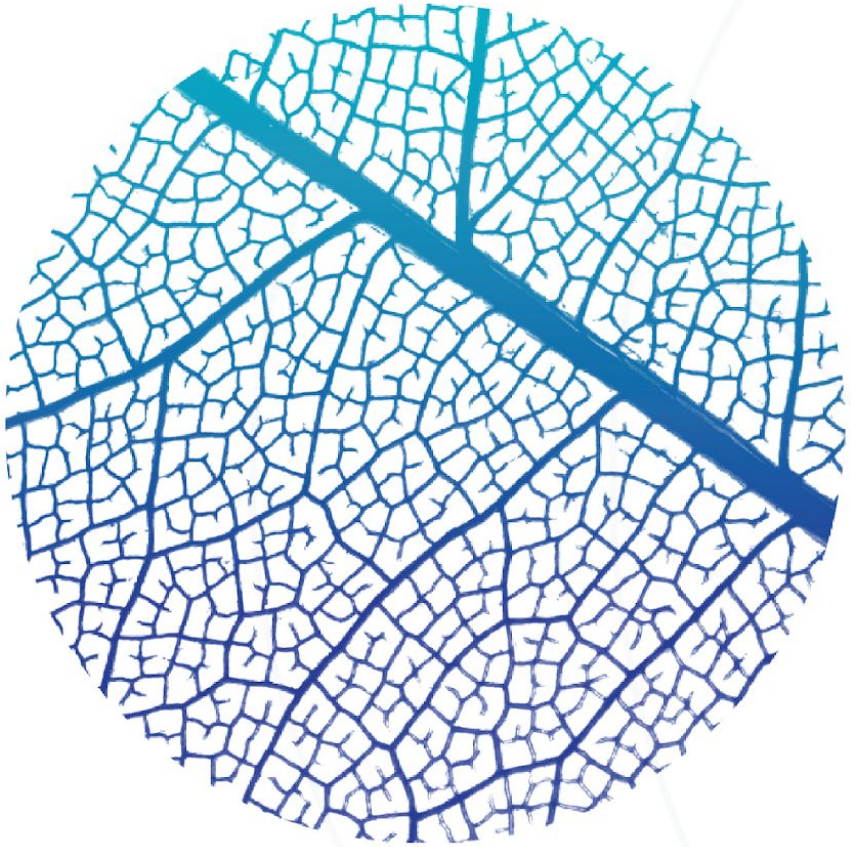


# ANTIMICROBIALS AS A DIAGNOSTIC TOOL

## USING BOTANICALS TO ASSESS THE ROLE OF DYSBIOSIS IN SYSTEMIC CONDITIONS

DR. JOCELYN STRAND

Biocidin Botanicals™

# MY AHA! MOMENT(S) WITH BIOCIDIN®

Biocidin Botanicals™

# IT'S CALLED MEDICAL "PRACTICE" FOR A REASON

At some point I realized that I was using Biocidin for every dysbiosis case, and then…

- I started to watch the cascade of improvements
  - GI symptoms (of course!)
  - Lyme
  - Rheumatoid/Psoriatic Arthritis
  - Chronic Fatigue
  - Insomnia
  - Mood
  - The list goes on
- I could save patients' money
- Not everyone could tolerate it….

# HERXING AND BIOFILM BLUNDERS

Biofilm Blues - I didn't understand the importance of Herxing or Biofilms

- I thought people were reacting to the Biocidin
- I may have done harm
- I probably lost the faith of some patients

# MICROBES AND SYSTEMIC HEALTH

## WHY DID I OBSERVE WHAT I DID?

Biocidin Botanicals™

# THE MICROBIOME AND THE IMMUNE SYSTEM

Ways the intestinal microbiome affects systemic immunity

- Regulation of T cells
- Oral tolerance
- Production of short-chain fatty acids
- Regulation of systemic inflammation

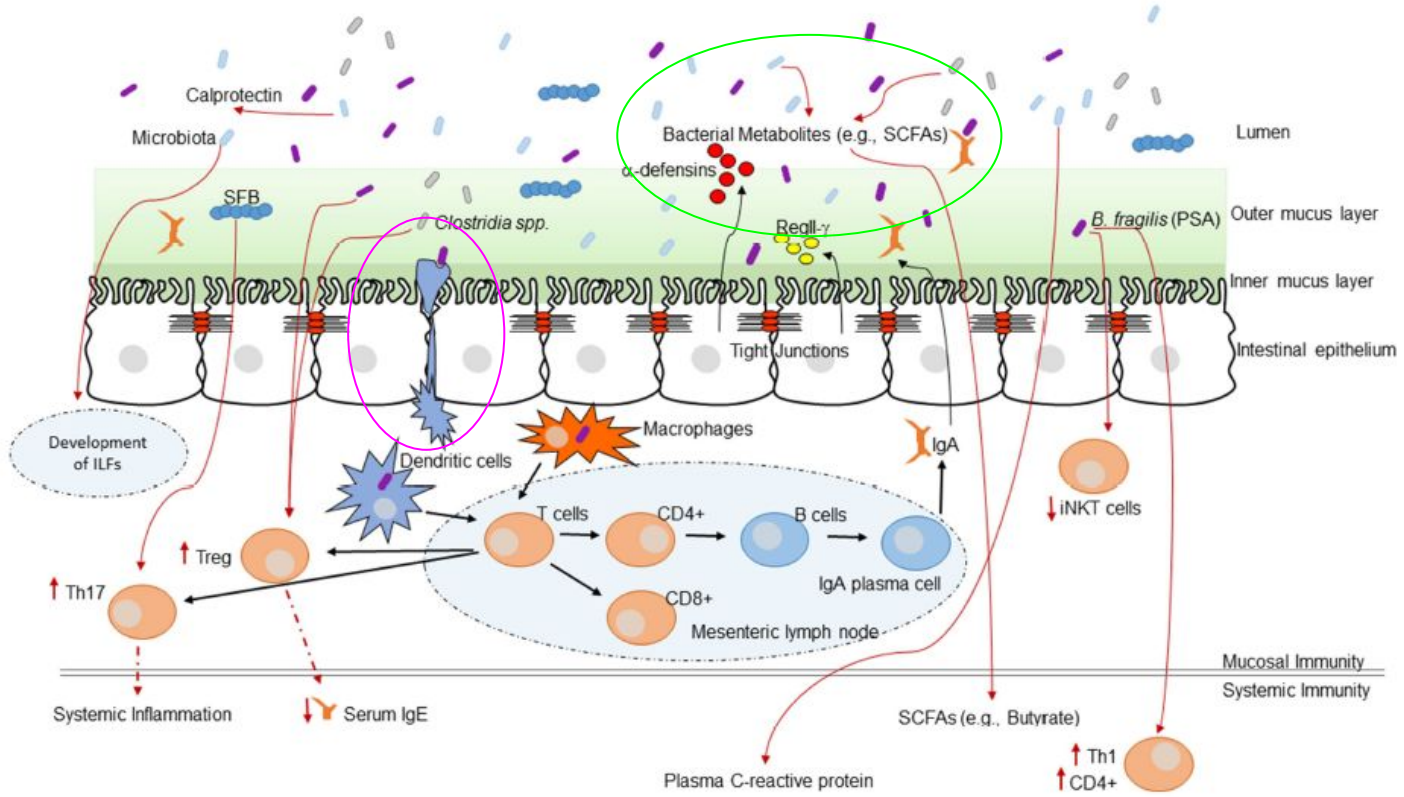



**FIGURE 1 | The intestinal microbiota and the host immune system.** Interaction between the immune system and the intestinal microbiota. Multiple immune effectors function together to minimize bacterial-epithelial invasion. These include the mucus layer, epithelial antibacterial proteins, and IgA secreted by lamina propria plasma cells. Compartmentalization is accomplished by unique anatomic adaptations that limit commensal bacterial exposure to the immune system. Some microbes are sampled by intestinal DCs. The loaded DCs traffic to the mesenteric lymph nodes through the intestinal lymphatic but do not migrate to distal tissues. This compartmentalizes live bacteria and induction of immune responses to the mucosal immune system. Induced B cells and T cell subsets recirculate through the lymphatic and the bloodstream back to mucosal sites, where B cells differentiate into IgA-secreting plasma cells. Thus, the intestinal microbiota shapes host mucosal as well as systemic immunity. ILFs, isolated lymphoid follicles.

