

FACT SHEET

Advanced Biological Age & Epigenetics

Biological ageing insights for healthcare professionals.

A blood-based epigenetic test that quantifies age-associated dysregulation in DNA methylation patterns. Rather than treating ageing as a uniform linear process, it evaluates biological variability across selected CpG sites and resolves the signal into organ- and system-specific ageing profiles.

SAMPLE Blood sample: at-home collection kit or in-clinic blood draw using a standard lavender EDTA tube.



460

Biologically selected CpG sites

21 systems

Organ and physiological systems

Action plan

Personalised, with a clinician dashboard

OVERVIEW

Ageing is not one number

DNA methylation is an epigenetic mechanism involved in regulating gene activity. Unlike the underlying DNA sequence, methylation patterns can change over time and are influenced by ageing, lifestyle and environmental factors. Research led by Prof. Irina Conboy and colleagues shows that ageing is associated not only with changes in methylation levels, but also with increasing variability, or epigenetic noise, reflecting declining regulatory control.

01

Biological noise

Measures variability in DNA methylation patterns
Associated with age-related loss of epigenetic regulatory control

02

System-level insight

Groups 460 CpG sites into functional systems
Shows where age-associated dysregulation is greatest

03

Non-linear ageing

Places each system within an age-related trajectory
Gives context on how dysregulation changes with ageing

WHAT IS MEASURED

What the patient report includes

The report translates epigenetic ageing signals into a system-level profile, so patients and healthcare professionals can see relative differences across biological systems and follow changes across repeat assessments.

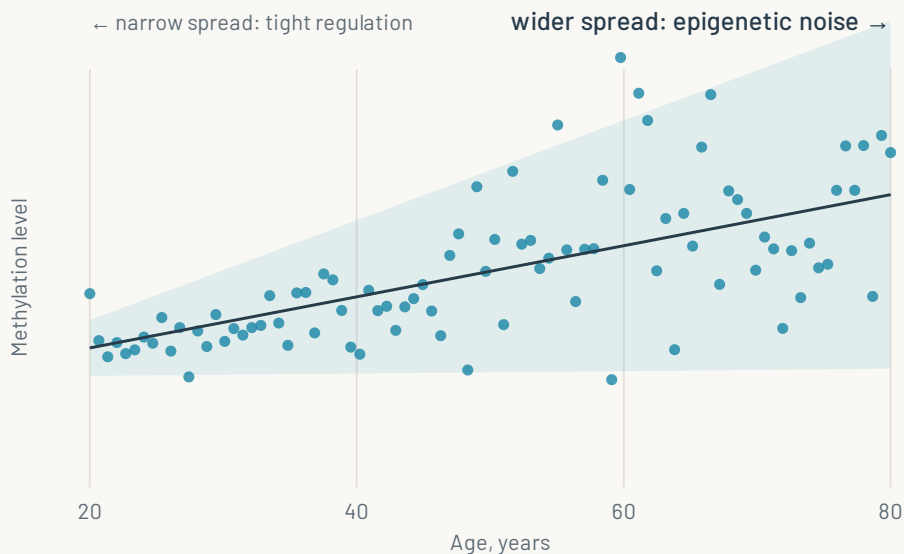
WHOLE-BODY VIEW Biological age and rate of ageing for the whole body.	21 BODY SYSTEMS Biological age and ageing rate for each of 21 organ and physiological systems.
TRAJECTORIES System-specific ageing trajectories and noise curves.	HIGHEST SIGNALS The systems showing the highest relative ageing signals.
CHANGE OVER TIME Longitudinal comparison to monitor biological change.	ACTION PLAN A preliminary personalised action plan for clinician review.

