

GI Map Results

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Most relevant findings:

1. PATHOGENS (Page 1)

- Bacterial pathogens <dl
- Parasitic pathogens <dl
- Viral pathogens <dl
- Helicobacter pylori <dl

Note: A result of **<dl** = represents '*result below detectable limit*'

This does not mean no microbial DNA was detected. Rather, the lab sets both a lower limit of detection (LLOD) and a reference range for which the organism is designated "High." This is different from other laboratories and methodologies that only report 'positive/negative'.

2. COMMENSAL / KEYSTONE BACTERIA (page 2)

Commensal Bacteria

These are the 'representative members' of the normal microbiome. They can provide key insights into the overall health and function of the microbiome, as well as the abundance and diversity. Also known as the 'good bacteria' these play vital roles in supporting our digestion, hormone, nutrient and neurotransmitter production.

- *Bacteroides fragilis* - LOW
- *Escherichia spp.* - UNDETECTED / Below detected level (<dl)
- *Lactobacillus spp.* - LOW
- *Enterobacter spp.* - LOW
- *Akkermansia muciniphila* - UNDETECTED / Below detected level (<dl)
- *Faecalibacterium prausnitzii* - LOW
- *Roseburia spp* - LOW

More about *Akkermansia muciniphila* - this species resides in the mucus layer of large intestine. It's very protective to the gut and has been shown to help maintain intestinal integrity (by down-regulating the leaky gut protein, Zonulin - more on this below). It also acts as a 'biofilm buster' organism. It's known to modulate the metabolic rate and low levels are associated with weight gain, obesity, insulin resistance and metabolic dysfunction. Studies have also linked a lack of this microbe to psoriasis and GI diseases (Crohn's, Ulcerative colitis) and Type 2 diabetes.

More about *Faecalibacterium prausnitzii* - this is one of our major anti-inflammatory microbes. It's a major producer of **butyrate** and other **short chain fatty acid (SCFA)** from the non-digestible carbohydrates we eat. These SCFA are important regulators of the gut mucosal integrity, immune balance and pathogen resistance. When low, you probably don't have good levels of the anti-inflammatory SCFA, **butyrate**. This is a health-promoting SCFA that provides energy for the colonic epithelial cells and also promotes anti-inflammatory actions in the intestinal mucosa.

More about butyrate - It's a compound produced in the gut, but it also plays a key role in brain function by acting as a signalling molecule within the gut-brain axis. It can influence mood, behaviour, cognition, and sleep by regulating inflammation, neurotransmitter production, and gene expression. Since butyrate can cross the blood-brain barrier and activate specific receptors, when the gut has (hopefully) made enough of its own butyrate, some then gets into the bloodstream and crosses the blood-brain barrier to support brain health. Lower levels have been linked to various symptoms eg. anxiety, panic attacks, brain fog, cognition and mental health issues. This is an example of the gut-brain connection.

Bacterial phyla

This provides a high level view of the microbiome based on the fact that these phyla are the top of the taxonomy hierarchy (also known as 'classification system' or 'organised ranking').

Gram-negative *Bacteroidetes* and gram-positive *Firmicutes* are bacterial phyla that dominate the entire human digestive tract, including the mouth, nose, throat and colon.

The 'ratio' shown on GI Map report is a form of a summary of those microbes belonging to these 2 phyla. When represented as either high or low, they indicate a significant imbalance in the microbiome.

- *Bacteroidetes* - LOW

(This needs an acidic colonic environment to thrive, lives in the mucosal layer so if this is compromised, levels will be affected)

- *Firmicutes* - LOW

3. OPPORTUNISTIC / OVERGROWTH MICROBES (Page 3)

An overgrowth of opportunistic bacteria may occur when the commensal (good) bacteria are impaired by poor diet, medications, antibiotics, parasitic infection, or a weakened immune system.

