

BHMT (Methylation)

Gene Report

REPORT CATEGORIES —



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

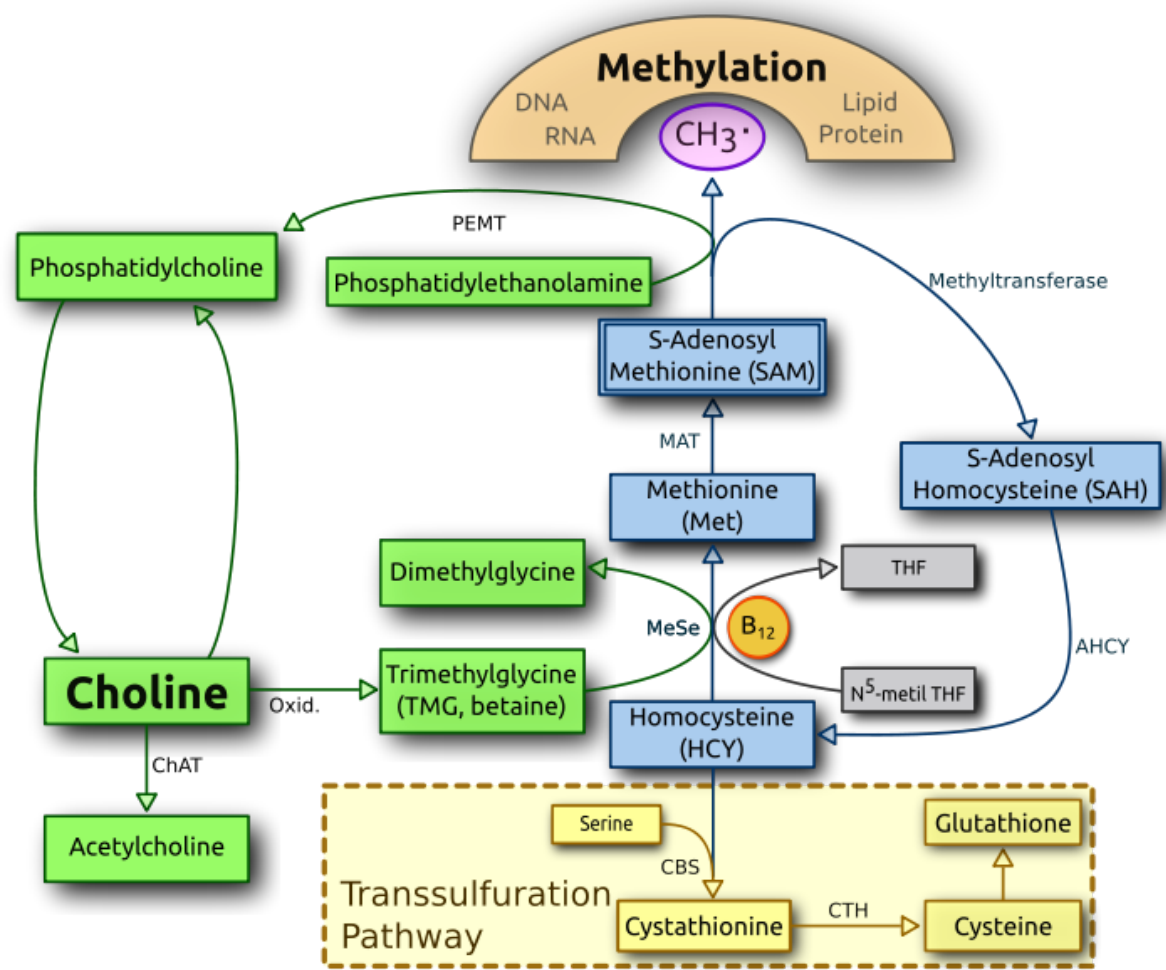
- High-quality
- Direct evidence that a recommendation helps more in people with your gene variant (many clinical trials, a few large clinical trials, or a meta-analysis).
-
- Medium-quality
- Direct evidence that a recommendation helps more in people with your gene variant (a few clinical trials or 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 [BHMT](#) gene encodes an enzyme called betaine-homocysteine methyltransferase that is part of the [methylation](#) cycle. The methylation cycle involves several steps outlined in the image below:



Specifically, the BHMT enzyme, which is most abundant in the kidneys and liver, participates in the betaine pathway. This uses betaine derived from [choline](#) to clear [homocysteine](#) by turning it into dimethylglycine and [methionine](#) [R, R, R, R].

Methionine is then used to create [SAM-e](#) (S-adenosyl-methionine), a compound that provides methyl group for methylation, and helps produce [phosphatidylcholine](#) via the PEMT enzyme [R, R, R, R].

These reactions — collectively known as the **one-carbon metabolism** — are vital for many aspects of physical and mental health. Issues with the methylation cycle play a role in heart health, mental health, fertility problems, birth defects, cancer, and more [R, R, R].

BHMT Genetics

By far, the most well-researched *BHMT* polymorphism is [rs3733890](#). Its minor ‘A’ allele encodes an enzyme with increased affinity for homocysteine. Its effects on homocysteine levels are unclear but a study in pregnant women found lower transformation of betaine to DMG in ‘A’-carriers with high folate levels [\[R\]](#), [\[R\]](#).

This variant may increase the risk of:

- Folate therapy failure [\[R\]](#), [\[R\]](#)
- Head and neck cancer [\[R\]](#)
- Pulmonary thromboembolism [\[R\]](#)
- Placental abruption [\[R\]](#)
- Having a child with congenital heart disease [\[R\]](#)
- Having a child with Down’s syndrome [\[R\]](#)
- Neural tube defects [\[R\]](#), [\[R\]](#)
- Omphalocele [\[R\]](#)
- Spina bifida [\[R\]](#)
- Short telomeres [\[R\]](#)
- Liver toxicity from methotrexate [\[R\]](#)

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

- Cervical cancer [\[R\]](#), [\[R\]](#)
- Breast cancer and death from this condition [\[R\]](#), [\[R\]](#), [\[R\]](#)
- Colorectal cancer [\[R\]](#)

In any case, the results are mixed in some cases and the effects may depend on other, less well-researched variants of the same gene, variants of other methylation pathway genes such as [MTHFR](#), [MTR](#), or [MTRR](#), and folate status.

Other variants of this gene include:

- ‘C’ at [rs651852](#): associated with lower folate levels [\[R\]](#)
- ‘C’ at [rs3797546](#): associated with cleft palate [\[R\]](#), [\[R\]](#)
- ‘C’ at [rs625879](#): associated with cleft palate and congenital heart defects, [\[R\]](#), [\[R\]](#)



Likely typical BHMT genetics based on 4 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
BHMT	rs3733890	AG
BHMT	rs651852	CT
JMY	rs3797546	TC
BHMT2	rs625879	AC

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

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.

	Vitamin B12	687 pg/mL		9 Nov 2025
	Homocysteine	12.84 umol/L		9 Nov 2025
	Vitamin B6	55 ng/mL		13 Jan 2026