WHAT YOU GET

Clinician-led, patient-friendly

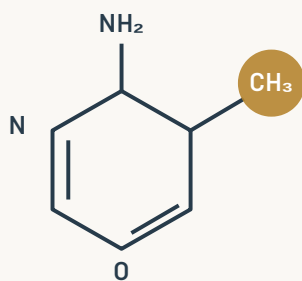
For the patient ● Whole-body biological age and rate of ageing ● Biological age and ageing rate across 21 body systems ● The systems with the highest relative ageing signals ● A preliminary personalised action plan ● Comparison across repeat assessments	For the clinician ● Manage: register patients, kits and testing histories ● Track: follow samples from registration to report readiness ● Review: access results and repeat assessments ● Personalise: review and customise system-specific action plans
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Biological noise

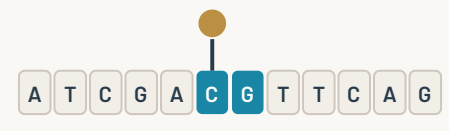


In a well-regulated system, methylation at key regulatory sites stays within a tight band. With age, values scatter in both directions. The test sums this variability across the selected CpG sites. Schematic.

What is measured: methylation at CpG sites



5-methylcytosine

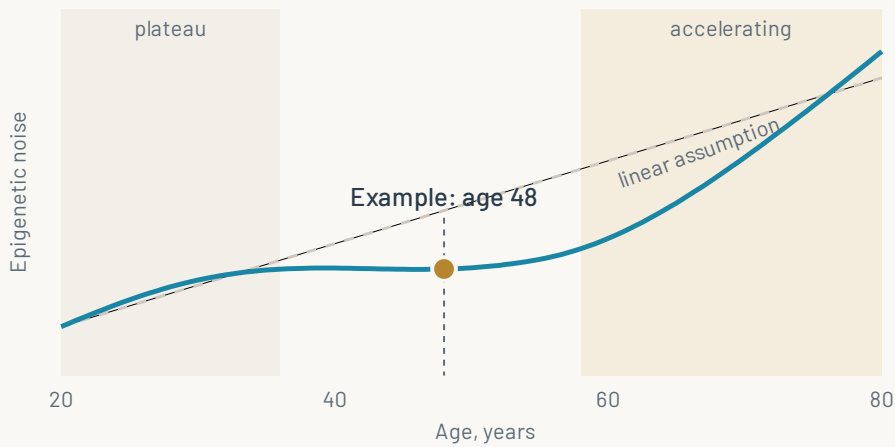


A CpG site on the DNA strand

C followed by G; the methyl group sits on the C

A methyl group attached to cytosine where it is followed by guanine. The sites are selected for how their variability changes with age, not for a shift in average level.

Non-linear ageing



Ageing can progress in waves, with plateaus and periods of acceleration, rather than as a straight line. Each system is placed on such a trajectory. Schematic; not a clinical threshold.

What your patients see

TOP AGEING FACTORS	YOUR TOP 5 AGEING RISKS	PRELIMINARY ACTION PLAN
Respiratory system 43 system age 0.9× ageing speed ↑ Digestive system 37 system age 0.8× ageing speed ↓ Skeletal system 38 system age 1.1× ageing speed ↑ Calendar age 27 in this example.	Cardiac system Muscular system Mitochondria health Nervous system Male reproductive system	1 Lifestyle and recovery 2 Follow-up testing 3 For clinician review Recommendations are reviewed and adjusted by the clinician.

Illustrative patient report with example data. Clinical question: which biological systems show relatively higher or lower ageing-associated signals, and how does the profile change across repeat measurements?

