SelfDecode™

Detox Pathway

Sample Client

Report date: 28 July 2025

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Personal information

NAME

Sample Client

SEX AT BIRTH

Male

HEIGHT

5ft 9"   175.0cm

WEIGHT

165lb   75.0kg
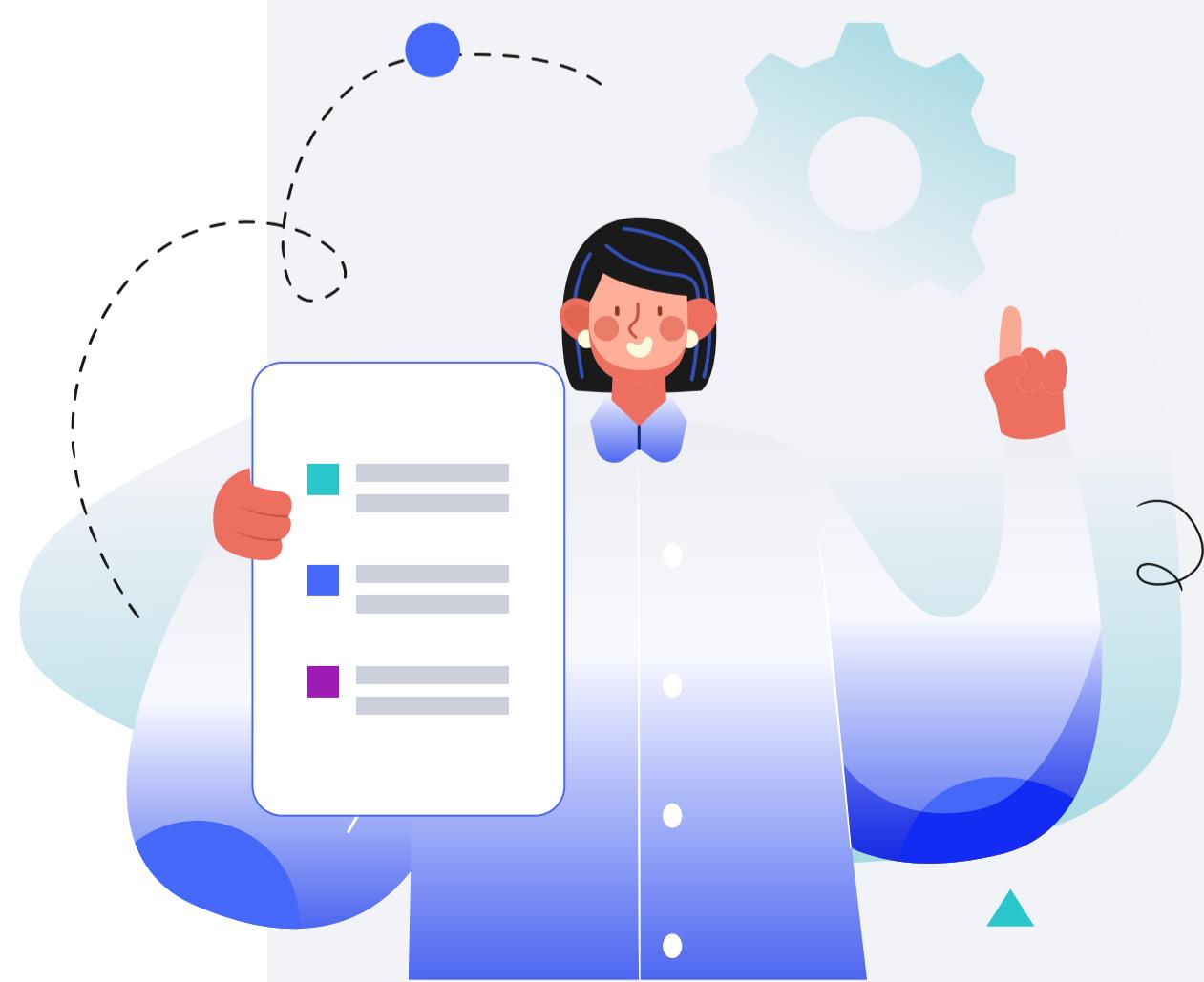
How this works

Detoxification is like the body's cleaning service, working to get rid of toxins or harmful substances that come from our environment, the foods we eat, or even from normal processes in our own bodies.

Being able to detoxify effectively is key to staying healthy. If our body can't properly handle toxins, it may lead to various physical and even mental health problems.

Think of detox as a multi-step cleaning process that mostly happens in our **liver**, split into two main parts or phases. Each of these phases has a special role in breaking down these unwanted substances so that our body can safely get rid of them.

In the first step, called **Phase I**, the body uses a set of enzymes, known as **CYP enzymes** (cytochrome P450), to start breaking down toxins. These enzymes are like skilled workers that change these harmful substances into something less harmful and easier to handle.

However, sometimes this process can make certain toxins more reactive, so it's crucial that the next step quickly takes over.

Variants in the genes encoding different CYP enzymes can greatly influence phase I detox ability. Examples include *CYP1A1*, *CYP2E1*, *CYP1B1*, *and CYP2D6*. Variants in these genes are linked to:

- Harmful effects of cigarette smoke [R, R, R, R, R]
- Pesticide sensitivity [R, R, R]
- Air pollution sensitivity [R]

Phase II is where the body takes these slightly transformed substances from Phase I and further changes them to make them harmless.

For example, UGTs (UDP glycosyltransferases) support essential **glucuronidation** reactions. These enzymes, encoded by genes like *UGT1A1*, remove toxins found in **plastics, cigarette smoke**, and more [R, R].

The *NAT2* codes for another major enzyme in phase II detox. Due to the variants in this gene, people can be **"slow acetylators"**, which means they may have a harder time detoxing **cigarette smoke and some chemicals and drugs** [R, R, R, R].

One of the key detox players, especially phase II, is the "master antioxidant" **glutathione**. It's like a super cleaner that attaches to the toxins, neutralizing them and making them water-soluble, which means they can be easily removed from the body.

The *GSTP1* gene codes for an enzyme that helps eliminate toxins using glutathione. Studies have linked its variants to harmful effects of **air pollution, cigarette smoke, mercury**, and more [R, R, R, R, R].

Detox Pathway: Phase I

Nicotine ★
Tobacco, cigarette smoke

Heterocyclic Amines ★
Well-done meat, cigarette smoke

Nitrosamines
Processed meats like salami, hot dogs

PAHs
Air pollution, cigarette smoke, grilled foods

Organophosphates
Pesticide residues on food, lawn chemicals

PAHs ★
Air pollution, cigarette smoke, grilled foods

Organophosphates ★
Pesticide residues on food, lawn chemicals

Xenoestrogens ★
Plastics, cosmetics, growth hormones in food

Benzene
Vehicle exhaust, gasoline, industrial emissions

Heterocyclic Amines ★
Well-done meat, cigarette smoke

PAHs ★
Air pollution, cigarette smoke, grilled foods

Caffeine
Coffee, tea, energy drinks

Dioxins
Industrial pollution, waste incineration

PAHs ★
Air pollution, cigarette smoke, grilled foods

Tobacco Toxins ★
Tobacco, cigarette smoke

Xenoestrogens ★
Plastics, cosmetics, growth hormones in food

Industrial Pollutants
Polluted water, contaminated fish

Nitrosamines
Processed meats like salami, hot dogs

Mycotoxins ★
Mold in food, damp buildings

Cannabinoids ★
Cbd oil, thc products, marijuana

Food Additives
Processed and packaged foods, restaurant meals

Phthalates
Flexible plastics, fragrances

Modified Substances and Toxins

Gene	Genotype	Status	Detox components
CYP2A6	AA	○	
CYP1A1	AA / TT	○	
AHR	GG	○	Sulforaphane, Resveratrol
CYP1B1	GG	↑	
CYP3A4	GG / CC / AA	○	Niacin, Magnesium
CYP2C9	CC / AA	○	Vitamin B6, Zinc
CYP1A2	AA	↑	Riboflavin, Niacin
CYP2C19	GG / GG	○	Vitamin B6, Magnesium
PON1	TT / AT	↓	Calcium, Vitamin C
CYP2B6	TG	○	Iron, Niacin

THC ★
Marijuana, cannabis products

Phthalates ★
Flexible plastics, fragrances, food packaging

Parabens ★
Cosmetics, processed foods

Food Dyes
Candy, sodas, snacks

Heterocyclic Amines
Well-done meat, cigarette smoke

Ochratoxin
Mold in grains, coffee, dried fruits

Caffeine ★
Coffee, tea, energy drinks

Aflatoxins ★
Mold in peanuts, corn, grains, and spices

Heterocyclic Amines
Well-done meat, cigarette smoke

Acrolein
Cigarette smoke, vehicle exhaust, fried foods

Aldehydes
Alcohol, frying oils, cigarette smoke

Food Dyes
Snacks, candies, and beverages

Cannabinoids ★
CBD oil, THC products, marijuana

MSG
Processed foods, restaurant meals

Synthetic Fragrances
Perfumes, air fresheners, scented candles

Organophosphates
Pesticide residues on food, lawn chemicals

BPA
Plastics, can linings, receipt paper

Organophosphates ★
Pesticide residues on food, lawn chemicals

Particulate Matter
Air pollution, diesel exhaust

Food Additives
Processed and packaged foods, restaurant meals

Lipid Peroxides
Fried and rancid oils

Heavy Metals
Contaminated fish, old pipes, cookware

PBDEs ★
Old furniture, household dust, contaminated fish

VOCs
Household cleaners, paint fumes, solvents

Diesel Particulates
Exhaust from trucks, buses, older vehicles

Synthetic Musks
Perfumes, fragrances, scented products

BPA
Plastic containers, can linings, receipt paper

Gene	Genotype	Status	Detox component
ALDH2	GG	○	Magnesium
ADH1B	TC	↑	

Ethanol ★
Alcohol, sanitizers, cosmetics

Methanol
Windshield washer, paint removers, fuel additives

Isopropanol
Rubbing alcohol, sanitizers, cosmetics

Propylene Glycol
Processed foods, cosmetics, e-cigarettes

Acetaldehyde ★
Alcohol, tobacco smoke, fermented foods

Formaldehyde
Indoor air, tobacco smoke, household cleaners

Acrolein
Frying oils, tobacco smoke, air pollution

Legend

- (A) (A) **Gene - Altered**
- (A) **Gene - Typical**
- (A) **Gene - Better**
- (A) **Gene - Not determined**
- ↑ **Gene - Upregulating**
- ↓ **Gene - Downregulating**
- ○ **Gene - Neutral**
- (A)(A)(A) **Genotype**
- (?) **Genotype not determined**
- - - - **Gene to gene interactions**

