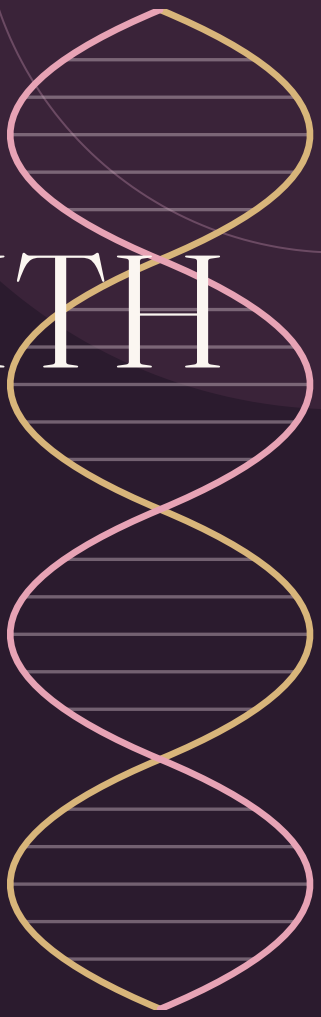
EPIGENETIC COACHING

LONDON • 2026

DANCING WITH *GENES IN MENOPAUSE*



A personalized guide to epigenetics, nutrigenetics and biological aging

DNA is not our destiny.

Knowledge is the beginning of healthy choices.

Prof. Dr. Gülsen Meral | MD, PhD, MBA
Epigenetic Coaching UK

SCIENTIFIC AWARENESS BOOKLET FOR THE PUBLIC

GETTING STARTED

What's in this booklet?

A short guide to making genetic information understandable, reliable and connected to everyday life.

03 Understanding menopause

04 What is epigenetics?

05 DNA methylation and gene expression

06 What your genes say, and what they don't

07 Choline, folate and one-carbon metabolism

08 Vitamin D, bone and individual differences

09 Biological age and epigenetic clocks

10 Microbiota and metabolic health

11 Healthy aging in daily life

12 Your personal roadmap

13 Short glossary and source notes

WOMEN'S HEALTH

Understanding menopause

Menopause is a natural stage of life. Everyone's experience is different.

WHEN?

Menopause is defined retrospectively as 12 months without a menstrual period in the absence of another cause. Perimenopause may begin with changes in the menstrual cycle and symptoms.

WHY DOES IT MATTER?

Changes in estrogen levels may be associated with hot flashes, sleep, mood, body composition, and bone and cardiometabolic health.

THERE IS NO SINGLE TYPE OF MENOPAUSE

Age, family history, lifestyle, genetic characteristics, coexisting conditions and personal preferences all change the assessment.

KEY MESSAGE · In menopause, the goal is not only to reduce symptoms but also to protect long-term health.

CORE SCIENCE

What is epigenetics?

The same DNA sequence can be used in different ways in different cells and under different environmental conditions.

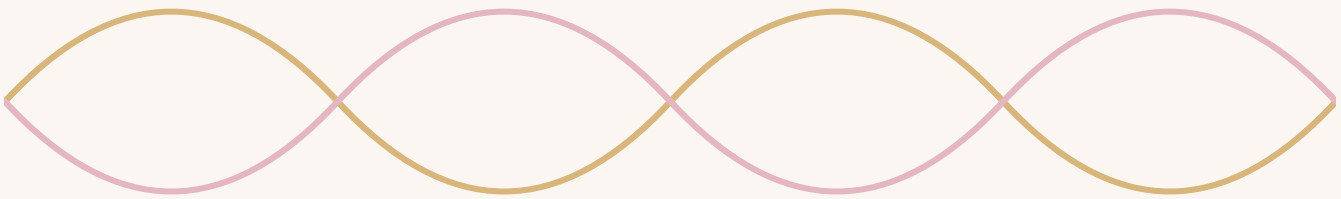
GENOME AND EPIGENOME

The genome describes the DNA sequence; the epigenome describes the chemical marks and chromatin features that help regulate gene activity.

THREE MAIN MECHANISMS

DNA methylation, histone modifications and non-coding RNA–based regulatory mechanisms play a role in gene expression.

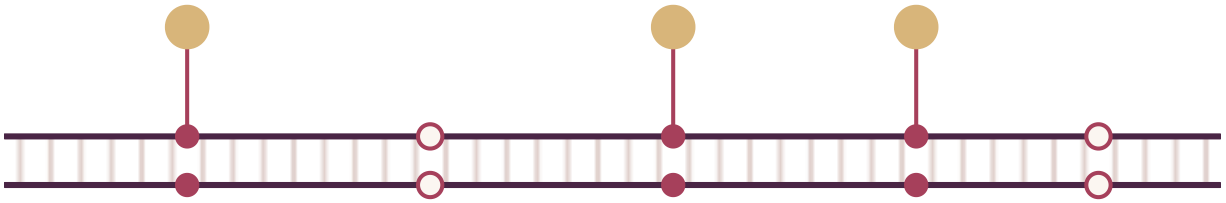
Nutrition, physical activity, smoking, stress and other environmental factors are associated with epigenetic patterns. However, not every epigenetic change is permanent or reversible.



MOLECULAR MECHANISM

How does DNA methylation work?

Most epigenetic clocks use methylation patterns at specific CpG sites.



CpG sites on DNA • methyl groups

METHYLATION IS NOT ALWAYS "SWITCHING OFF"

Increased methylation, particularly in some promoter regions, is associated with decreased gene expression. The effect depends on genomic location and cell type.

HOW IS IT MEASURED?

DNA is obtained from blood or another suitable sample; the methylation levels of selected CpG sites are analyzed using laboratory methods.

