

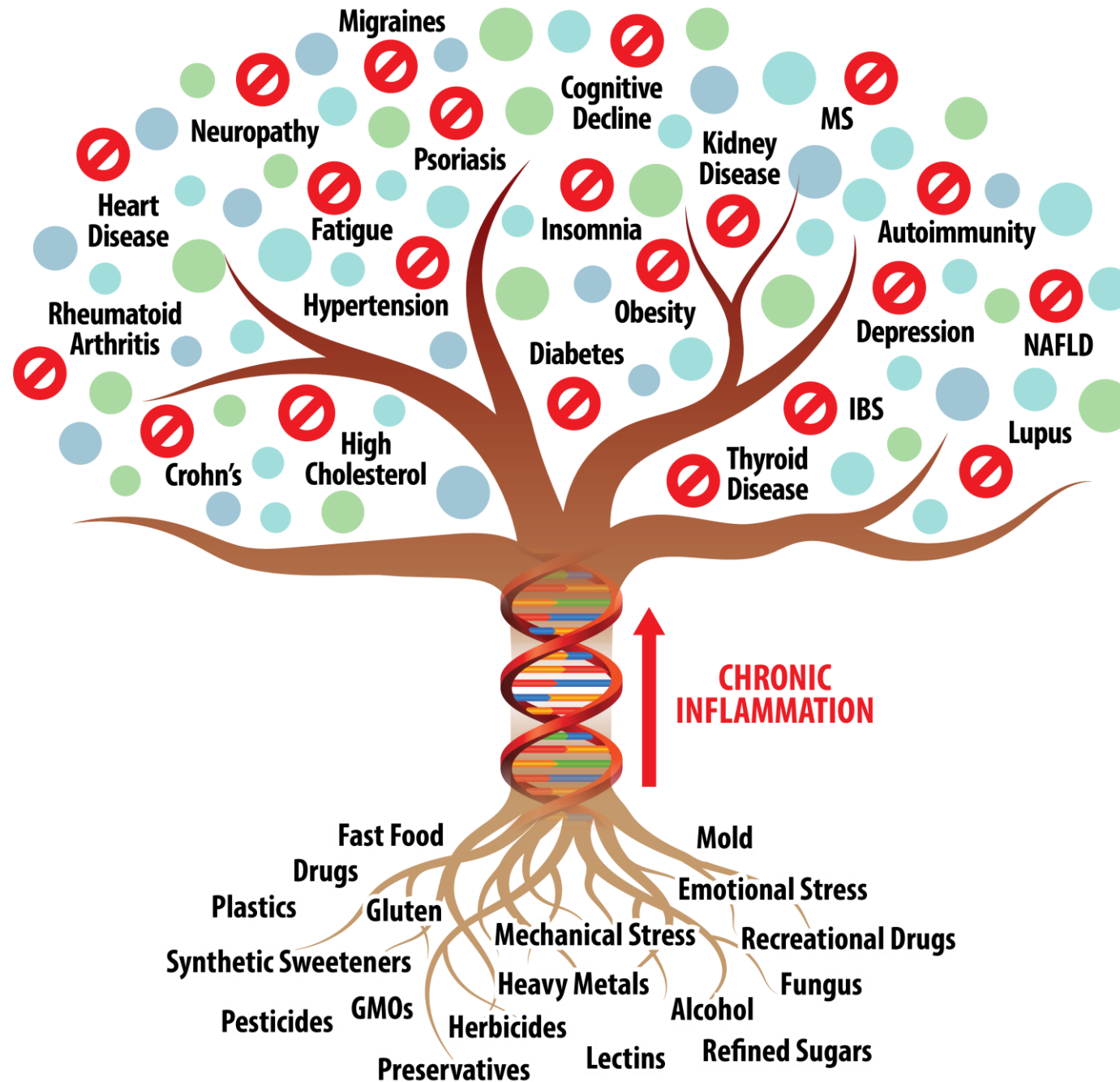
Casual Friday Presents

The Gut-Joint Axis

and Intervention Development

A BIOGENETIX CLINICAL PRESENTATION

biogenetix.com



Interactions between Gut Microbiota and Immunomodulatory Cells in

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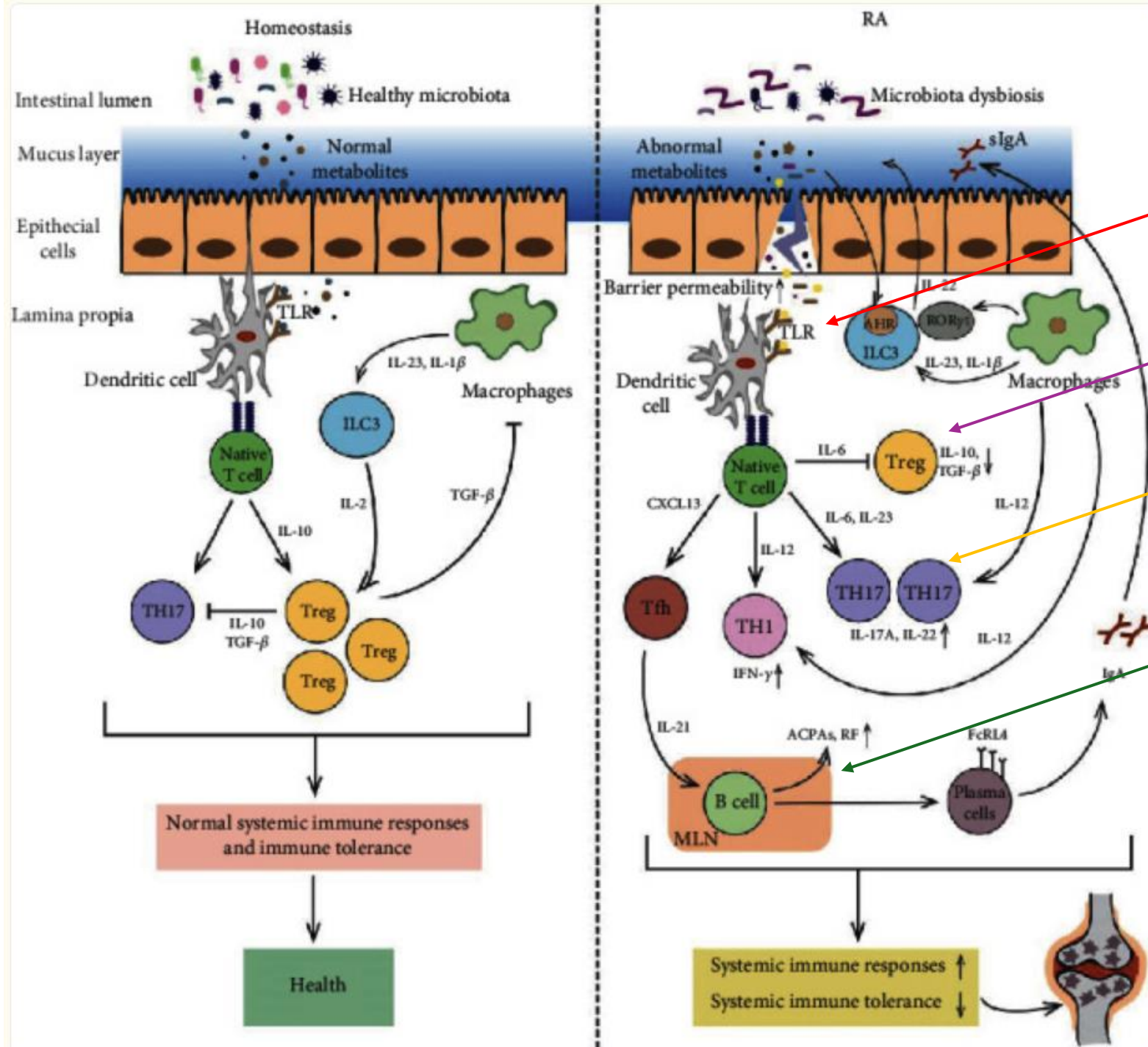
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The gut microbiota produces dozens of metabolites, which can participate in various physiological processes, including the modulation of immune cell function in the host gut mucosa [57]. As one of the active microbial metabolites, short-chain fatty acids (SCFAs) can induce metabolic alterations in T cells by activating the mTOR complex and modulating glucose metabolism [43]. Butyrate, a functional SCFA produced by the anaerobic gut microbiota, has been shown to prevent CIA in mice; butyrate might mediate the differentiation of CD4⁺ T cells towards Treg cells in the spleen, increase systemic Treg cells and decrease systemic Th17 cells, and enhance the polarization of Treg cells but not that of Th17 cells [58]. Shen et al. showed that antibiotic treatment could reduce the abundance of the microbiota in the colon, which led to decreased proportions of Treg cells and SCFAs in IL-10-deficient mice with colitis [59]. The bacterial metabolites pyruvic acid and lactic acid, which are produced in a bacteria-dependent manner, can lead to enhanced immune responses by GPR31-mediated induction of dendrite protrusions in small intestinal mononuclear cells that express CX3CR1 (CX3CR1⁺ cells) [60]. The aryl hydrocarbon receptor (AhR), which is a ligand-dependent transcription factor, can recognize not only tryptophan metabolites but also endogenous microbiota-derived factors and dietary components [61]. AhR can mediate crosstalk between ILCs and other immune cells in host tissues, especially in the intestinal mucosal surface [62], which may be the bridge between the gut microbiota and ICs. Li et al. demonstrated that human umbilical mesenchymal stem cells played a therapeutic role in rats with CIA by modulating the interactions between the immune status of Treg, Th17 cells, and B cells and the gut microbiota in the ileum via AhR

