



3840638

## COMPLETE MICROBIOME MAPPING

### General Macroscopic Description

	Result	Range	Markers
Stool Colour	<b>Brown</b>		<b>Colour</b> - Brown is the colour of normal stool. Other colours may indicate abnormal GIT conditions.
Stool Form	<b>Semi-formed</b>		<b>Form</b> -A formed stool is considered normal. Variations to this may indicate abnormal GIT conditions.
Mucous	<b>NEG</b>	< +	<b>Mucous</b> - Mucous production may indicate the presence of an infection, inflammation or malignancy.
Occult Blood	<b>NEG</b>	< +	<b>Blood (Macro)</b> - The presence of blood in the stool may indicate possible GIT ulcer, and must always be investigated immediately.

### GIT Functional Markers

	Result	Range	Units	
Calprotectin.	8.4	0.0 - 50.0	ug/g	
Pancreatic Elastase	>500.0	> 200.0	ug/g	
Faecal Secretory IgA	527.0	510.0 - 2010.0	ug/g	
Faecal Zonulin	54.4	0.0 - 107.0	ng/g	
Faecal B-Glucuronidase	2349.6	337.0 - 4433.0	U/g	
Steatocrit	<1.0	0.0 - 15.0	%	
anti-Gliadin IgA	<20	0.0 - 100.0	units/L	

### Microbiome Mapping Summary

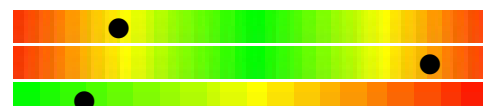
#### Parasites & Worms

#### Bacteria & Viruses

#### Fungi and Yeasts

#### Key Phyla Microbiota

Bacteroidetes	10.01	8.61 - 33.10	x10 <sup>11</sup> org/g
Firmicutes	34.05 *H	5.70 - 30.40	x10 <sup>10</sup> org/g
Firmicutes:Bacteroidetes Ratio	0.34	< 1.00	RATIO













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Parasites and Worms.	Result	Range	Units
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**Parasitic Organisms**













Cryptosporidium.	<dl	< 1.0	x10 <sup>6</sup> org/g	
Entamoeba histolytica.	<dl	< 1.0	x10 <sup>4</sup> org/g	
Giardia lamblia.	<dl	< 5.0	x10 <sup>3</sup> org/g	
Blastocystis hominis.	<dl	< 2.0	x10 <sup>3</sup> org/g	
Dientamoeba fragilis.	<dl	< 1.0	x10 <sup>5</sup> org/g	
Endolimax nana	<dl	< 1.0	x10 <sup>4</sup> org/g	
Entamoeba coli.	<dl	< 5.0	x10 <sup>6</sup> org/g	
Pentatrichomonas hominis	<dl	< 1.0	x10 <sup>2</sup> org/g	

**Worms**









Ancylostoma duodenale, Roundworm	Not Detected
Ascaris lumbricoides, Roundworm	Not Detected
Necator americanus, Hookworm	Not Detected
Trichuris trichiura, Whipworm	Not Detected
Taenia species, Tapeworm	Not Detected
Enterobius vermicularis, Pinworm	Not Detected

Comment: Not Detected results indicate the absence of detectable DNA in this sample for the worms reported.






Opportunistic Bacteria/Overgr	Result	Range	Units
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Bacillus species.	<dl	< 1.5	x10 <sup>5</sup> org/g	
Enterococcus faecalis	<dl	< 1.0	x10 <sup>4</sup> org/g	
Enterococcus faecium	<dl	< 1.0	x10 <sup>4</sup> org/g	
Morganella species	<dl	< 1.0	x10 <sup>3</sup> org/g	
Pseudomonas species	<dl	< 1.0	x10 <sup>4</sup> org/g	
Pseudomonas aeruginosa.	<dl	< 5.0	x10 <sup>2</sup> org/g	
Staphylococcus species	<dl	< 1.0	x10 <sup>4</sup> org/g	
Staphylococcus aureus	0.1	< 5.0	x10 <sup>2</sup> org/g	
Streptococcus species	0.4	< 1.0	x10 <sup>3</sup> org/g	
Methanobacteriaceae	<0.10	< 5.00	x10 <sup>9</sup> org/g	
Desulfovibrio piger	<dl	0.0 - 18.0	x10 <sup>7</sup> org/g	
Oxalobacter formigenes	16.0	> 15.0	x10 <sup>7</sup> org/g	

