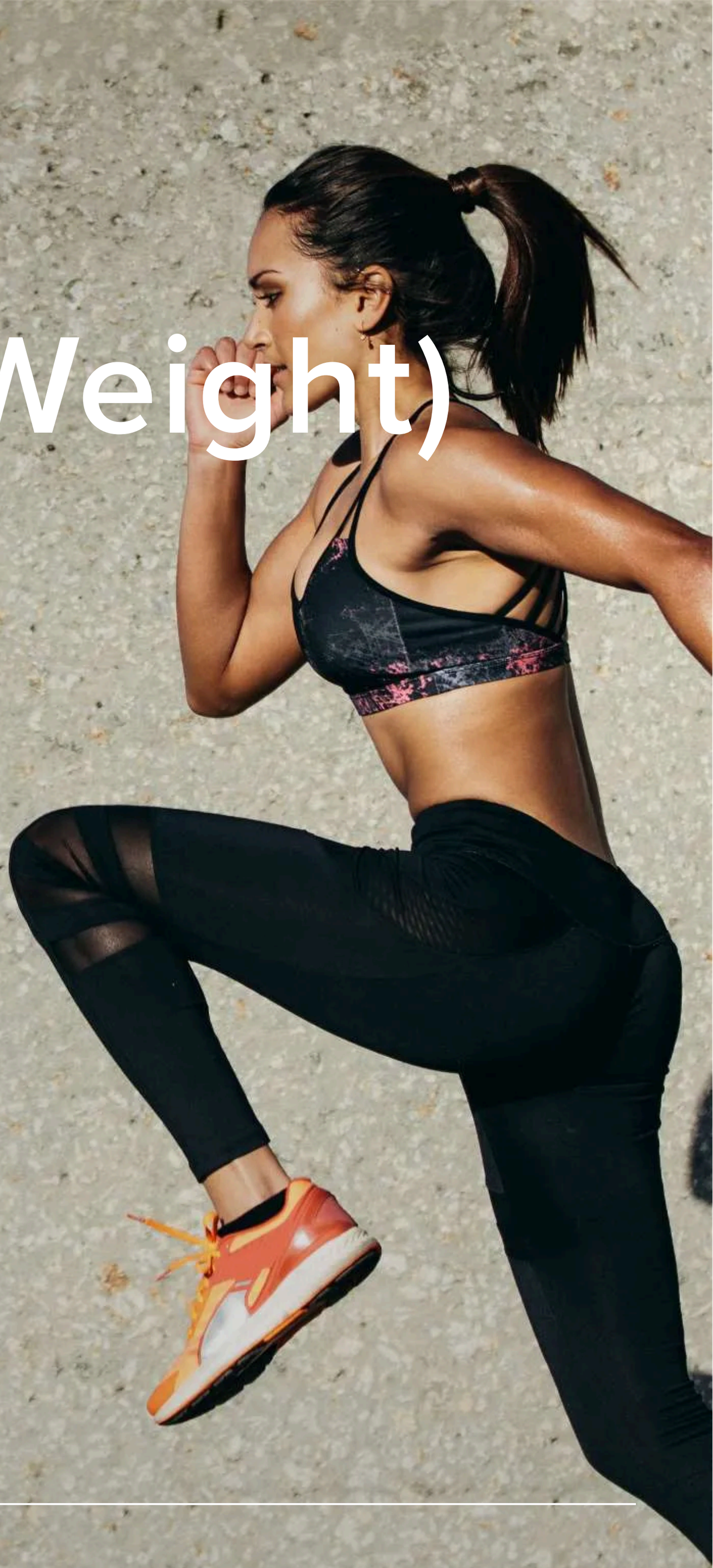
SelfDecode™

ADRB2 (Weight)

