

**TEST NAME: Summary Report HCP**





PATIENT: XXXXXXXXXXXXXXXX

TEST REF: GNL-NL-XXXXX

TEST NUMBER: G-NL-XXXXXX

COLLECTED: 23-Mar-2023

PRACTITIONER:

GENDER: XX

RECEIVED: 01-Mar-2023

SSSSSSSSSSSS

AGE: XX

TESTED: 01-Mar-2023

XXXXXXXXXXXXXXXXXXXX

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# OMICm Age

Developed with Harvard\*



Calendar Age

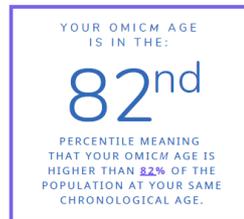
43.36

Biological Age

47.25



Your OMICm Age is **HIGHER THAN** your calendar age by 4.25 years.



Aging has been scientifically proven to be the number one risk factor for major chronic diseases world-wide. Accelerated aging (having an older biological age than your calendar age) increases your risk of disease with each year of discrepancy, and having a younger biological age decreases these risks. Based on age, we can predict the following increase or decreased risk of Death, Cancer, Heart Disease, Stroke, Type 2 Diabetes, COPD, and Depression.

## YOUR RISK OF DISEASE



Reflects your current risk. A -28% score means that your risk is 28% lower compared to people of your same chronological age.

Reflects your current risk. A 47% score means that your risk is 47% higher compared to people of your same chronological age.

Reflects your potential risk score based on potential changes to your biological age.

### DEATH



### CANCER



### HEART DISEASE



### STROKE



### TYPE 2 DIABETES



### COPD



### DEPRESSION



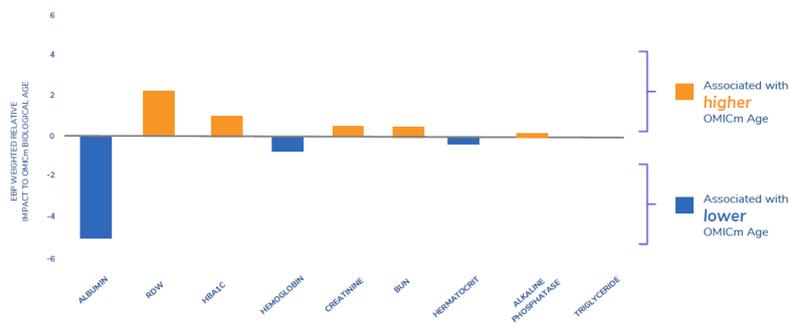
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# The Epigenetic Biomarker Proxies Driving your Biological Age

We use epigenetic biomarker proxies (EBPs) to predict genomics, transcriptomics, proteomics, and metabolomics sum values that are positive for your aging, and some that are negative for your aging. In the graph below you will see the factors contributing to your aging the most. If a bar is above zero, it's increasing your OMICm Age, if below zero, it is decreasing your OMICm Age.

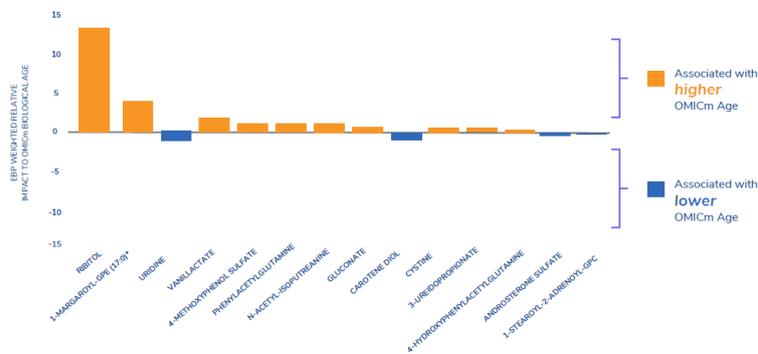
## CLINICAL FACTORS

Your Clinical Epigenetic Biomarker Proxies (EBP)



