Genova Diagnostics
Metametrix Clinical Laboratory
3425 Corporate Way • Duluth GA 30096 USA
770.446.5483 • Fax: 770.441.2237
www.gdx.net/www.metametrix.com

Ordering Physician:
Metametrix

1234 Main St.
Anywhere, GA 30096

Accession Number: **A1202150458**
Reference Number:
Patient: Sample Report
Age: 50 *Sex:* Female
Date of Birth: 02/05/1962
Date Collected: 2/14/12
Date Received: 2/15/12
Report Date: 3/1/12
Telephone: (770) 446-4583
Fax: (770) 441-2237
Reprinted: 10/22/12
Comment:

2100 Gastrointestinal Function Profile

Methodology: DNA Analysis, GC/MS, Microscopic, Colorimetric, Automated Chemistry, ELISA

Consistency = Formed/Normal

Percentile Ranking by Quintile

Results CFU/gram	1st	2nd	3rd	4th	5th	95% Reference Range
		20%	40%	60%	80%	

Predominant Bacteria (E+007)

E+007

Obligate anaerobes

	Results CFU/gram	1st	2nd	3rd	4th	5th	95% Reference Range
Bacteroides sp.	2.4	1.6				6.7	>= 1.3
Clostridia sp.	4.2	1.5				6.2	>= 1.0
Prevotella sp.	4.8	1.6				6.2	>= 1.1
Fusobacteria sp.	3.7	1.6				7.4	>= 1.1
Streptomyces sp.	6.2	1.6				5.8	>= 1.0
Mycoplasma sp.	4.5	1.7				6.2	>= 1.2

Facultative anaerobes

	Results CFU/gram	1st	2nd	3rd	4th	5th	95% Reference Range
Lactobacillus sp.	2.2	1.8				7.8	>= 1.2
Bifidobacter sp.	4.9	2.3				7.6	>= 1.8

Obligate aerobes

	Results CFU/gram	1st	2nd	3rd	4th	5th	95% Reference Range
Escherichia coli (E. coli)	3.2	1.7				7.7	>= 1.1

Opportunistic Bacteria

No clinically significant amounts.

Units and Reference Ranges

Organisms are detected by DNA analysis. One colony forming unit (CFU) is equivalent to one bacterium. Each genome detected represents one cell, or one CFU. Results are expressed in scientific notation, so an organism reported as 2.5 E7 CFU/gram is read as 25 million colony forming units per gram of feces. The cutoff for significance of Opportunistic Bacteria has been set at 1.0E+ 005 (100,000). These are levels above which clinically significant growth may be present. Rather than reporting semi-quantitative +1 to +4 levels, the new methodology provides full quantitative analysis.

Predominant Bacteria play major roles in health. They provide colonization resistance against potentially pathogenic organisms, aid in digestion and absorption, produce vitamins and SCFA's, and stimulate the GI immune system. DNA probes allow detection of multiple species (sp.) within a genus, so the genera that are reported cover many species.

Opportunistic Bacteria may cause symptoms and be associated with disease. They can affect digestion and absorption, nutrient production, pH and immune state. Antibiotic sensitivity tests will be performed on all opportunistic bacteria found, although clinical history is usually considered to determine treatment since the organisms are not generally considered to be pathogens.

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Pathogenic Bacteria

		95% Reference Range
Helicobacter pylori	<0.01	<=1.0E+005
E. coli 0157:H7	<0.01	<=1.0E+005
Clostridium difficile	<0.01	<=1.0E+005
Campylobacter sp.	<0.01	<=1.0E+005

Yeast/Fungi

		Expected Value
Saccharomyces sp.	**+2 => 1000 pg DNA/g specimen**	Neg

Yeast/Fungi
Yeast overgrowth has been linked to many chronic conditions, in part because of antigenic responses in some patients to even low rates of yeast growth. Potential symptoms include diarrhea, headache, bloating, atopic dermatitis and fatigue. Positives are reported as +1, +2, +3 or +4 indicating >100, >1000, >10000 or >100000 pg DNA/g.

Parasites

		Expected Value
Parasite present; taxonomy unavailable.	**Positive**	Neg

A taxonomy unavailable finding likely indicates an ingested protozoan and not a human parasite. It does not indicate treatment unless patient symptoms and other inflammatory markers are consistent with parasite infection.

