population in the U.S. found that the 'T' allele is also associated with reduced levels of omega-6 fatty acids [\[R\]](#).

This allele has also been associated with higher triglyceride levels, but lower [LDL](#) and [total cholesterol](#), based on research in European, Canadian, and Mexican populations [\[R, R, R, R\]](#).

Similar results have been found for other SNPs, such as [rs174547](#), [rs174548](#), [rs174550](#), and [rs1535](#). In all these cases, the minor allele was associated with lower D5D activity and decreased levels of omega-3 and omega-6 fatty acids. These alleles are usually inherited together, so you will typically carry all the minor variants or none of them [\[R, R, R, R, R, R, R\]](#).

A different study looked at the SNP [rs174547](#) in over 21,000 Japanese and over 1,200 Mongolian individuals. Researchers also found that the 'C' allele was associated with higher triglycerides and lower [HDL cholesterol](#) in Japanese individuals. In the Mongolian population, the 'C' allele was only associated with lower LDL cholesterol but was unrelated to HDL or triglyceride levels [\[R\]](#).

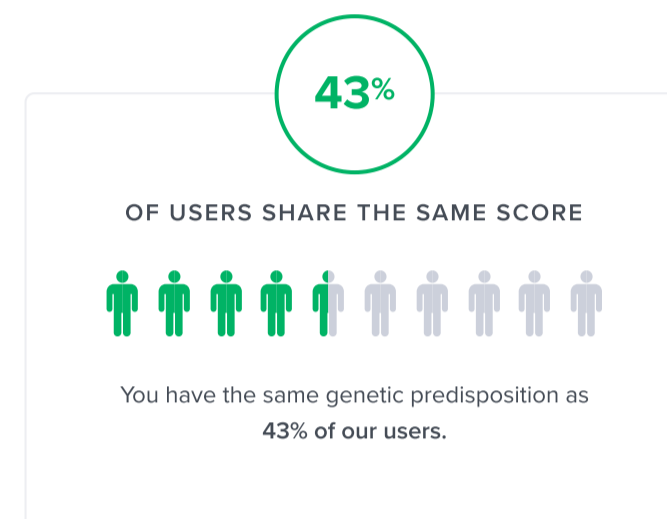
Another study of [rs174547](#) suggests that the 'C' allele is only associated with lower LDL in people who have a low intake of omega-3 fatty acids [\[R\]](#).

In addition, the 'C' allele of [rs174550](#) may also be associated with low HDL and higher triglyceride levels, according to research in Chinese populations [\[R\]](#).



HIGHER ACTIVITY

Likely higher FADS1/2 activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
FADS2	rs174546	CC
FADS2	rs174550	TT
FADS2	rs174548	CC
FADS2	rs174547	TT
FADS2	rs1535	AA

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

Recommendations Details

1



Aerobic Exercise (Cardio)

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

Helps with these Symptoms & Conditions:

Allergies

Anxiety

High Blood Pressure

Migraines

Helps with these Goals:

Energy

Immunity

Mood

Helps with these DNA Risks:

⚠️ Coronary Artery Disease

⚠️ Crohn's Disease

⚠️ Low Mood

⚠️ Parkinson's Disease

⚠️ Psoriasis

⚠️ Ulcerative Colitis

⚠️ BDNF

⚠️ Fibromyalgia

⚠️ Irritable Bowel (IBS)

⚠️ UCP1 (Weight)

Helps with these Lifestyle Risks:

⚠️ Chronic Fatigue Syndrome

✅ Depression

✅ Low Testosterone

2



Relaxation Techniques

Incorporate relaxation techniques such as deep breathing exercises, meditation, or yoga into your daily routine. Spend at least 15-30 minutes each day practicing one of these techniques, preferably in a quiet, comfortable space without interruptions.