**Potential Autoimmune Triggers**

Citrobacter species.	<dl	< 5.0	x10 <sup>5</sup> org/g	
Citrobacter freundii.	3.0	< 5.0	x10 <sup>5</sup> org/g	
Klebsiella species	<dl	< 5.0	x10 <sup>3</sup> org/g	
Klebsiella pneumoniae.	<dl	< 5.0	x10 <sup>4</sup> org/g	
Prevotella copri	<dl	< 1.0	x10 <sup>7</sup> org/g	
Proteus species	<dl	< 5.0	x10 <sup>4</sup> org/g	
Proteus mirabilis.	<dl	< 1.0	x10 <sup>3</sup> org/g	
Fusobacterium species	4.49	< 10.00	x10 <sup>7</sup> org/g	

Fungi & Yeast	Result	Range	Units
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Candida species.	<dl	< 5.0	x10 <sup>3</sup> org/g	
Candida albicans.	2.3	< 5.0	x10 <sup>2</sup> org/g	
Geotrichum species.	<dl	< 3.0	x10 <sup>2</sup> org/g	
Microsporidium species	<dl	< 5.0	x10 <sup>3</sup> org/g	
Rhodotorula species.	<dl	< 1.0	x10 <sup>3</sup> org/g	



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Bacterial Pathogens	Result	Range	Units	
Aeromonas species.	<dl	< 1.0	x10 <sup>3</sup> CFU/g	●
Campylobacter.	<dl	< 1.0	x10 <sup>3</sup> CFU/g	●
C. difficile, Toxin A	<dl	< 1.0	x10 <sup>3</sup> CFU/g	●
C. difficile, Toxin B	<dl	< 1.0	x10 <sup>3</sup> CFU/g	●
Enterohemorrhagic E. coli	<dl	< 1.0	x10 <sup>3</sup> CFU/g	●
E. coli O157	<dl	< 1.0	x10 <sup>2</sup> CFU/g	●
Enteroinvasive E. coli/Shigella	<dl	< 1.0	x10 <sup>3</sup> CFU/g	●
Enterotoxigenic E. coli LT/ST	<dl	< 1.0	x10 <sup>3</sup> CFU/g	●
Shiga-like Toxin E. coli stx1	<dl	< 1.0	x10 <sup>3</sup> CFU/g	●
Shiga-like Toxin E. coli stx2	<dl	< 1.0	x10 <sup>3</sup> CFU/g	●
Salmonella.	<dl	< 1.0	x10 <sup>4</sup> CFU/g	●
Vibrio cholerae	<dl	< 1.0	x10 <sup>5</sup> CFU/g	●
Yersinia enterocolitica.	<dl	< 1.0	x10 <sup>5</sup> CFU/g	●
Helicobacter pylori	<dl	< 1.0	x10 <sup>3</sup> CFU/g	●

**Comment: Helico Pylori virulence factors will be listed below if detected POSITIVE**

H.pylori Virulence Factor, babA	Not Detected	H.pylori Virulence Factor, cagA	Not Detected
H.pylori Virulence Factor, dupA	Not Detected	H.pylori Virulence Factor, iceA	Not Detected
H.pylori Virulence Factor, oipA	Not Detected	H.pylori Virulence Factor, vacA	Not Detected
H.pylori Virulence Factor, virB	Not Detected	H.pylori Virulence Factor, virD	Not Detected

Viral Pathogens	Result	Range	Units	
Adenovirus 40/41	<dl	< 1.0	x10 <sup>10</sup> CFU/g	●
Norovirus GI/II	<dl	< 1.0	x10 <sup>7</sup> CFU/g	●
Bocavirus	<dl	< 1.0	x10 <sup>10</sup> CFU/g	●