- (A) **Enhancers**
- (A)(A)(A) **Toxins**
- ★ **High evidence / Important**
- (A) **Detox component**

Lab Results:
- ⚠ **Significantly out of optimal**
- (!) **Out of optimal**
- ✓ **Normal**
- ✓ **Optimal**
- (i) **Missing lab result**

Detox Pathway: Phase II

Modified Substances and Toxins

Mycotoxins ★
Mold in food, damp buildings

Statins ★
Cholesterol-lowering drugs

Bilirubin
Natural byproduct of red blood cell breakdown

Heavy Metals
Contaminated water, certain fish, old pipes

Food Additives
Processed and packaged foods, restaurant meals

Heterocyclic Amines ★
Well-done meat, cigarette smoke

PAHs ★
Air pollution, cigarette smoke, grilled foods

Caffeine
Coffee, tea, energy drinks

Dioxins
Industrial pollution, waste incineration

Bilirubin ★
Natural byproduct of red blood cell breakdown

BPA ★
Plastic containers, can linings, receipt paper

Endotoxins
Harmful gut bacteria, poor digestion, leaky gut

Ethanol
Alcohol, sanitizers, cosmetics

Aflatoxins
Mold in peanuts, corn, grains, and spices

Lipid Peroxides
Fried and rancid oils

Aromatic Amines ★
Hair dyes, fabric dyes, tattoo ink

Tobacco Toxins ★
Tobacco, cigarette smoke

Heterocyclic Amines ★
Well-done meat, cigarette smoke

Caffeine
Coffee, tea, energy drinks

Mycotoxins
Mold in food, damp buildings

Catecholamines ★
Stress hormones like dopamine, adrenaline

Xenoestrogens ★
Plastics, cosmetics, growth hormones in food

Organophosphates
Pesticide residues on food, lawn chemicals

Methylation

Eliminated Substances and Toxins

TC · **↓ SLCO1B1** · Magnesium · CoQ10

GG · **○ AHR** · Sulforaphane · Resveratrol

GG · **○ UGT1A1** · Calcium · Vitamin D

GG · **○ NAT1**

GA · **○ NAT2**

AG · **○ COMT** · Magnesium · SAM-e

GG GG · Riboflavin · **↑ NQO1** · NADPH

TT GG GG · Curcumin · **○ NFE2L2** · Sulforaphane

CC · **○ SULT1A1**

Selenium · **↑ GSTP1** · Curcumin · AA CC

AA · Sulforaphane · **↓ GSTA1** · Selenium

Benzene ★
Vehicle exhaust, gasoline, industrial emissions

Lipid Peroxides ★
Fried and rancid oils

Particulate Matter
Air pollution, diesel exhaust

Heavy Metals
Contaminated water, certain fish, older cookware

Arsenic ★ 🗑
Contaminated water, rice products

Aldehydes ★
Alcohol, frying oils, cigarette smoke

Oxidative Stress/ROS
Air pollution, radiation, metabolic byproducts

PAHs ★
Air pollution, cigarette smoke, grilled foods

Heterocyclic Amines ★
Well-done meat, cigarette smoke

Caffeine
Coffee, tea, energy drinks

Food Additives
Processed and packaged foods, restaurant meals

Chemical Surfactants
Household cleaners, detergents

PAHs ★
Air pollution, cigarette smoke, grilled foods

Organophosphates ★
Pesticide residues on food, lawn chemicals

Benzene
Vehicle exhaust, gasoline, industrial emissions

BPA
Plastic containers, can linings, receipt paper

Cadmium 🗑
Cigarette smoke, contaminated soil, rice

Arsenic 🗑
Contaminated water, rice products

Aflatoxins ★
Mold in nuts, grains, dried fruits

Mercury 🗑
Dental amalgam fillings, large fish

Lead ⚠️
Old paint, contaminated dust, old water pipes

Lipid Peroxides
Rancid oils, fried foods

Heterocyclic Amines
Well-done meat, cigarette smoke

Industrial Solvents
Cleaning products, paints, furniture polish

GLUTATHIONE PATHWAY

🗑 **Glutathione** GSH ↔ **Oxidative Stress**

Oxidized Glutathione GSSG

γ-Glutamylcysteine

NAC · Glutathione

🗑 **L-Cysteine** · **↓ GCLC** · 🗑 **L-Glutamate**

AG · CA

Legend

🔴Ⓐ 🟠Ⓐ **Gene - Altered**

🔵Ⓐ **Gene - Typical**

🟢Ⓐ **Gene - Better**

⚪Ⓐ **Gene - Not determined**

↑ **Gene - Upregulating**

↓ **Gene - Downregulating**

○ **Gene - Neutral**

Ⓐ Ⓐ Ⓐ **Genotype**

? **Genotype not determined**

--- **Gene to gene interactions**

⚫Ⓐ **Enhancers**

Ⓐ🔴Ⓐ🔴Ⓐ **Toxins**

★ **High evidence / Important**

🟣Ⓐ **Detox component**

Lab Results:

⚠️ **Significantly out of optimal**

❗ **Out of optimal**

✓ **Normal**

✓ **Optimal**

🗑 **Missing lab result**

Results Overview

✓ **Predisposed to typical detox ability**

Phase I

Gene - SNP Summary

ADH1B	rs1229984	↑ TC
AHR	rs2066853	○ GG
CYP1A1	rs4646903	○ AA
	rs1048943	○ TT
CYP3A4	rs35599367	○ GG
	rs55785340	○ AA
	rs2242480	○ CC

CYP1B1	rs1056836	↑ GG
ALDH2	rs671	○ GG
CYP2A6	rs1801272	○ AA
CYP2C19	rs4244285	○ GG
	rs4986893	○ GG
CYP1A2	rs762551	↑ AA

PON1	rs662	↓ TT
	rs854560	○ AT
CYP2B6	rs3745274	↓ TG
CYP2C9	rs1799853	○ CC
	rs1057910	○ AA

Labs Summary

⚠ **Lead, Blood**   ⓘ **Vitamin C**   ⓘ **16-OH-E1 (DUTCH)**   ⓘ **Cholinesterase, Serum**   ⓘ **GGT**   ⓘ **Iron**   ⓘ **Malondialdehyde**   ⓘ **Selenium**

Health Reports

ⓘ **Alcohol Sensitivity**   ✓ **Air Pollution Sensitivity**   ✓ **Benzene Sensitivity**   ✓ **BPA Sensitivity**   ✓ **Pesticide Sensitivity**   ✓ **Phthalate Sensitivity**

✓ **Sensitivity to Airborne Mold**   ✓ **Sensitivity to Foodborne Mold**

Phase II

Gene - SNP Summary

GCLC	rs17883901	↓ AG
	rs761142	○ CA
NFE2L2	rs35652124	↓ TT
	rs6721961	○ GG
	rs2364723	↑ GG

GSTA1	rs3957357	↓ AA
COMT	rs4680	○ AG
SULT1A1	rs1042028	↑ CC
GSTP1	rs1695	↑ AA
	rs1138272	○ CC

AHR	rs2066853	○ GG
NAT1	rs4986782	○ GG
UGT1A1	rs4148323	○ GG
NAT2	rs1495741	○ GA

Labs Summary

⊙ AST   🔒 8-Hydroxy-2-deoxyguanosine, Urine   🔒 ALT   🔒 Arsenic, 24-Hour Urine   🔒 Arsenic, Blood   🔒 Cystine, Serum/Plasma   🔒 GGT

🔒 Magnesium   🔒 Mercury, 24-Hour Urine   🔒 Mercury, Blood   🔒 Selenium   🔒 Total Glutathione

Health Reports

✓ Air Pollution Sensitivity   ✓ Arsenic   ✓ Benzene Sensitivity   ✓ Bilirubin   ✓ BPA Sensitivity   ✓ Cadmium   ✓ Glutathione   ✓ Lead

✓ Mercury   ✓ Pesticide Sensitivity   ✓ Sensitivity to Airborne Mold   ✓ Sensitivity to Foodborne Mold

Your recommendations

Your recommendations are prioritized according to the likelihood of it having an impact for you based on your lab results, 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	N-acetylcysteine (NAC)	1200 mg	2	Probiotics	30 billion CFU
3	Activated Charcoal	500 mg	4	Chlorella	3 g
5	Cruciferous Vegetables		6	Garlic	
7	Selenium Supplements	50 mcg	8	Avoid Exposure to Molds	
9	Glutathione supplements		10	Intermittent Fasting	
11	Milk Thistle (Silymarin)	300 mg	12	Air Purifier	
13	Avoid Arsenic Exposure		14	Avoid Mercury Exposure	
15	Avoid PBDE		16	Avoid Pesticide Exposure	
17	Coriander		18	Curcumin	500 mg
19	Green Tea	400 mg	20	Magnesium	350 mg
21	Sauna	15 minutes	22	Spirulina	500 mg
23	Vitamin C	2000 mg	24	Zinc	15 mg

N-acetylcysteine (NAC) ⬚

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

How it helps

N-Acetylcysteine (NAC) is a powerful detoxification ally that boosts glutathione production—your body's master detoxifier [R].

Hospitals rely on NAC to treat acetaminophen overdose by rapidly restoring liver glutathione. Beyond emergency use, NAC's chelating properties bind to heavy metals like mercury and lead, facilitating their safe removal from the body while protecting cells from oxidative damage caused by environmental toxins [R].

Personalized to Your Genes

↑ ADH1B	NAC protects against acetaldehyde toxicity and supports liver function [R].
↓ GCLC	NAC may support this variant by increasing glutathione levels [R, R].
↓ GSTA1	NAC may support this variant by increasing glutathione levels and GST activity [R, R].
↓ PON1	NAC supports PON1 antioxidant function [R].

Probiotics ⬚

How to implement

Take a probiotic supplement containing 10 billion or more live cultures once daily, preferably with a meal or as directed by the packaging or a healthcare provider.

TYPICAL STARTING DOSE

30 billion CFU

How it helps

Probiotics support detoxification by transforming your gut into a toxin-filtering system. Specific beneficial bacteria strains can bind to heavy metals and other toxins in the digestive tract, preventing their absorption into the bloodstream. These microorganisms also strengthen the intestinal barrier, reducing exposure to harmful endotoxins [R, R].

Personalized to Your Genes

↓ GSTA1	Probiotics may reduce mold toxicity linked to this variant [R, R].
↓ PON1	Probiotics may reduce pesticide toxicity linked to this variant [R].
↓ SLCO1B1	Probiotics may reduce mold toxicity linked to this variant [R, R].
○ NFE2L2	Probiotics may support detox by increasing NRF2 activity [R].

Activated Charcoal ⬈

How to implement

Take 500-1000 mg of activated charcoal with a full glass of water at least 1 hour before a meal or 2 hours after a meal. Do not consume it daily for long periods; use it for short-term detoxification or occasional upset stomach only.