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Report

Enteric Barrier

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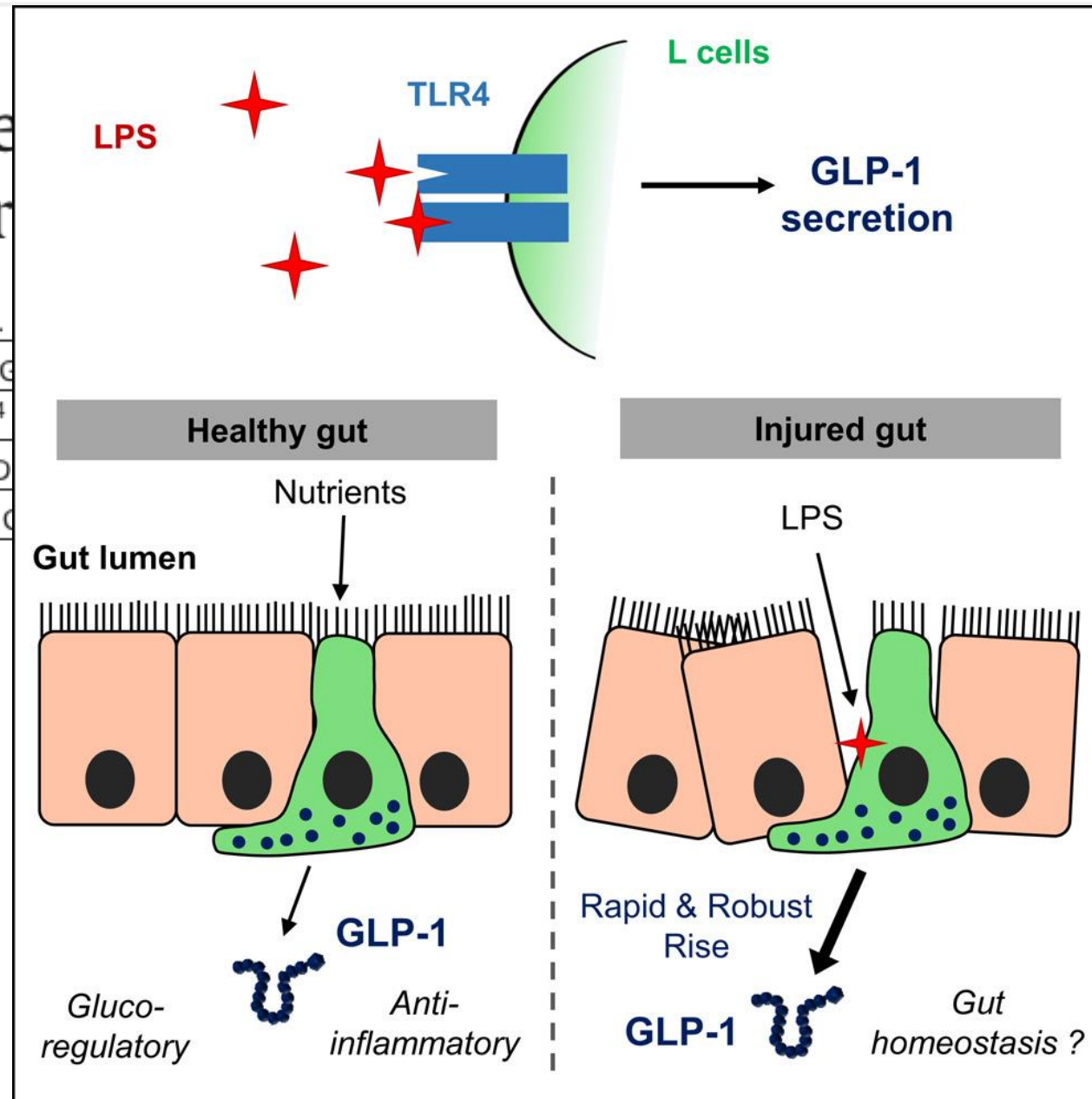
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Gut Inflammatory Markers				
Test Name	Comments	Current	Ref Range	Prev
S100A12	S100A12 is primarily secreted by activated neutrophils in response to pro-inflammatory stimuli. Its release is a component of the immune response to bacterial overgrowth and other microbial pathogens, particularly during infections or dysbiosis. Elevated levels of S100A12 indicate heightened neutrophil activity and active inflammation, typically associated with inflammatory bowel disease (IBD). Increased S100A12 levels correlate with disease severity and immune system activation, which can lead to mucosal damage and gut barrier dysfunction. Symptoms include rectal bleeding and persistent diarrhea, frequently observed in conditions such as ulcerative colitis (UC) and Crohn's disease.	39.0	≤50.0	
Calprotectin	Calprotectin, a protein released by neutrophils, is a hallmark of inflammation in the gastrointestinal tract. Elevated calprotectin levels indicate active disease and immune cell infiltration, which can result in tissue damage and disrupted gut function. Symptoms may include abdominal pain and loose stools. The presence of elevated calprotectin in stool serves as a marker of neutrophil activity and gastrointestinal inflammation. This makes it a valuable biomarker for conditions such as inflammatory bowel disease (IBD), including ulcerative colitis (UC) and Crohn's disease, and for distinguishing these conditions from irritable bowel syndrome (IBS), which typically does not involve significant inflammation.	313.6 H	≤50.0	
Fecal Lactoferrin	Lactoferrin, a glycoprotein released by neutrophils, serves as a marker of gastrointestinal inflammation. It is released in response to bacterial infections and immune activation, indicating significant neutrophil infiltration and active inflammation, often associated with inflammatory bowel disease (IBD). Elevated lactoferrin levels suggest ongoing immune activity and mucosal damage, which can lead to symptoms such as abdominal discomfort and blood in the stool, commonly observed in IBD subtypes such as active Crohn's disease and ulcerative colitis.	2.3	≤6.4	