21 organ and physiological systems



BRAIN & NERVOUS

- Brain health & cognition
- Nervous system
- Auditory system

REPRODUCTIVE

- Male / female reproductive system

HEART, VESSELS & LUNGS

- Cardiac system
- Blood & vascular system
- Respiratory system

STRUCTURAL

- Skin health
- Muscular system
- Skeletal system

METABOLIC

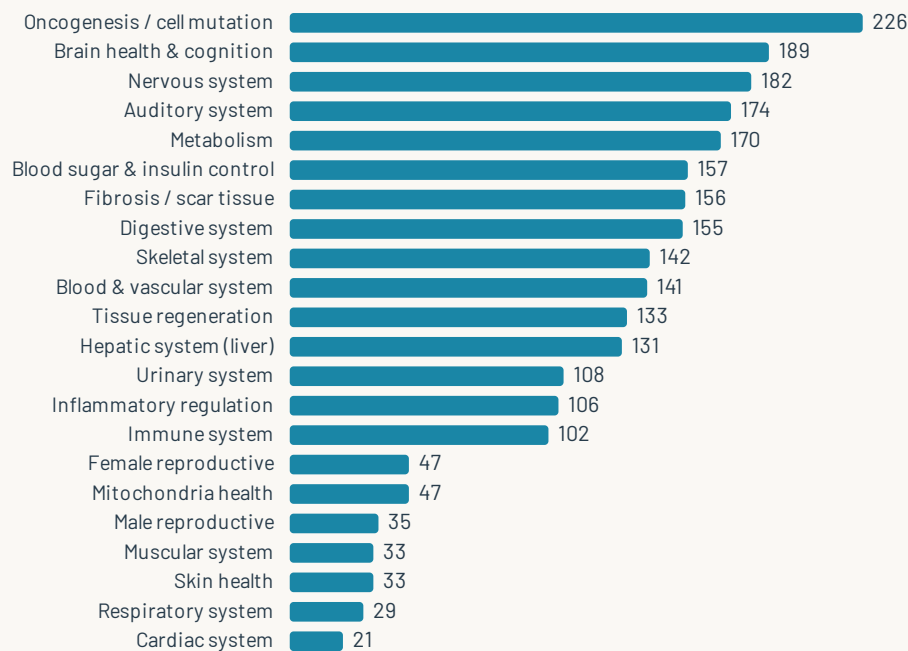
- Digestive system
- Hepatic system (liver)
- Blood sugar & insulin control
- Urinary system
- Metabolism

CELLULAR & IMMUNE

- Immune system
- Mitochondria health
- Inflammatory regulation
- Tissue regeneration
- Fibrosis / scar tissue formation
- Oncogenesis / cell mutation

Grouped here for reading. The reproductive system is reported for the person’s sex.

Markers behind each system



CpG markers per system · the reproductive panel follows the person's sex

Number of CpG markers informing each system, as published by the laboratory. Sites are shared between systems, so the counts add up to more than 460.

HOW IT WORKS

The clinical workflow



1. ORDER

The clinician orders the test and registers the patient in the clinical dashboard.

2. COLLECT

At-home collection kit or in-clinic blood draw using a standard lavender EDTA tube.

3. REVIEW

The clinician follows the sample and opens the patient report when it is ready.

4. PERSONALISE

The clinician reviews and customises the action plan in the patient's broader clinical context.

CLINICAL VALUE

Monitoring biological change over time

Repeat testing enables longitudinal comparison of epigenetic ageing profiles and may help characterise biological change over time.

01	BASELINE	See which systems show the highest relative ageing signals.
02	INTERVENE	Use the clinician-reviewed action plan alongside other clinical information.
03	RE-MEASURE	Compare system-level profiles across repeat assessments.

MEASURE → INTERVENE → RE-MEASURE → VERIFY

LIMITATIONS

Clinical note

Results provide information about biological ageing-associated epigenetic patterns and should be interpreted within the broader clinical context. Biological age, ageing-rate and system-level outputs are not diagnoses and should not be used independently to diagnose, prevent or treat disease, or to determine treatment efficacy.

Results should be considered alongside relevant clinical assessments, established biomarkers and professional judgement. Product configuration, intended use, laboratory workflow and regulatory status may vary by market.

