



# The Microbiome's Crucial Role in Women's Wellness

A Comprehensive Overview of the Gut and Vaginal Microbiome's Impact on Female Health Across the Lifespan





# Women's Wellness: A Lifelong Journey

## The Unseen Ally

Gut and vaginal microbiomes play pivotal roles in overall well-being and reproductive health.

## Empowerment Through Knowledge

Understanding the microbiome enables proactive, personalised approaches to health.



### Hormonal Balance

Menstrual regularity and hormonal equilibrium



### Fertility & Reproduction

Reproductive outcomes and pregnancy health



### Menopausal Support

Symptom management and metabolic health



### Mental Wellness

Mood regulation and cognitive performance

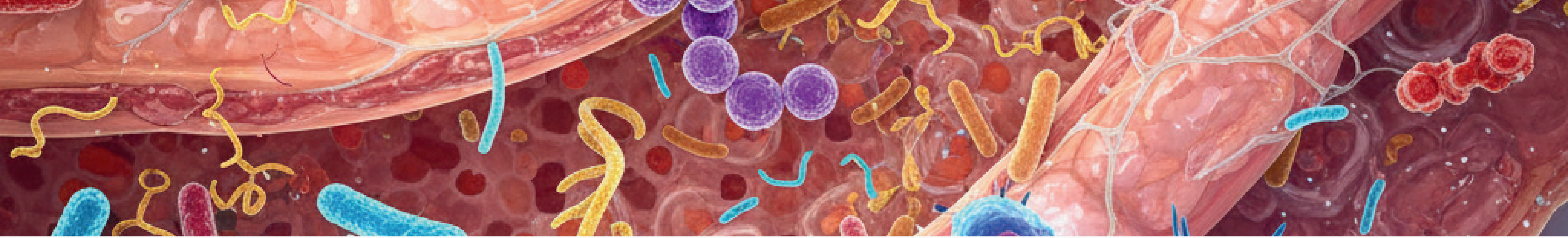
# The Microbiome: Your Body's Hidden Universe

Trillions of microorganisms—bacteria, archaea, fungi, and viruses—residing in and on the body, with the gut microbiome being one of the most significant communities.



❏ **Dysbiosis:** Imbalance in microbial composition linked to digestive disorders, chronic disease, and mental health conditions.





# Gut Microbiome: Central Regulator of Female Physiology

## The Estrobolome

Gut bacteria produce  $\beta$ -glucuronidase to activate oestrogen. Dysbiosis leads to lower enzyme activity, resulting in reduced active oestrogen and irregular cycles.

## Gynaecological Cancer Links

- **Breast:** Increased *Clostridiales*
- **Ovarian:** Increased *Prevotella*
- **Cervical:** Increased *Proteobacteria*, decreased *Bacteroides*



# Vaginal Microbiome: Nature's Protective Shield

## Healthy Balance

Dominated by *Lactobacillus* species producing lactic acid, creating an acidic, pathogen-resistant environment.

## When Disrupted

Bacterial Vaginosis (BV): Decrease in *Lactobacillus* allows harmful bacteria overgrowth.

