

# DNA Damage

## Biohacker Report

REPORT CATEGORIES —



DETOX



LONGEVITY



CANCER

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.



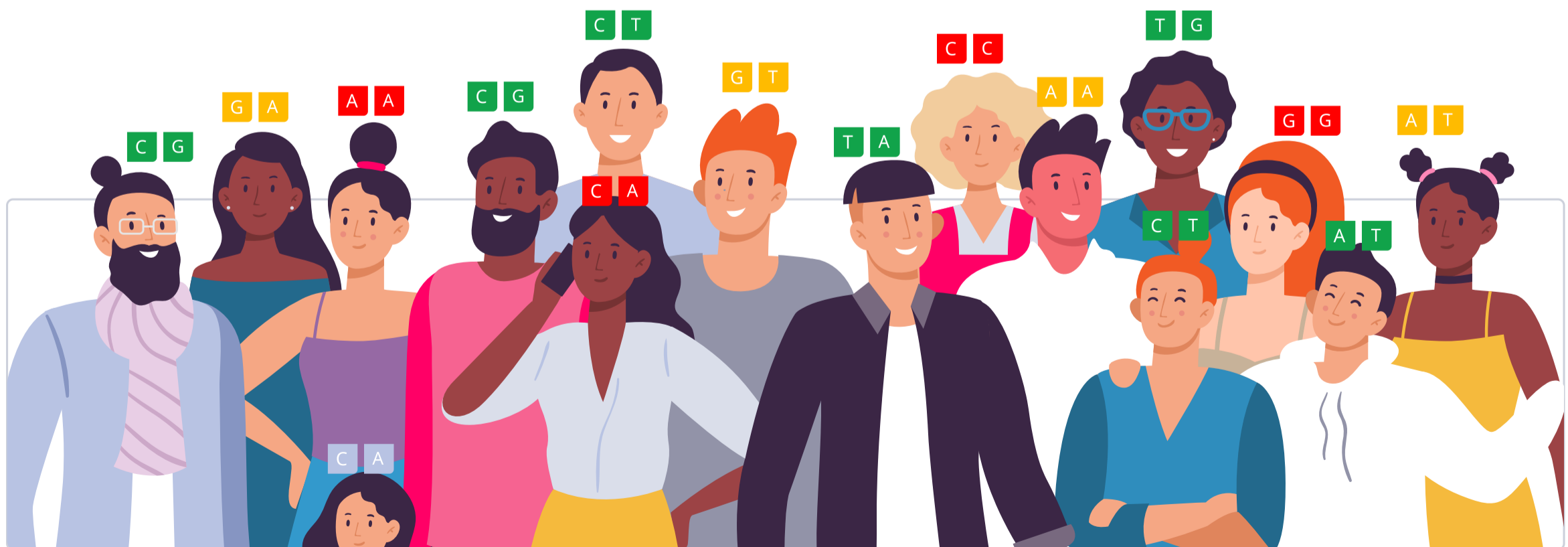
Similarly, our Trait Reports look at how your DNA influences your traits.



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

DNA damage is a critical biological process that can significantly impact cell function, leading to aging, neurodegenerative disorders, and cancer. The integrity of DNA is constantly threatened by both external and internal factors, and the ability of a cell to repair this damage is crucial for maintaining cellular function and organismal health.

DNA damage can occur in both the coding and non-coding regions of DNA. Depending on the type and extent of damage, it can lead to mutations or even cell death. The most common forms of DNA damage include:

- **Single-strand breaks:** breakage of one of the DNA strands. While these breaks can often be repaired efficiently by cells, they can lead to more severe double-strand breaks or mutations if not repaired.
- **Double-strand breaks:** both strands of the DNA helix are severed. These breaks can result in the loss of genetic material and are difficult to repair, leading to genomic instability and increased risk of cancer.
- **Base modifications:** modifications of the DNA bases (such as methylation, oxidation, or alkylation) can alter the base pairing properties of the DNA and lead to mutations during replication. For example, oxidative damage to guanine can result in 8-oxoguanine, which can mispair with adenine during DNA replication.
- **Cross-linking:** covalent bonds form between the strands of DNA or between DNA and proteins. This impairs the ability of the DNA to unwind and replicate, leading to cell cycle arrest or cell death.
- **Nucleotide excision:** formation of bulky DNA adducts, which can distort the DNA helix. These adducts are typically caused by UV radiation, leading to thymine dimers and the formation of pyrimidine cross-links.
- **Replication errors:** the DNA polymerase enzyme inserts the wrong nucleotide during DNA synthesis. Though cells have mechanisms to correct these errors, some can evade repair and result in permanent mutations.

# Causes and Consequences

DNA damage can occur due to a variety of internal and external factors:

- **Environmental factors:** exposure to UV radiation from the sun is a major cause of DNA damage, particularly in the form of thymine dimers. Other environmental factors that contribute to DNA damage include ionizing radiation (e.g., X-rays and gamma rays), chemical agents (e.g., tobacco smoke and environmental pollutants), and certain chemotherapy drugs.
- **Metabolic byproducts:** cells produce reactive oxygen species (ROS) such as superoxide anions and hydrogen peroxide as byproducts of normal cellular metabolism. These species can attack DNA, causing base modifications, strand breaks, and other forms of damage. Chronic oxidative stress can lead to the accumulation of DNA damage and mutations.
- **Replication stress:** during DNA replication, the DNA polymerase may encounter obstacles, such as DNA secondary structures or tightly bound proteins. This can lead to stalled replication forks, which increase the likelihood of DNA breaks and mutations.
- **Inflammation:** chronic inflammation, often associated with diseases like arthritis, infections, or cancer, can lead to increased production of ROS and reactive nitrogen species (RNS), which damage DNA. Inflammatory cytokines can also indirectly promote DNA damage by inducing oxidative stress.

