TruDiagnostic™
The Epigenetic Company

TruHealth Report

Sample Patient

Age: 46 | Sex: Female

ID#: SAMPLE-0002

Collected: 10/12/2026 | Reported: 11/02/2026

Fasted: Yes

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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.

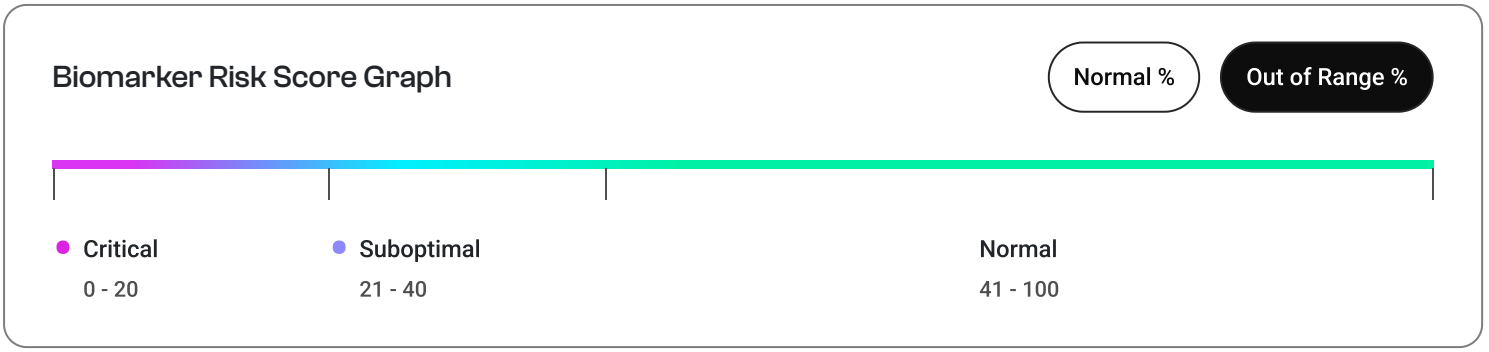
Epigenetic biomarkers provide a more stable and comprehensive view of your health over time, reflecting long-term exposures and trends rather than short-term fluctuations.

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		81%
Amino Acids		78%
Antioxidants		81%
Fats and Cellular Membranes		70%

GENERAL HEALTH MARKERS

Serum Lipids	47%
Blood Pressure	71%
Metabolic Markers	62%
Immune Markers	85%
Neurocognitive Markers	81%
Inflammation Markers	72%
Stress Markers	84%
Toxins	73%
Uric Acid Pathway	78%
NAD+ Metabolism	94%
Supplements	86%
Oxidative Defense	68%

TOP PERSONALIZED RECOMMENDATIONS

SERUM LIPIDS

LDL-C

Lower LDL-C by eating a heart-healthy diet (rich in fiber, omega-3s, and healthy fats), avoiding trans fats and added sugars, exercising regularly, and maintaining a healthy weight.

Red Yeast Rice | Omega 3's

FATS AND CELLULAR MEMBRANES

Omega 3

Increase consumption of fatty fish (salmon, mackerel).

Fish oil or algae

SERUM LIPIDS

Total triglycerides

Limit added sugars, refined carbs, and alcohol while increasing physical activity, prioritizing healthy fats (omega-3s, avocados), and eating a fiber-rich diet with vegetables and whole grains.

Omega 3s | Berberine

METABOLIC MARKERS

HgbA1c

Low carb diet, caloric restriction, regular exercise, weight loss.

Alpha Lipoic Acid | Berberine

SERUM LIPIDS

ApoB

Lower ApoB by eating a heart-healthy diet (rich in fiber, omega-3s, and healthy fats), avoiding trans fats and added sugars, exercising regularly, and maintaining a healthy weight.

Red Yeast Rice | Omega 3's

METABOLIC MARKERS

Glucose

Low carb diet, caloric restriction, regular exercise, weight loss.

Alpha Lipoic Acid | Berberine

EPIGENETIC BIOMARKERS **RISK SCORES**

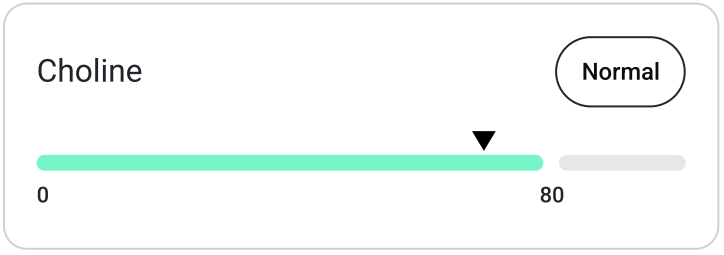
The **Epigenetic Biomarkers Risk Scores** section of the report provides a detailed breakdown of specific **epigenetic biomarkers** derived from your epigenome, each linked to relevant **risk scores** and associated **biomarkers**. Every epigenetic biomarker is accompanied by a concise explanation of 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.