1

### Healthy Microbiome

*Lactobacillus* dominance maintains protective acidic environment

2

### Dysbiosis Occurs

Beneficial bacteria decrease, harmful microbes proliferate

3

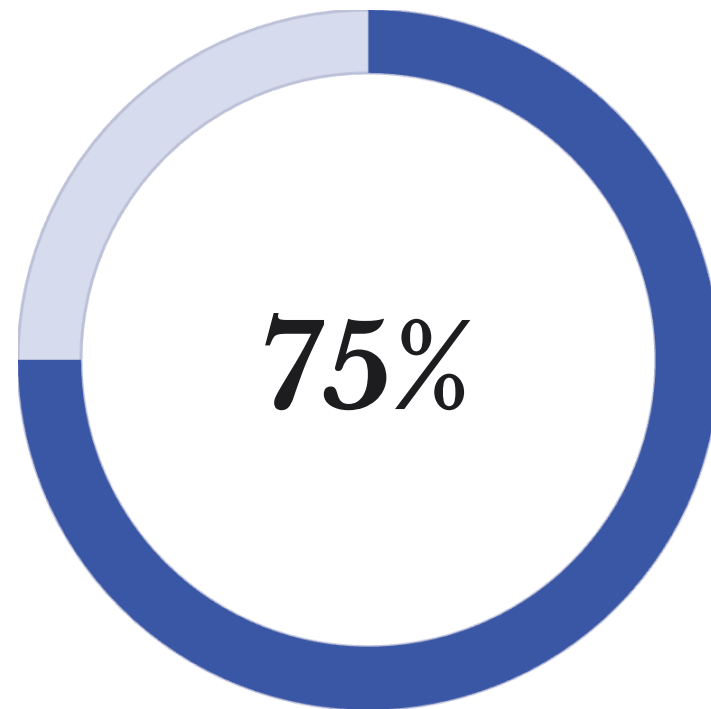
### Increased Risks

Preterm birth, miscarriage, infertility, postpartum infections

❏ **Group B Streptococcus (GBS):** Can cause life-threatening infections in newborns; screening and antibiotics are standard care.

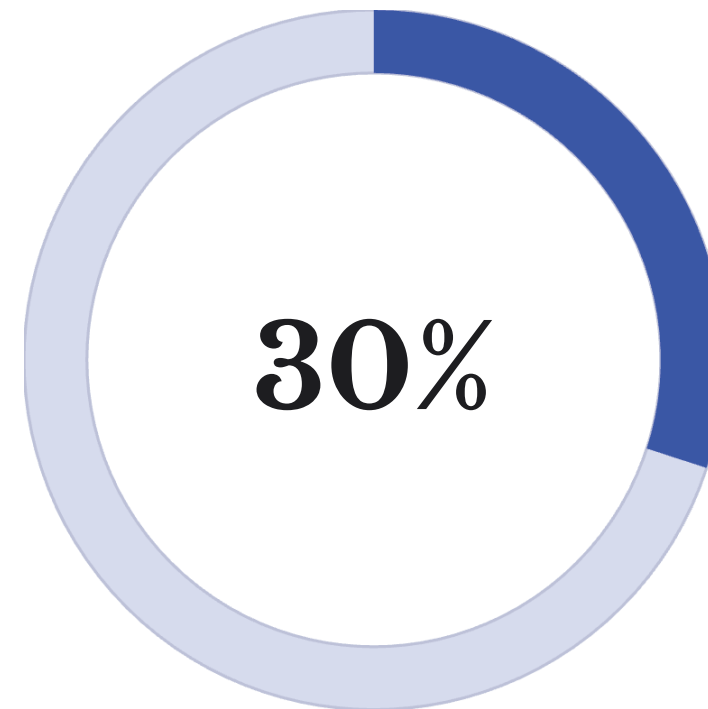
# Vaginal Microbiome Test: Why It's Essential

Silent microbial imbalances can lead to recurrent infections, fertility issues, pregnancy risks, and menopausal discomfort.