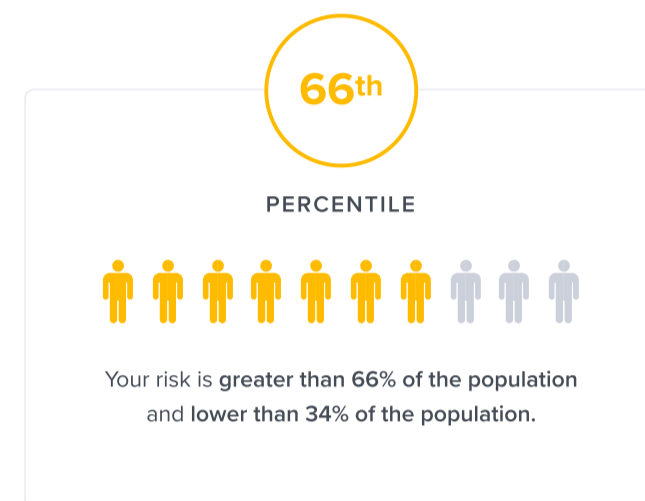
The consequences of DNA damage depend on the type of damage and the cell's ability to repair it. If DNA damage is not repaired or if it accumulates over time, it can lead to several adverse outcomes such as:

- **Mutagenesis:** DNA damage can cause mutations—changes in the DNA sequence that may affect gene expression or protein function. If these mutations occur in critical genes (e.g., tumor suppressor genes or oncogenes), they can lead to cancer development.
- **Genomic Instability:** when DNA damage is not properly repaired, it can result in genomic instability, characterized by an increased rate of mutations, chromosomal rearrangements, or aneuploidy



TYPICAL LEVELS

Predisposed to typical DNA damage based on 69 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ATM	rs1801516	GG
SLC6A3	rs2736108	CC
SOD2	rs4880	GG
FOXE1	rs1867277	AA
PARP1	rs3219090	TT
FOXO3	rs479744	GG
SIRT1	rs7895833	AA
FOXO3	rs12202234	CC
FOXO3	rs9398171	TT
FOXO3	rs3800230	TT
FOXO3	rs4946936	CC
TERT	rs2075786	GG
SLK	rs9419958	CC
GSTO1	rs9420907	AA
ORMDL1	rs2289226	TT
CAT	rs769217	CC
FCGR2A	rs1801274	AA
MRPS31	rs2755209	AA
FOXO3	rs12212067	TT
FOXO3	rs17069665	AA
FOXO3	rs9400239	CC
TERT	rs4449583	CC
STN1	rs10786775	CC
GSTO1	rs4387287	CC

(abnormal number of chromosomes). Genomic instability is a hallmark of many cancers.

- **Cell death:** in cases where DNA damage is too severe to be repaired, cells may undergo programmed cell death (apoptosis) to prevent the damage from passing on to daughter cells. While apoptosis protects the organism from potentially harmful mutations, excessive cell death can contribute to tissue degeneration and aging.
- **Aging:** the accumulation of DNA damage over time is a key factor in the aging process. Reduced DNA repair efficiency and increased oxidative stress contribute to age-related diseases, such as neurodegeneration, cardiovascular diseases, and sarcopenia (muscle wasting).
- **Cancer:** one of the most significant consequences of DNA damage is cancer. If DNA repair mechanisms fail, mutations may accumulate in genes that regulate the cell cycle, apoptosis, or DNA repair itself. This can lead to uncontrolled cell proliferation, a hallmark of cancer.

GENE	SNP	GENOTYPE
CFHR3	rs10801555	GG
TFAM	rs1937	GC
TERT	rs7705526	CA
TERT	rs2736100	AC
SLC6A3	rs2735940	GA
TERT	rs2853677	AG
COMT	rs4680	AG
TERT	rs2853672	AC
TERT	rs2853676	CT
ADA	rs73598374	TC
NQO1	rs689453	TC
SIRT1	rs12778366	TC
TERT	rs10069690	CT
TERT	rs13167280	AG
TERT	rs2242652	GA
BCHE	rs17713088	TG
BCHE	rs9881048	AC
CAT	rs480575	AG
TRMO	rs10984009	GA
UGT2A1	rs10518065	GA
SIRT1	rs7896005	GA
STN1	rs11191865	AG
ARHGEF3	rs1354034	TC
SLC22A5	rs2240032	CC
TERT	rs2736098	CC
SLC22A5	rs2040704	AA

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		2	
Avoid Pesticide Exposure		Broccoli	
3		4	
Avoid Cadmium Exposure		Avoid Lead Exposure	
5	500 mg	6	600 mg
Brown Seaweed		Alpha-Lipoic Acid	
7		8	
Onion		Grapes	
9		10	
Red Grape Juice		Avoid Phthalate Exposure	
11		12	
Almonds		Avoid Exposure to Heavy Metals	
13		14	100 mg
Avoid Mercury Exposure		Tocotrienols	
15	250 mg	16	
Cat's Claw		Brussels Sprouts	
17		18	
Apples		Avoid Organophosphate Pesticide Exposure	
19		20	
Avoid Formaldehyde Exposure		Topical Niacinamide	
21	100 mg	22	12 mg
Grape Seed Extract		Astaxanthin	
23		24	400 mg
Orange Juice		Green Tea	
25		26	
Turmeric		Avoid Excess Sunlight Exposure	
27		28	15 mg
Kale		Zinc	
29	500 mg	30	
Curcumin		Avoid Volatile Organic Compounds Exposure	
31	2000 mg	32	
Vitamin C		Pomegranate	


- 33 Sulforaphane 30 mg
- 34 N-acetylcysteine (NAC) 1200 mg
- 35 Strawberries
- 36 Selenium Supplements 50 mcg
- 37 Green Tea Extract 250 mg
- 38 Berries
- 39 Avoid Arsenic Exposure

1

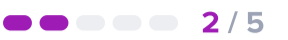


## Avoid Pesticide Exposure

IMPACT

 2 / 5

EVIDENCE

 2 / 5

### 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.

### Description

Pesticides include all chemicals used to kill weeds, insects, fungi, and microbes. Reducing pesticide exposure involves choosing organic or pesticide-free foods and using natural pest control methods to limit contact with potentially harmful chemical residues. It supports overall health by reducing the risk of pesticide-related health issues.

Pesticides include all chemicals used to kill weeds, insects, fungi, and microbes. They are widely used in agriculture to improve crop yields. Common groups of pesticides include:

- Organophosphates (glyphosate, parathion, malathion, chlorpyrifos, diazinon, phosmet)
- Neonicotinoids (imidacloprid, acetamiprid, thiacloprid, clothianidin)
- Pyrethroids (permethrin, alpha-cypermethrin)

Chronic exposure to pesticides has been linked to:

- Fertility problems [\[R\]](#)
- Cognitive problems [\[R\]](#)
- Alzheimer's and Parkinson's disease [\[R, R\]](#)
- Thyroid problems [\[R\]](#)
- Obesity [\[R\]](#)
- DNA damage and cancer [\[R, R, R\]](#)

### How it helps

This study analyzed 42 studies on DNA damage in farmers exposed to pesticides. They found significant damage (SMD 4.63) with high heterogeneity and bias. Confounders showed slight genotoxicity in smoking farmers. Occupational pesticide exposure poses a significant risk of related diseases [\[R\]](#).

