

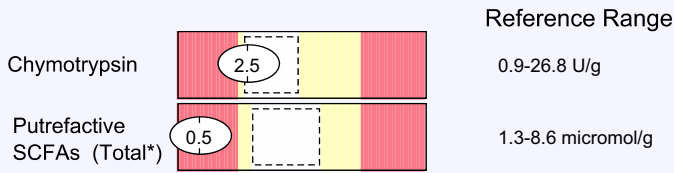


Comprehensive Digestive Stool Analysis

Patient: **Order Number:**
 Completed: September 23, 2011
DOB: Received: September 15, 2011
Sex: Collected: September 14, 2011
MRN:

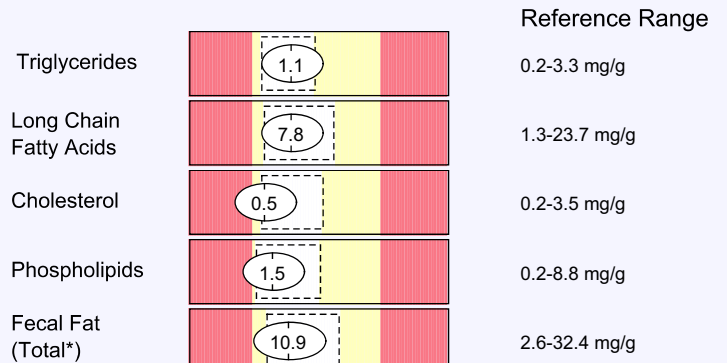
REDOX Biomedicine Co., Ltd.
 Referring Laboratory
 Attn Alan Ou
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 Taiwan

Digestion

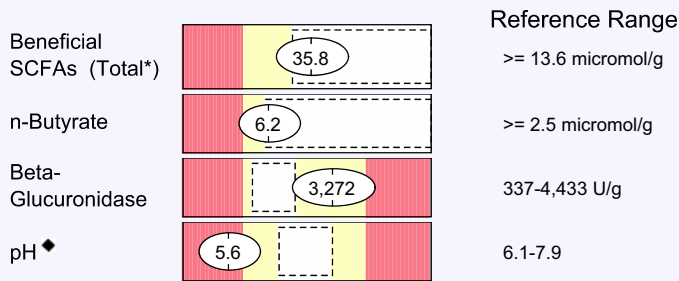


	Inside	Outside	Reference Range
Meat Fibers ♦	None		None
Vegetable Fibers	Rare		None - Few

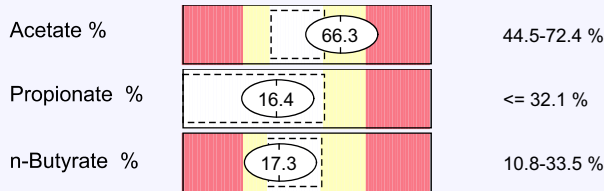
Absorption



Metabolic Markers



SCFA distribution



Immunology

	Inside	Outside	Reference Range
Fecal Lactoferrin ♦	Negative		Negative

Macroscopic

	Inside	Outside	Reference Range
Color	Brown		Brown
Mucus	Negative		Negative
Occult blood ♦	Negative		Negative

Microbiology

Bacteriology

Beneficial Bacteria

Lactobacillus species	*NG	
Escherichia coli		4+
Bifidobacterium		3+

Additional Bacteria

alpha haemolytic Streptococcus	NP	3+
gamma haemolytic Streptococcus	NP	3+
Bacillus species	NP	3+
Enterobacter cloacae	PP	4+

Mycology

Candida intermedia	NP	1+
Candida parapsilosis	NP	1+

*NG NP PP P
 No Growth Non-Pathogen Possible Pathogen Pathogen

Additional Tests (if indicated)

Commentary

Lab Comments

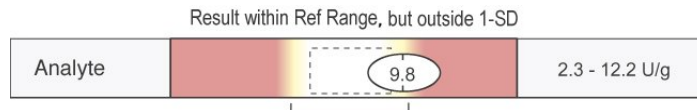
SENSI'S: All yeast, add'l bacteria

The performance characteristics of all assays have been verified by Genova Diagnostics, Inc. Unless otherwise noted with ♦ as cleared by the U.S. Food and Drug Administration, assays are For Research Use Only.

Commentary is provided to the practitioner for educational purposes, and should not be interpreted as diagnostic or treatment recommendations. Diagnosis and treatment decisions are the responsibility of the practitioner.

The **Reference Range** is a statistical interval representing 95% or 2 Standard Deviations (2 S.D.) of the reference population.

One Standard Deviation (1 S.D.) is a statistical interval representing 68% of the reference population. Values between 1 and 2 S.D. are not necessarily abnormal. Clinical correlation is suggested. (See example below)



Human microflora is influenced by environmental factors and the competitive ecosystem of the organisms in the GI tract. Pathological significance should be based upon clinical symptoms and reproducibility of bacterial recovery.

