GENOVA DIAGNOSTICS
3425 Corporate Way
Duluth, GA. 30096

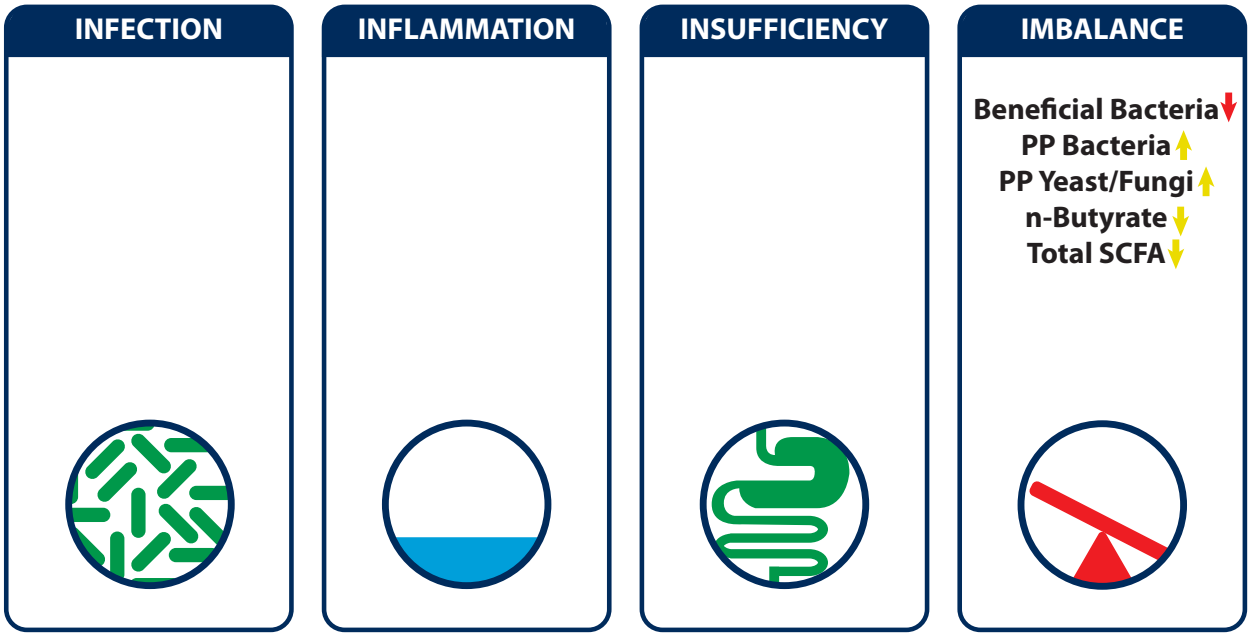
GI Effects Stool Profiles

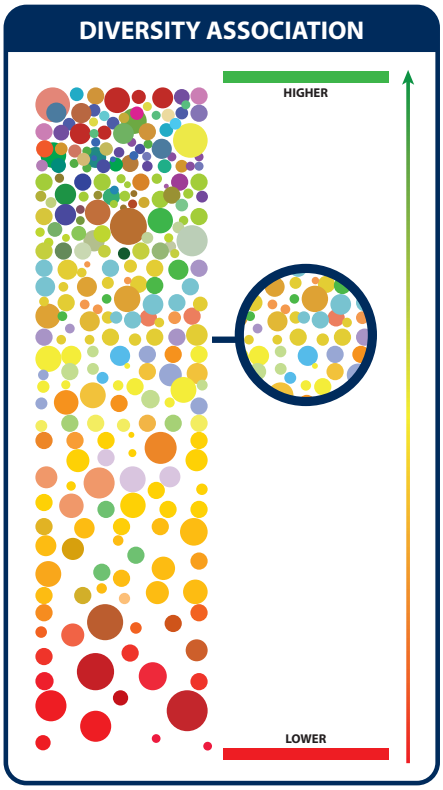
Patient: Jane Doe
DOB: September 16, 1960
Sex: F
MRN:

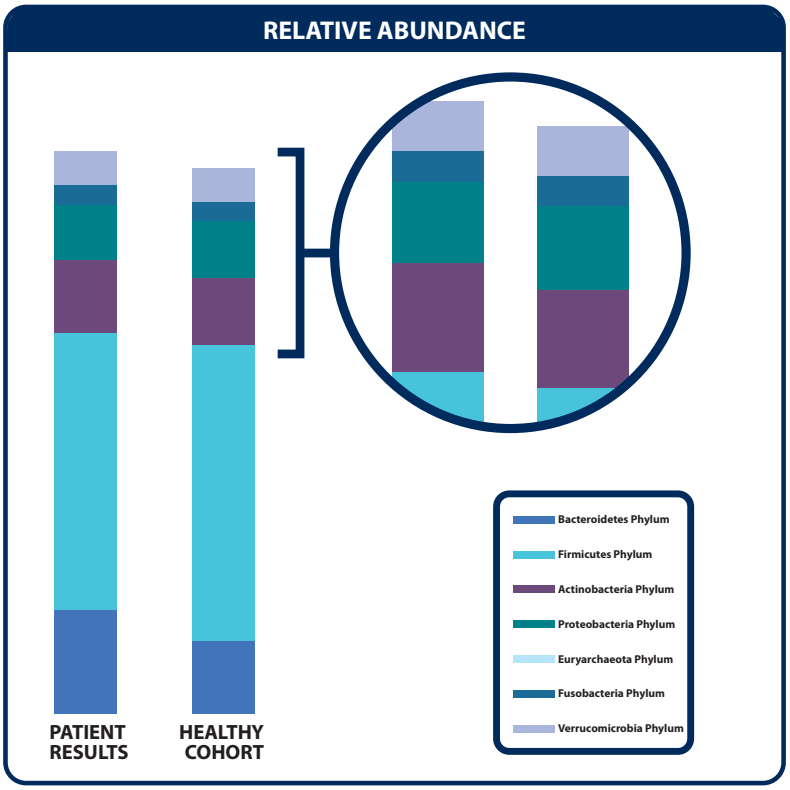
Order Number: E1210572
Completed: October 05, 2013
Received: September 21, 2013
Collected: September 20, 2013

2200 GI Effects™ Comprehensive Profile – Stool

Interpretation At-a-Glance







2200 GI Effects™ Comprehensive Profile – Stool

Methodology: GC/MS, Automated Chemistry, EIA

	Results	QUINTILE DISTRIBUTION (1st 2nd 3rd 4th 5th)	Reference Range
Digestion and Absorption			
Pancreatic Elastase 1†◆◆	606	100 200	>200 mcg/g
Products of Protein Breakdown (Total) (Valerate+Isobutyrate+Isovalerate)	2.8		1.8 - 9.9 micromol/g
Fecal Fat (Total*)	32.2		3.2 - 38.6 mg/g
Triglycerides	2.0		0.3 - 2.8 mg/g
Long Chain Fatty Acids	21.7		1.2 - 29.1 mg/g
Cholesterol	1.6		0.4 - 4.8 mg/g
Phospholipids	6.9		0.2 - 6.9 mg/g
Inflammation and Immunology			
Calprotectin†◆◆	19.7	50 120	<= 50 mcg/g
Eosinophil Protein X (EPX)†	1.4	2 7	<= 7.0 mcg/g
Fecal sIgA	622		x ng/g
Gastrointestinal Microbiome			
Metabolic			
SCFA (Total*) (Acetate, n-Butyrate, Propionate)	25.6		> = 23.3 micromol/g
n-Butyrate Concentration	4.0		> = 3.6 micromol/g
n-Butyrate %	15.4		11.8 - 33.3 %
Acetate%	25.6		48.1 - 69.2 %
Propionate%	16.2		11.9 - 29.7%
Beta-Glucuronidase	1514		368 - 6266 U/g

**Total Value equals the sum of all measurable parts*

† These results are not represented by quintile values.

Assays noted with ◆◆ have been cleared or approved by the US Food and Drug Administration (or are exempt from FDA review) and have been modified by Genova Diagnostics. All other assays not denoted by such icons are for Research Use only.