Gene Report

REPORT CATEGORY

WEIGHT & BODY FAT



Sample Client

Report date: 15 January 2026

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Personal information

NAME

Sample Client

SEX AT BIRTH

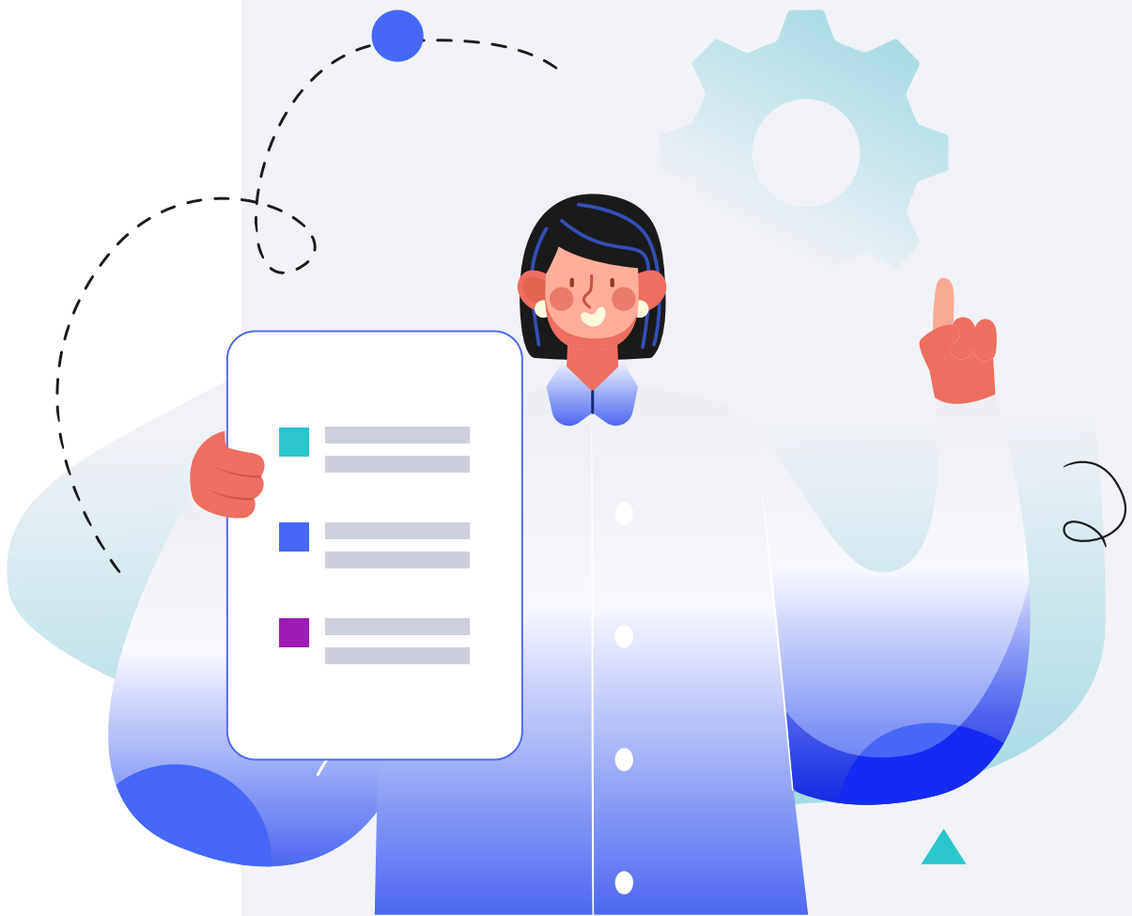
Male

HEIGHT

5ft 5" 165cm

WEIGHT

137lb 62kg

