



Your Microbiome Matters! The Role of Probiotics in Women's Health

Dr Iveta Garaiova
18th June 2026

THE PRO-VEN STORY

FROM RESEARCH TO INNOVATION



1994

Founded

by microbiologists
Drs Nigel & Sue Plummer
to explore the potential of
friendly bacteria in the
human microbiome.



2012

Pro-Ven® launched

to bring our very own
bacteria blend
to the public.



TODAY



Sold in **20+** countries



35+ clinical trials



30+ years of microbiome
expertise and innovation



PROPRIETARY PROBIOTIC CONSORTIA

Lab4®

Lab4B

Lab4P

Lab4S



Driven by
science



Focused on
innovation



Backed by
research



Dr Nigel Plummer
CEO, Cultech Ltd / PRO-VEN

Microbiologist • International Speaker • Probiotic Expert

RESEARCH COLLABORATIONS

Imperial College
London

CARDIFF
UNIVERSITY
PRIFYSGOL
CAERDYDD

Swansea University
Prifysgol Abertawe

LIVERPOOL
JOHN MOORES
UNIVERSITY

LSTM
LIVERPOOL SCHOOL
OF TROPICAL MEDICINE

The University
Of Sheffield.



JUVENALIA
DETSKÉ ZDRAVOTNÉ CENTRUM



COMAC MEDICAL
EXPERTS IN CLINICAL RESEARCH

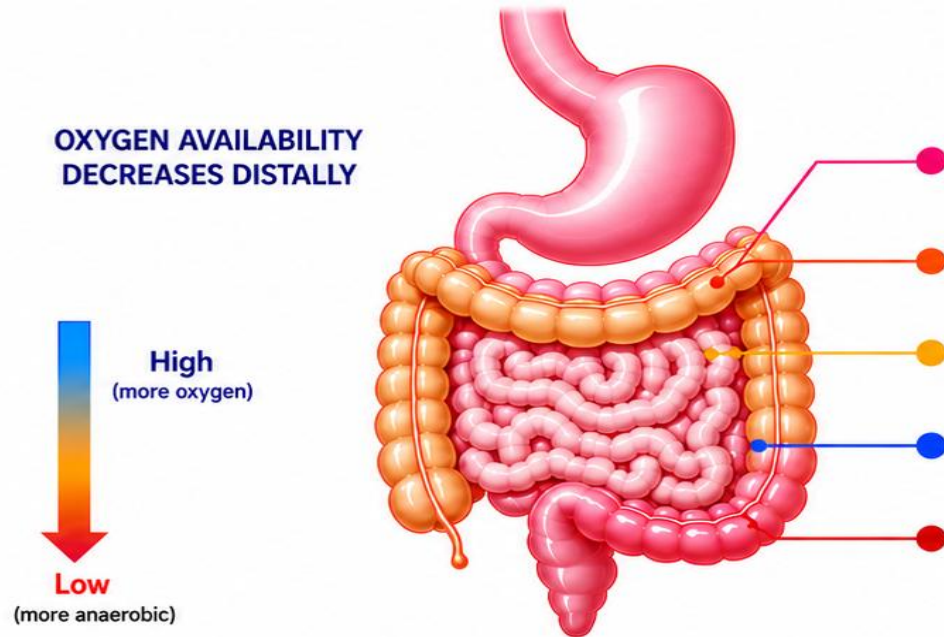
indigo

Cambridge
University Hospitals
NHS Foundation Trust

NHS

and other UK and international
research partners

ADULT HUMAN GUT MICROBIOTA: COMPOSITION AND FUNCTION



GUT REGION		APPROXIMATE MICROBIAL DENSITY (cells/g content)
	Stomach	$10^1 - 10^3$
	Duodenum	$10^2 - 10^4$
	Jejunum	$10^3 - 10^5$
	Ileum	$10^7 - 10^8$
	Colon	$10^{11} - 10^{12}$



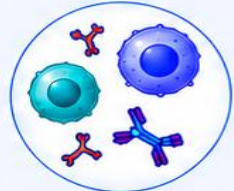
DIGESTION

Supports digestion and nutrient absorption; produces vitamins (e.g., K and B vitamins) through microbial synthesis; ferments dietary fibre.



BARRIER

Maintains intestinal barrier integrity and protects against pathogen colonisation and infection.



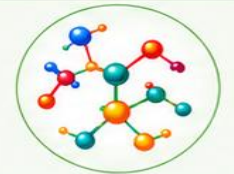
IMMUNITY

Supports immune development after birth and helps regulate immune responses to maintain immune balance.



GUT-BRAIN AXIS

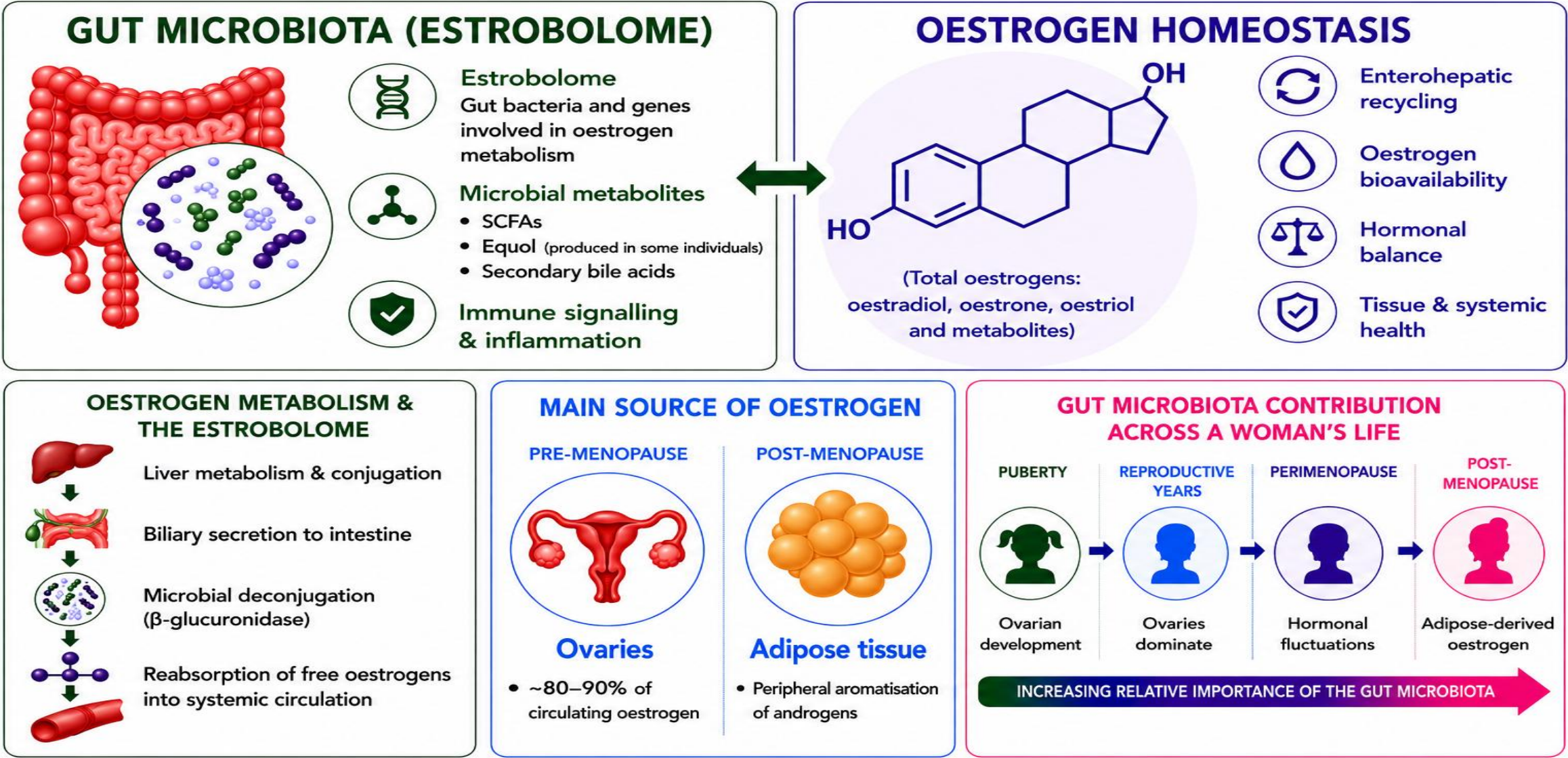
Facilitates bidirectional communication via neural, endocrine, immune and microbial metabolite pathways, influencing brain function and behaviour.



METABOLISM

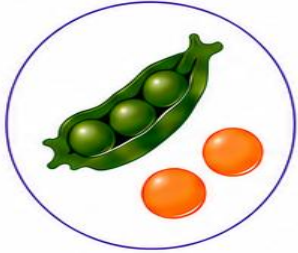
Produces SCFAs and other bioactive metabolites; performs biotransformation of dietary and endogenous compounds to support metabolic health.