Methodology: DNA by PCR

Gastrointestinal Microbiome

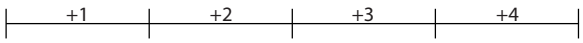
Commensal Bacteria (PCR)	Result CFU/g stool	QUINTILE DISTRIBUTION (1st 2nd 3rd 4th 5th)	Reference Range CFU/g stool
Bacteroidetes Phylum			
Bacteroides-Prevotella group	7.14E+08		2.44E+08 - 3.09E+09
Bacteroides vulgatus	8.39E+08		<1.83‡‡E+05 - 2.82E+09
Barnesiella spp.	1.40E+07		<7.61E+07
Odoribacter spp.	2.17E+08		<4.31‡‡E+04 - 1.68E+09
Prevotella spp.	2.37E+06		9.53E+04 - 3.87E+07
Firmicutes Phylum			
Anaerotruncus colihominis	4.89E+07		<5.11‡‡E+05 - 2.77E+08
Butyrivibrio crossotus	1.49E+06		4.66E+04 - 4.87E+07
Clostridium spp.	<3.20E+06		<3.20‡‡E+06 - 2.34E+09
Coprococcus eutactus	<3.05E+05		<3.05‡‡E+05 - 1.04E+09
Faecalibacterium prausnitzii	7.03E+08		<5.70‡‡E+05 - 8.33E+09
Lactobacillus spp.	1.00E+06		<4.73‡‡E+04 - 2.02E+08
Pseudoflavonifractor spp.	4.54E+08		<4.46‡‡E+04 - 6.52E+08
Roseburia spp.	2.21E+09		<1.14‡‡E+06 - 2.48E+09
Ruminococcus spp.	1.16E+11		1.27E+08 - 6.95E+11
Veillonella spp.	6.50E+05		<4.44‡‡E+03 - 1.10E+07
Actinobacteria Phylum			
Bifidobacterium spp.	3.05E+08		<4.53‡‡E+05 - 4.93E+09
Bifidobacterium longum	8.31E+06		<2.09‡‡E+05 - 4.62E+08
Collinsella aerofaciens	3.52E+08		<3.88‡‡E+04 - 1.50E+09
Proteobacteria Phylum			
Desulfovibrio piger	<1.32E+05		<1.32E+05
Escherichia coli	6.73E+04		5.58E+04 - 7.98E+08
Oxalobacter formigenes	<1.52E+05		<1.52‡‡E+05 - 6.09E+07
Euryarchaeota Phylum			
Methanobrevibacter smithii	<2.05E+04		<2.05‡‡E+04 - 5.65E+07
Fusobacteria Phylum			
Fusobacterium spp.	1.21E+05		<1.74‡‡E+03 - 2.68E+06
Verrucomicrobia Phylum			
Akkermansia muciniphila	3.01E+08		>1.9‡‡E+06
Firmicutes/Bateriodetes Ratio			
Firmicutes/Bacteroidetes (F/B Ratio)	1.74E+02		3.65E+00 - 9.13E+02

‡‡*Assay lower detection limit based on the average stool concentration from the reference population.*

Methodology: culture/MALDI-TOF MS, Automated and Manual Biochemical Methods, Vitek 2® System Microbial identification and Antibiotic susceptibility

Gastrointestinal Microbiome

Bacteriology (Culture)



Lactobacillus spp.	+3	NP
Escherichia coli		NG
Bifidobacterium spp.	+4	NP

Additional Bacteria

Alphahaemolytic streptococcus	+3	NP
Gammahaemolytic streptococcus	+3	NP
Citrobacter freundii	+4	PP
Streptococcus agalactiae gp B	+2	NP

Mycology (Culture)

Candida albicans/dubliniensis	+2	PP
Yeast, not Candida albicans	+1	NP

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

Microbiology Legend

NG	NP	PP	P
No Growth	Non-Pathogen	Potential Pathogen	Pathogen

Additional bacteria

Non-pathogen: Organisms that fall under this category are those that constitute normal, commensal flora, or have not been recognized as etiological agents of disease.

Potential Pathogen: Organisms that fall under this category are considered potential or opportunistic pathogens when present in heavy growth.