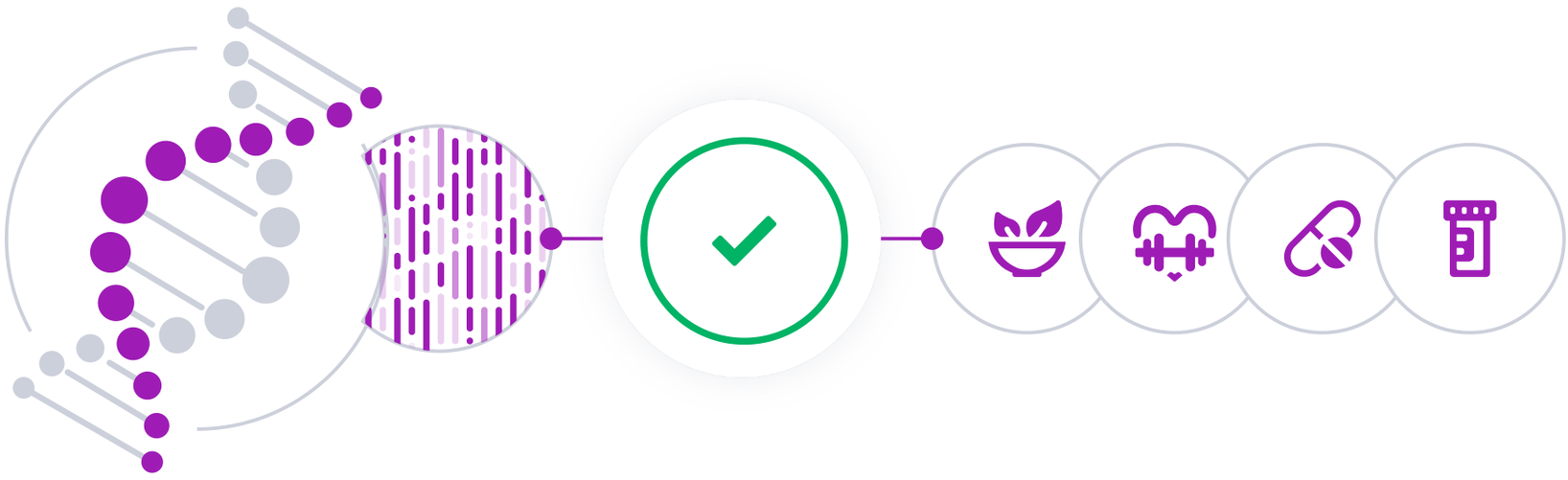


DISCLAIMER

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

How this works

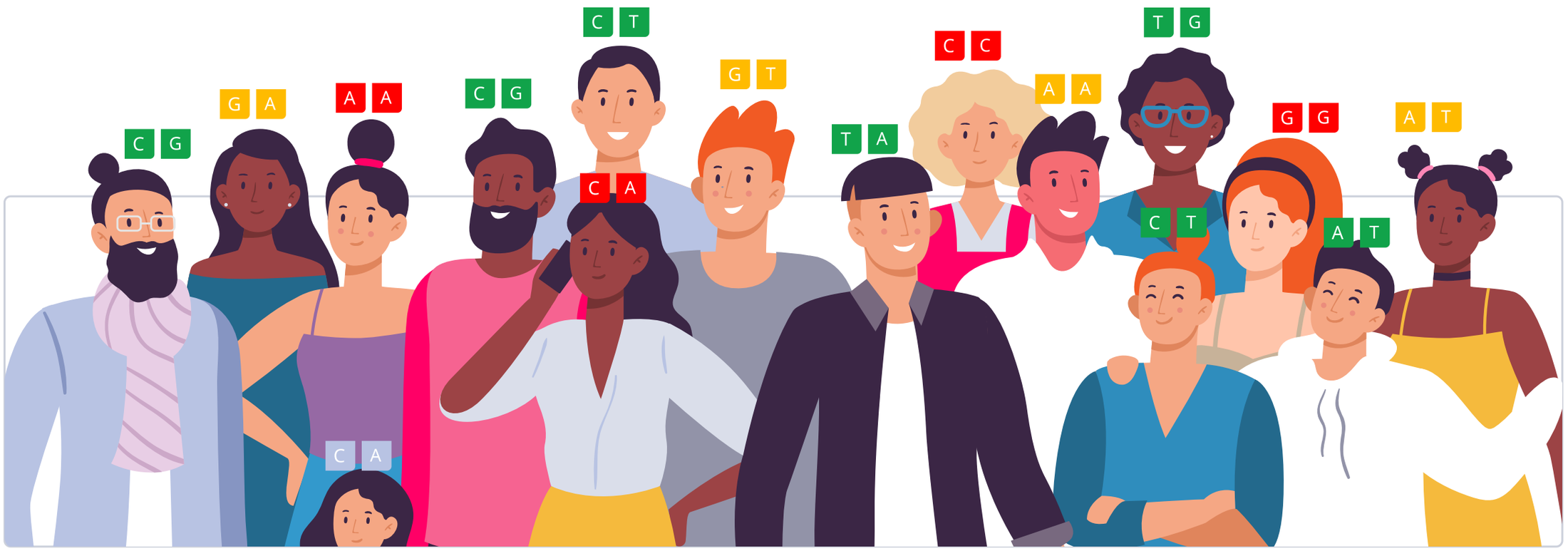
Our Wellness Reports analyze how your DNA influences your health.
We then use this analysis to give you personalized risk estimates and recommendations.