Digestion And Immune Balance				
Test Name	Comments	Current	Ref Range	Prev
Fecal Zonulin	Zonulin, a regulatory protein involved in intestinal permeability, is a marker for "leaky gut." It is produced by intestinal epithelial cells and hepatocytes in response to gut microorganisms, gluten, and other environmental triggers, regulating the integrity of tight junctions in the gut lining. Elevated fecal zonulin levels are associated with metabolic syndrome, obesity, Crohn's disease, and increased gut permeability. High levels indicate disrupted tight junctions, resulting in symptoms such as bloating, diarrhea, food sensitivities, and fatigue. Zonulin is a key marker of gut dysbiosis and systemic metabolic disorders.	344.3 H	25.1-160.8	
pH	Fecal pH reflects the acidity or alkalinity of stool, with a normal pH averaging around 6.6. A high fecal pH, indicating stool alkalinity above the normal average, is typically associated with insufficient acid production or the presence of undigested food in the gastrointestinal tract. This condition may suggest digestive enzyme insufficiency or imbalances in the gut microbiota that hinder proper digestion. Symptoms associated with high fecal pH include bloating, abdominal pain, and digestive inefficiencies, which can lead to nutrient malabsorption and, eventually, malnutrition. Evaluating and managing alkaline stool levels is crucial for addressing potential metabolic or digestive dysfunctions and maintaining overall health.	6.5	6.1-7.8	

Gut barrier disruption allows microbial fragments into circulation

Barrier integrity weakens (for example with high zonulin & inflammation):

Small microbial molecules, toxins, foods cross the gut wall:

- LPS
- peptidoglycan
- bacterial DNA
- Flagellin
- Phosphates, metals, molds

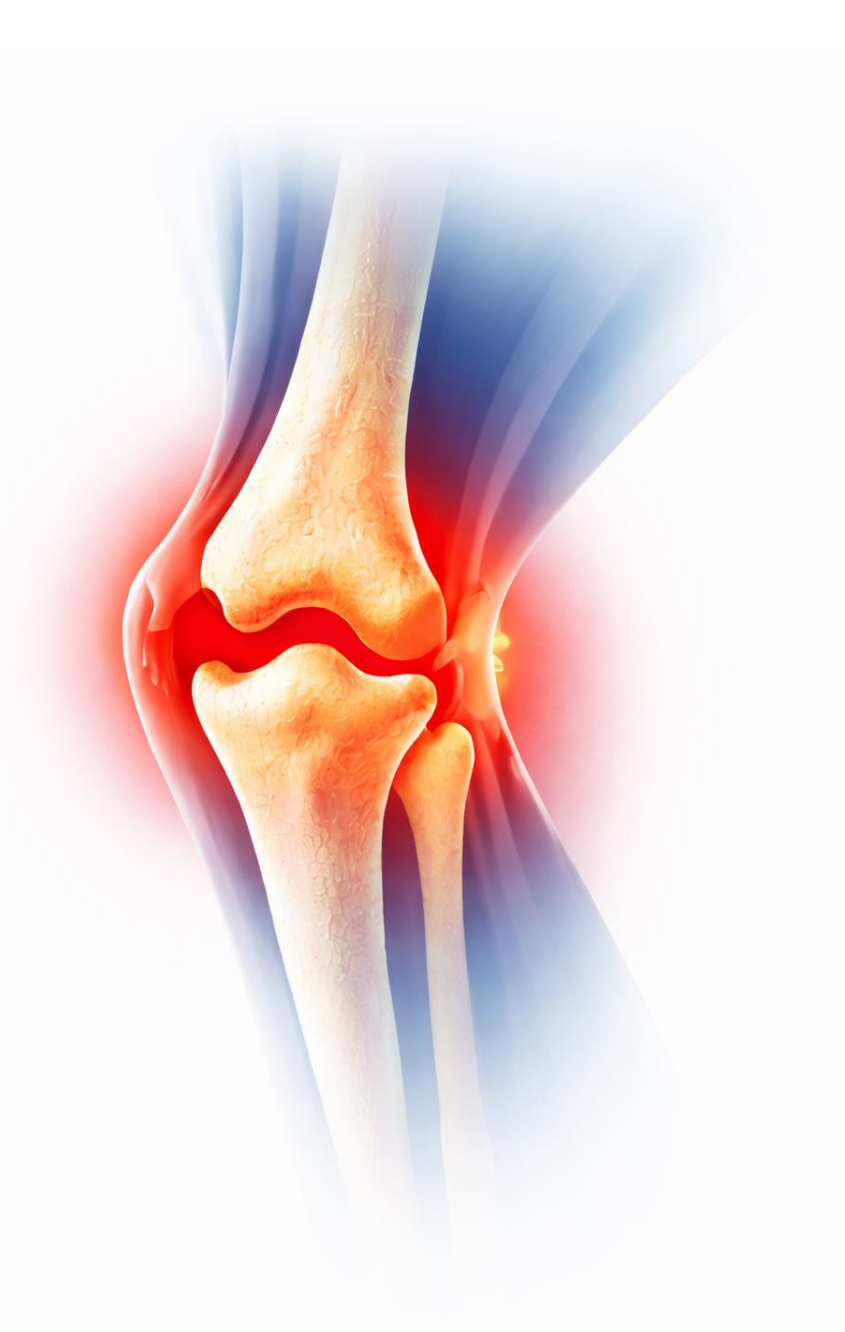
These are detected by immune receptors like:

- Toll-like receptors

Activation leads to systemic cytokines:

- TNF- α
- IL-6
- IL-1 β

Those cytokines circulate and impact distant tissues—including joints.



Biogenetix™

Reduced SCFA production → immune dysregulation

Key metabolites

- butyrate
- propionate
- acetate

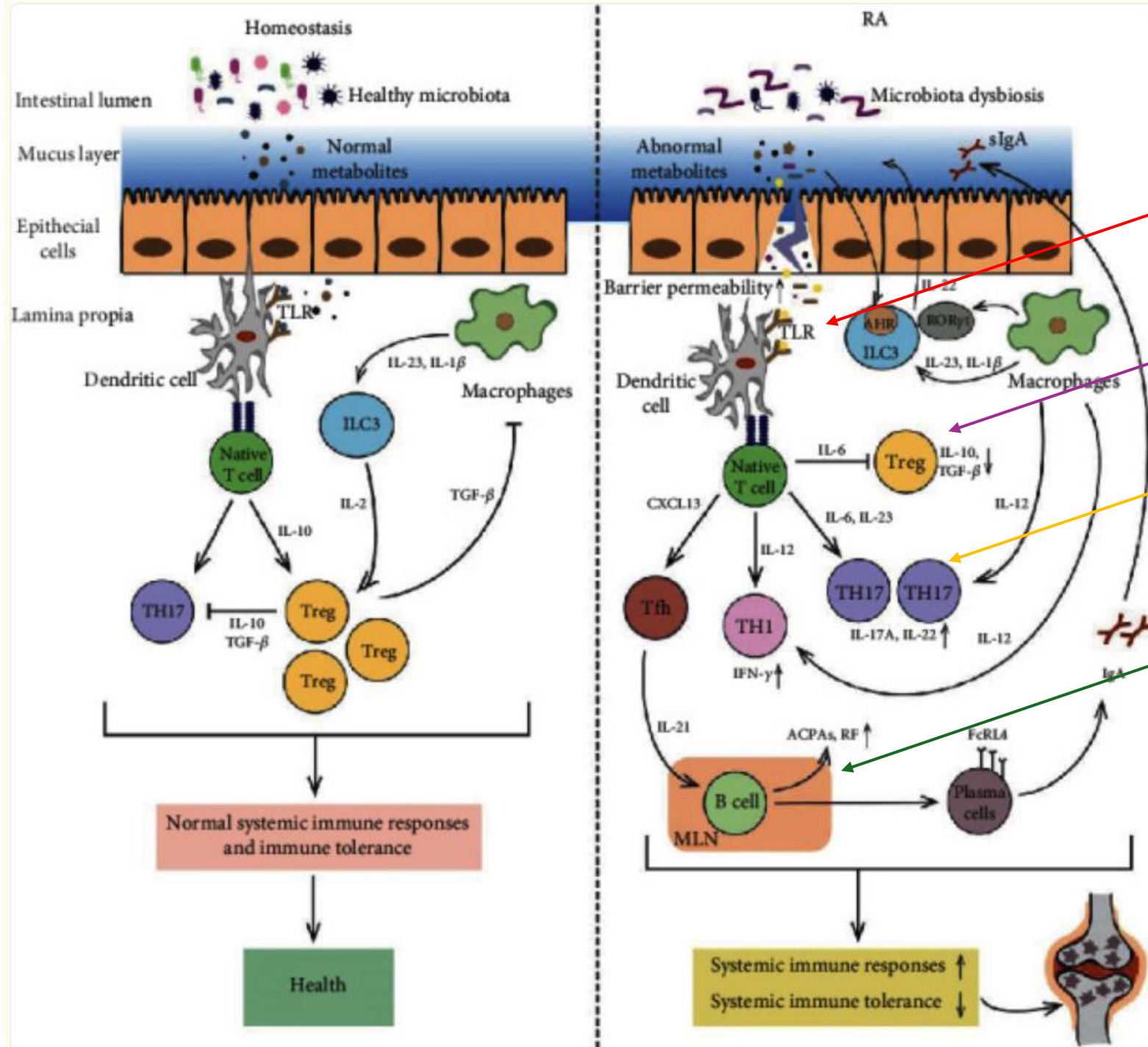
They regulate:

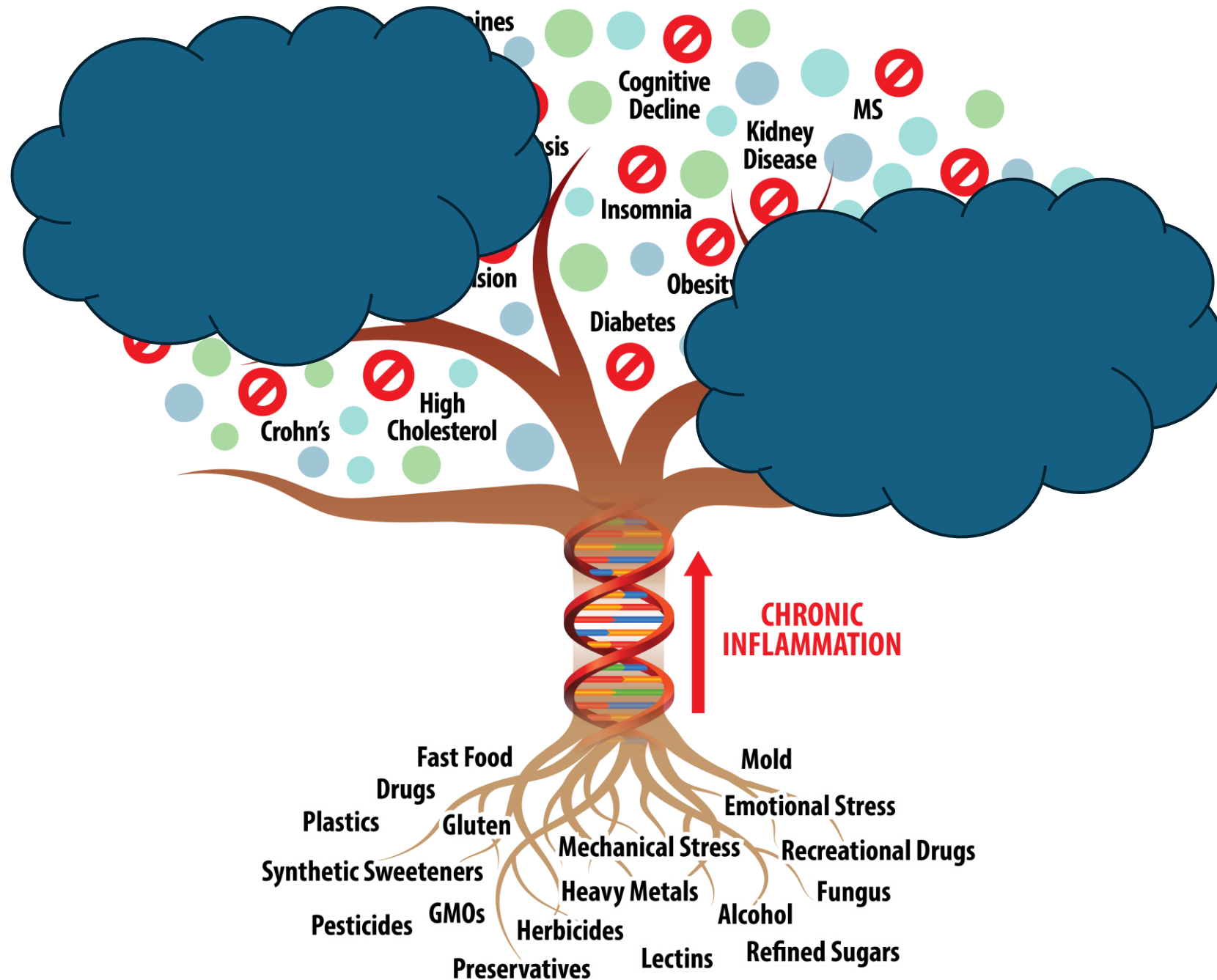
- Treg cells
- epithelial barrier integrity
- inflammatory cytokines