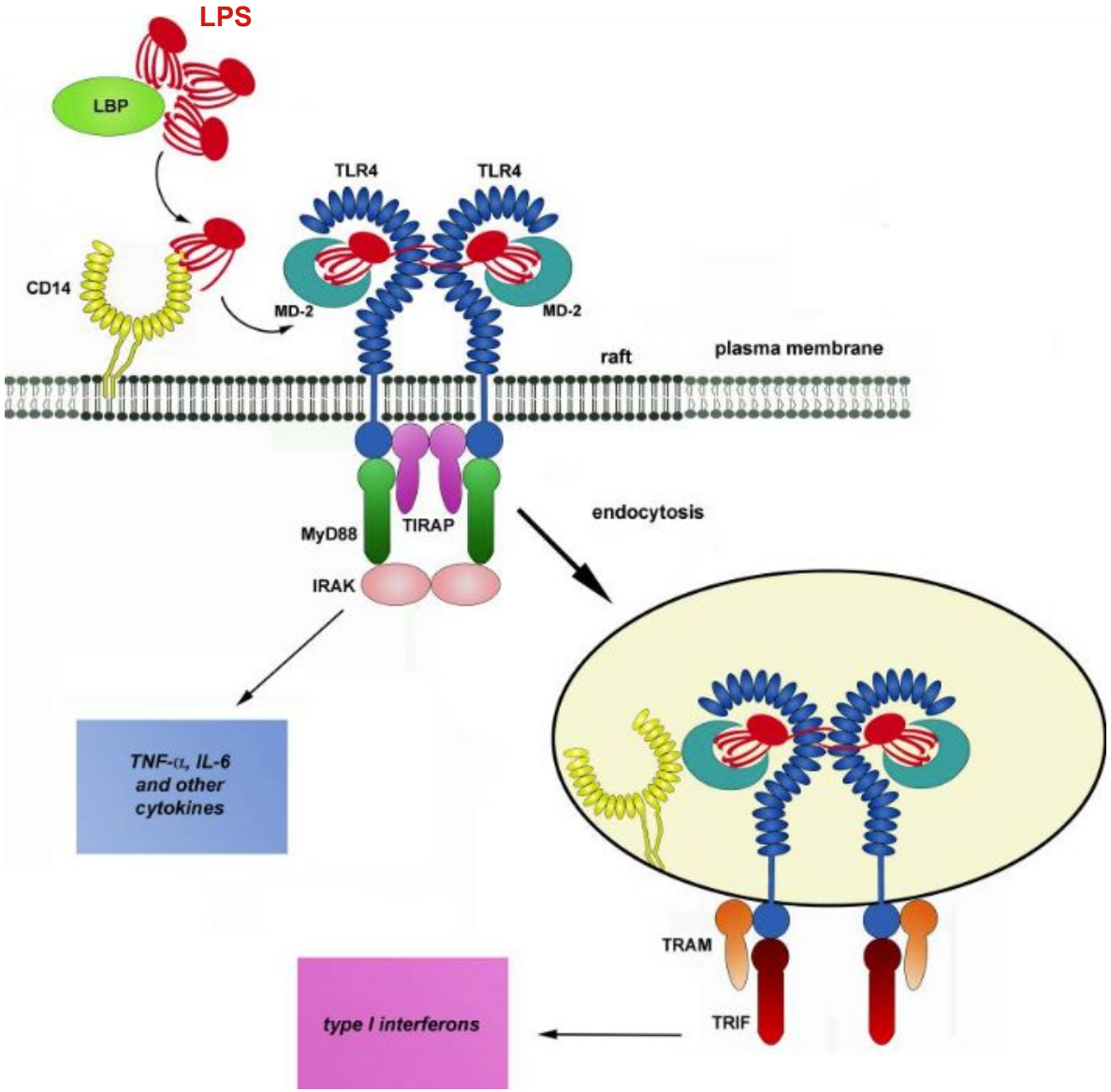
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4595839/

# LPS REVIEW

- Lipopolysaccharide (LPS) is an endotoxin derived from the outer membrane of gram-negative bacteria
- Detected in the portal venous blood – enters through damaged GI epithelium or chylomicrons
- Dietary and microbial LPS is consistently absorbed through the intestinal epithelia
- Present in triglyceride-rich, very low density lipoproteins (VLDL) in systemic blood flow
- Is transported by LDL
- A component of biofilms
- Causes immunologic and metabolic disruption

# LPS, TLR4, AND INFLAMMATION

- LPS is the most potent immune stimulant known.
- TLR4 is a pattern recognition receptor – it means “Wow!” in German, because the discovery was so exciting.
- TLR4 receptors have evolved to recognize PAMPS and DAMPS to activate innate and adaptive immunity and protect the host.
- TLR4 binding activates NF Kappa-Beta, increasing proinflammatory cytokines including TNF-alpha and IL-6