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

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

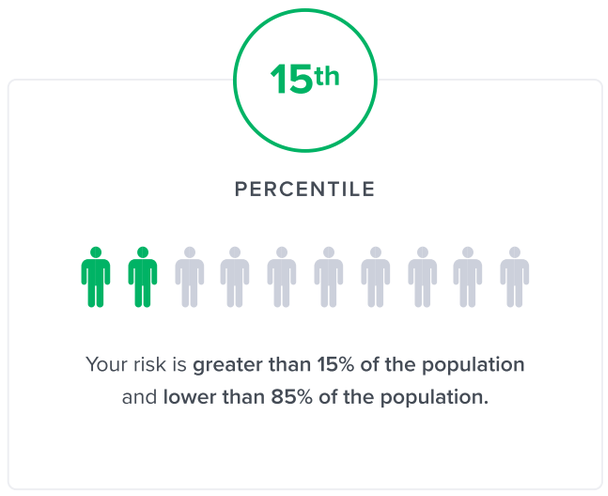
Genetic variants are parts of DNA that differ from person to person. Some can make you more vulnerable to certain health issues, while others may influence traits such as eye color.



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

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

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



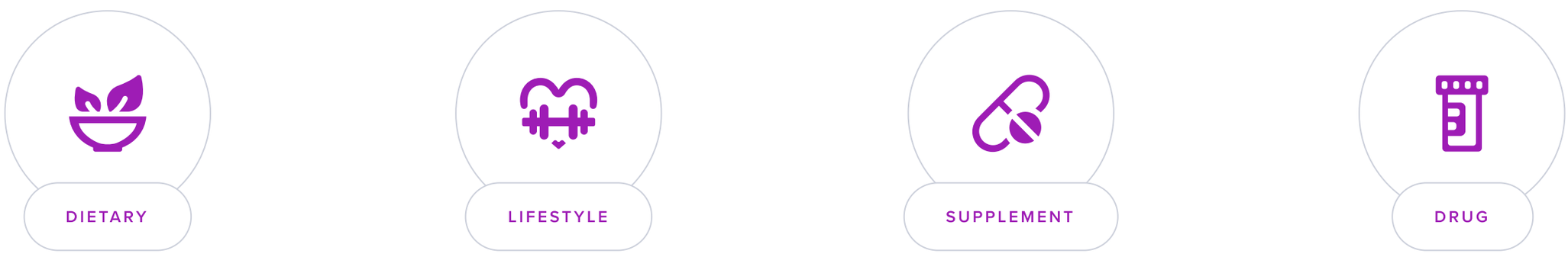
Genotype color info: AA You don't have any risk alleles | AA You have 1 risk allele | AA You have 2 risk alleles

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

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

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

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



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

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

Impact

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

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

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

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

Recommendation Evidence

5 / 5

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

4 / 5

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

3 / 5

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

2 / 5

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

1 / 5

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

0 / 5

No evidence in humans.