TYPICAL STARTING DOSE

500 mg

How it helps

Activated charcoal acts as a powerful toxin magnet in the digestive system, binding to various poisons and preventing their absorption. Its porous structure traps toxins, chemicals, and even some bacteria, making it invaluable for acute detoxification situations. However, it should be used strategically as it can also bind beneficial nutrients and medications. For detox purposes, it's most effective when taken away from meals and supplements [R, R].

Personalized to Your Genes

| ↓ GSTA1 | Activated charcoal may reduce mold toxicity linked to this variant [R, R]. |

↓ PON1	Activated charcoal may reduce pesticide toxicity linked to this variant [R, R, R].
↓ SLCO1B1	Activated charcoal may reduce mold toxicity linked to this variant [R, R].

Chlorella ⬈

How to implement

Take 3 to 5 grams of chlorella in tablet or powder form daily, ideally before meals to improve digestion. Continue this supplementation for at least 2 to 3 months to observe benefits.

TYPICAL STARTING DOSE

3 g

How it helps

Chlorella is a green microalgae with exceptional heavy metal detox capabilities. Its unique cell wall contains polysaccharides that bind to toxins in the digestive tract, preventing their reabsorption and facilitating elimination. Studies demonstrate that chlorella supplementation may reduce the levels of heavy metals, HCAs, and other toxins in the body [R, R].

Personalized to Your Genes

↓ GCLC	Chlorella may combat mercury toxicity linked to this variant [R].
↓ GSTA1	Chlorella may reduce mold toxicity linked to this variant [R].
↓ SLCO1B1	Chlorella may reduce mold toxicity linked to this variant [R].

Cruciferous Vegetables ⬈

How to implement

Incorporate a serving of cruciferous vegetables, such as broccoli, cauliflower, Brussels sprouts, kale, or cabbage, into at least one meal each day. A serving size is about a half cup cooked or one cup raw. Try to maintain this habit consistently over time for the best health outcomes.

How it helps

Cruciferous vegetables are natural detox activators, rich in beneficial substances (glucosinolates) like **sulforaphane**. These bioactive compounds directly enhance Phase II detoxification enzymes in the liver, boosting your body's ability to process and eliminate carcinogens and harmful chemicals [R, R].

Personalized to Your Genes

↑ CYP1B1	DIM from cruciferous vegetables supports healthy estrogen metabolism, which may be affected by your CYP1B1 variant [R, R].
↓ GSTA1	Cruciferous vegetables may increase GST-alpha activity by 15-35% [R].
○ NFE2L2	Sulforaphane from cruciferous vegetables may boost NRF2 activity [R, R].

Garlic ⬈

How to implement

Incorporate 1-2 cloves of raw garlic into your meals daily. This can be achieved by finely chopping or crushing the garlic and letting it sit for a few minutes before adding it to your dishes to maximize its health benefits.

How it helps

Garlic is a powerful detoxifier known for its sulfur-containing compounds, particularly **allicin**. These compounds stimulate liver detoxification enzymes, which help neutralize and eliminate carcinogens, heavy metals, and other xenobiotics. Garlic also enhances glutathione production and supports the excretion of fat-soluble toxins by increasing bile flow [R, R].

Personalized to Your Genes

↓ GCLC	Allicin from garlic helps boost glutathione and its enzymes [R, R].
↓ GSTA1	Allicin from garlic helps boost glutathione and its enzymes like GST [R, R].
↓ PON1	Sulfur-rich garlic compounds like allicin may boost PON1 activity and support detox [R].

Selenium Supplements ⬀

How to implement

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

TYPICAL STARTING DOSE

50 mcg

How it helps

This trace mineral is essential for glutathione peroxidase activity, one of your body's most important antioxidant enzymes that neutralizes toxins and free radicals. Selenium supports thyroid function and helps protect against mercury toxicity by forming protective selenoproteins. It also supports Phase II liver detoxification and helps maintain cellular integrity during toxin exposure and elimination.

Personalized to Your Genes

↓ GCLC — Selenium helps support the function of glutathione and its enzymes [R, R].

↓ GSTA1 — Selenium helps support the function of glutathione and its enzymes like GST [R, R].

↓ PON1 — Selenium supports PON1 antioxidant function [R].

Avoid Exposure to Molds ⬀

How to implement

Keep indoor humidity levels below 50% by using dehumidifiers or air conditioners, ensure proper ventilation in areas like bathrooms and kitchens, fix leaks promptly, and clean up any water damage within 24-48 hours to prevent mold growth. Regularly check and clean places where mold tends to accumulate, such as shower curtains, window sills, and refrigerator drip pans.

How it helps

Mold exposure generates toxic compounds like mycotoxins, which can damage the liver, impair immune function, and trigger chronic inflammation. Minimizing exposure—by avoiding contaminated food, reducing indoor humidity, and using air filters—helps prevent burdening detox pathways. This simple lifestyle change supports liver health and immune system balance [R].

Personalized to Your Genes

↓ GSTA1   This variant may be linked to kidney damage due to mold toxin exposure [R, R].

↓ SLCO1B1   This variant is a risk factor for liver damage due to mold toxin (aflatoxin B1) exposure [R].

Glutathione supplements ⧉

How to implement

Take glutathione supplements orally, usually in pill or powder form, with a recommended dose ranging from 500mg to 1000mg daily, divided into two doses. It's best taken on an empty stomach or as directed by a healthcare professional. Continuous use is advised for sustained benefits, but consulting with a healthcare provider for personalized advice and duration is important.

How it helps

Glutathione (GSH) is the body's master antioxidant and a critical player in detoxification. It facilitates the neutralization and elimination of various toxins, including heavy metals, smoke toxins, industrial chemicals, pesticides, and more [R].

Additionally, it combats oxidative stress by neutralizing free radicals, thus protecting cellular components from damage. Supporting glutathione levels through precursors like N-acetylcysteine or direct supplementation can enhance the body's detoxification capacity [R].

Personalized to Your Genes

↓ GCLC   Glutathione supplementation might lessen the impact of this variant on detox and oxidative stress [R].

↓ GSTA1   Glutathione supplementation might lessen the impact of this variant on detox and oxidative stress [R].

Intermittent Fasting ⧉

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.

How it helps

Intermittent fasting enhances detoxification by giving your digestive system regular breaks, allowing energy to be redirected toward cellular repair and toxin elimination. During fasting periods, your body activates autophagy—a cellular cleaning process that breaks down damaged proteins and organelles. This "cellular housekeeping" removes accumulated toxins and metabolic waste while improving mitochondrial function [R, R].

Personalized to Your Genes

↓ GCLC	Calorie restriction increases GCLC activity and glutathione levels [R].
○ NFE2L2	Calorie restriction promotes detox by boosting NRF2 activity [R, R].

Milk Thistle (Silymarin) ↗

How to implement

Take a 300 mg milk thistle (silymarin) supplement daily with water, preferably with a meal for better absorption. Continue this regimen as advised by your healthcare provider.

TYPICAL STARTING DOSE

300 mg

How it helps

Milk thistle contains silymarin, a potent liver protector that shields your primary detox organ from damage while enhancing its function. Silymarin promotes the regeneration of damaged liver tissue. It demonstrates remarkable effectiveness in protecting against liver damage from alcohol, acetaminophen, and environmental pollutants [R, R].

Personalized to Your Genes

↓ SLCO1B1	Sylimarin may help reduce the adverse effects of this variant on liver health [R].

NFE2L2   Sylimarin may protect the liver from alcohol and other toxins by boosting NRF2 [R, R].

Air Purifier 🔗

How to implement

Install an air purifier in your home, ideally in the rooms you spend the most time in, such as your bedroom and living room. Keep the air purifier on for at least 12 hours each day, or continuously if possible, to effectively reduce airborne contaminants. Regularly clean or replace the filters according to the manufacturer's instructions to maintain its efficiency.

How it helps

Indoor air often contains 2-5 times higher concentrations of pollutants than outdoor air, including volatile organic compounds, mold toxins, and particulates that burden your detoxification systems. High-quality HEPA air purifiers with activated carbon filters remove airborne toxins, reducing your daily toxic load and allowing your liver and lungs to focus on eliminating stored toxins rather than constantly processing new exposures from contaminated indoor environments.

Personalized to Your Genes

↑ CYP1B1   Toxins from air pollution and cigarette smoke may have stronger effects on people with this variant [R, R].

Avoid Arsenic Exposure 🔗

How to implement

Use a water filter certified to remove arsenic if you rely on well water, opt for arsenic-tested rice or rice products, and avoid using contaminated pesticides or herbicides in gardening or farming. Test your home for arsenic if you live in an area known for high levels of arsenic in soil or water. Limit consumption of foods known to accumulate arsenic such as rice and rice-based products, especially if you are pregnant, nursing, or preparing meals for young children.

How it helps

Chronic exposure to inorganic arsenic—found in contaminated well water, certain rice, and root vegetables—can lead to skin lesions, cardiovascular disease, and cancers of the skin, lung, bladder, and liver. Avoid sources by testing private well water,

diversifying grains, peeling root vegetables, and minimizing apple juice consumption. Preventing arsenic accumulation lightens the liver's detox burden and supports long-term health [R].

Personalized to Your Genes

○ NFE2L2   NFE2L2 gene variants may be linked to arsenic toxicity [R, R].

Avoid Mercury Exposure ⬀

How to implement

Limit consumption of large fish such as shark, swordfish, king mackerel, and tilefish, which are known to have higher mercury levels. Opt for smaller fish like salmon, shrimp, pollock, and catfish, and limit seafood intake to 8-12 ounces (two to three servings) per week. Check and follow local advisories regarding the safety of fish caught by family and friends in your local lakes, rivers, and coastal areas.

How it helps

Mercury, often present in high-mercury fish (like shark, swordfish, king mackerel), dental amalgams, and polluted waters, accumulates in the brain and kidneys, disrupting neurological function and oxidative balance. Limiting high-mercury fish intake, choosing low-mercury seafood (e.g., salmon, sardines), and ensuring safe dental practices helps reduce the body's exposure. This preventative step supports neural detoxification and overall health [R].

Personalized to Your Genes

↓ GCLC   This variant is linked to increased mercury toxicity [R, R].

Avoid PBDE ⬀

How to implement

To avoid PBDEs, replace old furniture that might contain these chemicals, vacuum and dust your home regularly to reduce dust particles that might contain PBDEs, and use products labeled as PBDE-free. Ensure you check labels on electronics, furnishings, and textiles for mention of being PBDE-free.

