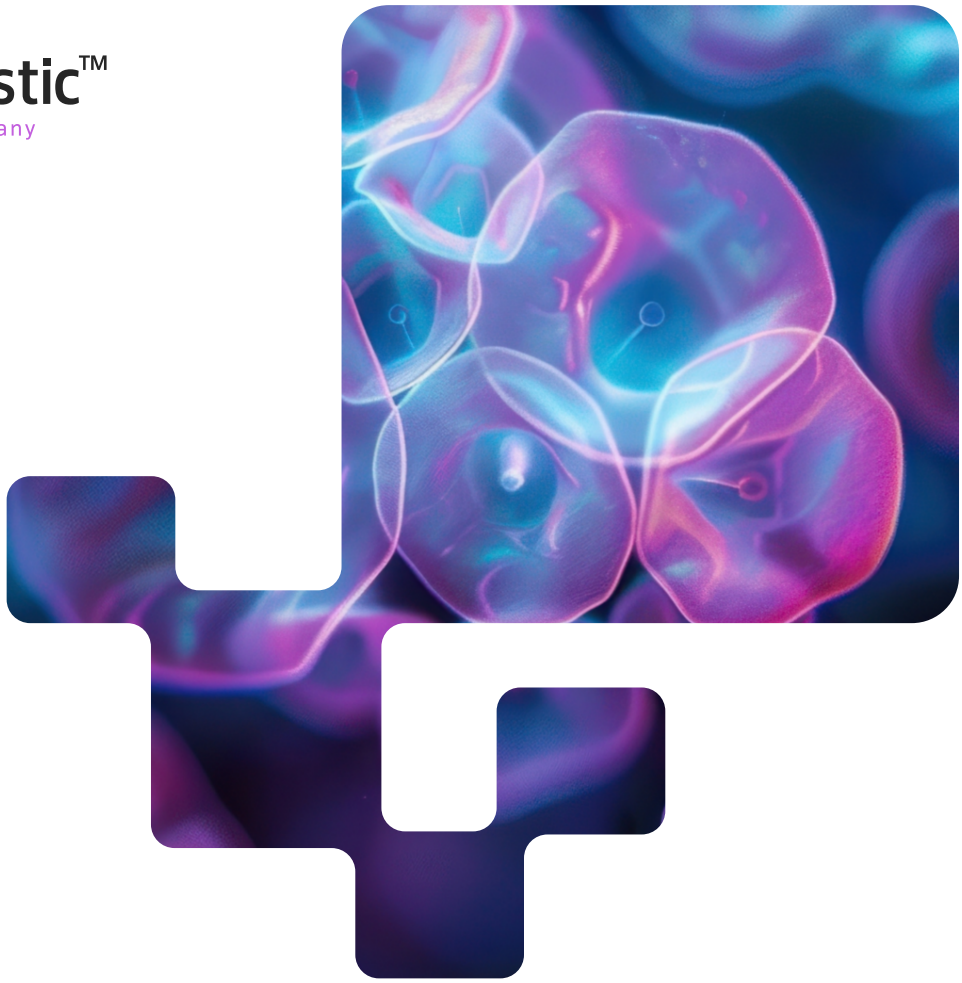
TruDiagnostic™
The Epigenetic Company



TruHealth Report

Jane Doe

Age: 29 | Sex: Female

ID#: VBC43XM

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CLIA Lab Director: Melissa Keinath, PhD FACMG
TruDiagnostic
881 Corporate Drive
Lexington, KY 40503

Welcome to your personalized report on **Epigenetic Biomarkers**

What are Epigenetic Biomarkers?

Epigenetic biomarkers are specific biological markers derived from analyzing DNA methylation patterns in your genome. Unlike traditional blood-based metrics of your health such as serum levels, which provide a single snapshot in time, epigenetic biomarkers uniquely offer insights into ongoing biological functions by predicting levels of nutrients, metabolites, and other essential biochemical entities. These epigenetic measurements are based on patterns in your DNA methylation landscape, influenced by both genetic and environmental factors. Epigenetic biomarkers provide a more stable and comprehensive view of your health over time, reflecting long-term exposures and trends rather than short-term fluctuations.

Epigenetic Biomarkers vs Serum Levels

Serum levels represent a direct measurement of substances in your blood at a specific point in time. These levels can vary based on recent meals, exercise, stress, and other transient factors. In contrast, epigenetic biomarkers are derived from DNA methylation patterns, providing a broader and more consistent indication of health, which isn't as influenced by short-term changes. This makes epigenetic biomarkers especially useful for understanding long-term health trends and risks.

Epigenetic biomarkers provide a more stable and comprehensive view of your health over time, reflecting long-term exposures and trends rather than short-term fluctuations.

The Reference Cohort: The Data Behind TruHealth's Analytics

Our algorithms and biomarkers are developed and validated using data from a subset of the Massachusetts General Brigham (MGB) Biobank. The MGB Biobank is a comprehensive repository containing over 130,000 high-quality samples from more than 100,000 consented patients. These samples are linked to detailed EMR data, which includes the patients' lifetime medical histories. The biobank also incorporates survey data on lifestyle, environment, and family history. To ensure meaningful percentile comparisons in your report, we used an equal combination of data from the MGB Biobank and TruDiagnostic patients, providing a robust, diverse, and extensively studied reference population.

