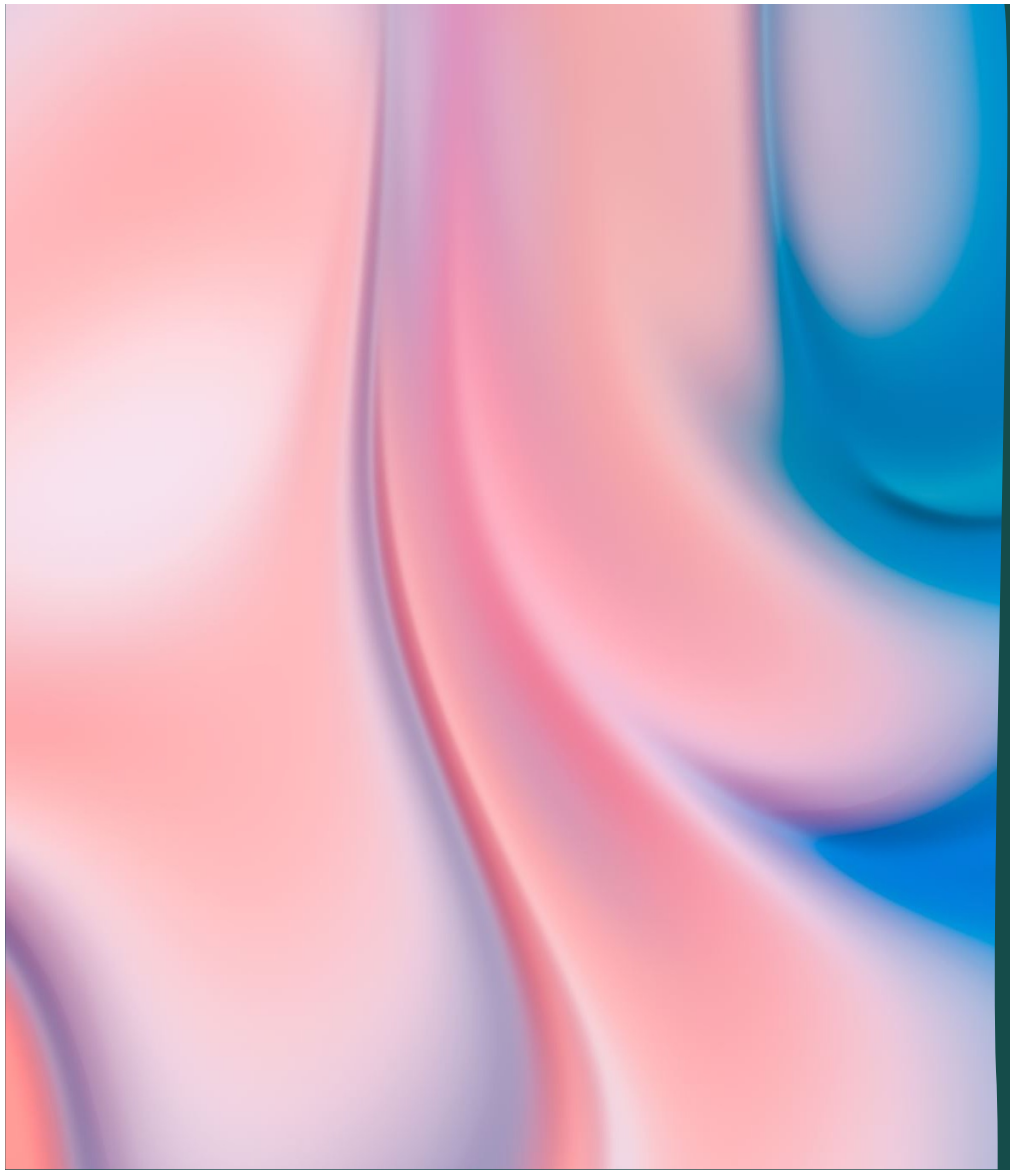


PEPTIDES AND THE MICROBIOME

LEXI YOO

FNP-BC, CPNP, IFMCP

Disclosures

- Nothing to Disclose
-
-
- This presentation is not intended to diagnose or treat any condition. Dosing should be made by the clinical judgment of the practitioner.
- This material is provided for educational and informational purposes only to licensed health care professionals. This information is obtained from sources believed to be reliable, but its accuracy cannot be guaranteed. Herbs and other natural substances are very powerful and can occasionally cause dangerous allergic reactions in a small percentage of the population. Licensed health care professionals should rely on sound professional judgment when recommending medications, herbs, peptides and natural medicines to specific individuals. Individual use of herbs and natural medicines should be supervised by an appropriate health care professional. The use of any specific product should always be in accordance with the manufacturer's directions.

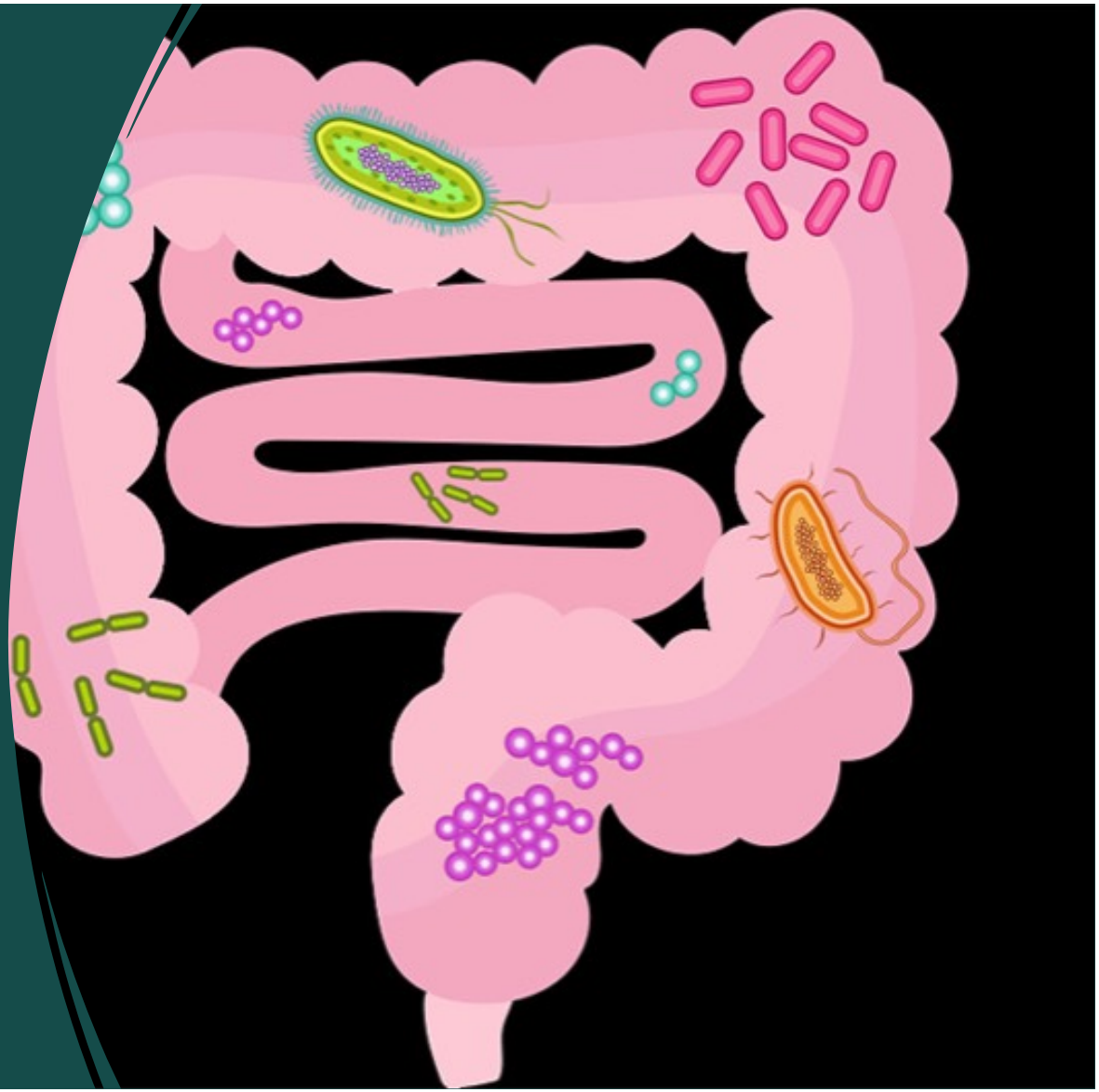
About Me

- Double Boarded Family Practice and Pediatrics
- IFM Certified Practitioner (Institute for Functional Medicine)
- SSRP Peptide Certification
- A4M Peptide Certification
- AMMG Peptide Certification
- KOL Biote
- American Academy of Anti-aging – Aesthetic Fellow
- Galderma Aesthetics Injector Network Trainer
- Member of American Academy of Facial Esthetics
- National Speaker and Trainer