Triglycerides constitute the major component of dietary fat and are normally broken down by pancreatic lipase into glycerol and free fatty acids. Triglycerides are within the reference range, indicating adequate fat digestion or a lack of dietary fat.

Chymotrypsin is within the reference range. Chymotrypsin is a key pancreatic enzyme that catalyzes protein digestion. Thus, the fecal level is a measure of proteolytic activity and a marker for pancreatic enzyme output as a whole. A value within the reference range suggests normal enzyme production. Levels are also influenced by transit

Commentary

time, such that faster transit results in higher fecal levels.

Valerate, iso-valerate and iso-butyrate are "putrefactive" short chain fatty acids produced when anaerobic bacteria ferment undigested protein. While low levels of Short Chain Fatty Acids are statistically significant, the clinical relevance is doubtful. Low Putrefactive SCFAs appear to be a variant of normal.

Long chain fatty acids (LCFAs) are within the reference range, suggesting adequate absorption of fats by the mucosa of the small intestine or a lack of dietary fat.

Cholesterol is within the reference range, suggesting adequate absorption of cholesterol by the small intestine or low dietary intake.

Phospholipids are normal. 50% of phospholipids are derived from bile, with 25% coming from mucosal desquamation and 25% from dietary sources. Nearly 85% of intestinal phospholipids are absorbed. Normal levels of fecal phospholipids indicate average dietary fat intake and adequate digestion/ absorption.

Total fecal fats are within the reference range. The total fecal fat is calculated as the sum of fecal triglycerides, phospholipids, cholesterol and long chain fatty acids.

Beneficial (Total) short chain fatty acids (SCFAs) are acetate, propionate and n-butyrate. They are the end products of anaerobic microbial fermentation of dietary fiber. Levels thus reflect the concentration of intestinal flora as well as soluble fiber in the diet. These beneficial SCFAs are crucial to the health of the intestine, serving as sources of fuel for the cells and the rest of the body. They also help to regulate the fluid balance in the colon.

n-Butyrate is the most important of the beneficial SCFAs, and is the primary energy source for colonic epithelial cells. Adequate amounts are necessary for the healthy metabolism of the colonic mucosa, and have been shown to have protective effects against colorectal cancers.

Beta-glucuronidase is within the reference range. This is an inducible enzyme, produced by *E. coli* and anaerobes *Bacteroides*, and *Clostridia*. Its activity reverses the detoxication of compounds processed in the hepatic Phase II glucuronidation pathway (including many pharmaceuticals, carcinogens, bile acids, and estrogen).

Fecal pH is below the reference range. The pH of the stool is a reflection of several factors in the GI tract, such as gastric acid, pancreatic bicarbonate, short chain fatty acids, ammonia, bile, organic acids, and acids produced by beneficial flora. Proper levels enhance colonization by beneficial flora, deter possible pathogens, promote normal digestive processes, and promote SCFA production. Beside the possible influences listed here, an acidic pH may also result from malabsorption of sugars in the intestine.

The SCFA Distribution reflects the relative proportions of the beneficial SCFAs (n-butyrate, propionate, and acetate), thus providing an indirect measure of balance among the anaerobic organisms in the colon.

Sufficient amounts of *E. coli* appear to be present in the stool. However, *Lactobacilli* and *Bifidobacteria* were found in lower than optimal levels. Ample amounts of *E. coli* have been associated with a balanced gut flora. The "friendly bacteria", *Lactobacilli* and *Bifidobacteria*, are important for gastrointestinal function, as they are involved in vitamin synthesis, natural antibiotic production, immune defense, digestion, detoxification of pro-carcinogens and a host of other activities. Ideally, levels of *Lactobacillus* and *E. coli* should be 2+ or greater. *Bifidobacteria* being a predominate anaerobe should be recovered at levels of 4+.

There is no detection of fecal lactoferrin. This indicates no active intestinal inflammation. However, non-inflammatory diarrhea caused by irritable bowel syndrome, small intestinal viral infections, non-invasive parasitic infections, or other etiologies may still be present even in the absence of lactoferrin.

A 1+ quantity of yeast is considered an acceptable amount of yeast in the stool. It may, however, reflect a condition of yeast overgrowth, especially when moderate or many yeast are reported on the microscopic (parasitology) exam, or may lead to symptoms in individuals showing deficient beneficial bacteria.