Normal Bacterial GUT Flora	Result	Range	Units	
Bacteroides fragilis	28.2	1.6 - 250.0	x10 <sup>9</sup> CFU/g	●
Bifidobacterium species	48.9	> 6.7	x10 <sup>7</sup> CFU/g	●
Bifidobacterium longum	4.0 *L	> 5.2	x10 <sup>6</sup> CFU/g	●
Enterococcus species	5.0	1.9 - 2000.0	x10 <sup>5</sup> CFU/g	●
Escherichia species	1103.0	3.7 - 3800.0	x10 <sup>6</sup> CFU/g	●
Lactobacillus species	1.5 *L	8.6 - 6200.0	x10 <sup>5</sup> CFU/g	●
Lactobacillus Rhamnosus	1.1 *L	8.3 - 885.0	x10 <sup>4</sup> CFU/g	●
Clostridium species	56.4 *H	5.0 - 50.0	x10 <sup>6</sup> CFU/g	●
Enterobacter species	1.0	1.0 - 50.0	x10 <sup>6</sup> CFU/g	●
Akkermansia muciniphila	<dl *L	0.01 - 50.00	x10 <sup>3</sup> CFU/g	●
Faecalibacterium prausnitzii	1879.0	1.0 - 500000	x10 <sup>3</sup> CFU/g	●

Short Chain Fatty Acids	Result	Range	Units	
Short Chain Fatty Acids, Beneficial	42.2	> 13.6	umol/g	●
Butyrate	36.9 *H	10.8 - 33.5	%	●
Acetate	41.7 *L	44.5 - 72.4	%	●
Propionate	19.1	0.0 - 32.0	%	●
Valerate	2.2	0.5 - 7.0	%	●



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**ABBY MORGAN**  
**21-Jul-2002**      **Female**

107 FALCON STREET  
CROWS NEST NSW 2065

LAB ID : 3840638  
UR NO. : 6611005  
Collection Date : 13-Sep-2022  
Received Date:15-Sep-2022



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## Pathogen Summary:

### Macroscopy Comment

BROWN coloured stool is considered normal in appearance.

Faecal Occult Blood Negative:

Faecal occult blood has not been detected in this specimen. If the test result is negative and clinical symptoms persist, additional follow-up testing using other clinical methods is recommended.

### Metabolism Comment

In a healthy gut Short Chain Fatty Acids (SCFAs) exhibited in the following proportions; Butyrate, Acetate, Propionate (16%:60%:24%).

The primary SCFAs butyrate, propionate and acetate are produced by predominant commensal bacteria via fermentation of soluble dietary fibre and intestinal mucus glycans.

Key producers of SCFAs include *Faecalibacterium prausnitzii*, *Akkermansia muciniphila*, *Bacteroides fragilis*, *Bifidobacterium*, *Clostridium* and *Lactobacillus* Spp.

The SCFAs provide energy for intestinal cells and regulate the actions of specialised mucosal cells that produce anti-inflammatory and antimicrobial factors, mucins that constitute the mucus barriers, and gut active peptides that facilitate appetite regulation and euglycemia. Abnormal SCFAs may be associated with dysbiosis, intestinal barrier dysfunction and inflammatory conditions.

**ELEVATED BUTYRATE LEVEL:**

Butyrate is a short chain fatty acid that is extremely important for gut health. It is the main fuel source for gut cells, which helps keep the gut cell barrier intact, can reduce inflammation, and helps control appetite. Elevated levels are associated with carbohydrate intolerance and diarrhoea.

### GIT Markers Comment

**PANCREATIC ELASTASE:** Normal exocrine pancreatic function.

Pancreatic Elastase reflects trypsin, chymotrypsin, amylase and lipase activity.

This test is not affected by supplements of pancreatic enzymes.

Healthy individuals produce on average 500 ug/g of PE-1. Thus, levels below 500 ug/g and above 200 ug/g suggest a deviation from optimal pancreatic function.

The clinician should therefore consider digestive enzyme supplementation if one or more of the following conditions is present:

Loose watery stools, Undigested food in the stools, Post-prandial abdominal pain, Nausea or colicky abdominal pain, Gastroesophageal reflux symptoms, Bloating or food intolerance.

**CALPROTECTIN Normal:**

Faecal calprotectin values <50 ug/g are not indicative of inflammation in the gastrointestinal tract. Subjects with low faecal calprotectin levels normally do not need to be further investigated by invasive procedures. In patients with strong clinical indications of intestinal inflammation, repeat testing may be useful.

