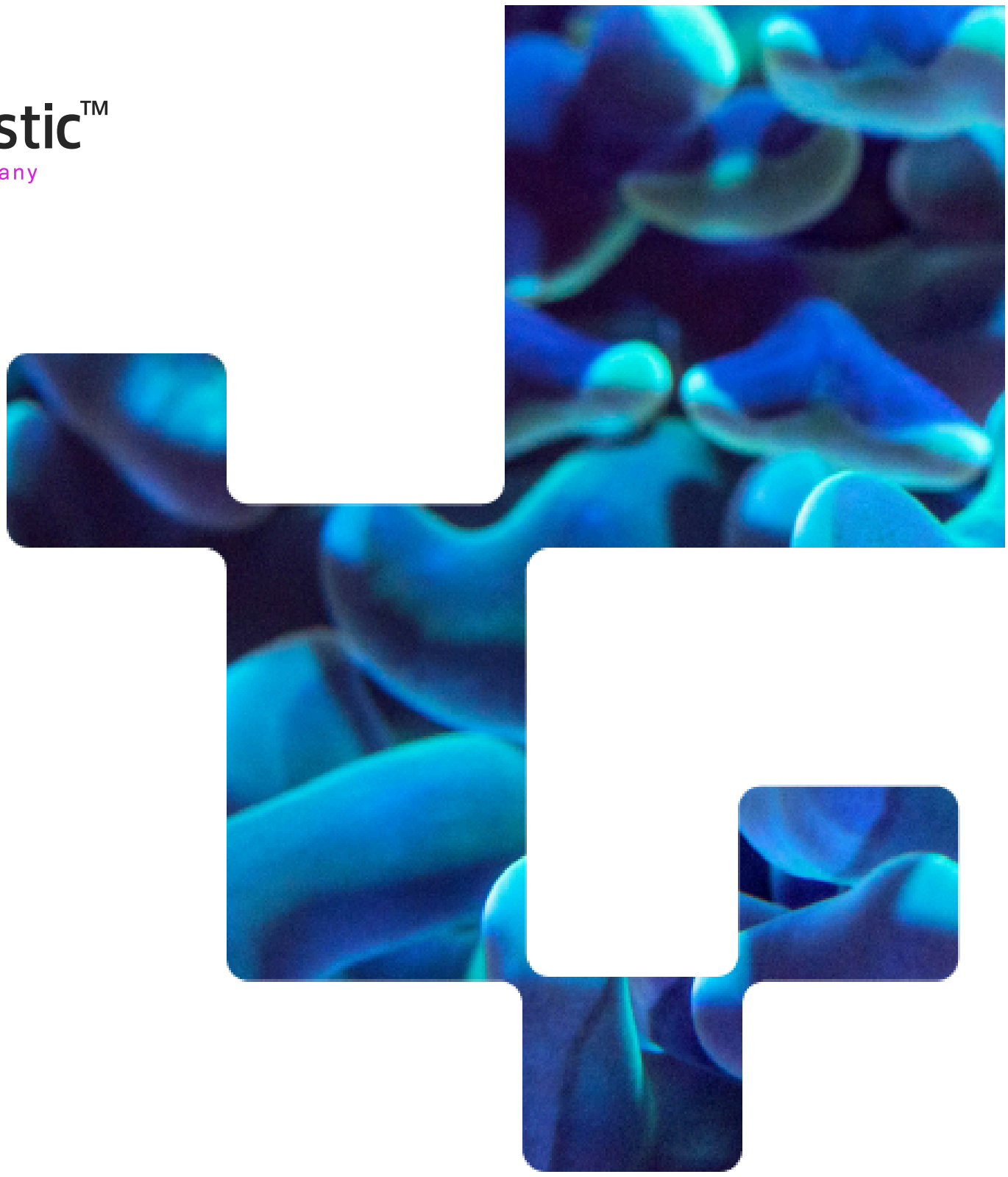
TruDiagnostic™
The Epigenetic Company



Advanced TruAge Report

Jane Doe

Age: 28 | Sex: Female

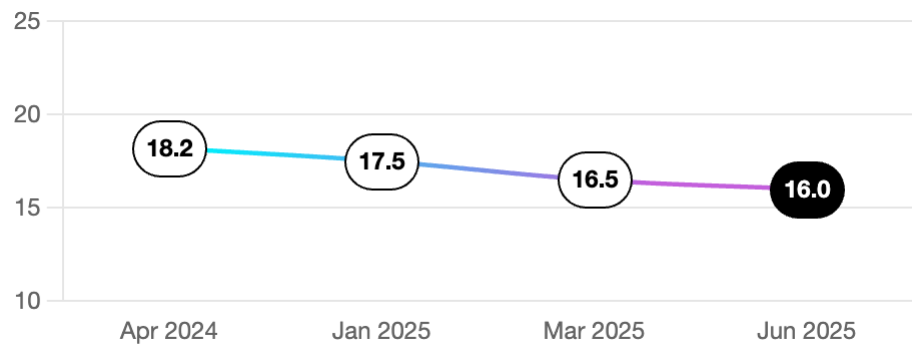
ID#: 2A3ALUD

Collected: 05/05/2025 | Reported: 06/23/2025

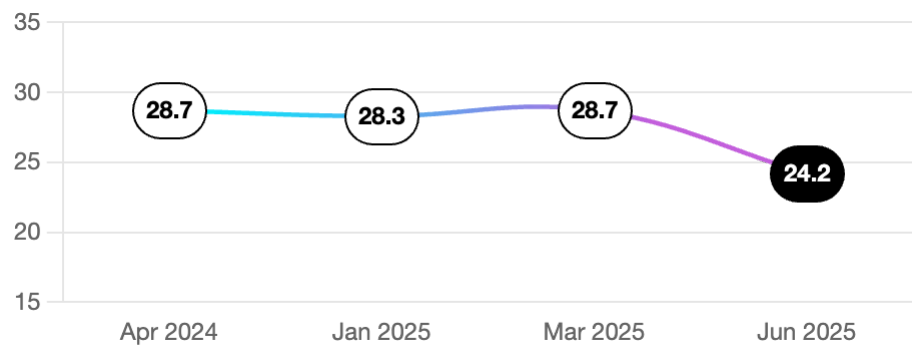
Aging Summary

Chronological Age: 28.2

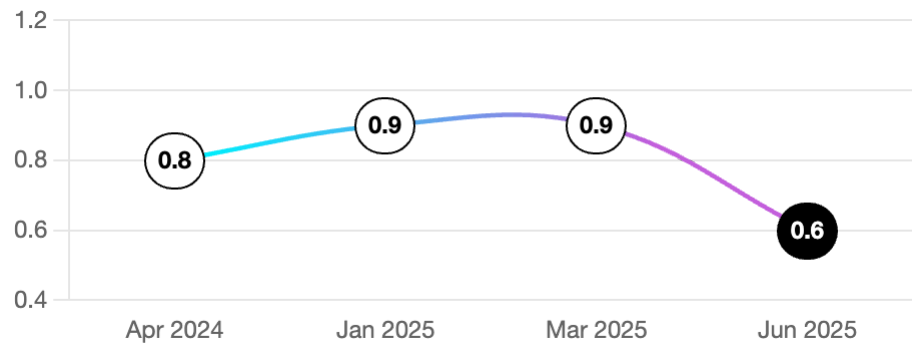
OMICm Age



Symphony Age



Pace of Aging



DEVELOPED WITH HARVARD

OMICm Age

Chronological Age: 28.2

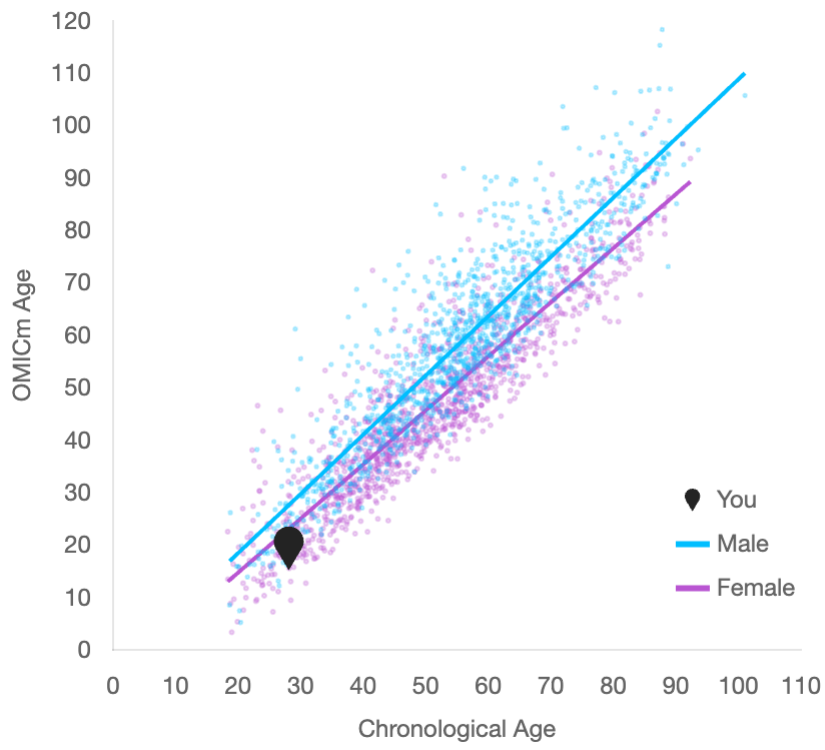
OMICm Age

16.0

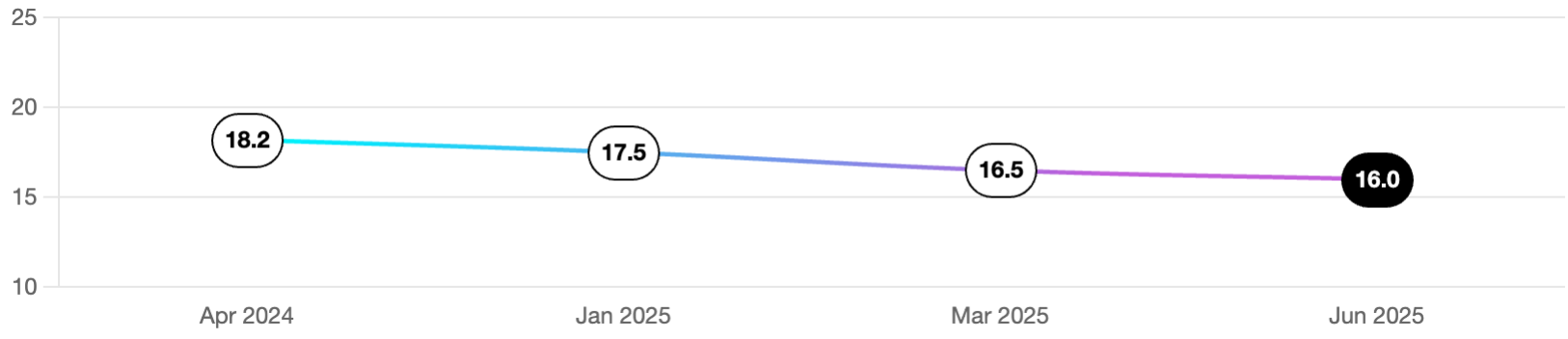
Younger

18.4%

Your OMICm Age is **lower** than 81.6% of people of the same age and sex.



Results Over Time



DISCLAIMER: The population graph and percentile for OMICm Age are based on observed and validated data patterns from an equal distribution of Harvard research participants and TruDiagnostic clients to emulate a population of average health.

Most Actionable Epigenetic Biomarkers

Epigenetic Biomarker (EBs) are compared against a balanced reference dataset composed of individuals from both the Harvard and TruDiagnostic cohorts. We identify individuals of the same sex and a similar age (within ±5 years) to create a personalized comparison group. Above the 80th percentile: Indicates your outcome is higher than 80% of individuals in the cohort. Below the 20th percentile: Indicates your outcome is lower than 80% of individuals in the cohort.

*** Listed in order of impact on OMICm age. Find the rest of your Epigenetic Biomarkers at the end of the report**

Serum Paraoxonase/arylesterase 1

Low

2.1%

Function

Serum Paraoxonase/Arylesterase 1 (PON1): An enzyme with antioxidant properties; linked to cardiovascular health.

Recommendations

- Increase selenium intake with foods like Brazil nuts, seafood, and whole foods
- Consider chokeberry extract and pomegranate
- Minimize intake of trans fat

Chokeberry extract | Brazil nuts | Seafood | Pomegranate

Vanillactic Acid

High

81.6%

Function

Vanillactate: A product of gut microbial metabolism of phenolic compounds; involved in energy pathways.

Recommendations

- Manage blood pressure
- Reduce sodium intake
- Eat a heart-healthy diet
- Reduce stress
- Check heart function

Matrix-remodeling-associated protein 5

High

86.3%

Function

Matrix-Remodeling-Associated Protein 5: A protein involved in extracellular matrix remodeling and tissue repair.

Recommendations

- Reduce general systemic inflammation through an anti-inflammatory diet and an active lifestyle
- Reduce stress

