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1620 Linden Av N
Shoreline WA, 98133
Dr.- US BIOTEK

SAMPLE REPORT
09-May-1990 Female

LAB ID : 12345555
Collection Date : 08-May-2023
Received Date: 08-May-2023

Accession #: 0000000000

GI Basic

Microbiome Mapping Summary

Parasites & Worms

Blastocystis hominis.
Entamoeba coli.

Bacteria & Viruses

Streptococcus species
Desulfovibrio piger
Citrobacter freundii

Fungi and Yeasts

Candida species.

Firmicutes:Bacteroidetes Ratio 1.84 *H < 1.00 RATIO

Relative Commensal Abundance of the 6 Phyla groups can be found on page 4 of this report

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Parasites and Worms.	Result	Range	Units
Parasitic Organisms			
Cryptosporidium species	<dl	< 1.0	x10^6 org/g
Entamoeba histolytica.	<dl	< 1.0	x10^4 org/g
Giardia intestinalis	<dl	< 1.0	x10^3 org/g
Blastocystis hominis.	*181.5* *H	< 1.0	x10^3 org/g
Dientamoeba fragilis.	<dl	< 1.0	x10^5 org/g
Endolimax nana	<dl	< 1.0	x10^4 org/g
Entamoeba coli.	*12.9* *H	< 5.0	x10^6 org/g
Pentatrichomonas hominis	<dl	< 1.0	x10^2 org/g
Worms			
Ascaris lumbricoides, Roundworm	Not Detected	Necator americanus, Hookworm	Not Detected
Trichuris trichiura, Whipworm	Not Detected	Enterobius vermicularis,Pinworm	Not Detected
Enterocytozoon spp	Not Detected	Hymenolepis spp, Tapeworm	Not Detected
Strongyloides spp, Roundworm	Not Detected	Taenia species, Tapeworm	Not Detected

Comment: Not Detected results indicate the absence of detectable DNA in the sample for the worms reported.
NOTE: Reflex testing is performed on clinically indicated samples

Opportunistic Bacteria/Overgrowth	Result	Range	Units
Bacillus species.	0.70	< 1.00	x10^5 CFU/g
Enterococcus faecalis	0.30	< 1.00	x10^4 CFU/g
Enterococcus faecium	0.55	< 1.00	x10^4 CFU/g
Morganella species	<dl	< 1.00	x10^3 CFU/g
Pseudomonas species	<dl	< 1.00	x10^4 CFU/g
Pseudomonas aeruginosa.	<dl	< 3.00	x10^2 CFU/g
Staphylococcus species	<dl	< 1.00	x10^4 CFU/g
Staphylococcus aureus	<dl	< 5.00	x10^2 CFU/g
Streptococcus species	*3.85* *H	< 3.00	x10^3 CFU/g
Methanobrevibacter smithii	4.00	< 5.00	x10^9 CFU/g
Desulfovibrio piger	*84.22* *H	< 18.00	x10^7 CFU/g
Enterobacter complex.	<dl	< 1.00	x10^6 CFU/g
Potential Autoimmune Triggers			
Citrobacter species.	<dl	< 5.00	x10^5 CFU/g
Citrobacter freundii.	6.87 *H	< 5.00	x10^5 CFU/g
Klebsiella species	<dl	< 5.00	x10^3 CFU/g
Klebsiella pneumoniae.	<dl	< 5.00	x10^4 CFU/g
Prevotella copri	<dl	< 1.00	x10^7 CFU/g
Proteus species	<dl	< 5.00	x10^4 CFU/g
Proteus mirabilis.	<dl	< 1.00	x10^3 CFU/g
Fusobacterium species	0.20	< 10.00	x10^7 CFU/g

Fungi & Yeast	Result	Range	Units
Candida species.	*5.58* *H	< 5.00	x10^3 CFU/g
Candida albicans.	<dl	< 5.00	x10^2 CFU/g
Geotrichum species.	<dl	< 3.00	x10^2 CFU/g
Saccharomyces cerevisiae.	<dl	< 3.00	x10^3 CFU/g
Rhodotorula species.	<dl	< 1.00	x10^3 CFU/g