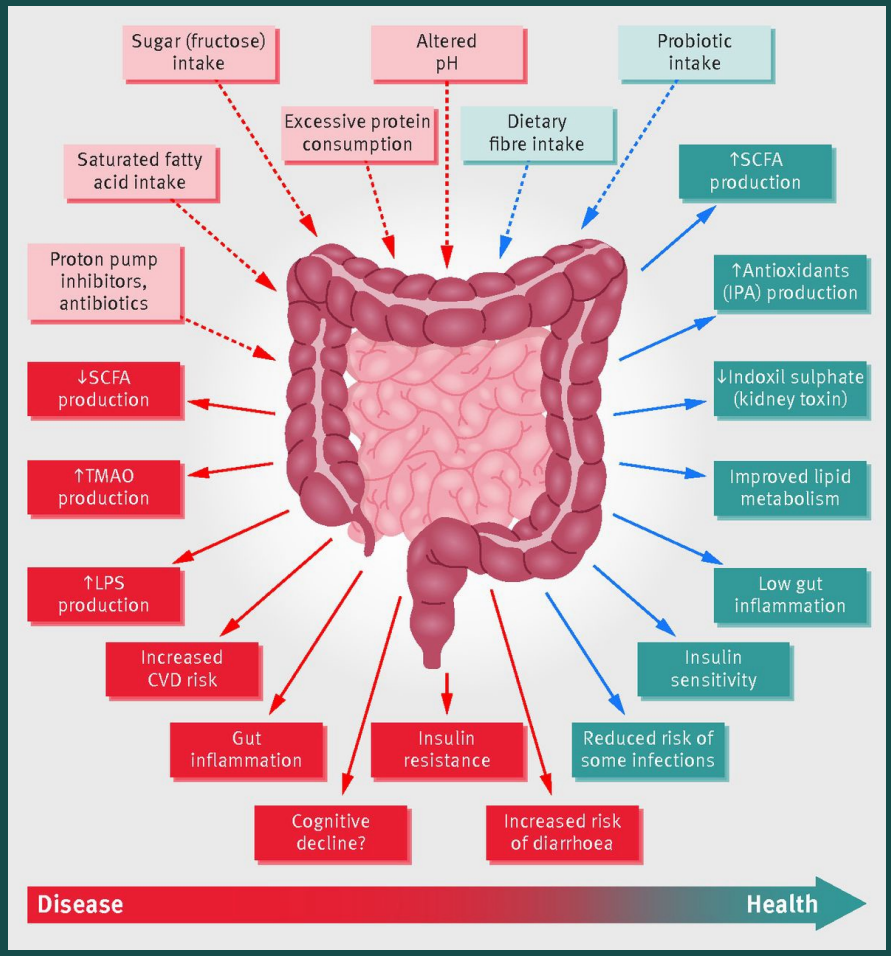
Where do you start? Gut Heath

"Every day we live and every meal we eat we influence the great microbial organ inside us - for better or for worse."-

Giulia Enders, Gut: The Inside Story of Our Body's Most Underrated Organ



Key Functions of the Gut

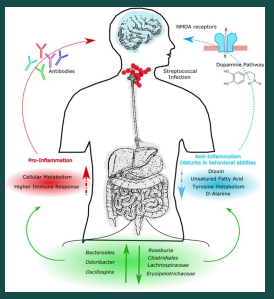


Ana M Valdes et al. BMJ 2018;361:bmj.k2179

Common Presenting Symptoms

- Abdominal Pain
- Constipation
- Diarrhea
- Heart Burn, Gerd
- Bloating
- Gas
- Indigestion

- Leaky Gut Symptoms (Intestinal Permeability)
- Food Sensitivities
- Headaches
- Joint Pain
- Fatigue
- Skin symptoms (such as eczema or rashes)

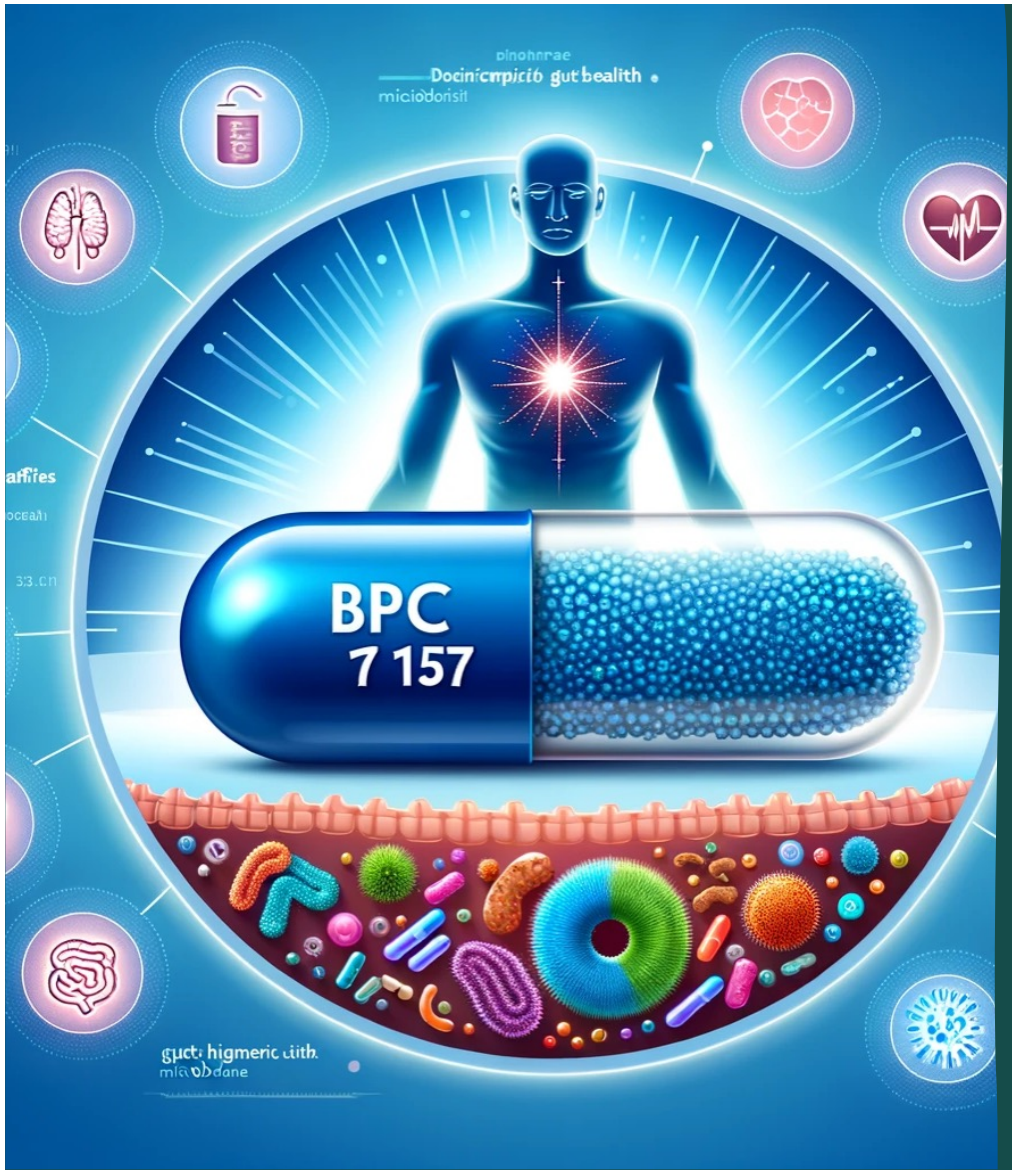


Other:

- Respiratory symptoms (such as asthma)
- Mood symptoms (such as Depression or Anxiety)
- Brain symptoms (such as Autism)
- Acne
- Difficulty with Focus
- Nutrition Deficiencies

5 R Protocol

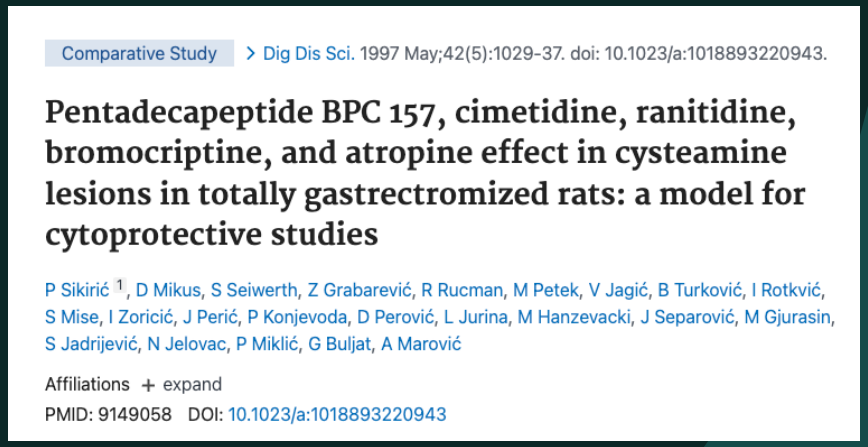
- **Remove-** anything that can be irritating to the gut (foods, medications, stress, allergens, infections, over growth)
- **Replace**- give the body what it needs (digestive enzymes, or nutrients such as B12, iron, calcium, magnesium and zinc.)
- **Repopulate**- replace the good guys (prebiotics- fiber, butyrate Probiotics- kimchi, kefir, kombucha)
- **Repair**- repair of the intestinal cells and mucosa, reduce inflammation and help our microbiome find a happy home within our digestive tract. (L-glutamine, collagen, aloe vera, marshmallow or slippery elm)
- **Rebalance-** address lifestyle (sleep, stress, exercise, mindset)



PEPTIDES AND THE 5 R PROTOCOL

- BPC-157
- BPC-157/KPV
- Larazotide
- VIP
- Semaglutide

BPC-157



Comparative Study > Dig Dis Sci. 1997 May;42(5):1029-37. doi: 10.1023/a:1018893220943.

Pentadecapeptide BPC 157, cimetidine, ranitidine, bromocriptine, and atropine effect in cysteamine lesions in totally gastrectromized rats: a model for cytoprotective studies

P Sikirić [1], D Mikus, S Seiwerth, Z Grabarević, R Rucman, M Petek, V Jagić, B Turković, I Rotkvić, S Mise, I Zoricić, J Perić, P Konjevoda, D Perović, L Jurina, M Hanzevacki, J Separović, M Gjurasin, S Jadrijević, N Jelovac, P Miklić, G Buljat, A Marović

Affiliations + expand

PMID: 9149058 DOI: 10.1023/a:1018893220943

- BPC 157- composed of 15 amino acids isolated from human gastric juice. It is highly stable and resistant to hydrolysis or enzyme digestion, even in the gastric juice.
- Enhances blood vessel formation: Promotes angiogenesis, aiding healing.
- Reduces inflammation: Decreases gut inflammation and oxidative stress.
- Promotes tissue repair: Stimulates healing in gastrointestinal ulcers and injuries.
- Protects mucosa: Guards against harmful substances.
- Improves gut motility: Enhances digestive function and nutrient absorption.

Sikirić P, Mikus D, Seiwerth S, Grabarević Z, Rucman R, Petek M, Jagić V, Turković B, Rotkvić I, Mise S, Zoricić I, Perić J, Konjevoda P, Perović D, Jurina L, Hanzevacki M, Separović J, Gjurasin M, Jadrijević S, Jelovac N, Miklić P, Buljat G, Marović A. Pentadecapeptide BPC 157, cimetidine, ranitidine, bromocriptine, and atropine effect in cysteamine lesions in totally gastrectromized rats: a model for cytoprotective studies. Dig Dis Sci. 1997 May;42(5):1029-37. doi: 10.1023/a:1018893220943. PMID: 9149058.

BPC-157- How it Works!

- BPC 157 activates endothelial nitric oxide synthase (eNOS), which is crucial for tissue repair and angiogenesis.
- BPC 157 demonstrates strong angiogenic potential, promoting the formation of granulation tissue, collagen production, and angiogenesis.
- BPC 157 increases the expression of growth hormone receptors in tendon fibroblasts, potentiating the effects of growth hormone and promoting cell proliferation and healing
- BPC -157 is a 15 amino acid partial sequence of Body protection compound that was discovered and isolated in gastric juice. It increases fibroblast migration and dispersal, induces F-actin formation in fibroblasts, modulates angiogenesis, and enhances vascular expression of VEGFR2. It can be neuroprotective, cardioprotective, and counteracts the QTc prolongation induced by neuroleptics.

The beneficial effect of BPC 157, a 15 amino acid peptide BPC fragment, on gastric and duodenal lesions induced by restraint stress, cysteamine and 96% ethanol in rats. A comparative study with H2 receptor antagonists, dopamine promotors and gut peptides

P Sikiric [1], S Seiwerth, Z Grabarevic, M Petek, R Rucman, B Turkovic, I Rotkvic, V Jagic, M Duvnjak, S Mise, et al.

Affiliations + expand

PMID: 7904712 DOI: 10.1016/0024-3205(94)00796-9

BPC-157: CLINICAL APPLICATION

- BPC-157 Capsule:
  - Dosing:500mcg daily
  - BID dosing for: acute issues, antibiotics, GI protocol, post trauma, post surgical
  - Side effects: minimal

BPC-157/KPV COMBO: GUTTIDES

- BPC-157 is a peptide shown to accelerate healing, particularly in the digestive tract. BPC-157 is derived from a protein found in stomach acid and has been shown to support gut health, protect against ulcers, and improve recovery from soft tissue injuries.

- KPV is a tripeptide consisting of Lysine, Proline, and Valine. KPV is recognized for its ability to reduce inflammation and support the immune system by inhibiting the activation of NF-kappaB and MAP kinase inflammatory pathways and decreasing proinflammatory cytokine secretion.

KPV

- KPV (Lys-Pro-Val) is a tripeptide with anti-inflammatory properties.
- It works by being transported into cells via the PepT1 transporter.
- KPV inhibits NF-κB and MAP kinase inflammatory signaling pathways.
- It reduces the secretion of pro-inflammatory cytokines in both intestinal epithelial cells and immune cells.

KPV and Candida

- Alpha-MSH, an anti-inflammatory peptide, is present in gut and skin, suggesting a role in innate defense.
- Alpha-MSH and its tripeptide KPV have antimicrobial effects against Staphylococcus aureus and Candida albicans.
- These peptides inhibit colony formation, reduce pathogen viability, and enhance neutrophil killing without reducing effectiveness.
- Alpha-MSH peptides could treat disorders with coexisting infection and inflammation.

JOURNAL ARTICLE

Antimicrobial effects of α-MSH peptides

Get access >

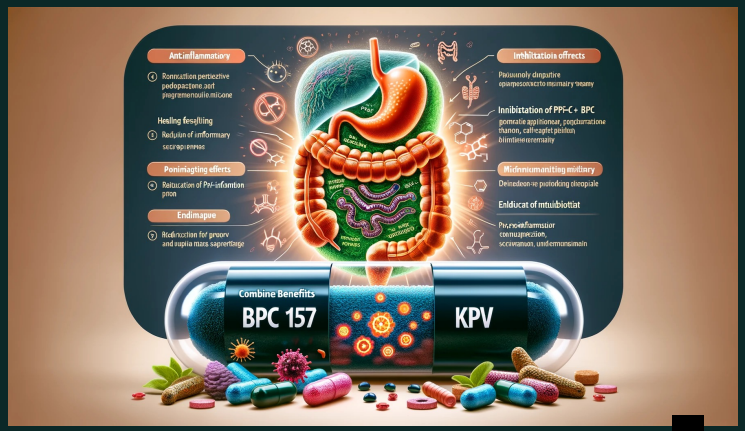
Mariagrazia Cutuli, Silvia Cristiani, James M Lipton, Anna Catania ✉

Journal of Leukocyte Biology, Volume 67, Issue 2, February 2000, Pages 233–239,
https://doi.org/10.1002/jlb.67.2.233
Published: 01 February 2000

Cutuli M, Cristiani S, Lipton JM, Catania A. Antimicrobial effects of alpha-MSH peptides. J Leukoc Biol. 2000 Feb;67(2):233-9. doi: 10.1002/jlb.67.2.233. PMID: 10670585.