How it helps

PBDEs are flame-retardant chemicals found in furniture, electronics, and textiles. They accumulate in fat tissue and disrupt thyroid hormone metabolism, brain development, and liver function. PBDEs are not easily excreted and place a long-term burden on detox systems. Minimizing exposure by choosing natural-fiber furniture, reducing dust, and avoiding foam-based products helps reduce the body's toxin load and supports long-term endocrine health [R].

Personalized to Your Genes

○ CYP2B6   This variant is linked to a higher persistence of PBDEs in the blood and breast milk [R].

Avoid Pesticide Exposure ↗

How to implement

Purchase organic produce when possible, wash fruits and vegetables thoroughly under running water, and peel them if not organic. Use natural pest control methods instead of chemical pesticides at home and garden. Limit the use of non-organic lawn and garden chemicals.

How it helps

Pesticides—including organophosphates, glyphosate, and pyrethroids—are common environmental toxins linked to hormone disruption, oxidative stress, and neurological damage. These chemicals can accumulate in fatty tissues and challenge the liver and gut detox pathways. Reducing pesticide exposure by **choosing organic produce, washing fruits and vegetables thoroughly, and avoiding pesticide-treated lawns** can significantly decrease your body's toxic load [R, R].

Personalized to Your Genes

↓ PON1   Pesticides may have stronger adverse effects in people with your PON1 variant [R, R].

Coriander ↗

How to implement

Take coriander supplements in the form of capsules or powder. If using powder, aim for 1/4 to 1/2 teaspoon per day, mixed into food or drinks. If taking capsules, follow the dosage instructions provided on the product label, typically one capsule, one to two times daily with meals. Continue consistently for at least a few weeks to observe effects.

How it helps

Cilantro has been traditionally valued for its ability to mobilize heavy metals from tissues and enhance their elimination. Studies suggest that compounds in cilantro can bind to metals like mercury and help transport them out of the body. The herb works particularly well for detoxifying mercury and other heavy metals when part of a comprehensive detox protocol [R, R].

Personalized to Your Genes

↓ GCLC   Cilantro may bind and remove excess mercury linked to this variant [R].

Curcumin ⧉

How to implement

Take a 500 mg curcumin supplement daily with food. To enhance absorption, take it with a meal that contains fats or oils since curcumin is fat-soluble.

TYPICAL STARTING DOSE
500 mg

How it helps

Curcumin supports Phase II liver detoxification and provides powerful anti-inflammatory effects. It helps protect liver cells from oxidative damage and may support the body's natural response to toxin-induced inflammation. Enhanced absorption forms like liposomal or piperine-combined curcumin show better bioavailability for therapeutic effects.

Personalized to Your Genes

⊙ NFE2L2   Curcumin enhances detox and antioxidant protection, in part by boosting NRF2 [R].

Green Tea ⧉

How to implement

Consume 400 mg of green tea extract daily. This can be taken in the form of capsules or tablets available that specify the amount of green tea extract. Ensure the supplement is taken according to the product's specific instructions, usually once a day with water.

TYPICAL STARTING DOSE

400 mg

How it helps

Green tea's catechins, especially **EGCG**, are powerful detox enhancers that activate Phase II detoxification enzymes in the liver. These compounds improve your body's ability to conjugate and eliminate toxins while providing antioxidant protection against oxidative damage from toxic exposure [R, R].

Personalized to Your Genes

○ NFE2L2   EGCG from green tea helps boost NRF2 activity and antioxidant protection [R].

Magnesium ⬈

How to implement

Take up to 350 mg of magnesium daily as a supplement, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

350 mg

How it helps

Magnesium is essential for optimal detoxification, playing crucial roles in hundreds of enzymatic reactions involved in toxin processing. This vital mineral supports glutathione function and aids in heavy metal elimination while maintaining cellular membrane integrity to reduce toxin uptake [R].

Magnesium sulfate or **Epsom salts** baths may support detoxification through skin absorption of magnesium and promotion of sweating. While transdermal magnesium absorption is debated, many people report feeling better after these baths [R].

Personalized to Your Genes

↓ GCLC   Magnesium supports GCLC activity [R].

Sauna ⧉

How to implement

Use a sauna 2-3 times a week for 15-20 minutes per session. Begin with a temperature that feels comfortable, typically between 150-195 degrees Fahrenheit (65-90 degrees Celsius), and gradually increase the time and temperature as you become more accustomed to the heat.

TYPICAL STARTING DOSE

15 minutes

How it helps

Regular sauna use promotes detoxification through enhanced sweating, allowing your body to eliminate toxins directly through the skin. Sweating can remove heavy metals, BPA, and other environmental chemicals that may not be efficiently processed by other detox pathways. **Infrared saunas** are particularly effective as they penetrate deeper into tissues, mobilizing stored toxins. The heat stress also upregulates heat shock proteins that help protect cells during detoxification and support the elimination of damaged proteins [R, R].

Personalized to Your Genes

○ CYP2B6   Sauna helps eliminate toxins like PBDEs through sweat [R].

Spirulina ⧉

How to implement

Take 1-8 g of spirulina supplements daily, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

500 mg

How it helps

Spirulina is a blue-green algae that excels at heavy metal detoxification through dual mechanisms. It directly chelates toxic metals like arsenic, cadmium, and lead while simultaneously boosting your body's own antioxidant enzymes like glutathione peroxidase [R, R].

Personalized to Your Genes

○ NFE2L2   Spirulina may reduce arsenic toxicity linked to low NRF2 [R].

🔗 **Vitamin C** ↗

How to implement

Take 500-2000 mg of vitamin C supplement daily. It can be taken at any time of the day, with or without food, according to personal preference or tolerance.

> **TYPICAL STARTING DOSE**
> **2000 mg**

How it helps

This powerful antioxidant directly neutralizes free radicals generated during toxin processing while supporting glutathione regeneration in liver cells. Vitamin C enhances iron absorption needed for detox enzymes and supports collagen production for tissue repair. It also helps protect cellular membranes from oxidative damage caused by toxin exposure and supports immune function during detox protocols.

Personalized to Your Genes

↓ PON1   Vitamin C supports PON1 antioxidant function and enzyme protection [R].

🔗 **Zinc** ↗

How to implement

Take a 15 mg zinc supplement daily, ideally with a meal to enhance absorption.

> **TYPICAL STARTING DOSE**
> **15 mg**

How it helps

Zinc serves as a cofactor for over 200 enzymes involved in detoxification, including superoxide dismutase which protects cells from oxidative stress. It supports metallothionein production—proteins that bind and neutralize heavy metals like mercury and cadmium. Zinc also maintains healthy gut barrier function, preventing toxin absorption, and supports immune system function during detox processes.

Personalized to Your Genes

| NFE2L2 | Zinc may reduce arsenic toxicity linked to low NRF2 [R]. |

How it helps

ADH1B

ADH1B Report [↗]

The ADH1B gene produces a liver enzyme involved in the first step of alcohol metabolism, converting **ethanol into acetaldehyde**. This enzyme also processes other alcohol-based compounds found in everyday products. Examples include [R, R]:

- **Ethanol** – from alcohol, sanitizers, and cosmetics
- Methanol – from windshield washer fluid, paint removers, and fuel additives
- Isopropanol – from rubbing alcohol, sanitizers, and cosmetics
- Propylene-glycol – from processed foods, cosmetics, and e-cigarettes

Higher activity is **potentially harmful** because it may lead to the buildup of toxic acetaldehyde.

SNP	Your Genotype
rs1229984 ADH1B*2	**↑ TC**
Alleles	Your genotype is linked to increased ADH1B activity and altered detox ability.
C: Typical ADH1B activity and detox ability	
T: Increased ADH1B activity and altered detox ability	

Intro and Health Effects

Carrying the 'T' allele of **rs1229984** can result in a 70- to 80-fold **increase** in the rate of conversion of alcohol to **acetaldehyde**, its toxic metabolite. This can cause side effects from alcohol consumption, including migraines, flushing, and breathlessness [R, R, R].

On the bright side, people with this variant are less likely to drink alcohol due to unpleasant symptoms [R, R, R].

This variant is prevalent in East Asians, and it's the main reason why they generally drink less [R, R].

CYP1B1

CYP1B1 Report ↗

The [CYP1B1](#) gene codes for a detox enzyme expressed mainly in the lungs, colon, and kidneys. It helps metabolize pollutants and hormone-disrupting chemicals, such as [[R](#)]:

- **PAHs** – from air pollution, cigarette smoke, and grilled foods
- **Tobacco Toxins** – from tobacco and cigarette smoke
- **Xenoestrogens** – from plastics, cosmetics, and growth hormones in food
- Industrial pollutants – from polluted water and contaminated fish
- Nitrosamines – found in processed meats like salami and hot dogs

Higher activity may lead to an **increase in toxic intermediates**, especially from PAHs and xenoestrogens. This may elevate cancer risk if detox is not supported by adequate phase II pathways such as glutathione conjugation [[R](#)].

SNP	Your Genotype
rs1056836 Leu432Val	↑ **GG**
Alleles	
G: Increased CYP1B1 activity and toxin activation	
C: Reduced CYP1B1 activity and toxin activation	Your genotype is linked to increased CYP1B1 activity and toxin activation

Intro and Health Effects

The main *CYP1B1* variant is **[rs1056836](#)** (Leu432Val). The **G (Val) allele** seems to **increase** the enzyme's activity. This may lead to increased production of toxic metabolites of hormones and toxins.

In line with this, studies have found a link between this allele and **higher odds of multiple myeloma and lung cancer** [[R](#), [R](#)].

On the other hand, increased CYP1B1 activity may protect the skin against excessive UV radiation. The high-activity G allele may be linked to lower odds of skin cancer [[R](#)].

GCLC

GCLC Report ⧉

The GCLC gene encodes an enzyme crucial for glutathione production and thus plays a role in detoxing:

- **Mercury** – from dental fillings, large fish, and industrial exposure
- **Oxidative Stress** – from air pollution, radiation, and metabolic byproducts
- Industrial Solvents – found in cleaning products, paints, and furniture polish

Reduced GCLC activity compromises glutathione production, leading to increased oxidative stress and impaired detox capacity.

Blockers:

Heavy metals   Cigarette smoke

Enhancers:

Selenium   N-acetylcysteine (NAC)   Sulforaphane   Magnesium

SNP	Your Genotype
rs17883901	**↓ AG**
Alleles	
A: Reduced GCLC activity and detox ability	Your genotype is linked to reduced GCLC activity and detox ability.
G: Typical GCLC activity and detox ability	

Intro and Health Effects

The 'A' allele at rs17883901 showed a link with **higher levels of mercury** in hair and blood in several studies. The effects were major for people with two copies (AA). However, one small study found the opposite effect [R, R, R, R].