GUT MICROBIOTA AND OESTROGEN HOMEOSTASIS



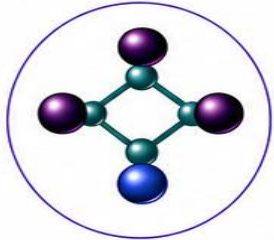
MICROBIOTA-DERIVED BIOACTIVES AND INTERVENTIONS

MICROBIOTA-DERIVED BIOACTIVES



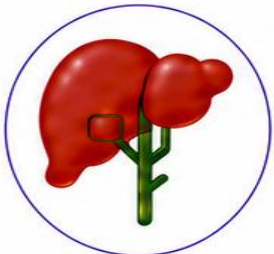
EQUOL

- Produced from daidzein by specific gut bacteria
- Selective oestrogen receptor β (ER β) activity
- Associated with menopausal, bone and cardiometabolic health



SHORT-CHAIN FATTY ACIDS (SCFAs)

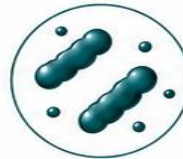
- Produced by fermentation of dietary fibre
- Support immune regulation and inflammatory balance
- Support gut barrier function and metabolic health



SECONDARY BILE ACIDS

- Produced from primary bile acids by gut microbiota
- Activate nuclear receptors (FXR, TGR5)
- Influence metabolic and endocrine signalling pathways relevant to oestrogen homeostasis

PROBIOTICS



1

SUPPORT MICROBIAL DIVERSITY AND BALANCE

- Support a diverse and balanced gut microbiota



2

SUPPORT MICROBIAL PATHWAYS INVOLVED IN OESTROGEN METABOLISM

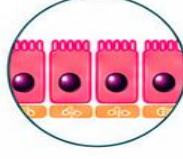
- Influence microbial metabolism of oestrogens
- May support enterohepatic oestrogen metabolism



3

INCREASE BENEFICIAL MICROBIAL METABOLITES

- SCFAs
- Potentially equol (in equol-producing individuals)



4

SUPPORT GUT BARRIER FUNCTION

- Strengthen gut barrier integrity
- Reduce intestinal permeability

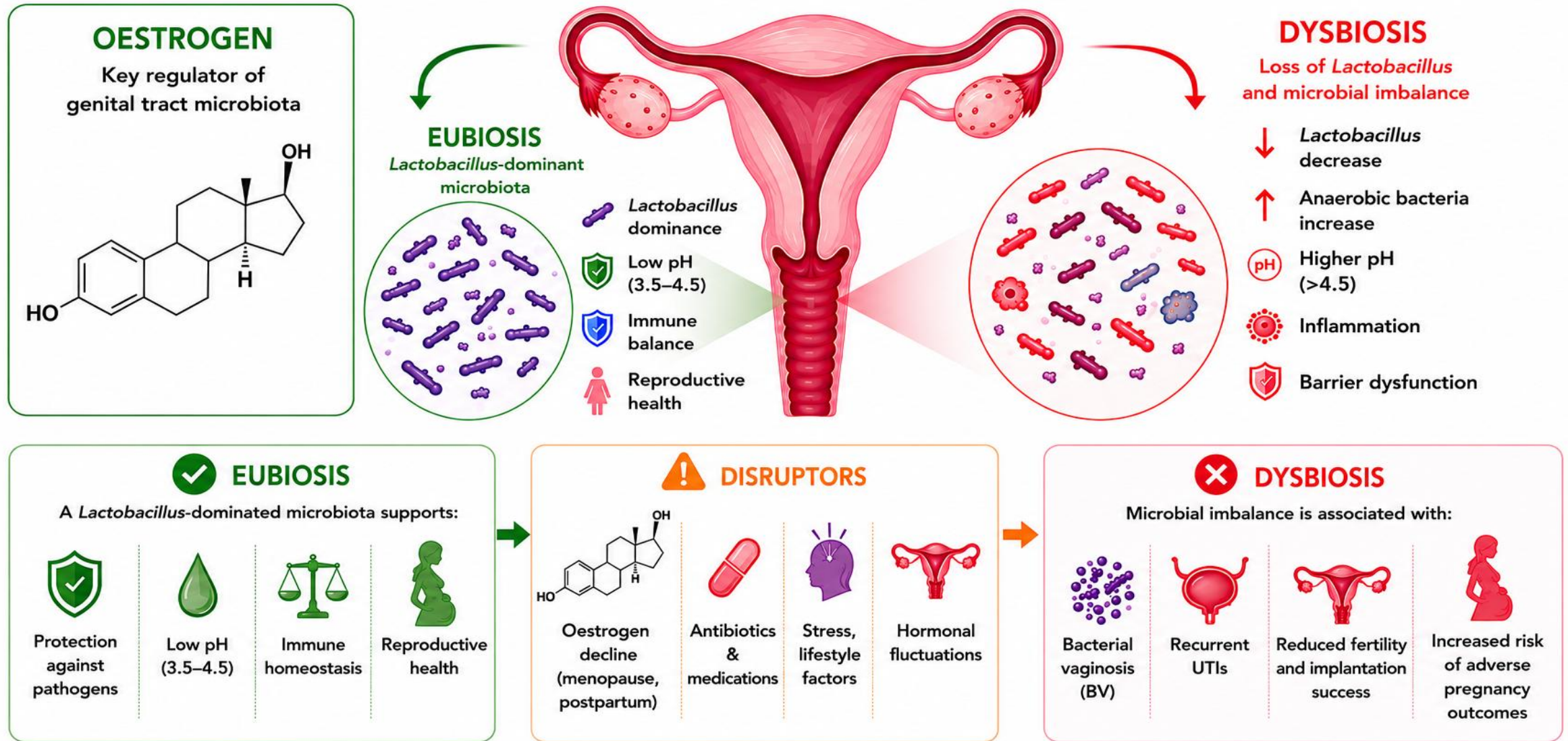


5

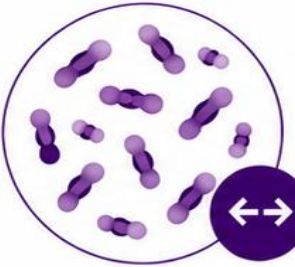
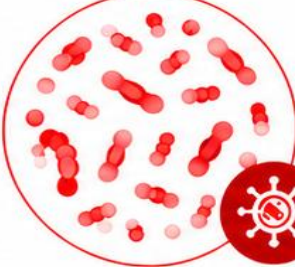
MODULATE IMMUNE AND INFLAMMATORY RESPONSES

- Support immune homeostasis
- Promote anti-inflammatory pathways

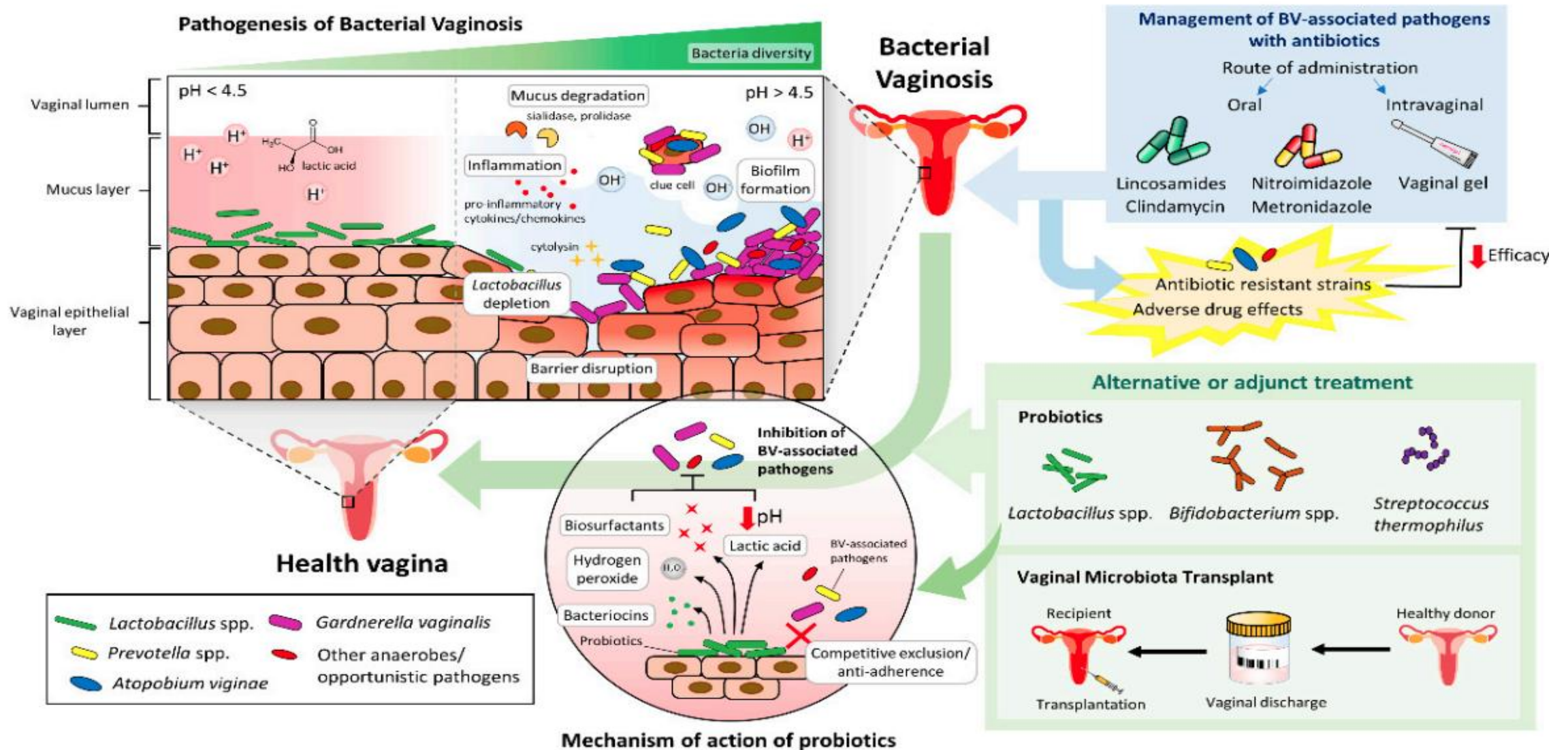
FEMALE GENITAL TRACT MICROBIOTA



VAGINAL MICROBIOTA – COMMUNITY STATE TYPES (CSTs)