TYPICAL STARTING DOSE

30 minutes

Helps with these Symptoms & Conditions:

Anxiety

High Blood Pressure

Migraines

Helps with these Goals:

- Energy
- Immunity
- Mood

Helps with these DNA Risks:

- ⚠️ Coronary Artery Disease
- ⚠️ Crohn's Disease
- ⚠️ Low Mood
- ⚠️ Psoriasis
- ⚠️ Ulcerative Colitis
- ⚠️ DHEAS
- ⚠️ Homocysteine
- ⚠️ Irritable Bowel (IBS)
- ⚠️ Methylation

Helps with these Lifestyle Risks:

- ⚠️ Chronic Fatigue Syndrome
- ✅ Depression

3



Yoga

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

Helps with these Symptoms & Conditions:

- Anxiety
- High Blood Pressure
- Migraines

Helps with these Goals:

- Energy
- Exercise Recovery
- Immunity
- Mood
- Muscle Growth


Helps with these DNA Risks:

- ⚠️ Coronary Artery Disease
- ⚠️ Crohn's Disease
- ⚠️ Low Mood
- ⚠️ Parkinson's Disease
- ⚠️ Ulcerative Colitis
- ⚠️ BDNF
- ⚠️ Fibromyalgia
- ⚠️ Homocysteine
- ⚠️ Irritable Bowel (IBS)
- ⚠️ Methylation

Helps with these Lifestyle Risks:

- ⚠️ Chronic Fatigue Syndrome
- ✅ Depression

4



Methylfolate

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

Helps with these Symptoms & Conditions:

High Blood Pressure

Helps with these Goals:

Immunity

Mood

Helps with these DNA Risks:

⚠️ Coronary Artery Disease

⚠️ Crohn's Disease

⚠️ Low Mood

⚠️ MTHFR

⚠️ Parkinson's Disease

⚠️ Psoriasis

⚠️ Ulcerative Colitis


⚠️ Folate (Functional)

⚠️ Homocysteine

Helps with these Lifestyle Risks:

✔️ Depression

5



Strength Training

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

Helps with these Symptoms & Conditions:

Anxiety

High Blood Pressure

Helps with these Goals:

Immunity

Mood

Muscle Growth

Helps with these DNA Risks:

⚠️ Coronary Artery Disease

⚠️ Low Mood

⚠️ Parkinson's Disease

⚠️ Homocysteine

Helps with these Lifestyle Risks:

✔️ Depression

✔️ Low Testosterone

6

**Mediterranean Diet**

Incorporate a variety of primarily plant-based foods, such as fruits, vegetables, whole grains, nuts, and legumes, into every meal. Choose healthy fats, like olive oil, over saturated fats and consume fish and poultry at least twice a week. Limit red meat to a few times a month and include a moderate amount of dairy products. Opt for water and red wine in moderation as your beverages.

Helps with these Symptoms & Conditions:

Allergies

High Blood Pressure

Helps with these Goals:

Energy

Mood

Helps with these DNA Risks:

⚠️ Coronary Artery Disease

⚠️ Crohn's Disease

⚠️ Low Mood

⚠️ Parkinson's Disease

⚠️ Psoriasis

⚠️ Ulcerative Colitis

⚠️ Fibromyalgia

Helps with these Lifestyle Risks:

⚠️ Chronic Fatigue Syndrome

✔️ Depression

7

**Omega-3 (Fish Oil)**

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

TYPICAL STARTING DOSE

500 mg

Helps with these Symptoms & Conditions:

- Anxiety
- High Blood Pressure
- Migraines

Helps with these Goals:


- Exercise Recovery
- Immunity
- Mood

Helps with these DNA Risks:

- ⚠️ Coronary Artery Disease
- ⚠️ Crohn's Disease
- ⚠️ Low Mood
- ⚠️ Psoriasis
- ⚠️ Ulcerative Colitis
- ⚠️ BDNF
- ⚠️ Homocysteine

Helps with these Lifestyle Risks:

- ✔️ Depression

8  **Zinc**

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

TYPICAL STARTING DOSE
15 mg

Helps with these Symptoms & Conditions:

- High Blood Pressure
- Migraines

Helps with these Goals:

- Immunity
- Mood

Helps with these DNA Risks:

- ⚠️ Coronary Artery Disease
- ⚠️ Crohn's Disease
- ⚠️ Low Mood
- ⚠️ MTHFR
- ⚠️ Ulcerative Colitis
- ⚠️ Homocysteine
- ⚠️ Methylation
- ⚠️ Zinc

Helps with these Lifestyle Risks:

 Depression

 Low Testosterone

9



Sleep for 7+ Hours

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

Helps with these Symptoms & Conditions:

High Blood Pressure

Migraines

Helps with these Goals:

Energy

Immunity

Mood

Helps with these DNA Risks:

 Coronary Artery Disease

 Low Mood

 Methylation

Helps with these Lifestyle Risks:

 Chronic Fatigue Syndrome

 Depression

 Low Testosterone

10



Dietary Omega-3 Fatty Acids

Incorporate foods high in omega-3 fatty acids into your diet daily. This includes eating fish such as salmon, mackerel, and sardines at least twice a week. Alternatively, include a tablespoon of flaxseed oil or chia seeds in your daily diet.

Helps with these Symptoms & Conditions:

High Blood Pressure

Migraines

Helps with these Goals:

Immunity

Mood

Helps with these DNA Risks:

 Coronary Artery Disease

 Crohn's Disease

 Low Mood

 Ulcerative Colitis

Helps with these Lifestyle Risks:

 Depression

11



Music Therapy

Engage in music therapy sessions for at least 30 minutes a day, three times a week. These sessions can involve listening to music, playing an instrument, singing, or writing songs, facilitated by a certified music therapist if possible.

TYPICAL STARTING DOSE

30 minutes

Helps with these Symptoms & Conditions:

Anxiety

High Blood Pressure

Migraines

Helps with these Goals:

Exercise Recovery

Mood

Helps with these DNA Risks:

 Coronary Artery Disease

 Low Mood

 Parkinson's Disease

 Psoriasis

 Fibromyalgia

Helps with these Lifestyle Risks:

 Depression

12



Tai Chi

Practice Tai Chi for 30 to 60 minutes at least twice a week. Choose a quiet, spacious area and follow along with a qualified instructor, either in person at a class or through an online video tutorial, to ensure proper technique and maximum benefit.

TYPICAL STARTING DOSE

1 hour

Helps with these Symptoms & Conditions:

- Anxiety
- High Blood Pressure

Helps with these Goals:

- Energy
- Mood

Helps with these DNA Risks:

- ⚠️ Coronary Artery Disease
- ⚠️ Low Mood
- ⚠️ Parkinson's Disease
- ⚠️ BDNF
- ⚠️ Fibromyalgia

Helps with these Lifestyle Risks:

- ⚠️ Chronic Fatigue Syndrome
- ✅ Depression

13



Maintain Optimal Vitamin D Levels

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

Helps with these Symptoms & Conditions:

- Allergies
- Anxiety
- High Blood Pressure
- Migraines

Helps with these Goals:

- Energy
- Immunity
- Mood
- Muscle Growth

Helps with these DNA Risks:

- ⚠️ Crohn's Disease
- ⚠️ Low Mood
- ⚠️ Parkinson's Disease
- ⚠️ Psoriasis
- ⚠️ Ulcerative Colitis
- ⚠️ BDNF
- ⚠️ Calcium
- ⚠️ Fibromyalgia
- ⚠️ Homocysteine
- ⚠️ Irritable Bowel (IBS)

Helps with these Lifestyle Risks:

- ⚠️ Chronic Fatigue Syndrome
- ✅ Depression
- ✅ Low Testosterone

14



Practice Exercise Snacks

Integrate short bursts of physical activity, each lasting about 1 to 2 minutes, into your daily routine at least two to three times a day. These 'exercise snacks' can include activities like doing a set of stairs, rapid bodyweight exercises, pull-ups, push-ups, sit-ups, or brisk walking.