Test performed by Phadia ELIA Fluorescence enzyme immunoassay (FEIA).



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## Opportunistic Bacteria Comment

### METHANOBACTERIACEAE:

Of the Methanobacteriaceae(family), Methanobrevibacter smithii is the main human methanogen almost always found in the digestive tract of adults. Methanobacter species facilitate carbohydrate fermentation and short-chain fatty acid production by beneficial bacteria. Lower levels may indicate reduced production of short-chain fatty acids and may be associated with inflammation. Higher levels linked to chronic constipation, as well as some types of SIBO and IBS which often correlate to a SIBO breath test.

### DESULFOVIBRIO COMMENT:

Sulfate is present in different concentrations in the intestine dependent on diet. Remnants not absorbed, alongside the presence of lactate, promote the growth of Sulfate reducing bacteria (SRB). Desulfovibrio Piger is the dominant SRB genus and has been implicated in gastrointestinal disorders such as ulcerative colitis via the reduction of sulfate to hydrogen sulphide in the gut. High Desulfovibrio piger levels serves as an indicator of inflammatory bowel disease. Treatment options include lowering the intake of sulfate rich foods such as some breads, dried fruits, beers, ciders and wines. It is also suggested to avoid foods high in fat.

### OXALOBACTER COMMENT:

Oxalate is formed in the liver by amino acid catabolism as well as present in a wide range of foods including tea, coffee, chocolate and certain fruits and vegetables. High concentration of oxalate in the urine is related to the potential formation of calcium oxalate kidney stones. Oxalobacter Formigenes is the main known bacterial species involved in oxalate degradation in the gut. Levels of O. Formigenes tends to decrease with age as well as with the use of antibiotics or other drugs, with low levels identified as a risk factor for calcium oxide stone formation. Treatment options include probiotic treatment and low oxalate diet modification. Urinary oxalate levels can also be monitored by test code 4025 (oxalate urinary).

## Potential Autoimmune Comments

### FUSOBACTERIUM SPECIES:

Fusobacterium species is a gram-negative bacteria in the Fusobacteria phylum. The bacteria is a common member of the human oral microbiome, this pro-inflammatory bacterium can also be found in the human gut. In the mouth, high levels are strongly linked to oral hygiene. In the gut, high levels have been observed in individuals with colon cancer and appendicitis. Review Fusobacterium levels in conjunction with elevated calprotectin levels.

#### Sources:

It primarily uses protein as its main source. However, research also shows that it can thrive from sugar.

#### Treatment:

Antimicrobial botanicals such as berberine, oregano, quercetin, curcumin, green and black tea extracts, blueberry extract, cinnamon and rosemary have shown to decrease levels.

## Phyla Microbiota Comment

### BACTEROIDETES PHYLUM:

Bacteroidetes make up approximately 28% of the gut Microbiota in healthy human adults. They are early colonisers of the infant gut and are amongst the most stable, at a species and strain level, in the host.

### FIRMICUTES PHYLUM:

Firmicutes constitutes the most diverse and abundant group of gastrointestinal microbiota which are grouped into four classes, Bacilli, Clostridia, Erysipelotrichia, and Negativicutes. According to current literature, about 39% of gut bacteria is made up of firmicutes and may increase to as high as 80% in an imbalanced microbial community.

### ELEVATED FIRMICUTES LEVEL:

Elevated Firmicutes may suggest microbial imbalance which may be related to increased caloric extraction from food, fat deposition and lipogenesis, impaired insulin sensitivity, and increased inflammation.

#### Treatment:

Consider using Bifidobacteria probiotics and Saccharomyces boulardii primarily. It may also be suggested to optimise the patient diet. A lower fat diet may help to normalize Firmicutes levels.



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## Normal Bacterial Flora Comment

### LOW BIFIDOBACTERIUM LONGUM LEVEL:

Bifidobacterium longum is one of the well-established probiotic strains with numerous profound health benefits in humans. Supplementing with Bifidobacterium longum has been effective in alleviating gastrointestinal, immunological and infectious diseases. Increasingly, evidence is accumulating which shows beneficial effects of supplementation with bifidobacteria for the improvement of human health conditions ranging from protection against infection to different extra- and intra-intestinal positive effects. Moreover, bifidobacteria have been associated with the production of a number of potentially health promoting metabolites including short chain fatty acids.