BPC 157 COMBOS

- BPC-157 +KPV:
  - Use: Dysbiosis, candida, gut health
  - Dosing: 500mcg/500mcg- 1 capsule po daily



PepT1-mediated tripeptide KPV uptake reduces intestinal inflammation

Guillaume Dalmasso [1], Laetitia Charrier-Hisamuddin, Hang Thi Thu Nguyen, Yutao Yan, Shanthi Sitaraman, Didier Merlin

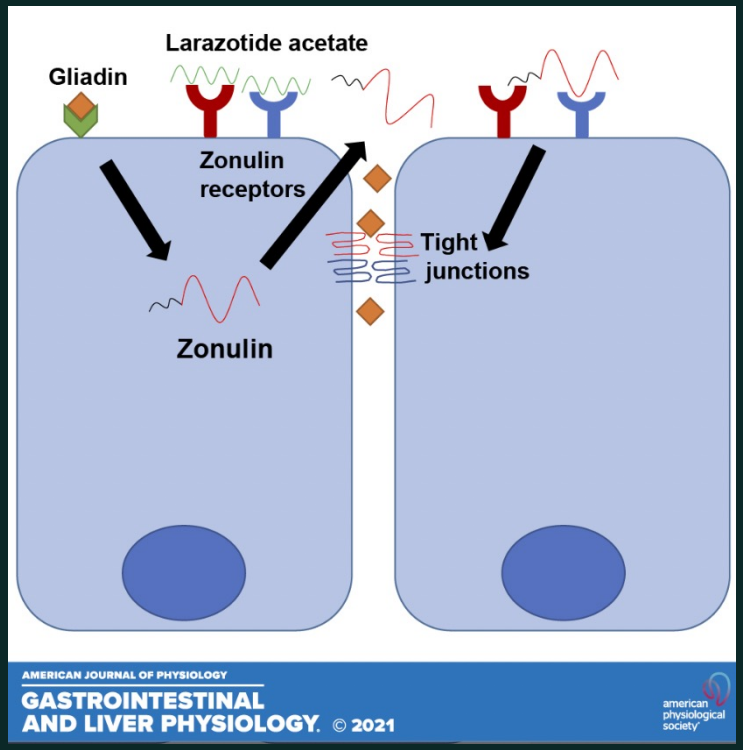
Affiliations + expand

PMID: 18061177 PMCID: PMC2431115 DOI: 10.1053/j.gastro.2007.10.026

Free PMC article

Larazotide

- Single-chain peptide of eight amino acids.
- Acts as a tight junction regulator.
- Restore intestinal barrier function.
- Enhance intestinal barrier function disrupted by gliadin-induced immune reactivity in celiac disease.



Slifer, Z. M., Krishnan, B. R., Madan, J., & Blikslager, A. T. (2021). Larazotide acetate: A pharmacological peptide approach to tight junction regulation. American Journal of Physiology-Gastrointestinal and Liver Physiology, 320(6), G983–G989. https://doi.org/10.1152/ajpgi.00386.2020

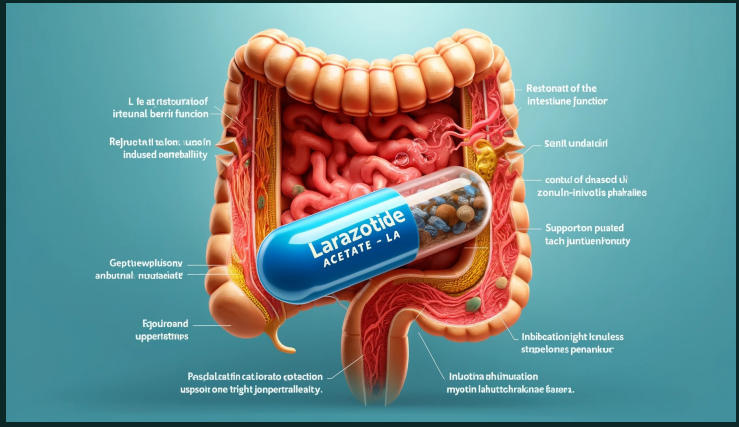
Larazotide Benefits

- Restores Intestinal Barrier Function:
  - Helps maintain integrity of the intestinal lining.
  - Prevents unwanted substances from passing through the gut lining into the bloodstream.
- Reduces Zonulin-Induced Permeability:
  - Lowers the permeability of the intestinal barrier caused by zonulin.

Supports Tight Junction Proteins:

- Promotes the redistribution and rearrangement of tight junction proteins.
- Strengthens the connection between cells in the gut lining.

- Inhibits Myosin Light Chain Kinase:
  - Reduces tension on actin filaments.
  - Facilitates the closure of tight junctions, enhancing barrier integrity.
- Potential for Broader Applications:
  - Effective in animal models for conditions beyond celiac disease.
  - Potential treatment for other diseases involving intestinal barrier dysfunction.



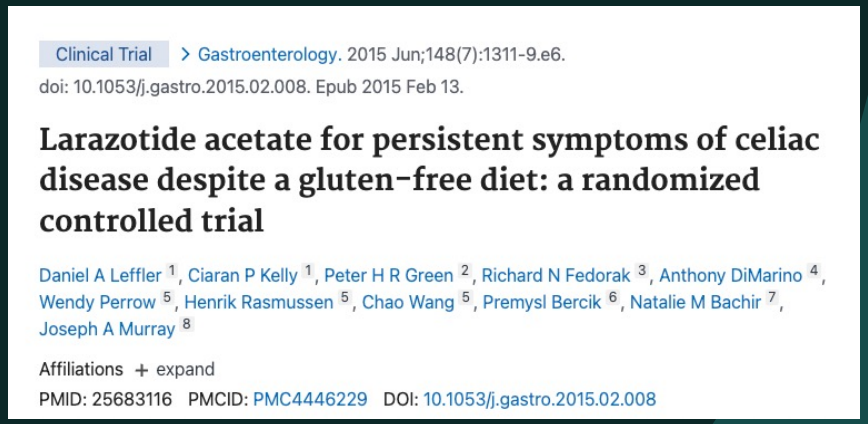
Mini-Review | Translational Physiology

Larazotide acetate: a pharmacological peptide approach to tight junction regulation

Zachary M. Slifer, B. Radha Krishnan, Jay Madan, and Anthony T. Blikslager

07 JUN 2021 // https://doi.org/10.1152/ajpgi.00386.2020

Larazotide Acetate and Celiac Disease



Clinical Trial > Gastroenterology. 2015 Jun;148(7):1311-9.e6.
doi: 10.1053/j.gastro.2015.02.008. Epub 2015 Feb 13.