Biomarkers Overview

This section of the TruHealth report provides a comprehensive overview of an individual's general health and nutrition markers, each derived from one or more epigenetic biomarkers that reflect underlying cellular health and function. These markers are presented in a normalized percentile range, allowing for a straightforward comparison with a reference population. A score of 0 indicates the worst outcome, representing potential areas of concern or risk, while a score of 100 signifies the best possible outcome, highlighting areas of optimal health. The percentile ranking provides an easy-to-interpret indication of how an individual's health status compares to the broader population, offering valuable insights into their relative standing in terms of metabolic health, immune function, inflammation, mitochondrial activity, and more. This comparison against a carefully studied cohort gives context to these markers, enabling users to understand areas where they may need intervention or where they are already performing well.

NUTRITION

Vitamins	61%
Amino Acids	58%
Antioxidants	54%
Fats and Cellular Membranes	63%

GENERAL HEALTH MARKERS

Lipid Peroxidation		69%
Serum Lipids		81%
Blood Pressure		49%
Metabolic Markers		75%
Immune Markers		69%
Neurocognitive Markers		48%
Inflammation Markers		77%
Stress Markers		56%
Toxins	Suboptimal	33%
Uric Acid Pathway		63%
Mitochondrial Function		42%
Oxidative Defense		68%
NAD+ Metabolism		77%
Ketones		83%
Supplements		41%

TOP PERSONALIZED RECOMMENDATIONS

VITAMINS

Vitamin C

Consume foods high in Vitamin C.

Vitamin C

NEUROCOGNITIVE MARKERS

Brain Inflammation Marker

Adjust Brain Inflammation Marker levels through diet and lifestyle changes.

VITAMINS

Vitamin C

Consume foods high in Vitamin C.

Vitamin C

BLOOD PRESSURE

Vanilla Acetic Acid (VAA)

Adjust Vanilla Acetic Acid (VAA) levels through diet and lifestyle changes.

FATS AND CELLULAR MEMBRANES

LA

Adjust LA levels through diet and lifestyle changes.

AMINO ACIDS

Cystathionine

Adjust Cystathionine levels through diet and lifestyle changes.

EPIGENETIC BIOMARKERS **RISK SCORES**

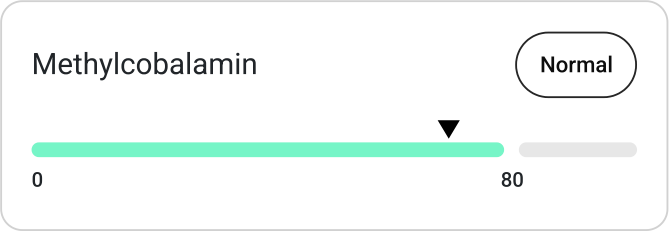
The **Epigenetic Biomarkers Risk Scores** section of the report provides a detailed breakdown of specific **epigenetic biomarkers** derived from your epigenome, each linked to relevant **risk scores** and associated **biomarkers**. Every epigenetic biomarker is accompanied by a concise explanation of its function in the body and its relationship to disease or health outcomes. The **optimal and suboptimal ranges** for these biomarkers vary, depending on whether the biomarker is most beneficial at **high, low, or midrange levels**. For biomarkers identified as suboptimal, personalized **lifestyle** and **supplement recommendations** are provided for improvement. Additionally, prior epigenetic biomarker values are displayed to **track changes over time**, offering insight into progress and areas that may need continued attention.

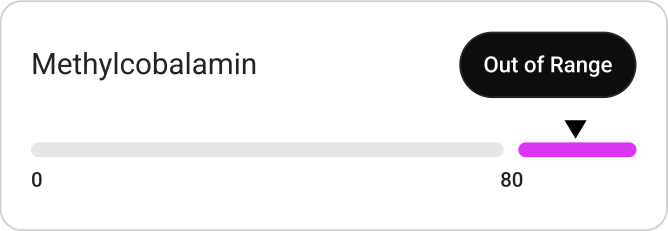
There are Three Different Ranges for Each Epigenetic Biomarkers (EB)

In the below section, each epigenetic biomarker will be presented as your percentile when compared against the reference population. Each epigenetic biomarker is identified by our science team as ideal when LOW, MIDDLE, or HIGH. When the ideal biomarker is thought to be LOW, a percentile of 0% is best. When the MIDDLE is ideal, 50% is best. When HIGH is ideal, 100% is best.