CST I STABLE	CST II DYNAMIC	CST III TRANSITIONAL	CST IV DYSBIOTIC	CST V STABLE	NOT CLASSIFIED (Other <i>Lactobacillus</i>)
<i>Lactobacillus crispatus</i> DOMINATED	<i>Lactobacillus gasseri</i> DOMINATED	<i>Lactobacillus iners</i> DOMINATED	Anaerobic bacteria DOMINATED	<i>Lactobacillus jensenii</i> DOMINATED	<i>Lactobacillus</i> spp. DOMINATED
					
 Low vaginal pH < 4.0	 Vaginal pH ~ 4.4	 Vaginal pH > 4.5	 Vaginal pH > 4.5	 Vaginal pH ~ 4.2	 Vaginal pH ≤ 4.5
 Strong lactic acid production	 Lactic acid production	 Lower lactic acid production	 Low lactic acid production due to low <i>Lactobacillus</i>	 Strong lactic acid production	 Lactic acid production
 Most protective community state	 Generally healthy state	 Sensitive to environmental changes	 Associated with BV (<i>Atopobium</i> , <i>Gardnerella</i> , <i>Prevotella</i>)	 Stable and protective state	 Isolated from healthy and asymptomatic women
 Transition to diseased state is very rare	 Transition to CST I can occur rarely during pregnancy	 Associated with elevated IL-1α, IL-18 and TNF-α	 Increased risk of STIs, preterm labour, miscarriage	 No transition to other CST was reported	 Generally indicative of a healthy state

MECHANISM OF ACTION OF PROBIOTICS IN BACTERIAL VAGINOSIS



PROBIOTICS FOR BACTERIAL VAGINOSIS

KEY CLINICAL BENEFITS



Improved clinical outcomes and cure rates



Reduced BV recurrence (up to 45%)



Improved Nugent scores



Restoration of a *Lactobacillus*-dominant vaginal microbiota



Increased *Lactobacillus* spp. abundance

PROBIOTIC STRAINS WITH CLINICAL EVIDENCE

MOST STUDIED STRAINS

- *Lacticaseibacillus rhamnosus* GR-1® + *Limosilactobacillus reuteri* RC-14®
- *Lactobacillus crispatus* (CTV-05 / Lactin-V®)

ADDITIONAL STRAINS EVALUATED IN CLINICAL STUDIES

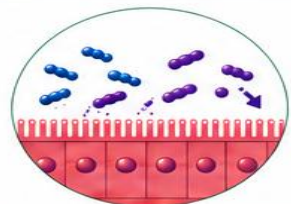
- *Lactobacillus acidophilus*
- *Lacticaseibacillus rhamnosus* (Lcr35)
- *Lactobacillus fermentum*
- *Lactobacillus plantarum*
- *Lactobacillus gasseri*

ROUTES EVALUATED IN CLINICAL STUDIES

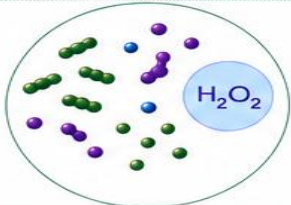
- Oral administration
- Vaginal administration

PROBIOTICS AND VULVOVAGINAL CANDIDIASIS

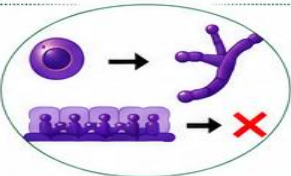
MECHANISMS OF ACTION



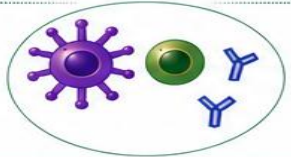
1 Inhibition of adhesion and colonisation



2 Production of antimicrobial compounds



3 Suppression of virulence and biofilm formation



4 Immune modulation

SUMMARY EVIDENCE



Evidence from 2026 systematic review and meta-analysis (Chen *et al.*)

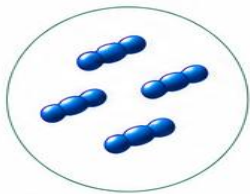
14 randomised controlled trials

Probiotics used as an adjunct to antifungal therapy improved:

Outcome	Effect (Probiotics + Antifungal vs Antifungal Alone)	<i>p</i> value
Clinical cure (<1 month) ✓	↑ 41% higher cure rate	<i>p</i> = 0.001
Mycological cure (<1 month) 🔬	↑ 19% higher cure rate	<i>p</i> = 0.02
Recurrence (6 months) ↻	↓ 80% lower recurrence rate	<i>p</i> = 0.03

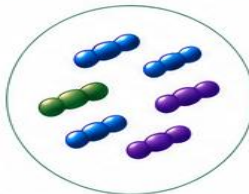
STUDIED PROBIOTIC STRAINS

SINGLE STRAINS STUDIED



- *Lactobacillus crispatus*
- *Lactobacillus gasseri*
- *Lactobacillus jensenii*
- *Lactobacillus plantarum*
- *Lactobacillus fermentum*
- *Lactobacillus acidophilus*

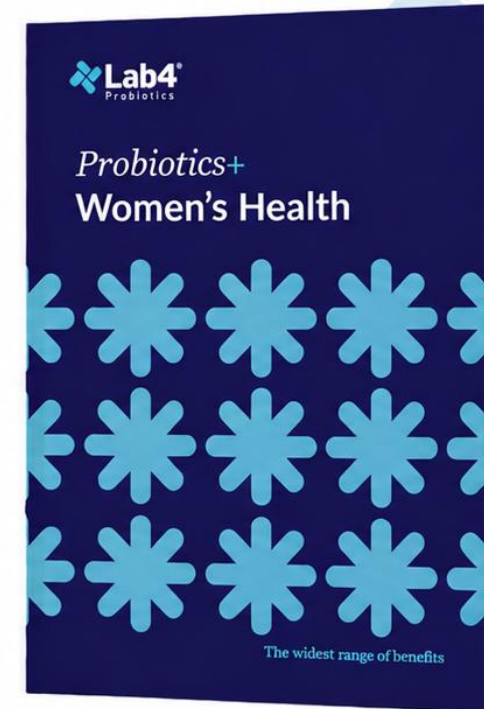
MULTI-STRAIN FORMULATIONS



- *Lactobacillus rhamnosus* GR-1 + *Lactobacillus reuteri* RC-14 (most studied combination)
- Multi-strain *Lactobacillus* blends
- *Lactobacillus* + *Bifidobacterium* blends (e.g., *B. longum*, *B. lactis*, *B. bifidum*)
- Combinations including *Streptococcus thermophilus*



Scientific evidence



**For more information
pick up our guide**

THE LAB4 FAMILY – WIDE RANGE OF BENEFITS



Lactobacillus acidophilus CUL60
Lactobacillus acidophilus CUL21
Bifidobacterium bifidum CUL20
Bifidobacterium animalis subsp. *lactis* CUL34



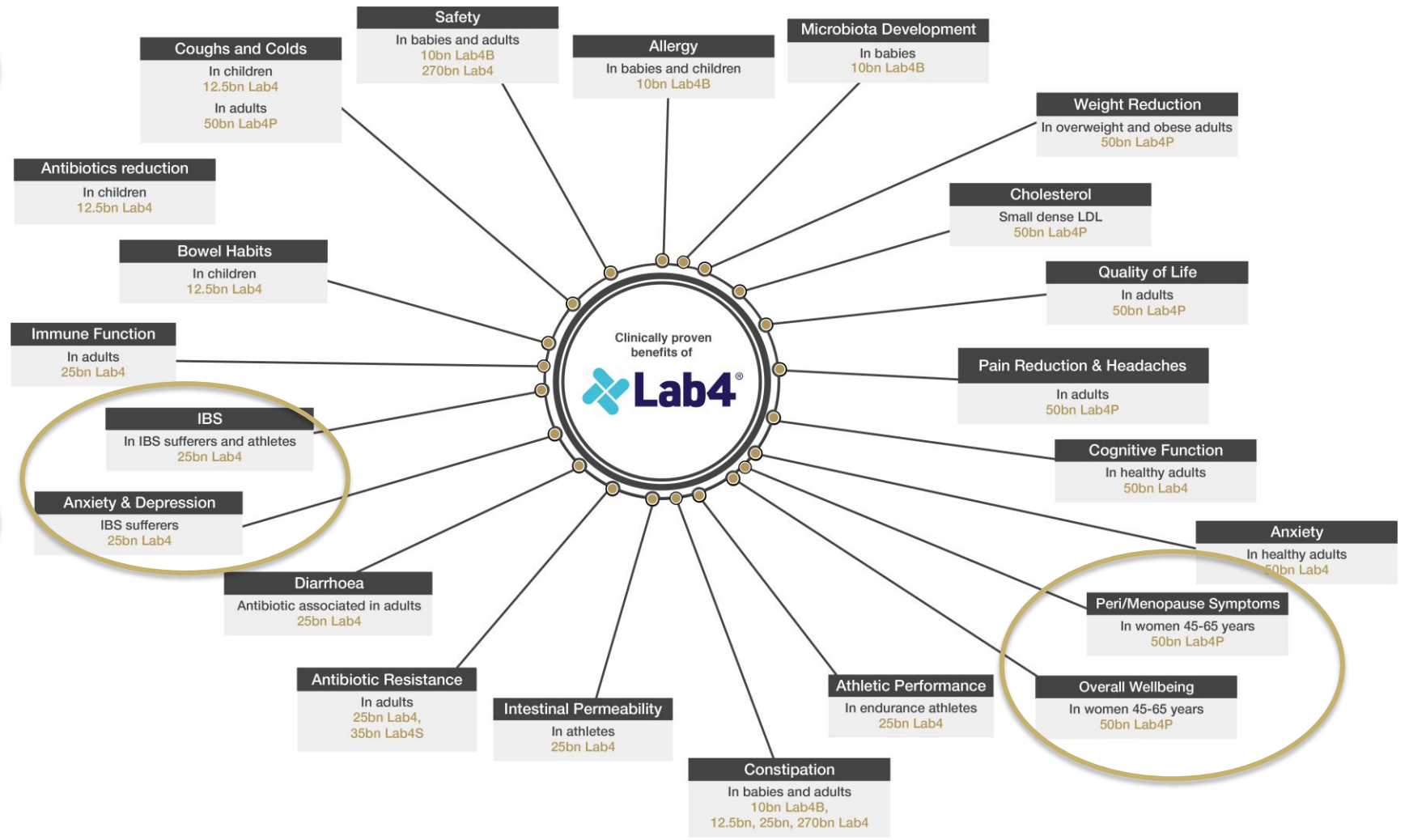
Lactobacillus salivarius CUL61
Lactobacillus paracasei CUL08
Bifidobacterium animalis subsp. *lactis* CUL34
Bifidobacterium bifidum CUL20



