

**NutriPATH**

INTEGRATIVE PATHOLOGY SERVICES

P: 1300 688 522

E: info@nutripath.com.au

A: PO Box 442 Ashburton VIC 3142

TEST PATIENT

Sample Test Name

Sex : F

Date Collected : 00-00-0000

111 TEST ROAD TEST SUBURB

LAB ID: 00000000 UR#:0000000**TEST PHYSICIAN**

DR JOHN DOE

111 CLINIC STREET

CLINIC SUBURB VIC 3000

COMPLETE MICROBIOME MAPPING

General Macroscopic Description

	Result	Range	Markers
Stool Colour	Brown		Colour - Brown is the colour of normal stool. Other colours may indicate abnormal GIT conditions.
Stool Form	Unformed		Form - A formed stool is considered normal. Variations to this may indicate abnormal GIT conditions.
Mucous	NEG	< +	Mucous - Mucous production may indicate the presence of an infection, inflammation or malignancy.
Occult Blood	NEG	< +	Blood (Macro) - 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.	4.4	0.0 - 50.0	ug/g	
Pancreatic Elastase	>500.0	> 200.0	ug/g	
Faecal Secretory IgA	838.2	510.0 - 2010.0	ug/g	
Faecal Zonulin	93.3	0.0 - 107.0	ng/g	
Faecal B-Glucuronidase	4322.0	337.0 - 4433.0	U/g	
Steatocrit	9.0	0.0 - 15.0	%	
anti-Gliadin IgA	18.0	0.0 - 157.0	units/L	

Microbiome Mapping Summary

Parasites & Worms

Bacteria & Viruses

Bacillus species.
Streptococcus species
Citrobacter freundii.
Helicobacter pylori

Fungi and Yeasts

Candida species.

Key Phyla Microbiota

Bacteroidetes	13.40	8.61 - 33.10	x10 ¹¹ org/g	
Firmicutes	19.55	5.70 - 30.40	x10 ¹⁰ org/g	
Firmicutes:Bacteroidetes Ratio	0.15	< 1.00	RATIO	

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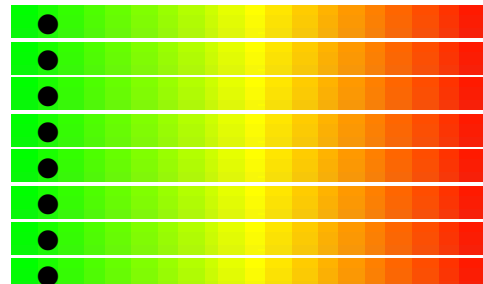
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Parasites and Worms.**Parasitic Organisms**

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

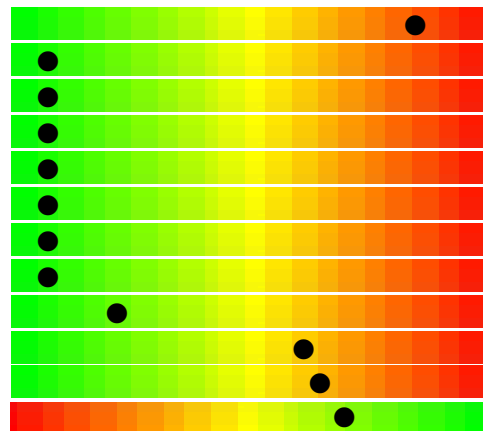
**Worms**

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

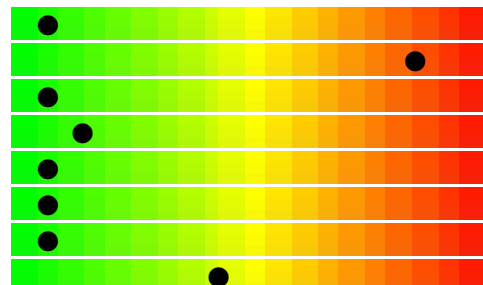
Comment: Not Detected results indicate the absence of detectable DNA in this sample for the worms reported.