This variant may also be linked to:

- Diabetic eye disease (retinopathy) [R]
- Reduced kidney function in people with diabetes [R]
- Fatty liver (NASH) [R]
- Reduced lung function [R]
- High blood pressure in pregnancy (preeclampsia) [R]

SNP

rs761142

Alleles

A: Reduced GCLC activity and detox ability

C: Increased GCLC activity and detox ability

Your Genotype

○ CA

Your genotype is linked to typical GCLC activity and detox ability.

Intro and Health Effects

One GCLC gene variant, **rs761142-A,** may affect mercury levels and toxicity. In one study, mothers with two copies of this variant (AA) had higher hair mercury levels. Also, increased blood mercury levels during pregnancy were linked to developmental issues in their children [R].

GSTA1

GSTA1 Report ↗

The GSTA1 gene helps make a crucial detox enzyme. It supports glutathione-based detoxification, mainly in the liver, targeting a broad range of toxins such as [R]:

- **Mycotoxins** – from mold in nuts, grains, and dried fruits
- Mercury – from dental fillings, large fish, and industrial exposure
- Lead – from old paint, dust, and pipes
- Lipid Peroxides – from rancid oils and fried foods
- Heterocyclic Amines – from well-done meat and cigarette smoke
- Industrial Solvents – found in cleaning products, paints, and furniture polish

Robust GSTA1 function protects against oxidative damage and chemical exposure. Genetic variants that reduce activity may raise the risk of toxin accumulation and oxidative stress.

Blockers:

Heavy metals   Acrylamide (fried foods)

Enhancers:

Selenium   Sulforaphane

SNP	Your Genotype
rs3957357 Alleles **A:** Reduced GSTA1 activity and detox ability **G:** Increased GSTA1 activity and detox ability	**↓ AA** **Your genotype is linked to reduced GSTA1 activity and detox ability.**

Intro and Health Effects

The most studied GSTA1 variant is **rs3957357**. The **A allele** is associated with reduced enzyme activity and detox capacity [R].

A study found a link between this variant and a rare kidney disease, likely due to impaired **fungal toxin** metabolism [R].

This variant may also be linked to [R, R, R, R, R]:

- Higher odds of liver cancer
- Stronger adverse effects of chemo
- Higher odds of asthma and allergies
- Lower hemoglobin levels
- Lower free testosterone levels

PON1

PON1 Report ↗

The PON1 gene helps produce a detox enzyme active in the blood and liver. It helps neutralize oxidative and environmental toxins, including [R]:

- **Organophosphates** – from pesticide residues and lawn chemicals
- Particulate Matter – found in air pollution and diesel exhaust
- Food Additives – common in processed and packaged meals
- Lipid Peroxides – from fried and rancid oils
- Heavy Metals – present in contaminated fish, old pipes, and cookware

Higher activity is protective, particularly against organophosphates and air pollutants. Genetic variations that reduce activity can raise toxin sensitivity and cardiovascular risk [R].

Blockers:

Lead   Pesticides   Acrylamide (fried foods)

Enhancers:

Vitamin C   Allicin   Selenium

SNP

rs662 Gln192Arg

Alleles

C: Increased PON1 activity and detox ability

T: Reduced PON1 activity and detox ability

Your Genotype

↓TT

Your genotype is linked to reduced PON1 activity and detox ability

---

Intro and Health Effects

The **rs662**-**T** variant **reduces** PON1 enzyme activity, resulting in a slower breakdown of toxins. Studies have associated this variant with [R, R]:

- Increased risk of organophosphate toxicity (by 74%)
- Increased risk of heart disease
- Decreased longevity

SNP

rs854560 Leu55Met

Alleles

A: Reduced PON1 activity and detox ability

T: Increased PON1 activity and detox ability

Your Genotype

○ **AT**

Your genotype is linked to typical PON1 activity and detox ability

Intro and Health Effects

Carriers of the rs854560-A variant have lower blood levels of PON1. This means they may have a reduced detox ability. This variant has been associated with [R, R]:

- Increased risk of organophosphate toxicity (by 82%)
- Increased risk of heart disease
- Decreased longevity

SLCO1B1

The *SLCO1B1* gene helps make a liver transporter protein that supports detoxification by moving toxins, drugs, and metabolites into liver cells for breakdown. It helps eliminate [R, R]:

- **Mycotoxins** – from mold in food and damp buildings
- **Statins** – cholesterol-lowering drugs
- **Bilirubin** – a natural byproduct of red blood cell breakdown
- Heavy Metals – from contaminated water, fish, and pipes
- Food Additives – in processed and packaged foods, restaurant meals

Variants that reduce transporter function can cause statin intolerance or increase toxin buildup. **Higher activity generally supports better detox**.

Blockers:

Air pollution

SNP	Your Genotype
rs4149056 SLCO1B1*5	↓ **TC**
Alleles	
C: Reduced SLCO1B1 activity and detox ability	Your genotype is linked to reduced SLCO1B1 activity and detox ability.
T: Typical SLCO1B1 activity and detox ability	

Intro and Health Effects

The 'C' allele of rs4149056 (T521C or SLCO1B1*5) **reduces transport activity**, leading to the buildup of drugs, substances, and toxins transported by this protein [R, R].

A study identified this variant as a risk factor for **liver damage** among those exposed to high **mold toxin** (aflatoxin B1) levels. The link between this variant and **higher bilirubin** levels may put additional strain on the liver [R, R].

This variant may also reduce the protein's ability to transport **statins** into the liver. As a result, more of the medication stays in the bloodstream, which can increase the risk of side effects like **statin-induced muscle pain** [R, R, R, R, R, R].

AHR

AHR acts like an environmental "alarm system" that ramps up detox enzymes in response to chemical exposures. It activates detox enzymes like CYP1A1 and CYP1B1. By doing so, it helps eliminate toxins such as [R, R]:

- **Heterocyclic Amines** – from well-done meat and cigarette smoke
- **PAHs** – from air pollution, cigarette smoke, and grilled foods
- **Caffeine** – found in coffee, tea, and energy drinks
- Dioxins – from industrial pollution and waste incineration

Blockers:

Heavy metals

Enhancers:

Sulforaphane   Curcumin

SNP

rs2066853

Alleles

A: Reduced AHR activity and detox ability

G: Typical AHR activity and detox ability

Your Genotype

○ **GG**

Your genotype is linked to typical AHR activity and detox ability.

Intro and Health Effects

The **"A" allele of rs2066853** decreases AhR levels. Lower levels of AhR would mean less protection from toxins, oxidative stress, and inflammation [R].

This variant may be linked to:

- Colorectal polyps in people exposed to toxins from well-done meat [R]
- Lung cancer in smokers [R]
- Acute lung failure (ARDS) [R]
- Reduced sperm quality [R, R]

Interestingly, people with this variant may also have slower caffeine metabolism and thus consume less coffee and tea [R].

ALDH2

The ALDH2 gene produces a liver enzyme involved in the second step of alcohol metabolism, converting toxic acetaldehyde into harmless acetate. It also detoxifies aldehydes from various environmental sources. Examples include [R, R]:

- **Acetaldehyde** – from alcohol, tobacco smoke, and fermented foods
- Formaldehyde – from car air, tobacco smoke, and household cleaners
- Other Aldehydes – from frying oils, tobacco smoke, and air pollution

Higher activity is generally beneficial, especially for preventing acetaldehyde buildup during alcohol consumption.

Enhancers:

Vitamin B3 (Niacin)   Magnesium

SNP	Your Genotype
rs671 ALDH2*2	○ **GG**
Alleles	
A: Reduced ALDH2 activity and detox ability	Your genotype is linked to typical ALDH2 activity and detox ability.
G: Typical ALDH2 activity and detox ability	

Intro and Health Effects

The 'A' allele of rs671 reduces ALDH2 activity, leading to acetaldehyde buildup. Enzyme activity is completely reduced in those who carry two copies of the 'A' allele, and by 50-70% for those who carry one [R, R].

Carriers of this variant tend to get drunk faster and are more likely to experience a hangover. This effect is more pronounced in people with vitamin B12 deficiency. Vitamin B12 can assist in acetaldehyde breakdown [R, R].

On the bright side, the variant carriers drink less and are less likely to be alcohol-dependent. The variant is most prevalent in Asian populations and almost non-existent in other populations [R].

COMT

COMT Report ⧉

The COMT gene produces an enzyme active in the brain and liver that breaks down catechol-containing toxins, including certain stress and hormone compounds [R, R]:

- **Catecholamines** – such as dopamine, noradrenaline, and adrenaline
- **Xenoestrogens** – from plastics, cosmetics, and growth hormones in food
- Organophosphates – from pesticide residues and lawn chemicals

Low activity can lead to elevated estrogen and dopamine levels, potentially increasing anxiety, estrogen dominance, and toxin retention. Higher activity promotes detox but may reduce neurotransmitter tone.

Blockers:

Heavy metals   BPA (plastics)   Stress

Enhancers:

SAMe   Magnesium

SNP

rs4680   **Val158Met**

Alleles

A: Reduced COMT activity and detox ability

G: Increased COMT activity and detox ability

Your Genotype

○ AG

Your genotype is linked to typical COMT activity and detox ability.

Intro and Health Effects

People with two copies of the "A" allele at rs4680 (AA) may have lower COMT enzyme activity. They have been nicknamed the "worriers." They break down stress-related chemical messengers more slowly in the brain [R, R].

For this reason, they may be more vulnerable to stress. This includes an increased susceptibility to heart disease, possibly due to the effects of these chemical messengers on blood pressure and heart rate [R, R].

Reduced COMT activity may also impair the detox of **xenoestrogens** and some pesticides [R].

CYP1A1

CYP1A1 Report ↗

The CYP1A1 gene codes for a key enzyme primarily found in the lungs. It helps detox airborne pollutants and chemicals including:

- **PAHs** – from air pollution, cigarette smoke, and grilled foods
- **Organophosphates** – pesticide residues on food and lawn chemicals
- **Xenoestrogens** – found in plastics, cosmetics, and growth hormones in food
- Benzene – from vehicle exhaust, gasoline, and industrial emissions

Increased activity can lead to the creation of **more toxic intermediates**, particularly with PAHs and benzene. Adequate support from downstream detox pathways is essential to prevent accumulation of these harmful byproducts.

SNP

rs4646903 CYP1A1*4

Alleles

A: Typical CYP1A1 activity and detox ability

G: Increased CYP1A1 activity and altered detox ability

Your Genotype

○ **AA**

Your genotype is linked to typical CYP1A1 activity and detox ability

---

Intro and Health Effects

The 'G' allele of rs4646903 is linked to higher CYP1A1 levels. It may increase the conversion of **PAHs, pesticides, and xenoestrogens** into **more toxic** metabolites. Studies have linked this variant to:

- Leukemia [R, R]
- Cervical cancer [R]
- Head and neck cancer [R]
- Laryngeal cancer [R]
- Liver cancer [R]
- Lung cancer [R, R]
- Prostate cancer [R]
- Breast cancer [R, R]
- PCOS [R]
- Recurrent pregnancy loss [R]
- Male infertility [R]

However, this variant has also been associated with a decreased risk of colorectal cancer [R, R].