A meta-analysis found that pesticide exposure is associated with higher SCE frequency in human blood cells, suggesting it as an early genetic effect indicator in pesticide-exposed populations [\[R\]](#).

In a study, 1,131 CpG sites showed significant DNA methylation differences between case and control groups. These sites, found in 598 genes, revealed a link between prenatal DDT exposure and altered BRCA1 gene methylation and expression in fetuses, suggesting a role for epigenetic processes in their development [\[R\]](#).

Urine and blood samples from children in different areas were analyzed for pesticide exposure (atrazine) and cytogenetic damage markers. Higher damage markers were found in pesticide-exposed areas compared to the control group [\[R\]](#).

2



Broccoli

IMPACT

2 / 5

EVIDENCE

1 / 5

## How to implement

Incorporate at least one cup of chopped broccoli, either steamed or raw, into your daily diet. This can be as part of a meal or snack. Continue this practice daily for ongoing health benefits.

## Description

Broccoli and broccoli sprouts are nutrient-dense vegetables packed with vitamins, minerals, and antioxidants. They are known for their potential to support a healthy immune system, protect against chronic diseases, and promote overall nutritional wellness.

**Broccoli** is high in vitamin K and C, as well as a number of other vitamins and minerals, and antioxidants like quercetin. A ½ cup serving provides 110 mcg of vitamin K or 92%DV.

## How it helps

Broccoli contains sulforaphane, a compound known for its potent antioxidant properties, which help protect cells from DNA damage. Its regular consumption has been linked to reduced oxidative stress and improvement in the body's defense against cellular damage.

In a crossover study, 27 young healthy smokers consumed 250 g/day of steamed broccoli or a control diet for 10 days each. Broccoli intake reduced oxidized DNA lesions by 41% and increased resistance to H<sub>2</sub>O<sub>2</sub>-induced DNA strand breaks by 23%. Protection was higher in GST M1-null genotype individuals, suggesting improved antioxidant status from broccoli intake [\[R\]](#).


In a study with ten healthy subjects, consuming a single portion of steamed broccoli (250 g) with pasta led to significant increases in plasma vitamin C and folate levels at 3 hours, and β-carotene at 6 hours. Broccoli also modulated plasma GST activity and reduced H<sub>2</sub>O<sub>2</sub>-induced DNA damage in blood mononuclear cells 24 hours post-consumption, particularly in GSTM1 positive individuals [\[R\]](#).

3




## Avoid Cadmium Exposure

IMPACT

 1 / 5

EVIDENCE

 2 / 5

### How to implement

To avoid cadmium exposure, refrain from smoking or exposure to secondhand smoke, reduce consumption of foods high in cadmium like shellfish, liver, kidney meats, and certain leafy vegetables, and use ceramic or glass containers instead of plastic when microwaving food. Limit intake of cadmium-contaminated workplace air by using protective gear if you work in battery manufacturing, welding, or metal refining industries.

### Description

Avoiding cadmium exposure is essential to prevent potential health risks associated with this heavy metal, such as kidney damage and increased cancer risk. Reducing exposure to cadmium-containing products and contaminated foods is crucial.

Heavy metals are elements naturally found in the environment. They are also used for agricultural, industrial, and medicinal purposes. Some can even be found in small amounts in your body [\[R, R\]](#).

Long-term exposure to high amounts of heavy metals can be harmful to your health [\[R, R\]](#).


Heavy metals that are most often linked to health problems include [\[R, R\]](#):

- Lead
- Cadmium
- Arsenic
- Chromium
- Mercury

### How it helps

A review of 29 studies involving 3080 cadmium-exposed and 1807 unexposed workers found that cadmium exposure led to higher levels of DNA damage, including increased MN, sister chromatid exchange, chromosomal aberrations, and oxidative DNA damage [\[R\]](#).

4



## Avoid Lead Exposure

IMPACT

1 / 5

EVIDENCE

1 / 5

## How to implement

Prevent lead exposure by using cold water for drinking and cooking, regularly cleaning dust from windowsills and floors, and ensuring that your home's paint is not chipping if it was built before 1978. For occupations involving potential lead exposure, use protective gear and follow safety protocols. Test your home for lead if it's old or you're concerned about contamination.

## Description

Lead is a heavy metal. It is naturally found in the environment in small amounts [\[R, R\]](#).

Exposure to lead can cause it to build up in the body. A buildup of lead can contribute to oxidative stress and cell damage. This is called **lead poisoning** [\[R, R\]](#).

Lead is no longer used in the manufacturing of some products like gasoline and paint. However, it can still be found in some pipes, batteries, and the wall paint of older homes [\[R, R, R\]](#).

## How it helps

A systematic review of 45 studies associated occupational lead exposure with significantly higher DNA damage biomarkers (micronucleus frequency, chromosomal aberrations, comet assay, 8-OHdG) [\[R\]](#).

5



## Brown Seaweed

IMPACT

1 / 5

EVIDENCE

1 / 5

## How to implement

Take a supplement containing brown seaweed extract, such as *Fucus vesiculosus* or *Ascophyllum nodosum*, in capsule or powder form. Aim for a daily dosage of 500-1000 mg, preferably with meals to enhance absorption. Continue this regimen for at least 8-12 weeks to evaluate its effects on your health.

TYPICAL STARTING DOSE

500 mg


## Description

Brown seaweed, such as kelp and wakame, is a nutrient-dense marine alga often used in Asian cuisine and dietary supplements. It's a natural source of essential minerals like iodine and may offer various health benefits, including thyroid support and potential antioxidant effects.

## How it helps

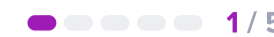
An 8-week study involving 80 participants with BMI  $\geq 25$  showed that daily intake of 100 mg seaweed (poly)phenols led to a modest reduction in DNA damage in obese individuals but had no significant impact on CRP, antioxidants, or cytokines. Potential biomarkers of seaweed consumption were identified in urine and plasma samples [\[R\]](#).