Lactobacillus acidophilus CUL60
Lactobacillus acidophilus CUL21
Bifidobacterium animalis subsp. *lactis* CUL34
Bifidobacterium bifidum CUL20
Lactobacillus bifidum CUL66



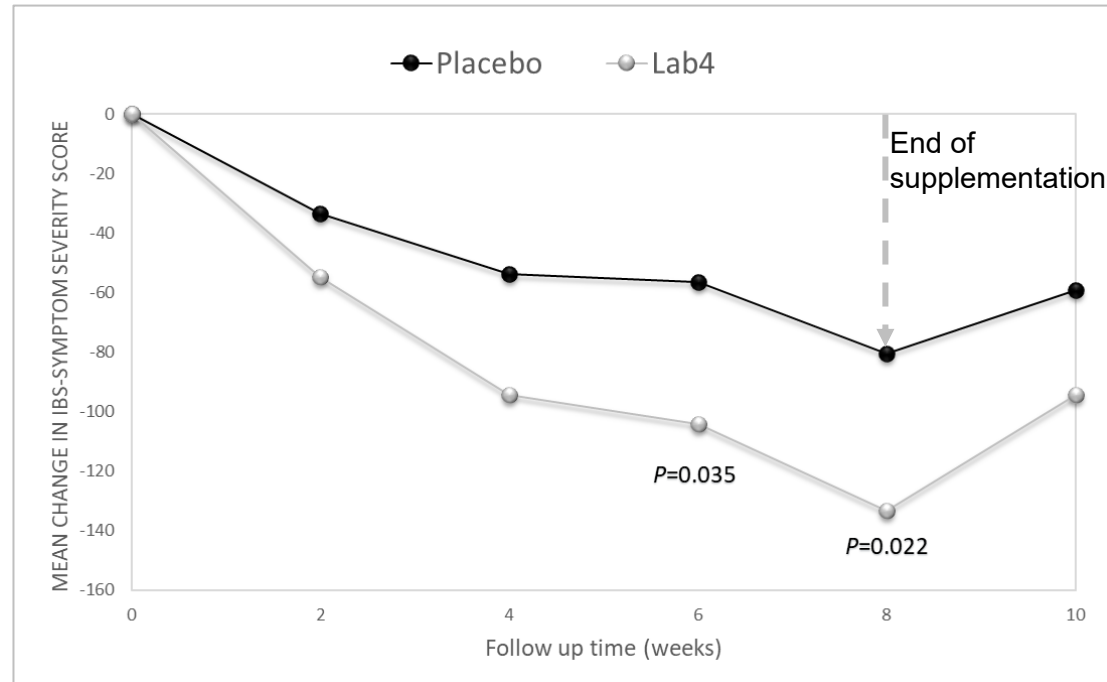
Lactobacillus acidophilus CUL60
Lactobacillus acidophilus CUL21
Bifidobacterium animalis subsp. *lactis* CUL34
Bifidobacterium bifidum CUL20
Saccharomyces boulardii



IRRITABLE BOWEL SYNDROME STUDY NO.1

SYMPTOMS SCORE

IBS sufferers randomly assigned to take daily either 25 billion Lab4 Probiotics or a matching placebo for 8 weeks. IBS symptoms assessed every two weeks during the study period and again at 10 weeks (2 weeks after taking the Lab4/placebo).



Total IBS symptoms:

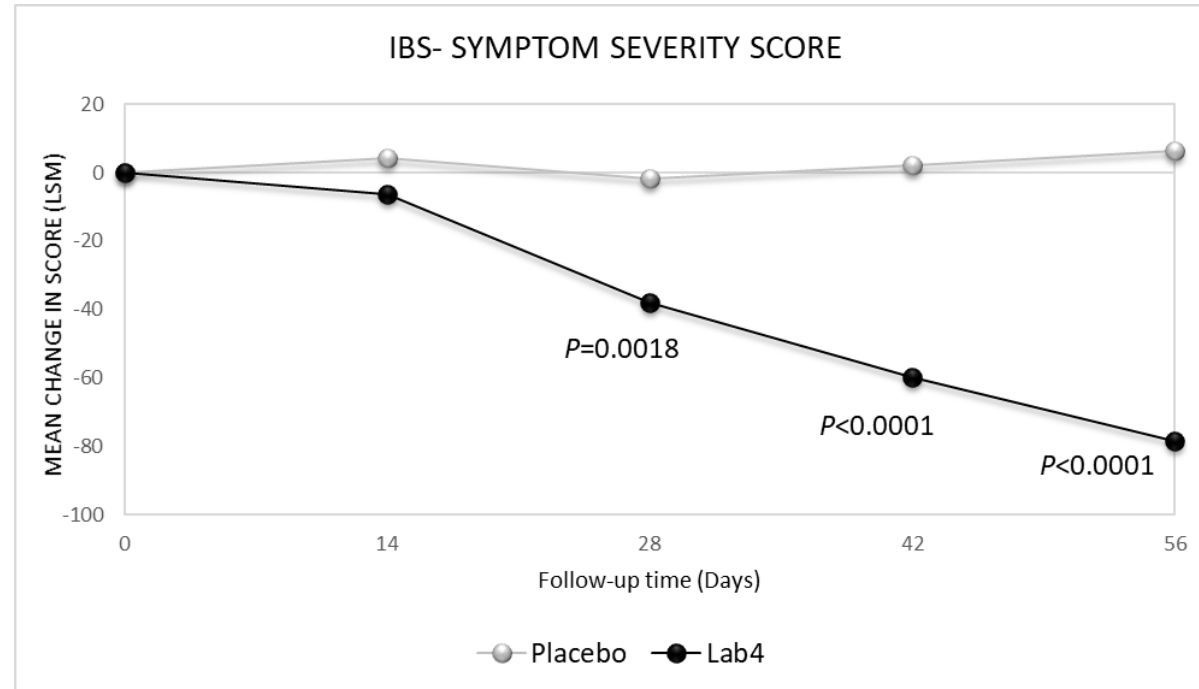
- Frequency of pain
- Severity of pain
- Bloating
- Satisfaction with bowel habit
- Quality of Life

**Significant difference observed despite strong placebo effect.
Continuous supplementation is necessary to sustain the effect.**

IRRITABLE BOWEL SYNDROME STUDY No.2

SYMPTOMS SCORE

Female IBS sufferers randomly assigned to take daily either 25 billion Lab4 Probiotics or a matching placebo for 8 weeks. IBS symptoms assessed every two weeks during the study period (days 0, 14, 28, 42 and 56).



Significant reductions in IBS scores with Lab4 supplementation.
Two probiotic studies showed the beneficial effect of Lab4 in the management of IBS.

IRRITABLE BOWEL SYNDROME STUDY No.1 and No.2

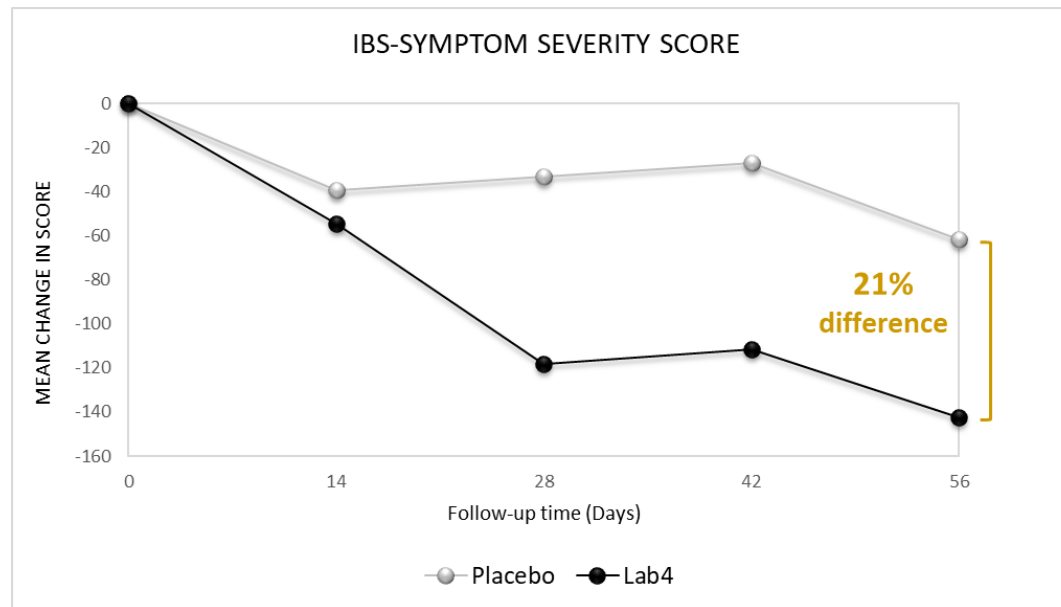
SYMPTOM SCORE: CLINICAL SIGNIFICANCE

Reduction in IBS symptom severity scores ≥ 50 points is considered to be clinically meaningful.