HOW IT WORKS

The clinical flow

CLINICIAN

1	Order the test and register the patient in the dashboard
2	Monitor sample status
3	View the patient report
4	Review and personalise the action plan

PATIENT

1	Receives the collection kit at home
2	Kit registered: first update
3	Sample received and processing
4	Sample processed
5	Report ready
6	Views the report

The clinician orders and follows the test in the dashboard; the patient receives updates from kit to report.

HOW IT WORKS

The clinician dashboard

Patients

Kits

Samples

Reports

Action plans

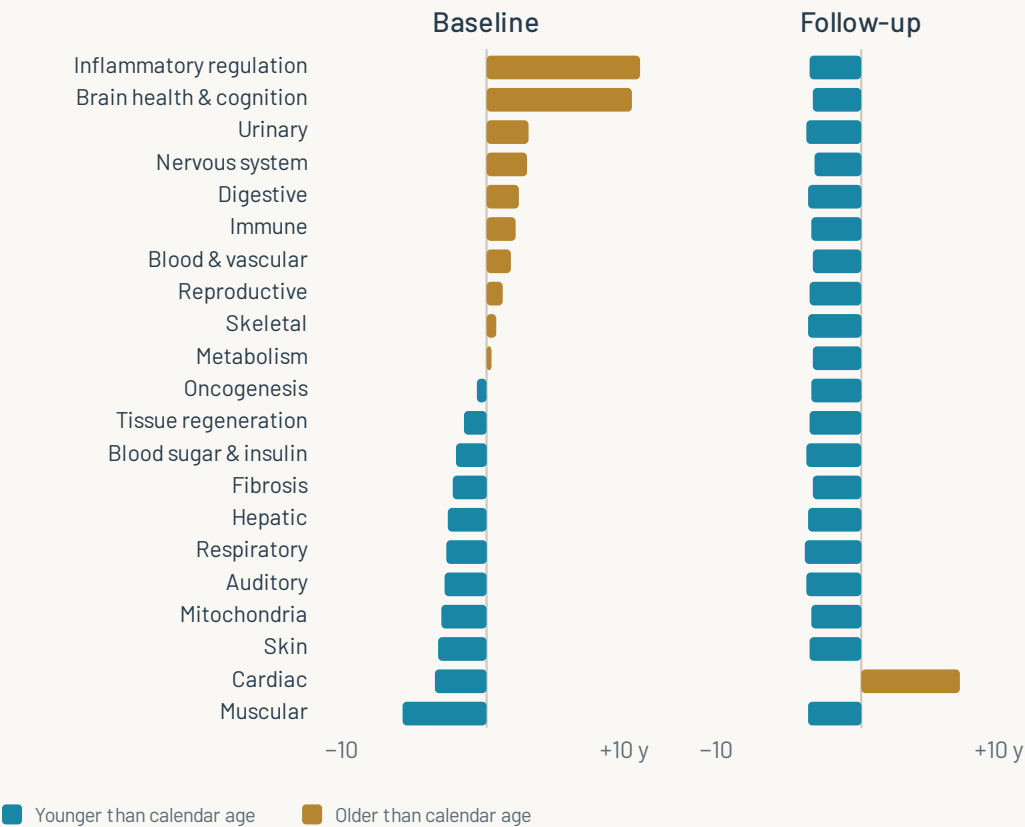
Sample status

Patient A		Registered
Patient B		In laboratory
Patient C		Report ready
Patient D		Report ready
Patient E		Kit dispatched

Manage · Track · Review · Personalise

Manage patients, kits and testing histories; track samples from registration to report; review results and repeat assessments; personalise system-specific action plans. Schematic.

Monitoring biological change over time



Example data: system age minus calendar age at baseline and follow-up. Repeat testing enables longitudinal comparison and may help characterise biological change. Observed changes should not be interpreted independently as evidence of treatment efficacy.

Laboratory analysis & quality framework

Analytical method

Samples are analysed on a custom DNA methylation microarray within an accredited international laboratory network. The applicable laboratory site, analytical scope and accreditation depend on the market and testing workflow.