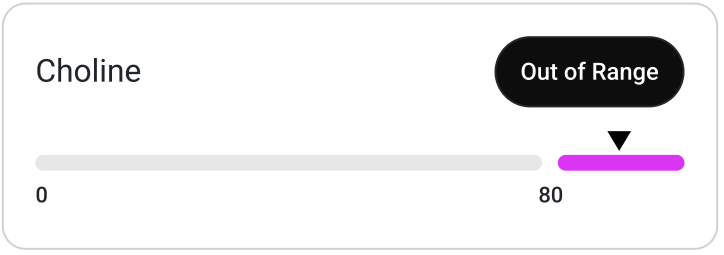
There are Three Different Ranges for Each Epigenetic Biomarkers (EB)

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.

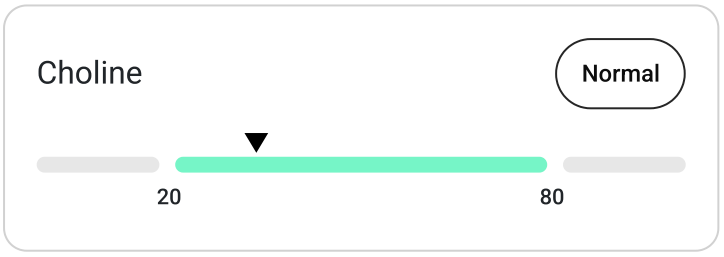
Normal Out of Range ⚠ Critically Out of Range

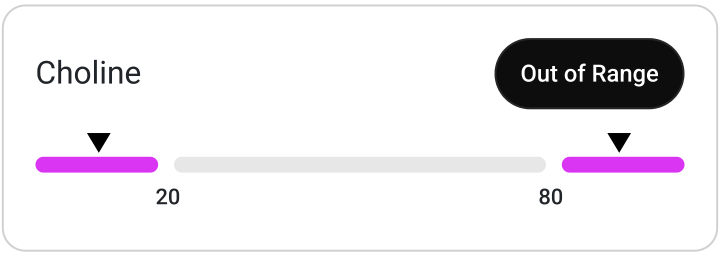
Example: Normal Range is **LOW**



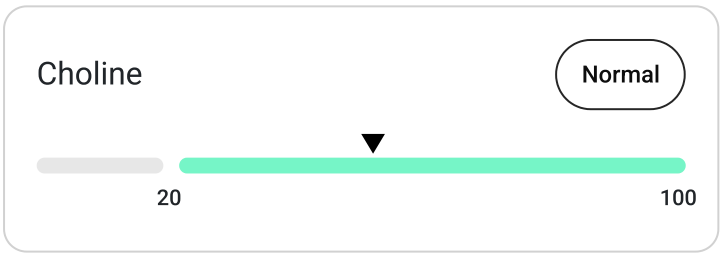


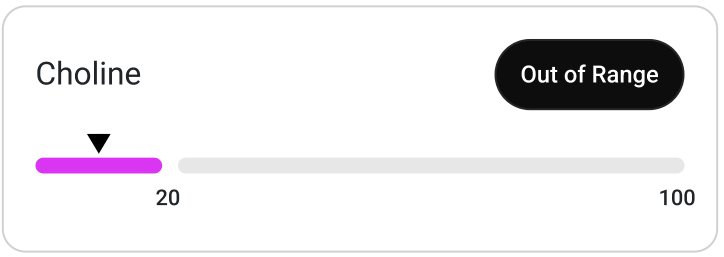
Example: Normal Range is **MIDDLE**





Example: Normal Range is **HIGH**





VITAMINS

Vitamin A_m

Retinol (vitamin A)$_m$

40%

Description

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

Vitamin B5 (Pantothenic Acid)$_m$

Pantothenic Acid (vitamin B5)$_m$

61%

Description

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

Vitamin B6 (P5P)$_m$

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

81%

Description

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

Vitamin B8 (Inositol)$_m$

Inositol (myoinositol)$_m$

38%

Description

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

Vitamin C_m

Ascorbic acid 2-sulfate$_m$

82%

Description

Sulfated form of Vitamin C.

Vitamin C_m

Ascorbic acid 3-sulfate$_m$

53%

Description

Another sulfated form of Vitamin C.

Vitamin E$_m$

Alpha-tocopherol$_m$

60%

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$_m$

69%

Description

Essential nutrient involved in brain health and fat metabolism.