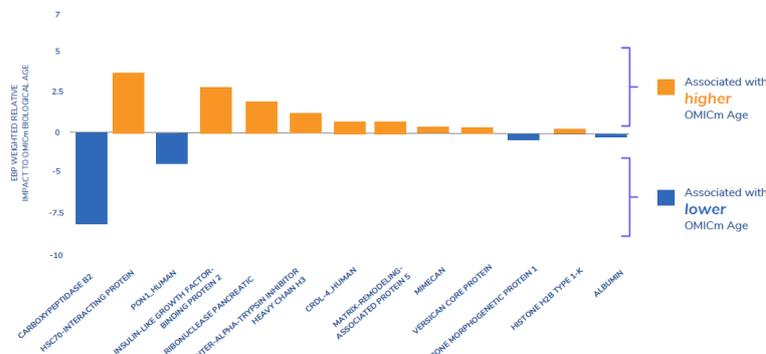
## METABOLITES

Your Metabolites Epigenetic Biomarker Proxies (EBP)



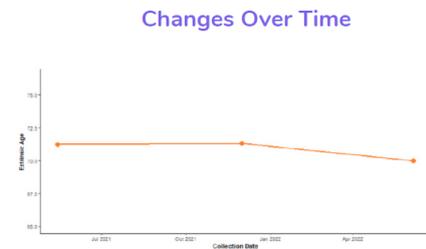
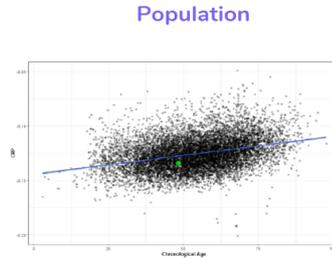
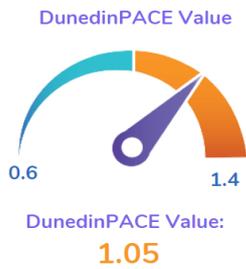
## PROTEINS

Your Proteomics Epigenetic Biomarker Proxies (EBP)



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# DunedinPACE of Aging



ALGORITHM	PATIENT DATA	MORBIDITY AND MORTALITY ASSOCIATIONS	RISK STATEMENT
DunedinPACE	<b>1.05</b> Biological years per year	<b>All-Cause Mortality</b> (Beslsky et al., 2020)	If you are aging above a rate of 1.00, you would increase risk of death by 56% over the next 7 years.
		<b>Chronic Disease</b> (Beslsky et al., 2020)	If you are aging above a rate of 1.00, you would increase risk of chronic disease diagnosis by 54% over the next 7 years.

## Significant Variation in Facial Aging

Female:



10 slowest-aging cohort members



10 average-aging cohort members



10 fastest-aging cohort members

Male:



10 slowest-aging cohort members



10 average-aging cohort members



10 fastest-aging cohort members



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# Immune Health

IMMUNE CELL TYPE	95% CONFIDENCE INTERVAL RANGE	YOUR PERCENTAGE	MEAN	SD	# OF STANDARD DEVIATIONS ABOVE OR BELOW MEAN	IS THIS HIGHER OR LOWER THAN ANTICIPATED?
Naïve CD4T	7.196%-7.35%	3.59%	7.273	0.0383	1.446	HIGHER
Memory CD4T	5.14%-5.284%	2.05%	5.212	0.0361	1.647	HIGHER
Memory CD8T	6.519%-6.691%	9.00%	6.605	0.0430	1.346	HIGHER
Naïve CD8T	1.09%-1.16%	0%	1.125	0.0175	1.545	HIGHER
Basophils	1.026%-1.056%	0.77%	1.041	0.0076	2.389	HIGHER
B Memory	1.689%-1.785%	1.03%	1.737	0.0241	-1.57	LOWER
Naïve B	2.207%-2.311%	0%	2.259	0.0260	2.987	HIGHER
Regulatory T	0.604%-6.408%	2.89%	3.506	1.4510	-2.316	LOWER
Eosinophils	0.376%-0.424%	0%	0.400	0.0121	3.205	HIGHER
Natural Killer	3.353%-3.459%	5.08%	3.406	0.0264	-1.365	LOWER
Neutrophils	62.899%-62.953%	74.86%	62.93	0.0136	-1.781	LOWER
Monocyte	4.453%-4.567%	0.73%	4.510	0.0285	-2.981	LOWER

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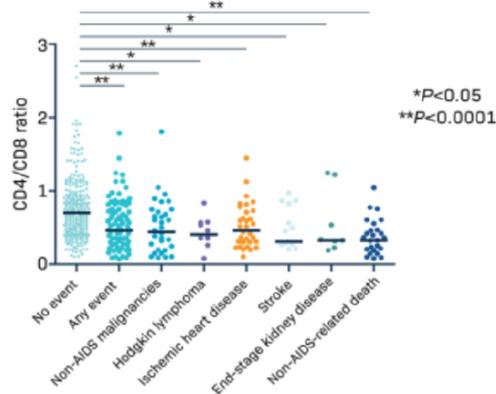
# CD4/CD8 T Cell Ratio

CD4/CD8T cell ratio is incredibly informative on disease. A value between 1 and 4 is ideal. A value between 0 and 1 marks "inverted ratio". A low or inverted CD4/CD8 ratio is an immune risk phenotype and is associated with altered immune function, immune senescence, and chronic inflammation.