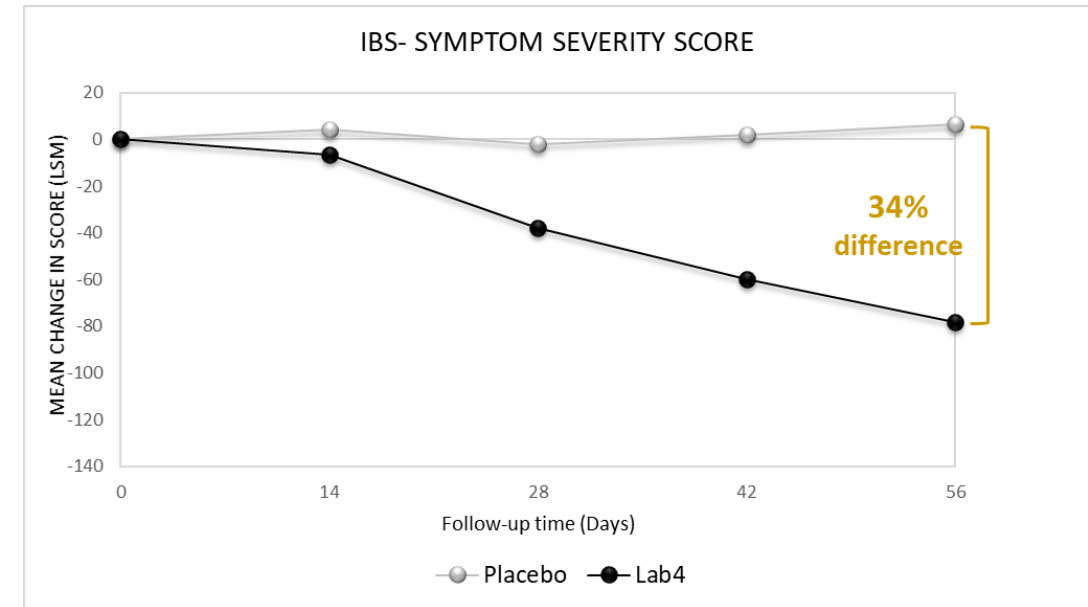
In both IBS studies, significant reductions in severity scores over 50 points were found:

- IBS No.1: 52.7 points difference for whole group (F/M) and 80.9 points for a subgroup of females 18-40y
- IBS No.2: 85 points difference for females aged 18-40

IBS Study No.1 (Subgroup of females aged 18-40)



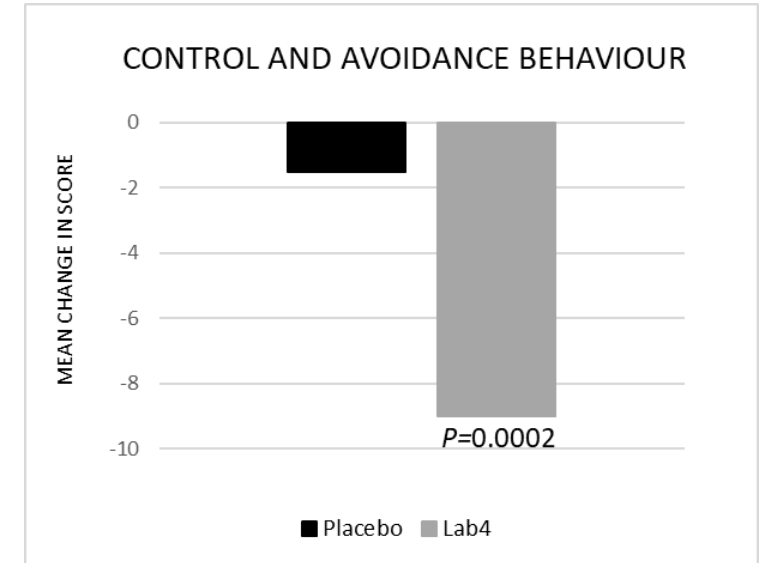
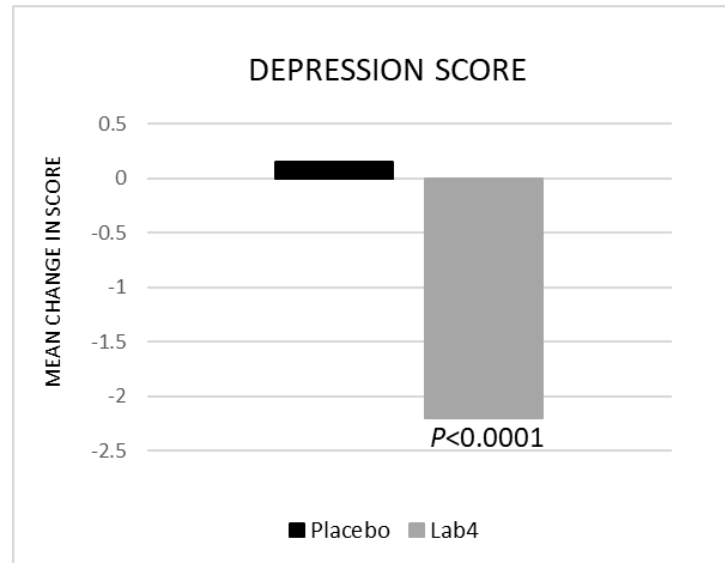
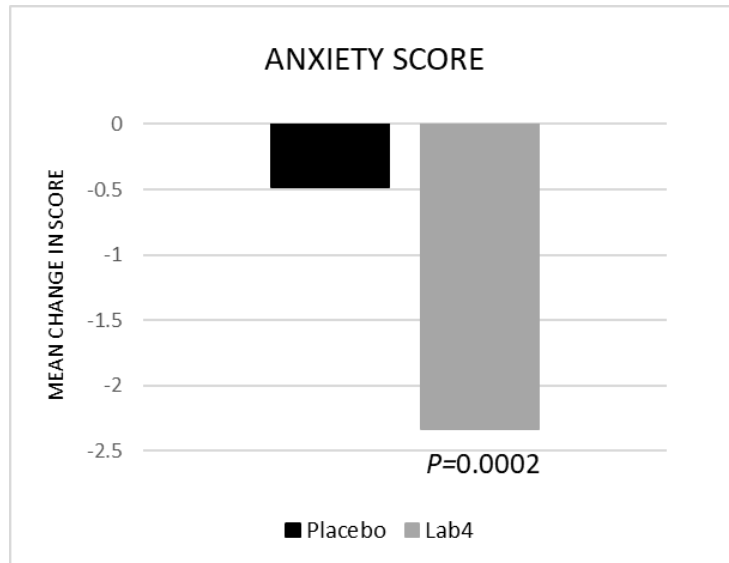
IBS Study No.2 (females aged 18-40)



IRRITABLE BOWEL SYNDROME STUDY No.2

MENTAL HEALTH

The HADS (anxiety and depression) and IBS-BRQ (control and avoidance behaviour) questionnaires were completed at days 0 and 56.



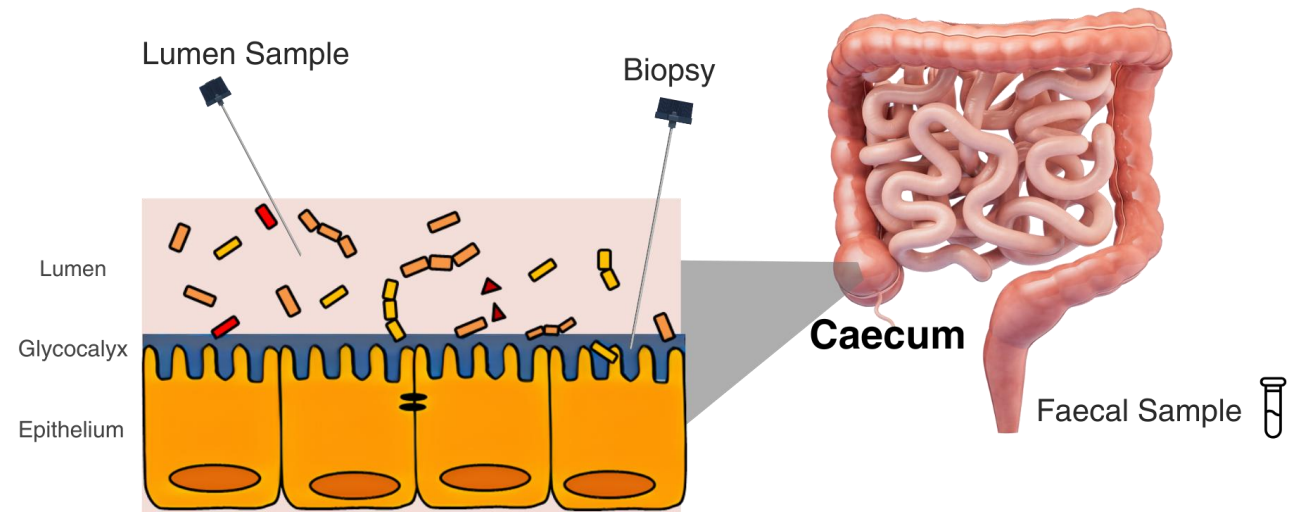
Lab4 supplementation has a beneficial impact on the mental health of IBS sufferers.