SNP

rs1048943 CYP1A1*2A

Alleles

C: Increased CYP1A1 activity and altered detox ability

T: Typical CYP1A1 activity and detox ability

Your Genotype

○ TT

Your genotype is linked to typical CYP1A1 activity and detox ability
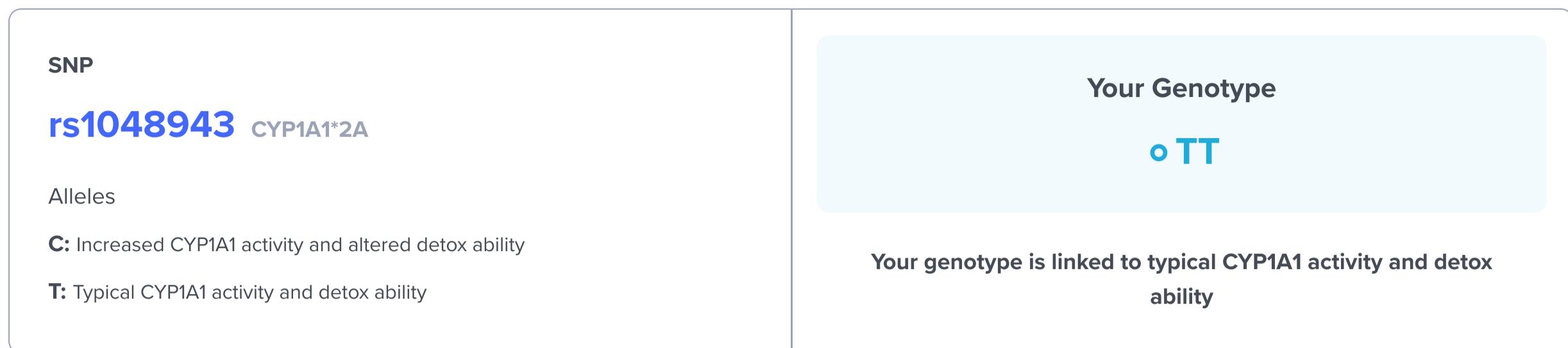
Intro and Health Effects

The 'C' allele of rs1048943 is linked to higher CYP1A1 levels. It may increase the conversion of **PAHs, pesticides, and xenoestrogens** into **more toxic** metabolites. Studies have linked this variant to:

- Lung cancer [R, R, R]
- Leukemia [R]
- Oral cancer [R]
- Laryngeal cancer [R]
- Liver cancer [R]
- Colorectal cancer [R]
- Cervical cancer [R]
- Prostate cancer [R]

The risk of lung cancer may be even **higher in smokers** carrying this variant [R, R, R].

CYP2A6

The [CYP2A6](#) gene helps make a crucial detox enzyme in the **liver**. It breaks down a range of drugs and toxins, especially nicotine. Toxins metabolized by CYP2A6 include [[R](#), [R](#), [R](#)]:

- **Nicotine** – from tobacco and cigarette smoke
- Heterocyclic amines – from well-done meat and cigarette smoke
- Nitrosamines – found in processed meats like salami and hot dogs
- PAHs – from air pollution, cigarette smoke, and grilled foods
- Organophosphates – found in pesticide residues on food and lawn chemicals

Higher activity can enhance the clearance of toxins like nicotine, which might be protective. However, people with **higher activity** tend to **smoke more** due to nicotine cravings.

Faster metabolism might also convert **procarcinogens** like PAHs into more toxic intermediates, making **higher CYP2A6 activity potentially harmful**.

SNP	Your Genotype
rs1801272 CYP2A6*2	**○ AA**
Alleles	
A: Typical CYP2A6 activity and toxin activation	Your genotype is linked to typical CYPA6 activity and toxin activation
T: Reduced CYPA6 activity and toxin activation	

Intro and Health Effects

The main CYP2A6 SNP is [rs1801272](#), also known as **CYP2A6*2**. The 'T' allele **reduces** CYP2A6 activity and nicotine metabolism. Carriers of this variant are less likely to be smokers, which may protect them against [[R](#), [R](#)]:

- COPD [[R](#)]
- Lung cancer [[R](#)]

CYP2A6 activates other toxins like PAHs into more dangerous metabolites, so this variant may be beneficial for detox as well.

CYP2B6

CYP2B6 Report ⬈

The CYP2B6 gene makes a liver detox enzyme involved in processing airborne and synthetic chemical exposures. Main toxins metabolized by this gene include [R]:

- **PBDEs** – flame retardants in old furniture, household dust, and contaminated fish
- VOCs – from household cleaners, paint fumes, and solvents
- Diesel Particulates – from trucks, buses, and older vehicles
- Synthetic Musks – found in perfumes, fragrances, and scented products
- BPA – in plastic containers, can linings, and receipts

Higher enzyme activity aids detox of the above chemicals. Reduced activity may lead to buildup of these chemicals, affecting hormone balance and nervous system health [R].

Blockers:

Pesticides   Cigarette smoke

Enhancers:

Iron   Allicin   Sulforaphane

SNP

rs3745274 CYP2B6*6

Alleles

G: Increased CYP2B6 activity and detox ability

T: Reduced CYP2B6 activity and detox ability

Your Genotype

↓ TG

Your genotype is linked to reduced CYP2B6 activity and detox ability

---

Intro and Health Effects

The change from 'G' to 'T' at **rs3745274** encodes the *CYP2B6*6* variant, which has **markedly reduced enzyme activity**. This variant is linked to a **higher persistence of PBDEs** in the blood and breast milk [R].

CYP2C19

The CYP2C19 gene produces a liver enzyme involved in detoxifying various food and fragrance-related toxins. Examples include:

- **Cannabinoids** – from CBD oil, THC products, marijuana
- **Organophosphates** – present in pesticide residues and lawn chemicals
- **BPA** – from plastics, can linings, and receipt paper
- MSG – found in processed foods and restaurant meals
- Synthetic Fragrances – from perfumes, air fresheners, and scented products

Higher activity is generally beneficial, especially for clearing hormone-disrupting chemicals like BPA and pesticides such as organophosphates.

Blockers:

Alcohol

Enhancers:

Iron   Vitamin B6 (Pyridoxin)   Magnesium

SNP

rs4244285 CYP2C19*2

Alleles

A: Reduced CYP2C19 activity and detox ability

G: Typical CYP2C19 activity and detox ability

Your Genotype

○ **GG**

Your genotype is linked to typical CYP2C19 activity and detox ability.

Intro and Health Effects

One of the most common variants associated with reduced CYP2C19 activity is CYP2C19*2 (**rs4244285**-A). Carriers of one copy of this variant have a reduced ability to break down drugs, toxins, and substances like **CBD**. Those with two copies can metabolize very little or none of the substance and are classified as poor metabolizers [R, R, R].

SNP

rs4986893 CYP2C19*3

Alleles

A: Reduced CYP2C19 activity and detox ability

G: Typical CYP2C19 activity and detox ability

Your Genotype

○ GG

Your genotype is linked to typical CYP2C19 activity and detox ability.

Intro and Health Effects

One of the most common variants associated with reduced CYP2C19 activity is CYP2C19*3 (**rs4986893**-A). Carriers of one copy of this variant have a reduced ability to break down drugs, toxins, and substances like **CBD**. Those with two copies can metabolize very little or none of the substance and are classified as poor metabolizers [R, R, R].

CYP2C9

CYP2C9 Report ↗

The CYP2C9 gene helps make a liver-based detox enzyme that processes various environmental and food-based toxins such as [R, R]:

- **THC** – from marijuana, cannabis products
- **Phthalates** – found in flexible plastics, fragrances, and food packaging
- **Parabens** – present in cosmetics and processed foods
- Food Dyes – found in candy, sodas, and snacks
- Heterocyclic Amines – from well-done meat and cigarette smoke
- Ochratoxin – from mold in grains, coffee, and dried fruits

Higher activity is generally protective, promoting toxin clearance—although in cases like heterocyclic amines, it can sometimes activate toxins into more harmful intermediates if not properly conjugated [R, R].

Blockers:

Pesticides

Enhancers:

Zinc   Iron   Curcumin

SNP

rs1799853 CYP2C9*2

Alleles

C: Typical CYP2C9 activity and detox ability

T: Reduced CYP2C9 activity and detox ability

Your Genotype

○ **CC**

Your genotype is linked to typical CYP2C9 activity and detox ability

---

Intro and Health Effects

The CYP2C9*2 variant ('T' at rs1799853) reduces enzyme activity. It may impair the metabolism of certain drugs, toxins, and substances like **THC** [R, R].

SNP

rs1057910 CYP2C9*3

Alleles

A: Typical CYP2C9 activity and detox ability

C: Reduced CYP2C9 activity and detox ability

Your Genotype

○ **AA**

Your genotype is linked to typical CYP2C9 activity and detox ability.

Intro and Health Effects

The CYP2C9*3 ('C' at rs1057910) reduces enzyme activity. It may impair the metabolism of certain drugs, toxins, and substances like THC. **THC metabolism is especially impaired** in people with **two copies** of this variant [R, R].

CYP3A4

CYP3A4 Report ⧉

The CYP3A4 gene produces one of the body's most versatile detox enzymes, predominantly found in the liver and intestines. It's responsible for metabolizing a wide range of toxins and drugs including [R, R]:

- **Mycotoxins** – from mold in food or damp buildings
- **Food additives** – found in processed and packaged foods, restaurant meals
- **Cannabinoids** – from CBD oil, THC products, and marijuana
- Phthalates – found in flexible plastics and fragranced products

Higher activity is generally protective, promoting faster clearance of a broad range of toxins.

Blockers:

Pesticides   Grapefruit juice

Enhancers:

Omega-3   Iron   Vitamin D

SNP	Your Genotype
rs35599367 CYP3A4*22	○ **GG**
Alleles	Your genotype is linked to typical CYP3A4 activity and detox ability.
A: Reduced CYP3A4 activity and detox ability	
G: Typical CYP3A4 activity and detox ability	

Intro and Health Effects

The 'A' allele of **rs35599367**, also known as CYP3A4*22, **reduces** CYP3A4 levels and activity by half, resulting in slower drug and toxin metabolism [R, R, R, R].

In carriers of this variant, the breakdown of **toxins and cannabinoids** (THC, CBD) may be slower. Moreover, people with this variant shouldn't use cannabis if they are being treated with CYP3A inhibitors (e.g., ketoconazole, fluconazole, diltiazem) [R, R].