Genotype-specific Evidence

High-quality

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

Medium-quality

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

Low-quality

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

Indirect

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

In theory

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

Some things to keep in mind:

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

Introduction

The *ADRB2* gene encodes the beta-2 adrenergic receptor, a vital part of the sympathetic nervous system. This receptor binds catecholamines, especially adrenaline (epinephrine), which increase cAMP levels [R].

The beta-2 receptors cause relaxation of the airways and smooth muscles (such as lungs) while contracting skeletal muscles (such as biceps). Their activity promotes breathing and circulation, slows down digestion, and improves physical performance [R, R].

Catecholamines control fat burning and energy expenditure, especially during caloric restriction (fasting) and exercise. Along with the primary beta-3 receptors in fat tissue, beta-2 receptors stimulate fat burning, resulting in energy and temperature release [R, R, R].

Leptin is a crucial metabolic hormone that helps burn fat stores by stimulating sympathetic activity and raising catecholamine levels. This pathway is often blunted in obese people, leading to excess fat accumulation [R].

ADRB2 Genetics and Weight

The **rs1042714** variant (also known as Q27E or Gln27Glu) has been most widely researched when it comes to weight. Its minor **'G' allele** (Glu, E) was associated with approximately 20% higher odds of **obesity** in a meta-analysis of 18 studies [R].

An older meta-analysis came to a similar conclusion. However, the authors observed a significant link between rs1042714-G and obesity only in populations with lower frequencies of this allele, such as **Asians and Native Americans**. In two studies with 150 women, those with the 'G' allele had more fat mass and impaired burning [R, R, R].

This variant has also been linked to:

- Reduced exercise performance and VO2 max [R]
- Increased risk of cardiovascular events in coronary artery disease patients [R]
- Increased risk of Graves' disease in Caucasians [R]

On the bright side, people with this variant tend to **lose weight more easily** when they reduce calorie intake. However, given the link of this variant with obesity under regular conditions, there is a potential risk of **weight regain** ("yo-yo" effect) after dieting [R, R].

This variant may be linked to lower asthma odds in adults and children [R].

Normally, leptin helps burn excess fat stores by stimulating the sympathetic activity in fat tissue. However, according to one clinical trial, this pathway may be suppressed in people with the above SNP. The 'G' allele carriers had higher leptin levels, indicating leptin resistance [R].

Interestingly, this SNP doesn't seem to alter the function of beta-2 receptors. Scientists are still looking for the exact mechanism behind its effects on sympathetic activity and fat burning. It may be just a marker for another variant with functional consequences [R].

WORSE GENETICS

Likely worse ADRB2 genetics based on the genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ADRB2	rs1042714	GC

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

Your Recommendations

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

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

		DOSAGE
1	Exercise At Least One Hour a Day	1 hour
2	Strength Training	1 hour
3	Aerobic Exercise (Cardio)	1 hour
4	Intermittent Fasting	
5	Dietary Calcium	
6	Cold Exposure	1 minutesute

1

Exercise At Least One Hour a Day

IMPACT 5 / 5

EVIDENCE 5 / 5

How to implement

Dedicate a minimum of 60 minutes to moderate-intensity activities such as brisk walking, swimming, or cycling. Do this most days of the week, aiming for at least 5 days to optimize benefits.

TYPICAL STARTING DOSE

1 hour

Description

Exercise **can do wonders for your health.** It can help you lose weight, improve your heart health, boost your mood, and more [R].

There are many ways you can be active. You can walk, run, swim, dance, or play team sports. **Everything counts, and it's never too late to start!**

Try to get at least **60 minutes of moderate physical activity on most days**, including walking. **Getting a mix of cardio (min 150 min/day) and strength training (min 2 times a week) may be optimal**.

How it helps

Exercise is the best way to burn fat. Among other mechanisms, it helps by increasing catecholamines and improving leptin sensitivity [R, R, R, R, R].

Most experts agree that getting 150-300 minutes of exercise per week can help you control your weight. For best results, try to push yourself a bit with **moderate or intense exercise** [R, R].

Exercise helps by burning calories and boosting your metabolism. It may also lower your appetite [R, R].