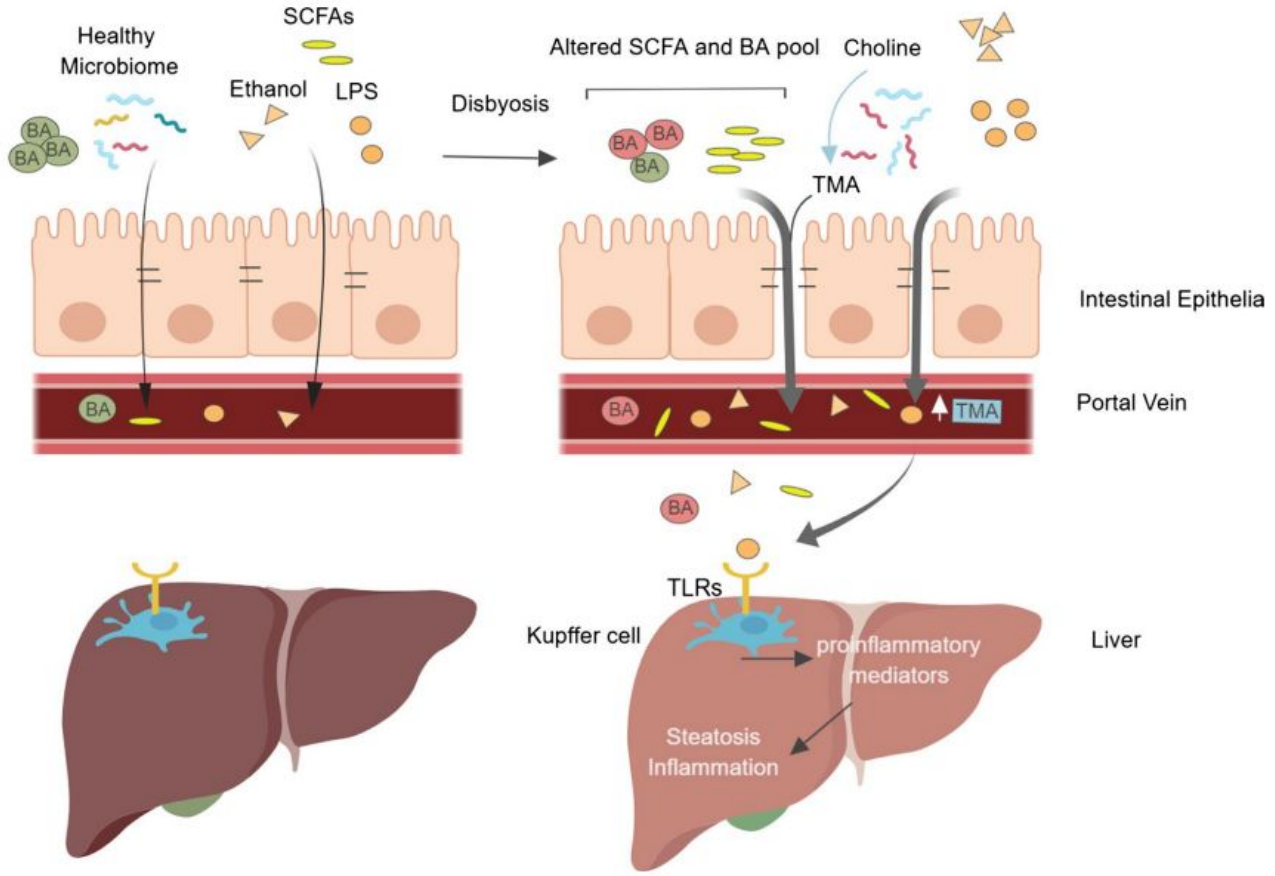



https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4293489/

# THE MICROBIOME AND THE LIVER

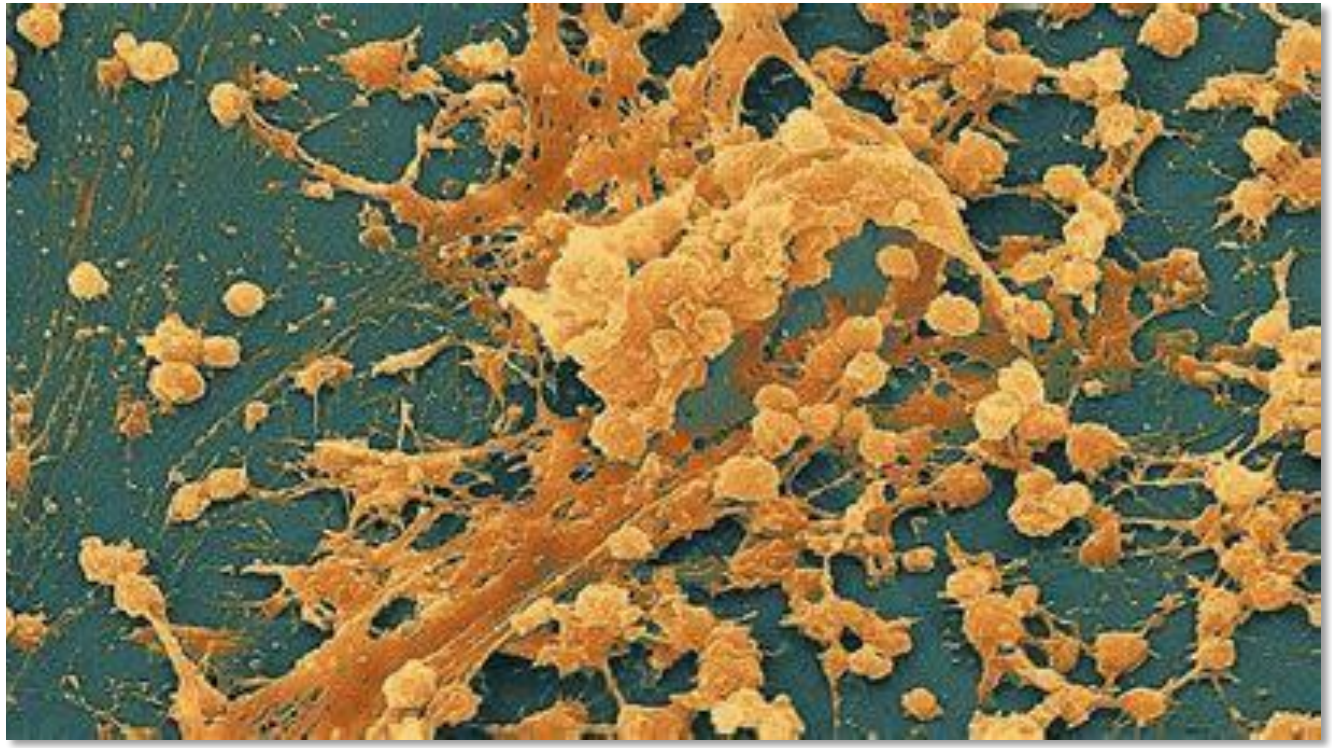
## THE GUT-LIVER AXIS

- GLA plays an essential role in the development of NAFLD
- Blood comes from intestines and contains products produced by the microbiome
  - Phenols
  - Acetaldehyde
  - Ammonia
  - Proinflammatory bacterial components
    - Peptidoglycan
    - LPS
- Immune cells of the liver (lymphocytes, macrophages, dendritic cells and natural killer cells) respond to DAMPS and PAMPS
- Toll-like receptor binding results in hepatic damage and inflammation



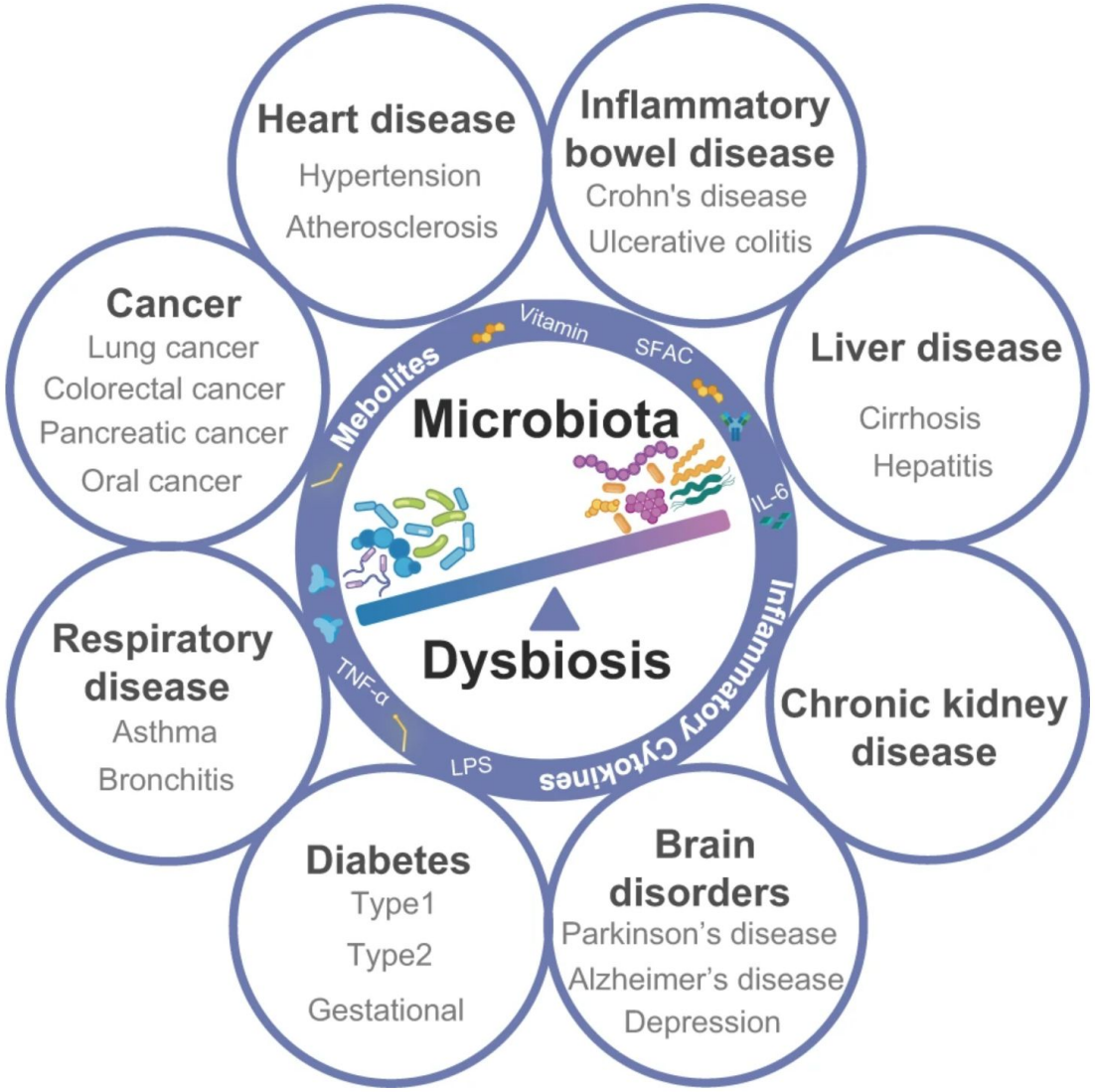
# BIOFILMS

- LPS and other metabolites produced continually
- Ineffective immune response, generating chronic inflammation
- Inflammatory damage to hepatocytes
- Retention of toxins in the extracellular matrix (heavy metals, organophosphates)
- Retention of endogenously produced toxins (oxalates, ROS)
- Ongoing source of dysbiotic organisms preventing balance in the GI tract