Bacterial Sensitivity

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Prescriptive Agents			
ENTEROBACTER CLOACAE			
	S	I	R
Ampicillin	<input type="text"/>	<input type="text"/>	<input type="text" value="R"/>
Amox./Clavulanic Acid	<input type="text"/>	<input type="text"/>	<input type="text" value="R"/>
Cephalothin	<input type="text"/>	<input type="text"/>	<input type="text" value="R"/>
Ciprofloxacin	<input type="text" value="S"/>	<input type="text"/>	<input type="text"/>
Tetracycline	<input type="text"/>	<input type="text"/>	<input type="text" value="R"/>
Trimethoprim/Sulfa	<input type="text" value="S"/>	<input type="text"/>	<input type="text"/>





S Indicates susceptibility to prescriptive agents
I Indicates intermediate susceptibility to prescriptive agents
R Indicates resistance to prescriptive agents

Prescriptive Agents:

Microbial testing has been performed in vitro to determine antibiotic sensitivity and resistance at standard dosages. Prudent use of antimicrobials requires knowledge of appropriate blood or tissue levels of those agents. Antibiotics that appear in the "S" (susceptible) column are more effective at inhibiting the growth of this organism. Antibiotics that appear in the "I" (intermediate) column are partially effective at inhibiting the growth of this organism. Antibiotics that appear in the "R" (resistant) column allow continued growth of the organism in vitro and are usually less effective clinically. Inappropriate use of antibacterials often results in the emergence of resistance.

Natural Agents:

In this assay, "inhibition" is defined as the reduction level on organism growth as a direct result of inhibition by a natural substance. The level of inhibition is an indicator of how effective the natural substance was at limiting the growth of an organism in an in vitro environment. High inhibition indicates a greater ability by the natural substance to limit growth, while Low Inhibition a lesser ability to limit growth. These natural products should be considered investigational in nature and not be viewed as standard clinical treatment substances.

Natural Agents	
ENTEROBACTER CLOACAE	
	Low Inhibition High Inhibition
Berberine	
Oregano	
Plant Tannins	
Uva-Ursi	

Yeast Sensitivity


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Azole Antifungals			
CANDIDA INTERMEDIA			
	S	I	R
Fluconazole	=8		
Itraconazole		=0.5	
Ketoconazole	=0.125		

S Indicates susceptibility to prescriptive agents
I Indicates intermediate susceptibility to prescriptive agents
R Indicates resistance to prescriptive agents







Azole Antifungals:

Microbial testing has been performed in vitro to determine antifungal sensitivity and resistance at standard dosages. Prudent use of antimicrobials requires knowledge of appropriate blood or tissue levels of those agents. Antifungals that appear in the "S" (susceptible) column are more effective at inhibiting the growth of this organism. Antifungals that appear in the "I" (intermediate) column are partially effective at inhibiting the growth of this organism. Antifungals that appear in the "R" (resistant) column allow continued growth of the organism in vitro and are usually less effective clinically. Inappropriate use of antifungals often results in the emergence of resistance.

Non-absorbed Antifungals	
CANDIDA INTERMEDIA	
	Low Inhibition High Inhibition
Nystatin	

Nystatin and Natural Antifungals:

In this assay, "inhibition" is defined as the reduction level on organism growth as a direct result of inhibition by a natural substance. The level of inhibition is an indicator of how effective the natural substance was at limiting the growth of an organism in an in vitro environment. High Inhibition indicates a greater ability by the natural substance to limit growth, while Low Inhibition a lesser ability to limit growth. In accordance with laboratory guidelines for reporting sensitivities, results for Nystatin are now being reported with natural antifungals in this category.

Natural Antifungals	
CANDIDA INTERMEDIA	
	Low Inhibition High Inhibition
Berberine	
Caprylic Acid	
Garlic	
Undecylenic Acid	
Plant tannins	
Uva-Ursi	

Yeast Sensitivity


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Azole Antifungals			
CANDIDA PARAPSILOSIS			
	S	I	R
Fluconazole	=4.0		
Itraconazole		=0.5	
Ketoconazole	=0.25		

S Indicates susceptibility to prescriptive agents
I Indicates intermediate susceptibility to prescriptive agents
R Indicates resistance to prescriptive agents






Azole Antifungals:

Microbial testing has been performed in vitro to determine antifungal sensitivity and resistance at standard dosages. Prudent use of antimicrobials requires knowledge of appropriate blood or tissue levels of those agents. Antifungals that appear in the "S" (susceptible) column are more effective at inhibiting the growth of this organism. Antifungals that appear in the "I" (intermediate) column are partially effective at inhibiting the growth of this organism. Antifungals that appear in the "R" (resistant) column allow continued growth of the organism in vitro and are usually less effective clinically. Inappropriate use of antifungals often results in the emergence of resistance.

Non-absorbed Antifungals	
CANDIDA PARAPSILOSIS	
	Low Inhibition High Inhibition
Nystatin	

Nystatin and Natural Antifungals:

In this assay, "inhibition" is defined as the reduction level on organism growth as a direct result of inhibition by a natural substance. The level of inhibition is an indicator of how effective the natural substance was at limiting the growth of an organism in an in vitro environment. High Inhibition indicates a greater ability by the natural substance to limit growth, while Low Inhibition a lesser ability to limit growth. In accordance with laboratory guidelines for reporting sensitivities, results for Nystatin are now being reported with natural antifungals in this category.

Natural Antifungals	
CANDIDA PARAPSILOSIS	
	Low Inhibition High Inhibition
Berberine	
Caprylic Acid	
Garlic	
Undecylenic Acid	
Plant tannins	
Uva-Ursi	