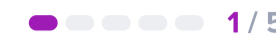
6



## Alpha-Lipoic Acid

IMPACT
EVIDENCE





## How to implement

Take 600-1800 mg of alpha-lipoic acid daily, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

**600 mg**

## Description

[Alpha-lipoic acid](#) is a natural antioxidant found in almost every cell in your body. People use alpha-lipoic acid to help with issues like skin aging, weight loss, and high blood sugar [\[R, R, R\]](#).

People use alpha-lipoic acid to help with [\[R, R, R, R\]](#):

- Complications of high blood sugar
- Skin aging
- Weight loss
- Carpal tunnel syndrome

## How it helps

In a study with 12 healthy males, 1000 mg of  $\alpha$ -lipoic acid supplementation for 14 days reduced exercise-induced DNA and lipid damage, demonstrating its potential protective effect against oxidative stress [\[R\]](#).

7



## Onion

IMPACT
EVIDENCE





## How to implement


Incorporate raw or cooked onions into your daily meals, aiming for about a half to one whole onion per day, depending on your taste preference and tolerance. This can be done by adding onions to salads, sandwiches, soups, or as a cooked ingredient in various dishes.

## Description

Onions are a flavorful and versatile vegetable grown around the world. They are rich in antioxidants, vitamins, and minerals, like B-vitamins, vitamin C, phosphorus, and magnesium. Incorporating onions into your diet may promote heart health, improve immune function, and contribute to overall well-being.

## How it helps

A study with six healthy women compared the antioxidant effects of fried onions alone and fried onions with cherry tomatoes. Results showed improved DNA protection after the onion meal and reduced DNA damage markers with both meals, but mechanisms remain unclear [\[R\]](#).

8  **Grapes**IMPACT 1/5 EVIDENCE 1/5

## How to implement

Incorporate a serving of grapes, which is about 32 seedless grapes or approximately 1 cup, into your daily diet. You can eat them as a snack, add them to salads, or blend them into smoothies. Do this consistently for a period of at least 3 months to observe potential health benefits.

## Description

Grapes are a nutrient-dense fruit rich in vitamins, fiber, and antioxidants like resveratrol. Regular consumption of grapes is associated with potential benefits for heart health, skin health, and overall well-being.

## How it helps

This study compared organic and conventional red grape juices, finding higher phenolic content in organic juice. Both juices reduced lipid peroxidation in healthy individuals, regardless of cultivation method [\[R\]](#).

Grape juice intake for two weeks reduced post-exercise lipid peroxidation and DNA damage but had no effect on certain biomarkers. It also improved lower limb power post-exercise [\[R\]](#).

9  **Red Grape Juice**IMPACT 1/5 EVIDENCE 1/5

## How to implement

Consume 8-12 ounces of red grape juice daily, preferably unsweetened or with no added sugars, with a meal to enhance absorption and reduce the risk of digestive upset. Continue this practice regularly as part of your daily diet.

## Description


Red grape juice, made from crushed red grapes, is rich in vitamin C, manganese, and antioxidants like resveratrol, which may contribute to heart health and overall well-being when consumed in moderation.

## How it helps


This study compared organic and conventional red grape juices, finding higher phenolic content in organic juice. Both juices reduced lipid peroxidation in healthy individuals, regardless of cultivation method [\[R\]](#).


Grape juice intake for two weeks reduced post-exercise lipid peroxidation and DNA damage but had no effect on certain biomarkers. It also improved lower limb power post-exercise [\[R\]](#).

10



Avoid Phthalate Exposure

IMPACT  


EVIDENCE  


## How to implement

To avoid phthalate exposure, check product labels and choose phthalate-free options for personal care items, plastics (look for recycling codes 3 and 7 or the letters 'V' or 'PVC'), and household products. Additionally, reduce the use of plastic containers for food storage, especially those not marked as 'phthalate-free', and avoid microwaving food in plastic containers. Aim to make these changes consistently in your daily life for long-term health benefits.

## Description

Avoiding phthalate exposure involves choosing phthalate-free products, such as personal care items and plastics, to minimize potential endocrine-disrupting effects and protect reproductive and hormonal health.

## How it helps

This study examined phthalate exposure and oxidative stress in 288 college students who frequently consumed takeaway food. Phthalates were detected in their urine samples, with higher levels linked to more frequent takeaway food consumption. While phthalate exposure was associated with DNA oxidative damage, the study didn't find significant differences in oxidative damage levels among groups based on takeaway food frequency. This suggests that regular takeaway food consumption may increase phthalate exposure but may not markedly impact DNA oxidative damage levels unless other pollutants are involved [\[R\]](#).

11



Almonds

IMPACT  


EVIDENCE  


## How to implement

Incorporate a handful of almonds (about 23 kernels) into your daily diet. You can eat them as a snack, add them to your breakfast cereals or yogurt, or include them in salads and other dishes. Do this consistently for ongoing health benefits.

## Description

**Almonds** are a good source of omega-6s, protein and vitamins, making for a great snack food. A 1-ounce serving provides 3700 mg of omega-6.

Almonds are nutritious tree nuts that originate from the *Prunus dulcis* tree. They are packed with essential nutrients, including healthy fats, fiber, vitamin E, and magnesium, which collectively contribute to heart health, support weight management, and may help regulate blood sugar levels.

## How it helps

In a study with 30 male smokers, two almond-treated groups (3 oz and 6 oz daily for 4 weeks) showed reduced DNA damage and oxidative stress compared to the control group. Almond consumption may protect against smoking-induced oxidative damage [\[R\]](#).

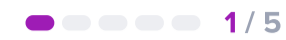
A randomized trial with 60 male smokers (18-25 y) found that after a 4-week almond supplementation, smokers showed improved antioxidant defenses (alpha-tocopherol, SOD, GPX) and reduced oxidative stress markers (8-OHdG, MDA, DNA strand breaks). However, 8-OHdG levels remained higher in smokers compared to nonsmokers after almond intake. Almonds can enhance antioxidant protection in smokers [\[R\]](#).

12

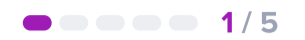


## Avoid Exposure to Heavy Metals

IMPACT

 1 / 5

EVIDENCE

 1 / 5

### How to implement

To avoid exposure to heavy metals, ensure you're not using cosmetic products with heavy metals, opt for organic foods to minimize pesticide exposure, and use filters for drinking water to remove possible contaminants. Check for lead-based paints in older homes and avoid cooking or storing food in uncoated metal containers. When possible, choose glass or BPA-free plastics instead.