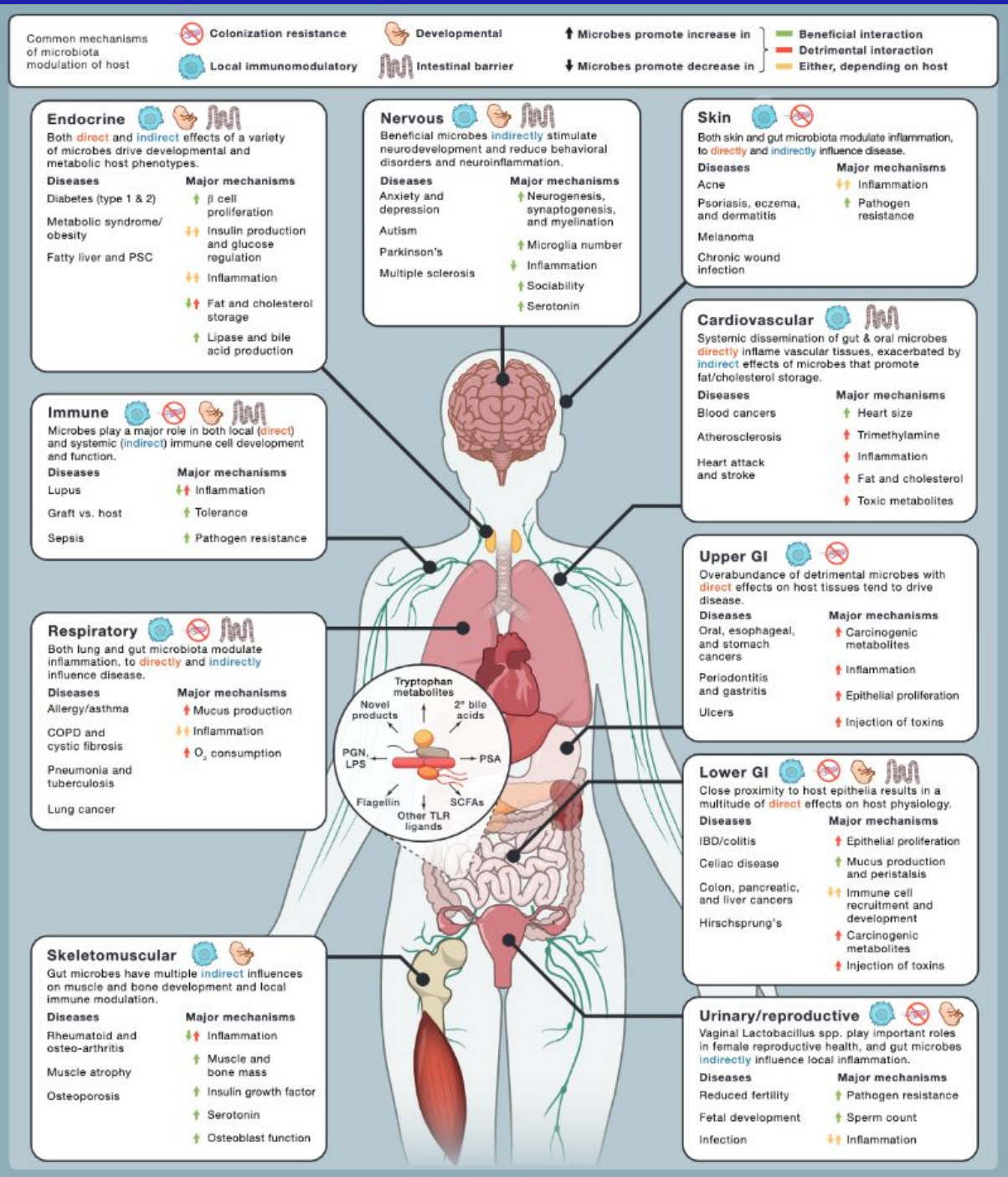


# THE MICROBIOME IN HUMAN DISEASE

"Microbiomes exist in every human ecological niche that has been examined, the oral cavity, skin surface, intestinal tract, oesophagus, lungs and other."




https://www.nature.com/articles/s41392-022-00974-4
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8657205/pdf/ijerph-18-12836.pdf




# SnapShot: Microbiota effects on host physiology

Jennifer H. Hill and June L. Round
Department of Pathology, Division of Microbiology and Immunology, University of Utah School of Medicine, Salt Lake City, UT 84112, USA

Cell

https://pubmed.ncbi.nlm.nih.gov/33989551/

# THE POWER OF BOTANICALS

Biocidin Botanicals™

# THE POWER OF BOTANICALS AND THE MICROBIOME

At Biocidin Botanicals we understand that microbes are not an enemy to be eliminated, but an ecology to be nourished. How do we do that? By working with the gift of botanicals.

Plants have developed tools to grow and flourish under the same environmental stressors that we face. They have an innate capacity to protect themselves – producing antimicrobial compounds, antioxidants, biofilm disruptors, and immune modulators. (Yes, plants have immune systems, too!)

# THE SYNERGY OF PLANTS

Each plant offers multiple activities. When layered together in a formula – a powerful synergy occurs.

- Antimicrobial activity
- Activity against biofilms
- Protective antioxidant action
- Immunomodulation

The outcome is not additive but exponential!

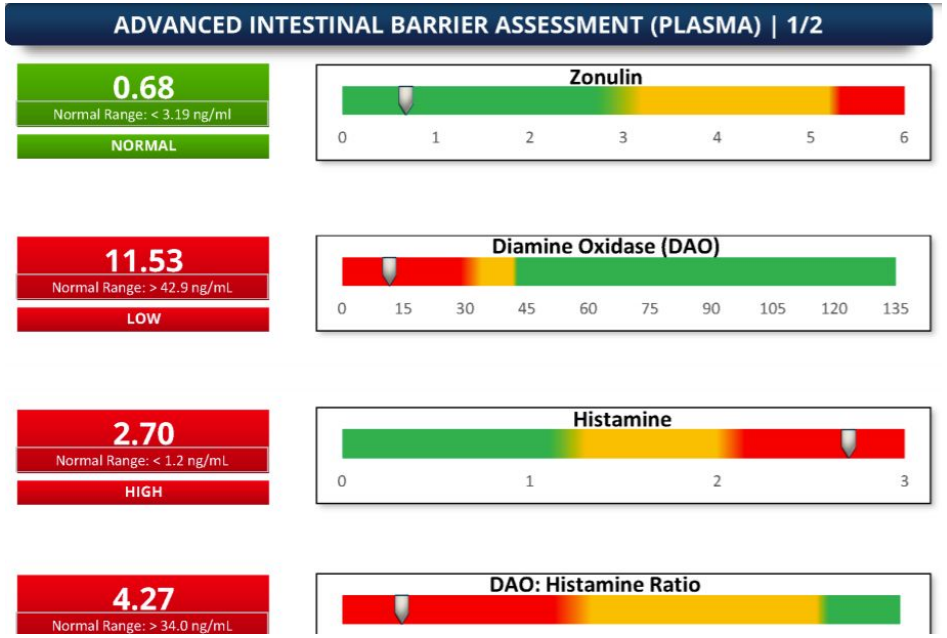
Botanicals offer a graceful and mighty solution that cannot be duplicated. The power to achieve and maintain balance.