The prevalence of an inverted CD4/CD8 ratio increases with age. An inverted ratio is seen in 8% of 20-59 year olds and in 16% of 60-94 year olds. Women across all age groups are less likely to have an inverted ratio than their male counterparts.

Age, and hormone-related atrophy of the thymus is theorized to explain the differences between populations. Hormonal influence on the ratio is supported by a correlation between low Plasma Estradiol levels, high circulating CD8, and low CD4/CD8 ratios in women with premature ovarian failure.

We have been able to refer patients for additional testing to diagnose HIV, Chronic Lymphocytic Leukemia, and even individuals taking their Rapamycin at too high of a dose. If you see a low CD4/CD8 ratio, it is not an immediate cause for concern but we might recommend testing via traditional labs just in case. A value of 4+ marks hyperactivity or possible infection, autoimmunity or additional immune risk phenotypes.



CELL TYPE	REFERENCE RANGE	YOUR RATIO	MEAN	SD	# OF STANDARD DEVIATIONS ABOVE OR BELOW MEAN	IS THIS HIGHER OR LOWER THAN ANTICIPATED?
CD4T/CD8T T Cell Ratio	1.00-4.00	1.61	2.59	0.074	1.469	HIGHER

RATIO	ABOUT THIS RATIO	YOUR VALUE
Regulatory T Cells to Total T Lymphocytes (RegT/all other T Cells)	There is evidence that Tregs exhibit atheroprotective properties by suppression of autoreactive T cell responses or by secretion of anti-inflammatory cytokines (Pastrana et al., 2012). Thus this might be a marker for cardiovascular disease. (www.sciencedirect.com)	0.147
Adaptive to Innate Immune (A/A Ratio)	The adaptive-to-innate immune ratio (A/I ratio) has been linked to response to several types of immunotherapy.	0.517

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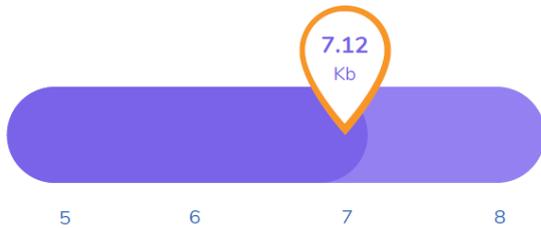
# Other Immunosenescence Ratios

RATIO	ABOUT THIS RATIO	NORMATIVE RATIO	YOUR VALUE
Neutrophil to Lymphocyte	<p>The NLR is simply the number of Neutrophils divided by the number of Lymphocytes. Under physiologic stress, the number of Neutrophils increases, while the number of Lymphocytes decreases. The NLR <b>combines</b> both of these changes, making it more sensitive than either alone:</p> <p>Effect of Physiologic Stress on the NLR:</p> $\uparrow \uparrow \text{NLR} = \frac{\text{Neutrophils}}{\text{Lymphocytes}}$ <p>Endogenous cortisol and catecholamines may be major drivers of the NLR. Increased levels of cortisol are known to increase the neutrophil count while simultaneously decreasing the lymphocyte count.</p> <p>Thus, NLR is not solely an indication of infection or inflammation. Any cause of physiologic stress may increase the NLR (e.g. hypovolemic shock).</p>	<p>NLR Stress-O-Meter</p> <p>Neutrophil-to-Lymphocyte ratio (NLR) reflects the amount of physiologic stress. The optimal cutoff value will vary depending on the specific patient population and disease state. The numbers provided above are intended merely to provide a general concept of NLR interpretation.</p>	1.724
Monocyte to Lymphocyte	<p>MLR (Monocyte to Lymphocyte ratio) has demonstrated to be a novel hematological and inflammatory parameter. MLR is associated with various diseases, such as community-acquired pneumonia, axial spondylarthritis, and coronary angiography, as well as the systemic inflammatory response, which reflects the abnormal immune status of diseases.</p>	<p>The mean Neutrophil-to-Lymphocyte ratio in the whole population was <math>1.70 \pm 0.70</math> (Range: 8.38, Min: 0.23, Max: 8.61), mean lymphocyte-to-monocyte ratio was <math>11.15 \pm 3.14</math> (Range: 23.21, Min: 3.46, Max: 26.67), and mean platelet-to-lymphocyte ratio was <math>117.05 \pm 47.73</math> (Range: 93.60, Min: 19.11, Max: 1598.77).</p>	11.45