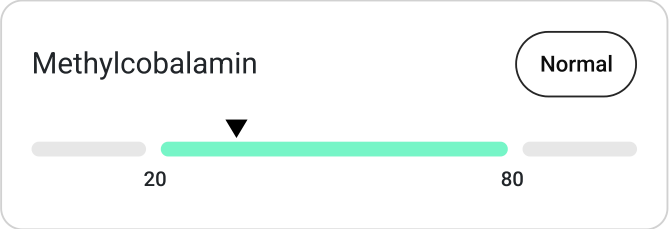
Normal Out of Range ⚠ Critically Out of Range

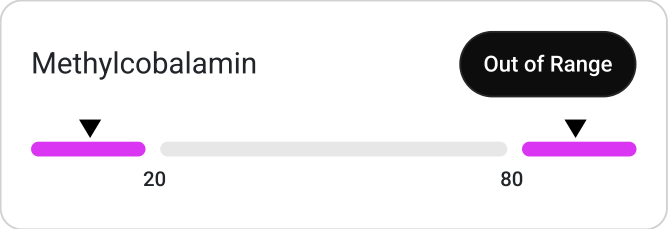
Example: Normal Range is **LOW**



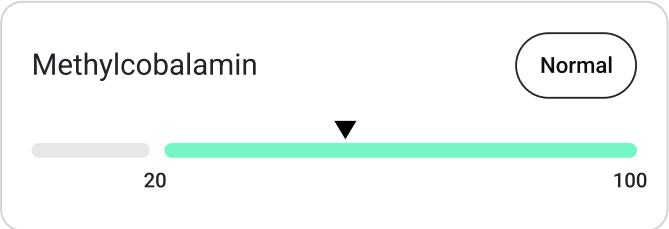


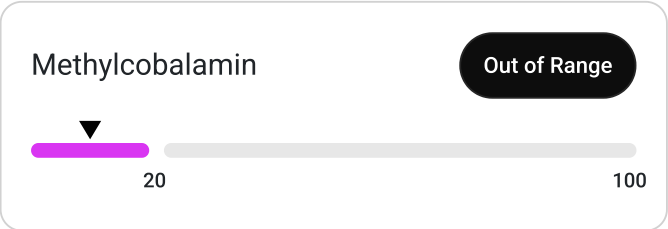
Example: Normal Range is **MIDDLE**





Example: Normal Range is **HIGH**





VITAMINS

Vitamin A$_m$

Retinol (vitamin A)$_m$

90%

Description

Retinol (Vitamin A) is essential for vision, immune function, and cellular communication.

Vitamin B2 (Riboflavin)$_m$

Riboflavin (vitamin B2)$_m$

26%

Description

A B-vitamin essential for energy production and cellular function

Vitamin B3 (Nicotinamide)$_m$

Nicotinamide$_m$

52%

Description

Nicotinamide is a form of vitamin B3, essential for NAD+ production and cellular energy. Low levels are associated with lower NAD+ production, and high levels are associated with inhibition of Sirtuins and NAD+ recycling pathways.

Vitamin B5 (Pantothenic Acid)$_m$

Pantothenic Acid (vitamin B5)$_m$

67%

Description

Pantothenic Acid (Vitamin B5) is essential for CoA synthesis and energy metabolism.

Vitamin B6 (P5P)$_m$

Pyridoxine, Pyridoxine-5-Phosphate (vitamin B6)$_m$

10%

Description

Pyridoxine (Vitamin B6) is a coenzyme in amino acid metabolism and neurotransmitter synthesis.

Vitamin B8 (Inositol)$_m$

Inositol (myoinositol)$_m$

46%

Description

Inositol is a carbohydrate involved in cell membrane formation and insulin signal transduction.

Vitamin C$_m$

Ascorbic acid 2-sulfate$_m$

6%

Description

Sulfated form of Vitamin C.

Vitamin C$_m$

Ascorbic acid 3-sulfate$_m$

5%

Description

Another sulfated form of Vitamin C.

Vitamin D$_m$

Cholecalciferol (vitamin D)$_m$

63%

Description

A form of Vitamin D; important for bone health and immune function.

Vitamin E$_m$

Alpha-tocopherol$_m$

51%

Description

A form of Vitamin E with strong antioxidant properties. High levels can be associated with reduced gamma-tocopherol function, and low levels can be associated with poor antioxidant function.

Choline$_m$

Total cholines$_m$

78%

Description

Essential nutrient involved in brain health and fat metabolism.

Betaine$_m$

43%

Description

A methyl donor involved in liver function and cell hydration.

AMINO ACIDS

Methionine$_m$

59%

Description

An essential amino acid involved in protein synthesis and detoxification processes.

Cysteine$_m$

54%

Description

Amino acid involved in protein synthesis and antioxidant functions

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S-methylmethionine$_m$

S-Methylmethionine$_m$

54%

Description

A methylated form of methionine involved in methylation reactions

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Taurine$_m$

41%

Description

A sulfur-containing amino acid with antioxidant properties.

Ergothioneine$_m$

88%

Description

Ergothioneine is a powerful antioxidant involved in cellular protection and oxidative stress regulation. High levels may reflect increased oxidative stress or enhanced antioxidant activity, while low levels could indicate reduced cellular defense against oxidative damage.

Glutamine$_m$

78%

Description

An amino acid essential for gut health.

Arginine$_m$

90%

Description

An amino acid involved in protein synthesis and nitric oxide production.

Tyrosine$_m$

46%

Description

An amino acid involved in protein synthesis and a precursor to neurotransmitters such as dopamine and norepinephrine.