Opportunistic Bacteria/Overgr

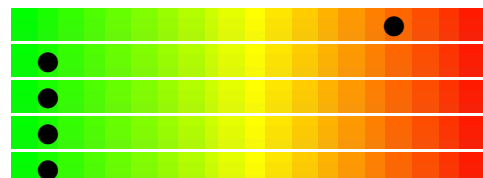
Bacillus species.	8.8 *H	< 1.5	x10 ⁵ org/g
Enterococcus faecalis	<dl	< 1.0	x10 ⁴ org/g
Enterococcus faecium	<dl	< 1.0	x10 ⁴ org/g
Morganella species	<dl	< 1.0	x10 ³ org/g
Pseudomonas species	<dl	< 1.0	x10 ⁴ org/g
Pseudomonas aeruginosa.	<dl	< 5.0	x10 ² org/g
Staphylococcus species	<dl	< 1.0	x10 ⁴ org/g
Staphylococcus aureus	<dl	< 5.0	x10 ² org/g
Streptococcus species	1.0 *H	< 1.0	x10 ³ org/g
Methanobacteriaceae	4.10	< 5.00	x10 ⁹ org/g
Desulfovibrio piger	17.22	0-18.0	x10 ⁹ org/g
Oxalobacter formigenes	315	>15.00	x10 ⁹ org/g

**Potential Autoimmune Triggers**

Citrobacter species.	<dl	< 5.0	x10 ⁵ org/g
Citrobacter freundii.	167.5 *H	< 5.0	x10 ⁵ org/g
Klebsiella species	<dl	< 5.0	x10 ³ org/g
Klebsiella pneumoniae.	2.9	< 5.0	x10 ⁴ org/g
Prevotella copri	<dl	< 1.0	x10 ⁷ org/g
Proteus species	<dl	< 5.0	x10 ⁴ org/g
Proteus mirabilis.	<dl	< 1.0	x10 ³ org/g
Fusobacterium species	7.43	< 10.00	x10 ⁷ org/g

**Fungi & Yeast**

Candida species.	62.4 *H	< 5.0	x10 ³ org/g
Candida albicans.	<dl	< 5.0	x10 ² org/g
Geotrichum species.	<dl	< 3.0	x10 ² org/g
Microsporidium species	<dl	< 5.0	x10 ³ org/g
Rhodotorula species.	<dl	< 1.0	x10 ³ org/g





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Bacterial Pathogens	Result	Range	Units	
Aeromonas species.	<dl	< 1.0	x10 ³ CFU/g	
Campylobacter.	<dl	< 1.0	x10 ³ CFU/g	
C. difficile, Toxin A	<dl	< 1.0	x10 ³ CFU/g	
C. difficile, Toxin B	<dl	< 1.0	x10 ³ CFU/g	
Enterohemorrhagic E. coli	<dl	< 1.0	x10 ³ CFU/g	
E. coli O157	<dl	< 1.0	x10 ² CFU/g	
Enteroinvasive E. coli/Shigella	<dl	< 1.0	x10 ³ CFU/g	
Enterotoxigenic E. coli LT/ST	<dl	< 1.0	x10 ³ CFU/g	
Shiga-like Toxin E. coli stx1	<dl	< 1.0	x10 ³ CFU/g	
Shiga-like Toxin E. coli stx2	<dl	< 1.0	x10 ³ CFU/g	
Salmonella.	<dl	< 1.0	x10 ⁴ CFU/g	
Vibrio cholerae	<dl	< 1.0	x10 ³ CFU/g	
Yersinia enterocolitica.	<dl	< 1.0	x10 ⁵ CFU/g	
Helicobacter pylori	56.0 *H	< 1.0	x10 ³ 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 ¹⁰ CFU/g	
Norovirus GI/II	<dl	< 1.0	x10 ⁷ CFU/g	
Bocavirus	<dl	< 1.0	x10 ¹⁰ CFU/g	

Normal Bacterial GUT Flora	Result	Range	Units	
Bacteroides fragilis	57.0	1.6 - 250.0	x10 ⁹ CFU/g	
Bifidobacterium species	5.5 *L	> 6.7	x10 ⁷ CFU/g	
Bifidobacterium longum	2.2 *L	> 5.2	x10 ⁶ CFU/g	
Enterococcus species	24.0	1.9 - 2000.0	x10 ⁵ CFU/g	
Escherichia species	1065.0	3.7 - 3800.0	x10 ⁶ CFU/g	
Lactobacillus species	19.8	8.6 - 6200.0	x10 ⁵ CFU/g	
Lactobacillus Rhamnosus	5.1 *L	8.3 - 885.0	x10 ⁵ CFU/g	
Clostridium species	27.6	5.0 - 50.0	x10 ⁶ CFU/g	
Enterobacter species	64.0 *H	1.0 - 50.0	x10 ⁶ CFU/g	
Akkermansia muciniphila	59.84 *H	0.01 - 50.00	x10 ³ CFU/g	
Faecalibacterium prausnitzii	905.9	1.0 - 500000	x10 ³ CFU/g	