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# Telomere Length

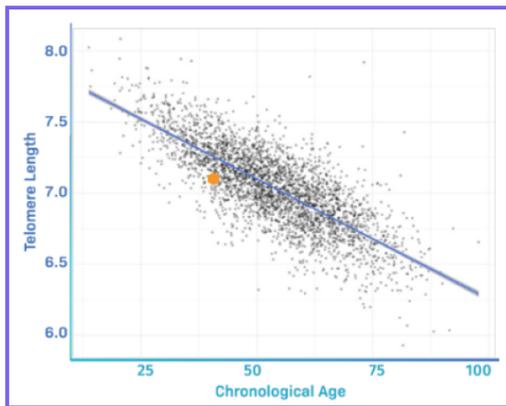
Telomere Length:



If we were to estimate your biological age strictly from your telomere measurement, we would anticipate your age to be:

**47.36**  
YEARS OLD

Telomere Length Based on Biological Age Prediction:



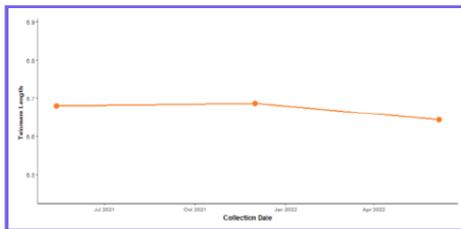
Your average telomere prediction length:

**7.2kb**

This puts you in the:

**70th Percentile**

Changes Over Time



ALGORITHM	PATIENT DATA	MORBIDITY AND MORTALITY ASSOCIATIONS	RISK STATEMENT
Telomere	<b>7.2</b> Kilobase Unit	At your chronological age of 61, your telomeres are longer than 70% of people who share the same chronological age as you.	Shorter telomeres are not only associated with age but with disease too. Shorter telomere length and low telomerase activity are correlated with several chronic preventable diseases.

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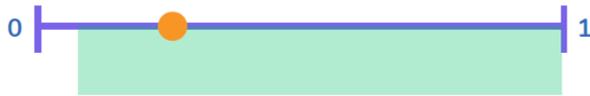
# Type 2 Diabetes Risk

PHOSPHO1 (Cg02650017)

Average Beta Value:

Your EpiType Value:

.15



[.05-1]

No Increased Risk

ABCG1 (Cg06500161)

Average Beta Value:

Your EpiType Value:

.73



[.71-1]

Disease Risk

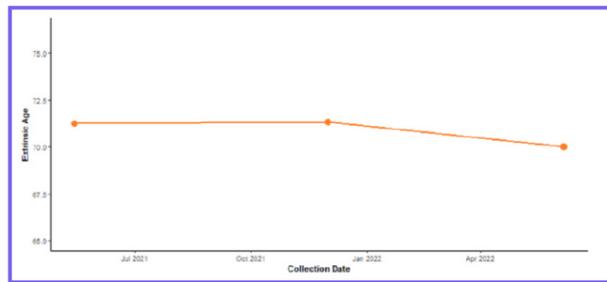
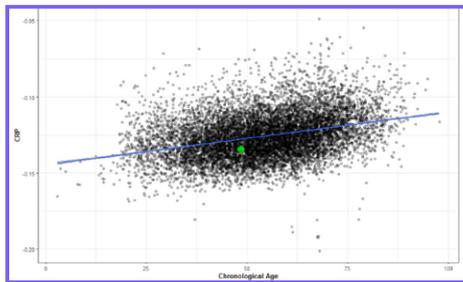
RISK REPORT	PATIENT OUTCOMES	SUMMARY	IMPACT	ADDITIONAL NOTE
Type 2 Diabetes	<b>High Risk</b>	Your DNA methylation score was <b>0.73</b> at the ABCG1 locus and <b>0.15</b> at the PHOSPHO1 locus.	<p>Your DNA methylation score at ABCG1 and PHOSPHO1 gives an indication of your level of risk for type 2 diabetes.</p> <p>If your score is 73% or greater at the ABCG1 locus, it is associated with a 9% increased risk for future type 2 diabetes occurrence.</p> <p>A DNA methylation score of 4% or greater at the PHOSPHO1 locus is associated with a 15% decreased risk for future type 2 diabetes occurrence.</p>	<p>DNA methylation at these loci is associated with cholesterol levels, triglyceride levels, ischemic stroke, and risk of T2D.</p> <p>Studies on these particular CpG loci have suggested that fasting and low carb diets can reduce methylation at these loci to lower your risk. Please consult your doctor to discuss this and more treatment options.</p>