Anti-inflammatory diet

SYMPHONY Age

Chronological Age: 28.2

This advanced approach dives into the age of **11 distinct organ systems.**

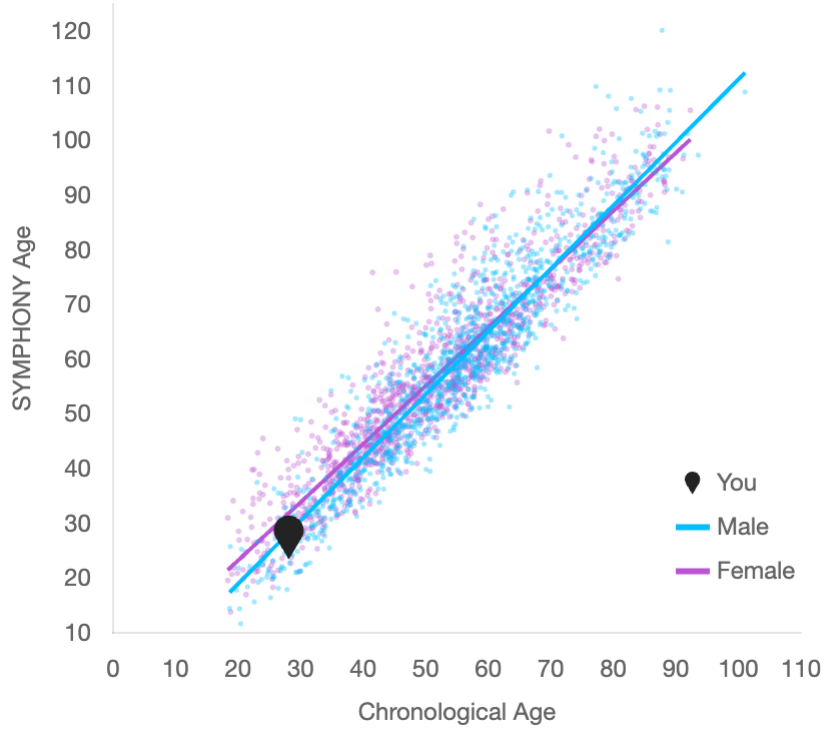
SYMPHONY Age

24.2

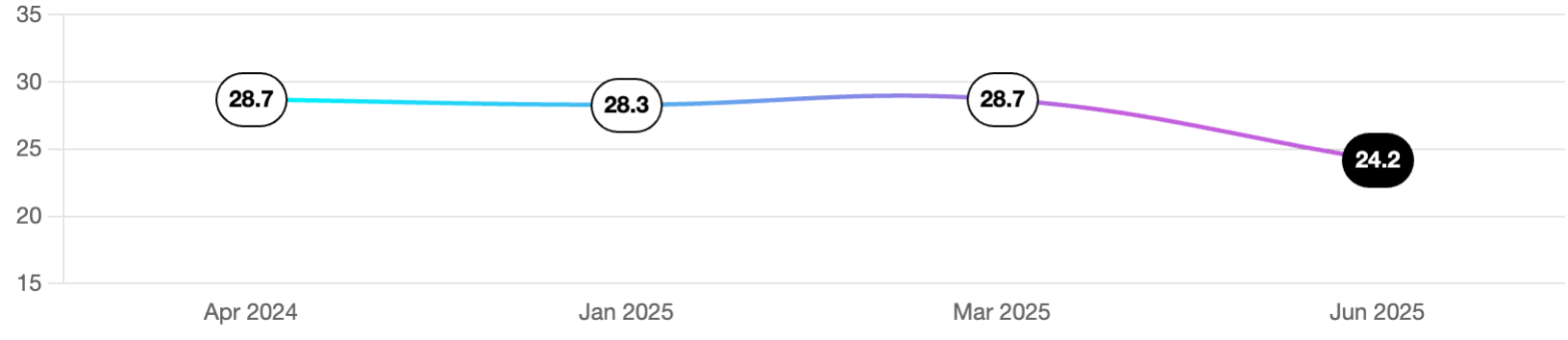
Younger

12.8%

Your SYMPHONY Age is **lower** than 87.2% of people of the same age and sex.



Results Over Time



DISCLAIMER: The population graph and percentile for SYMPHONY Age are based on observed and validated data patterns from an equal distribution of Harvard research participants and TruDiagnostic clients to emulate a population of average health.

Compare the age of **11 distinct organ systems** versus your chronological age

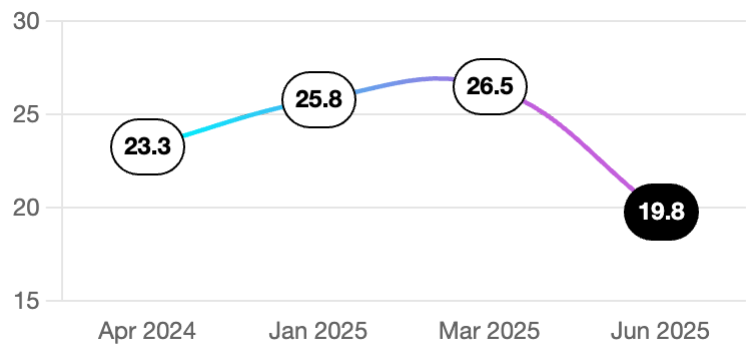
How was this clock created and designed?

Many clocks have used blood based biomarkers and their changes as we get older to predict OMICm age. For SYMPHONY Age, the researchers did this with biomarkers which were specific for each organ system. While previous clocks (like PhenoAge) did this with 9 blood markers, SYMPHONY Age incorporates 133 biomarkers for training to develop this clock. In addition to having a large and detailed number of clinical datapoints, this study is also one of the largest for clock development with approximately 8,000 participants. Together, this gives us an incredibly robust clock associated with organ specific clinical biomarkers which is highly predictive of aging outcomes.

Systems Related Biomarkers

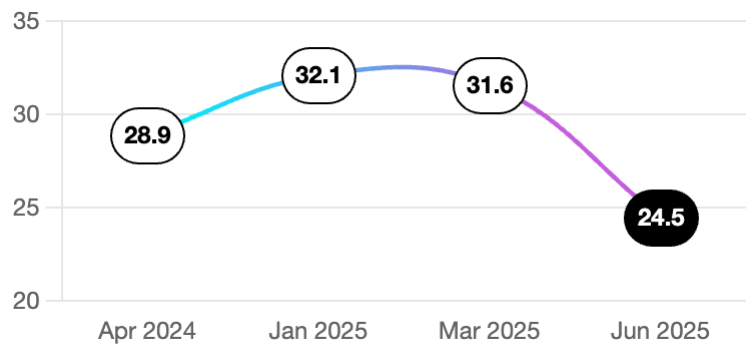
Blood

Biomarkers: Ferritin, Hematocrit, Hemoglobin, Mean Corpuscular Hemoglobin, Mean Corpuscular Hemoglobin Conc, Mean Corpuscular Volume, Mean Platelet Volume, Platelet Distribution width, Platelet Count, Red Blood Cell Count, Red Cell Distribution Width



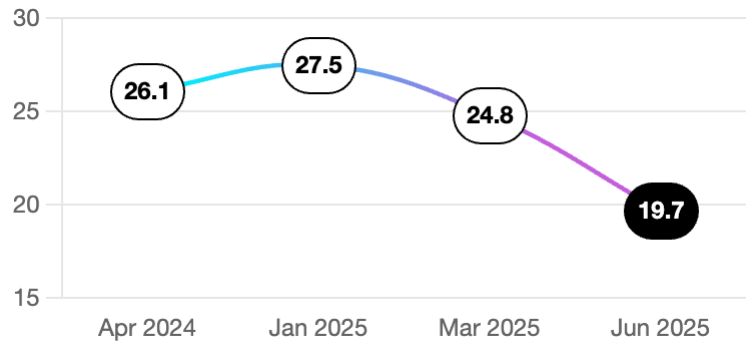
Brain

Biomarkers: Homocysteine, BDNF (serum), Clusterin, Stroke, Total mental status summary score, Total cognition summary score, Immediate word recall, Delayed word recall, Total word recall summary score, Serial 7s



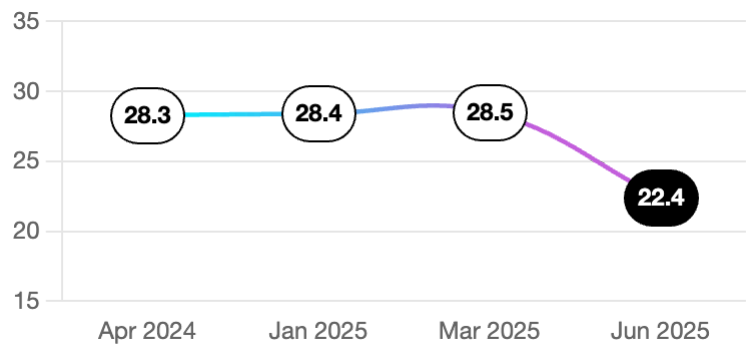
Inflammation

Biomarkers: Ferritin, C-Reactive Protein, Transforming Growth Factor Beta, Interleukin 10, Interleukin 1 Receptor Antagonist, Interleukin 6, Tumor Necrosis Factor Receptor 1