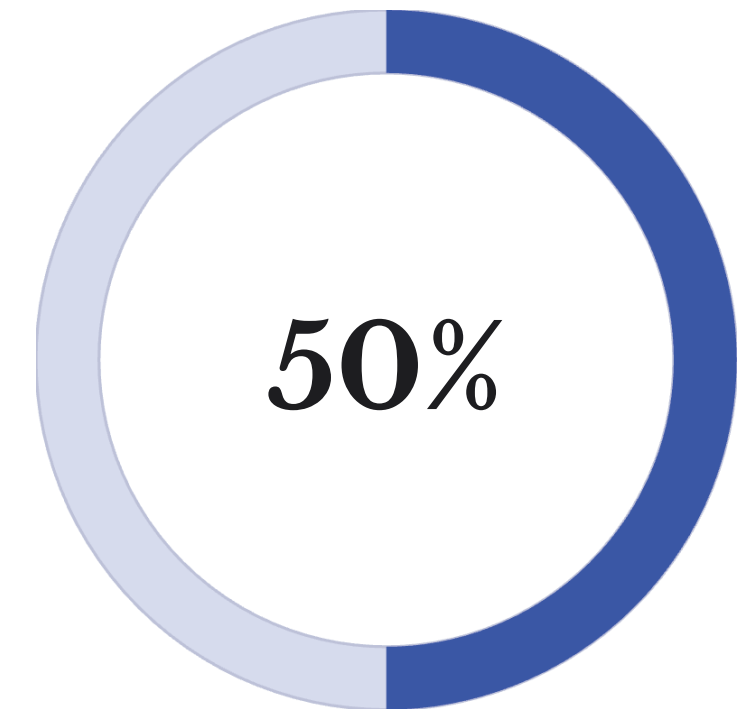
## Yeast Infections

Women experience yeast infections



## Recurrent UTIs

Women suffer from recurrent UTIs



## Menopausal Discomfort

Women experience discomfort linked to vaginal health

Early Detection is Key: Understanding your unique vaginal microbiome allows you and your doctor to take proactive steps to restore balance and prevent complications.



# Microbiome's Role in PCOS

Gut bacteria metabolise sex hormones, regulating estrogen and steroid balance. PCOS affects 8–13% of reproductive-age women.