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# Inflammation

## DNAm CRP

### Changes Over Time

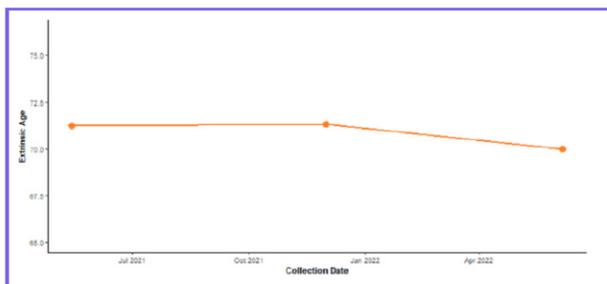
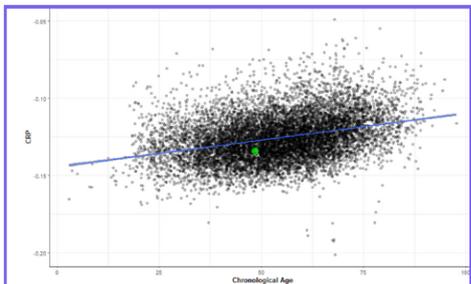


Your CRP methylation level is higher than **45%** of the population at your same calendar age and sex.

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.

## DNAm IL-6

### Changes Over Time



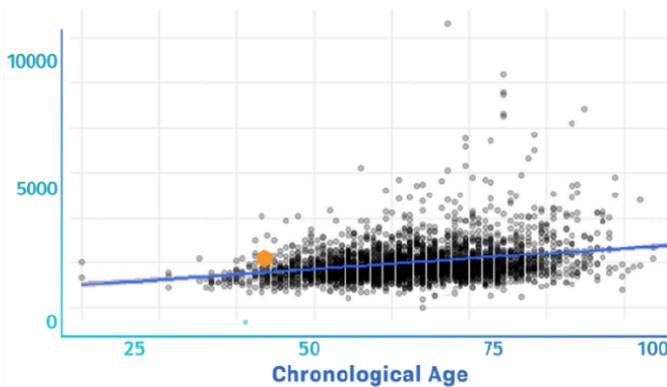
Your IL-6 methylation level is higher than **48%** of the population at your same calendar age and sex.

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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# Mitotic Clock

Cumulative number of stem cell divisions per stem cell per year:



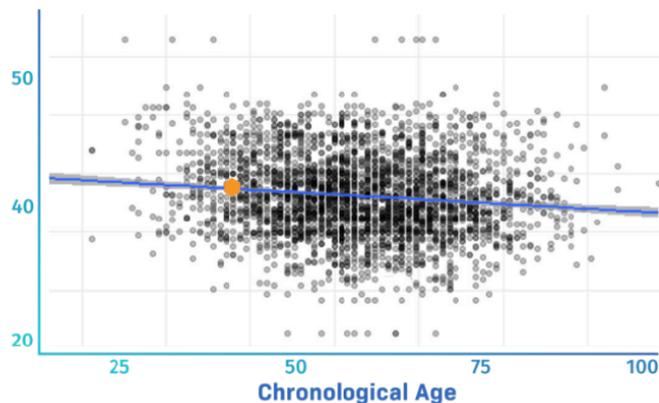
Stem cell divisions per stem cell per year:

**3001**

This puts you in the:

**60th Percentile**

Average estimate for the intrinsic rate of stem-cell division for the tissue:



Average estimate for intrinsic rate of stem-cell division:

**4004**

This puts you in the:

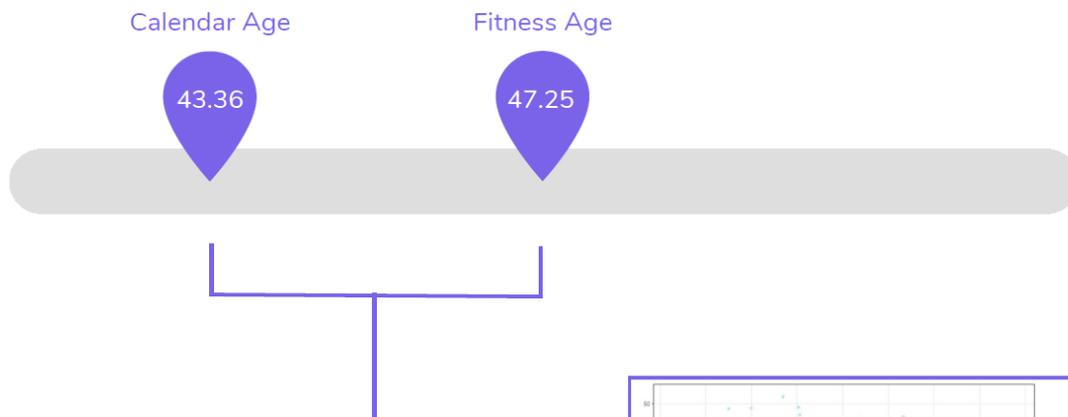
**50th Percentile**

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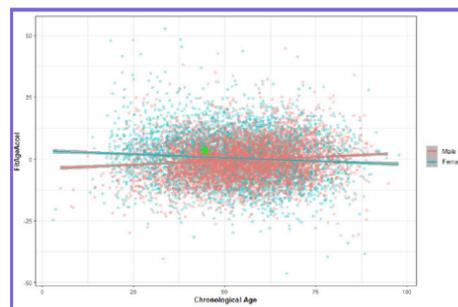
# Fitness Age

## OMICm FitAge

The incorporation of physical fitness measurements into epigenetic clocks **increases the measurable effects of lifestyle, medical, and environmental interventional changes** on the aging process. The DNAmFitAgeAccel algorithm, also simply known as FitAgeAcceleration, was developed by researchers at UCLA, and is an estimate of epigenetic age acceleration. We have created a version of this, however, we incorporated our **OMICm Age** algorithm (developed with Harvard) instead. We call this **OMICm FitAge**, which tells you how old you are according to your physical fitness and functionality.



Your OMICm FitAge is **HIGHER THAN** your calendar age by 4.25 years.



For every one year older OMICm FitAge is, there is an average **0.29 decrease in relative grip strength and 0.32 increase in BMI**. OMICm FitAge has estimated that high-fit individuals (classified through VO2max) have a **1.5 to 2.0 younger biological age** compared to low/medium fit individuals in females and males, respectively. Younger OMICm FitAge was associated with better memory test performance, emphasizing the beneficial role of physical exercise on cognitive health.

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OMICm FitAge is impacted by:



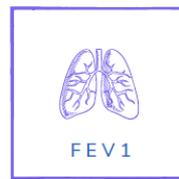
Maximum hand grip strength (GripMax) a measurement of force taken in kg and is used to measure the age-associated decline in terms of muscle strength.



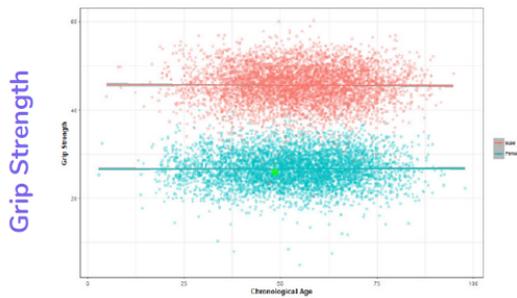
Gait speed, also known as walking speed, is measured in meters per second.



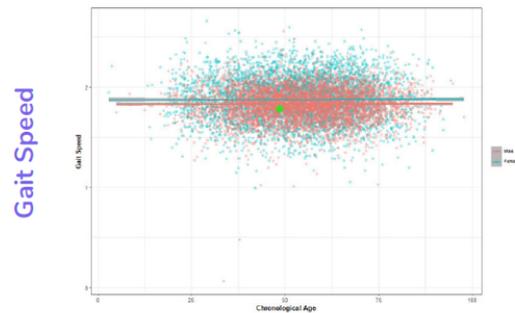
Maximal oxygen uptake, or VO2max, is a measure of cardiovascular health and aerobic endurance.