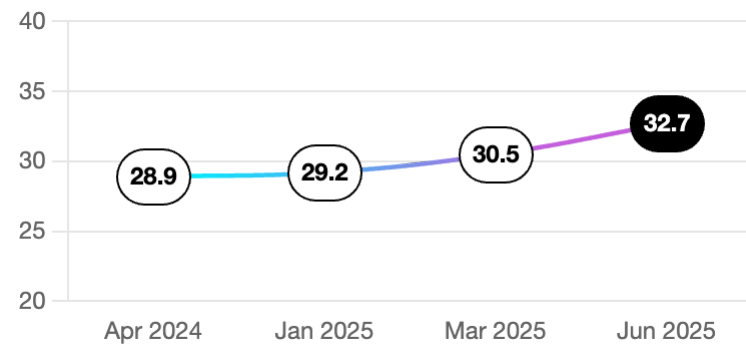
Heart

Biomarkers: Shortness of breath while awake, PCcomponents of Grimage, Previous High Blood Pressure, Previous Heart Attack, Previous Stroke, Homocysteine, BMI



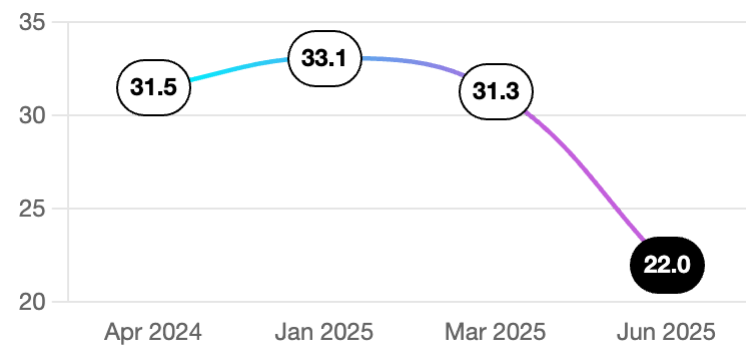
Hormone

Biomarkers: IGF-1, DHEAS



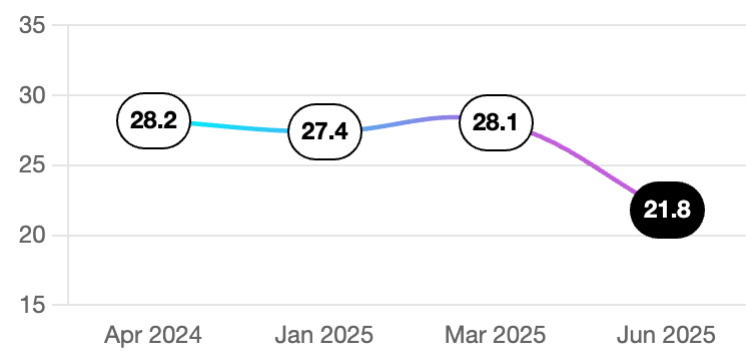
Immune

Biomarkers: Eosinophil Count, Lymphocyte Count, Monocyte Count, Neutrophil Count, Percent Basophils, Percent Eosinophils, Percent Lymphocytes, Percent Monocytes, White Blood Cell Count, Myeloid Dendritic cells (DC-M) Percentage, Plasmacytoid, Dendritic Cells (DC-P) Percentage, NK Cells: CD56HI Percentage, NK Cells: CD56LO Percentage, CD16- Monocytes Percentage, CD16+ Monocytes Percentage, B Cells Percentage, CD8+ T Cells: Central Memory (CM) Percentage, CD4+ T Cells: Central Memory (CM) Percentage, CD8+ T Cells Percentage, CD8+ T Cells: (TemRA) Percentage, CD4+ T Cells: (TemRA) Percentage, CD4+ T Cells Percentage, IgD+ Memory B Cells Percentage, IgD- Memory B Cells Percentage, CD8+ T Cells: Naïve Percentage, CD4+ T Cells: Naïve Percentage, T Cells Percentage, Naive B Cells Percentage, CD8+T Cells: Effector Memory (Tem) Percentage, CD4+ T Cells: Effector Memory (Tem) Percentage, Natural Killer (NK) Cells Percentage, Monocytes Percentage, Dendritic Cells Percentage



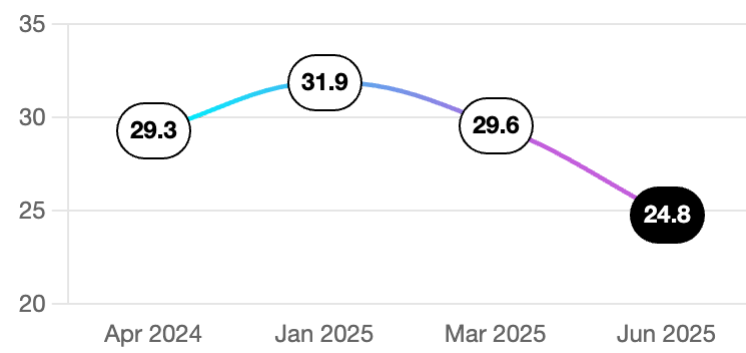
Kidney

Biomarkers: Albumin, Urea Nitrogen, Chloride, Bicarbonate, Creatinine, Cystatin C, Potassium, Sodium



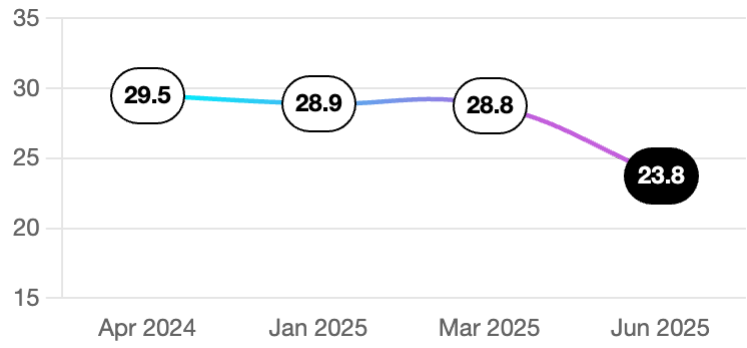
Liver

Biomarkers: Albumin, Alkaline Phosphatase, ALT, AST, Bilirubin, Total Protein



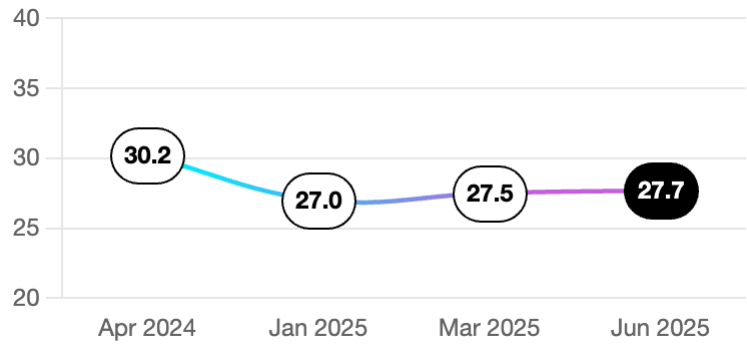
Metabolic

Biomarkers: PCSmoking-packyears, Previous Diabetes, C-Reactive Protein, Glucose-Fasting, HDL-Cholesterol, LDL-Cholesterol, Triglycerides, Interleukin-6, BMI, Waist circumference



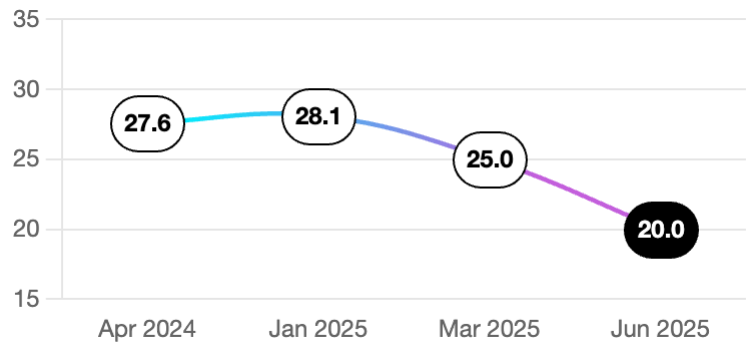
Lung

Biomarkers: Peak expiratory flow, bicarbonate, chronic lung disease, shortness of breath while awake, persistent wheezing, cough, or bringing up phlegm, PCSmoking-packyears



