

DIO1 (Thyroid)

Gene Report

REPORT CATEGORY —



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.

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 thyroid is a gland found in the front of the neck. It produces [thyroid hormones](#): **T3 (triiodothyronine)** and T4 (thyroxine). These hormones affect [\[R\]](#):

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

T3 is the active form. It contains 3 [iodine](#) atoms, and it's released by T4 breakdown [\[R, R, R\]](#).

The [DIO1](#) gene encodes an enzyme called iodothyronine deiodinase that converts T4 to T3. DIO1 is also involved in the degradation of both T3 and T4. Less DIO1 means less T3 and more T4, resulting in a lower activity of thyroid hormones [\[R\]](#).

DIO1 requires a complex of [selenium](#) and [cysteine](#) for its optimal function, which makes it a so-called selenoenzyme [\[R, R, R\]](#).

DIO1 Genetics

Based on the data from over 3,000 individuals, the researchers identified one variant, [rs2235544](#), that correlates with [low thyroid hormones](#). More precisely, carriers of the “A” allele have lower levels of T3, which is the active form of thyroid hormones [\[R\]](#).

Carriers of the "A" allele on rs2235544 have reduced expression of *DIO1* (compared with the “C” allele), which may lower the activity of thyroid hormones. People with low T3 can experience the symptoms of hypothyroidism despite having normal, or even slightly elevated T4 levels [\[R, R, R\]](#).

Studies have identified another variation on the same gene, [rs11206244](#), but its effects are less significant and stem from a correlation with the SNP mentioned above [\[R, R\]](#).



HIGHER ACTIVITY

Likely higher DIO1 activity based on the genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
DIO1	rs2235544	CC

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		DOSAGE	
1	Selenium Supplements	50 mcg	
2	Avoid Organochlorine Pesticide Exposure		
3	Avoid Organophosphate Pesticide Exposure		
4	Relaxation Techniques	30 minutes	
5	N-acetylcysteine (NAC)	1200 mg	

1

Selenium Supplements

IMPACT3 / 5

EVIDENCE3 / 5

How to implement

Take 50 mcg of selenium supplements once daily, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

50 mcg

Description

Selenium is a trace mineral found in Brazil nuts and many other foods as well as supplements. It is an essential nutrient that plays a crucial role in maintaining the body's antioxidant defenses and supporting thyroid function.

[Selenium](#) supports [\[R\]](#):

- Reproduction
- Thyroid function
- DNA production
- Immune response

Adults should be getting **55 micrograms** of selenium per day. Selenium supplements are available for people who can't meet their needs with a balanced diet [\[R\]](#).

How it helps

People with underactive thyroid may have lower selenium levels. Healthy levels may support normal thyroid function. They may also help reduce the risk of thyroid problems [\[R, R, R, R, R\]](#).

Importantly, selenium is crucial for DIO1 activity. In one study, selenium-deficient rats retained only 6-13% of DIO1 activity [\[R\]](#).

Selenium supplements (80-200 micrograms/day for 3-12 months) may help on their own or in combination with other nutrients. However, not all studies found a clear benefit [\[R, R, R, R, R, R, R, R, R, R\]](#).

Some experts recommend against supplementing with selenium [\[R\]](#).

Please note: *High intake and levels of selenium are linked to type 2 diabetes. Selenium is not a replacement for thyroid medication. Talk to your doctor before taking selenium or any supplements for thyroid issues* [\[R\]](#).

2



Avoid Organochlorine Pesticide Exposure

IMPACT

3 / 5

EVIDENCE

3 / 5

How to implement

Minimize exposure by choosing organic fruits and vegetables, thoroughly washing produce before consumption, and avoiding areas where organochlorine pesticides are applied. Consider using air purifiers in homes close to agricultural areas to reduce indoor pesticide levels.

Description

Reducing organochlorine pesticide exposure involves minimizing contact with pesticides like DDT, which can accumulate in the body and potentially lead to adverse health effects, including disruption of hormonal functions and carcinogenicity.

How it helps

A meta-analysis of 9 studies concluded that exposure to organochlorines increases the risk of hypothyroidism by 33% [\[R\]](#).

Another meta-analysis (32 studies) associated prenatal organochlorine exposure with lower total T4 levels [\[R\]](#).

Organochlorine pesticides can prevent thyroid hormone activation by inhibiting DIO1 [\[R\]](#).

3

Avoid Organophosphate Pesticide Exposure

IMPACT

3 / 5

EVIDENCE

3 / 5

How to implement

To reduce organophosphate pesticide exposure, buy organic produce when possible, thoroughly wash and peel fruits and vegetables, avoid using chemical pesticides in your home and garden, and wear protective clothing and a mask if you must handle pesticides for agricultural or landscaping work.