Opportunistic microbes create imbalance in the gut microbiota and can also preventing proper healing of the GI mucosal barrier. It's also important to identify the 'opportunity' that contributed to their overgrowth and also treat this.

- *Bacillus spp.* - low/moderate presence
- *Enterococcus faecium* - moderate presence
- *Enterobacter spp.* - low/moderate presence
- Fungi/Yeast <dl
- Viruses <dl
- *Entamoeba coli* - very low presence

This is a non-pathogenic protozoa/amoeba found in the large intestine. While it does not cause disease, its presence can suggest poor gut health, exposure to contaminated food or water, or imbalances in the gut microbiome. It may also indicate a history of travel or ingestion of unfiltered water.

- Worms - Not Detected

4. INTESTINAL HEALTH MARKERS (Page 4)

- **Steatocrit <dl**

This is a marker for fat in the stool. We should not have any fat in our stool if we are digesting and absorbing it well.

- **Elastase - 415 (optimal 500+)**

This is just one of our several pancreatic/digestive enzymes that digest our food so we can extract the nutrients from what we eat.

- **Beta-Glucuronidase - 1019 (optimal 500-1000)**

This is an enzyme produced by certain species of intestinal bacteria and also cells of our body (liver, kidneys, the gut wall, reproductive organs). This result is a marker of the *activity* of the enzyme, and not the quantitative *amount* of the the enzyme. This enzyme essentially 'undoes' what the liver did to the various toxins, hormones (our own and environmental xeno-oestrogens), xenobiotics, mould mycotoxins, medications when they when through the liver detox pathways. The liver binds up these toxins (through a process called glucuronidation) in preparation for their excretion from the body via the stool. Beta-Glucuronidase breaks this bond, undoing the liver's work and essentially frees up these toxins, allowing them to be reabsorbed and go back into circulation.

Moderate levels can be seen with bacterial overgrowth, lack of beneficial bacteria, 'liver stress', antibiotics use, dietary factors, lifestyle factors.

A higher level of Beta-Glucuronidase activity:

- is associated with hormonal imbalance when >1000
- is associated with an imbalance of oestrogen to progesterone, and creates a back-log in the clearance of oestrogen metabolites through your liver- may lead to high oestrogen/excess circulating oestrogen > increases symptoms of PMS, heavy/painful periods, breast tenderness, fibroids. Excess oestrogen may lead to specific breast cancers.
- *may* increase cancer risk as hormones and toxins re-enter bloodstream instead of being eliminated. Associations with breast and colon cancer.

- **Occult blood <dl**

This test for blood in the stool sample.

- **Secretory IgA - 296 (1200 ideal)**

This is our primary immunoglobulin in the intestinal mucosa. It's involved in immunological surveillance, and is our first line of defence for antigens and pathogens. It also monitors and balances the microbiome. When low, it's suggestive of a gut that's immune compromised, often also with low beneficial/protective bacteria (eg low phyla of *Bacteroidetes*). High cortisol/high stress can decrease it.

- **Anti-gliadin IgA - 13 (<40 ideal)**

This is a marker for non-coeliac gluten sensitivity (NCGS)