MusculoSkeletal

Biomarkers: Vitamin D3, Dehydroepiandrosterone sulphate, IGF-1, Arthritis, Height, Weight, BMI, some diff-mobility, hand grip strength maximum measurement, semi tandem balance test time, timed walk test time, hand grip strength-left hand hand grip strength-right hand, had back problems, some diff-stoop/kneel/crouch, diff-stoop/kneel/crouch, diff-walk one block, diff-walk sev blocks, some diff-walk one block, some diff-walk sev blocks, diff-climb sev flt stair, diff-climb one flt stair, some diff-clmb sev flt str, some diff-clmb 1 flt stair, diff-get up fr chair, some diff-get up fr chair, diff-reach/extnd arms up, some diff-rch/xtnd arms up, diff-lift/carry 10lbs, some diff-lift/carry 10lbs, side-by-side balance test time, full tandem balance test time, Sum of 7 different functional tests, Combination of all balance scores



DunedinPACE of Aging

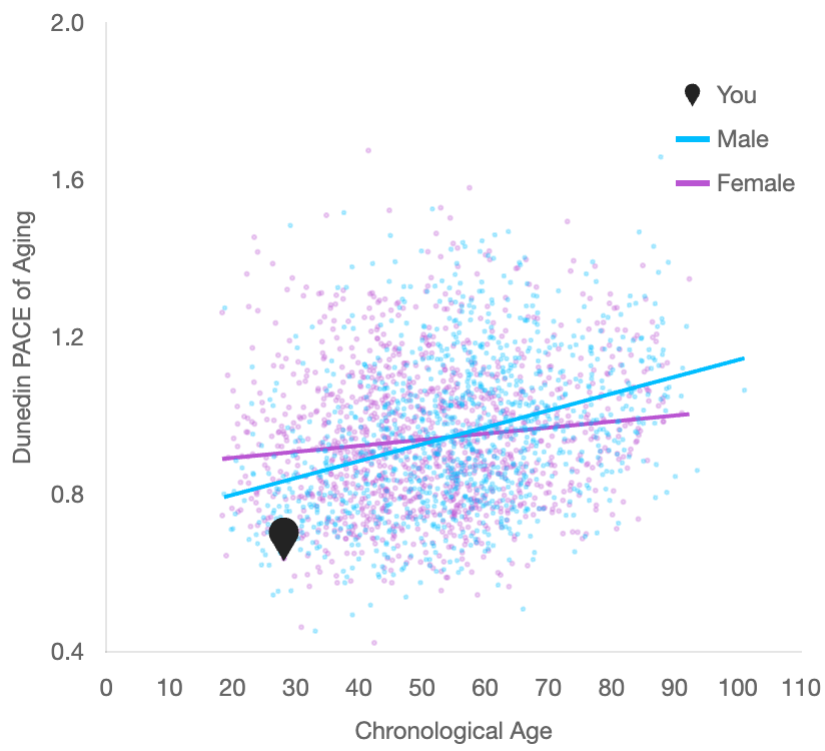
Chronological Age: 28.2

Your Rate of Aging will change based on your lifestyle interventions. Be sure to retest every 3 months to track your progress.

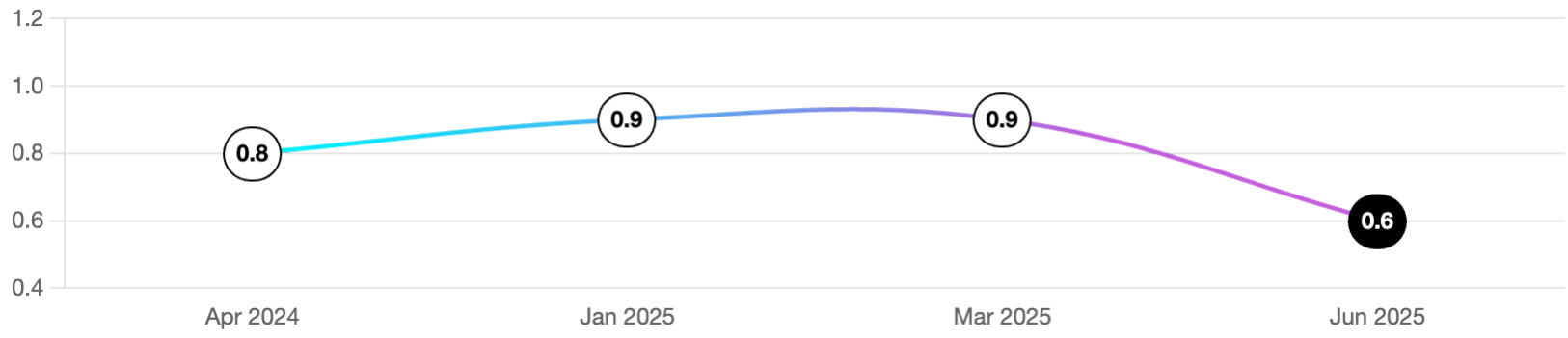
Your score < 1

Each year that passes, your body will biologically age **0.6 years** .

*Based on the last 2-3 months



Results Over Time



DISCLAIMER: The population graph for DunedinPACE of Aging is based on observed and validated data patterns from an equal distribution of Harvard research participants and TruDiagnostic clients to emulate a population of average health.

Immune Health

Naïve CD4T	Normal	63.5%
Memory CD4T	Normal	84.5%
Memory CD8T	Normal	64.9%
Naïve CD8T	Normal	91.2%
Basophils	High	96.5%
B Memory	Normal	94.0%
Naïve B	Normal	86.1%
Regulatory T	High	95.7%
Eosinophils	Normal	85.2%
Natural Killer	Normal	76.3%
Neutrophils	Normal	10.4%
Monocyte	Normal	88.5%
CD4T / CD8T Ratio	Normal	43.8%

CD4/CD8T cell ratio is incredibly informative on disease. A low or inverted CD4/CD8 ratio is an immune risk phenotype and is associated with altered immune function, immune senescence, and chronic inflammation.

Neutrophil To Lymphocyte	Normal	10.4%

The Neutrophil-to-Lymphocyte Ratio (NLR) is obtained by dividing the number of neutrophils by the number of lymphocytes. During physiological stress, neutrophil count increases while lymphocyte count decreases. Physiological stress, driven by illness, inflammation, or psychological stress, can elevate NLR. Therefore, NLR elevation is not exclusive to infection or inflammation but can result from any form of physiological stress, including everyday stress and poor recovery or stress management.

Telomere Length

Chronological Age: 28.2

Shorter telomere length and low telomerase activity are correlated with several chronic preventable diseases.