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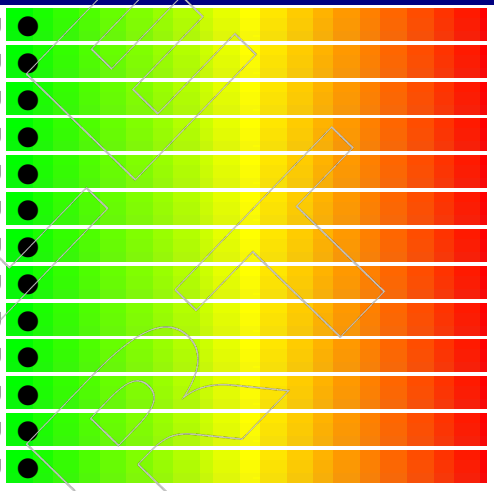
Bacterial Pathogens	Result	Range	Units
Aeromonas hydrophila.	<dl	< 1.00	x10^3 CFU/g
Campylobacter species.	<dl	< 1.00	x10^3 CFU/g
C. difficile, Toxin A	<dl	< 1.00	x10^3 CFU/g
C. difficile, Toxin B	<dl	< 1.00	x10^3 CFU/g
Enterohemorrhagic E. coli	<dl	< 1.00	x10^3 CFU/g
Enteroinvasive E. coli/Shigella	<dl	< 1.00	x10^3 CFU/g
Enterotoxigenic E. coli LT/ST	<dl	< 1.00	x10^3 CFU/g
Shiga-like Toxin E. coli stx1	<dl	< 1.00	x10^3 CFU/g
Shiga-like Toxin E. coli stx2	<dl	< 1.00	x10^3 CFU/g
Salmonella species.	<dl	< 1.00	x10^4 CFU/g
Vibrio species.	<dl	< 1.00	x10^5 CFU/g
Yersinia species.	<dl	< 1.00	x10^5 CFU/g
Helicobacter pylori	<dl	< 1.0	x10^3 CFU/g

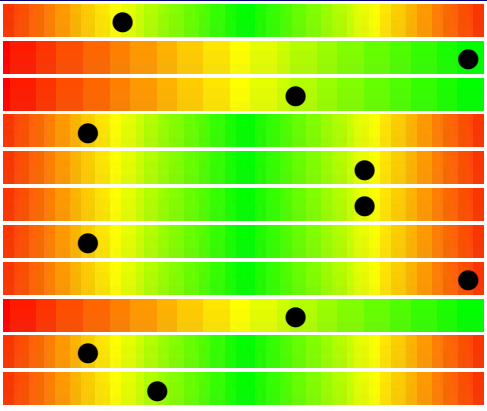


Comment: Helico Pylori virulence factors will be listed below if detected POSITIVE

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
Adenovirus 40/41	Not Detected
Norovirus GI/II	Not Detected
Rotavirus A	Not Detected
Sapovirus (I,II,IV,V)	Not Detected
Astrovirus (hAstro)	Not Detected

Normal Bacterial GUT Flora	Result	Range	Units
Bacteroides fragilis	35.0	1.6 - 250.0	x10^9 CFU/g
Bifidobacterium species	254.1	> 6.7	x10^7 CFU/g
Bifidobacterium longum	6.1	> 5.2	x10^6 CFU/g
Enterococcus species	40.1	1.9 - 2000.0	x10^5 CFU/g
Escherichia species	3705.0	3.7 - 3800.0	x10^6 CFU/g
Lactobacillus species	6102.0	8.6 - 6200.0	x10^5 CFU/g
Lactobacillus Rhamnosus	25.0	8.3 - 885.0	x10^4 CFU/g
Clostridium species	*99.0* *H	5.0 - 50.0	x10^6 CFU/g
Oxalobacter formigenes	17.00	> 15.00	x10^7 CFU/g
Akkermansia muciniphila	*<dl* *L	1.00 - 50.00	x10^3 CFU/g
Faecalibacterium prausnitzii	1084.9	200.0 - 3500.0	x10^3 CFU/g



Methodology:
GIT Functional markers performed by GCMS,EIA,FEIA.
Bacteriology,Virology,Fungi,Parasites & Worms performed by PCR,qPCR.
<dl = result below detectable limit. *H = Result greater than the reference range. *L = Result less than the reference range