TYPICAL STARTING DOSE

1 minutes

Helps with these Symptoms & Conditions:

High Blood Pressure

Helps with these Goals:

Mood

Muscle Growth

Helps with these DNA Risks:

 Coronary Artery Disease

 Low Mood

 DHEAS

Helps with these Lifestyle Risks:

 Depression

15



Meditation

Set aside 10-20 minutes each day in a quiet space without distractions to practice meditation. Focus on your breath or perform guided meditation using an app or audio track.

TYPICAL STARTING DOSE

30 minutes

Helps with these Symptoms & Conditions:

Anxiety

Migraines

Helps with these Goals:

Energy

Immunity

Mood

Helps with these DNA Risks:

- ⚠️ Coronary Artery Disease
- ⚠️ Crohn's Disease
- ⚠️ Low Mood
- ⚠️ Parkinson's Disease
- ⚠️ Psoriasis
- ⚠️ Ulcerative Colitis
- ⚠️ BDNF
- ⚠️ Fibromyalgia
- ⚠️ Irritable Bowel (IBS)

Helps with these Lifestyle Risks:

- ⚠️ Chronic Fatigue Syndrome
- ✅ Depression

Next Steps

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

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

Your Lifestyle Assessments

Ever heard of the term Nature vs. Nurture?

The thing is, both DNA and environment play a role in determining your health risks. The following assessments shows how much of an impact your lifestyle, environment and medical history are having on your health risks.



LIFESTYLE

You have a **slightly increased risk** of chronic fatigue syndrome based on the answers you provided.



Factors impacting your risk:

What is your sex?

Male

Increasing Risk

What is your current marital status?

Single or not living with partner

Increasing Risk

Have either of your biological parents ever suffered from anxiety?

Yes

Increasing Risk

What is your household annual income (in USD)?

More than \$25,000

Decreasing Risk

Have either of your biological parents ever suffered from chronic fatigue syndrome?

No

Decreasing Risk

Do you have frequent colds/flu?

No

Decreasing Risk

In a typical week, how many times do you participate in any physical activities or exercise for 30 minutes at a time? (such as walking, running, bike riding, weight training, yoga, etc.)

*Note: longer exercise equals more sessions (e.g., 1 hour = 2 sessions)

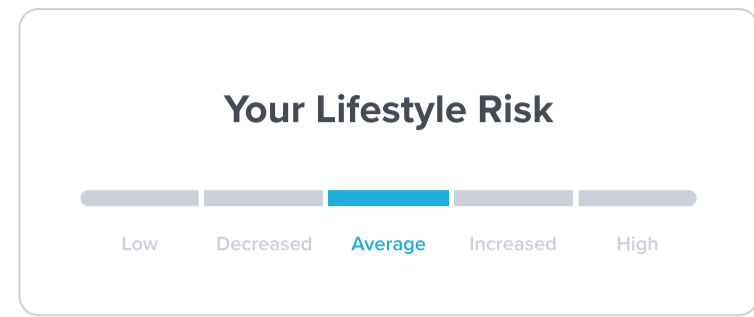
8 or more

Decreasing Risk 



LIFESTYLE

You have an **average risk** of depression based on the answers you provided.