Short Chain Fatty Acids	Result	Range	Units	
Short Chain Fatty Acids, Beneficial	37.9	> 13.6	umol/g	
Butyrate	17.8	10.8 - 33.5	%	
Acetate	50.4	44.5 - 72.4	%	
Propionate	30.6	0.0 - 32.0	%	
Valerate	1.2	0.5 - 7.0	%	



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Pathogen Summary:

Macroscopy Comment

BROWN coloured stool is considered normal in appearance.

UNFORMED/LIQUID stools may indicate the presence of infection and/or inflammation.

Consider dysbiosis, food sensitivity, high dose vitamin C and magnesium, infection, intestinal permeability, laxative use, malabsorption, maldigestion, stress. Other causes: bacterial, fungal, viral and other parasitic infections.

Treatment:

- Investigate and treat possible underlying cause.
- Assess other CDSA markers such as pH, pancreatic elastase 1 & microbiology markers."

Metabolism Comment

In a healthy gut Short Chain Fatty Acids are exhibited in the following proportions;

Butyrate, Acetate, Propionate (16% : 60% : 24%)

VALERATE:

Valerate is a short chain fatty acid that is important for gut health. Although Acetate, propionate, and butyrate make up the the most abundant SCFAs in gastrointestinal tract (95%), Valerate and other SCFA's make up the remaining and work optimally when within range.

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.

FAECAL SECRETORY IgA:

Production of sIgA is important to the normal function of the gastrointestinal mucosa as an immune barrier.

It represents the first line immune defense of the GIT.

Elevated levels are associated with an upregulated immune response.



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Opportunistic Bacteria Comment

ELEVATED BACILLUS SPECIES LEVEL:

Bacillus species are spore forming, gram-positive rods belonging to the Bacillaceae family. There are currently 50 valid species within the genus.

It has been noted that some strains are used as probiotics.

Sources:

Meat dishes are a common source of infection in other species of Bacillus such as *B. subtilis* and *B. licheniformis*.

B. cereus food poisoning includes meats, pasta, vegetable dishes, desserts, cakes, sauces and milk.

Pathogenicity:

As yet, no toxins or other virulence factors have been identified in association with the symptoms that accompany non-*B. cereus* species.

Symptoms:

B. licheniformis and *B. subtilis* are associated with food-borne diarrheal illness.

Treatment:

It should be noted that the level of Bacillus spp should be considered in context of clinical symptoms. The level may be neither beneficial nor pathogenic. Where present, often inadequate levels of beneficial bacteria are also noted. These organisms may become dysbiotic at high levels where treatment may become necessary.

Natural Microbials:

In high levels of Bacillus spp, a combination of berberine and plant tannins have shown a high susceptibility success for treatment.

Antibiotics:

B. species is almost always susceptible to clindamycin, erythromycin and vancomycin.

METHANOBACTERIACEAE:

Family of bacteria-like microbes that produce methane. Facilitates carbohydrate fermentation and short-chain fatty acid production by beneficial bacteria.

LOW levels may indicate reduced production of short-chain fatty acids and may be associated with inflammation.

HIGH levels linked to chronic constipation, as well as some types of SIBO and IBS.

Potential Autoimmune Comments

ELEVATED CITROBACTER FREUNDII LEVEL:

Sources:

Citrobacter is a gram-negative bacteria in the Enterobacteriaceae family. Common in the environment and may be spread by person-to person contact. Several outbreaks have occurred in babies in hospital units. Isolated from water, fish, animals and food.

Pathogenicity:

Citrobacter is considered an opportunistic pathogen and therefore can be found in the gut as part of the normal flora.

Symptoms:

Citrobacter has occasionally been implicated in diarrheal disease, particularly *C. freundii* and *C. diversus* and *C. koseri*

Treatment:

Treatment is not generally required in low amounts. However, where high levels are present and patients are symptomatic. A combination of oregano, plant tannins and oregano has shown high susceptibility.