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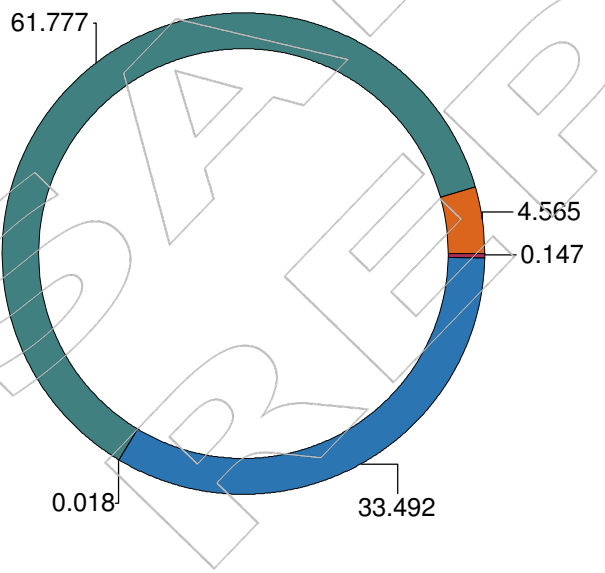
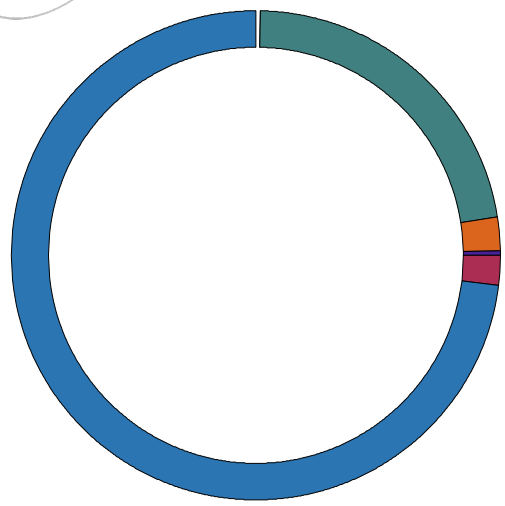
Introduction:
Your gut microbiome is a collective name for the 40 trillion cells and up to 1000 microbial species that include bacteria, viruses, fungi, parasites, and archaea and reside in our gut. The number of gut bacterial cells is approximately equal to the total number of human cells in our body, so if we consider only cell counts, we are only about half human. In terms of gene counts, the microbiome contains about 200 times more genes than the human genome, making bacterial genes responsible for over 99% of our body's gene content! Of all the microbial communities in the human body, the gut microbiome is by far the most dense, diverse, and physiologically important ecosystem to our overall health.

Relative Commensal Abundance	Result	Range	Units
Firmicutes Phylum	*61.777* *H	3.500 - 40.000	%
Bacteroidetes Phylum	*33.492* *L	50.000 - 95.000	%
Proteobacteria Phylum	4.565	0.500 - 12.500	%
Actinobacteria Phylum	0.147	0.001 - 4.818	%
Euryarchaeota Phylum	0.018	0.000 - 0.177	%
Verrucomicrobia Phylum	0.000	0.000 - 2.400	%

Your Phyla:



Healthy Phyla:



References:
NOTE: Relative abundance reference ranges have been based on a healthy population study.
King CH, et., al. (2019) Baseline human gut microbiota profile in healthy people and standard reporting template. PLoS One. 2019 Sep 11;14(9):e0206484.

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Pathogen Summary:

Parasites/Worms Comment

ELEVATED BLASTOCYSTIS HOMINIS LEVEL:
Blastocystis hominis may be the cause of persistent, mild diarrhoea. Although considered endemic, it may also be associated with recent overseas travel. Detection suggests the ingestion of contaminated material or contact with farm animals. Continued symptoms may require further testing for the detection of bacterial, viral and/or parasitic co-pathogens.

TREATMENT SUGGESTIONS:
Mild symptoms are self-limiting.
If treatment is warranted, metronidazole 400 - 750mg (child 12-17mg/kg up to 750mg) three times daily for at least 10 days. Lower dosages are usually associated with treatment failure.
Paromomycin has also shown to be effective as an alternative treatment option.
Rule out allergy to above medication before prescribing/taking. Consult ID specialist if patient is showing severe symptoms or immunocompromised.