CAMBRIDGE IBS STUDY

- The effect of Lab4 Probiotics supplementation on the composition of microbiota in IBS sufferers (9 female, 3 male) receiving antibiotic therapy.

	Treatment	Period (days)
Group 1	Placebo	1-14
	Antibiotics	8-14
Group 2	25 billion Lab4 Probiotics	1-14
	Antibiotics	8-14

- Caecal biopsy and lumen samples were collected at baseline and day 14 (end of antibiotic therapy).
- Faecal samples were collected at baseline, day 14 and day 28 (14 days post antibiotic therapy).



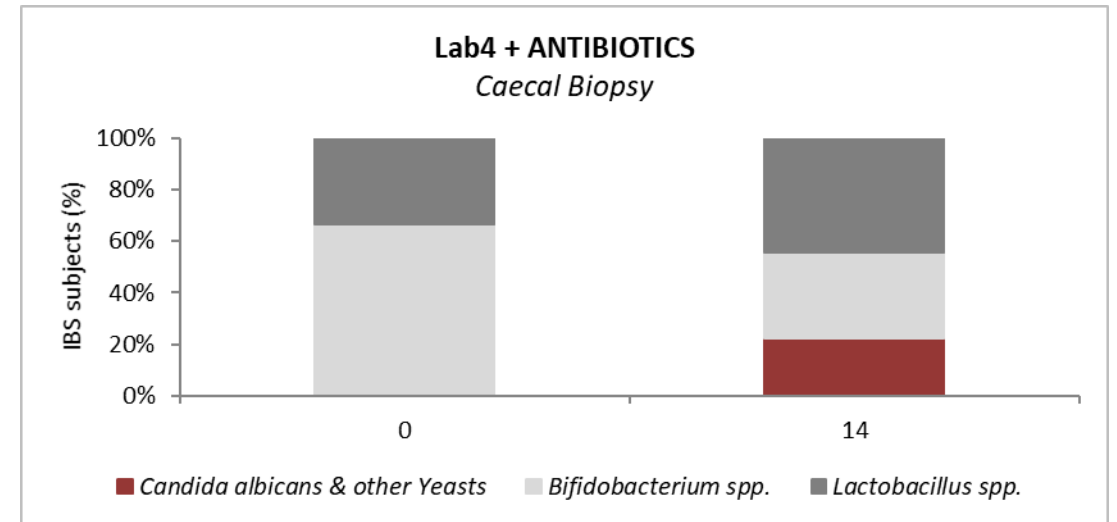
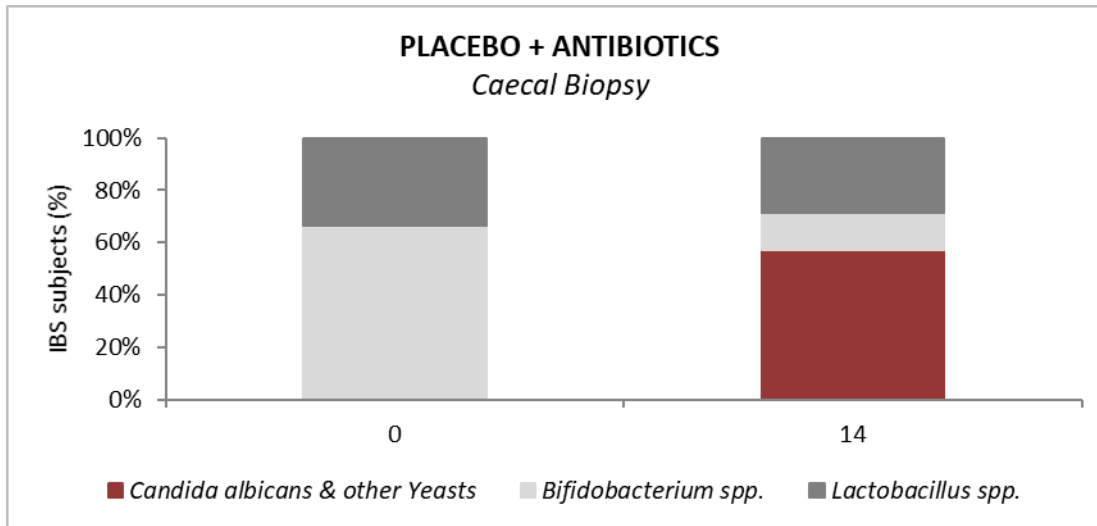
CAMBRIDGE IBS STUDY – CAECAL BIOPSY

Placebo Group

- Significant increase in the detection of *Candida albicans* and other Yeasts at day 14
- Decreases in the detection of Bifidobacteria and Lactobacilli at day 14

Lab4 Group

- Detection of *Candida albicans* and other Yeasts was reduced at day 14 compared to placebo



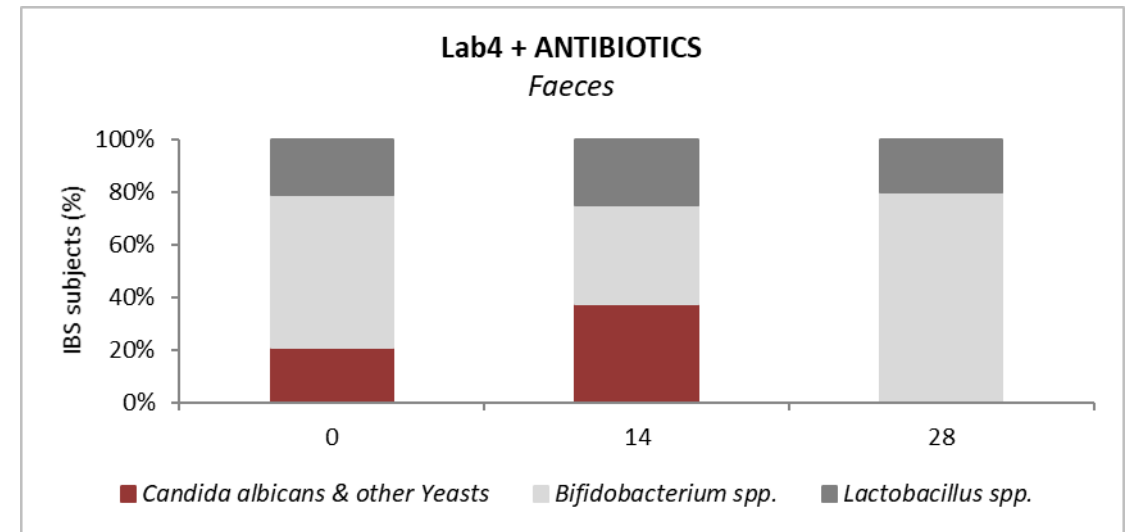
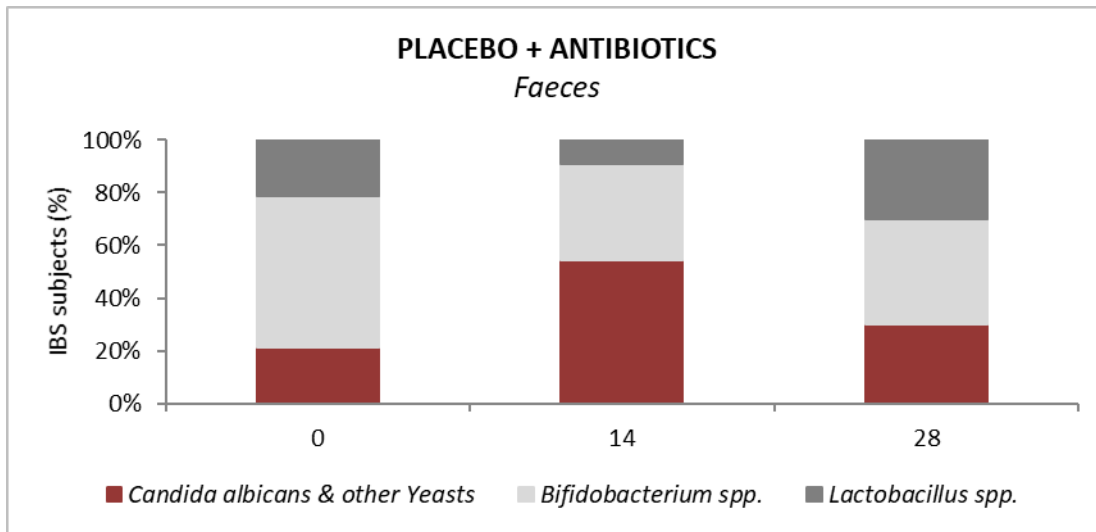
CAMBRIDGE IBS STUDY – FAECAL SAMPLES

Placebo Group

- The percentage of IBS sufferers harbouring *Candida albicans* and other Yeasts was higher at day 14 and 28 (14 days after terminating antibiotic treatment) than at day 0

