

CYP2C19 (Detox)

Gene Report

REPORT CATEGORY —



Sample Client

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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.

Personal information

NAME

Sample Client

SEX AT BIRTH

Male

HEIGHT

5ft 5" 165cm

WEIGHT

137lb 62kg



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.

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

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



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, a few 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 [CYP2C19](#) gene encodes a member of the [cytochrome P450](#) family. These enzymes are involved in the breakdown and elimination of most toxins and drugs from the body. [CYP2C19](#) is mostly found in the liver and metabolizes ~10% of clinical drugs, including antidepressants, proton pump inhibitors, blood thinners, and antimalarial drugs [\[R\]](#), [\[R\]](#):

Variants in the *CYP2C19* gene may alter the rate at which these drugs are broken down. An elevated CYP2C19 activity may reduce the effectiveness of the treatment (by speeding up drug clearance) but also increase it if the drug needs to be broken down to become active, as is the case for clopidogrel.

CYP2C19 is also involved in the metabolism of substances naturally produced in the body., such as [arachidonic acid](#) and estrogens [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

Cannabidiol (CBD), a chemical compound naturally found in cannabis, is primarily broken down by CYP2C19 and CYP3A4. Specifically, CYP2C19 breaks down CBD to 7-hydroxy-CBD (7-OH-CBD) [\[R\]](#).

CYP2C19 can also break down the psychoactive cannabinoid THC. Specifically, it converts THC into 11-hydroxy-THC (a metabolite that still has psychoactive properties but is less potent than THC) and 11-nor-9-carboxy-THC (the non-psychoactive metabolite often used in drug testing) [\[R\]](#), [\[R\]](#).

Alternatively, CBD, THC, and their metabolites can inhibit this enzyme and reduce its effectiveness at metabolizing drugs [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

CYP2C19

Genetics and Metabolism

There are more than 30 known *CYP2C19* variants. Based on the variants they carry, individuals can be categorized as [\[R\]](#), [\[R\]](#):

- Ultrarapid metabolizers (*1 /*17 or *17 /*17)
- Extensive metabolizers (*1 /*1)
- Intermediate metabolizers (*1 /*2, *1 /*3, or *2 /*17)
- Poor metabolizers (*2 /*2 or *2 /*3)

The normal version of the gene is called CYP2C19*1.

The two most common polymorphisms associated with reduced CYP2C19 activity and clopidogrel resistance are CYP2C19*2 ([rs4244285](#)) and CYP2C19*3 ([rs4986893](#)). Carriers of one copy of the minor ‘A’ alleles have a reduced ability to break down drugs, including CBD. Those with two copies can metabolize very little or none of the drug and are classified as poor metabolizers [\[R\]](#), [\[R\]](#), [\[R\]](#).

The [rs12248560](#) polymorphism, also known as CYP2C19*17, is located in the region that controls gene expression (the *promoter*). Its minor allele ‘T’ is associated with increased gene expression and protein activity. People with this variant are classified as ultrarapid metabolizers [\[R\]](#), [\[R\]](#).

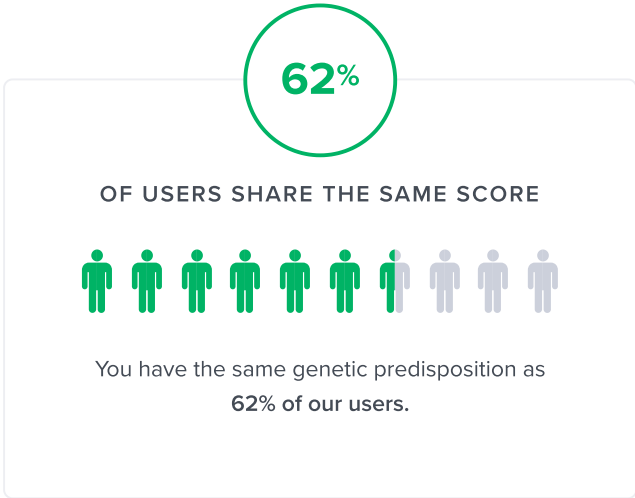
The following supplements and chemicals may decrease CYP2C19 activity [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Propolis
- Caffeic acid
- Quercetin
- Ginger
- Kale
- African lettuce
- Saint John's wort
- Astaxanthin
- Canthaxanthin
- Hops
- Licorice
- Berberine



EXTENSIVE METABOLIZER

Likely an extensive metabolizer based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
NOC3L	rs12248560	CC
CYP2C19	rs4986893	GG
CYP2C19	rs4244285	GG

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

- Capsaicin
- Bulbocapnine, canadine, and protopine
- Fluconazole