The power to thrive.

# BIOCIDIN®, G.I. DETOX™+ & HISTAMINE

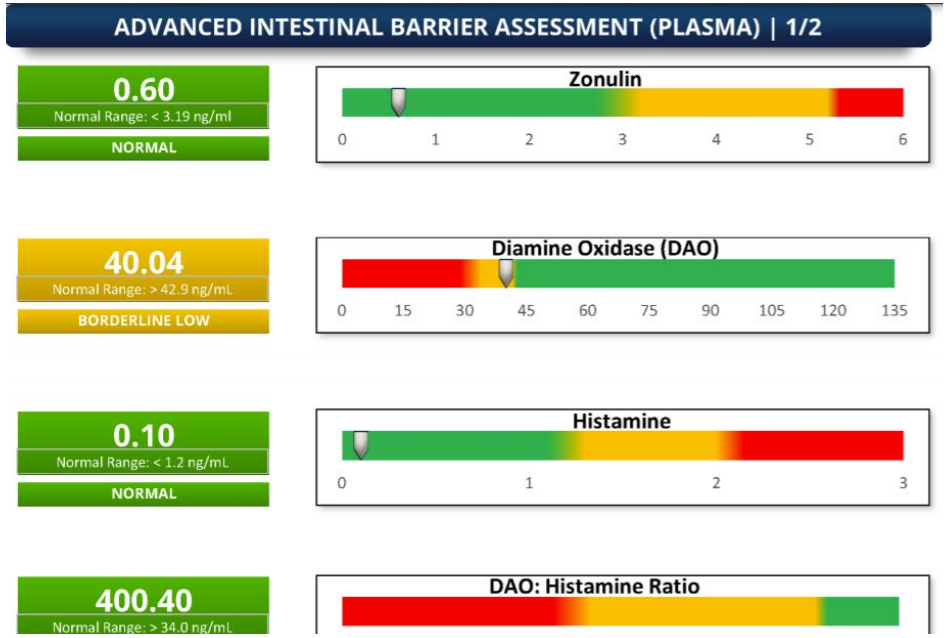
Participant #1

Pre-test 5/11/21




Participant #1

Post-test 6/23/21

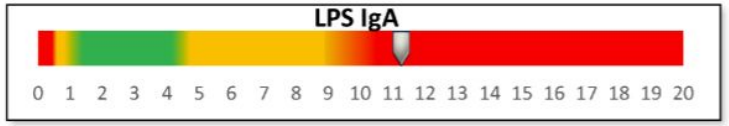


# BIOCIDIN®, G.I. DETOX™+ & LPS

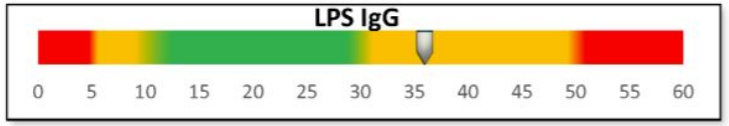
Participant #1

Pre-test 5/11/21

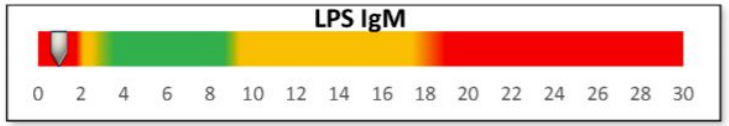
11.25
Normal RANGE: 0.83-4.47 µg/mL
HIGH