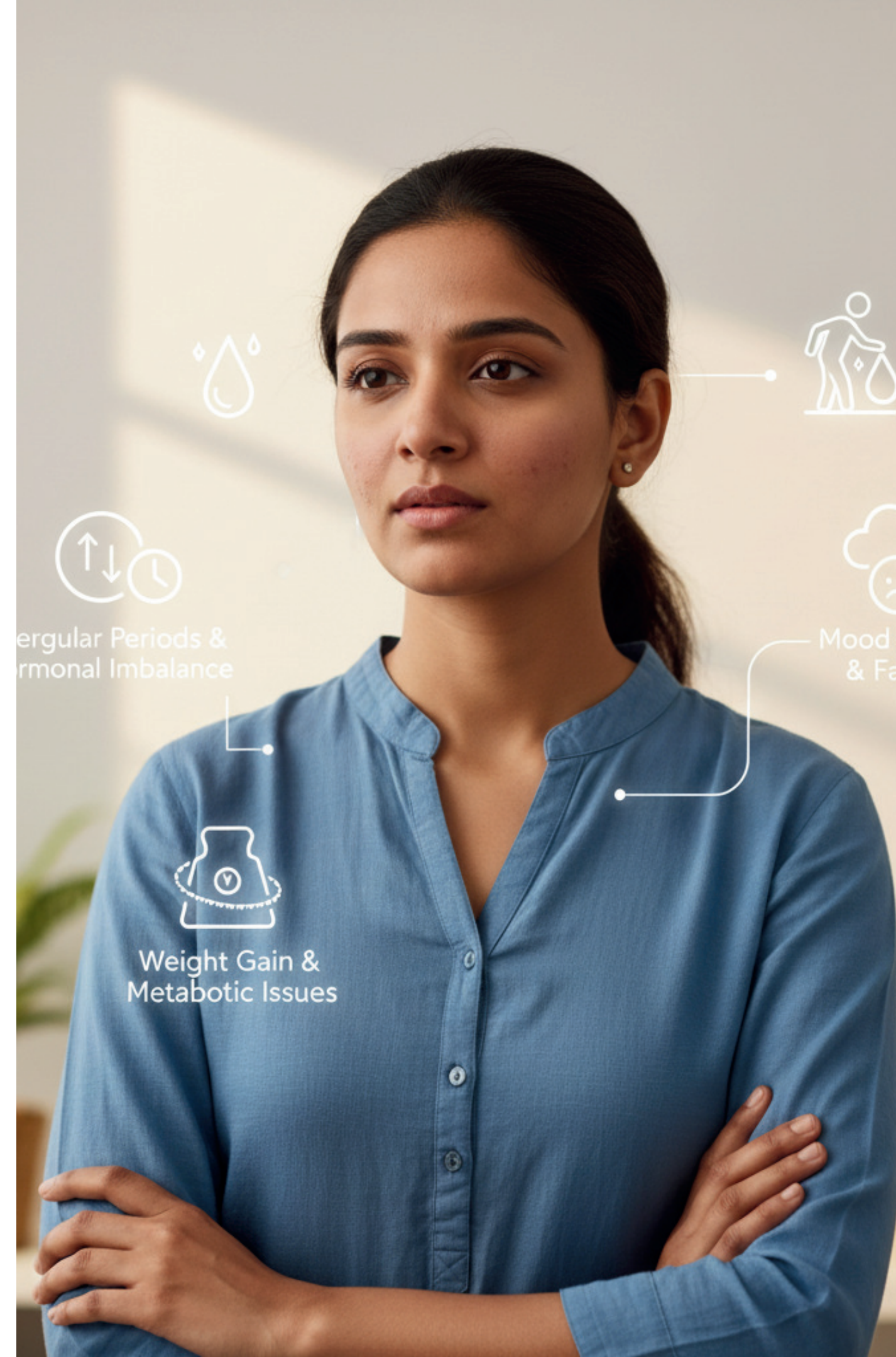
## Microbiome Changes

**Increased:** *Bacteroides vulgatus*, *Firmicutes*, *Streptococcus*

**Decreased:** *Akkermansia*, *Ruminococcaceae*, *Bacteroidetes*

## PCOS Characteristics

- Insulin resistance
- Hyperandrogenism
- Metabolic dysfunction







# Microbiome & Pregnancy Outcomes

Hormones, diet, and immunity reshape the maternal microbiome during gestation, with significant implications for both mother and baby.

1

## Preterm Birth & Low Birth Weight

Vaginal *Lactobacillus* absence; infants lack *Bifidobacterium/Lactobacillus*

2

## Preeclampsia

Decreased *Prevotella* and *Lactobacillus* levels

3

## Gestational Diabetes

Increased Firmicutes, decreased *Bacteroidetes* and *Actinobacteria*

4

## Maternal Obesity

Microbiome linked to weight gain and foetal growth restriction



# Menopause & Microbiome Changes

1

## Estrogen Decline

Menopause reduces gut microbial diversity, leading to dysbiosis

2

## Microbial Shifts

Beneficial bacteria decrease whilst potentially harmful bacteria increase

3

## Health Consequences

Weight gain, metabolic changes, and increased health risks



**Emerging Research:** *Prevotella* may protect postmenopausal bone mass, though further research is needed.



# Mental Health and the Gut-Brain Connection

The microbiome influences neurotransmitter production and mood regulation, with profound implications for women's mental wellness.

## Gut Microbiome

Produces neurotransmitters and inflammatory signals

## Mental Wellness

Optimised gut health improves mood, energy, and well-being

## Brain Function

Receives microbial signals affecting mood and cognition

## Pregnancy & Postpartum

Dysbiosis increases maternal stress, anxiety, and postpartum depression risk

## Intergenerational Impact

Prenatal stress leads to offspring gut dysbiosis via inflammatory gene expression



# Vaginal Test: Who Should Get Tested?

Our test is especially recommended for:



## Women with Recurrent Issues

Experiencing recurrent infections (BV, yeast infections), unusual discharge, or odor.



## Pregnant Women

Seeking to reduce the risk of complications like preterm birth.



## Couples Planning Pregnancy

Planning pregnancy or undergoing fertility treatments.



## Menopausal Women

Managing dryness, irritation, or recurrent UTIs.





# Research Supporting the Role of Microbiome

## Menopausal Microbial Shift

Estrogen decline reduces gut microbial diversity, linked to obesity, cardiovascular disease, osteoporosis, and cognitive decline.

## Estrogen-Microbiome Axis

Estrobolome enzymes metabolise and reactivate estrogen, regulating circulating levels. Estrogen shapes gut microbiota in a dynamic feedback loop.

## Vaginal Microbiome CSTs

Healthy Lactobacillus-dominant CSTs create acidic, protective environment. Dysbiosis increases infection risk significantly.