Lab4 Group

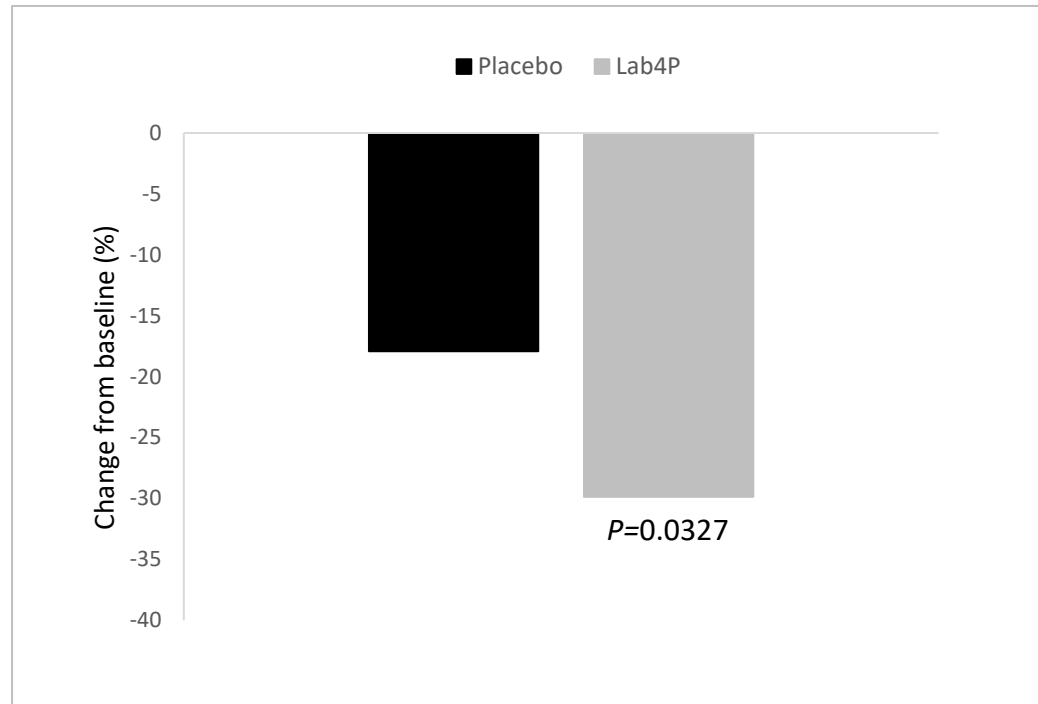
- Detection of yeasts was reduced at day 14 compared to placebo
- *Candida albicans* and other Yeasts were not detected at day 28



The supplementation with Lab4 probiotics prior to and alongside antibiotics may provide protection against overgrowth by yeast in IBS sufferers.

PERI/MENOPAUSE & WELL-BEING STUDY - MENOPAUSE RELATED SYMPTOMS

Women aged 45-65 years took daily either 50 billion Lab4 + *L. plantarum* CUL66 (Lab4P) in combination with vitamin D (400IU), vitamin C (80mg) and zinc (10mg) or placebo for 4 months.



Lab4P significantly reduced menopause related symptoms by 18.5%.

↓ ANXIETY (OR=6.71, $P=0.0381$)

↓ HEART DISCOMFORT (OR=5.81, $P=0.0322$)

↓ HOT FLUSHES (OR=7.69, $P=0.0225$)

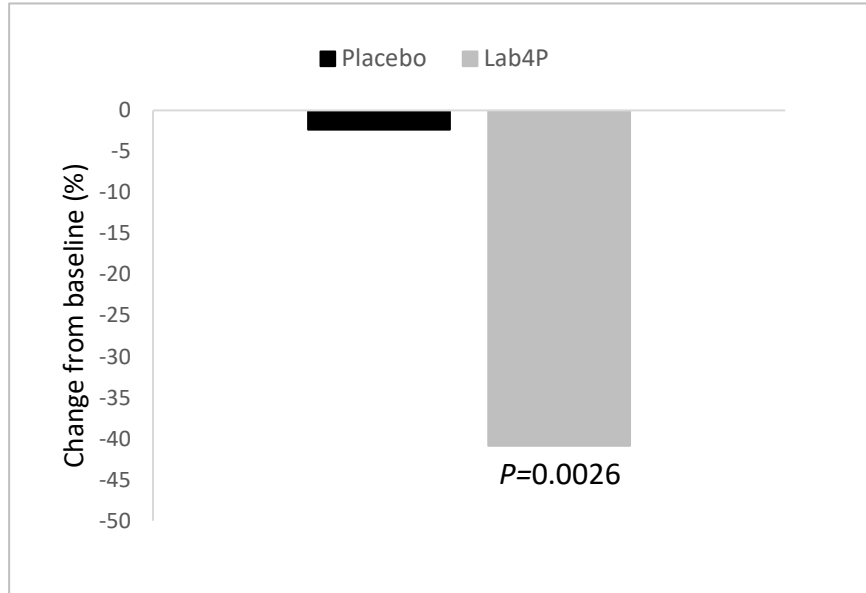
↓ IRRITABILITY (OR=3.47, $P=0.0674$, trend)

↓ DRYNESS OF VAGINA (OR=6.85, $P=0.0911$, trend)

Menopause Rating Scale: A total score

Odds Ratio: An OR >1 indicates that participants in the Lab4P group were more likely to report a lower score, whereas an OR <1 indicates a lower likelihood.

PERI/MENOPAUSE & WELL-BEING STUDY - ANXIETY



A significant 40% reduction in anxiety with Lab4P supplementation compared to placebo.

↓ WORRYING THOUGHTS (OR=23.26, $P=0.0227$)*

↓ FRIGHTENED FEELING (OR=5.03, $P=0.0225$)*

↓ FEELING 'WOUND UP' (OR=4.85, $P=0.0657$, trend)*

↓ LAUGHING (OR=4.00, $P=0.0648$, trend)*

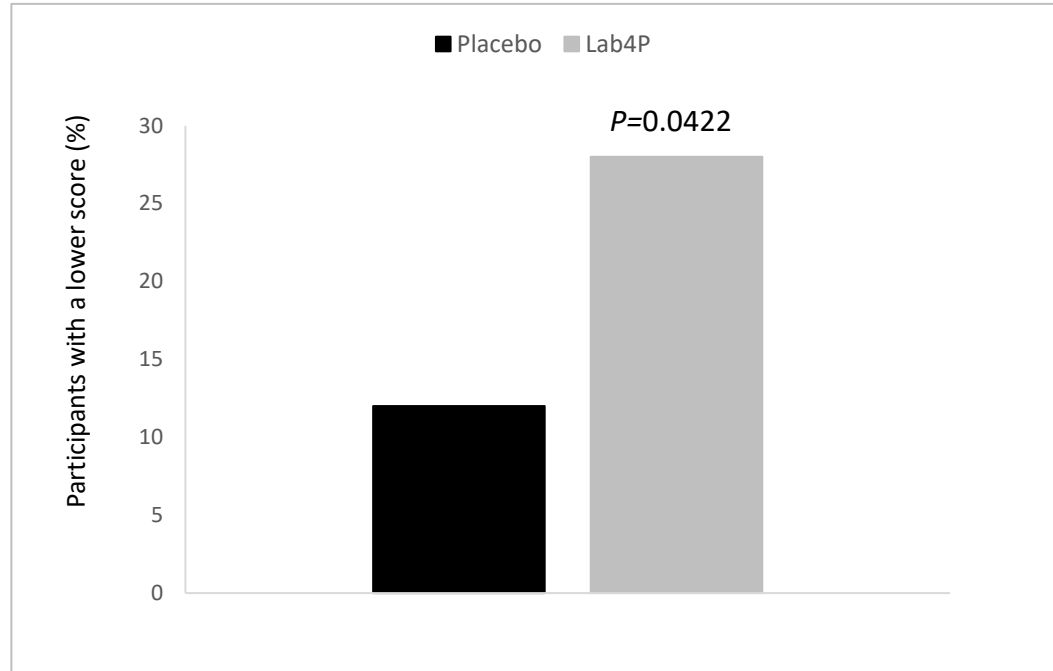
↑ CHEERFULNESS (OR=4.63, $P=0.0236$)*

The Hospital Anxiety and Depression Score (HADS): A total score
Odds Ratio: An OR >1 indicates that participants in the Lab4P group were more likely to report a lower score, whereas an OR <1 indicates a lower likelihood.