35.94
Normal RANGE: 9.09-31.5 µg/mL
BORDERLINE HIGH



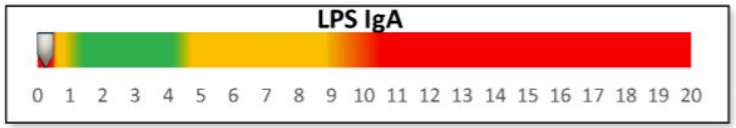

0.96
Normal RANGE: 2.5-9.4 µg/mL
LOW




Participant #1

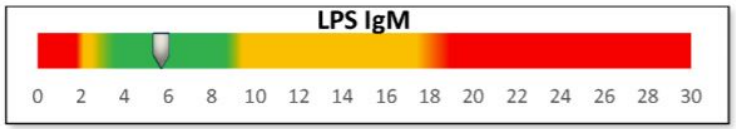
Post-test 06/23/21

0.10
Normal RANGE: 0.83-4.47 µg/mL
LOW



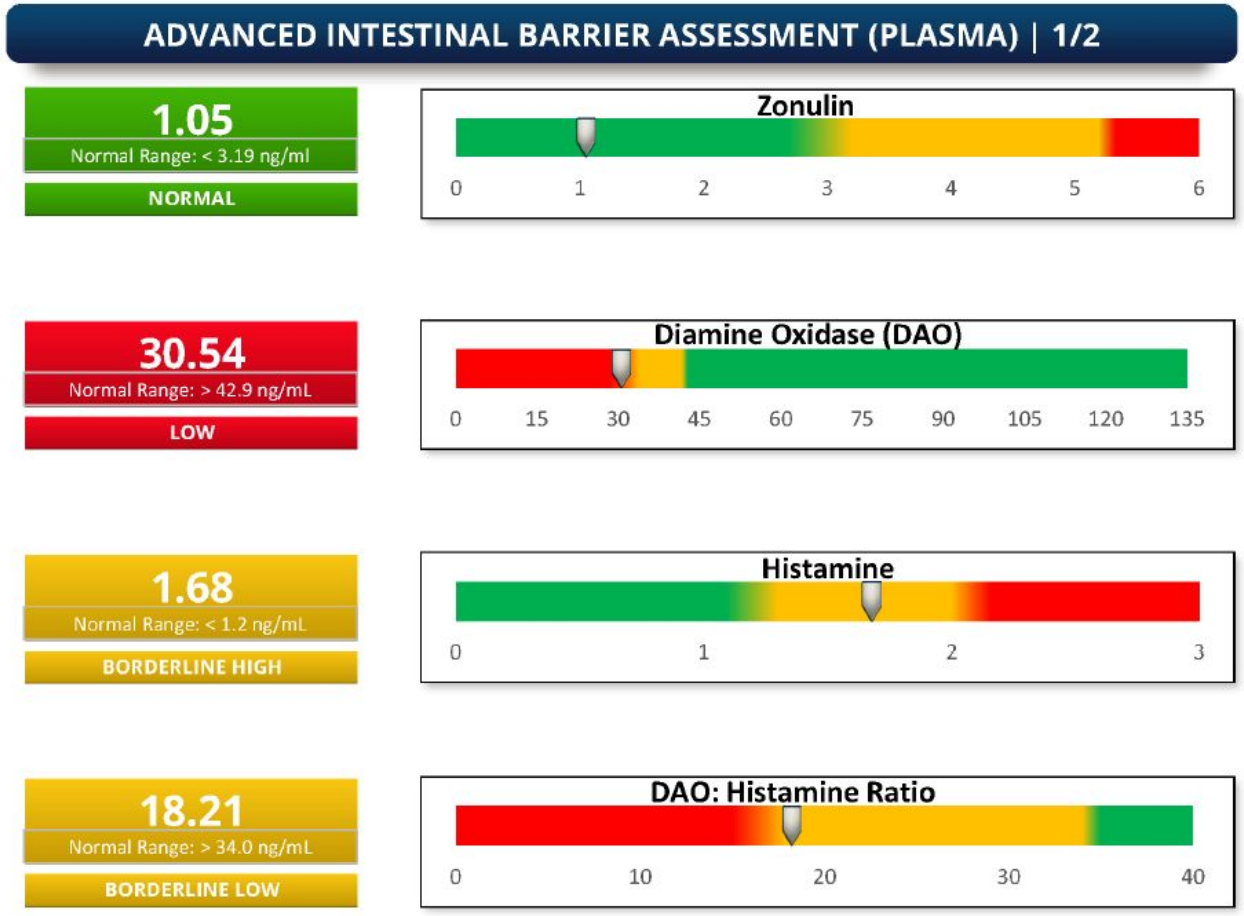

16.16
Normal RANGE: 9.09-31.5 µg/mL
NORMAL


5.67
Normal RANGE: 2.5-9.4 µg/mL
NORMAL

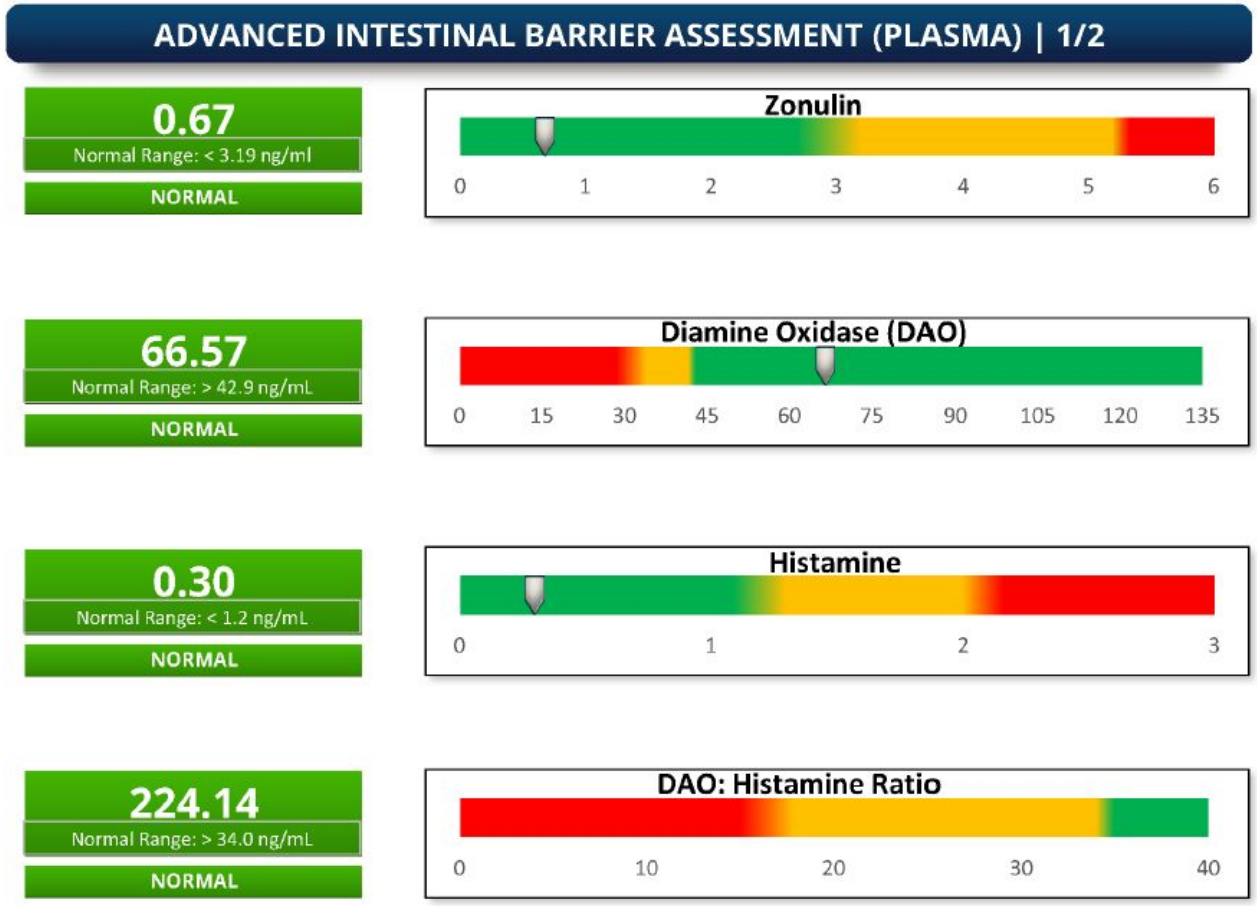


# BIOCIDIN® DAO & HISTAMINE

12/10/21




03/08/22



# BIOCIDIN® & LPS

12/10/21

03/08/22

**ADVANCED INTESTINAL BARRIER ASSESSMENT (PLASMA) | 2/2**

| 12/10/21 | | 03/08/22 | |
|---|---|---|---|
| 5.71<br>Normal RANGE: 0.83-4.47 µg/mL<br>BORDERLINE HIGH | LPS IgA<br>0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 | 1.55<br>Normal RANGE: 0.83-4.47 µg/mL<br>NORMAL | LPS IgA<br>0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 |
| 74.58<br>Normal RANGE: 9.09-31.5 µg/mL<br>HIGH | LPS IgG<br>0 5 10 15 20 25 30 35 40 45 50 55 60 | 3.27<br>Normal RANGE: 9.09-31.5 µg/mL<br>LOW | LPS IgG<br>0 5 10 15 20 25 30 35 40 45 50 55 60 |
| 19.27<br>Normal RANGE: 2.5-9.4 µg/mL<br>HIGH | LPS IgM<br>0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 | 7.93<br>Normal RANGE: 2.5-9.4 µg/mL<br>NORMAL | LPS IgM<br>0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 |

# DYSBIOSIS AND MAFLD

## A CASE STUDY

| | 09/02/21 | 10/22/21 | BCP | 01/11/22 | 02/01/22 | 02/24/22 | 04/20/22 | 05/26/22 | 06/09/22 | 07/22/22 | 11/02/22 | 03/03/23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alk Phos (40-150) | | 67 | | 56 | | | 51 | | | 55 | 58 | 64 |
| ALT (6-40) | 51 | 66 | | 40 | | | 40 | 44 | 46 | 44 | 37 | 48 |
| AST (10-40) | 43 | 50 | | 31 | | | 32 | 36 | 37 | 36 | 43 | 30 |
| Hgb A1C (<5.7) | 5.7 | | | | 5.5 | 5.3 | | | | | | |
| Glucose (70-99) | 117 | | | | 111 | 105 | | 105 | 111 | | | 116 (NF) |
| Total Cholesterol (114-200) | 233 | | | | | 148 | | | | | 164 | 121 |
| HDL (40-60) | 28 | | | | | 29 | | | | | 27 | 22 |
| LDL (<100) | 133 | | | | | 93 | | | | | 85 | 65 |
| Triglycerides (10-200) | 358 | | | | | 130 | | | | | 130 | 170 |

# MAFLD

| Pre Biocidin 3/15/21 | Post Biocidin 2/2/23 |
|---|---|
| CAP (Steatosis) Score: 387 dB/m **(severe)** | CAP (Steatosis) Score: 293 dB/m **(mild)** |
| Fibrosis Score: 9.5 kPa **(significant)** | Fibrosis Score: 6.3 kPa **(insignificant)** |

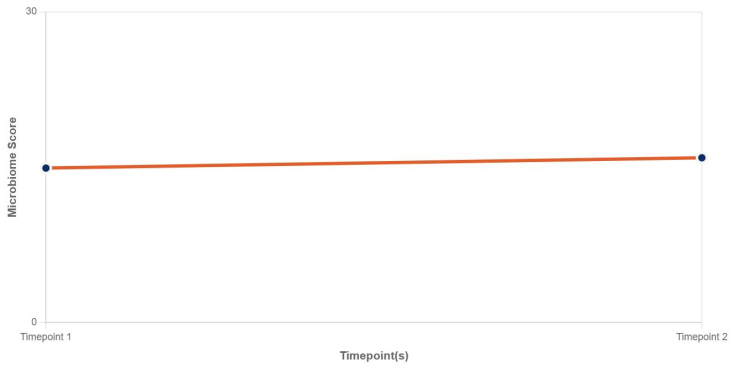
"I am also very grateful to be in this study that has so much benefited me. I am excited to see how the supplement regimen affects me next. Again, I want to reiterate just how much gratitude I have in my heart for you both and for Biocidin Botanicals and the research they do. I can see so many benefits to people. No wonder you have so much passion for your work, Jocelyn. I totally get it now.