### Description

Heavy metals are elements naturally found in the environment. They are also used for agricultural, industrial, and medicinal purposes. Some can even be found in small amounts in your body [\[R, R\]](#).


Long-term exposure to high amounts of heavy metals can be harmful to your health [\[R, R\]](#).

Heavy metals that are most often linked to health problems include [\[R, R\]](#):


- Lead
- Cadmium
- Arsenic
- Chromium
- Mercury


### How it helps

A study of 15 participants found higher DNA damage among those occupationally exposed to heavy metals [\[R\]](#).

13 

## Avoid Mercury Exposure

IMPACT  1 / 5

EVIDENCE  1 / 5

## 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.

## Description

Avoiding exposure to mercury, a toxic heavy metal found in certain seafood and environmental sources, is essential to prevent adverse health effects, including neurological damage and developmental issues.


Mercury and other [heavy metals](#) are found in the soil, water, food, and some commonly-used household products. They adversely affect the environment and living organisms. According to some studies, mercury is considered **the most toxic heavy metal** in the environment [\[R\]](#), [\[R\]](#).

A major source of mercury exposure is seafood, especially large fish such as [\[R\]](#):

- Tuna
- Shark
- Swordfish

## How it helps

This study highlights that lead and mercury induce cancer in humans and animals through DNA damage via various mechanisms, including reactive oxygen species and DNA repair interactions. MN tests with lymphocytes consistently showed positive results for lead and mercury exposure, suggesting their suitability for monitoring exposed individuals [\[R\]](#).

14  **Tocotrienols**

**IMPACT** 1/5 **EVIDENCE** 1/5

## How to implement

Take tocotrienols as a dietary supplement in doses ranging from 100 to 200 mg, 1-2 times a day, ideally with meals to enhance absorption. This intake can be continuous, but it's recommended to review its effects with a healthcare provider periodically, typically every 6 to 12 months.

**TYPICAL STARTING DOSE****100 mg**


## Description

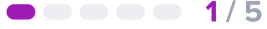
Tocotrienols are a form of vitamin E that helps to protect your cells. They fight harmful substances in your body called free radicals, which can damage our cells and lead to illness. By helping your body in this way, tocotrienols contribute to overall health, boosting immunity, and slowing down aging processes.

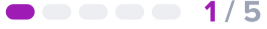
## How it helps

A randomized, double-blinded placebo-controlled study found that Tri E Tocotrienol supplementation reduced DNA damage, sister chromatid exchange (SCE) frequency, and urinary 8-hydroxy-2'-deoxyguanosine (8-OHdG) levels, indicating potential benefits in DNA protection [\[R\]](#).

Another study compared tocotrienol-rich fraction (TRF) and  $\alpha$ -tocopherol ( $\alpha$ -TF) supplementation effects on oxidative stress in older adults. TRF reduced MDA levels in both genders, while  $\alpha$ -TF reduced MDA and protein carbonyl in females. TRF also reduced DNA damage in females and increased vitamin D concentration in both genders [\[R\]](#).

15  **Cat's Claw**

**IMPACT**  1 / 5

**EVIDENCE**  1 / 5

## How to implement

Take 250-350 mg of cat's claw extract daily, preferably with a glass of water. This dosage can be split into two separate doses, one in the morning and one in the evening. Continue this regimen for at least 4 to 8 weeks to observe potential benefits.

**TYPICAL STARTING DOSE**

**250 mg**

## Description

Cat's claw is an herbal supplement derived from a tropical vine known for its potential anti-inflammatory and immune-boosting properties. It's used in traditional medicine to support joint health and overall well-being.


Cat's claw (*Uncaria tomentosa* and *Uncaria guinaensis*) is a vine native to the Amazon rainforest and other tropical regions of Central and South America. Its curved thorns look like cat's claws [\[R\]](#).



Cat's claw has been used for centuries in South American traditional medicine for [\[R\]](#):

- Fever
- Fatigue
- Muscle and joint pain

## How it helps

In a non-placebo-controlled trial of 12 healthy volunteers, supplementation with cat's claw extract (250-350 mg/day) for 8 weeks reduced experimentally induced DNA damage [\[R\]](#).

16  **Brussels Sprouts**

**IMPACT**  **EVIDENCE** 

## How to implement

Incorporate brussels sprouts into your diet by eating them 2-3 times per week. They can be steamed, roasted, or sautéed and seasoned to taste, forming part of a balanced meal. Each serving should be about 1 cup, which roughly equals 5-6 medium-sized brussels sprouts.


## Description


Brussels sprouts are a cruciferous vegetable packed with vitamins, fiber, and antioxidants. They are a nutritious addition to a balanced diet and may support immune health and overall well-being.


**Brussels sprouts** are good sources of vitamin C, vitamin K, fiber, as well as small amounts of other vitamins and minerals. A ½ cup serving provides 48 mg of vitamin C or 53%DV.

## How it helps

Three studies demonstrated that Brussels sprouts consumption can reduce oxidative DNA damage and may provide protective effects against specific types of DNA damage related to cancer-causing agents [\[R, R, R\]](#).

17  **Apples**

**IMPACT**  1 / 5

**EVIDENCE**  1 / 5

## How to implement

Incorporate at least one whole apple into your daily diet, either as a snack or part of your meals, ensuring to eat them consistently every day for an ongoing period to derive potential health benefits.

## Description

Apples are a nutritious fruit known for their fiber content and antioxidant-rich skin. They support overall health by aiding digestion, reducing the risk of chronic diseases, and promoting heart health.

Apples (*Malus domestica Borkh.*) are one of the most widely consumed fruits in the world. They have a high nutritional value and content of antioxidants [\[R, R\]](#).

Eating apples is associated with a lower risk of [\[R, R\]](#):

- Heart disease
- Asthma
- Diabetes

## How it helps

In a study with six volunteers, no significant differences were found between organic and conventional apples in terms of polyphenol content or their effects on antioxidant capacity and DNA protection [\[R\]](#).



19



## Avoid Formaldehyde Exposure

IMPACT

1 / 5

EVIDENCE

1 / 5

### How to implement

To minimize formaldehyde exposure, choose household products and building materials labeled low-VOC (Volatile Organic Compounds) or formaldehyde-free. Ensure proper ventilation in your living and working spaces, especially when using products known to contain formaldehyde like certain adhesives, cleaning agents, and cosmetics. Aim to reduce use of pressed wood products and seek out alternatives when possible.