Betaine$_m$

87%

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$_m$

60%

Description

Amino acid involved in protein synthesis and antioxidant functions. Higher levels associated with insulin resistance and cardiometabolic risk signalling higher oxidative stress. Low levels could impair glutathione production.

S-methylmethionine$_m$

52%

Description

A methylated form of methionine involved in methylation reactions

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Ergothioneine$_m$

87%

Description

Ergothioneine is a powerful antioxidant involved in cellular protection and oxidative stress regulation. Low levels could indicate reduced cellular defense against oxidative damage.

Glutamine$_m$

67%

Description

An amino acid essential for gut health.

Valine$_m$

N-carbamoylvaline$_m$

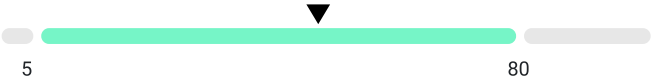
42%

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.

Threonine$_m$

N-acetylthreonine$_m$



49%

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$_m$

40%

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$_m$

78%

Description

An amino acid involved in detox and sleep.

Carnosine$_m$

N-acetylcarnosine$_m$

34%

Description

Involved in buffering, antioxidant, and antiglycation defense. Circulating levels rise with muscle breakdown, oxidative stress, and impaired tissue uptake. Low plasma levels generally indicate efficient utilization and good metabolic health. Elevated levels have been associated with metabolic dysfunction, insulin resistance, and sarcopenia.

Cystathionine$_m$

41%

Description

Important for transsulfuration and glutathione production. It rises with functional vitamin B6 insufficiency. Low levels associated with risk of glutathione deficiency. Elevated plasma cystathionine tracks with higher all cause and cardiovascular mortality, higher AMI and stroke risk.

Histidine$_m$

N-acetylhistidine$_m$

43%

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.

ANTIOXIDANTS

Carotenoids$_m$

Lutein$_m$

68%

Description

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

Carotenoids$_m$

Carotene diol$_m$

39%

Description

Carotenoid found in plants; antioxidant properties.

Acetyl-L-Carnitine$_m$

79%

Description

Acetyl-L-Carnitine is a compound involved in fatty acid metabolism and mitochondrial energy production. Low levels could suggest impaired mitochondrial function or reduced fatty acid utilization.

Vitamin A$_m$

Retinol (vitamin A)$_m$

40%

Description

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

Vitamin E$_m$

Alpha-tocopherol$_m$

60%

Description

A form of Vitamin E with strong antioxidant properties.

Ergothioneine$_m$

87%

Description

Ergothioneine is a powerful antioxidant involved in cellular protection and oxidative stress regulation. Low levels could indicate reduced cellular defense against oxidative damage.

Vitamin C$_m$

Ascorbic acid 2-sulfate$_m$

82%

Description

A sulfated form of Vitamin C.

Vitamin C$_m$

Ascorbic acid 3-sulfate$_m$

53%

Description

Another sulfated form of Vitamin C.

FATS AND CELLULAR MEMBRANES

Omega 3$_m$

Omega-3$_m$

Low

14%

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.

Recommendations

Increase consumption of fatty fish (salmon, mackerel).

Fish oil or algae

DHA$_m$

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

84%

Description

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

EPA$_m$

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

59%

Description

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

Omega 6$_m$

Omega-6$_m$

57%

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

48%

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.

$PUFA_m$

41%

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.

$MUFA_m$

47%

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

40%

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.

$Phosphoglycerides_m$

61%

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$_m$

83%

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$_m$

55%

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.

SERUM LIPIDS

ApoB$_m$

High

83%

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.

Recommendations

Lower ApoB by eating a heart-healthy diet (rich in fiber, omega-3s, and healthy fats), avoiding trans fats and added sugars, exercising regularly, and maintaining a healthy weight.

Red Yeast Rice | Omega 3's | Berberine | Psyllium Husk

LDL-C$_m$

High

88%

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.

Recommendations

Lower LDL-C by eating a heart-healthy diet (rich in fiber, omega-3s, and healthy fats), avoiding trans fats and added sugars, exercising regularly, and maintaining a healthy weight.

Red Yeast Rice | Omega 3's | Berberine | Psyllium Husk

VLDL-C$_m$

33%

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$_m$

24%

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$_m$

79%

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$_m$

56%

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$_m$

53%

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$_m$

High

86%

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.

Recommendations

Limit added sugars, refined carbs, and alcohol while increasing physical activity, prioritizing healthy fats (omega-3s, avocados), and eating a fiber-rich diet with vegetables and whole grains.

Omega 3s Berberine Curcumin

BLOOD PRESSURE

Vanillactic Acid (VAA)$_m$

Vanillactic Acid$_m$

44%

Description

Vanillactic 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$_m$

36%

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.