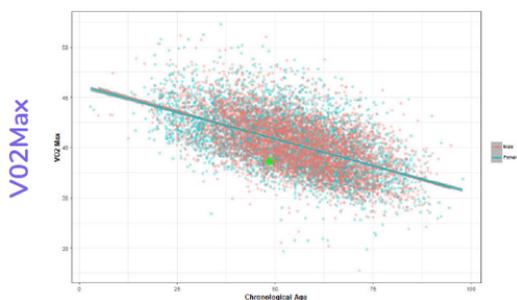
Forced expiratory volume, also known as FEV1, measures lung function by determining the amount of air forced from the lungs in one second.



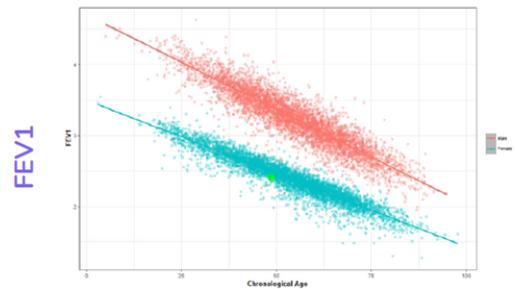
Your Grip Strength epigenetic biomarker proxy is **28**. This puts you scoring higher than **49%** of the population with a similar reported age and sex.



Your Gait Speed epigenetic biomarker proxy is **1.7**. This puts you scoring higher than **47%** of the population with a similar reported age and sex.



Your VO2Max epigenetic biomarker proxy is **38**. This puts you scoring higher than **42%** of the population with a similar reported age and sex.



Your FEV1 epigenetic biomarker proxy is **2.86**. This puts you scoring higher than **32%** of the population with a similar reported age and sex.

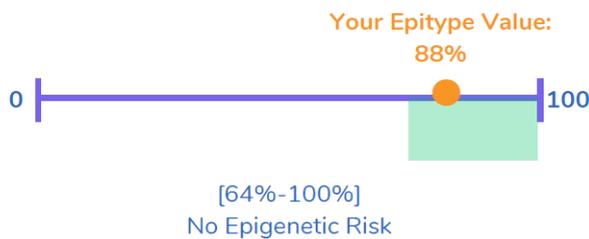
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# Smoking & Drinking

## Smoking and Disease Risk

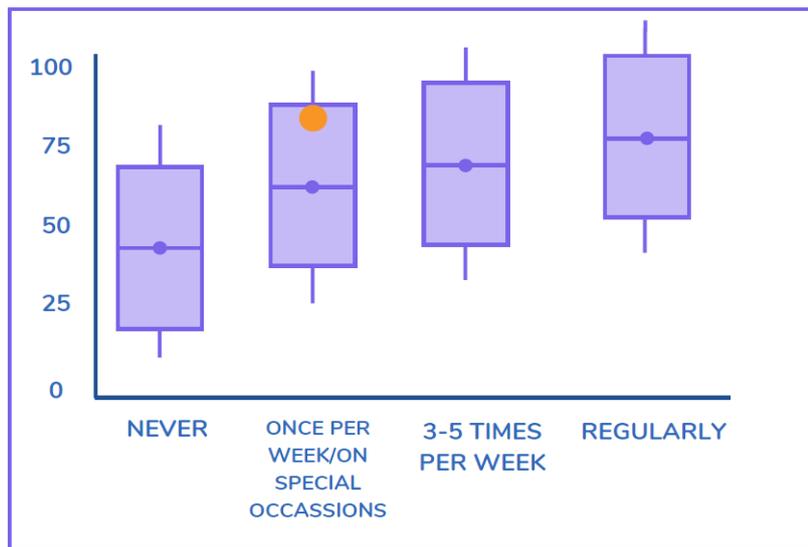
AHRR (cg05575921)  
Average Beta Value %:

The impact that tobacco smoke exposure has on the epigenome is based on the level of methylation at the AHRR gene locus cg05575921.



Your DNA methylation score was **88%** at the AHRR locus, meaning that your methylation score aligns with the status of **non-smokers**, putting you at **low risk** for developing smoking-related conditions.