For further information, refer to the 4R treatment protocol located at the end of this report.

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.

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.

Fungi/Yeasts Comment



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ELEVATED CANDIDA SPECIES LEVEL:

Sources:

Most sources of Candida infection are thought to be of endogenous origin. While yeast are ubiquitous in the environment and are found on fruits, vegetables and other plant materials, contamination from external sources is linked to patients and health care workers.

Pathogenicity:

A normal inhabitant of the GI tract. May become an opportunistic pathogen after disruption of the mucosal barrier, imbalance of the normal intestinal flora and/or impaired immunity.

Risk factors for colonization include: Antibiotics, corticosteroids, antacids, H2 blockers, oral contraceptives, irradiation, GI surgery, Diabetes mellitus, burns, T cell dysfunction, chronic stress and chronic renal disease.

Symptoms:

The most common symptom attributable to non-invasive yeast overgrowth is diarrhoea. Symptoms of chronic candidiasis affect four main areas of the body.

1. Intestinal system - symptoms include: diarrhoea, constipation, abdominal discomfort, distention, flatulence and rectal itching.
2. Genital Urinary system - symptoms include: menstrual complaints, vaginitis, cystitis and urethritis.
3. Nervous system - symptoms include: severe depression, extreme irritability, inability to concentrate, memory lapses and headaches.
4. Immune system - symptoms include urticaria, hay fever, asthma, and external otitis.

Sensitivities to tobacco, perfumes, diesel fumes and other chemicals.

Treatment:

Currently, standard texts provide no specific antifungal guidelines for GI overgrowth of Candida.

Oral azoles have been recommended for extra intestinal infections.

Susceptibility testing is advised due to increasing drug resistance.

Bacterial Pathogens Comment

ELEVATED YERSINIA ENTEROCOLITICA LEVEL:

Source:

Faecal contamination of ingested foods and liquids (water, undercooked pork, meats, and dairy products).

Symptoms:

Symptoms usually develop three to seven days after exposure and are self-limiting.

Symptoms include water or bloody diarrhea, fever, vomiting, and abdominal pain (may resemble appendicitis).

Symptoms may mimic Crohn's disease.

May trigger autoimmune thyroiditis or inflammatory arthritis in susceptible individuals.

Treatment:

Consider probiotics, broad-spectrum antimicrobial herbs and follow the 4R treatment protocol.

Severe infections can be treated with doxycycline in combination with an aminoglycoside.

Trimethoprim-sulfamethoxazole, chloramphenicol, and rifaximin may also be useful treatments.

PLEASE NOTE:

Yersinia detection has been confirmed through a secondary PCR test.

Yersinia is a Notifiable Disease in Queensland, South Australia, Western Australia and Tasmania.

If applicable, the laboratory has notified the relevant state Department of Health.

If applicable, the practitioner is also required to notify the state Dept of Health.

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Normal Bacterial Flora Comment

LOW BIFIDOBACTERIUM LEVEL:
Organism of the Actinobacteria phylum.
Low levels may result from low fiber intake or reduced mucosal health. Thrives on a wide variety of prebiotic fibers.

ELEVATED ENTEROBACTER SPECIES LEVEL:
Organism of the Proteobacteria phylum. Closely related to E. coli (in the same taxonomic family).
High levels may indicate increased intestinal inflammatory activity.

ELEVATED AKKERMANSIA MUCINIPHILA LEVEL:
Akkermansia muciniphila is a 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.

Although research suggests that this bacterium appears to have mostly beneficial effects within the human microbiome, studies have shown it can be elevated in patients with multiple sclerosis and Parkinson's disease.



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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 sup lactise, lactobacillus acidophilus, lactobacillus plantarum, lactobacillus casei, bifidobacterium breve, bifidobacterium bifidum, bifidobacterium longum, lactobacillus salivarius ssp salivarius, lactobacillus paracasei, lactobacillus rhamnosus, Saccaromyces 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	Saccaromyces boulardii, lauric acid
		INTESTINAL BARRIER REPAIR	L-Glutamine, aloe vera, liquorice, marshmallow root, okra, quercetin, slippery elm, zinc carnosine, Saccaromyces boulardii, omega 3 essential fatty acids, B vitamins
		SUPPORT CONSIDERATION	Sleep, diet, exercise, and stress management