Telomere Biological Age

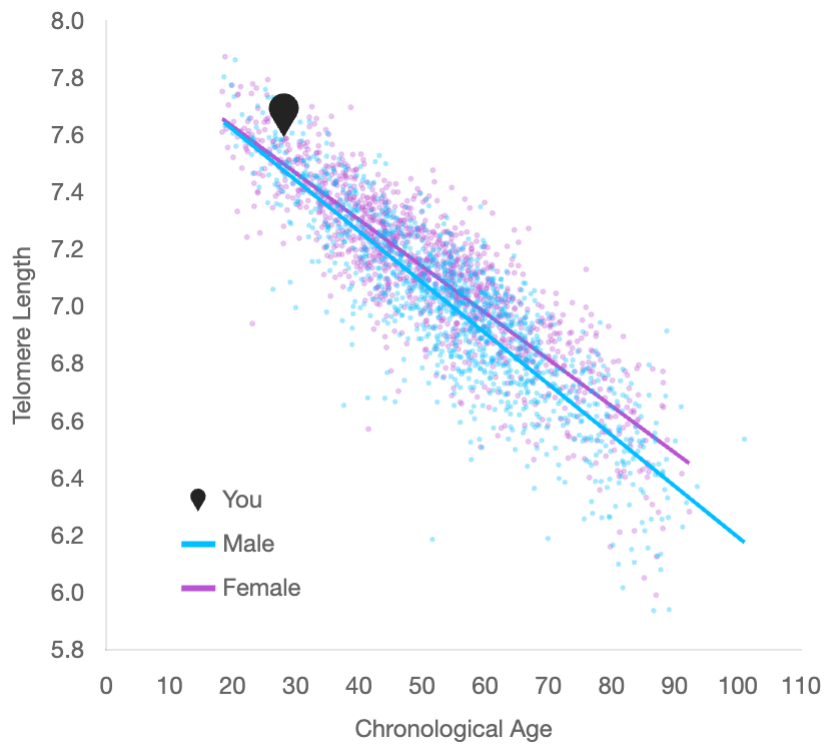
19.5

Younger

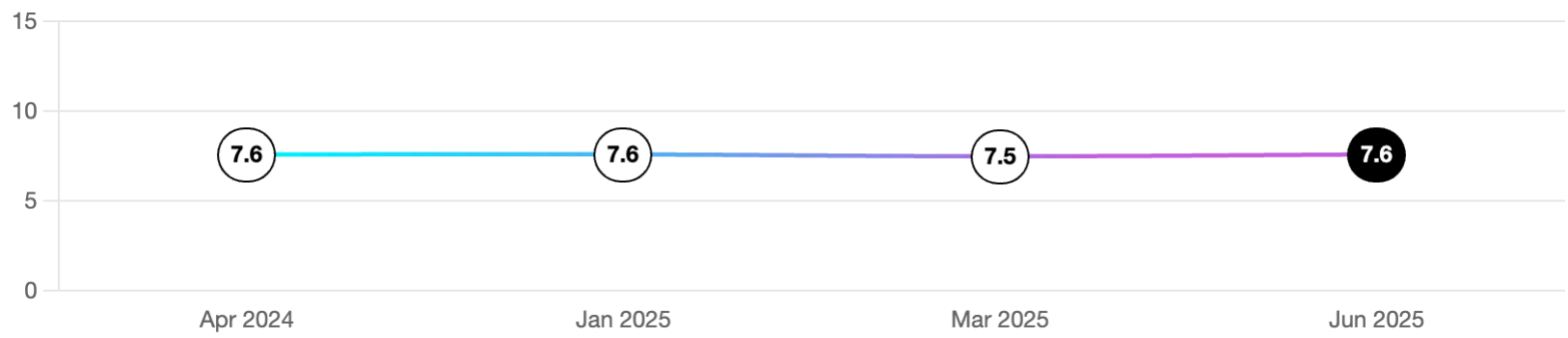
Telomere Length

7.6

5.5 8.5



Results Over Time



DISCLAIMER: Telomere length is mostly determined based on predetermined genetic function. The population graph is based on observed and validated data patterns from an equal distribution of Harvard research participants and TruDiagnostic clients to emulate a population of average health.

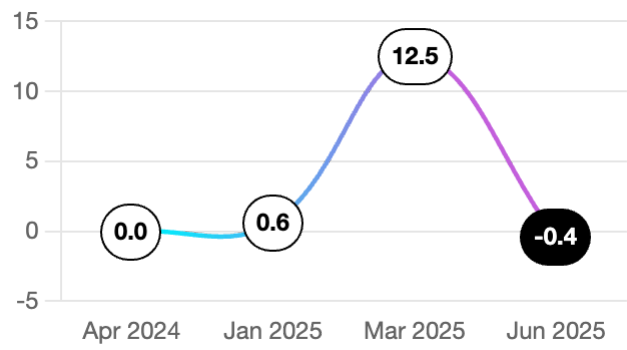
Inflammation

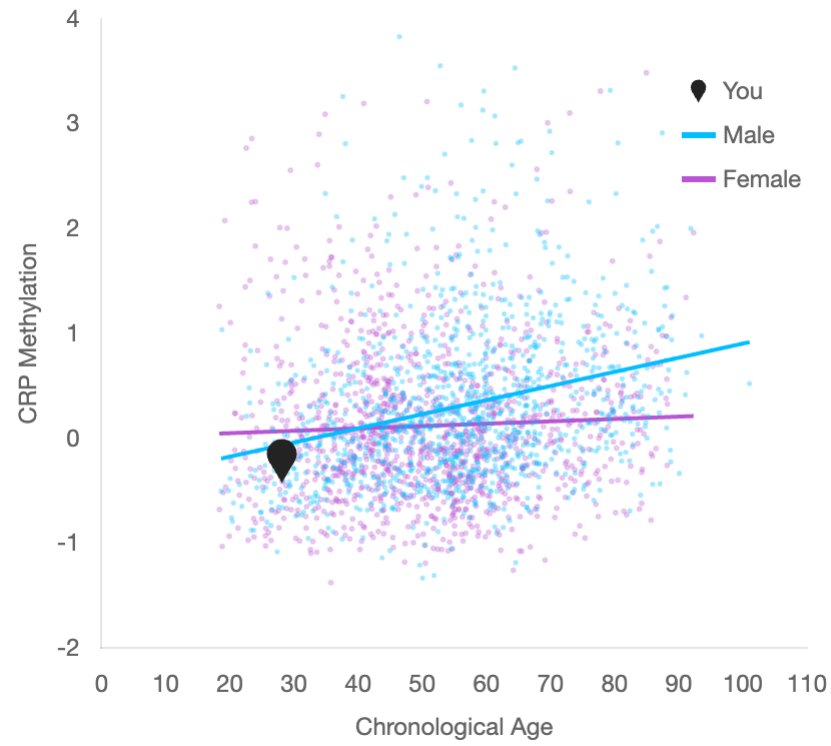
CRP

36.2%

Your CRP methylation level is lower than 63.8% of the population at your same age and sex.

CRP is produced by the liver in response to acute inflammation. DNAm CRP has an inverse relationship with cognitive functions such as memory, speed, and visuospatial functions.