Larazotide acetate for persistent symptoms of celiac disease despite a gluten-free diet: a randomized controlled trial

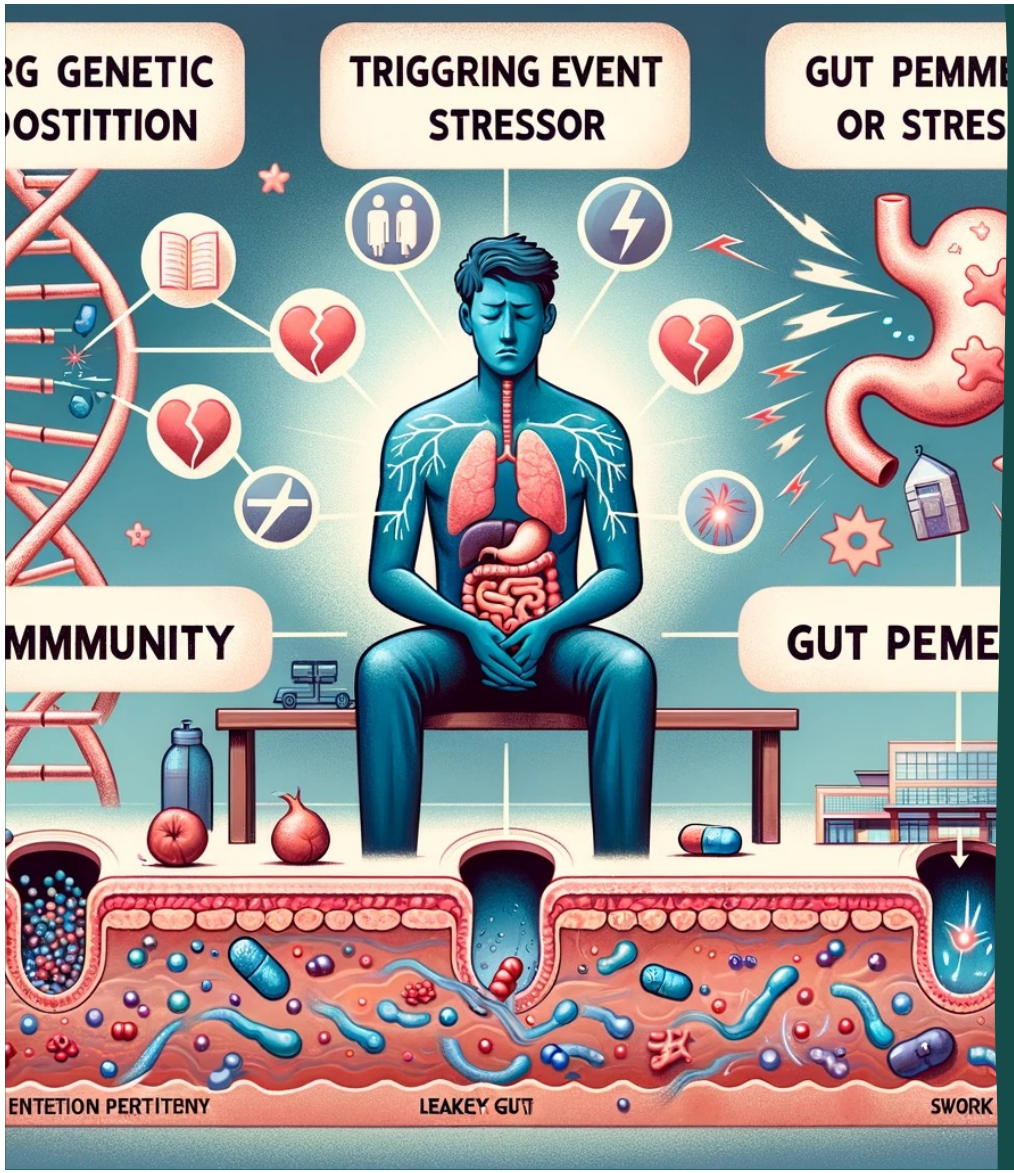
Daniel A Leffler [1], Ciaran P Kelly [1], Peter H R Green [2], Richard N Fedorak [3], Anthony DiMarino [4], Wendy Perrow [5], Henrik Rasmussen [5], Chao Wang [5], Premysl Bercik [6], Natalie M Bachir [7], Joseph A Murray [8]

Affiliations + expand

PMID: 25683116 PMCID: PMC4446229 DOI: 10.1053/j.gastro.2015.02.008

- Celiac disease (CeD) is common, with ongoing symptoms despite a gluten-free diet (GFD). No proven nondietary treatments exist.
- 342 adults with CeD on a GFD for 12+ months were treated with larazotide acetate (0.5, 1, or 2 mg) or placebo in a randomized, double-blind study. Treatment lasted 12 weeks, with a 4-week placebo run-in and run-out.
- -Results: The 0.5 mg dose of larazotide acetate reduced symptoms significantly compared to placebo. Higher doses showed no difference. Safety was comparable to placebo.
- -Conclusion: Larazotide acetate 0.5 mg is a promising treatment for reducing symptoms in CeD patients on a GFD.

Hoilat, G. J., Altowairqi, A. K., Ayas, M. F., Alhaddab, N. T., Alnujaidi, R. A., Alharbi, H. A., Alyahyawi, N., Kamal, A., Alhabeeb, H., Albazee, E., Almustanyir, S., & Abu-Zaid, A. (2022). Larazotide acetate for treatment of celiac disease: A systematic review and meta-analysis of randomized controlled trials. Clinics and Research in Hepatology and Gastroenterology, 46(1), 101782. https://doi.org/10.1016/j.clinre.2021.101782

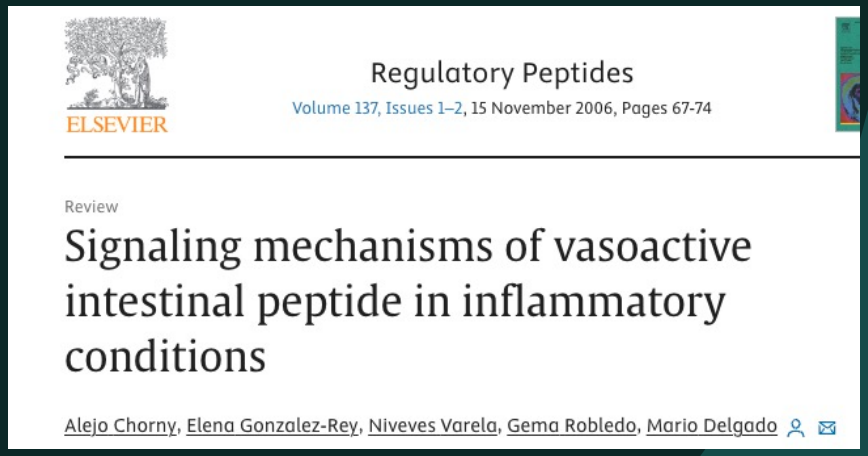


Larazotide: Clinical Application

Use in: Gut permeability, Gluten sensitivity, Celiac disease, AUTOIMMUNITY

Dosing: 500mcg 1 capsule 20 mins prior to meal 3 x a day

VIP (VASOACTIVE INTESTINAL PEPTIDE)



ELSEVIER

Regulatory Peptides

Volume 137, Issues 1–2, 15 November 2006, Pages 67-74

Review

Signaling mechanisms of vasoactive intestinal peptide in inflammatory conditions

Alejo Chorny, Elena Gonzalez-Rey, Niveves Varela, Gema Robledo, Mario Delgado

- Vasoactive intestinal peptide (VIP) is a 28-amino acid neuropeptide
- Neuroprotection: provides neuroprotective effects, enhancing neuronal survival and function. Lipophilic derivatives of VIP have been shown to be 100-fold more potent in promoting neuronal survival, acting at very low concentrations (Gozes et al., 1999).
- Anti-inflammatory effects: inhibits the production of pro-inflammatory cytokines and modulates immune responses, making it a potential therapeutic agent for inflammatory and autoimmune diseases like rheumatoid arthritis and Crohn's disease (Chorny et al., 2006; Delgado et al., 2001).
- Cardiovascular effects: acts as a vasodilator and positive inotropic agent, increasing coronary blood flow and enhancing heart function. It also helps regulate coronary vasomotor tone and heart rate (Henning & Sawmiller, 2001).
- Gastrointestinal regulation: stimulates intestinal ion secretion, nutrient absorption, and gut motility. It is also involved in glycemic control and has potential therapeutic applications in gastrointestinal diseases (Iwasaki et al., 2019).