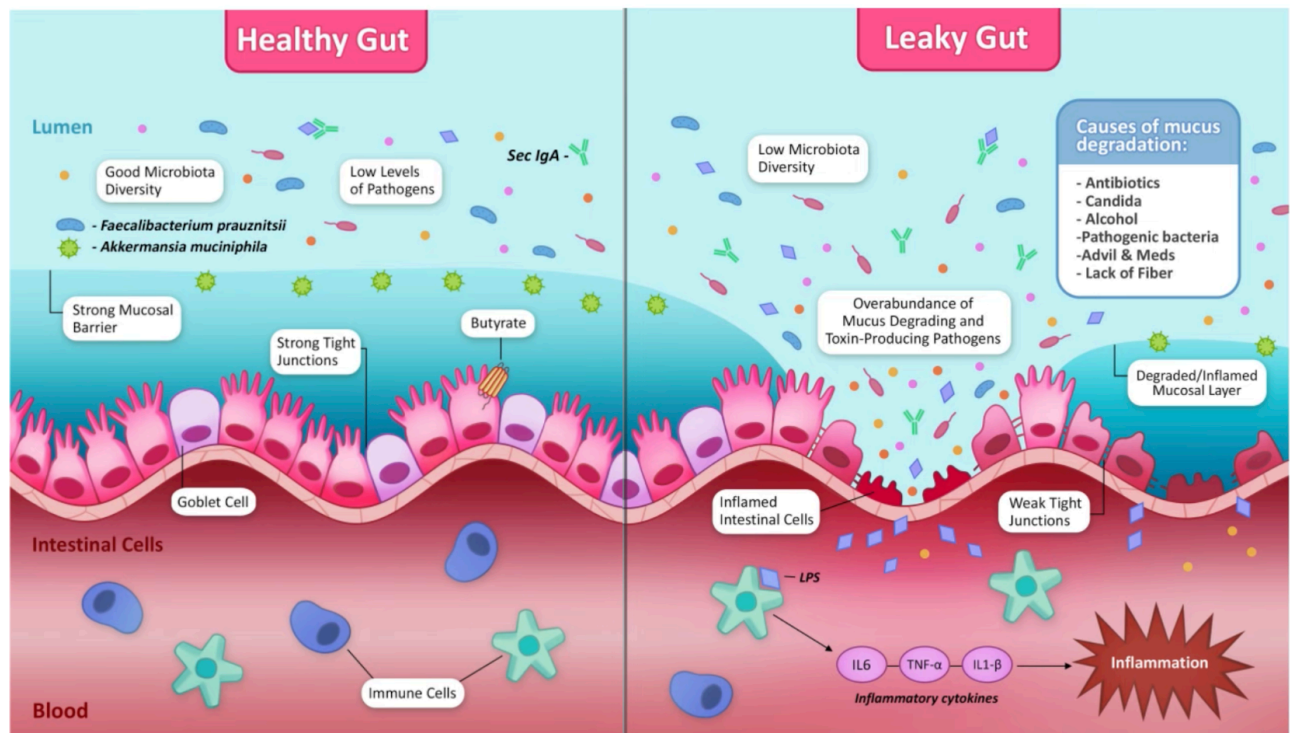
- **Calprotectin - 15 (<50 ideal)**

This is the gold standard marker for GI inflammation, a great indicator for inflammation in the colon.

- **Zonulin - 217 (<40 ideal)**

This is a marker of 'leaky gut'. Zonulin is the protein that opens up the intercellular tight junctions in the mucous membranes, so it's reflective of the "degree of permeability" occurring in the mucosa of the gut wall. High levels are linked to immune-mediated conditions (eg. autoimmunity). When Zonulin is elevated, especially when combined with bacterial overgrowths, low levels of 'good' bacteria, and poor immune surveillance (as seen in your low Secretory-IGA) it allows intestinal bacteria, toxins, pathogens, and undigested food particles to enter the bloodstream, potentially triggering inflammation and immune responses.

The microbe *Akkermansia* usually down-regulates Zonulin, protecting against intestinal permeability so a lack of this will contribute to leaky gut also. Leaky gut can also be linked to chronic stress.



SUMMARY:

1. **Opportunistic bacteria overgrowths:** Low-moderate presence of *Bacillus* spp, *Enterococcus faecium*, *Enterobacter* spp, *Entamoeba coli*
2. **Low commensal (good) species:** *Bacteroides fragilis*, *Escherichia*, *Lactobacillus*, *Enterobacter*, *Akkermansia*, *Faecalibacterium*, *Roseburia* spp
3. **Poor detoxification:** high beta-Glucuronidase
4. **Decreased immune activity:** low Secretory IgA
5. **Increased intestinal permeability:** very high Zonulin