L-Aspartic Acid$_m$

34%

Description

L-Aspartic Acid is a non-essential amino acid important in the urea cycle and energy production. Low levels may impair protein synthesis and neurotransmitter function, while high levels could indicate metabolic stress.

Valine$_m$

N-carbamoylvaline$_m$

26%

Description

N-carbamoylvaline is a derivative of valine, playing a role in nitrogen metabolism. Abnormal levels might indicate stress on nitrogen metabolism from diet or inflammation.

Asparagine$_m$

81%

Description

An amino acid involved in metabolic processes.

Threonine$_m$

N-acetylthreonine$_m$

15%

Description

N-acetylthreonine is an acetylated derivative of threonine, essential for protein production. Low levels could impair immune function and recovery, while high levels might suggest dietary imbalances.

Valine$_m$

N-acetylvaline$_m$

65%

Description

N-acetylvaline is involved in valine metabolism, an essential amino acid. Low levels could affect muscle recovery, while high levels could reflect metabolic stress.

Glycine$_m$

95%

Description

An amino acid involved in detox and sleep.

Carnosine$_m$

N-acetylcarnosine$_m$

15%

Description

A derivative of carnosine, which acts as an antioxidant in the body.

Cystathionine$_m$

8%

Description

Intermediate in methionine metabolism and cysteine biosynthesis

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Histidine$_m$

N-acetylhistidine$_m$

28%

Description

A derivative of histidine, important for metal ion binding and antioxidant functions. Low levels could affect muscle recovery, while high levels may indicate inflammation or stress.

Citrulline$_m$

42%

Description

Non-essential amino acid involved in nitric oxide production and vascular health.

ANTIOXIDANTS

Carotenoids$_m$

Lutein$_m$

98%

Description

A carotenoid with antioxidant properties, found in green leafy vegetables.

Carotenoids$_m$

Carotene diol$_m$

78%

Description

Carotenoid found in plants; antioxidant properties.

Acetyl-L-Carnitine$_m$

15%

Description

Acetyl-L-Carnitine is a compound involved in fatty acid metabolism and mitochondrial energy production. Elevated levels may indicate increased energy demand or metabolic adaptation, while low levels could suggest impaired mitochondrial function or reduced fatty acid utilization.

Vitamin A$_m$

Retinol (vitamin A)$_m$

90%

Description

Retinol (Vitamin A) is essential for vision, immune function, and cellular communication.

Vitamin E$_m$

Alpha-tocopherol$_m$

51%

Description

A form of Vitamin E with strong antioxidant properties.

Ergothioneine$_m$

88%

Description

Ergothioneine is a powerful antioxidant involved in cellular protection and oxidative stress regulation. High levels may reflect increased oxidative stress or enhanced antioxidant activity, while low levels could indicate reduced cellular defense against oxidative damage.

Vitamin B2 (Riboflavin)$_m$

Riboflavin (vitamin B2)$_m$

26%

Description

A B-vitamin essential for energy production and cellular function

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Vitamin C$_m$

Ascorbic acid 2-sulfate$_m$

6%

Description

A sulfated form of Vitamin C.

Vitamin C$_m$

Ascorbic acid 3-sulfate$_m$

5%

Description

Another sulfated form of Vitamin C.

FATS AND CELLULAR MEMBRANES

Omega 3$_m$

Omega-3$_m$

59%

Description

Omega-3 is a polyunsaturated fatty acid with essential roles in reducing inflammation and supporting heart, brain, and joint health. High levels may indicate adequate dietary intake, while low levels could suggest poor dietary consumption or increased risk of inflammatory conditions.

DHA$_m$

Docosahexaenoate (DHA; 22:6n3)$_m$

86%

Description

An omega-3 fatty acid that plays a key role in brain health and inflammation.

DPA$_m$

Docosapentaenoic acid$_m$

54%

Description

A lesser-known omega-3 fatty acid involved in inflammatory processes.

EPA$_m$

Eicosapentaenoate (EPA; 20:5n3)$_m$

79%

Description

An omega-3 fatty acid with anti-inflammatory effects, found in fish oils.

Omega 6$_m$

Omega-6$_m$

18%

Description

Omega-6 is a polyunsaturated fatty acid involved in cell function and inflammation regulation. High levels may indicate excessive intake of processed foods or an imbalance with omega-3, potentially promoting inflammation. Low levels could suggest insufficient dietary intake or impaired fat metabolism.

LA$_m$

92%

Description

Linoleic Acid (LA) is an essential omega-6 polyunsaturated fatty acid critical for cell membrane integrity and inflammatory processes. Excessive LA intake may promote lipid peroxidation and chronic inflammation, potentially negatively affecting metabolic health and longevity.

PUFA$_m$

84%

Description

Polyunsaturated Fatty Acids (PUFAs) are essential fats involved in cell structure and inflammation regulation. Excessive omega-6 PUFA intake may promote lipid peroxidation, leading to oxidative stress and inflammation, which could negatively impact longevity and metabolic health.