Low SCFAs are linked with:

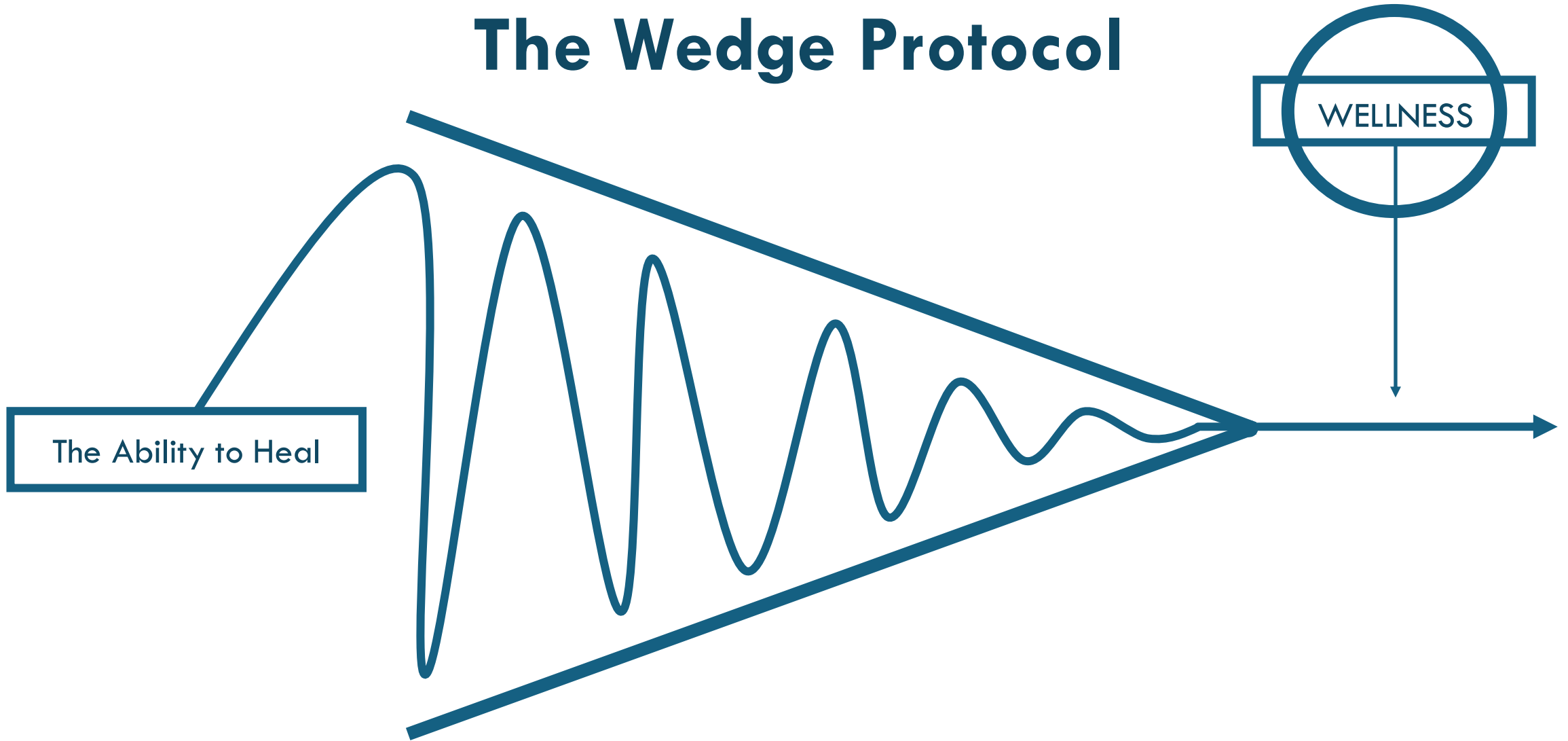
- rheumatoid arthritis
- ankylosing spondylitis
- IBD-associated arthritis