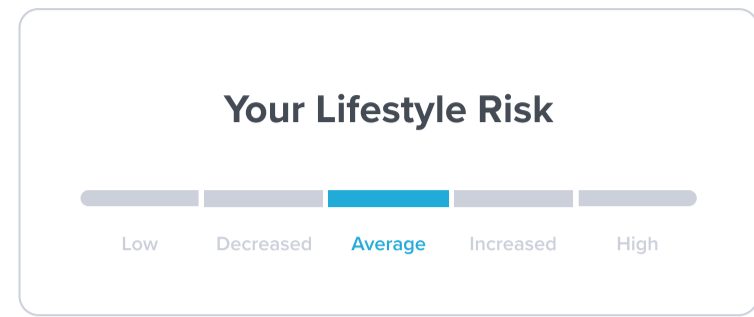
Factors impacting your risk:

What is your age? 41	Increasing Risk
Do you have a parent or sibling who has ever suffered from depression? Yes	Increasing Risk
Your BMI: 30.77	Increasing Risk
In a typical week, how many times do you participate in any physical activities or exercise for 30 minutes at a time? (such as walking, running, bike riding, weight training, yoga, etc.) *Note: longer exercise equals more sessions (e.g., 1 hour = 2 sessions) 8 or more	Decreasing Risk
Do you smoke tobacco? No, never	Decreasing Risk
Did you ever suffer from physical abuse or physical bullying during your childhood? No	Decreasing Risk
Did you ever suffer from sexual abuse during your childhood? No	Decreasing Risk
What is your height? 178 cm	No impact
What is your current weight? 97.5 kg	No impact



LIFESTYLE

You have an **average risk** of low testosterone based on the answers you provided.



Factors impacting your risk:

What is your age? 41	Increasing Risk
Have you recurrently been diagnosed with high cholesterol? Yes	Increasing Risk
Your BMI: 30.77	Increasing Risk
Have you ever been diagnosed with diabetes? No	Decreasing Risk
In a typical week, how many times do you participate in any physical activities or exercise for 30 minutes at a time? (such as walking, running, bike riding, weight training, yoga, etc.) 8 or more <small>*Note: longer exercise equals more sessions (e.g., 1 hour = 2 sessions)</small>	Decreasing Risk
Do you smoke tobacco? No, never	Decreasing Risk
Have you recurrently been diagnosed with high triglycerides? No	Decreasing Risk
Have you ever been diagnosed with high blood pressure (hypertension)? No	Decreasing Risk
Have you ever been diagnosed with a stroke? No	Decreasing Risk
Have you ever been diagnosed with prostate disease (prostatitis, benign prostate hyperplasia, prostate cancer)? No	Decreasing Risk
What is your height? 178 cm	No impact
What is your current weight? 97.5 kg	No impact



LIFESTYLE

You have a **slightly reduced risk** of hashimoto's disease based on the answers you provided.



Factors impacting your risk:

Your BMI: 30.77	Increasing Risk
Have you ever been diagnosed with multiple sclerosis? No	Decreasing Risk
Have you been diagnosed with psoriasis? No	Decreasing Risk
Have you ever been diagnosed with rheumatoid arthritis (autoimmune joint inflammation)? No	Decreasing Risk
Have you ever been diagnosed with lupus? No	Decreasing Risk
Have you ever been diagnosed with type 1 diabetes? No	Decreasing Risk
Do you have a parent or sibling who has been diagnosed with Hashimoto's disease (autoimmune underactive thyroid)? No	Decreasing Risk
What is your sex? Male	Decreasing Risk
What is your height? 178 cm	No impact
What is your current weight? 97.5 kg	No impact



LIFESTYLE

You have a **slightly reduced risk** of reduced longevity based on the answers you provided.



Factors impacting your risk:

How much sleep do you get in a typical night? 6 hours or less	Increasing Risk
How many cups of coffee do you drink on a typical day? 0	Increasing Risk
Your BMI: 30.77	Increasing Risk
In a typical week, how many times do you participate in any physical activities or exercise for 30 minutes at a time? (such as walking, running, bike riding, weight training, yoga, etc.) *Note: longer exercise equals more sessions (e.g., 1 hour = 2 sessions) 8 or more	Decreasing Risk
Do you smoke tobacco? No, never	Decreasing Risk
How often do you eat fish? 1 or more times a week	Decreasing Risk
Do you regularly eat 5 or more servings of fruit or vegetables a day? Yes	Decreasing Risk
How many times a week do you eat processed meat (e.g., ham, sausage, beef jerky, etc.)? 0-2	Decreasing Risk
How often do you eat meat? Once a day	Decreasing Risk
Have you ever been diagnosed with alcohol use disorder? No	Decreasing Risk
What is your height? 178 cm	No impact
What is your current weight? 97.5 kg	No impact



LIFESTYLE

You have a **slightly reduced risk** of high blood pressure (hypertension) based on the answers you provided.