MUFA$_m$

13%

Description

Monounsaturated Fatty Acids (MUFAs) are healthy fats with a single double bond, involved in maintaining cell membrane fluidity and supporting cardiovascular health. MUFAs may reduce inflammation and oxidative stress, potentially benefiting metabolic health and longevity.

SFA$_m$

53%

Description

Saturated Fatty Acids (SFAs) are fats with no double bonds, commonly found in animal products and some plant oils. High intake of SFAs can increase cholesterol levels and may promote inflammation, potentially impacting cardiovascular health and longevity when consumed in excess.

Pentadecanoate$_m$

Pentadecanoate (C15:0)$_m$

29%

Description

Pentadecanoate (C15:0) is a saturated fatty acid with potential anti-inflammatory properties. High levels may indicate metabolic stress or excessive intake of specific dietary fats, while low levels could suggest impaired fat metabolism.

Phosphoglycerides$_m$

48%

Description

Phosphoglycerides are a class of phospholipids that form a major component of cell membranes, supporting membrane fluidity, signaling, and energy metabolism. Imbalances in phosphoglycerides may disrupt cellular function, potentially affecting metabolic health and longevity.

Phosphatidylcholine$_m$

Phosphatidylcholines$_m$

93%

Description

Phosphatidylcholines are a major class of phospholipids critical for cell membrane structure, lipid transport, and signaling. They support liver function and cognitive health, with imbalances potentially affecting metabolism and longevity.

Sphingomyelins$_m$

86%

Description

Sphingomyelins are a type of sphingolipid essential for cell membrane integrity and signaling, particularly in nerve and brain tissues. Dysregulation of sphingomyelins may contribute to metabolic dysfunction and neurodegenerative diseases, potentially impacting longevity.

LIPID PEROXIDATION

Phospholipase A2$_m$

50%

Description

Phospholipase A2 is an enzyme involved in lipid metabolism and inflammatory regulation. High levels may indicate heightened inflammatory activity or cellular damage, while low levels could suggest impaired lipid signaling or reduced inflammatory response.

Glutathione peroxidase$_m$

Glutathione peroxidase 1 (GPX1)$_m$

64%

Description

Glutathione peroxidase is an enzyme involved in antioxidant defense and cellular protection. Elevated levels may reflect increased oxidative stress or an adaptive response to cellular damage, while low levels could indicate impaired antioxidant capacity and increased vulnerability to oxidative damage.

Octadecadienedioate (C18:2-DC)$_m$

5%

Description

C18:2-DC is a dicarboxylic acid, linked to lipid metabolism and energy regulation. High levels could be linked to metabolic disorders, while low levels may indicate impaired lipid metabolism or energy production.

SERUM LIPIDS

ApoB$_m$

10%

Description

Apolipoprotein B (ApoB) is a structural protein of atherogenic lipoproteins, including LDL and VLDL. Elevated ApoB levels reflect the number of these lipoproteins, providing a stronger predictor of cardiovascular disease risk and atherosclerosis than LDL cholesterol alone, making it crucial for assessing metabolic health and longevity.

LDL-C$_m$

78%

Description

LDL-C (Low-Density Lipoprotein Cholesterol) represents the cholesterol carried by LDL particles, often referred to as “bad cholesterol.” Elevated LDL-C levels are strongly associated with increased risk of atherosclerosis and cardiovascular disease, making it a key marker for assessing cardiovascular health and longevity.

LDL particle size$_m$

78%

Description

Smaller, dense LDL particles are more atherogenic and strongly associated with cardiovascular disease risk, while larger LDL particles are less likely to penetrate arterial walls, indicating a potentially lower risk profile and better metabolic health.

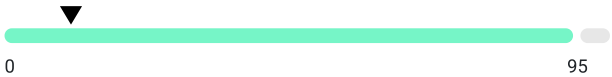
VLDL-C$_m$

26%

Description

VLDL-C (Very-Low-Density Lipoprotein Cholesterol) represents cholesterol carried by VLDL particles, which transport triglycerides from the liver to peripheral tissues. Elevated VLDL-C is associated with increased atherogenic risk, contributing to triglyceride-rich lipoprotein accumulation, cardiovascular disease, and metabolic dysfunction, negatively impacting longevity.

VLDL particle size$_m$



11%

Description

Smaller VLDL particles are more atherogenic and linked to higher cardiovascular risk, while larger particles may indicate improved lipid metabolism and reduced metabolic dysfunction, influencing overall health and longevity.

ApoA1$_m$

91%

Description

Apolipoprotein A1 (ApoA1) is the primary structural protein of HDL particles, playing a key role in reverse cholesterol transport and antioxidant defense. Higher ApoA1 levels are associated with improved cardiovascular health, reduced atherosclerosis risk, and better longevity outcomes through enhanced lipid metabolism and anti-inflammatory effects.

HDL-C$_m$

91%

Description

HDL-C (High-Density Lipoprotein Cholesterol) represents the cholesterol carried by HDL particles, often referred to as “good cholesterol.” Higher HDL-C levels are associated with improved reverse cholesterol transport, reduced cardiovascular disease risk, and better longevity outcomes through anti-inflammatory and antioxidant effects.