### Description

Avoiding exposure to formaldehyde, a chemical commonly found in building materials and certain products, is crucial to prevent respiratory problems and potential carcinogenic effects.

### How it helps

Occupational exposure to formaldehyde may cause more DNA damage in people with certain gene variants [\[R, R, R\]](#).




PERSONALIZED TO YOUR GENES

Occupational exposure to formaldehyde may cause more DNA damage in people with your [PARP1](#) gene variant [\[R\]](#).

#### YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
PARP1	rs1136410	AG	

20  **Topical Niacinamide**

**IMPACT** 0 / 5

**EVIDENCE** 0 / 5

## How to implement

Apply a topical niacinamide product, containing 2-5% niacinamide, to clean, dry skin once or twice daily. For best results, use consistently as part of your morning and/or evening skincare routine.

## Description

Niacinamide, a form of vitamin B3, is used topically for its ability to improve skin texture, reduce redness, and minimize the appearance of pores. It is a versatile skincare ingredient suitable for various skin types and conditions.

[Niacinamide](#) is a form of [vitamin B3](#) (niacin). Vitamin B3 supports your nerves, skin, gut, and more [\[R\]](#).

Niacinamide can be applied to the skin to potentially help with [\[R, R, R\]](#):

- Acne
- Wrinkles
- Dark patches

## How it helps

Niacinamide, a form of vitamin B3, when applied topically, has been shown to enhance DNA repair in UV-damaged skin and reduce signs of sun damage such as dark spots and wrinkles.

21



## Grape Seed Extract

IMPACT

0 / 5

EVIDENCE

0 / 5

### How to implement

Take 100-300 mg of grape seed extract daily, preferably with a meal to enhance absorption. This can be done either through a single dose or split into multiple doses throughout the day. Continue this regimen for at least 3 months to observe potential benefits.

TYPICAL STARTING DOSE

100 mg

### Description

Grape seed extract is rich in antioxidants called polyphenols, which may help protect against oxidative stress and support cardiovascular health. It's also believed to have potential benefits for skin health and overall well-being.

[Grape seed extract](#) is made from the seeds of wine grapes. It contains antioxidant compounds that may help support [\[R, R\]](#):

- Blood circulation
- Heart health
- Blood sugar control
- Healthy weight

### How it helps

Grape seed extract contains antioxidants that can protect cells from DNA damage. These antioxidants can neutralize harmful free radicals in the body, reducing the risk of cellular mutations that could lead to diseases.

22

Astaxanthin

IMPACT

EVIDENCE

## How to implement

Take an astaxanthin supplement daily, with a typical dosage ranging from 4 to 12 mg. It is best taken with a fat-containing meal to enhance absorption.

TYPICAL STARTING DOSE

12 mg

## Description

Astaxanthin is a powerful antioxidant found in certain microalgae and seafood. It is known for its potential benefits in reducing oxidative stress, supporting skin health, and promoting eye health.

[Astaxanthin](#) is a naturally-occurring orange-red pigment carotenoid found in algae, shrimp, lobster, crab, and salmon [\[R\]](#).

As an antioxidant, astaxanthin is **10 times stronger than zeaxanthin, lutein and beta-carotene**, and **100 times stronger than vitamin E** [\[R\]](#).

People take astaxanthin to:

- Support skin health [\[R, R\]](#)
- Reduce exercise fatigue [\[R, R\]](#)
- Prevent heart disease [\[R, R, R\]](#)

## How it helps

Astaxanthin is known for its potent antioxidant properties, which can help protect cells against oxidative stress. Oxidative stress can cause DNA damage, so by reducing it, astaxanthin helps to preserve DNA integrity.

23

Orange Juice

IMPACT

EVIDENCE

## How to implement


Consume 8-ounces (about 240 milliliters) of orange juice daily, preferably in the morning with breakfast. This routine can be followed every day as part of a balanced diet for an indefinite period.

## Description

Orange juice is a citrus beverage made from the juice of oranges. It is a rich source of vitamin C and other essential nutrients, contributing to immune support, skin health, and overall well-being.

## How it helps

Orange juice is rich in vitamin C, an antioxidant that protects cells by neutralizing free radicals. Consuming vitamin C-rich foods like orange juice may help prevent oxidative stress, thereby reducing the risk of DNA damage.

24  **Green Tea**

**IMPACT** 0 / 5

**EVIDENCE** 0 / 5

## 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**

## Description

Tea is a beverage made by steeping the leaves of the *Camellia sinensis* plant in hot water. It comes in various types, including black, green, white, and herbal teas, and is known for its diverse flavors and potential health benefits due to antioxidants and other bioactive compounds.


[Green](#) and black tea are made from the same plant (*Camellia sinensis*). This plant is processed in different ways to make each type of tea [\[R, R\]](#).

Tea contains antioxidants called **flavonoids**, which may help prevent [\[R, R, R, R\]](#):

- Heart disease
- Cancer
- Diabetes

## How it helps

Green tea is abundant in catechins, powerful antioxidants that protect cells against oxidative damage. Specifically, epigallocatechin gallate (EGCG) in green tea has been found to reduce DNA damage caused by harmful free radicals.

25  **Turmeric**

**IMPACT** 0 / 5

**EVIDENCE** 0 / 5

## How to implement

Incorporate 500-1000 mg of turmeric into your daily diet, either by adding ground turmeric spice to your food, such as in curries, soups, and smoothies, or by taking a dietary turmeric supplement. This should be done daily for at least 8 weeks to observe potential health benefits.

## Description

Turmeric is a bright yellow spice derived from the root of the *Curcuma longa* plant. It contains curcumin, a potent antioxidant and anti-inflammatory compound. Turmeric is used for various health conditions, including reducing inflammation, alleviating joint pain, and supporting digestive health.

## How it helps

Turmeric contains curcumin, a compound known for its anti-inflammatory and antioxidant properties. Research indicates that curcumin can help reduce oxidative stress and inflammation, potentially leading to a reduction in DNA damage and an enhancement in the body's ability to repair damaged DNA.

26



## Avoid Excess Sunlight Exposure

IMPACT

0 / 5

EVIDENCE

0 / 5

### How to implement

Limit direct sun exposure to early morning or late afternoon hours, ideally before 10 a.m. or after 4 p.m., when UV rays are less intense. Wear protective clothing, such as long-sleeved shirts, pants, and wide-brimmed hats, along with sunglasses that block UVA and UVB rays. Apply a broad-spectrum sunscreen with at least SPF 30 to all exposed skin, reapplying every two hours or immediately after swimming or sweating.