NUTRIGENETICS

What do your genes say?

An SNP is a common single-nucleotide difference in the DNA sequence.

01

MTHFR

Associated with folate metabolism. A variant alone does not mean a disease diagnosis or an automatic need for supplements.

02

PEMT

A gene associated with choline and phosphatidylcholine synthesis. Estrogen signaling and nutritional status also matter.

03

VDR / GC / CYP2R1

Genes associated with vitamin D signaling, transport and metabolism. Serum 25(OH)D level and clinical status are evaluated together.

04

FADS1

Plays a role in the metabolism of polyunsaturated fatty acids; omega-3 dose is not determined by genotype alone.

Genetic variant ≠ definitive clinical outcome. Effect size, level of evidence and the person's health data should be interpreted together.

METHYLATION AND NUTRITION

Choline, folate and the one-carbon cycle

Biochemical context is important for understanding nutrient needs in menopause.

ESTROGEN AND PEMT

Estrogen may support phosphatidylcholine synthesis in the liver via PEMT. A decline in this biological support with menopause may make dietary choline intake more important in some women.

METHYL DONORS

Folate, vitamin B12, choline, betaine and methionine take part at different stages of one-carbon metabolism.

PRACTICAL APPROACH

Routine high-dose supplementation should not be planned without evaluating dietary pattern, medications, laboratory results, kidney function and coexisting conditions together.

BONE AND VITAMINS

Vitamin D and bone health

Post-menopausal bone health is not about a single vitamin.

VITAMIN D PATHWAY

25(OH)D can be converted to the active form $1,25(OH)_2D$ via CYP27B1. The active form interacts with VDR; the VDR-RXR complex regulates gene expression.

PERSONAL RISK ASSESSMENT

Bone mineral density, fracture history, age at menopause, physical activity, protein/calcium intake and, when needed, laboratory tests are evaluated holistically.

WHAT DOES NUTRIGENETICS ADD?

Variants such as VDR, GC and CYP2R1 are valuable in research; however, a single SNP result does not determine osteoporosis treatment or vitamin D dose.

EPIGENETIC CLOCKS

What is your biological age? How fast are you aging?

DNA methylation–based algorithms were developed to answer different questions.

01 Horvath / Hannum

Estimates age from methylation patterns.

02 PhenoAge / GrimAge

Produces indicators of biological aging associated with health outcomes and mortality.

03 DunedinPACE

A DNA methylation biomarker designed to estimate the pace of biological aging.

Important distinction: A change in an epigenetic clock does not prove that all of a person's organs have become younger or that disease risk has definitely decreased. The clinical uses of these tools are still evolving.

MICROBIOTA

Gut, nutrition and metabolism

The microbiota is one of the important layers of personalized health assessment under investigation.

GUT ECOSYSTEM

Microorganisms are associated with the fermentation of fibers, short-chain fatty acids and the production of some metabolites.

RELATIONSHIP WITH MENOPAUSE

Reciprocal relationships between hormonal status and the microbiota are being studied. However, a single stool test cannot determine the cause or treatment of menopausal symptoms.

IN DAILY LIFE

A variety of plant foods, well-tolerated fiber sources, regular physical activity and adequate sleep are general lifestyle elements that support microbial diversity.

PERSONALIZED LIVING

The cornerstones of healthy aging

Do not let a genetic result matter more than daily behaviors: strong evidence is often found in lifestyle.

01

Movement

Combine aerobic activity and resistance exercise suited to your age and health status.

02

Nutrition

Build a pattern with adequate protein, a variety of vegetables and fruits, whole foods and your individual tolerance.

03

Sleep and stress

Regular sleep hours, stress management and social connections are part of holistic health.

04

Preventive health

Do not neglect breast and cervical screenings or bone and cardiometabolic risk assessments.

IMPLEMENTATION GUIDE

Your personal roadmap

The aim is not to search for a single "perfect gene"; it is to tailor evidence-based steps to the individual.

01

1. Listen to the story

Symptoms, lifestyle habits, family history, medications and goals.

02

2. Measure when needed

Clinical assessment, appropriate biomarkers and genetic analysis only when meaningful.

03

3. Plan together

Align nutrition, movement, sleep and physician evaluation with the necessary treatments.

04

4. Monitor and reassess

Track not only test scores but also symptoms, function and quality of life.

Personalized longevity = *scientific evidence + clinical context + individual preference.*

SHORT GLOSSARY

Scientific terms, plain explanations

A mini glossary you can consult while reading the booklet.

01	**SNP**	A common single-nucleotide difference in the DNA sequence.
02	**CpG**	A sequence in DNA where cytosine and guanine lie next to each other; an area where methylation is frequently studied.
03	**DNA methylation**	A chemical epigenetic mark on DNA.
04	**Epigenetic clock**	A model that uses methylation patterns to calculate age or aging-related indicators.
05	**Nutrigenetics**	The field that studies the relationship between genetic differences and the response to nutrients.

FINAL WORD

Dancing with genes is possible

A journey that begins with scientific curiosity gains meaning through sustainable habits.

“DNA is not our destiny.”

Menopause is not an end; it is a new period for re-evaluating our health, understanding personal risks and making more conscious choices.

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Scientific note: This booklet is for general information purposes; it is not a diagnosis, treatment or individual supplement prescription. Epigenetic age measurements should not be used alone for treatment decisions.

Content basis: Prof. Dr. Gülsen Meral’s presentation on menopause, nutrigenetics and epigenetics. Design approach: a short, sectioned example–genetics–guide format. Visuals and texts have been re-prepared for this booklet.

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