HDL particle size$_m$

96%

Description

Larger HDL particles are generally more effective at reverse cholesterol transport and provide stronger antioxidant and anti-inflammatory benefits, contributing to reduced cardiovascular disease risk and improved longevity.

Total triglycerides$_m$

2%

Description

Total triglycerides are the primary form of fat in the blood, stored for energy use in adipose tissue. Elevated levels are associated with insulin resistance, metabolic syndrome, and increased cardiovascular risk, making them a critical marker for assessing metabolic health and longevity.

BLOOD PRESSURE

Vanilla Acetic Acid (VAA)$_m$

Vanilla Acetic Acid$_m$

7%

Description

Vanilla Acetic Acid (VAA) is a metabolite derived from phenylalanine metabolism. Elevated levels of VAA are associated with increased cardiovascular disease (CVD) risk and hypertension (HTN) and may indicate pathways contributing to vascular inflammation, oxidative stress, or hormonal regulation of blood pressure. Conversely, low levels of VAA might reflect insufficient phenylalanine metabolism or altered gut microbiome activity, which could indicate disruptions in metabolic or microbial processes.

Phenylacetylglutamine$_m$

18%

Description

Phenylacetylglutamine (PAG) is a gut-derived metabolite linked to phenylalanine metabolism. Elevated PAG levels are associated with increased cardiovascular and kidney disease risk, systemic inflammation, and reduced longevity.

Systolic Blood Pressure$_m$

Systolic Blood pressure$_m$

50%

Description

Systolic Blood Pressure (SBP) is the pressure in arteries during heartbeats. Elevated SBP is strongly associated with cardiovascular disease, kidney damage, and reduced longevity due to increased vascular strain and systemic inflammation.

METABOLIC MARKERS

HgbA1c$_m$

7%

Description

Measure of blood sugar levels over a period of time, indicative of glucose control.

Glucose$_m$

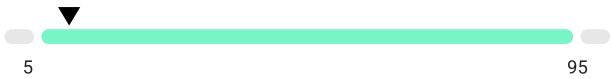
10%

Description

Blood sugar level, related to diabetes risk.

Fat Burning Marker$_m$

Palmitoylcarnitine$_m$



11%

Description

Palmitoylcarnitine plays a role in fatty acid transport into mitochondria for oxidation. High levels can signal impaired fatty acid oxidation, while low levels might affect energy production from fats.

Satiety Hormone$_m$

Leptin$_m$

14%

Description

Leptin is a hormone produced by fat cells that helps regulate appetite and energy balance by signaling the brain to reduce hunger and increase energy expenditure. High levels may indicate leptin resistance and excess body fat, while low levels can suggest insufficient fat reserves or impaired metabolic function.

Phenylalanine Dysbiosis Marker$_m$

Phenylacetylglutamine$_m$

18%

Description

Phenylacetylglutamine (PAG) is a gut-derived metabolite linked to phenylalanine metabolism. Elevated PAG levels are associated with increased cardiovascular and kidney disease risk, systemic inflammation, and reduced longevity.

IMMUNE MARKERS

White Blood Cell Count$_m$

50%

Description

Measures the amount of white blood cells in the blood, important for immune function.

Neutrophil count$_m$

17%

Description

Neutrophil count indicates levels of neutrophils, important for immune defense.

Lymphocyte count$_m$

64%

Description

A type of white blood cell, important for immune system function.

CRP$_m$

15%

Description

Inflammation marker, linked to cardiovascular and chronic diseases

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Neutrophil to lymphocyte ratio (NLR)$_m$

23%

Description

Neutrophil-to-lymphocyte ratio (NLR) is a marker of systemic inflammation and immune balance. High ratios are associated with chronic inflammation, cardiovascular disease, and poor immune regulation, while low ratios may indicate impaired immune response or hematological abnormalities.

Systemic Immune-Inflammation Index (SII)$_m$

23%

Description

Systemic Immune-Inflammation Index (SII) is a composite marker calculated as (Platelet count × Neutrophil count) / Lymphocyte count. High levels are linked to systemic inflammation, poor prognosis in cancer, and cardiovascular risk, while low levels may indicate immune suppression or reduced inflammatory response.

CD4/CD8 Ratio$_m$

49%

Description

The CD4/CD8 ratio reflects the balance between helper and cytotoxic T cells, indicating immune system status. High ratios are linked to autoimmune disorders or chronic inflammation, while low ratios suggest immune suppression, aging, or increased risk of infections and certain cancers.

NEUROCOGNITIVE MARKERS

Memory Health Protein$_m$

Neurogranin$_m$

26%

Description

Neurogranin is a calmodulin-binding protein, linked to synaptic plasticity and cognition. High levels can be linked to neurodegenerative diseases (e.g., Alzheimer's), while low levels might impair synaptic plasticity and cognitive function.

Brain Inflammation Marker$_m$

Quinolinate$_m$

5%

Description

Quinolinate is a metabolite in the kynurenine pathway linked to neuroinflammation. High levels are linked to neurotoxicity and neurodegenerative disorders, while low levels may impair tryptophan metabolism and affect immune function.