Total Short Chain Fatty Acids	Total short-chain fatty acids (SCFAs) refer to the combined concentration of acetate, butyrate, propionate, valerate, iso-butyrate, and other SCFAs in the gut. They are produced through the anaerobic fermentation of indigestible dietary fibers, such as resistant starch and polysaccharides, by gut microbiota. SCFAs play essential roles in maintaining gut health by serving as energy sources for intestinal epithelial cells, strengthening the gut barrier, and regulating microbial diversity. They help suppress intestinal inflammation, support gut homeostasis, and influence systemic metabolic and immune responses. SCFAs interact with G-protein-coupled receptors 41 and 43 (GPR41 and GPR43), affecting gut motility, energy metabolism, and inflammatory pathways. Their benefits extend beyond the gut, impacting insulin sensitivity, lipid metabolism, and neuroimmune interactions. Low fecal SCFA levels indicate dysbiosis and are linked to various health conditions, including irritable bowel syndrome, inflammatory bowel disease, obesity, and metabolic disorders. Symptoms of reduced SCFAs may include bloating, abdominal discomfort, fatigue, and irregular bowel movements.	27.9 L
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The Wedge Protocol



Biogenetix™

SUPPLEMENT FACTS

Serving size: 1 Scoop (about 10 g)	Amount	% Daily
Servings per container: 45	Per Serving	Value
Calories	30	
Total Fat	1 g	2%*
Saturated Fat	0 g	0%
Cholesterol	0 g	0%
Total Carbohydrates	2 g	1%*
Total Sugars	0 g	
Includes added sugars	0 g	0%
Dietary Fiber	1 g	4%*
Protein	4 g	8.5%*
Vitamin A (as Beta-Carotene)	207 mcg REA	23%
Vitamin C (as Calcium Ascorbate)	176 mg	2667%
Vitamin D3 (Cholecalciferol)	1 mcg	5%
Vitamin B1 (as Thiamine HCL)	1.6 mg	133%
Vitamin B2 (as Riboflavin 5'-Phosphate)	1.6 mg	123%
Vitamin B3 (as Niacinamide)	3.2 mg	20%
Vitamin B6 (as Pyridoxal 5'-Phosphate)	3.2 mg	188%
Folate (as L-5-Methyl-THF Calcium)	68 mcg DFE	17%
Vitamin B12 (as Methylcobalamin)	64 mcg	2667%
Biotin	60 mcg	200%
Calcium (as Calcium Citrate)	162 mg	12%
Phosphorus (as Disodium Phosphate)	12 mg	1%
Magnesium (as Magnesium Citrate)	40 mg	10%
Zinc (as Zinc Mnomethionine)	1.6 mg	15%
Selenium (as Slenium Glycinate)	8 mcg	15%
Manganese (as Manganese Glycinate Chelate)	3.2 mg	139%
Chromium (as Chromium Picolinate)	38 mcg	109%
Molybdenum (as Molybdenum Glycinate Chelate)	34 mcg	76%
Pea Protein Isolate	5.4 g	**
Evening Primrose (<i>Oenothera biennis</i>) Powder	365 mg	**
Inulin	365 mg	**
Glutamine	200 mg	**
Quercetin Dihydrate	67 mg	**
Milk Thistle (<i>Silybum marianum</i>) [Fruit] Extract (std to Contain 80% Silymarin)	32 mg	**
L-Taurine	32 mg	**
Marshmallow (<i>Althaea officinalis</i>) [Root] Extract 4:1	24 mg	**
Curcumin (<i>Curcuma longa</i>) [Root] Extract (std to Contain 95% Curcuminoids)	24 mg	**
Ginger (<i>Zingiber officinale</i>) [Root] Extract 10:1	8 mg	**

* Percent Daily Values are based on a 2000 calorie diet.

** Daily Value Not Established

Other Ingredients: Cocoa powder, natural flavors, organic rice hulls, natural flavors, organic stevia leaf extract, monk fruit extract.

Metabolic Clearing Kit



GI ResQ Protocol

SUPPLEMENT FACTS

Serving size: 1 Scoop (about 6.32 g)	Amount	% Daily
Servings per container: 28	Per Serving	Value
Zinc (as Zinc Carnosine)	16.13 mg	147%
L-Glutamine	2 g	**
Slippery Elm Bark Powder	1 g	**
Glucosamine HCl	1 g	**
Aloe Vera Leaf Extract	300 mg	**
Porcine Gastric Mucin Powder	200 mg	**
Actazin® <i>Actinidia deliciosa</i> Fruit Powder	200 mg	**
Marshmallow Root Powder	200 mg	**
GutGard® Licorice Root Extract	150 mg	**
Quercetin (as Quercetin Dihydrate)	100 mg	**
Plum Fruit Powder	100 mg	**
Chamomile Flower Extract	100 mg	**
Cat's Claw Bark Powder	100 mg	**
Okra Fruit Powder	100 mg	**

** Daily Value Not Established

Other Ingredients: Natural Flavors, Rebudioside A (from Stevia Leaf Extract), Silicon Dioxide, Luo Han Guo Fruit Extract (Sweetener)

GutGard® is a registered trademark of Natural Remedies Pvt. Ltd.

Actazin® is a registered trademark of Anagenix