Parasites
Parasite infections are a major cause of non-viral diarrhea. Symptoms may include constipation, gas, bloating, increased allergy response, colitis, nausea and distention.

Adiposity Index

Firmicutes	34	<= 80
Bacteroidetes	66	>= 20

The **Adiposity Index** is derived by using DNA probes that detect multiple genera of the phyla Firmicutes and Bacteroidetes. Abnormalities of these phyla may be associated with increased caloric extraction from food.

Drug Resistance Genes

aacA, aphD	**Pos**	gyrB, ParE	Neg
mecA	**Pos**	PBP1a, 2B	Neg
vanA, B, and C	Neg		

Drug Resistance Genes
aacA, aphD - Gentamycin, Kanamycin, and Tobramycin
mecA - Methicillin
VanA, vanB, vanC - Vancomycin and Teicoplan
GyrB, ParE - Ciprofoxacin and later quinolones
PBP1a, PBP2B - Penicillin

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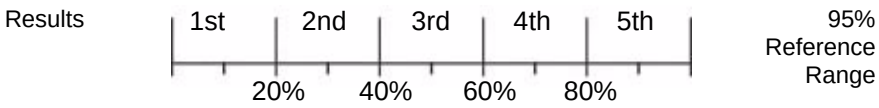

Beneficial SCFA

Total SCFA	69		53	>= 35 mM/g
n-Butyrate	9.1		5.2	>= 3.9 mM/g
Acetate %	61		52 – 71	47 - 77 %
Butyrate %	13		10 – 25	7 - 30 %
Propionate %	25		13 – 25	10 - 29 %
Valerate %	0.7	L	1.0 – 3.6	0.4 - 4.6 %

Inflammation

Lactoferrin	0.4		3.1	<= 6.3 µg/mL
WBCs	Neg			Neg-Rare
Mucus	Neg			Neg

Immunology

Fecal sIgA	55		20 – 144	5 - 161 mg/dl
Anti-gliadin sIgA	3.6		6.4	<= 21.4 mg/dl

Beneficial SCFA

Short chain fatty acids (SCFA) are produced by bacterial fermentation of dietary polysaccharides and fiber. The product, N-butyrate, is taken up and used to sustain the normal activity of colonic epithielial cells. Butyrate has been shown to lower the risk of colitis and colorectal cancer. A healthy balance of GI microbes depends on production of SCFA by one specie to allow the normal growth of another one in a complex cross-feeding network.

Inflammation

Lactoferrin, an iron-binding glycoprotein, is released in IBD but not in non-inflammatory IBS. High levels are found in Crohn's, UC or infection. WBC's are elevated in general inflammation/infection. Mucus is often visualized in acute GI inflammation.

Immunology

High fecal sIgA indicates immune system reactions to the presence of antigens from bacteria, yeast or other microbes. Low sIgA can result from stress or malnutrition. Anti-gliadin sIgA is a screening marker for gluten sensitivity.

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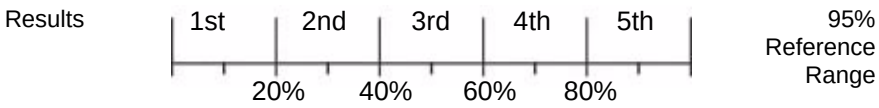

Additional Tests

pH	6.1	5.9 – 6.9	5.7 - 7.1
RBCs	Neg		Neg
Color	Brown		

Digestion

Elastase 1	345	200	> 100 µg/g
Triglycerides	80	119	<= 181 mg/dL
Putrefactive SCFA	2.0	4.4	<= 7.4 mM/g
Vegetable Fibers	Rare		None-Few

Absorption

LCFAs	8.3	9.1	<= 15.1 mmol/L
Total Fat	10.8	12.9	<= 18.9 mmol/L
Cholesterol	61	142	<= 191 mg/dL

UC** = Unable to Calculate

Additional Tests
pH is influenced by numerous factors, but it is strongly related to the bacterial release of pH-lowering organic acids and pH-raising ammonia. Positive **RBCs** can signify GI tract bleeding. **Color** (other than brown) abnormalities can be due to upper GI bleeding, or bile duct blockage, steatorrhea or antibiotic use.