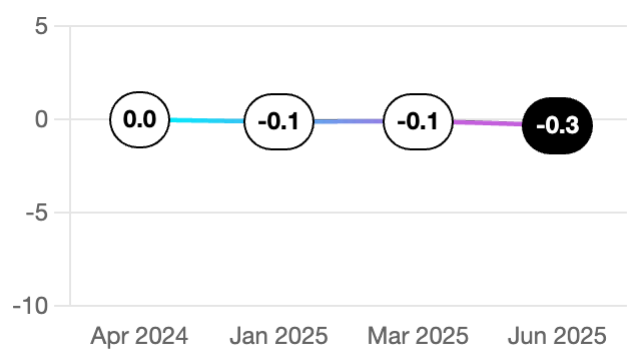


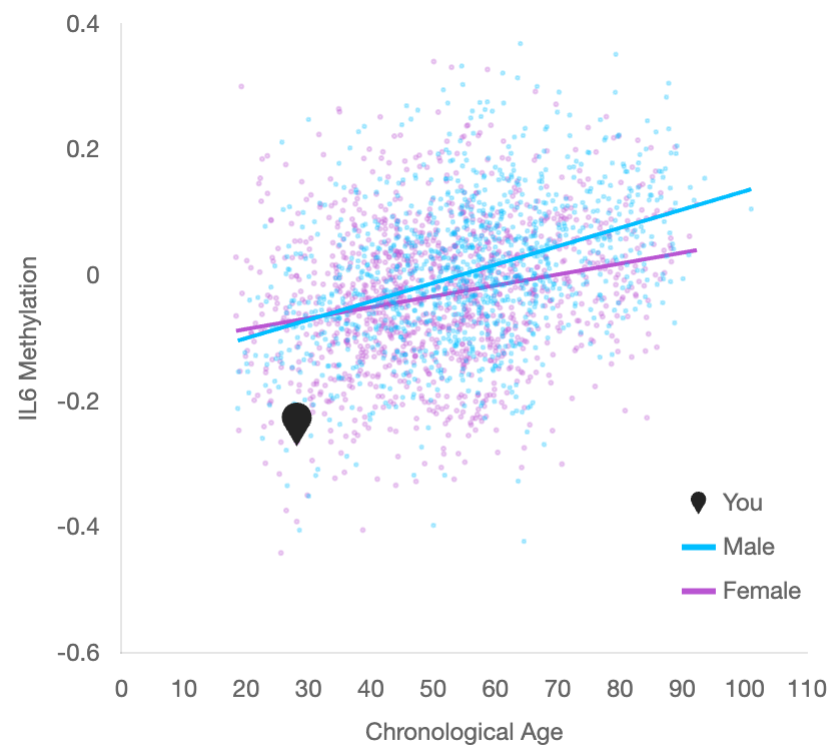
IL-6

5.3%

Your IL-6 methylation level is lower than 94.7% of the population at your same age and sex.

IL-6 is a widely used marker of inflammation and circulating levels of the cytokine typically rise in older age. DNAm IL-6 is positively associated with BMI, self-reported smoking status, and alcohol intake.





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Relative **Smoking Risk**

Tobacco Smoking Epigenetic Predictor Low Risk 3.4%

High Risk	80+
Intermediate Risk	70 - 80
Low Risk	0 - 70

Relative **Alcohol Risk**

Alcohol Epigenetic Biomarker Low Risk 51.1%

High Risk	80+
Intermediate Risk	70 - 80
Low Risk	0 - 70

Additional Epigenetic Biomarkers

Albumin

Normal

28.9%

Function

Albumin: A protein in the blood that helps maintain oncotic pressure and transport substances.

Recommendations

- If applicable, consume high-proten foods
- Diversify protein sources
- Consider vitamin D and omega-3-rich foods or supplements.
- Manage liver and kidney health
- Limit nephrotoxic medications

Vitamin D | Omega-3 Fatty Acids | Lean meats | Poultry | Fish | Eggs | Dairy | Legumes | Nuts

Hemoglobin

Normal

62.4%

Function

Hemoglobin: A protein in red blood cells that carries oxygen; critical for evaluating oxygen transport and anemia.

Recommendations

- Correct nutrient deficiencies, especially folate, iron, B12, and vitamin C.
- Consider EPO in the setting of CKD
- Manage chronic conditions
- Stay active and hydrated

Vitamin B12 | Folate | Iron | Vitamin C | Leafy green vegetables | Citrus fruits | Legumes | Eggs

HbA1c

Normal

13.9%

Function

HbA1c: Glycated hemoglobin; indicates average blood sugar levels over the past 2–3 months.

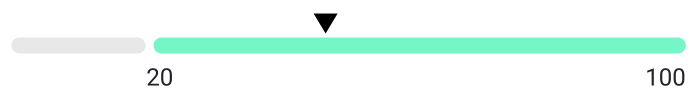
Recommendations

- Consume low-glycemic balanced meals
- Exercise regularly
- Pursue weight loss if applicable
- Reduce sugar intake
- Manage stress
- Consider medications if advised by your physician
- Consider supplements like ALA, berberine, or dihydroberberine

Alpha Lipoic Acid | Berberine | Dihydroberberine | Lean proteins | Healthy fats | Fiber-rich foods

Hematocrit

Normal



46.8%

Function

Hematocrit: Percentage of red blood cells in blood; used to assess anemia and hydration.

Recommendations

- Correct nutrient deficiencies, especially folate, iron, B12, and vitamin C
- Treat illness
- Stay active and hydrated

Vitamin B12 | Folate | Iron | Vitamin C | Leafy green vegetables | Citrus fruits | Legumes | Eggs

Additional Epigenetic Biomarkers

Blood Urea Nitrogen

Normal

41.9%

Function

Blood Urea Nitrogen (BUN): Measures urea levels in the blood, indicating kidney function and protein metabolism.

Recommendations

- Hydrate regularly
- If applicable, moderate protein intake
- Manage any kidney or liver disease
- Avoid nephrotoxic drugs

Alkaline Phosphatase

Normal

1.0%

Function

Alkaline Phosphatase: An enzyme found in the liver, bones, and other tissues; elevated levels indicate liver or bone issues.

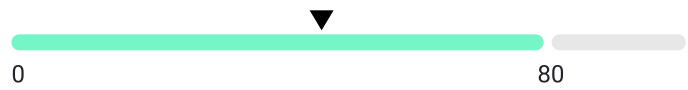
Recommendations

- Correct Vitamin D deficiency
- Treat liver or bone disease if applicable
- Eat a diet low in saturated fats
- Exercise regularly
- Avoid alcohol and toxins

Vitamin D

Insulin-like Growth Factor-Binding Protein 2

Normal



46.3%

Function

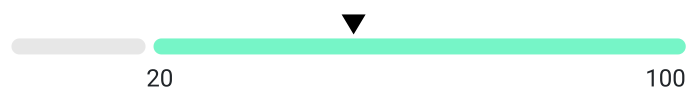
Insulin-Like Growth Factor-Binding Protein 2 (IGFBP2): Regulates insulin-like growth factor activity; linked to metabolism and aging.

Recommendations

- Regularly practice calorie restriction under healthcare provider guidance
- Engage in aerobic and resistance exercise to improve insulin sensitivity
- Consume balanced meals
- Manage stress
- Reduce excessive protein intake
- Improve sleep to support growth hormone function

Carboxypeptidase B2

Normal



51.1%

Function

Carboxypeptidase B2: An enzyme involved in clot dissolution and complement regulation.

Recommendations

- Consume adequate protein
- Correct any nutrient deficiencies, especially vitamin K and omega-3
- Control inflammation through an anti-inflammatory diet and regular exercise

Omega-3 Fatty Acid Vitamin K

Additional Epigenetic Biomarkers

Ribonuclease pancreatic

Normal

0 80

54.3%

Function

Ribonuclease Pancreatic: An enzyme that degrades RNA; linked to digestive and cellular processes.

Recommendations

- Consider an anti-inflammatory diet
- Regulate blood sugar levels
- Manage stress
- Maintain an active lifestyle

Omega-3 Fatty Acid | Anti-inflammatory diet

Inter-alpha-trypsin Inhibitor Heavy Chain H3

Normal

0 80

21.3%

Function

Inter-Alpha-Trypsin Inhibitor Heavy Chain H3: A protein involved in inflammation and tissue repair.

Recommendations

- Identify and control sources of inflammation, especially insulin resistance, gut microbiome imbalances, dietary factors, lipids, toxins, autoimmunity, and environmental exposures
- Maintain an active lifestyle
- Consider an anti-inflammatory diet

Anti-inflammatory diet

Fasting Glucose

Normal

0 80

32.9%

Function

Glucose: Blood sugar level; essential for assessing metabolic health and diagnosing diabetes.