Description

Reducing organophosphate exposure involves minimizing contact with pesticides and insecticides containing these chemicals, which can protect against potential health risks such as neurotoxicity and respiratory issues, particularly for individuals working in agriculture or pest control.

Organophosphates (OP) are the most widely used pesticides worldwide. They include [\[R\]](#):

- Parathion
- Malathion
- Chlorpyrifos
- Diazinon
- Phosmet

Chronic exposure to OPs has been linked to [\[R\]](#), [\[R\]](#):

- Fertility problems
- Cognitive problems
- Nerve damage
- Cancer and gene damage

How it helps

A meta-analysis of 9 studies concluded that exposure to organophosphates increases the risk of hypothyroidism by 12% [\[R\]](#).

A study of 1089 participants associated urinary organophosphate metabolites with higher TSH, particularly in men [\[R\]](#).

However, a study of 3249 participants associated urinary levels of the chlorpyrifos metabolite 3,5,6-trichloro-2-pyridinol with higher levels of T4 and lower levels of TSH in men Another study (413 pregnant women) associated a high sum of DMP, DMTP, DEP, and DETP in urine with higher T4 and lower TSH levels [\[R\]](#), [\[R\]](#).

Higher DMP levels were associated with increased T4 and TSH but decreased T3 in a study of 136 men [\[R\]](#).

4



Relaxation Techniques

IMPACT2 / 5

EVIDENCE1 / 5

How to implement

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

Description

Relaxation techniques encompass various methods like deep breathing, yoga, meditation, and progressive muscle relaxation, aimed at reducing stress and promoting mental and physical relaxation. Practicing these techniques regularly can help manage stress, improve mental clarity, and enhance overall emotional well-being.

We all get stressed from time to time.

[Stress](#) can help you deal with a challenge or avoid danger. However, **it’s not healthy to be stressed for a long time** [\[R\]](#), [\[R\]](#).

Relaxation techniques such as [yoga](#) and [meditation](#) can relieve stress in different ways. Most of them focus on breathing and help you get rid of negative thoughts and emotions [\[R\]](#).

People use relaxation techniques to improve conditions like [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Anxiety
- Depression
- Chronic pain

Progressive muscle relaxation is another relaxation technique. In this technique, you focus on tensing and relaxing different parts of your body. It is common to start with the toes and slowly work your way up to the neck and head [\[R\]](#), [\[R\]](#).

Autogenic training is a relaxation technique that a person may carry out on their own. It uses exercises that take the mind’s attention to bodily sensations such as warmth and heaviness [\[R\]](#), [\[R\]](#).

How it helps

Stress may affect thyroid function. It may reduce or increase levels of thyroid hormones [\[R\]](#), [\[R\]](#).

However, some studies found no clear link between stress and an underactive thyroid [\[R\]](#), [\[R\]](#).

Importantly, stress may suppress DIO1 activity [\[R\]](#).

5



N-acetylcysteine (NAC)

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 600 mg of N-Acetylcysteine (NAC) supplement daily with water. It can be taken at any time of the day, but try to take it at the same time each day for best results.

TYPICAL STARTING DOSE

1200 mg

Description

NAC is a supplement that contains a form of the amino acid cysteine, a protein building block that your body uses to make the antioxidant glutathione. It is used for its potential antioxidant properties and its ability to support lung, gut, and mental health.

[N-acetylcysteine](#) (NAC) is converted to cysteine in the body. Cysteine is a protein building block (amino acid) that helps make the antioxidant glutathione [\[R\]](#).

People take NAC to potentially support [\[R\]](#), [\[R\]](#):

- Mental health
- Ovarian health and pregnancy outcomes
- Lung health
- Gut health

How it helps

DIO1 requires a complex of [selenium](#) and [cysteine](#) for its optimal function, which makes it a so-called selenoenzyme [\[R\]](#), [\[R\]](#), [\[R\]](#).

As a source of cysteine, NAC may help support DIO1 function and reduce the risk of hypothyroidism [\[R\]](#).

Next Steps

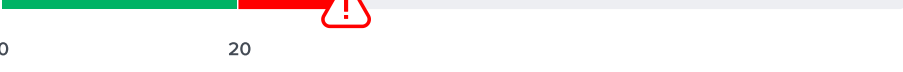
Remember, your genes only tell one important part of your health story!

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.

	T4 Free (FT4)	1.26 ng/dL		9 Nov 2025
	TSH	2.76 mIU/mL		9 Nov 2025
	T4 (Thyroxine), Total	7.27 mcg/dL		9 Nov 2025
	T3, Free (FT3)	3.34 pg/mL		9 Nov 2025
	Thyroglobulin Antibodies	49 IU/mL		9 Nov 2025
	T3 Total	0.95 ng/mL		9 Nov 2025
	Thyroid Peroxidase Antibodies (TPO)	3.03 IU/mL		9 Nov 2025