VIP Effects on Gut Health

- Stimulation of Gastrointestinal Motility
- Maintenance of Intestinal Epithelial Barrier
- Anti-inflammatory Effects
- Modulation of Gut Microbiota

VIP clinical application

Version 1. F1000Res. 2019; 8: F1000 Faculty Rev-1629. PMCID: PMC6743256
Published online 2019 Sep 12. doi: 10.12688/f1000research.18039.1 PMID: 31559013

Recent advances in vasoactive intestinal peptide physiology and pathophysiology: focus on the gastrointestinal system

Mari Iwasaki, Conceptualization, Writing – Original Draft Preparation,[1] Yasutada Akiba, Conceptualization, Resources, Supervision, Writing – Review & Editing,[1,2] and Jonathan D Kaunitz, Conceptualization, Funding Acquisition, Supervision, Writing – Review & Editing[a,1,3]

- Autoimmune patients: Patients suffering from autoimmune diseases, including lupus, autoimmune thyroiditis, multiple sclerosis (MS), and rheumatoid arthritis (RA), typically exhibit reduced levels of vasoactive intestinal peptide (VIP) in their blood. This deficiency is sometimes linked to elevated levels of VIPase autoantibodies, which can degrade VIP and exacerbate the condition.
- Dosing: VIP 500mcg/ml
  - Titration schedule based on what you are treating:
  - Week 1: 1 spray to ONE nostril daily, alternating nostrils
  - Week 2: 1 spray twice a day, alternating nostril
  - Week 3: up to 1 spray 3 x a day MAX
  - All sprays before 3:00PM
  - Side effects: Cardiovascular Effects:
    - Decrease in blood pressure
    - Tachycardia
    - Cutaneous flushing
  - Gastrointestinal Effects:
    - Watery diarrhea syndrome
  - Other Side Effects:
  - Transient facial flushing

Semaglutide: What is it? How does it work?

- GLP-1, or glucagon-like peptide-1, is a hormone involved in the regulation of blood sugar levels and appetite. It is an incretin, a type of gastrointestinal hormone that is released after eating and stimulates insulin secretion.
- Increases Insulin Secretion: Semaglutide enhances the release of insulin from the pancreas in response to food intake, helping to lower blood sugar levels.
- Suppresses Glucagon Release: It reduces the secretion of glucagon, a hormone that increases blood sugar levels, thereby reducing glucose production in the liver.
- Slows Gastric Emptying: Semaglutide slows the emptying of the stomach, which helps to reduce spikes in blood sugar levels after meals.
- Reduces Appetite: By acting on the brain, Semaglutide promotes feelings of fullness and reduces appetite, which can lead to weight loss.
- Improves Cardiovascular Health: It has positive effects on cardiovascular risk factors, such as lowering blood pressure and improving lipid profiles.

Semaglutide and the Microbiome

> Eur J Pharmacol. 2024 Apr 15:969:176440. doi: 10.1016/j.ejphar.2024.176440. Epub 2024 Feb 24.

Semaglutide alleviates gut microbiota dysbiosis induced by a high-fat diet

Xinhao Duan [1], Lei Zhang [2], Yi Liao [1], Zijing Lin [1], Changxin Guo [1], Sen Luo [3], Fu Wang [3], Zhen Zou [4], Zhijun Zeng [5], Chengzhi Chen [6], Jingfu Qiu [7]

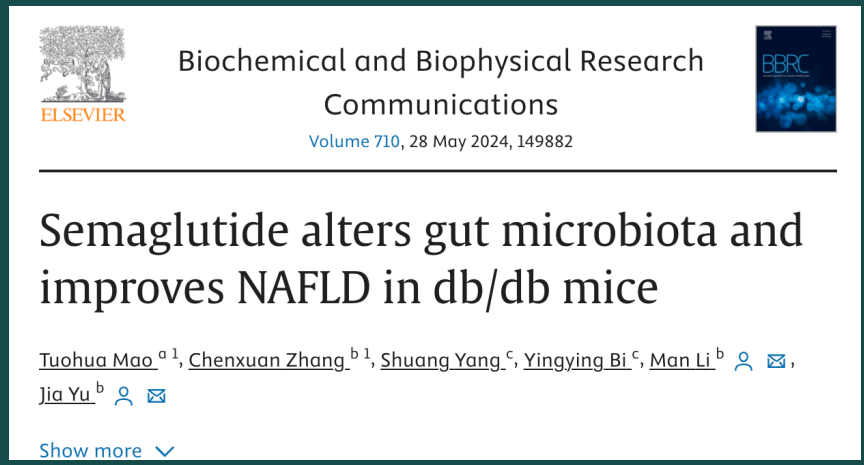
Affiliations + expand

PMID: 38402930 DOI: 10.1016/j.ejphar.2024.176440

- Slowing gastric motility good and bad?
  - Depends on patient!
  - This study looked at how Semaglutide (Sema) affects the gut microbiota in obese mice fed a high-fat diet (HFD).
  - Results showed Semaglutide reduced body weight gain, glucose tolerance, insulin resistance, and adipose tissue weight.
  - Semaglutide also decreased liver lipid deposition and regulated genes linked to blood glucose control.
  - Semaglutide positively impacted gut microbiota, reducing dysbiosis caused by the HFD and increasing gut diversity.
  - HFD decreased certain bacteria (Akkermansia, Faecalibaculum, Allobaculum) but increased others (Lachnospiraceae, Bacteroides); Semaglutide reversed these changes.
  - Semaglutide also improved intestinal barrier function by increasing tight junction proteins.
  - Higher Akkermansia levels were linked to less weight gain and better glucose levels, suggesting Semaglutide's anti-obesity effects are related to gut microbiota changes.

Semaglutide and Gut Barrier Function

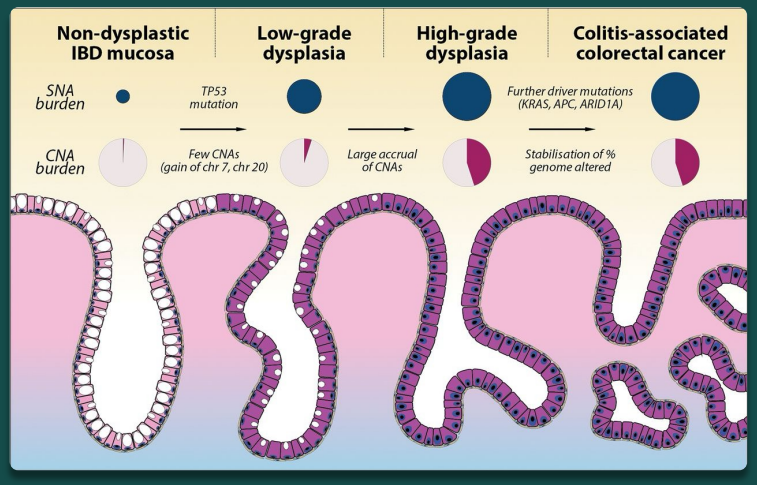
- Semaglutide also enhances gut barrier integrity and alters gut microbiota



Mao, T., Zhang, C., Yang, S., Bi, Y., Li, M., & Yu, J. (2024). Semaglutide alters gut microbiota and improves NAFLD in db/db mice. Biochemical and Biophysical Research Communications, 710, 149882. https://doi.org/10.1016/j.bbrc.2024.149882

Case Studies

Case Study 1:



- 35 yo female, presents with bloating, gas, diarrhea and constipation at times difficulty with getting pregnant
- Pmh: Ulcerative Colitis
- Has a GI doctor
- Meds: Prilosec, Lexapro, OCP
- Surgery: 2 c-section, Gall bladder removal

Case Study

- H.Pylori: Treat with Gastromend 2 caps bid
- Clostridia: Promote a healthy mucosal barrier, influence immune balance, and protect against many gastrointestinal pathogens
- Support beneficial bacteria: butyrate – 1 capsule per day

H. pylori			
	Result		Normal
Helicobacter pylori	**8.4e2**		<1.0e3
Virulence Factor, babA	**Negative**		Negative
Virulence Factor, cagA	**Negative**		Negative
Virulence Factor, dupA	**Negative**		Negative
Virulence Factor, iceA	**Negative**		Negative
Virulence Factor, oipA	**Negative**		Negative
Virulence Factor, vacA	**Negative**		Negative
Virulence Factor, virB	**Negative**		Negative
Virulence Factor, virD	**Negative**		Negative
Normal Bacterial Flora			
	Result		Normal
Bacteroides fragilis	**4.14e9**		1.60e9 - 2.50e11
Bifidobacterium spp.	**1.89e11**		>6.70e7
Enterococcus spp.	**5.13e5**		1.9e5 - 2.00e8
Escherichia spp.	**6.60e7**		3.70e6 - 3.80e9
Lactobacillus spp.	**8.48e6**		8.6e5 - 6.20e8
Clostridia (class)	**2.23e8**	**High**	5.00e6 - 5.00e7
Enterobacter spp.	**1.42e7**		1.00e6 - 5.00e7
Akkermansia muciniphila	**<dl**		1.00e1 - 5.00e4
Faecalibacterium prausnitzii	**1.25e6**		1.00e3 - 5.00e8
Phyla Microbiota	Result		Normal
Bacteroidetes	**3.96e9**	**Low**	8.61e11 - 3.31e12
Firmicutes	**5.51e8**	**Low**	5.70e10 - 3.04e11
Firmicutes:Bacteroidetes Ratio	**0.14**		<1.00

Opportunistic Bacteria

Methanobacter: THINK SIBO

High levels linked to chronic constipation, as well as some types of SIBO and IBS. Low levels may indicate reduced production of short-chain fatty acids and may be associated with inflammation.