*Unpublished data

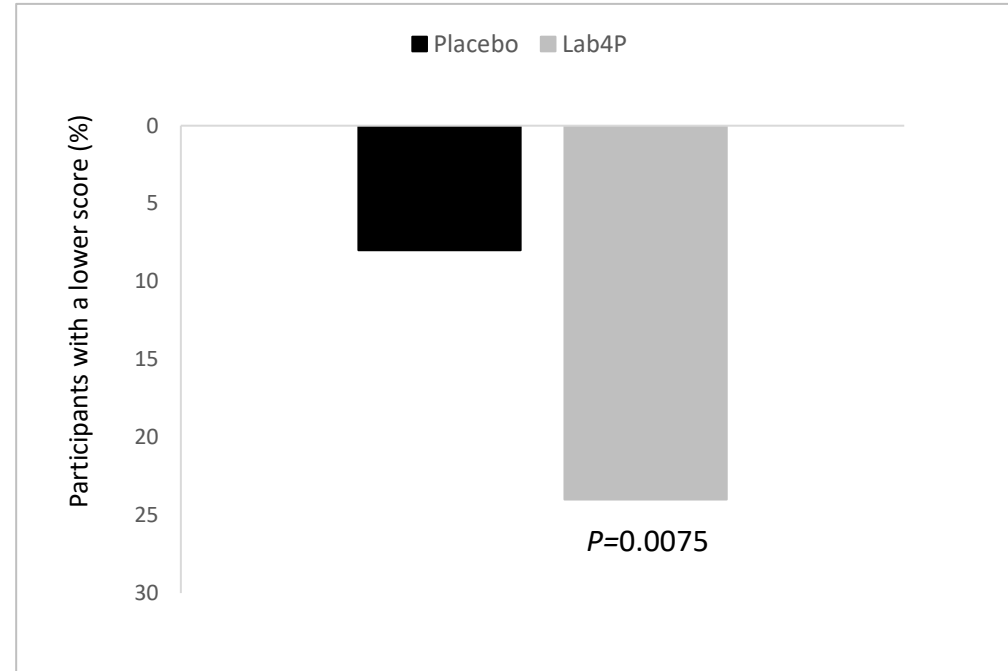
PERI/MENOPAUSE & WELL-BEING STUDY - DAYTIME PERFORMANCE

DAYTIME FUNCTIONING



Lab4P significantly improved daytime functioning.

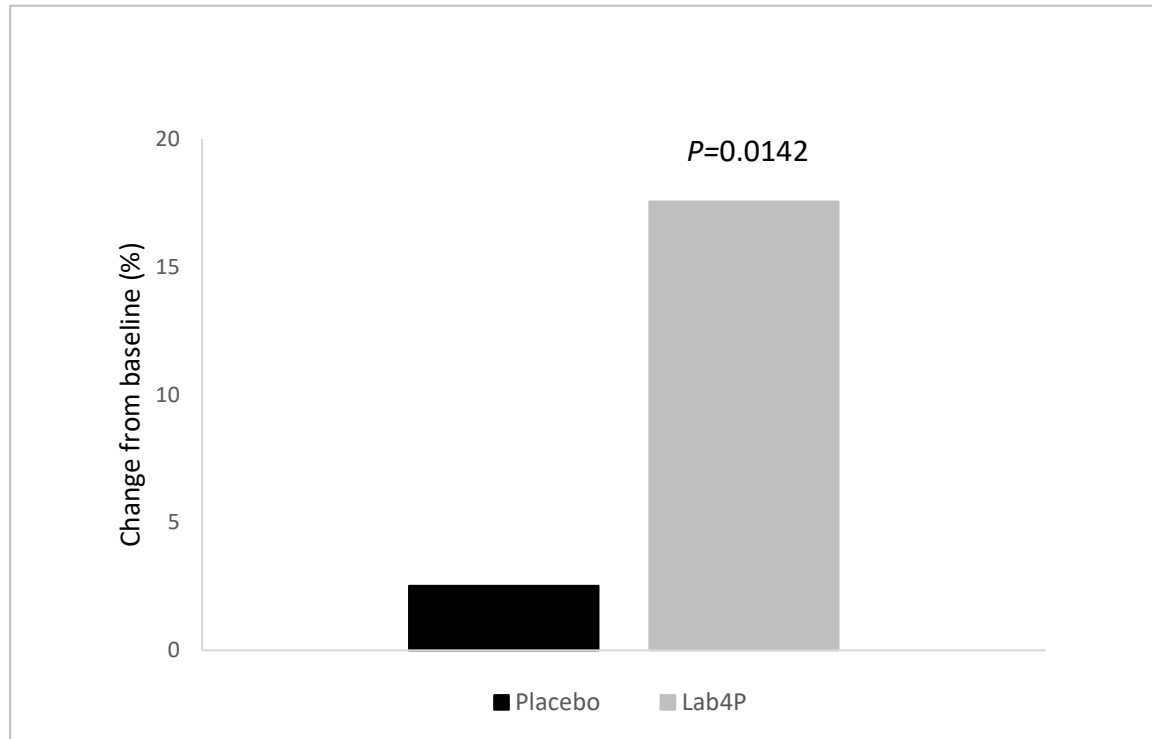
DAYTIME SLEEPINESS



Lab4P significantly reduced daytime sleepiness.

Athens Insomnia Scale:
Functioning (physical & mental) during the day
Sleepiness during the day

PERI/MENOPAUSE & WELL-BEING STUDY – OVERAL WELLBEING

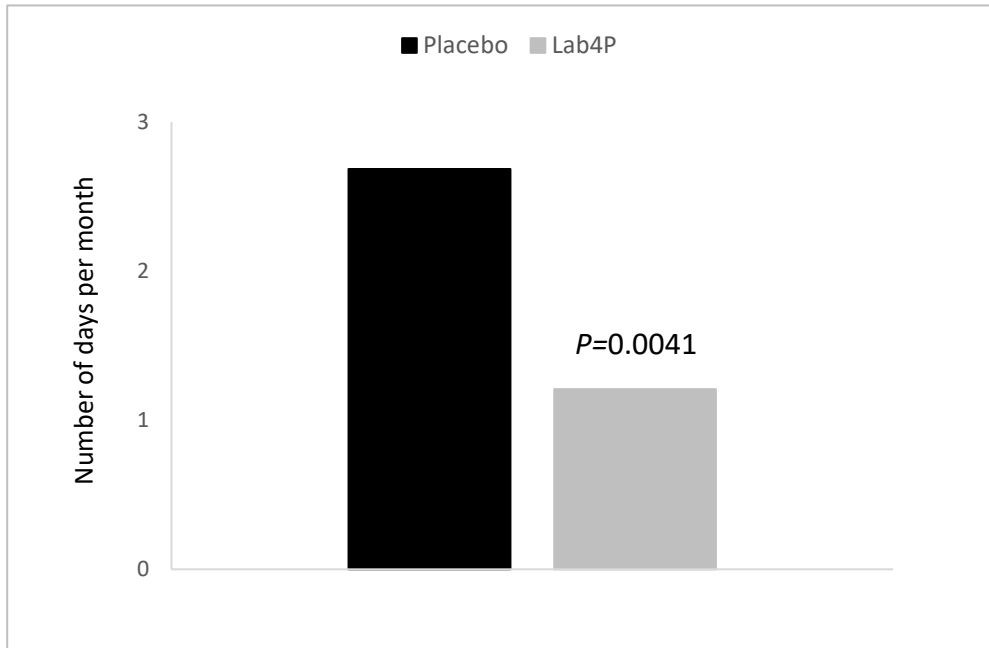


- ANXIETY
- DEPRESSION
- SLEEP QUALITY
- MENOPAUSE RELATED SYMPTOMS

A significant 17.5% improvement in overall wellbeing scores in probiotic group compared to placebo.

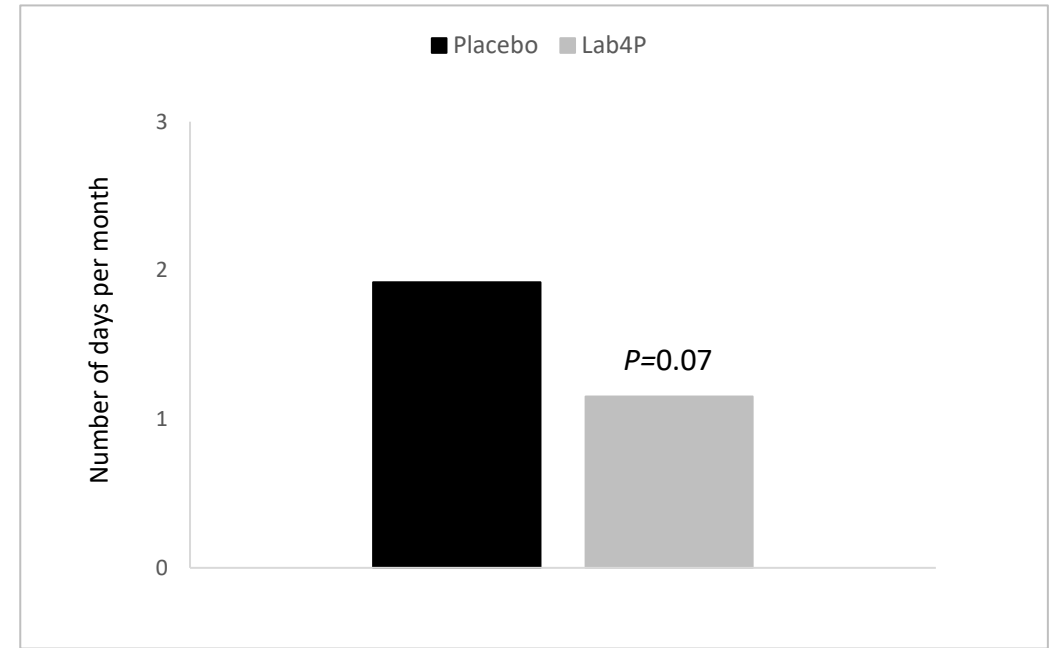
PERI/MENOPAUSE & WELL-BEING STUDY – GUT DISCOMFORT

INDIGESTION



55% fewer days with indigestion were reported with Lab4P supplementation compared to placebo.

STOMACH PAIN



40% fewer days with stomach pain were reported with Lab4P supplementation compared to placebo.

THANK YOU!



Iveta Garaiova, PhD, MSc
Science Communication Officer



+44 (0)7375 520417



ivetag@cultech.co.uk



ProVen Biotics



www.provenbiotics.uk



Lab4 Probiotics



www.lab4probiotics.co.uk



Visit us at **Stand B12**

