VERA ZADNIPROVSKA

-.ALEXANDRA MIDDLETON

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Date of Birth : 07-Aug-1987
Sex : F
Collected : 8/Feb/2022
Received: 09-Feb-2022
125 AWABA STREET
MOSMAN NSW 2088
Lab id : **3795630** UR#: 6599663

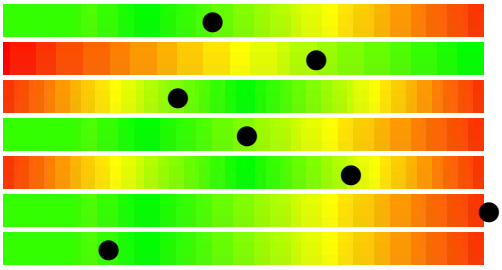
6 EDWARDS BAY ROAD
MOSMAN NSW 2088

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	Semi-formed		**Form** -A formed stool is considered normal. Variations to this may indicate abnormal GIT conditions.
Mucous	NEG	< +	**Mucous** - Mucous production may indcate 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.	20.0	0.0 - 50.0	ug/g
Pancreatic Elastase	>500.0	> 200.0	ug/g
Faecal Secretory IgA	880.4	510.0 - 2010.0	ug/g
Faecal Zonulin	53.0	0.0 - 107.0	ng/g
Faecal B-Glucuronidase	4039.2	337.0 - 4433.0	U/g
Steatocrit	*>35.0* *H	0.0 - 15.0	%
anti-Gliadin IgA	<20	0.0 - 100.0	units/L



Microbiome Mapping Summary

Parasites & Worms

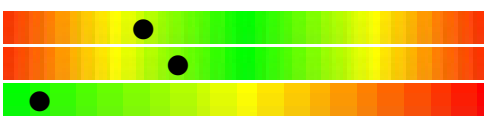
Bacteria & Viruses

Enterococcus faecium
Streptococcus species
Citrobacter freundii.
Klebsiella pneumoniae.
Enterohemorrhagic E. coli

Fungi and Yeasts

Key Phyla Microbiota

Bacteroidetes	10.40	8.61 - 33.10	x10^11 org/g
Firmicutes	11.82	5.70 - 30.40	x10^10 org/g
Firmicutes:Bacteroidetes Ratio	0.11	< 1.00	RATIO



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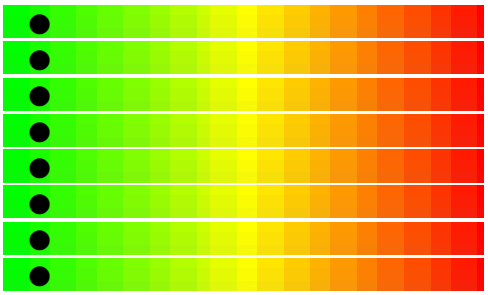
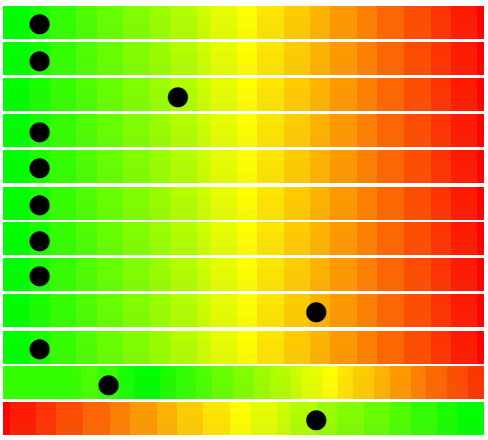
Parasites and Worms.	Result	Range	Units
Parasitic Organisms			
Cryptosporidium.	<dl	< 1.0	x10^6 org/g
Entamoeba histolytica.	<dl	< 1.0	x10^4 org/g
Giardia lamblia.	<dl	< 5.0	x10^3 org/g
Blastocystis hominis.	<dl	< 2.0	x10^3 org/g
Dientamoeba fragilis.	<dl	< 1.0	x10^5 org/g
Endolimax nana	<dl	< 1.0	x10^4 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		

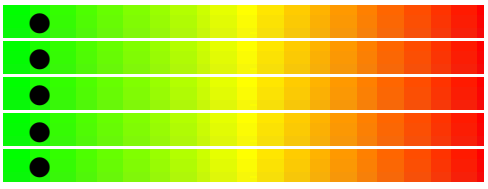


Comment: Not Detected results indicate the absence of detectable DNA in this sample for the worms reported.

Opportunistic Bacteria/Overgr	Result	Range	Units
Bacillus species.	<dl	< 1.5	x10^5 org/g
Enterococcus faecalis	<dl	< 1.0	x10^4 org/g
Enterococcus faecium	*1.8* *H	< 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	*4.2* *H	< 1.0	x10^3 org/g
Methanobacteriaceae	0.63	< 5.00	x10^9 org/g
Desulfovibrio piger	<dl	0.0 - 18.0	x10^7 org/g
Oxalobacter formigenes	893.4	> 15.0	x10^7 org/g
Potential Autoimmune Triggers			
Citrobacter species.	<dl	< 5.0	x10^5 org/g
Citrobacter freundii.	*17.5* *H	< 5.0	x10^5 org/g
Klebsiella species	<dl	< 5.0	x10^3 org/g
Klebsiella pneumoniae.	*6.3* *H	< 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	5.73	< 10.00	x10^7 org/g