Dimethylarginine, SDMA and ADMA$_m$

40%

Description

Markers that block blood vessel relaxation; higher levels are linked to kidney disease and heart risk. Higher levels associated with cardiovascular events and reduced GFR. Lower levels associated with better Nitric Oxide bioavailability and renal handling. Caveat: ACEi, ARB, SGLT2 inhibitors, PDE-5 inhibitors, and statins can change serum faster than epigenetic signal.

METABOLIC MARKERS

HgbA1c$_m$

High

84%

Description

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

Recommendations

Low carb diet, caloric restriction, regular exercise, weight loss.

Alpha Lipoic Acid | Berberine | Cinnamon | Magnesium

Glucose$_m$

73%

Description

Blood sugar level, related to diabetes risk.

Fat Burning Marker$_m$

Palmitoylcarnitine$_m$

40%

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$_m$

36%

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$_m$

36%

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.

IGF-1$_m$

45%

Description

Growth factor that supports muscle and metabolism. Lower levels associated with frailty and sarcopenia. Higher levels associated with cancer risk and acromegaly or GH therapy. Caveat: GH therapy or anabolic steroids can elevate serum while the epigenetic marker may remain lower.

Adiponectin$_m$

41%

Description

Hormone from fat tissue that improves insulin sensitivity. Lower levels associated with insulin resistance and visceral adiposity. Very high levels associated with heart failure or catabolic states in older adults.

Cystatin-C$_m$

34%

Description

Kidney function measure, not muscle independent like creatinine. Higher levels associated with chronic kidney disease, cardiovascular events, and all-cause mortality. Lower levels associated with preserved filtration.

Erythritol$_m$

27%

Description

Sugar alcohol made in the body and found in sugar-free foods. Higher levels associated with frequent sugar-free intake and cardiometabolic risk signals in observational studies. Lower levels reflect minimal exposure.

Homocitrulline$_m$

42%

Description

Marker of protein damage from nitrogen waste, often elevated in kidney disease and tied to heart and vessel risk. Higher levels associated with CKD or uremia, atherosclerosis, heart failure, and mortality in CKD cohorts. Lower levels reflect lower carbamylation burden.

IMMUNE MARKERS

White Blood Cell Count$_m$

52%

Description

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

Neutrophil count$_m$

52%

Description

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

Lymphocyte count$_m$

42%

Description

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

CRP$_m$

35%

Description

Inflammation marker, linked to cardiovascular and chronic diseases

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Neutrophil to lymphocyte ratio (NLR)$_m$

51%

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)$_m$

40%

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$_m$

61%

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

Brain Inflammation Marker$_m$

Quinolinate$_m$

40%

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.

VGF$_m$

Neurosecretory protein VGF$_m$

59%

Description

Brain-derived protein that supports mood, memory, and energy balance. Lower levels associated with cognitive decline and depression. Higher levels associated with exercise adaptation. Caveat: may be altered by antidepressents.

INFLAMMATION MARKERS

IL-6$_m$

19%

Description

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

Oxidative Stress Marker$_m$

Methionine sulfone$_m$

41%

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$_m$

19%

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$_m$

24%

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$_m$

35%

Description

Inflammation marker, linked to cardiovascular and chronic diseases

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STRESS MARKERS

Chronic Stress Marker$_m$

Kynurenine$_m$

52%

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)$_m$

61%

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.

DHEA Sulfate$_m$

39%

Description

Long-term adrenal androgen availability. Lower levels associated with frailty, depressed mood, and higher mortality in older adults. Higher levels associated with PCOS or supplementation. Caveat: exogenous DHEA, testosterone, estrogen, or progesterone can make the epigenetic signal appear low despite normal or high serum.

TOXINS

PFAS (Forever Chemicals)$_m$

Perfluorooctanesulfonate (PFOS)$_m$

38%

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)$_m$

13%

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)$_m$

43%

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$_m$

27%

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$_m$

15%

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.

URIC ACID PATHWAY

Uric Acid$_m$

Urate$_m$

47%

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.

Allantoin$_m$

38%

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

NAD+ METABOLISM

Nicotinamide riboside (NR, Precursor)$_m$

Nicotinamide riboside$_m$

47%

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.

SUPPLEMENTS

Alpha-ketoglutarate$_m$

57%

Description

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

OXIDATIVE DEFENSE

Oxidative Damage Marker$_m$

Allantoin$_m$

38%

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$_m$

41%

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.

Dimethyllysine$_m$

17%

Description

Strain on protein repair and folding systems. Higher levels associated with inflammation, insulin resistance, CKD, and higher cardiometabolic risk. Lower levels reflect lower cumulative damage.