However, it might take a while to see the results of your hard work. **The benefits of moderate or intense exercise may only show after 12 weeks** [R, R, R, R, R].

Note that exercise may be less effective at helping you lose weight than limiting your calorie intake. However, **it will likely help you maintain a lower weight in the long run** [R, R, R].

2

Strength Training

IMPACT 5 / 5

EVIDENCE 5 / 5

How to implement

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

TYPICAL STARTING DOSE

1 hour

Description

Strength training, also called resistance or *anaerobic* training, contracts the muscles against an external resistance for short periods of time. This helps gain muscle strength, tone, and mass. This can include activities like weight lifting, pushups, and crunches.

Strength training, also known as resistance training, is a type of physical exercise that uses resistance to build strength, anaerobic endurance, and size [R]. Some of the most common strength training methods include [R]:

- Weight lifting
- Bodyweight exercises like push-ups, pull-ups, squats, and lunges.
- Resistance bands
- Plyometrics or explosive force exercises

The benefits of strength training are numerous, and include [R]:

- Increased muscle strength
- Improved bone health
- Reduced risk of injury
- Improved balance and coordination
- Enhanced mood
- Boost metabolism

Consult with a doctor before starting any new exercise program, especially if you have any health conditions.

How it helps

Exercise is the best way to burn fat. Among other mechanisms, it helps by increasing catecholamines and improving leptin sensitivity [R, R, R, R, R].

Resistance training is a great choice when it comes to weight loss. Additionally, it boosts BDNF, endorphins, and other beneficial hormones that suppress appetite, improve mental health, and more [R, R].

Most experts agree that getting 150-300 minutes of exercise per week can help you control your weight. For best results, try to push yourself a bit with **moderate or intense exercise** [R, R].

Exercise helps by burning calories and boosting your metabolism. It may also lower your appetite [R, R].

Multiple meta-analyses (the most recent one with 43 trials and 3,552 participants) found that both **aerobic and resistance training are equally effective for weight loss**. Exercise programs lasting 8-40 weeks **reduced weight (by 1.6-1.7 kg), waist circumference (by 1.95-2.12 cm), and belly fat area (by 5.39-13.05 cm2)** [R, R, R, R, R].

3

Aerobic Exercise (Cardio)

IMPACT 5 / 5

EVIDENCE 5 / 5

How to implement

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

TYPICAL STARTING DOSE

1 hour

Description

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

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

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

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

How it helps

Exercise is the best way to burn fat. Among other mechanisms, it helps by increasing catecholamines and improving leptin sensitivity [R, R, R, R, R].

Most experts agree that getting 150-300 minutes of exercise per week can help you control your weight. For best results, try to push yourself a bit with **moderate or intense exercise** [R, R].

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4

Intermittent Fasting

IMPACT 4 / 5

EVIDENCE 4 / 5

How to implement

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

Description

Intermittent fasting is an eating pattern that involves cycling between periods of fasting and eating. It may help with weight management, improve metabolic health, and offer potential benefits for certain health conditions when done under proper guidance.

Intermittent fasting (IF) is a pattern of eating that alternates between periods of eating and fasting. The most popular IF method is called the 16/8 method, where you fast for 16 hours and eat during an 8-hour window.

People mainly practice IF to lose weight. Besides benefits related to weight reduction, IF may help lower the risk of [R]:

- Alzheimer's disease
- Joint pain
- Asthma
- Multiple sclerosis
- Stroke

Some types of intermittent fasting, such as Ramadan fasting, are also practiced for religious reasons.

How it helps

Fasting stimulates fat burning mediated by catecholamines, potentially reducing the impact of this SNP [R, R].