Dopamine Metabolites$_m$

Dopamine 3-O-sulfate$_m$

10%

Description

Dopamine 3-O-sulfate is a dopamine metabolite involved in neurotransmitter regulation and detoxification. Elevated levels may indicate altered dopamine metabolism, while low levels could suggest reduced detoxification or neurotransmitter imbalance.

Dopamine Metabolites$_m$

Dopamine 4-sulfate$_m$

60%

Description

Dopamine 4-sulfate is a dopamine metabolite involved in neurotransmitter regulation and detoxification. High levels may indicate altered dopamine metabolism, while low levels could suggest impaired neurotransmitter balance.

Cell Repair Marker$_m$

Transforming growth factor beta (TGF-beta)$_m$

69%

Description

Transforming Growth Factor Beta (TGF-beta) is a cytokine involved in cell growth, proliferation, differentiation, and apoptosis, with key roles in immune regulation and inflammation. Elevated levels may indicate heightened immune activity or chronic inflammation, while low levels could suggest impaired cellular signaling or immune response.

Brain Anti-inflammatory Protein$_m$

Progranulin$_m$

56%

Description

Progranulin is a protein involved in wound healing, inflammation, and neurodegeneration. Elevated levels may reflect active inflammation or tissue repair, while low levels could indicate impaired healing processes or an increased risk of neurodegenerative conditions.

INFLAMMATION MARKERS

IL-6$_m$

21%

Description

IL-6 (Interleukin-6) is a cytokine involved in inflammation and the immune response.

Oxidative Stress Marker$_m$

Methionine sulfone$_m$

54%

Description

An oxidized form of methionine, a marker of oxidative stress. High levels may indicate excessive oxidative stress or impaired sulfur amino acid metabolism, while low levels could affect protein synthesis and antioxidant production.

Serum amyloid A-1 protein$_m$

9%

Description

Serum Amyloid A-1 Protein is an acute-phase protein involved in inflammation and immune response. Elevated levels may indicate active inflammation, while low levels could reflect a lack of inflammatory activity.

Glycoprotein acetyls$_m$

15%

Description

Glycoprotein acetyls (GlycA) are inflammatory biomarkers representing glycosylated acute-phase proteins in the bloodstream. Elevated GlycA levels are associated with systemic inflammation, increased cardiovascular disease risk, and poorer metabolic health, making it a key marker for assessing longevity and chronic disease burden.

CRP$_m$

15%

Description

Inflammation marker, linked to cardiovascular and chronic diseases

STRESS MARKERS

Cortisol$_m$

26%

Description

Cortisol is the primary stress hormone, regulating metabolism and immune response. Elevated levels may indicate chronic stress or metabolic imbalance, while low levels could suggest adrenal insufficiency or impaired stress response.

Chronic Stress Marker$_m$

Kynurenine$_m$

16%

Description

Kynurenine is a metabolite of tryptophan, involved in immune modulation and neurobiology. High levels are associated with inflammation and neurodegenerative diseases, while low levels may indicate impaired tryptophan metabolism.

Adrenal Activity Marker$_m$

Vanilmandelic Acid (VMA)$_m$

30%

Description

VMA is a metabolite of catecholamines (epinephrine and norepinephrine), and high levels are linked to catecholamine excess, while low levels might indicate adrenal insufficiency or low catecholamine turnover.

TOXINS

PFAS (Forever Chemicals)$_m$

Perfluorooctanesulfonate (PFOS)$_m$

80%

Description

PFOS is a synthetic chemical found in industrial and consumer products, including nonstick cookware, water-repellent fabrics, and stain-resistant treatments.

PFAS (Forever Chemicals)$_m$

Perfluorooctanoate (PFOA)$_m$

80%

Description

Perfluorooctanoate (PFOA) is a synthetic chemical used in the production of nonstick cookware, waterproof fabrics, and certain industrial processes.

Acrolein (Pollution and Smoking)$_m$

S-(3-hydroxypropyl)mercapturic acid (HPMA)$_m$

77%

Description

HPMA is a metabolite involved in the detoxification of chemicals like acrolein, found in cigarette smoke, exhaust fumes, and industrial emissions.

Polycyclic aromatic hydrocarbons (Air Pollution)$_m$

2-hydroxyfluorene sulfate$_m$

74%

Description

2-Hydroxyfluorene sulfate is a metabolite that indicates exposure to polycyclic aromatic hydrocarbons (PAHs), which are found in tobacco smoke, grilled or charred foods, and industrial emissions.

Pesticides$_m$

Glyphosate$_m$

60%

Description

Glyphosate is a broad-spectrum herbicide commonly used to control weeds, known for its role in agricultural practices but controversial due to potential health and environmental risks.

Lead Exposure$_m$

Bone Lead Predictor$_m$

29%

Description

This measure reflects long-term lead accumulation in the body, particularly within the skeleton, which stores lead for decades. Elevated levels can be associated with chronic health risks, including hypertension and cognitive decline, due to lead's prolonged presence in bone tissue and periodic release into the bloodstream.