Factors impacting your risk:

What is your current marital status? Single or not living with partner	Increasing Risk
Do you ever add salt to your meal after it has been prepared and seasoned? Almost always	Increasing Risk
Do you often feel anxious? Yes	Increasing Risk
Do you have a parent or sibling who has ever been diagnosed with high blood pressure? Yes	Increasing Risk
Your BMI: 30.77	Increasing Risk
In a typical week, how many times do you participate in any physical activities or exercise for 30 minutes at a time? (such as walking, running, bike riding, weight training, yoga, etc.) 8 or more <small>*Note: longer exercise equals more sessions (e.g., 1 hour = 2 sessions)</small>	Decreasing Risk
Do you smoke tobacco? No, never	Decreasing Risk
What is your age? 41	Decreasing Risk
How many cups of coffee do you drink on a typical day? 0	Decreasing Risk
What is your annual household income in USD? More than \$20,000	Decreasing Risk
On a scale of 1 to 5, how would you rate the amount of stress in your life in the past month (at home and at work)? 2	Decreasing Risk
How many alcoholic drinks do you consume in a week? 0-7	Decreasing Risk
Do you have a job that requires you to work shifts? No	Decreasing Risk
What is your ethnicity? Other	Decreasing Risk

What is your height?

178 cm

No impact 

What is your current weight?

97.5 kg

No impact 



LIFESTYLE

You have a **slightly reduced risk** of diabetes based on the answers you provided.



Factors impacting your risk:

<p>How much alcohol do you drink on a typical day? Calculate your alcohol consumption in units here</p> <p>0 units</p>	Increasing Risk
<p>How many servings of whole grains do you eat in a typical day? Please click here for more information on whole grain servings</p> <p>Less than 3</p>	Increasing Risk
<p>How many cups of coffee do you drink on a typical day?</p> <p>0</p>	Increasing Risk
<p>Your BMI:</p> <p>30.77</p>	Increasing Risk
<p>In a typical week, how many times do you participate in any physical activities or exercise for 30 minutes at a time? (such as walking, running, bike riding, weight training, yoga, etc.)</p> <p>8 or more</p> <p><small>*Note: longer exercise equals more sessions (e.g., 1 hour = 2 sessions)</small></p>	Decreasing Risk
<p>Do you smoke tobacco?</p> <p>No, never</p>	Decreasing Risk
<p>Do you have a parent or sibling who has ever been diagnosed with diabetes?</p> <p>No</p>	Decreasing Risk
<p>What is your waist size?</p> <p>Less than 35 (less than 89 cm)</p>	Decreasing Risk
<p>How many times in a typical day do you eat refined grains (e.g., white pasta, white rice, white bread, etc.)?</p> <p>0-2</p>	Decreasing Risk
<p>How much sleep do you get in a typical night?</p> <p>7-8 hours</p>	Decreasing Risk
<p>Have you recurrently been diagnosed with high triglycerides?</p> <p>No</p>	Decreasing Risk
<p>What is your ethnicity?</p> <p>Other</p>	Decreasing Risk
<p>What is your height?</p> <p>178 cm</p>	No impact

What is your current weight?

97.5 kg

No impact 

What is your sex?

Male

No impact 



LIFESTYLE

You have a **slightly reduced risk** of obesity based on the answers you provided.



Factors impacting your risk:

What is your age?

41

Increasing Risk

What is your current marital status?