Intermittent fasting may reduce weight, but not BMI, better than continuous calorie restriction. Short-term intermittent fasting may also reduce weight. Intermittent fasting may also improve fasting blood glucose and HOMA-IR. In four studies with 355 participants, intermittent fasting led to better weight loss (1.70 kg). In six studies, significant reductions in BMI (1.56 kg/m2), fat mass (1.35%), fat-free mass (0.63%), body weight (2.49 kg), and waist circumference (-3.06 cm) were observed. In seven studies, IF decreased body weight by -1.89 kg, with greater effects in heavier populations and shorter studies (≤ 4 months). However, intermittent fasting didn't significantly outperform other diets in a meta-analysis of 9 studies [R, R, R, R, R, R, R, R, R, R].

Eighty-five studies from 25 countries conducted between 1982 and 2019 found that Ramadan intermittent fasting led to a small but significant weight reduction (approximately 1.022 kg). Time-restricted feeding showed greater weight loss than control regimens, particularly in observational studies [R, R].

Intermittent fasting may help by reducing the amount of calories you consume and enhancing your body's fat-burning processes.

5

Dietary Calcium

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Consume 1,000-1,200 mg of calcium daily through dietary sources such as dairy products (milk, yogurt, cheese), green leafy vegetables (kale, broccoli), and fortified foods (orange juice, plant-based milks). Adults under 50 need 1,000 mg per day, while those over 50 should aim for 1,200 mg per day.

Description

Dietary calcium is a mineral found in dairy products, leafy greens, and fortified foods. It is essential for bone health, muscle function, and nerve transmission.

Calcium is the most abundant mineral in the human body. It is vital for the bones, heart, muscles, and nervous system [R].

Your body gets calcium from food and needs vitamin D to help absorb it. Calcium can be found in a variety of foods, including [R]:

- Dairy products
- Green, leafy vegetables
- Fish with edible soft bones (e.g., sardines)
- Calcium-fortified foods and beverages

How it helps

By reducing PTH levels, dietary calcium indirectly promotes fat burning via beta-adrenergic receptors [R, R].

A review of clinical studies associated a higher intake of calcium with a leaner body and lower obesity rates. Calcium supplements were not as beneficial, compared with food sources [R].

6

Cold Exposure

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Gradually expose yourself to cold temperatures for short periods, starting with 1-2 minutes and increasing up to 5-10 minutes. This can be achieved through cold showers, outdoor exposure in cold weather, or ice baths. Aim to do this 2-3 times per week.

TYPICAL STARTING DOSE

1 minutesute

Description

Cold exposure, when done safely and gradually, can have potential health benefits like increased calorie burn, improved circulation, and enhanced resilience to cold temperatures. Cold exposure techniques, such as cold showers or outdoor winter activities, may help boost metabolism and promote overall well-being when practiced mindfully.

Please note: rapid instead of gradual cold exposure causes dangerous, and even fatal, changes in the breath and heart rates, known as the cold shock response. Be cautious with any form of sudden temperature change in your environment, especially if you have heart disease or other chronic conditions [R].

How it helps

Acute cold exposure boosts sympathetic activity in brown and white fat tissues, resulting in energy and heat production. It also boosts adiponectin, a protein that increases fat burning and prevents obesity [R, R, R, R].

In a study of 11 young lean men, researchers employed an individualized cooling protocol in a cold room, gradually decreasing the cooling vest's temperature until participants shivered. This resulted in a notable increase in energy expenditure and a substantial rise in fat oxidation. Another study with 28 participants found that cold exposure led to increased metabolic rate, particularly at room temperature. Additionally, a 10-day cold acclimation protocol increased brown adipose tissue activity and nonshivering thermogenesis. In a separate experiment with 6 men exposed to cold, the brown adipose tissue showed oxidative metabolism activation, leading to elevated energy expenditure [R, R, R, R, R].

Cold exposure may help by forcing the body to burn additional calories to stay warm. Plus, it can stimulate the growth of calorie-burning brown fat.

Please note: *Rapid cold exposure can cause life-threatening changes to your breathing and heart rate. This is called the cold-shock response. Be cautious of any form of sudden temperature change to your environment, especially if you have heart disease or other health conditions* [R].

Next Steps

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

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

Your lab results

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

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

Insulin, Fasting — 9.08 uU/mL — 9 Nov 2025