Prevotella: High levels may result from reduced digestive capacity, or a high-starch diet. Think autoimmune?

SIBO treatment:
Gi MicroBx, - or- Candibactin - Rifaxmin/flagyl
AND BPC 157/KPV (GUTTIDES)

Opportunistic Bacteria			
Additional Dysbiotic/Overgrowth Bacteria	Result		Normal
Bacillus spp.	**7.97e5**	**High**	<1.50e5
Enterococcus faecalis	**3.31e2**		<1.00e4
Enterococcus faecium	**<dl**		<1.00e4
Morganella spp.	**3.28e4**	**High**	<1.00e3
Pseudomonas spp.	**1.91e6**	**High**	<1.00e4
Pseudomonas aeruginosa	**1.89e4**	**High**	<5.00e2
Staphylococcus spp.	**<dl**		<1.00e4
Staphylococcus aureus	**3.11e1**		<5.00e2
Streptococcus spp.	**4.87e3**	**High**	<1.00e3
Methanobacteriaceae (family)	**8.50e8**		<5.00e9
Potential Autoimmune Triggers	Result		Normal
Citrobacter spp.	**<dl**		<5.00e6
Citrobacter freundii	**<dl**		<5.00e5
Klebsiella spp.	**<dl**		<5.00e3
Klebsiella pneumoniae	**<dl**		<5.00e4
M. avium subsp. paratuberculosis	**<dl**		<5.00e3
Prevotella spp.	**1.12e8**	**High**	<1.00e8
Proteus spp.	**<dl**		<5.00e4
Proteus mirabilis	**<dl**		<1.00e3
Fusobacterium spp.	**2.03e6**		<1.00e8

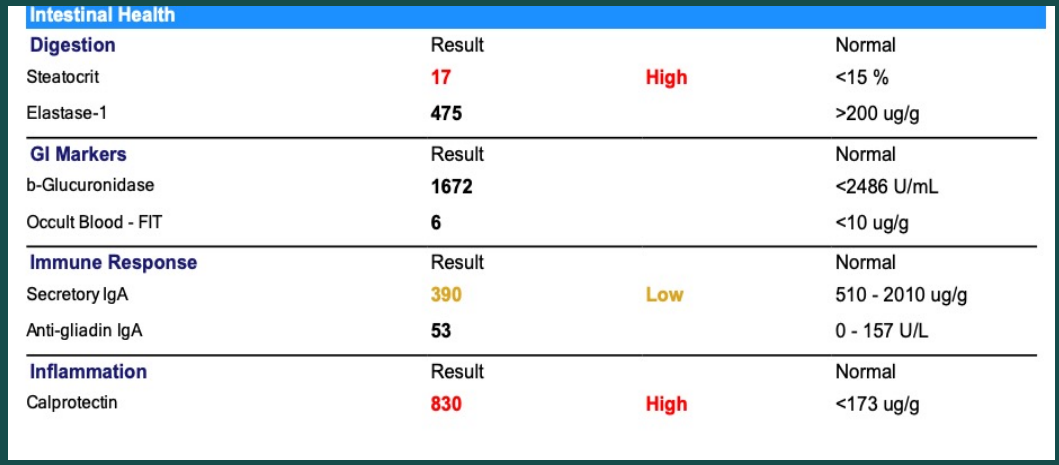
Intestinal Health- "Gut Report Card"

Digestion-

Steatocrit: High levels of fat in the stool may be an indication of maldigestion, malabsorption, or steatorrhea.
Causes:
Hypochlorhydria (Get off the Prilosec? Treat underlying infections? Treat the H. pylori)

Maldigestion – VIP nasal spray 1 spray daily

Elastase-1: Hypochlorhydria, especially if H. pylori present-
Tx: Gastromend bid x 4 weeks



Intestinal Health			
Digestion	Result		Normal
Steatocrit	17	High	<15 %
Elastase-1	475		>200 ug/g
GI Markers	Result		Normal
b-Glucuronidase	1672		<2486 U/mL
Occult Blood - FIT	6		<10 ug/g
Immune Response	Result		Normal
Secretory IgA	390	Low	510 - 2010 ug/g
Anti-gliadin IgA	53		0 - 157 U/L
Inflammation	Result		Normal
Calprotectin	830	High	<173 ug/g

Consider weaning off PPI-

This can be tricky! Gastromend, DGL synergy, HCL betaine, Gi Revive

Intestinal Health- “Gut Report Card”

IMMUNITY-

Low Secretory IgA- The gut immune system is suppressed. Investigate underlying causes, such as chronic dysbiosis, antigen exposure, chronic stress, immunocompromised patient, or even protein malnutrition

Tx; Address any chronic GI infections, if appropriate

- Address microbiome imbalances
- Address chronic stress and adrenal health, if needed
- Colostrum or immunoglobulins
- Supplement with S. Boulardii
- GI mucosal support with glutamine

Lactobacillus and Bifidobacteria probiotics

Intestinal Health			
Digestion	Result		Normal
Steatocrit	17	High	<15 %
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GI Markers	Result		Normal
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Secretory IgA	390	Low	510 - 2010 ug/g
Anti-gliadin IgA	53		0 - 157 U/L
Inflammation	Result		Normal
Calprotectin	830	High	<173 ug/g

Diet: Low fodmap

Peptides:
BPC/KPV 157 (GUTTIDES)
VIP -SPRAY DAILY
Semaglutide (maybe) concern about constipation

Intestinal Health- “Gut Report Card”

Inflammation:

Calprotectin:

High calprotectin indicates neutrophil infiltration to the gut mucosa.

Calprotectin is the gold standard marker for the diagnosis and monitoring of inflammatory bowel disease. It is used to differentiate IBD from irritable bowel syndrome.

Causes:

Intestinal infections and proinflammatory dysbiosis

Food allergens, toxins and certain drugs (e.g., non-steroidal anti-inflammatory drugs [NSAIDs])

Inflammatory bowel disease

Polyps

Diverticulitis

Colorectal cancer

Intestinal Health			
Digestion	Result		Normal
Steatocrit	**17**	**High**	<15 %
Elastase-1	**475**		>200 ug/g
GI Markers	Result		Normal
b-Glucuronidase	**1672**		<2486 U/mL
Occult Blood - FIT	**6**		<10 ug/g
Immune Response	Result		Normal
Secretory IgA	**390**	**Low**	510 - 2010 ug/g
Anti-gliadin IgA	**53**		0 - 157 U/L
Inflammation	Result		Normal
Calprotectin	**830**	**High**	<173 ug/g

Refer to GI for colonoscopy, if greater > 200

BPC/KPV GUTTIDES

Candida

Fungi/Yeast			
	Result		Normal
Candida spp.	<dl		<5.00e3
Candida albicans	5.54e2	High	<5.00e2
Geotrichum spp.	<dl		<3.00e2
Microsporidium spp.	<dl		<5.00e3
Rhodotorula spp.	<dl		<1.00e3

GI symptoms: Antibiotic use High intake of sugar, starches, and dietary fungi (beer, bread, nuts, cheese, corn)
Hypochlorhydria
Impaired immune function

Dysbiosis: Gas, bloating, constipation, nausea, vomiting, and diarrhea. Other symptoms: Eczema, athlete's foot, vaginal yeast infections, thrush, and jock itch.