Recommendations

- Control carbohydrated intake when applicable
- Stay active
- Manage weight
- Avoid sugar
- Manage stress
- Consider medications if advised by your physician
- Consider supplements like ALA, berberine, or dihydroberberine

Alpha Lipoic Acid | Berberine | Dihydroberberine | Lean proteins | Healthy fats | Fiber-rich foods

Ribitol

Normal

0 80

49.4%

Function

Ribitol: A sugar alcohol; involved in pentose phosphate and metabolic pathways.

Recommendations

- Limit sugar and high glycemic food intake
- Consider monitoring blood sugar

Lean protein | Low fat dairy

Additional Epigenetic Biomarkers

Creatinine

Normal

0 — 80

48.6%

Function

Creatinine: A byproduct of muscle metabolism; used to evaluate kidney function.

Recommendations

- Hydrate regularly
- If applicable, reduce red meat intake
- Control diabetes and hypertension
- Avoid nephrotoxic drugs
- Note that creatine can affect this level

Phenylacetylglutamine

Normal

0 — 80

31.8%

Function

Phenylacetylglutamine: A gut microbiome-derived metabolite of phenylalanine; linked to kidney function.

Recommendations

- Balance protein intake
- Limit foods high in phenylalanine (e.g, processed foods, dairy, meat, and some grains)
- Stay hydrated
- Monitor liver and kidney function
- Consider prebiotics or probiotics for gut health

Prebiotics | Probiotics

Uridine

Normal

20 — 100

93.2%

Function

Uridine: A nucleoside involved in RNA synthesis and energy metabolism.

Recommendations

- Incorporate uridine-rich foods like tomatoes, broccoli, and mushrooms, which are synergistic with choline and DHA

Uridine | Choline | DHA | Tomatoes | Broccoli | Mushrooms | Eggs | Fatty fish

1-margaroyl-glycerophospholipid(GPE)(17:0)*

Normal

0 — 80

42.1%

Function

1-Margaroyl-Glycerophospholipid (GPE) (17:0): A glycerophospholipid; essential for cell membrane stability.

Recommendations

- If applicable, reduce saturated fat intake
- Increase omega-3 intake
- Consider anti-inflammatory agents like curcumin or green tea extract

Omega-3 Fatty Acid | Curcumin | Green tea extract | Green tea

Additional Epigenetic Biomarkers

4-Methoxyphenol Sulfate

Normal

0 80

66.7%

Function

4-Methoxyphenol Sulfate: A sulfated metabolite of phenolic compounds; reflects detoxification processes.

Recommendations

- Avoid woodsmoke exposure and dark-aged beer
- Avoid synthetic fragrances

N-acetyl-isoputreanine

Normal

0 80

69.3%

Function

N-Acetyl-Isoputreanine: A metabolite of polyamine biosynthesis; associated with cellular growth and repair.

Recommendations

- Consider NAC supplementation

NAC

Gluconate

Normal

0 80

24.4%

Function

Gluconate: A metabolite of glucose; involved in carbohydrate metabolism and energy production.

Recommendations

- Cut added sugar, added fat, and processed foods
- Exercise regularly
- Consider ALA, berberine, or dihydroberberine
- Limit wine

Alpha Lipoic Acid | Berberine | Dihydroberberine

Carotene Diol

Normal

20 100

62.1%

Function

Carotene Diol: A carotenoid metabolite; an antioxidant linked to vitamin A activity. Important for eye and brain health.

Recommendations

- Consume more carotenoid-rich foods like carrots, kale, and spinach

Carrots | Kale | Spinach

Additional Epigenetic Biomarkers

4-hydroxyphenylacetylglutamine

Normal

0 — 80 — 77.8%

Function

4-Hydroxyphenylacetylglutamine: A gut microbial metabolite of tyrosine; linked to gut health and kidney function.

Recommendations

- Manage blood pressure
- If applicable, reduce protein intake
- Increase fiber and fermented foods
- Consider prebiotics or probiotics
- Stay hydrated
- Protect kidney health

Prebiotics | Probiotics | Kefir | Yogurt | Sauerkraut | Fiber-rich foods

Androsterone Sulfate

Normal

20 — 100 — 89.9%

Function

Androsterone Sulfate: A steroid hormone metabolite downstream of testosterone; reflects androgen activity and metabolism.

Recommendations

- Correct any nutrient deficiencies, especially zinc, magnesium, vitamin D, and omega-3
- Optimize sleep
- Manage stress
- Consider hormone therapy if needed
- Maintain an active lifestyle

Zinc | Magnesium | Vitamin D | Omega-3 | DHEA

3-Ureidopropionate

Normal

0 — 80 — 41.7%

Function

3-Ureidopropionate: A product of pyrimidine metabolism; involved in nitrogen recycling.

Recommendations

- If applicable, reduce excessive protein intake, especially those rich in pyrimidines like organ meats
- Stay hydrated
- Monitor kidney and liver health

Bone Morphogenetic protein 1

Normal

20 — 100 — 54.3%

Function

Bone Morphogenetic Protein 1 (BMP1): A protein involved in bone formation and extracellular matrix remodeling.

Recommendations

- Consume calcium-rich and vitamin D-rich foods
- Consider calcium or vitamin D supplementation
- Increase weight-bearing exercise
- Ensure adequate protein intake

Calcium | Vitamin D | Green leafy vegetables | Nuts | Dairy | Fatty fish

Additional Epigenetic Biomarkers

Versican core protein

Normal

47.3%

Function

Versican Core Protein: A proteoglycan in the extracellular matrix; involved in tissue remodeling and inflammation.

Recommendations

- Avoid being underweight
- Increase moderate-intensity exercise

Cystine

Normal

50%

Function

Cystine: A disulfide form of cysteine; indicates oxidative stress and protein turnover.

Recommendations

- Avoid excessive methionine-rich protein sources like eggs, dairy, certain nuts, and seeds
- Stay hydrated
- Increase vitamins B6, B9, and B12 to support homocysteine metabolism

Vitamin B6 | Vitamin B9 | Vitamin B12

Mimecan

Normal

34.7%

Function

Mimecan (Osteoglycin): A small leucine-rich proteoglycan; involved in bone mineralization and cardiovascular health.

Recommendations

- Consider an anti-inflammatory diet
- Manage stress
- Maintain an active lifestyle
- If applicable, manage underlying cardiovascular or fibrotic conditions
- Monitor blood pressure and cholesterol

Omega-3 Fatty Acid

Histone H2B type 1-K

Normal

25.5%

Function

Histone H2B Type 1-K: A histone protein involved in chromatin structure and epigenetic regulation.

Recommendations

- Limit UV exposure
- Increase antioxidant intake
- Avoid smoke exposure
- Manage stress
- Maintain an active lifestyle

Additional Epigenetic Biomarkers

1-Stearoyl-2-adrenoyl-GPC (18:0/22:4)* Normal

23.9%

Function

A glycerophosphocholine (GPC) lipid, this compound supports membrane integrity, brain function, and lipid metabolism, essential for longevity. Low levels may impair neuroprotection, increase oxidative stress, and accelerate age-related decline.

Recommendations

- If applicable, correct omega-3 deficiency
- Increase antioxidants
- Limit alcohol

Omega-3 Fatty Acid | Flaxseeds | Walnuts | Fatty fish

Red Blood Cell Distribution Width Normal

37.9%

Function

Red Blood Cell Width (RDW): Measures the variation in red blood cell size.

Recommendations

- Correct nutrient deficiencies, especially B12, folate, iron, and vitamin C
- Manage chronic illness and inflammation
- Consider omega-3s
- Avoid alcohol and smoking

Vitamin B12 | Folate | Iron | Vitamin C | Omega-3 Fatty Acids

Red meat | Beans | Fortified cereals | Dairy | Meat

Leafy green vegetables | Citrus fruits | Tomatoes | Peppers