

VDR Gene (Vitamin D Receptor)

What is the purpose of the VDR gene?

The Vitamin D receptor gene influences the ability to efficiently use vitamin D.

Healthy bone density and strength are influenced by the VDR gene.^{1,2,3} The VDR gene encodes the nuclear hormone receptor for vitamin D, which functions as a transcription factor that mediates the action of vitamin D by controlling the expression of hormone sensitive genes. This gene may also influence young adult growth,⁴ parathyroid hormone production,⁵ and normal cell division.⁶

Why is this gene important?

Our bodies are constantly creating new bone (formation), as well as breaking down bone (resorption). Formation outpaces resorption until peak bone mass (maximum bone density and strength) is reached around age 30 when resorption slowly begins to exceed bone formation. One of the most important roles of vitamin D is to maintain skeletal calcium balance by promoting calcium absorption in the intestines. This, in turn, promotes bone formation, by maintaining calcium and phosphate levels, and allows proper functioning of parathyroid hormone to maintain serum calcium levels.

What SNP is tested in the DNA Assessment?

Every SNP is identified by a unique Reference SNP ID (rs), followed by the nucleotide variation. The SNP tested is VDR_rs10735810_(A/G).

Individuals with a SNP in this gene can benefit from supplementation with ingredients that support:

- Optimal calcium absorption
- Healthy bone mineral density
- Overall bone health

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EPHX Gene

(Microsomal Epoxide Hydrolase)

What is the purpose of the EPHX gene?

The EPHX gene supports the detoxification of pollutants, pesticides, alcohol, tobacco, and other foreign chemicals.

Cigarette smoke, car exhaust, charcoal-grilled meat, smoke from wood burning, pesticides, and alcohol all contain toxic, foreign chemicals. The liver detoxifies these compounds and in this process, highly-reactive epoxides are formed. Some reactive epoxides are responsible for oxidation reactions with critical biological targets such as DNA and proteins. The body's way of eliminating damaging epoxides is through the enzyme Microsomal Epoxide Hydrolase, which is encoded by the EPHX gene. The EPHX enzyme supports optimal detoxification by reducing the oxidation and other damage caused by reactive epoxides.⁷

Why is this gene important?

Detoxification refers to the elimination of toxic substances from the body. The body's first line of defense against toxic substances is found in the liver and is called "xenobiotic metabolism" (xenobiotics = foreign substances). The EPHX enzyme eliminates toxic epoxides formed during xenobiotic metabolism. A poorly-performing detoxification system may lead to overwhelmed liver function, which in turn can affect energy levels, appetite, skin and the ability to react to stress.

What SNP is tested in the DNA Assessment?

Every SNP is identified by a unique Reference SNP ID (rs), followed by the nucleotide variation. The SNP tested is EPHX1_rs1051740_(C/T).

Individuals with a SNP in this gene can benefit from supplementation with ingredients that help to:

- Promote increased activity of the EPHX enzyme
- Support and protect overall liver health
- Support and enhance the natural detoxification mechanisms in the liver
- Scavenge free radicals caused by environmental pollutants
- Support healthy response to oxidation

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NQ01 Gene (Coenzyme Q10 Reductase)

What is the purpose of the NQ01 gene?

The NQ01 gene determines which form of CoQ10 (ubiquinone or ubiquinol) the body uses most efficiently to help eliminate free radicals and provide cellular energy.

NAD(P)H:quinine oxidoreductase 1 (NQ01) is an enzyme which converts coenzyme Q10 (or CoQ10) from its oxidized form (ubiquinone) to its reduced form (ubiquinol). Ubiquinol is the bioactive form of the antioxidant CoQ10 that the body uses for the production of cellular energy and the protection of cell components from oxidation, especially the lipid membranes.⁸

Why is this gene important?

In the mitochondria, Ubiquinol is the form of CoQ10 that plays a crucial role in the generation of energy from food. If ubiquinone, the oxidized form of CoQ10, is ingested, the body quickly transforms it into ubiquinol.⁹ CoQ10 is found at its greatest levels in cells with high energy requirements such as heart, brain, liver, and kidney. CoQ10 also functions as an important antioxidant, particularly in preventing free radicals from damaging cellular membranes.¹⁰ Free radicals are considered to play a key role in the aging process. A SNP in the NQ01 gene results in the production of a version of the NQ01 enzyme that has negligible ability to convert the inactive oxidized form (ubiquinone) to its active reduced form (ubiquinol).¹¹

What SNP is tested in the DNA Assessment?

Every SNP is identified by a unique Reference SNP ID (rs), followed by the nucleotide variation. The SNP tested is NQ01_rs1800566_(T/C).

Individuals with a SNP in this gene can benefit from supplementation with ubiquinol, the bioavailable form of CoQ10. Ubiquinol supports:

- Optimal Energy
- Cardiovascular health
- Healthy response to oxidation

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SOD2 Gene

(Manganese Superoxide Dismutase)

What is the purpose of the SOD2 gene?

The SOD2 gene helps protect against oxidation by eliminating toxic superoxide free radicals.