ELEVATED ENTAMOEBA COLI LEVEL:
Entamoeba Coli is generally considered non-pathogenic protozoa and infestation often remains asymptomatic. However, some patients may show gastrointestinal symptoms such as loose stools, colicky abdominal pain, and flatulence. High infection levels may also be associated with gastritis, indigestion, dyspepsia, or hyperacidity. It is transmitted through faecal-oral route. Typically, mature cysts are ingested from contaminated water and food sources.

TREATMENT SUGGESTIONS:
If the patient is symptomatic and no other organism or causes are found, treatment may be indicated. If treatment is warranted, diloxanide furoate 500 milligrams three times daily for ten days or Metronidazole 400 mg orally three times a day may be used. Rule out allergy to above medication before prescribing/taking. Consult ID specialist if patient is showing severe symptoms or immunocompromised.

Opportunistic Bacteria Comment

STREPTOCOCCUS SPECIES ELEVATED:

PHYLUM: Firmicutes

DESCRIPTION:
Streptococcal species are a genus of gram-positive cocci which are normally diverse in the intestinal microbial community. Streptococcus spp. are involved in the fermentation of sugars, yielding lactic acid as their predominant fermentation end product. Elevated gut streptococci may be associated with diseases such as inflammatory bowel disease, liver cirrhosis or hypertension.

Higher 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.

TREATMENT SUGGESTIONS:
Treatment of streptococcus in gut flora is not always recommended. A practitioner may take into consideration a range of patient factors and symptoms. The 4R treatment protocol at the end of this report may be considered.

DESULFOVIBRIO PIGER ELEVATED:

PHYLUM: Proteobacterium

DESCRIPTION:
Desulfovibrio piger is part of a group called sulfate-reducing bacteria (SRB) and are normal inhabitants of the intestine. Sulfate is present in different concentrations in the intestine dependent on diet. Remnants not absorbed, alongside the presence of lactate, promote the growth of SRB. Desulfovibrio Piger has been implicated in gastrointestinal disorders such as ulcerative colitis via the reduction of sulfate to hydrogen sulfide in the gut. High Delsulfovibrio piger levels may be associated with diarrhea or inflammatory bowel disease.

TREATMENT SUGGESTIONS:
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.

CITROBACTER FREUNDII ELEVATED:

PHYLUM: Proteobacteria

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DESCRIPTION:
Citrobacter freundii is a species of facultative anaerobic Gram-negative predominantly soil-dwelling bacteria, but can also be found in water, sewage, food, and the intestinal tract. Citrobacter freundii is an emerging opportunistic pathogen and elevation may be a cause of nosocomial infections, diarrheal infections and has increasingly become multidrug resistant (MDR).

TREATMENT SUGGESTIONS:
A practitioner may take into consideration a range of patient factors and symptoms to determine if treatment is necessary. Citrobacter freundii infection is usually treated with antibiotics like fluoroquinolones, carbapenems and cephalosporins. The treatment plan depends up on the vulnerability of the microbe to the antibiotics and the degree of infection. Treatments may also include herbal antimicrobials and/or probiotics. Rule out allergy to above medication before prescribing/taking.

Fungi/Yeasts Comment

CANDIDA SPECIES ELEVATED:

PHYLUM: Ascomycota

DESCRIPTION:
Candida is a genus of yeasts found in the environment and present in healthy persons colonizing the oropharyngeal, oesophageal and gastrointestinal mucosa. Most species are considered normal flora, however, they can behave as opportunistic pathogens. Candidiasis is an opportunistic infection due to Candida, which can affect the oral cavity, vagina, penis, or gastrointestinal tract. Elevated Candida colonization is associated with several diseases of the gastrointestinal tract including Ulcerative colitis, Crohn's and Gastric Ulcers as well as with antibiotic usage.

Other common symptoms include: Gas, bloating, constipation, nausea and skin conditions such as Eczema.