### LOW LACTOBACILLUS SPECIES LEVEL:

Lactate-producing bacteria in the Firmicutes phylum.

Low levels may be due to low carbohydrate intake or high salt intake, and may also indicate reduced mucosal health.

### LOW LACTOBACILLUS RHAMNOSUS LEVEL:

Lactobacillus Rhamnosus is a bacteria in the Firmicutes phylum. Lactobacillus rhamnosus is one of the most widely used probiotic strains. Various health effects are well documented including the prevention and treatment of gastro-intestinal infections and diarrhea, and stimulation of immune responses. Low levels may be linked to poor digestive health, diarrhea and IBS symptoms.

### ELEVATED CLOSTRIDIUM SPECIES LEVEL:

Organism of the Firmicutes phylum. The Clostridium genus is diverse and consists of both pathogens and normal commensals that perform a wide variety of functions (beneficial and potentially harmful).

High levels may result from reduced digestive capacity or constipation.

### LOW AKKERMANSIA MUCINIPHILA LEVEL:

Akkermansia muciniphila is an organism that lives in the mucus lining of your gut and uses mucus as its primary energy source. This species plays an important role in regulating mucus turnover in the gut so that there is a good balance between mucus breakdown and mucus production. Akkermansia muciniphila promotes healthy intestinal barrier and modulates immune responses.

Low levels of Akkermansia muciniphila has been observed in individuals with IBS, high fat diets, obesity, and type 2 diabetes. Reducing intake of high fat foods may help increase levels of this bacteria.





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# The Four “R” Treatment Protocol

REMOVE	Using a course of antimicrobial, antibacterial, antiviral or anti parasitic therapies in cases where organisms are present. It may also be necessary to remove offending foods, gluten, or medication that may be acting as antagonists.  Consider testing IgG96 foods as a tool for removing offending foods.	ANTIMICROBIAL	Oil of oregano, berberine, caprylic acid
		ANTIBACTERIAL	Liquorice, zinc carnosine, mastic gum, tribulus, berberine, black walnut, caprylic acid, oil of oregano
		ANTIFUNGAL	Oil of oregano, caprylic acid, berberine, black walnut
		ANTIPARASITIC	Artemesia, black walnut, berberine, oil of oregano
		ANTIVIRAL	Cat's claw, berberine, echinacea, vitamin C, vitamin D3, zinc, reishi mushrooms
		BIOFILM	Oil of oregano, protease
REPLACE	In cases of maldigestion or malabsorption, it may be necessary to restore proper digestion by supplementing with digestive enzymes.	DIGESTIVE SUPPORT	Betaine hydrochloride, tilactase, amylase, lipase, protease, apple cider vinegar, herbal bitters
REINOCULATE	Recolonisation with healthy, beneficial bacteria. Supplementation with probiotics, along with the use of prebiotics helps re-establish the proper microbial balance.	PREBIOTICS	Slippery elm, pectin, larch arabinogalactans
		PROBIOTICS	Bifidobacterium animalis subsp. lactis, lactobacillus acidophilus, lactobacillus plantarum, lactobacillus casei, bifidobacterium breve, bifidobacterium bifidum, bifidobacterium longum, lactobacillus salivarius, salivarius, lactobacillus paracasei, lactobacillus rhamnosus, Saccharomyces boulardii
REPAIR & REBALANCE	Restore the integrity of the gut mucosa by giving support to healthy mucosal cells, as well as immune support. Address whole body health and lifestyle factors so as to prevent future GI dysfunction.	INTESTINAL MUCOSA IMMUNE SUPPORT	Saccharomyces boulardii, lauric acid
		INTESTINAL BARRIER REPAIR	L-Glutamine, aloe vera, liquorice, marshmallow root, okra, quercetin, slippery elm, zinc carnosine, Saccharomyces boulardii, omega 3 essential fatty acids, B vitamins
		SUPPORT CONSIDERATION	Sleep, diet, exercise, and stress management