SNP

rs55785340 CYP3A4*2

Alleles

A: Typical CYP3A4 activity and detox ability

G: Reduced CYP3A4 activity and detox ability

Your Genotype

○ **AA**

Your genotype is linked to typical CYP3A4 activity and detox ability.

Intro and Health Effects

The 'G' allele of **rs55785340** (CYP3A4*2) has been associated with **lower** enzyme activity [R, R].

In carriers of this variant, the breakdown of **toxins and cannabinoids** (THC, CBD) may be slower. Moreover, people with this variant shouldn't use cannabis if they are being treated with CYP3A inhibitors (e.g., ketoconazole, fluconazole, diltiazem) [R, R].

SNP

rs2242480 CYP3A4*1G

Alleles

C: Typical CYP3A4 activity and detox ability

T: Reduced CYP3A4 activity and detox ability

Your Genotype

○ **CC**

Your genotype is linked to typical CYP3A4 activity and detox ability.

Intro and Health Effects

The 'T' allele at **rs2242480** (CYP3A4*1G) has been associated with lower enzyme activity [R, R].

In carriers of this variant, the breakdown of **toxins and cannabinoids** (THC, CBD) may be slower. Moreover, people with this variant shouldn't use cannabis if they are being treated with CYP3A inhibitors (e.g., ketoconazole, fluconazole, diltiazem) [R, R].

NAT1

NAT1 Report ⧉

TEXT

SNP	Your Genotype
rs4986782 NAT1*14B	○ **GG**
Alleles	
A: Reduced NAT1 activity and detox ability	
G: Typical NAT1 activity and detox ability	**Your genotype is linked to typical NAT1 activity and detox ability.**

Intro and Health Effects

The 'A' allele of **rs4986782**, known as *NAT1*14B,* encodes a **slow-acetylator** version of the protein. This variant has been associated with an increased risk of [R]:

- Lung cancer in smokers [R]
- Bladder cancer [R]

NFE2L2

NFE2L2 Report ⬈

The NFE2L2 gene encodes a master regulator of detox genes — NRF2. It activates antioxidant and defense enzymes in response to oxidative stress and toxins such as [R]:

- **Arsenic** – from contaminated water and rice products
- **Aldehydes** – from alcohol, frying oils, and cigarette smoke
- Oxidative Stress – from air pollution, radiation, and metabolic byproducts

Strong NRF2 activation promotes resilience to pollution, toxins, and inflammation.

Blockers:

Alcohol   **Oxidative stress**

Enhancers:

Curcumin   Sulforaphane   Exercise

SNP

rs35652124

Alleles

C: Increased NFE2L2 activity and detox ability

T: Reduced NFE2L2 activity and detox ability

Your Genotype

↓ TT

Your genotype is linked to reduced NFE2L2 activity and detox ability.

Intro and Health Effects

This is one of the main variants in the NFE2L2 gene that can reduce the expression and activity of NRF2. Reduced NRF2 impairs the body's ability to detox and defend itself from oxidative stress [R, R].

NFE2L2 gene variants may be linked to:

- Liver damage due to alcohol and other toxins [R, R]
- Drug and arsenic toxicity [R, R]
- Parkinson's disease (mixed evidence!) [R, R, R]
- Cancer [R, R, R, R, R, R]

SNP

rs6721961

Alleles

G: Typical NFE2L2 activity and detox ability

T: Reduced NFE2L2 activity and detox ability

Your Genotype

○ **GG**

Your genotype is linked to typical NFE2L2 activity and detox ability.

Intro and Health Effects

The "T" allele at rs6721961 is one of the NFE2L2 variants that can reduce the expression and activity of NRF2. Reduced NRF2 impairs the body's ability to detox and defend itself from oxidative stress [R, R].

NFE2L2 gene variants may be linked to:

- Liver damage due to alcohol and other toxins [R, R]
- Drug and arsenic toxicity [R, R]
- Parkinson's disease (mixed evidence!) [R, R, R]
- Cancer [R, R, R, R, R, R]

SNP

rs2364723

Alleles

G: Increased NFE2L2 activity and detox ability

C: Reduced NFE2L2 activity and detox ability

Your Genotype

↑ **GG**

Your genotype is linked to increased NFE2L2 activity and detox ability.

Intro and Health Effects

The "C" allele at rs2364723 is one of the NFE2L2 variants that can reduce the expression and activity of NRF2. Reduced NRF2 impairs the body's ability to detox and defend itself from oxidative stress [R, R].

NFE2L2 gene variants may be linked to:

- Liver damage due to alcohol and other toxins [R, R]
- Drug and arsenic toxicity [R, R]
- Parkinson's disease (mixed evidence!) [R, R, R]
- Cancer [R, R, R, R, R, R]

SULT1A1

The SULT1A1 gene makes a liver enzyme involved in sulfonation—a phase II detox process that adds sulfur to toxins for elimination. Main toxins metabolized by this gene include:

- **PAHs** – from air pollution, cigarette smoke, and grilled foods
- **Heterocyclic Amines** – from well-done meat and cigarette smoke
- Caffeine – from coffee, tea, and energy drinks
- Food Additives – from processed and packaged foods
- Chemical Surfactants – in household cleaners and detergents

Optimal activity promotes effective clearance, while both extremes (high and low activity) have certain downsides.

Blockers:

Aluminum   Arsenic   BPA (plastics)   Pesticides   Mold

Nitrites/nitrates (processed meat)

Enhancers:

PLP (active vitamin B6)   Vitamin B12   Vitamin B3 (Niacin)   Choline

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SNP

rs1042028 SULT1A1*2

Alleles

C: Typical SULT1A1 activity and detox ability

T: Reduced SULT1A1 activity and detox ability

Your Genotype

↑ CC

Your genotype is linked to increased SULT1A1 activity and altered detox ability.

Intro and Health Effects

A variant in this gene known as **SULT1A1*2** may reduce its activity. People with the **"T" allele at rs1042028** (previously named rs9282861) carry this variant [R].

In theory, **lower** SULT1A1 activity may impair the detox of some compounds present in smoke, like polycyclic aromatic hydrocarbons (PAHs). In line with this, some studies have linked the lower-activity variant, **SULT1A1*2 (rs1042028-T),** to [R, R].

- Higher odds of stomach, lung, and colon cancers in smokers [R, R, R]
- Higher odds of breast cancer in those who eat more smoked meat [R]

However, other studies have linked this variant to **lower odds** of prostate, bladder, colon, and oral cancers in smokers. This may be because SULT1A1 **activates** certain toxins, like heterocyclic amines (HAs) [R, R, R, R].

UGT1A1

UGT1A1 Report ↗

The UGT1A1 gene codes for a liver enzyme that helps neutralize toxins by attaching glucuronic acid to them—a key phase II detox step. Main toxins and substances metabolized by this enzyme include [R, R]:

- **BPA** – from plastics, can linings, and receipt paper
- **Bilirubin** – from red blood cell breakdown
- Endotoxins – from harmful gut bacteria and leaky gut
- Ethanol – found in alcohol, sanitizers, and cosmetics
- Aflatoxins – from mold in peanuts, corn, grains, and spices
- Lipid Peroxides – from fried and rancid oils

High activity is usually protective. Reduced activity can lead to buildup of these substances and greater toxic burden.

Blockers:

Alcohol

Enhancers:

Flavonoids **Vitamin D** **Sulforaphane**

SNP

rs4148323 UGT1A1*6

Alleles

A: Reduced UGT1A1 activity and detox ability

G: Typical UGT1A1 activity and detox ability

Your Genotype

○ **GG**

Your genotype is linked to typical UGT1A1 activity and detox ability

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Intro and Health Effects

The **UGT1A1*6** (**rs4148323**-A) variant reduces enzyme activity and detox ability. Studies have linked it to [R]:

- High **bilirubin** in adults and bilirubin toxicity in infants [R, R, R, R, R]
- Adverse congenital effects of **PAHs** exposure [R]
- Adverse reactions to certain drugs [R]

CYP1A2

CYP1A2 Report ↗

The CYP1A2 gene codes for a crucial liver enzyme. It detoxifies several common dietary and pollutant-based toxins, including [R, R]:

- **Caffeine** – from coffee, tea, and energy drinks
- **Aflatoxins** – found in moldy peanuts, corn, grains, and spices
- Heterocyclic Amines – from well-done meat and cigarette smoke
- Acrolein – from cigarette smoke, vehicle exhaust, and fried foods
- Aldehydes – from alcohol, frying oils, and cigarette smoke
- Food Dyes – present in snacks, candies, and beverages

Higher enzyme activity supports **faster clearance of toxins** like caffeine and acrolein, though it might increase activation of certain carcinogens like heterocyclic amines in the absence of robust antioxidant defense [R, R].

Blockers:

Heavy metals   Air pollution

Enhancers:

Riboflavin

SNP	Your Genotype
rs762551 CYP1A2*1F	↑ **AA**
Alleles	
A: Increased CYP1A2 activity and detox ability	
C: Reduced CYP1A2 activity and detox ability	Your genotype is linked to increased CYP1A2 activity and detox ability

Intro and Health Effects

The "slow metabolizer" CYP1A2 variant, rs762551-C, makes a less efficient enzyme. People who carry this variant may be **more sensitive to caffeine**. Accordingly, they may be more likely to experience negative effects when drinking coffee [R, R, R].

In terms of detox, they may be more susceptible to the adverse effects of certain drugs and toxins like **mold toxins**. However, the link between CYP1A2 variants and environmental toxins is more complex and requires further investigation [R, R].

GSTP1

GSTP1 Report ⬈

The GSTP1 gene helps produce a glutathione-related enzyme, active in the liver and lungs. It neutralizes harmful compounds by binding them to glutathione. Examples include [R]:

- **PAHs** – from air pollution, cigarette smoke, and grilled foods
- **Organophosphates** – from pesticide residues and lawn chemicals
- **Mercury** - from dental fillings, large fish, and industrial exposure
- Benzene – from vehicle exhaust, gasoline, and industrial emissions
- BPA – from plastic containers, can linings, and receipt paper
- Cadmium – from cigarette smoke and contaminated soil or rice
- Arsenic – from contaminated water and rice products

Higher activity increases glutathione conjugation capacity, reducing oxidative stress and toxic burden.

Enhancers:

Selenium   Curcumin   Allicin   Sulforaphane

SNP

rs1695 Ile105Val

Alleles

A: Increased GSTP1 activity and detox ability

G: Reduced GSTP1 activity and detox ability

Your Genotype

↑AA

Your genotype is linked to increased GSTP1 activity and detox ability.