### Description

Avoiding excessive sunlight exposure and practicing sun safety measures, such as wearing sunscreen and protective clothing, helps reduce the risk of skin damage, including sunburn and skin cancer. It supports long-term skin health and minimizes the harmful effects of UV radiation.

**Sunlight or bright light during the day can benefit your body and mind.** It may [\[R, R, R\]](#):


- Boost your mood
- Boost your performance and energy
- Improve sleep quality

Experts recommend getting **at least 5-15 minutes of midday sun, 2-3 times per week**. People with darker skin and those living at high latitudes may need longer periods of sun exposure [\[R, R\]](#).

However, **excessive sun exposure may lead to sunburn, skin aging, and skin cancer**, so make sure to find the right balance [\[R, R\]](#).

### How it helps

Excessive exposure to sunlight, especially UV radiation, is a major cause of skin DNA damage, including mutations leading to skin cancer. Minimizing sun exposure during peak UV radiation times and using protective measures can significantly reduce the risk of this kind of DNA damage.

27  **Kale**

**IMPACT** 0 / 5

**EVIDENCE** 0 / 5

## How to implement

Incorporate at least one cup of kale, cooked or raw, into your daily diet. You can add it to smoothies, salads, or use it as a cooked vegetable side dish.

## Description

Jumping, such as through activities like jumping jacks or trampolining, is a cardiovascular exercise that can improve heart health, strengthen muscles, and boost overall fitness. It's an effective way to increase physical activity and promote a healthy lifestyle.

**Kale** is a good source of calcium, and is also abundant in vitamins A, C, and K, manganese, and potassium. A 1-cup serving (cooked) has 94 mg of calcium or 7%DV.

## How it helps

In a study, 22 healthy subjects consumed *B. carinata* (kale) preparations, raw or cooked, for 5 days. Cooked kale significantly reduced DNA damage induced by aflatoxin B1, while raw kale had a weaker effect. Both forms reduced prostaglandin E<sub>2</sub> (PGE<sub>2</sub>) levels. A balanced diet with both raw and cooked Brassica vegetables may have health benefits [R].

28  **Zinc**

**IMPACT** 0 / 5

**EVIDENCE** 0 / 5

## How to implement

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

TYPICAL STARTING DOSE

**15 mg**

## Description

Zinc is an essential mineral found in various foods, including meat, dairy, and nuts. It is crucial for immune function, wound healing, DNA synthesis, and maintaining healthy skin and nails. Zinc supplements are sometimes used to support immune health and manage zinc deficiencies.

[Zinc](#) is an essential mineral. Your body needs it to [\[R, R\]](#):

- Defend against disease
- Protect DNA from damage
- Heal wounds
- Control blood sugar

Some of the best sources of zinc include **shellfish, pork, beef, and beans**. It is also available as a supplement [\[R\]](#).

Adults should get **8-11 mg of zinc** per day [\[R\]](#).

## How it helps

Zinc plays a crucial role in DNA synthesis and repair, and acts as an antioxidant. Supplementation has been linked to reduced levels of oxidative stress and DNA damage, which is essential for maintaining genomic stability and preventing mutations.

29  **Curcumin**

IMPACT 0 / 5 | EVIDENCE 0 / 5

## 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

## Description

Curcumin is a compound found in turmeric known for its anti-inflammatory and antioxidant properties. It has been studied for its potential to reduce inflammation, support joint health, and contribute to overall well-being.


[Turmeric](#) is a yellow spice from India. It may reduce inflammation and [oxidative stress](#) [R].

The most important active compound in turmeric is **curcumin**. People use curcumin for [R, R, R, R, R, R]:

- Joint pain
- Hay fever
- Mood
- High blood sugar
- Gut health
- Liver health

## How it helps

Curcumin, the active component of turmeric, has been studied for its antioxidant and anti-inflammatory effects. These properties contribute to its ability to reduce oxidative stress and inflammation, both of which can cause DNA damage.

30  **Avoid Volatile Organic Compounds Exposure**

**IMPACT** 0 / 5

**EVIDENCE** 0 / 5

## How to implement

Increase ventilation in your living and working spaces by opening windows or using air purifiers with activated carbon filters. Choose low-VOC or VOC-free paints, building materials, and household products. Limit the use of aerosol sprays, solvent-based cleaners, air fresheners, and scented candles. When possible, store products containing VOCs outside of living spaces, and always follow label instructions for proper use and ventilation.

## Description

Reducing VOC exposure involves minimizing contact with indoor air pollutants from sources like paints, cleaning products, and certain building materials, which can help prevent respiratory problems and maintain indoor air quality.

## How it helps

Exposure to volatile organic compounds may cause greater DNA damage in people with certain gene variants [\[R\]](#).

31  **Vitamin C**

**IMPACT** 0 / 5

**EVIDENCE** 0 / 5

## 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**

## Description

[Vitamin C](#) is an essential nutrient. This means that our bodies can't produce it on their own, so we have to get it from food or supplements [\[R\]](#).

Foods rich in Vitamin C include: [\[R\]](#)


- Citrus Fruits
- Peppers
- Brussel sprouts
- Kiwi
- Broccoli
- Tomato
- Cantaloupe
- Cauliflower
- Spinach

Vitamin C has antioxidant properties. It supports immunity, heart health, and wound healing [\[R\]](#), [\[R\]](#).

Vitamin C deficiency is called *scurvy*. In the past, many sailors suffered from it [\[R\]](#).

## How it helps

Vitamin C is a potent antioxidant that can protect cells from oxidative damage by neutralizing free radicals. Research indicates that high levels of vitamin C can reduce the rate of DNA damage, thereby lowering the risk of various diseases.

32  **Pomegranate**IMPACT 0/5 EVIDENCE 0/5

## How to implement

Incorporate pomegranate into your diet by consuming fresh pomegranate seeds, drinking pure pomegranate juice, or adding pomegranate extract to smoothies or yogurts. Aim for at least one serving per day, which could be about half a cup of seeds or a glass (8 ounces) of juice, to gain its health benefits.