Treatment: Oral liquid nystatin, BPC/KPV (Think KPV and Candida)

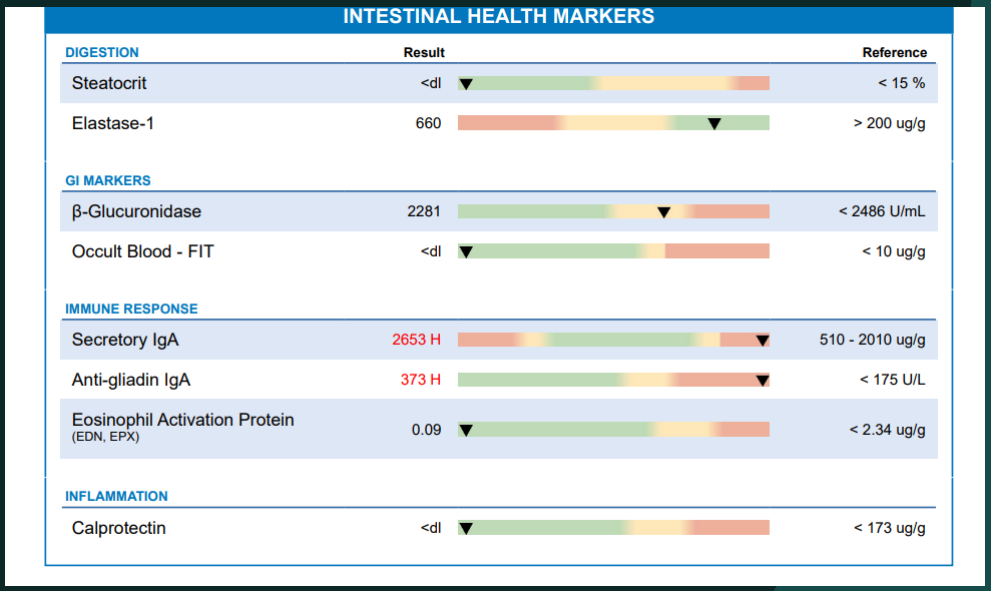
Candida

Fungi/Yeast			
	Result		Normal
Candida spp.	<dl		<5.00e3
Candida albicans	5.54e2	High	<5.00e2
Geotrichum spp.	<dl		<3.00e2
Microsporidium spp.	<dl		<5.00e3
Rhodotorula spp.	<dl		<1.00e3

What to do about Die off?

Optional: For potential “die off” reactions, take Metal-X Synergy or incorporate PaleoGreens daily as a binder of mycotoxins
Myer’s Cocktail
Ozone Therapy
Red Light Therapy

Case study #2:



INTESTINAL HEALTH MARKERS

	Result	Reference
DIGESTION		
Steatocrit	<dl	< 15 %
Elastase-1	660	> 200 ug/g
GI MARKERS		
β-Glucuronidase	2281	< 2486 U/mL
Occult Blood - FIT	<dl	< 10 ug/g
IMMUNE RESPONSE		
Secretory IgA	2653 H	510 - 2010 ug/g
Anti-gliadin IgA	373 H	< 175 U/L
Eosinophil Activation Protein (EDN, EPX)	0.09	< 2.34 ug/g
INFLAMMATION		
Calprotectin	<dl	< 173 ug/g

- 26 year female
- Pmh: Celiac
- Follows: GFD
- Presents with: difficulty with weight loss, bloating after most meals, some constipation
- Plan: Address 5 R protocol
  - IV ozone
  - BPC/KPV
  - LARAZOTIDE: 1 capsule before 3 meals a day
  - Semaglutide (added in ipamorelin to prevent constipation)

Case study #3

- 45 yo male pmh of Factor 5, ULCERATIVE COLITIS
- Meds: Eloquis 2.5mg daily, lialda 1.2mg daily
- c/o: loose stools, has to watch what he eats, really "wife made him get a gut test"

Pathogens			
Bacterial Pathogens	Result		Normal
Campylobacter	**<dl**		<1.00e3
C. difficile, Toxin A	**4.02e5**	**High**	<1.00e3
C. difficile, Toxin B	**2.83e5**	**High**	<1.00e3
Enterohemorrhagic E. coli	**<dl**		<1.00e3

Opportunistic Bacteria			
Additional Dysbiotic/Overgrowth Bacteria	Result		Normal
Bacillus spp.	**7.45e6**	**High**	<1.50e5
Enterococcus faecalis	**6.40e4**	**High**	<1.00e4
Enterococcus faecium	**2.64e6**	**High**	<1.00e4
Morganella spp.	**<dl**		<1.00e3
Pseudomonas spp.	**2.91e5**	**High**	<1.00e4
Pseudomonas aeruginosa	**1.68e3**	**High**	<5.00e2
Staphylococcus spp.	**<dl**		<1.00e4
Staphylococcus aureus	**1.18e3**	**High**	<5.00e2
Streptococcus spp.	**6.09e4**	**High**	<1.00e3
Methanobacteriaceae (family)	**1.33e9**		<5.00e9

DIGESTION	Result	Reference
Steatocrit	<dl	< 15 %
Elastase-1	>750	> 200 ug/g
GI MARKERS		
β-Glucuronidase	1006	< 2486 U/mL
Occult Blood - FIT	<dl	< 10 ug/g
IMMUNE RESPONSE		
Secretory IgA	810	510 - 2010 ug/g
Anti-gliadin IgA	>500 H	< 175 U/L
Eosinophil Activation Protein (EDN, EPX)	0.26	< 2.34 ug/g
INFLAMMATION		
Calprotectin	<dl	< 173 ug/g

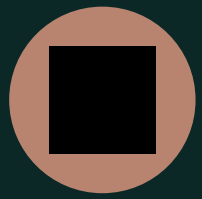
Plan: (Take a breath)

TX: C-DIFF VARIANTS: METRONIDAZOLE

LOW FOD MAP

BPC/KPV 1 CAPSULE BID

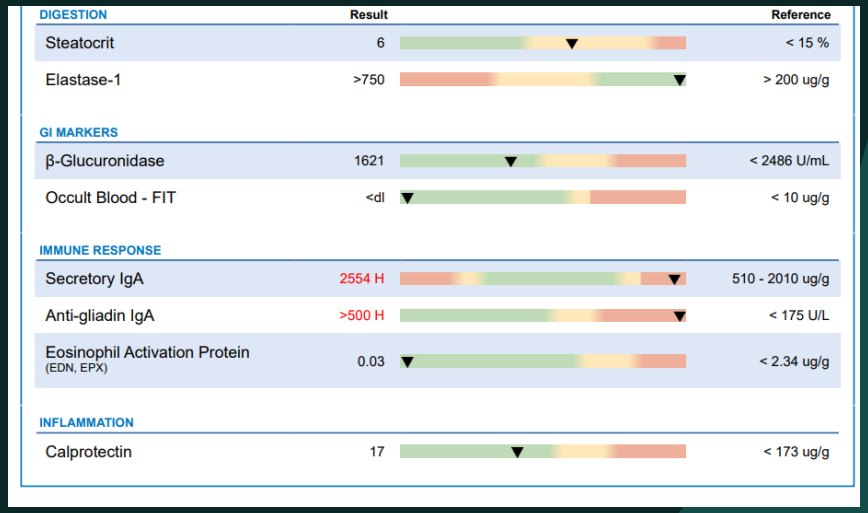
LARAZOTIDE 1 CAPSULE TID



SEMAGLUTIDE: TO SLOW DOWN GASTRIC MOTILITY, AND IMPROVE NUTRIENT ABSORPTION

IV OZONE

Case #4



DIGESTION	Result	Reference
Steatocrit	6	< 15 %
Elastase-1	>750	> 200 ug/g
GI MARKERS		
β-Glucuronidase	1621	< 2486 U/mL
Occult Blood - FIT	<dl	< 10 ug/g
IMMUNE RESPONSE		
Secretory IgA	2554 H	510 - 2010 ug/g
Anti-gliadin IgA	>500 H	< 175 U/L
Eosinophil Activation Protein (EDN, EPX)	0.03	< 2.34 ug/g
INFLAMMATION		
Calprotectin	17	< 173 ug/g

- 42 year female presents with heart burn, bloating, constipation and difficulty with weight loss, has 2BMs per week, exercise 3-4 x a week

- Plan: Elimination diet for 21 days
- VIP- 1 spray daily x 1 week, then 1 spray twice a day in week 2 (improved constipation)
- BPC/KPV- improve gut barrier, dysbiosis
- IV OZONE (immune system)
- Larazotide

Questions

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