Fungi & Yeast	Result	Range	Units
Candida species.	<dl	< 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	*8.1* *H	< 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	x10^5 CFU/g
Yersinia enterocolitica.	<dl	< 1.0	x10^5 CFU/g
Helicobacter pylori	<dl	< 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	3.5	1.6 - 250.0	x10^9 CFU/g
Bifidobacterium species	*4.6* *L	> 6.7	x10^7 CFU/g
Bifidobacterium longum	*2.9* *L	> 5.2	x10^6 CFU/g
Enterococcus species	174.7	1.9 - 2000.0	x10^5 CFU/g
Escherichia species	2100.7	3.7 - 3800.0	x10^6 CFU/g
Lactobacillus species	*7.0* *L	8.6 - 6200.0	x10^5 CFU/g
Lactobacillus Rhamnosus	*2.9* *L	8.3 - 885.0	x10^4 CFU/g
Clostridium species	19.1	5.0 - 50.0	x10^6 CFU/g
Enterobacter species	*53.2* *H	1.0 - 50.0	x10^6 CFU/g
Akkermansia muciniphila	*66.91* *H	0.01 - 50.00	x10^3 CFU/g
Faecalibacterium prausnitzii	1099.5	1.0 - 500000	x10^3 CFU/g

Short Chain Fatty Acids	Result	Range	Units
Short Chain Fatty Acids, Beneficial	20.0	> 13.6	umol/g
Butyrate	15.2	10.8 - 33.5	%
Acetate	63.1	44.5 - 72.4	%
Propionate	17.2	0.0 - 32.0	%
Valerate	4.5	0.5 - 7.0	%

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Pathogen Summary:

Macroscopy Comment

BROWN coloured stool is considered normal in appearance.

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.

ELEVATED STEATOCRIT:
The presence of steatorrhea is an indirect indicator of incomplete fat digestion. Consider high dietary fat intake, cholestasis, malabsorption and digestion (diarrhoea, pancreatic or bile salt insufficiency), intestinal dysbiosis, parasites, NSAIDs use, short bowel syndrome, whipple disease, crohn's disease, food allergies & sensitivities.
Treatment:
o Prebiotic and probiotic supplementation
o Supplement hydrochloride, digestive enzymes or other digestive aids
o Investigate underlying causes
o Investigate food sensitivities and allergies
o Remove potential irritants
o Review markers such as pancreatic elastase 1 and calprotectin

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Opportunistic Bacteria Comment

STREPTOCOCCUS SPECIES:
Description:
Streptococcus is a gram-positive bacteria in the Firmicutes phylum. Streptococcus is generally a common isolate from gut flora. However, emerging research suggests that high levels in the intestine may result from low stomach acid, PPI use, reduced digestive capacity, SIBO or constipation; Elevated levels may also be indicative of intestinal inflammatory activity, and may cause loose stools.

Sources:
Recent infections with streptococcus pyogenes or scarlet fever can be linked to the presence of this species in faeces.

Treatment:
Treatment of streptococcus in gut flora is not always recommended. A practitioner may take into consideration a range of patient factors and symptoms to determine if treatment is necessary. In this case please refer to the 4R treatment protocol located at the end of this report.

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.

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 Delsulfovibrio 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.
Reference: Kushkevych et. Al., J. Clin. Med. 2019, 8, 1054; doi:10.3390/jcm8071054

OXALOBACTER COMMENT:
Oxolate 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. Oxolobacter 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).
Reference: Duncan et. al., Applied and Environmental Microbiology, Aug. 2002, p. 3841-3847
Kaufman et. al., J Am Soc Nephrol. 2008 Jun; 19(6): 1197-1203.

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.
ELEVATED KLEBSIELLA PNEUMONIAE LEVEL:
Sources:
Klebsiella is part of the Enterobacteriaceae family and as such is a gram-negative bacteria. Klebsiella is Isolated from foods and environmental sources. Klebsiella appears to thrive in individuals on a high starch diet.

Pathogenicity:
Part of the normal gut flora in small numbers, but can be an opportunistic pathogen.
Klebsiella is capable of translocating from the gut when in high numbers.

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Certain strains of K. oxytoca have demonstrated cytotoxin production.

Symptoms:
When Klebsiella is found in considerable amounts, symptoms may include abdominal pain, bloating, loose stools, anxiety, insomnia, food allergies.

Treatment:
Avoiding carbohydrates such as rice, potatoes, flour products and sugary foods reduces the amount of Klebsiella in the gut
Other Herbal antimicrobials include:
Lemon and clove, Burr marigold, Thyme, Licorice, euphobia, cordyceps. For further treatment options, 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.

Bacterial Pathogens Comment

ELEVATED ENTEROHEMORRHAGIC E. COLI LEVEL:
Source:
Faecal contamination of food (undercooked beef, raw milk, and unpasteurized juice) and water.
Implicated in hemorrhagic colitis, may progress to hemolytic uremic syndrome (HUS).

Symptoms:
Symptoms include fever, abdominal cramping, fatigue, nausea, and diarrhoea lasting up to a week.

Treatment:
Review patient's calprotectin and Secretory IgA levels to determine GI inflammation and immune response.
Antibiotics may be contraindicated as they can initiate hemolytic uremic syndrome (HUS)
Consider high-dose probiotics (300+ billion CFU/g) such as: Lactobacillus acidophilus, Bifidobacterium bifidum, Bifidobacterium longum, Lactobacillus rhamnosus, Bifidobacterium breve, Lactobacillus casei, Streptococcus thermophilus
Consider bacteriophages, broad-spectrum antimicrobial herbs, and 4R Protocol

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.

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:
Lactobacullus 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 responsesL. Low levels may be linked to poor digestive health, diarrhea and IBS symptoms.

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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