

SOD3 (Oxidative Stress)

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 [SOD3](#) gene codes for an enzyme called extracellular superoxide dismutase. It is a member of the superoxide dismutase (SOD) family, whose job is to take molecules of superoxide (a strong oxidant) and transform them into hydrogen peroxide and oxygen (weaker oxidants). This process is part of the body’s natural antioxidant defenses [\[R\]](#).

On the whole, the SOD family of enzymes differ primarily in their location. SOD1 is located in the cytoplasm, or the cellular fluid, SOD2 is located in the [mitochondria](#), and SOD3 is located outside of the cell — hence the name “extracellular superoxide dismutase.” Another major difference is that SOD2 requires [manganese](#) to function, while SOD1 and SOD3 depend on copper and zinc [\[R\]](#), [\[R\]](#).

SOD3 Genetics

The only association study to find a link between *SOD3* and [human lifespan](#) discovered that [rs2536512](#) predicted age at death in a group of just over 1000 participants. In this study, people with the ‘GG’ genotype lived slightly longer than those with the ‘AG’ genotype, and those with the ‘AG’ genotype lived slightly longer than those with the ‘AA’ genotype. The total difference in age at death between ‘GG’ and ‘AA’ was about a year and a half (88.9 vs. 87.4) [\[R\]](#).

The risk ‘A’ variant has been associated with the following conditions [\[R\]](#), [\[R\]](#):

- High triglyceride levels
- Type 2 diabetes and insulin resistance

However, ‘G’ is the allele associated with high blood pressure [\[R\]](#).

The connection between SOD3 and longevity is broadly speculative at this point. Researchers have found an association between variants at this gene and longevity in mice, but the search for a human connection hasn’t borne much fruit so far. In fact, at least one study of known SOD3 variants found no correlation at all with longevity in German volunteers [\[R\]](#).

That said, there’s a reason why researchers keep looking. While studies on variants in the human SOD3 gene haven’t yet turned up a direct correlation with lifespan, such variants do appear to influence:

- Risk of dying from COPD [\[R\]](#)
- Lung injury and mortality [\[R\]](#)
- Stroke in women [\[R\]](#)

Among them, [rs1799895](#) is the most well-researched one. Its rare ‘G’ allele increases SOD levels in the blood by approximately 10 times, but reduces them in the arterial walls. In line with this, this variant has been associated with an increased risk of several cardiovascular conditions [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

Furthermore, low SOD3 levels have been associated with polyneuropathy in people with diabetes [\[R\]](#).



Likely worse SOD3 genetics based on the genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
SOD3	rs2536512	AA

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

These are all potentially life-threatening conditions. Thus, the search goes on for a more direct link between SOD3 and lifespan.

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.

- 1

Dietary Antioxidants
- 2

Dietary Zinc
- 3

Dietary Copper

1



Dietary Antioxidants

IMPACT3 / 5

EVIDENCE3 / 5

How to implement

Incorporate foods rich in antioxidants, such as fruits (berries, oranges, plums), vegetables (spinach, kale, bell peppers), nuts (walnuts, almonds), and seeds (flaxseeds, chia seeds) into your daily meals. Aim for at least 5 servings of fruits and vegetables per day, ensuring a variety of colors to cover different antioxidants.

Description

Dietary antioxidants are compounds found in foods that help neutralize harmful molecules called free radicals, potentially reducing the risk of oxidative stress-related diseases and supporting overall health. Examples include vitamins C and E, beta-carotene, and polyphenols.

Our cells sometimes produce molecules called **reactive oxygen species (ROS)** [\[R\]](#).

High levels of ROS can cause [oxidative stress](#) and damage our cells. Oxidative stress plays a role in many health conditions, including [\[R\]](#):

- High blood sugar
- Type 2 diabetes
- Heart disease

Antioxidants are substances that help combat ROS [\[R\]](#).

Antioxidants are found in many plants. Good sources include [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Fruits like tomatoes, berries, and pomegranates
- Vegetables like onions, spinach, and celery
- Chocolate
- Olive oil
- Wine

How it helps

People with detrimental *SOD3* variants may have less effective antioxidant defenses and may therefore benefit more than most from increasing their intake of antioxidant fruits and vegetables.

Higher blood levels of antioxidants are linked to increased longevity [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

In line with this, a higher intake of antioxidants may support a longer life. Antioxidants that may help include **carotenoids**, **vitamin C**, and **flavonoids** [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

Adding a variety of plant-based foods to your diet is an excellent way to get more antioxidants. High-antioxidant foods include [\[R\]](#), [\[R\]](#):

- Berries
- Sweet potato
- Peppers
- Leafy greens (e.g., kale, spinach)
- Nuts
- Dark chocolate

Antioxidants may help by reducing oxidative stress [\[R\]](#), [\[R\]](#).

2



Dietary Zinc

IMPACT2 / 5

EVIDENCE3 / 5

How to implement

Incorporate foods high in zinc, such as beef, poultry, seafood (especially oysters), beans, nuts, and whole grains, into your daily diet. Aim for the recommended dietary allowance of zinc, which is 11 mg per day for adult men and 8 mg per day for adult women.

Description

Dietary zinc is essential for the body. It helps our immune system fight off bacteria and viruses, plays a role in healing wounds, and is essential for our sense of taste and smell. Without enough zinc, these systems may not work as effectively as they should.

How it helps

Extracellular superoxide dismutase (SOD3) requires copper and zinc to function. Thus, one of the most important things to make sure SOD3 is working properly is to prevent deficiency of either of these mineral nutrients [\[R\]](#).

A study following over 143,000 adults aged 40 and older showed that lower dietary zinc intake was linked to a 13% higher risk of dying from any cause and a 42% higher risk of heart disease-related death (for those consuming ≤ 5.12 mg/day compared to > 7.28 mg/day) [\[R\]](#).

Furthermore, dietary intake of copper and zinc has been linked to longevity and healthy aging, according to a large study in Hainan Province in China [\[R\]](#).

A meta-analysis shows that zinc supplementation is linked to a decrease in serum markers of inflammation and oxidative stress in adults, highlighting its potential therapeutic benefits [\[R\]](#).

3



Dietary Copper

IMPACT2 / 5

EVIDENCE2 / 5

How to implement

Incorporate foods rich in copper into your daily diet. Include servings of shellfish, whole grains, nuts, seeds, potatoes, and dark leafy greens. Aim for an intake of 900 micrograms of copper per day for adults, adjusting slightly based on age and gender.

Description

Dietary copper is the copper you get from the food you eat. Your body needs it for various functions, including maintaining healthy nerves, bones, blood, and immune system. Not getting enough copper can lead to health problems, so it's important to consume it in recommended amounts.

How it helps

Extracellular superoxide dismutase (SOD3) requires copper and zinc to function. Thus, one of the most important things to make sure SOD3 is working properly is to prevent deficiency of either of these mineral nutrients [\[R\]](#).

The FoodCue study demonstrated that high dietary copper intake, up to 7 mg/day, protects red blood cells from oxidation in middle-aged volunteers [\[R\]](#).

Furthermore, dietary intake of copper and zinc has been linked to longevity and healthy aging, according to a large study in Hainan Province in China [\[R\]](#).

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.