URIC ACID PATHWAY

Uric Acid$_m$

Urate$_m$

13%

Description

Uric acid is an antioxidant byproduct of purine metabolism. High levels may indicate risk for gout, CVD, HTN, and metabolic disorders, while low levels could reduce antioxidant defense and increase oxidative stress.

Xanthine$_m$

2%

Description

Xanthine is a purine metabolite involved in nucleotide breakdown. Elevated levels may indicate oxidative stress or impaired purine metabolism, potentially contributing to inflammation and reduced longevity.

Allantoin$_m$

35%

Description

Allantoin is a purine metabolite formed from the oxidation of uric acid. Elevated levels may indicate oxidative stress, potentially linked to inflammation, tissue damage, and reduced longevity. In humans, it serves as a marker of increased ROS activity rather than a precursor to uric acid

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MITOCHONDRIAL FUNCTION

Energy Balance Marker$_m$

Dynamin-1-like protein (DRP1)$_m$

60%

Description

DRP1 is a protein involved in mitochondrial fission, crucial for cellular energy production and regulation of apoptosis. Elevated levels are linked to mitochondrial fission and could contribute to mitochondrial dysfunction

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ATP synthase (Enzyme)$_m$

ATP synthase subunit beta (ATP5B)$_m$

58%

Description

A component of the mitochondrial ATP synthase complex, high levels are associated with cellular stress and mitochondrial dysfunction.

Energy Transport Protein$_m$

Electron transfer flavoprotein subunit alpha (ETFα)$_m$

23%

Description

Involved in mitochondrial fatty acid oxidation. Low levels could impair fatty acid oxidation, while high levels may indicate abnormal energy metabolism.

OXIDATIVE DEFENSE

Myeloperoxidase (MPO)$_m$

8%

Description

An enzyme released during inflammation and used as a marker for oxidative stress.

Oxidative Damage Marker$_m$

Allantoin$_m$

35%

Description

Allantoin is formed through oxidation of uric acid and thus serves as a marker of oxidative stress. Higher levels of allantoin in the blood increased oxidative stress, inflammation, or other stress-related metabolic disturbances.

Oxidative Stress Indicator$_m$

Methionine sulfone$_m$

54%

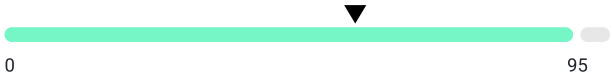
Description

An oxidized form of methionine, a marker of oxidative stress. High levels may indicate excessive oxidative stress or impaired sulfur amino acid metabolism, while low levels could affect protein synthesis and antioxidant production.

NAD+ METABOLISM

Byproduct marker (indicates inefficiency in NAD recycling)$_m$

N1-methyl-2-pyridone-5-carboxamide (2PY)$_m$



58%

Description

N1-methyl-2-pyridone-5-carboxamide (2PY) is a metabolite of NAD+ that can accumulate with increased NAD+ production. Elevated 2PY levels may inhibit enzymes like PARP, potentially impairing DNA repair and cellular energy metabolism, which could negatively affect longevity.

Nicotinamide riboside (NR, Precursor)$_m$

Nicotinamide riboside$_m$

54%

Description

Nicotinamide Riboside is a precursor to NAD+. Low levels can lead to reduced NAD+ production and decreased cellular energy, while high levels of NR indicate efficient NAD+ synthesis but could suggest over-reliance on supplementation.

1-MNA (NAD+ Metabolite)$_m$

1-Methylnicotinamide$_m$

21%

Description

1-MNA is produced by the enzyme NNMT. A byproduct of NAD+ metabolism. While it has anti-inflammatory and vasoprotective effects, elevated levels can signal increased NNMT activity, which diverts nicotinamide away from NAD+ recycling, potentially lowering NAD+ availability.

Nicotinamide (Precursor)$_m$

Nicotinamide$_m$

52%

Description

Nicotinamide is a form of vitamin B3, essential for NAD+ production and cellular energy. Low levels are associated with lower NAD+ production, and high levels are associated with inhibition of Sirtuins and NAD+ recycling pathways.

KETONES

Beta Hydroxybutyrate$_m$

3-hydroxybutyrate (BHBA)$_m$

43%

Description

3-Hydroxybutyrate (BHBA) is a ketone body produced during fat metabolism, primarily in the liver, and serves as an alternative energy source for the brain and muscles, especially during periods of low carbohydrate intake or fasting.

Acetoacetate$_m$

40%

Description

Acetoacetate is a ketone body produced in the liver during fat metabolism, serving as an alternative energy source for the brain and muscles, especially during periods of low carbohydrate availability or fasting.

SUPPLEMENTS

Alpha-ketoglutarate$_m$

11%

Description

Alpha-ketoglutarate is a key intermediate in the Krebs cycle, crucial for energy production, amino acid metabolism, and cellular function regulation.

Spermidine$_m$

30%

Description

Spermidine is a polyamine compound involved in cellular growth, proliferation, and apoptosis, known for its potential role in promoting autophagy and longevity, and is found in foods like aged cheese, soy products, and whole grains.