Pathogen: The organisms that fall under this category are well-recognized pathogens in clinical literature that have a clearly recognized mechanism of pathogenicity and are considered significant regardless of the quantity that appears in culture.

Methodology: Direct Microscopic Examination, EIA

Parasitology

Microscopic Exam Results:

Blastocystis hominis: Many

Parasitology
Parasite Recovery: Literature suggests that >90% of enteric parasitic infections are detected in a sample from a single stool collection. Increased sensitivity results from the collection of additional specimens on separate days.

Lab Comments
SENSI'S: All yeast, add'l bacteria

Parasitology EIA Tests:

	In Range	Out of Range
Cryptosporidium	Negative	
Giardia lamblia	Negative	
Entamoeba histolytica	Negative	

Methodology: Vitek 2® System Microbial Antibiotic susceptibility, Manual Minimum Inhibition Concentration

Bacteria Sensitivity

Prescriptive Agents

Citrobacter freundii	**S**	**I**	**R**
Ampicillin			R
Amox./Clavulanic Acid			R
Cephalothin			R
Ciprofloxacin	S		
Tetracycline	S		
Trimethoprim/Sulfa	S		

Natural Agents

Citrobacter freundii	**LOW INHIBITION**	**HIGH INHIBITION**
Berberine		
Oregano		
Plant tannins		
Uva Ursi		

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. In accordance with laboratory guidelines for reporting sensitivities, results for Nystatin are now being reported with natural antifungals in this category.

Methodology: Vitek 2® System Microbial Antibiotic susceptibility, Manual Minimum Inhibition Concentration

Mycology Sensitivity

Azole Antifungals

Candida albicans/dubliniensis	S	I	R
Fluconazole	=0.25		
Caspofungin		=0.25	
Voriconazole	=0.25		

Non-absorbed Antifungals

Candida albicans/dubliniensis	LOW INHIBITION	HIGH INHIBITION
Nystatin		

Natural Agents

Candida albicans/dubliniensis	LOW INHIBITION	HIGH INHIBITION
Berberine		
Caprylic Acid		
Garlic		
Undecylenic Acid		
Plant tannins		
Uva Ursi		

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:
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Methodology: EIA, Fecal Immunochemical Testing (FIT)

Additional Results

	Result	Expected Value
Fecal Occult Blood ◆	Negative	Negative
Color††	Brown	
Consistency††	Formed/Normal	
HpSA - *H.pylori*	Positive	Negative
Campylobacter spp	Negative	Negative
Clostridium difficile	Negative	Negative
Shiga toxin *E. coli*	Negative	Negative
Fecal Lactoferrin◆	Negative	Negative

†† Results provided from patient input.

HpSA (*Helicobacter pylori* stool antigen) *Helicobacter pylori* is a bacterium which causes peptic ulcer disease and plays a role in the development of gastric cancer. Direct stool testing of the antigen (HpSA) is highly accurate and is appropriate for diagnosis and follow-up of infection.

Campylobacter *Campylobacter jejuni* is the most frequent cause of bacterial-induced diarrhea. While transmission can occur via the fecal-oral route, infection is primarily associated with the ingestion of contaminated and poorly cooked foods of animal origin, notably, red meat and milk.

Clostridium difficile is an anaerobic, spore-forming gram-positive bacterium. After a disturbance of the gut flora (usually with antibiotics), colonization with *Clostridium* difficile can take place. *Clostridium difficile* infection is much more common than once thought.

Shiga toxin E. coli is a group of bacterial strains that have been identified as worldwide causes of serious human gastrointestinal disease. *Enterohemorrhagic E. coli* includes over 100 different serotypes; 0157:H7 is the most significant, occurring in over 80% of all cases. Contaminated food continues to be the principal vehicle for transmission; foods associated with outbreaks include alfalfa sprouts, fresh produce, beef, and unpasteurized juices.

The performance characteristics of all assays have been verified by Genova Diagnostics in a manner consistent with CLIA requirements. Assays noted with ◆ have been cleared or approved by the US Food and Drug Administration (or are exempt from FDA review).