My hepatic numbers are so much better.  I was so surprised when my PA from Essentia Health's Gastroenterology gave me the good news."

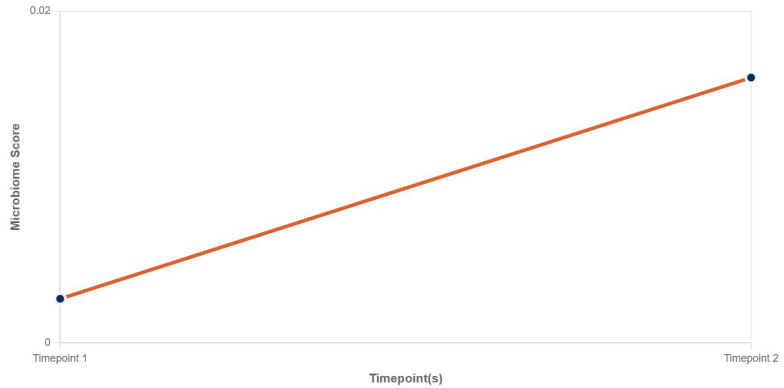
# BOTANICALS & THE MICROBIOME

- Pilot study was completed in 2020 with 13 participants using Biocidin® liquid and G.I. Detox™+ for 8 weeks at max dosing.
- 69% (9/13) of the participants had an increase in probiotic abundance.
- 73% (8/11) of the participants had an increase in *Akkermansia muciniphila*.