## The vaginal microbiome in health and disease

**Bryan A. White<sup>1,2,\*</sup>, Douglas J. Creedon<sup>3</sup>, Karen E. Nelson<sup>4</sup>, and Brenda A. Wilson<sup>1,5,\*</sup>**

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### Abstract

Infections of the vaginal tract result from perturbations in the complex interactions between the microbiome and the host vaginal ecosystem. Recent data have linked specific vaginal microbes and urogenital infection with pre-term birth. Here we discuss how next generation sequencing-based approaches to study the vaginal microbiome will be important for defining what constitutes an imbalance of the microbiome and the associated host conditions that lead to subsequent infection and disease states. These studies will provide clinicians reliable diagnostic tools and

References: Park, S.L. et al. (2025); Siddiqui, R. et al. (2022); Kroon, S.J. et al. (2018); Punzón-Jiménez, P. & Labarta, E. (2021)



# Research Supporting the Role of Microbiome



## Fertility Outcomes

Lactobacillus-dominant genital microbiome leads to higher IVF success rates. Non-Lactobacillus-dominant microbiomes result in implantation failure.



## Dysbiosis & Gynecological Pathologies

Bacterial vaginosis and microbial imbalance increase preterm birth, chronic endometritis, and STI susceptibility risks.



## Therapeutic Potential

Microbiome profiling can predict IVF outcomes. Targeted probiotics improve PCOS and postmenopausal vascular and bone health.

## Cervicovaginal microbiota, women's health, and reproductive outcomes

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## Menopausal shift on women's health and microbial niches

 Check for updates

Maria R. Nieto<sup>1</sup>, Maria J. Rus<sup>1</sup>, Victoria Areal-Quecuty<sup>1</sup>, Daniel M. Lubián-López<sup>2,3,4</sup> & Aurea Simon-Soro<sup>1</sup>✉

Menopause marks a key milestone in women's aging, triggering hormonal, histological, and microbiome changes. This review explores how hormonal shifts during menopause alter the microbiome's composition, affecting oral, intestinal, and urogenital communities, potentially leading to disease. The microbial metabolism of sex hormones highlights the bidirectional relationship between hormones and the microbiome. Understanding this interplay is crucial for developing personalized interventions to restore microbial balance and improve women's health during menopause.



# Biomend Lifesciences: Your Microbiome Partner



## Who We Are

Precision genomics company specializing in microbiome science and personalized health solutions



## Our Goal

Make microbiome testing accessible, clinically relevant, and actionable for doctors and individuals



## Our Services

State-of-the-art Gut and Vaginal Microbiome Profiling to decode your unique microbial signature





# From Sample to Actionable Insights

Our process is simple, non-invasive, and rooted in science.



## Easy At-Home Collection

Use our simple, painless collection kit with vaginal swab



## Advanced NGS Analysis

Cutting-edge shotgun sequencing maps your microbiome with precision



## Personalized Digital Report

Detailed report with microbiome profile, risk indicators, and recommendations





# Our Technology: Shotgun Metagenomics

We use advanced Shotgun Metagenomics, the gold standard in microbiome analysis.

## Comprehensive Analysis

Identifies bacteria, fungi, viruses, and archaea with complete coverage

## High Resolution

Provides species and strain-level precision for accurate diagnosis

## Functional Insights

Reveals not just who is there, but what they are doing through functional genes

**Unmatched Accuracy:** Powered by proprietary databases of 240,000+ microbial genomes and microbiome-disease associations.



# Therapeutic Approaches

## Probiotics, Prebiotics, and Diet

### Probiotics

- **PCOS:** *Lactobacillus acidophilus*, *Bifidobacterium bifidum*, *L. reuteri*, *L. fermentum* ameliorate symptoms
- **Pregnancy:** Probiotics prevent bacterial vaginosis and lower preeclampsia risk
- **Menopause:** Specific strains alleviate vascular dysfunction

### Dietary & Prebiotic Strategies

- Personalised nutrition improves health markers (HbA1c, blood pressure, inflammatory markers)
- Breast milk provides natural prebiotics for infant gut development







# Key Takeaways



## A Fundamental Pillar

Gut and vaginal microbiomes impact hormonal, metabolic, reproductive, and mental health across the lifespan.



## Dysbiosis

Linked to PCOS, infertility, pregnancy complications, and menopausal symptoms.



## Proactive Management

Diet, probiotics, and lifestyle can maintain a healthy microbiome throughout life.



## The Future is Personalised

Microbiome assessment empowers women to optimise their health through targeted interventions.





# Contact Us

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