## Alcohol Consumption and DNA Methylation



On your intake survey, you self-reported your drinking status as **3-5 Times Per Week**. With our custom epigenetic biomarker proxy, you are in the **80th** percentile. This means your score is higher than **80%** of the population we have tested.

\*Those who marked self-reported drinking as "Not Applicable" were assumed to have no drinking status and have been combined with data from "Never" status.



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# Weight Loss Response

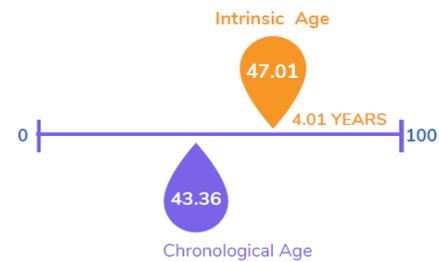
CPG SITE	GENE	β - VALUE RESPONDERS	YOUR SCORE	RESPONSE STATUS
cg15500865	PON3	0.072	0.634	Hypermethylated
cg25161512	PON3	0.115	0.111	Hypomethylated
cg11435506	PON3	0.165	0.161	Hypomethylated
cg03301582	PON3	0.120	0.117	Hypomethylated
cg08898155	PON3	0.163	0.167	Hypermethylated
cg04080282	PON3	0.324	0.321	Hypomethylated
cg26457160	PON3	0.490	0.494	Hypermethylated
cg10329418	PON3	0.252	0.250	Hypomethylated
cg27166921	PON3	0.253	0.251	Hypomethylated
cg24750391	PON3	0.355	0.359	Hypermethylated
cg08461772	PON3	0.418	0.417	Hypomethylated

RISK REPORT	PATIENT OUTCOMES	SUMMARY	IMPACT	ADDITIONAL NOTE
Weight Loss Response	<b>Intermediate Response</b>	Your DNA methylation scores at the above loci indicate you are a <b>Intermediate Responder</b> for weight loss treatment utilizing a hypocaloric diet. This means a calorie deficit diet <b>passably works</b> as your weight loss strategy.	If your DNA methylation score puts you in the category of non-responder or intermediate responder then a hypocaloric diet might not be the best treatment option for you. If you are a responder, that means a hypocaloric diet has a greater chance of positively impacting your weight loss goals.	Studies on these particular CpG loci have concluded that some individuals have a better response to a calorie deficit diet than others. This may indicate why weight loss has been difficult to achieve and can provide insight into finding the best weight loss strategy.

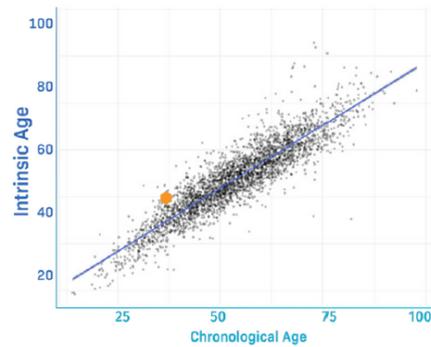
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# Intrinsic & Extrinsic Age

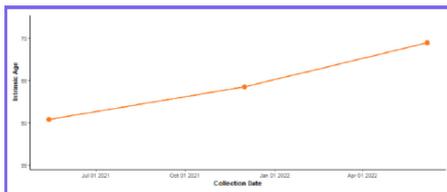
## Intrinsic Epigenetic Age



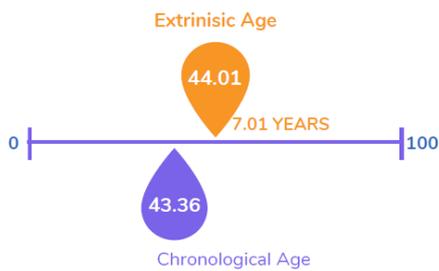
Population



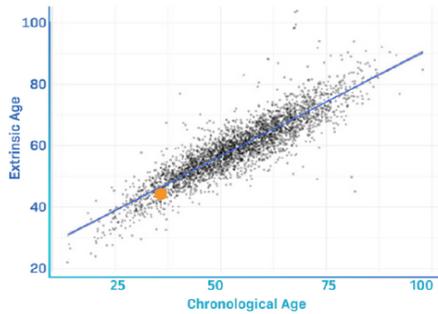
Changes Over Time



## Extrinsic Epigenetic Age



Population



Changes Over Time