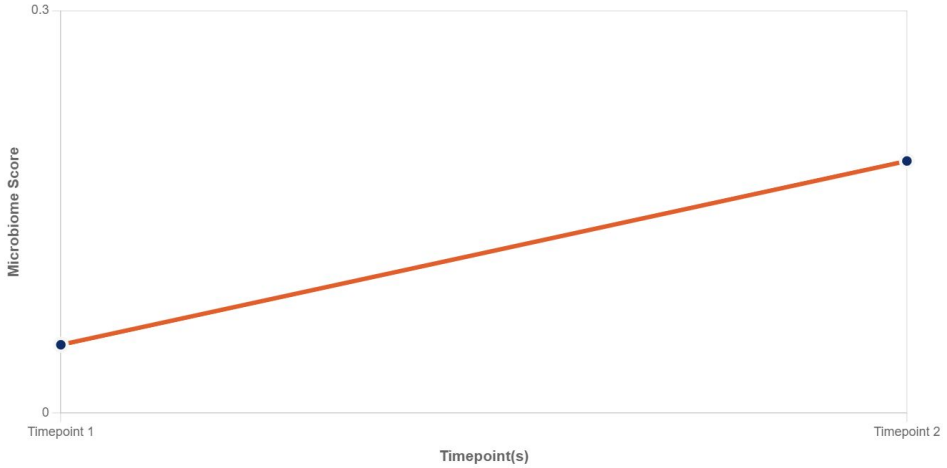
*Faecalibacterium prausnitzii*




*Lactobacillus plantarum*

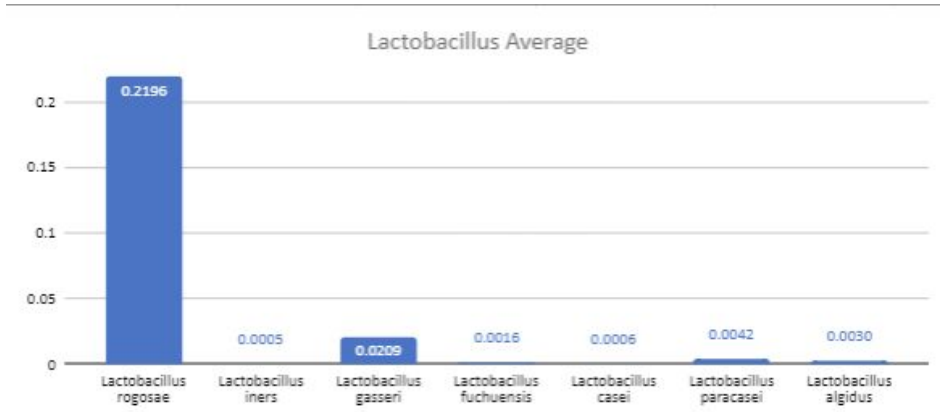


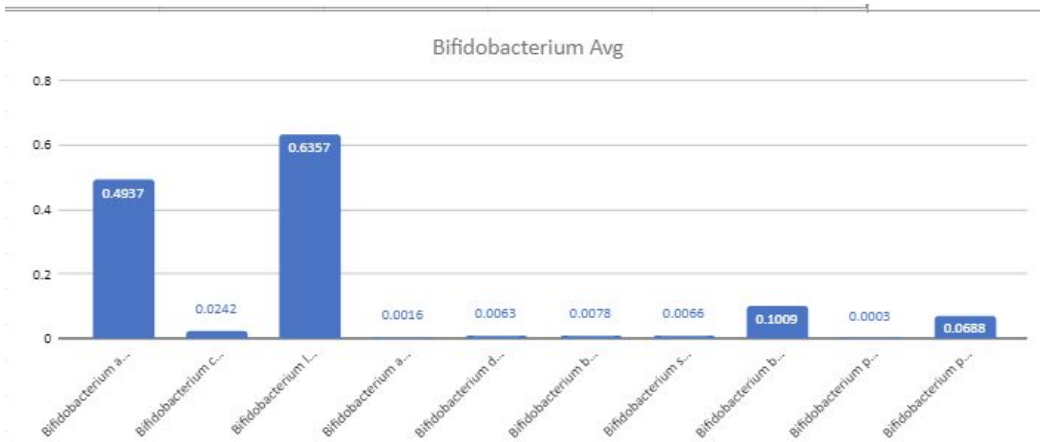

*Akkermansia muciniphila*



# BOTANICALS & THE MICROBIOME

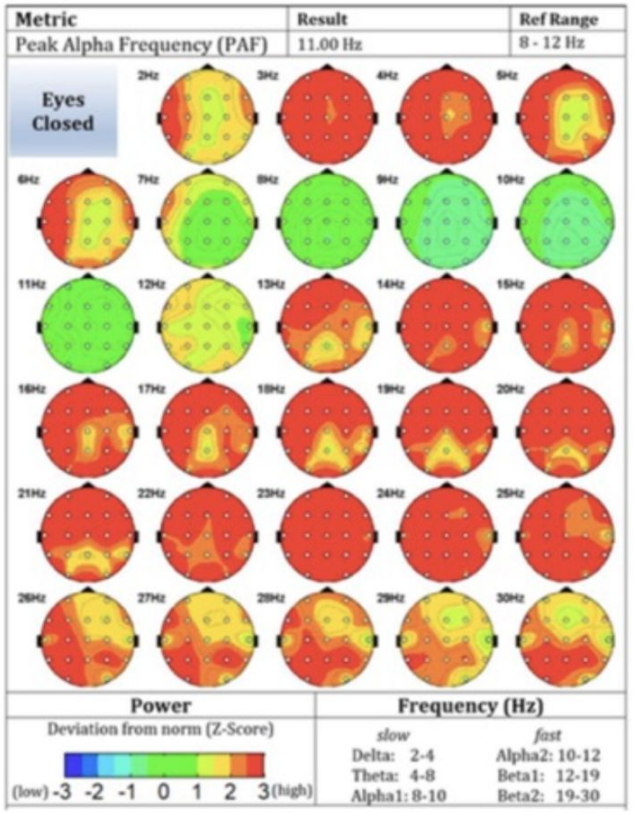
| Probiotic Organisms Abundance(%): | 23000064 | 23000099 | 23000065 | 23000096 | 23000070 | 23000078 | 23000061 | 23000068 | 23000057 | 23000090 | 23000101 | 23000060 | 23000084 | 23000085 | 23000055 | 23000051 | 23000052 | 23000054 | 23000088 | 24000359 | 23000083 | 24000366 | 23000086 | 24000499 | 23000076 | 23000077 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Akkermansia muniiciphila | 0% | 0.33% | 0.05% | 0.19% | 0% | 0% | 0.94% | 11.26% | 0.06% | 1.31% | 0.03% | 1.36% | 0.28% | 2.13% | 0.00% | 0.00% | 0.45% | 1.38% | 0.56% | 0.00% | 3.91% | 4.15% | 0.48% | 0.05% | 0.45% | 0.19% |
| Oxalobacter formigenes | 0.03% | 0.10% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0.00% | 0.02% | 0.00% | 0.00% | 0.00% | 0.00% | 0.13% | 0.07% | | | 0.03% | 0.07% |
| Bifidobacterium pseudocatenulatum | 0.09% | 0.04% | 0.08% | 0.09% | 0.01% | 0.03% | 0% | 0% | 0.16% | 0.35% | 0% | 0% | 0% | 0% | 0.00% | 0.00% | 0.02% | 0.00% | 0.00% | 0.00% | 0% | | 0.25% | | | |
| Bifidobacterium longum | 0.27% | 0.04% | 0% | 0% | 0.33% | 0.32% | 0.20% | 0.13% | 0.67% | 3.45% | 0% | 0% | 0.94% | 0.75% | 0.00% | 0.00% | 0.07% | 0.06% | 0.00% | 0.00% | 0.02% | 1.01% | 1.43% | 2.19% | 0.01% | |
| Lactococcus lactis | 0.00% | 0.01% | 0.01% | 0.02% | 0.01% | 0% | 0.14% | 0.11% | 0.02% | 0.07% | 0.08% | 0.25% | 0.14% | 0.02% | 0.03% | 0.13% | 0.02% | 0.05% | 1.00% | 0.01% | 0.01% | 0.22% | 0.02% | | 0.03% | 0.02% |
| Bifidobacterium pseudolongum | 0.01% | 0.00% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.05% | | 0.20% | | |
| Lactobacillus plantarum | 0% | 0% | 0% | 0.01% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0.02% | 0% | 0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.03% | | | | |
| Bifidobacterium bifidum | 0% | 0% | 0% | 0% | 0.26% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | 0.02% | | | |
| Streptococcus thermophilus | 0% | 0% | 0% | 0% | 0.01% | 0% | 0.04% | 0.01% | 0% | 0.06% | 0.73% | 0.08% | 0.07% | 0% | 0.03% | 0.04% | 0.03% | 0.00% | 4.00% | 3.30% | 0.01% | | | | | 0.02% |
| Bifidobacterium adolescentis | 0% | 0% | 0% | 0% | 0% | 0.08% | 2.05% | 1.51% | 0% | 0% | 0% | 0% | 0% | 0% | 0.00% | 0.00% | 5.30% | 2.84% | 0.00% | 0.00% | 0.00% | 8.29% | 1.80% | 6.25% | | |
| Lactobacillus reuteri | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0.01% | 0% | 0% | 0% | 0% | 0% | 0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | |
| Bifidobacterium sp.12_1_47BFAA | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0.02% | 0.17% | 0% | 0% | 0.03% | 0.02% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.02% | | 0.01% | | |
| Saccharomyces cerevisiae | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0.04% | 0% | 0% | 0% | 0% | 0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | |
| Bifidobacterium breve | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0.04% | 0% | 0% | 0% | 0.02% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | 0.01% | | |
| Lactobacillus paracasei | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0.11% | 0.03% | 0% | 0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | |
| Lactobacillus casei | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0.01% | 0% | 0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | 0.02% | | |
| Lactobacillus rhamnosus | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0.44% | 0% | 0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | |
| Bifidobacterium animalis | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0.00% | 0.00% | 0% | 0% | 0.00% | 0.00% | 0.06% | 0.00% | 0.00% | 0.00% | 0.00% | | 0.01% | | | |
| Bacillus Subtilis | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | | | | | | | | | | | | 0.03% | 0.00% | | | |
| Bifidobacterium Catenulatem | | | | | | | | | | | | | | | | | | | | | | 0.02% | 0.01% | 0.01% | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Abundance | 0.40% | 0.52% | 0.14% | 0.31% | 0.62% | 0.43% | 3.37% | 13.03% | 0.97% | 5.45% | 0.95% | 2.19% | 1.46% | 2.94% | 0.06% | 0.19% | 5.95% | 4.33% | 5.56% | 3.31% | 4.08% | 13.84% | 4.01% | 8.73% | 0.52% | 0.30% |



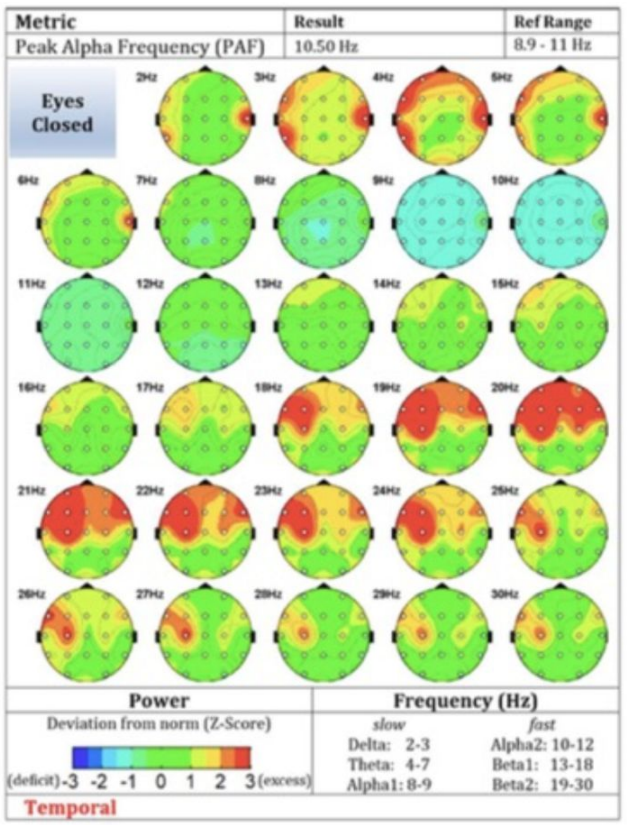



# NEUROINFLAMMATION CASE STUDY

11.21.18 Baseline




7.9.19 Post




NeuroRead

Improved alpha peak

Much improved delta and theta power.

Much improved reduction in what is believed to be neuro-inflammation

# BIOCIDIN®

BROAD-SPECTRUM LIQUID FORMULA AND LIQUID CAPSULES

- Selectively supports simultaneous clearance of multiple classes of harmful organisms*
- Disrupts and dismantles biofilm formations*
- Clinical research shows immunomodulatory activity*
- Addresses inflammation through multiple activities*
- May improve regularity and reduce bloating and gas*
- Helps improve vitality and mental clarity*
- Supports healthy mobility and body comfort*


Biocidin Botanicals™

*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure or prevent any disease.

# G.I. DETOX™+

ZEOLITE, CHARCOAL, & HERBAL FORMULA

- Assists in “mop up” of microbial and biofilm components*
- Supports healthy detoxification and full-body cleansing*
- Supports clearance of mold metabolites*
- Helps in the neutralization of histamine*
- Supports a more comfortable cleansing experience*
- May reduce bloating and gas*
- Supports microbiome balance*
- Recommended for use with Biocidin®


Biocidin Botanicals™

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