Quality & ISO certifications

ISO/IEC 17025 accredited analytical and molecular testing methods; ISO 13485 quality-system requirements relevant to medical-device frameworks; selected clinical laboratories ISO 15189 and/or CAP accredited; GLP, GCP and GMP frameworks depending on service, site and scope. Accreditations apply to specific entities, sites and scopes, not necessarily to every analytical step.

Technical repeatability

One sample analysed three times across the selected CpG sites agreed 99.4–99.5% between runs, as reported by the laboratory. This shows technical repeatability, not clinical validity.

Research basis

The noise approach builds on peer-reviewed work on the limits of conventional methylation clocks and on the stochastic component of epigenetic ageing.

International & EU availability

INTERNATIONAL MARKETS Advanced Biological Age & Epigenetics ● The international version of the test ● 21 organ and physiological systems ● System-level epigenetic ageing profiles ● Biological noise and longitudinal comparison ● At-home collection kit or in-clinic blood draw using a standard lavender EDTA tube	EUROPEAN UNION EU version ● Talk to our team about availability in your market. info@bioagediagnostics.com · +45 22 70 47 24
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Selected sources

1. Mei X, Blanchard J, Luellen C, Conboy MJ, Conboy IM. Fail-tests of DNA methylation clocks, and development of a noise barometer for measuring epigenetic pressure of aging and disease. *Aging (Albany NY)*. 2023;15(17):8552–8575. doi: [10.18632/aging.205046](https://doi.org/10.18632/aging.205046) | PubMed PMID: [37702598](https://pubmed.ncbi.nlm.nih.gov/37702598/)

2. Tong H, Dwaraka VB, Chen Q, Luo Q, Lasky-Su JA, Smith R, et al. Quantifying the stochastic component of epigenetic aging. *Nat Aging*. 2024;4:886–901. doi: [10.1038/s43587-024-00600-8](https://doi.org/10.1038/s43587-024-00600-8)

3. Skinner CM, Conboy MJ, Conboy IM. DNA methylation clocks struggle to distinguish inflammaging from healthy aging, but feature rectification improves coherence and enhances detection of inflammaging. *GeroScience*. 2025;47(3):3043–3060. doi: [10.1007/s11357-024-01460-1](https://doi.org/10.1007/s11357-024-01460-1) | PubMed PMID: [39825170](https://pubmed.ncbi.nlm.nih.gov/39825170/)

4. Ma S, Wang S, Ye Y, Ren J, Chen R, Li W, et al. Heterochronic parabiosis induces stem cell revitalization and systemic rejuvenation across aged tissues. *Cell Stem Cell*. 2022;29(6):990–1005.e10. doi: [10.1016/j.stem.2022.04.017](https://doi.org/10.1016/j.stem.2022.04.017) | PubMed PMID: [35613617](https://pubmed.ncbi.nlm.nih.gov/35613617/)

WHITE-LABEL OPPORTUNITY

Your programme. Your brand. Our infrastructure.

The biological age test can be integrated into healthcare, longevity and preventive-health programmes as a branded or co-branded testing pathway, without building the laboratory infrastructure behind it.

White-label options can include

- Branded test kits and packaging
- Integration into existing clinic or longevity programmes
- Remote sample collection
- Laboratory analysis
- A patient-facing experience in your name
- Results delivered into your preferred reporting environment
- Repeat testing and longitudinal programmes

Partner value

REMOTE ACCESS

Sample collection at home, outside the clinic.

SYSTEM-LEVEL DEPTH

Organ- and system-specific ageing profiles with a clinician dashboard.

LONGITUDINAL USE

Repeat testing to follow change over time.

Advanced Biological Age & Epigenetics

Biological ageing insights for healthcare professionals.

Where Longevity Becomes Measurable.

info@bioagediagnostics.com · +45 22 70 47 24 · www.bioagediagnostics.com