Intro and Health Effects

The main GSTP1 gene variant is **rs1695 or Ile105Val**. The 'G' allele reduces enzyme activity and detox ability. Studies have linked it to:

- Increased drug toxicity (chemotherapy) [R]
- Increased mercury toxicity [R]
- Higher odds of asthma due to smoke exposure ("GG" genotype) [R]
- Higher odds of breast cancer [R]
- Allergic reactions in people exposed to air pollution [R]

However, some studies **failed to confirm** those findings [R, R, R, R].

The effects of this variant on breast cancer may be more pronounced in women who eat less **cruciferous vegetables** [R].

SNP

rs1138272 Ala114Val

Alleles

C: Typical GSTP1 activity and detox ability

T: Reduced GSTP1 activity and detox ability

Your Genotype

○ **CC**

Your genotype is linked to typical GSTP1 activity and detox ability.

Intro and Health Effects

An important GSTP1 variant is **rs1138272 or Ala114Val**. Its 'T' allele may be linked to:

- Higher mercury levels in the blood and hair [R, R, R]
- Stronger effects of smoking on Parkinson's disease [R]
- Increased mercury toxicity [R]
- Nerve problems [R]

However, many studies **didn't find the negative effects** of this variant on detox ability and cancer [R, R, R, R, R].

NAT2

NAT2 Report ⬏

The NAT2 gene makes an enzyme that works alongside NAT1 in breaking down harmful amines and smoke-related toxins. Main toxins metabolized by this gene include [R]:

- **Aromatic Amines** – from hair dyes, fabric dyes, and tattoo ink
- **Tobacco Toxins** – from tobacco and cigarette smoke
- **Heterocyclic Amines** – from well-done meat and cigarette smoke
- Caffeine – from coffee, tea, and energy drinks
- Mycotoxins – from mold in food and damp buildings

NAT2 activity varies widely by genetics. Fast acetylators may activate some toxins (like amines) into more dangerous forms, while slow acetylators may accumulate unmetabolized compounds.

SNP	Your Genotype
rs1495741	○ **GA**
Alleles	
A: Reduced NAT2 activity and detox ability	
G: Increased NAT2 activity and altered detox ability	**Your genotype is linked to balanced NAT2 activity and detox ability.**

Intro and Health Effects

Most people with the 'AA' genotype at rs1495741 are **slow acetylators**. They might have higher odds of **bladder cancer**, especially when exposed to **cigarette smoke and chemical dyes** [R, R, R, R, R, R].

Slow acetylators may also have a harder time detoxing certain drugs, which may put them at higher odds of side effects. For example, they tend to have higher rates of liver injury from the anti-tuberculosis drug isoniazid [R].

On the other hand, fast acetylators (GG) may be more prone to **colon cancer**, especially if they consume **well-done meat** frequently. This may be due to activation (O-acetylation) of certain toxins by NAT2 in the colon [R, R].

NQO1

The NQO1 gene codes for a liver enzyme that helps neutralize reactive compounds and protect against oxidative damage. Main toxins metabolized by this gene include [R]:

- **Benzene** – from vehicle exhaust, gasoline, and industrial emissions
- **Lipid Peroxides** – from fried and rancid oils
- Particulate Matter – found in air pollution and diesel exhaust
- Heavy Metals – from contaminated water, certain fish, and older cookware

Higher activity is protective, especially in environments with high pollution. Deficiencies may increase oxidative stress and toxin burden.

Blockers:

Acrylamide (fried foods)   Benzene

Enhancers:

Vitamin B3 (Niacin)   Exercise   Curcumin   Riboflavin

Sulforaphane   Alpha-lipoic acid

SNP

rs1131341 *NQO1*3*

Alleles

A: Reduced NQO1 activity and detox ability

G: Typical NQO1 activity and detox ability

Your Genotype

○ **GG**

Your genotype is linked to typical NQO1 activity and detox ability.

Intro and Health Effects

NQO1 gene variants may play a role in **DNA damage**. Research has found their associations with different types of cancer [R, R, R, R, R].

The 'A' allele at rs1131341 (NQO1*3) leads to a slower conversion of **quinone** into its safer metabolites [R].

SNP

rs1800566 NQO1*2

Alleles

A: Reduced NQO1 activity and detox ability

G: Increased NQO1 activity and detox ability

Your Genotype

↑**GG**

Your genotype is linked to increased NQO1 activity and detox ability.

Intro and Health Effects

Research shows that people with the NQO1*2 variant (rs1800566-A) are up to **7.6 times** more likely to experience **benzene toxicity**, even from low-level exposure [R, R, R].

NQO1 gene variants may play a role in **DNA damage**. Research has found their associations with different types of cancer [R, R, R, R, R].

This variant may also be linked to Alzheimer's disease, but the evidence is mixed [R].

Lab markers to check

⚠ Lead, Blood   **400 ug/L**   0   10   100   400   3 Feb 2025

Personalized to Your Genes

↓ PON1   Lead may suppress PON1, so it's crucial to monitor exposure.

⚠ AST   **14 IU/L**   5   17   30   40   19 Dec 2024

Personalized to Your Genes

↓ SLCO1B1   Crucial to monitor due to potential adverse effects of SLCO1B1*5 on the liver.

○ NFE2L2   Cruical to monitor liver health compromised by low NRF2.

⚠ Vitamin C   **0.262 mg/dL**   0.2   0.85   1.2   1.4   16 Dec 2024

Personalized to Your Genes

↓ PON1   Vitamin C supports PON1 antioxidant function and enzyme protection.

🧪 16-OH-E1 (DUTCH)

Personalized to Your Genes

↑ CYP1B1　　Suboptimal levels indicate altered estrogen metabolism by CYP1B1

2-Methoxy-E1 (DUTCH)

8-Hydroxy-2-deoxyguanosine, Urine

Personalized to Your Genes

↓ GCLC　　Measures DNA oxidative damage from altered GCLC activity.

○ NFE2L2　　Measures DNA oxidative damage from altered NRF2 activity.

ALT

Personalized to Your Genes

↓ SLCO1B1　　Crucial to monitor due to potential adverse effects of SLCO1B1*5 on the liver.

○ NFE2L2　　Cruical to monitor liver health compromised by low NRF2.

Aluminum

Aluminum, 24-Hour Urine

Arsenic, 24-Hour Urine

Personalized to Your Genes

○ NFE2L2   Reduced NRF2 is linked to arsenic toxicity.

Arsenic, Blood

Personalized to Your Genes

○ NFE2L2   Reduced NRF2 is linked to arsenic toxicity.

Bilirubin, Direct

Bilirubin, Total

Personalized to Your Genes

↓ SLCO1B1   This variant is linked to higher bilirubin levels.

Cholinesterase, Serum

Personalized to Your Genes

↓ PON1   Marker of pesticide exposure, important to check when PON1 is reduced.

Coenzyme Q10

Personalized to Your Genes

↓ SLCO1B1   If you are taking statins, make sure to monitor CoQ10 levels because of this variant.

🧪 Creatine Kinase

Personalized to Your Genes

↓ SLCO1B1   If you are taking statins, make sure to monitor CK levels because of this variant.

🧪 Cyst(e)ine, Plasma

🧪 Cystine, Serum/Plasma

Personalized to Your Genes

↓ GCLC   Indicates the status of cysteine, which is required for GCLC activity.

↓ GSTA1   Indicates the status of cysteine, essential for glutathione and its enzymes.

🧪 GGT

Personalized to Your Genes

↑ ADH1B   GGT may be elevated due to alcohol metabolism stress caused by ADH1B.

○ NFE2L2   Crucial to estimate the effects of alcohol on the liver, amplified by low NRF2.

🧪 Glutamic Acid, Plasma

Homovanillate (HVA) (DUTCH)

Iron

Personalized to Your Genes

○ CYP2B6   Iron helps support CYP2B6 function.

Lead, 24-Hour Urine

Magnesium

Personalized to Your Genes

↓ GCLC   Magnesium supports GCLC activity.

Malondialdehyde

Personalized to Your Genes

↑ CYP1B1   May be increased due to oxidative stress from poor toxin clearance

Mercury, 24-Hour Urine

Personalized to Your Genes

| ↓ GCLC | This variant is linked to increased mercury toxicity. |

🧪 **Mercury, Blood**

Personalized to Your Genes

| ↓ GCLC | This variant is linked to increased mercury toxicity. |

🧪 **Nicotinamide (Vitamin B3)**

🧪 **SAM-e, Serum**

🧪 **Selenium**

Personalized to Your Genes

| ↓ GSTA1 | Selenium helps support glutathione and its enzymes like GST. |
| ↓ PON1 | Selenium supports PON1 antioxidant function. |

🧪 **Total Glutathione**

Personalized to Your Genes

| ↓ GCLC | This variant may affect glutathione levels. |
| ↓ GSTA1 | Maintaining optimal levels of glutathione is crucial for this variant. |

Vanilmandelate (VMA) (DUTCH)

Vitamin B12

Vitamin B2 (Riboflavin), Plasma

Glossary

Acrolein
Toxic burning chemical

Aflatoxins
Toxic food mold chemicals

Aldehydes
Strong-smelling irritants

Aromatic Amines
Dye chemicals

BPA
Plastic estrogen mimic

Cannabinoids
Cannabis plant compounds

Catecholamines
Stress response hormones

Detox Component
Molecules aiding toxin breakdown

Detox Phase I
Toxins made reactive by liver enzymes

Detox Phase II
Reactive toxins neutralized for excretion

Dioxins
Harmful industrial pollutants

Endotoxins
Harmful bacteria byproducts

Glutamate (L-Glutamate)
Amino acid and brain signal booster

Glutathione (GSH)
Master antioxidant made from three amino acids

Glutathione Pathway
Detox system using glutathione to neutralize toxins

GSSG (Oxidized Glutathione)
Used-up glutathione needing recycling

Heterocyclic Amines
Cooked-meat carcinogens

L-Cysteine
Sulfur-rich amino acid for detox

Lipid Peroxides
Damaged fats causing harm

MSG
Flavor enhancer chemical

Methylation
Cellular switch for genes and detox

Mycotoxins
Mold-produced toxins

Nitrosamines
Cancer-linked chemicals

Ochratoxin
Toxic mold byproduct

Organophosphates
Nerve-harming pesticides

Oxidative Stress
Cell damage from free radicals

Oxidized Glutathione
Used antioxidant needing regeneration

Oxidized Lipids
Damaged fats

PAHs
Burnt-fuel pollutants

PBDEs
Flame-retardant chemicals

Phthalates
Plastic-softener chemicals

Statins
Cholesterol-lowering drugs

THC
Cannabis's psychoactive ingredient

VOCs
Air-polluting chemicals

Xenoestrogens
Man-made estrogen mimics

γ-Glutamylcysteine
Precursor building block of glutathione