TREATMENT SUGGESTIONS: Dietary: Reduce intake of sugars, starches, and fungi.
Candida infections may be treated if warranted with antifungal medications such as nystatin, clotrimazole, amphotericin B or miconazole. Probiotic Lactobacillus treatment may also be effective. Rule out allergy to above medication before prescribing/taking.

Phyla Microbiota Comment

FIRMICUTES (PHYLUM) ELEVATED:

DESCRIPTION:
Firmicutes are a phylum of diverse bacteria which are primarily grouped into classes, Bacilli, Clostridia, Erysipelotrichia and Negativicutes. They are found in various environments, including the intestinal tract, and the group includes some notable pathogens. Firmicutes are involved in energy resorption in the gut microbiome and levels may be affected by diet. Elevated levels and disturbance of gastrointestinal microbiome balance, particularly Firmicutes/Bacteroidetes ratio, have been associated with inflammation, obesity, diabetes and with a high sugar/ fat diet.

TREATMENT SUGGESTIONS: Consider using Bifidobacterium or Saccharomyces containing probiotics. It may also be suggested to optimise the patient diet. A lower fat diet may help to normalize Firmicutes levels.

FIRMICUTES/BACTEROIDETES RATIO ELEVATED:
Elevated Firmicutes/Bacteroidetes ratio is frequently cited in the scientific literature as a hallmark of obesity, metabolic syndrome, irritable bowel syndrome or diabetes risk. The ratio may also be used to evaluate commensal microbial balance.

The calculation provided in this report is made by the sum of abundance of Firmucutes tested divided by the sum of abundance Bacteroidetes. Reference ranges are based off internal cohort studies.

Treatment:
Balance commensal bacteria using the 4R Protocol which is located at the end of this test report. When firmicutes are high, consider using Bifidobacterium probiotics and Saccharomyces boulardii primarily. Lactobacillus spp. and Bacillus spp. (found in probiotics) can elevate firmicutes. It is further suggested to optimize the patient diet. A lower fat diet may assist to normalize the F/B ratio.

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Normal Bacterial Flora Comment

BIFIDOBACTERIUM SPECIES LOW NORMAL:

PHYLUM: Actinobacteria

DESCRIPTION:
Bifidobacterium is a genus of gram-positive, nonmotile anaerobic bacteria that are ubiquitous inhabitants of the gastrointestinal tract and considered a probiotic. Bifidobacterium species prevent diarrhea and intestinal infections, alleviate constipation, and stimulate the immune system. Whilst, the Bifidobacterium species level is in range, it is below the average mean.

Lower levels may result from low fibre intake or reduced mucosal health. Additionally, Lower levels may be associated with irritable bowel syndrome or with pathogenic bacteria infection.

TREATMENT SUGGESTIONS: Treatment may involve the use of Bifidobacterium containing probiotics and treatment of any intestinal infections.

CLOSTRIDIUM SPECIES ELEVATED:

PHYLUM: Firmicutes

DESCRIPTION:
Clostridium is a genus of anaerobic, Gram-positive bacteria found in the environment and the intestinal tract. This genus includes several species and can utilize large amounts of nutrients that cannot be digested by host and produce short-chain fatty acids
(SCFAs), which play a noticeable role in intestinal homeostasis. Colonisation of Clostridium species may be affected by diet
(carbohydrate and protein in diet) and general health and may be protective against inflammation and infection. However, some species may act as potential pathogens. Elevated Clostridium species may indirectly damage the intestinal epithelial cells.
Another symptom may include constipation.

TREATMENT SUGGESTIONS: Treatment may involve the use of probiotics, treatment of any intestinal infections and dietary modification (reduce consumption of different fibres, such as inulin, oligofructose, arabinoxylan, guar gum and starch).

AKKERMANSIA MUCINIPHILA LOW:

PHYLUM: Verrucomicrobia

DESCRIPTION:
Akkermansia muciniphila is a Gram-negative, strictly anaerobic, non-motile bacterium, often considered a human intestinal symbiont. There is growing evidence to suggest that the prevalence of this bacteria is associated with intestinal homeostasis, immunity, and a healthy gut. Decreased colonisation levels may be associated with obesity, type 2 diabetes, and inflammation.

TREATMENT SUGGESTIONS: Treatment may involve the use of probiotics, treatment of any intestinal infections and dietary modification.

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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