A major type of free radical is the superoxide radical. Because the superoxide radical is so toxic, most organisms have evolved an enzyme that eliminates them. The SOD2 gene regulates the production of an enzyme, called manganese superoxide dismutase (mSOD), which is exceptionally efficient in eliminating superoxide radicals and thereby in protecting the cell machinery and DNA from damage.

Why is this gene important?

The superoxide radical is one of the main free radicals found in the cell and it is extremely biologically toxic to cellular DNA, proteins, lipids and cellular machinery.^{12,13} The mSOD enzyme acts as a first line of defense against oxidative damage by scavenging the superoxide radical. mSOD also has the distinction of being the only enzyme in the mitochondria that can neutralize superoxide, making it harmless.^{13,14,15}

What SNP is tested in the DNA Assessment?

Every SNP is identified by a unique Reference SNP ID (rs), followed by the nucleotide variation. The SNP tested is SOD2_rs4880_(C/T).

Individuals with a SNP in this gene can benefit from supplementation with ingredients that:

- Support a healthy response to oxidation
- Provide specific antioxidant activity against the superoxide radical
- Provide antioxidant support to help manage all free radicals

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GPX1 Gene (Glutathione Peroxidase 1)

What is the purpose of the GPX1 gene?

The GPX1 gene helps protect against oxidation by eliminating hydrogen peroxide, which gives rise to free radicals including hydroxyl radicals.

The GPX1 Gene encodes for the GPX1 antioxidant enzyme that specifically neutralizes hydrogen peroxide, a reactive oxygen species (ROS).

Why is this gene important?

ROS are aggressive, highly-reactive molecules that naturally occur in the body as a byproduct of metabolism. Cumulative ROS damage is now believed to be one of the major causes of aging. Hydrogen peroxide is one of the major types of ROS formed in the body that cause such damage. Glutathione peroxidase is the general name of an enzyme family produced by the body with specific antioxidant activity against hydrogen peroxide. These enzymes convert hydrogen peroxide molecules into a harmless product – water. GPX1 is the most abundant version of such enzymes and therefore protects the organism from oxidation. The GPX1 enzyme is a selenoprotein, meaning it incorporates selenium into its protein structure.¹⁶ Therefore, how much active GPX1 a person produces is also dependent on his or her selenium level.^{16,17,18} Optimal selenium intake is needed to afford protection to hydrogen peroxide-sensitive tissues.

What SNP is tested in the DNA Assessment?

Every SNP is identified by a unique Reference SNP ID (rs), followed by the nucleotide variation. The SNP tested is GPX1_rs1050450_(T/C).

Individuals with a SNP in this gene can benefit from supplementation with ingredients that:

- Help increase glutathione peroxidase activity
- Specifically neutralizes hydrogen peroxide radicals

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MMP-1 Gene (Matrix Metalloproteinase)

What is the purpose of the MMP-1 gene?

The MMP-1 gene helps regulate the recycling of collagen.

Collagen is the main component of cartilage, skin, ligaments, tendons, and bone. It is constantly synthesized and broken down in an ongoing cycle. The MMP-1 gene encodes for Matrix Metalloproteinase -1 (MMP-1), also known as collagenase, which is an enzyme that breaks down collagen.

Why is this gene important?

Collagen degradation from excess collagenase plus free radical damage from aging, leads to an imbalance between collagen breakdown and reformation. This results in the normally elastic and free-moving fibers becoming “stiff” and less mobile. A noticeable effect is seen in the connective tissue in our skin, the body’s largest organ. It becomes thinner and loses its elasticity. Degradation and depletion of collagen in the skin is one main reason for the appearance of skin aging.

What SNP is tested in the DNA Assessment?

Every SNP is identified by a unique Reference SNP ID (rs), followed by the nucleotide variation. The SNP tested is MMP1799740_(2G/G).

Individuals with a SNP in this gene can benefit from supplementation with ingredients that:

- Helps support healthy collagen
- Fight free radicals
- Manage MMP1 activity
- Support Skin Health

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MTRR Gene (Methionine Synthase Reductase)

What is the purpose of the MTRR gene?

The MTRR gene encodes for the MTRR enzyme, which regulates homocysteine levels to help maintain optimal cardiovascular health.

Why is this gene important?

Homocysteine is a metabolite of the amino acid methionine. One of the body's methods for keeping homocysteine levels in check is the Methionine Synthase Reductase (MTRR) enzyme, which is encoded by the MTRR gene. This enzyme transforms homocysteine back to methionine.¹⁹ Research has shown it is important to control homocysteine levels in order to preserve cardiovascular health.^{20,21,22}

What SNP is tested in the DNA Assessment?

Every SNP is identified by a unique Reference SNP ID (rs), followed by the nucleotide variation. The SNP tested is MTRR_rs10805087_(G/A).

Individuals with a SNP in this gene can benefit from supplementation with ingredients that:

- Help manage homocysteine levels
- Support the conversion of homocysteine to methionine
- Support overall cardiovascular health

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MTHFR Gene (Methylene Tetrahydrofolate Reductase)

What is the purpose of the MTHFR gene?