Single or not living with partner

Decreasing Risk

How would you describe the environment you live in?

Suburban

Decreasing Risk

On a scale of 1 to 5, how would you rate the amount of stress in your life in the past month (at home and at work)?

2

Decreasing Risk

In a typical week, how many times do you participate in any physical activities or exercise for 30 minutes at a time? (such as walking, running, bike riding, weight training, yoga, etc.)

*Note: longer exercise equals more sessions (e.g., 1 hour = 2 sessions)

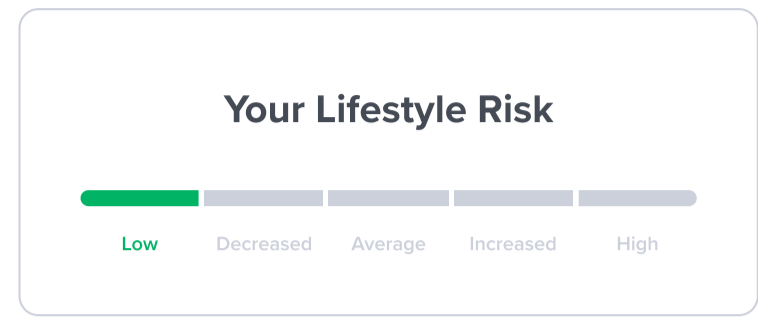
8 or more

Decreasing Risk



LIFESTYLE

You have a **reduced risk** of migraines based on the answers you provided.



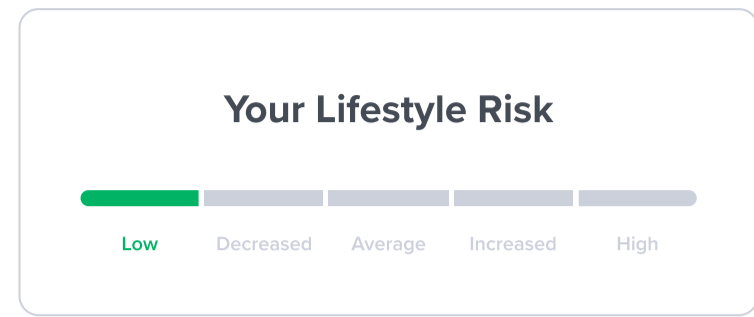
Factors impacting your risk:

Your BMI: 30.77	Increasing Risk
In a typical week, how many times do you participate in any physical activities or exercise for 30 minutes at a time? (such as walking, running, bike riding, weight training, yoga, etc.) *Note: longer exercise equals more sessions (e.g., 1 hour = 2 sessions) 8 or more	Decreasing Risk
Do you often experience periods of low mood? No	Decreasing Risk
On a scale of 1 to 5, how would you rate the amount of stress in your life in the past month (at home and at work)? 2	Decreasing Risk
What is your current employment status? Self-employed	Decreasing Risk
What is your sex? Male	Decreasing Risk
What is your height? 178 cm	No impact
What is your current weight? 97.5 kg	No impact



LIFESTYLE

You have a **reduced risk** of high homocysteine based on the answers you provided.



Factors impacting your risk:

Your BMI: 30.77	Increasing Risk
In a typical week, how many times do you participate in any physical activities or exercise for 30 minutes at a time? (such as walking, running, bike riding, weight training, yoga, etc.) *Note: longer exercise equals more sessions (e.g., 1 hour = 2 sessions) 8 or more	Decreasing Risk
Do you smoke tobacco? No, never	Decreasing Risk
How much alcohol do you drink on a typical day? Calculate your alcohol consumption in units here 0 units	Decreasing Risk
What is your age? 41	Decreasing Risk
Do you regularly eat 5 or more servings of fruit or vegetables a day? Yes	Decreasing Risk
Have you ever been diagnosed with high uric acid? No	Decreasing Risk
What is your height? 178 cm	No impact
What is your current weight? 97.5 kg	No impact