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| Order #: | [redacted] | Date Received: | [redacted] |
| Reference #: | | Date of Report: | [redacted] |
| Patient: | [redacted] | | |
| Date of Birth: | 08/31/1966 | Telephone: | [redacted] |
| Age: | 46 | Fax: | |
| Sex: | Female | | |
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GI Effects Stool Profiles
U.S. patent pending 2008

## 2100 Gastrointestinal Function Profile - Stool

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

Effective for samples received Wednesday, June 19, 2013, all positive molecular probe results for C. difficile, H. pylori, Shiga toxin E. coli (E. coli 0157) and Campylobacter species will be confirmed by EIA analysis. In addition, pathogenic bacteria and opportunistic bacteria will be reported as positive or negative.

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

| Results | Quintile Ranking (1st / 2nd / 3rd / 4th / 5th) | 95% Reference Range |
|---|---|---|
| **Predominant Bacteria** | | E+007 |
| **Obligate Anaerobes** | | |
| Bacteroides spp. 1.4 L | 1.6 – 6.7 | >= 1.3 |
| Clostridia spp. 3.6 | 1.5 – 6.2 | >= 1.0 |
| Prevotella spp. 5.2 | 1.6 – 6.2 | >= 1.1 |
| Fusobacteria spp. 3.9 | 1.6 – 7.4 | >= 1.1 |
| Streptomyces spp. 2.8 | 1.6 – 5.8 | >= 1.0 |
| Mycoplasma spp. 2.8 | 1.7 – 6.2 | >= 1.2 |
| **Facultative Anaerobes** | | |
| Lactobacillus spp. 2.3 | 1.8 – 7.8 | >= 1.2 |
| Bifidobacter spp. 2.7 | 2.3 – 7.6 | >= 1.8 |
| **Obligate Aerobes** | | |
| Escherichia coli (E. coli) 4.0 | 1.7 – 7.7 | >= 1.1 |

**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 (spp.) within a genus, so the genera that are reported cover many species.

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 E+007 CFU/gram is read as 25 million colony forming units per gram of feces.

## Opportunistic Bacteria

Expected Value

No clinically significant amounts.

**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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## 2100 Gastrointestinal Function Profile - Stool

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

### Pathogenic Bacteria

| | | Expected Value |
|---|---|---|
| Helicobacter pylori - Molecular Probe | Negative | Negative |
| Campylobacter spp. - Molecular Probe | Negative | Negative |
| Shiga toxin E. coli* | Negative | Negative |
| Clostridium difficile* | Negative | Negative |

*Positive results are confirmed by EIA

### Yeast/Fungi

| | | Expected Value |
|---|---|---|
| Yeast/Fungi; taxonomy unavailable | +1 => 100 pg DNA/g specimen | Negative |

**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 |
|---|---|
| No Ova and Parasites | |

**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

| | | Expected Value |
|---|---|---|
| Firmicutes % | 57 | <= 80 % |
| Bacteroidetes % | 43 | >= 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 | Neg |
| mecA | Neg |
| vanA, B, and C | Neg |
| gyrB, ParE | Neg |
| PBP1a, 2B | Neg |

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

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## 2100 Gastrointestinal Function Profile - Stool

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

| | Results | | Quintile Ranking (1st / 2nd / 3rd / 4th / 5th) | 95% Reference Range |
|---|---|---|---|---|
| **Beneficial SCFA** | | | | |
| Total SCFA | 76 | | 53 | >= 35 mM/g |
| n-Butyrate | 14.8 | | 5.2 | >= 3.9 mM/g |
| Acetate % | 68 | | 52 / 71 | 47-77 % |
| n-Butyrate % | 19 | | 10 / 25 | 7-30 % |
| Propionate % | 11 | L | 13 / 25 | 10-29 % |
| Valerate % | 1.3 | | 1.0 / 3.6 | 0.4-4.6 % |
| **Inflammation** | | | | |
| Lactoferrin | 3.2 | H | 3.1 | <= 6.3 ug/mL |
| WBCs | Neg | | | Neg-Rare |
| Mucus | Neg | | | Neg |
| **Immunology** | | | | |
| Fecal sIgA | 11 | L | 20 / 144 | 5-161 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 epithelial 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.

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## 2100 Gastrointestinal Function Profile - Stool

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

| | Results | Quintile Ranking (1st \| 2nd \| 3rd \| 4th \| 5th) | 95% Reference Range |
|---|---|---|---|
| **Additional Tests** | | | |
| pH | 7.9 H | 5.9 — 6.9 | 5.7-7.1 |
| RBCs | Neg | | Neg |
| Color | Brown | | |
| **Digestion** | | | |
| Elastase 1 | 302 | 200 | > 100 ug/g |
| Triglycerides | 81 | 119 | <= 181 mg/dl |
| Putrefactive SCFA | 2.0 | 4.4 | <= 7.4 mM/g |
| Vegetable Fibers | Rare | | None-Few |
| **Absorption** | | | |
| LCFAs | 3.5 | 9.1 | <= 15.1 mmol/L |
| Total Fat | 5.9 | 12.9 | <= 18.9 mmol/L |
| Cholesterol | 58 | 142 | <= 191 mg/dl |

**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.

UC* = Unable to Calculate

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

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GI Effects Stool Profiles
U.S. patent pending 2008

## 2155 GI Effects® Sensitivity Fungi Profile - Stool

*Methodology: DNA Analysis, ELISA*

| Pharmaceuticals | Sensitive | Resistant |
|---|---|---|
| 1. Amphotericin | S | |
| 2. Fluconazole | | |
| 3. Itraconazole | | |
| 4. Ketoconazole | | |
| 5. Nystatin | S | |

| Botanicals | Sensitive | Resistant |
|---|---|---|
| 6. 5-Hydroxy-1,4-naphthoquinone<br>Black Walnut | | |
| 7. Allin<br>Garlic | | |
| 8. Arbutin<br>Uva Ursi | | |
| 9. Artemisinin<br>Wormwood | | |
| 10. Berberine<br>Goldenseal | S | |
| 11. Caprylic acid<br>Octanoic acid | S | |
| 12. Carvacrol<br>Oregano | S | |
| 13. Oleuropein<br>Olive Leaf | | |
| 14. Quinic Acid<br>Cats Claw | | |
| 15. Thymol<br>Oil of Thyme | | |
| 16. Undecylenic acid<br>Undecylenic acid | S | |

Fungal growth suppression is measured in a liquid growth medium where bacterial growth is suppressed and specific antifungal agents are introduced before 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 agents 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.

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.