Digestion
Pancreatic elastase 1 levels below 100 are strongly correlated with severe pancreatic insufficiency; levels of 100-200 identify moderate pancreatic insufficiency. High triglycerides signify fat maldigestion. Putrefactive SCFA are a result of bacterial fermentation of undigested protein. High numbers of vegetable fibers indicate maldigestion.

Absorption
High **LCFA** indicates fat malabsorption due to pancreatic or biliary insufficiency, or acute bacterial infection that produces intestinal cell destruction. High total fat usually signals malabsorption, as does elevated fecal cholesterol.

Decisions involving diagnosis and treatment are the responsibility of the clinician.

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Accession Number: **A1003240300**
Reference Number:
Patient: Sample Report
Age: 48 *Sex:* Female
Date of Birth: 02/05/1962
Date Collected: 3/23/10
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2150 Sensitivity - Bacteria

Methodology: DNA Analysis, ELISA

Pharmaceuticals	Sensitive		Resistant
Amoxicillin			R
Ampicillin			R
Cefuroxime			R
Ciprofloxacin			R
Clindamycin			R
Erythromycin			R
Levofloxacin			R
Potassium Clavula			R
Rifaximin	S		
Sulfamethoxazole	S		
Tetracyclin			R
Trimethoprim-Sulfa			R

Botanicals	Sensitive		Resistant
5-Hydroxy-1,4-naphthoquinone Black Walnut			R
Alliin Garlic	S		
Arbutin Uva Ursi			R
Artemisinin Wormwood			R
Berberine Goldenseal	S		
Caprylic acid Octanoic acid			R
Carvacrol Oregano	S		
Oleuropein Olive Leaf	S		
Quinic Acid Cats Claw			R
Thymol Oil of Thyme			R
Undecylenic acid Undecylenic acid			R

Bacterial growth suppression is measured in a liquid growth medium where fungal growth is suppressed and specific antibacterial agents are introduced before incubation. In contrast to the old isolation and culture techniques, such universal culturing more closely approximates the actions of antibacterials in the complex milieu of the colon.

Agents marked as **"Sensitive"** cause effective bacterial growth suppression. Those antibacterial agents are candidates for suppressing the growth o bacteria in the patient's colon. The results apply to all organisms reported under **"Opportunistic Bacteria"**.

Agents indicated as **"Resistant"** have low effectiveness. If all tested agents are resistant, synergistic mixtures of antibacterial agents may be effective. Agents indicated as **"Resistant"** have lov effectiveness. If all tested agents are resistant, synergistic mixtures of antibacterial agents may be effective.

For Botanical sensitivity testing the active ingredients are tested and an example of the available source is shown.

Sensitivities are not performed on **"Pathogens"** or **"Parasites"** because they do not grow in culture under normal laboratory conditions. Standard protocols are generally used for treatment of pathogens and parasites.

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Reprinted: 10/22/12
Comment:

2155 Sensitivity - Fungi

Methodology: DNA Analysis, ELISA

Unable to determine sensitivity to pharmaceuticals and botanicals due to the lack of growth of fungi in vitro.

Fungal growth suppression is measured in a liquid growth medium where bacterial growth is suppressed and specific antifungal agents are introduced before incubation. Growth inhibition is measured after incubation. In contrast to the older isolation and culture techniques, such universal culturing more closely approximates the actions of antifungals in the complex milieu of the colon.

Agents marked as **"Sensitive"** cause effective fungal growth suppression. Those antifungal agent are candidates for suppressing the growth of fungi and yeasts in the patient's colon. The results apply to all organisms reported under **"Yeast/Fungi"**.

Agents indicated as **"Resistant"** have low effectiveness and can increase the risk of inducing drug resistant organisms. If all tested agents are **"Resistant"**, synergistic mixtures of antifungal agents may be effective.

Sensitivities are not performed on **"Pathogens"** or **"Parasites"** because they do not grow in culture under normal laboratory conditions. Standard protocols are generally used for treatment of pathogens and parasites.

For Botanical sensitivity testing the active ingredients are tested and an example of the available source is shown.