The MTHFR enzyme helps to manage homocysteine levels by determining which form of folic acid (folate or reduced folate) the body uses most efficiently.

Why is this gene important?

The MTHFR gene encodes for the enzyme Methylene Tetrahydrofolate Reductase (MTHFR), which catalyzes the conversion of dietary folic acid into its bioactive form that is more effectively used by the body.²³ This converted form of folate is in turn used in many biochemical pathways, most importantly in the recycling of homocysteine back into methionine. Research has shown it is important to control homocysteine levels in order to preserve cardiovascular health.^{20,21,22} Like the MTRR enzyme, the MTHFR enzyme is responsible for controlling levels of homocysteine for a healthy heart.

What SNP is tested in the DNA Assessment?

Every SNP is identified by a unique Reference SNP ID (rs), followed by the nucleotide variation. The SNP tested is MTHFR_rs1801133_(A/G).

In addition to the bioactive form of folate, individuals with a SNP in this gene can benefit from supplementation with ingredients that:

- Help manage homocysteine levels
- Support cardiovascular health

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TNF- α Gene

(Tumor Necrosis Factor- α)

What is the purpose of the TNF- α gene?

The TNF- α gene helps regulate a healthy inflammatory response.

Why is this gene important?

TNF- α gene regulates the production of TNF- α , a chemical messenger (cytokine) of the immune system that plays a role in inflammatory processes. Inflammation is the response of the immune system to attack from various sources such as pathogens, damaged cells, or irritants. Aging also results in an increased level of cytokines. TNF- α mobilizes white blood cells in response to infections and injuries. While it is a helpful response in the short-term, if the inflammatory response becomes unbalanced (too much TNF- α), it can negatively affect the cells, skin, tissues, and ultimately, the organs. An optimal inflammatory response requires a healthy balance of TNF- α .

What SNP is tested in the DNA Assessment?

Every SNP is identified by a unique Reference SNP ID (rs), followed by the nucleotide variation. The SNP tested is TNF_rs1800629_(A/G).

Individuals with a SNP in this gene can benefit from supplementation with ingredients that:

- Inhibit TNF- α activity
- Fight the increased production of free radicals caused by high TNF- α
- Support a healthy inflammatory response

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PON-1 Gene (Paraoxonase-1)

What is the purpose of the PON-1 gene?

The PON-1 gene supports healthy lipid levels and cardiovascular health.

Why is this gene important?

The PON-1 gene encodes for Paraoxonase 1, an enzyme which is transported on High Density Lipoprotein (HDL) in the plasma. By attaching to HDL, the PON-1 enzyme protects LDL from becoming oxidized.²⁴ When LDL becomes oxidized (attacked by free radicals), it is recognized by the body as foreign. Managing levels of oxidized LDL is important for optimal cardiovascular health.

What SNP is tested in the DNA Assessment?

Every SNP is identified by a unique Reference SNP ID (rs), followed by the nucleotide variation. The SNP tested is PON1_rs662_(C/T).

Individuals with a SNP in this gene can benefit from supplementation with ingredients that:

- Help maintain healthy lipids
- Increase PON-1 activity
- Support overall cardiovascular health

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CYP11B2 Gene (Aldosterone Synthase)

What is the purpose of the CYP11B2 gene?

CYP11B2 gene helps to maintain blood pressure in normal ranges, essential for a healthy heart.

Why is this gene important?

Maintaining blood pressure within the normal range is essential for a healthy heart. The CYP11B2 gene encodes the enzyme aldosterone synthase, which is an enzyme necessary in the biosynthesis of aldosterone. Aldosterone is a hormone that plays a role in achieving favorable salt and fluid levels in the body and hence retaining healthy blood pressure already in the normal range.

What SNP is tested in the DNA Assessment?

Every SNP is identified by a unique Reference SNP ID (rs), followed by the nucleotide variation. The SNP tested is CYP11B2_rs1799998_(C/T).

Individuals with a SNP in this gene can benefit from supplementation with ingredients that:

- Help retain blood pressure levels already in the normal range
- Support overall cardiovascular health

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ApoB Gene (Apolipoprotein B)

What is the purpose of the ApoB Gene?

The ApoB gene helps support a healthy heart, by helping to maintain healthy cholesterol levels already in normal range.

Why is this gene important?

Cholesterol is carried through the bloodstream on various lipoproteins: Low-Density Lipoprotein (LDL) and High-Density Lipoprotein (HDL). ApoB is an apolipoprotein that is the main protein component of LDL. In fact, without ApoB, LDL cannot form. LDL levels maintained in the healthy range are typically associated with good cardiovascular health. Research has shown that there is an inverse association between ApoB levels and cardiovascular health.^{25,26,27}

What SNP is tested in the DNA Assessment?

Every SNP is identified by a unique Reference SNP ID (rs), followed by the nucleotide variation. The SNP tested is APOB_rs693_(A/G).

Individuals with a SNP in this gene can benefit from supplementation with ingredients that:

- Help manage ApoB production
- Help retain healthy cholesterol levels already in the normal range
- Support overall cardiovascular health

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