## Description

Pomegranate is a fruit native to regions of the Middle East and Mediterranean. It is rich in antioxidants and nutrients such as vitamin C, vitamin K, and dietary fiber. It contains punicalagins, anthocyanins, and ellagic acid, which give it anti-inflammatory effects and potential heart health benefits.

[Pomegranates](#) are red fruits that contain seeds covered by edible sweet coats. They are rich in antioxidants [\[R, R\]](#).

Pomegranate may reduce inflammation and support heart health. People use pomegranate seed oil and peel in cosmetics and traditional medicine [\[R, R\]](#).

## How it helps

Pomegranate contains high levels of antioxidants, which can protect cells from damage by neutralizing harmful free radicals. Studies have shown that consuming pomegranate or its juice can reduce oxidative stress, which in turn may reduce DNA damage in the body.

33  **Sulforaphane**IMPACT 0/5 EVIDENCE 0/5

## How to implement

Take a sulforaphane supplement, typically available in capsule form, with a dosage ranging from 30 to 60 milligrams per day. It is generally taken once daily, with or without food, according to the product's label instructions or a healthcare provider's advice. Continue this regimen daily for as long as you seek its benefits, but consult a healthcare provider for long-term use guidance.

**TYPICAL STARTING DOSE**

**30 mg**

## Description

Sulforaphane is a natural compound found in cruciferous vegetables like broccoli and cauliflower. It is known for its potent antioxidant and anti-inflammatory properties, potentially offering protective effects against chronic diseases and promoting overall health.

## How it helps

Sulforaphane, found in cruciferous vegetables like broccoli, has been shown to activate pathways that detoxify carcinogens before they damage DNA. It also boosts antioxidant defenses in the body, contributing to reduced cellular damage.

34  **N-acetylcysteine (NAC)**

**IMPACT** 0 / 5

**EVIDENCE** 0 / 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

N-acetylcysteine (NAC) is known for its ability to replenish the levels of the antioxidant glutathione in the body. This helps in reducing oxidative stress and protecting cells from DNA damage.

35  **Strawberries**

**IMPACT** 0 / 5

**EVIDENCE** 0 / 5

## How to implement

Incorporate a serving of strawberries, which is approximately eight medium-sized strawberries (about 1 cup or 150 grams), into your daily diet. You can enjoy them as a snack, add them to your breakfast cereal or oatmeal, blend them into smoothies, or use them as a topping for salads and desserts.

## Description

Strawberries are a delicious fruit rich in vitamin C, antioxidants, and dietary fiber. They provide essential nutrients and are associated with various health benefits, including improved immune function and heart health.

Strawberries (*Fragaria ananassa*) are one of the most consumed berries, both fresh and processed in juices, jams, yogurts, and desserts [\[R\]](#).

Strawberries have a high content of antioxidants and vitamins, such as [\[R\]](#), [\[R\]](#):

- Vitamin C
- Folate
- Flavonoids

## How it helps

Strawberries are a good source of vitamin C and other antioxidants. These nutrients help protect the body's cells from oxidative stress, reducing the risk of DNA damage.

36  **Selenium Supplements**

IMPACT 0 / 5 | EVIDENCE 0 / 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

Selenium is an essential mineral that acts as an antioxidant protecting cells from damage. Studies show that selenium supplementation can reduce DNA damage and oxidative stress, potentially lowering cancer risk and supporting immune function.

37  **Green Tea Extract**

**IMPACT** 0 / 5 | **EVIDENCE** 0 / 5

## How to implement

Take a green tea extract supplement containing 250-500 mg of EGCG (the active compound in green tea) daily, preferably with a meal to enhance absorption. This dosage is typically split into two separate doses, taken in the morning and later in the day. Continue this regimen for at least three months to observe potential health benefits.

TYPICAL STARTING DOSE

250 mg

## Description

Green tea extract is a concentrated form of the beneficial compounds found in green tea, such as catechins. It is used in dietary supplements for its potential to enhance metabolism, aid in weight management, and provide antioxidant protection.

[Green tea](#) is made from the same plant as black tea (*Camellia sinensis*). However, the leaves and buds are processed differently [\[R\]](#).

Green tea contains **catechins**. These are antioxidants that help prevent [oxidative stress](#) [\[R\]](#).

**EGCG is the main catechin found in green tea.** It may help reduce inflammation and support weight loss [\[R\]](#).

## How it helps

Green tea extract is rich in catechins, potent antioxidants that have been shown to reduce oxidative stress and protect against cellular DNA damage. This can help in maintaining the integrity of the DNA structure.

38  **Berries**

**IMPACT** 0 / 5 | **EVIDENCE** 0 / 5

## How to implement

Incorporate a variety of berries such as strawberries, blueberries, raspberries, and blackberries into your daily diet. Aim for at least one cup of fresh or frozen berries every day, either as a snack, part of your breakfast (such as in oatmeal or yogurt), or as a dessert.

## Description

Berries, such as strawberries, blueberries, and raspberries, are packed with antioxidants, vitamins, and fiber. Regular consumption of berries may support heart health, improve cognitive function, and contribute to overall well-being.

## How it helps

Berries, including strawberries, blueberries, and raspberries, are rich in antioxidants like vitamin C and anthocyanins. These compounds can help neutralize harmful free radicals, thereby reducing oxidative stress and preventing damage to DNA.

39



## Avoid Arsenic Exposure

IMPACT

0 / 5

EVIDENCE

0 / 5

### 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.

### Description

Avoiding arsenic exposure is essential for preventing potential health risks associated with arsenic contamination in drinking water and foods. Chronic exposure to arsenic has been linked to various health issues, including cancer and cardiovascular problems.

Arsenic is a [heavy metal](#) naturally found in the environment. It is used for mining, fracking, and industrial applications, such as the production of pesticides and wood preservatives, and the use of fossil fuels [\[R\]](#).

The main sources of exposure to arsenic are contaminated [\[R, R, R\]](#):

- **Drinking water**
- **Rice** and fish
- Air

Long-term exposure to high amounts of arsenic may be linked to health problems, including [\[R, R, R, R, R\]](#):

- Skin disorders
- Heart disease
- High blood pressure
- Stroke
- Diabetes
- Cancer

**Please note:** *Soaking, washing until clear, and cooking rice with a high (1:6) water-to-rice ratio may help reduce rice's arsenic content [\[R, R, R\]](#).*

### How it helps

Exposure to arsenic may cause greater DNA damage in people with certain gene variants [\[R, R\]](#).

# 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.