Your Sign In Information

Web Address

https://app.geneticdirection.com/access

Email

You will be required to set a password
so that you may sign in to the system.

GxGutHealth

Personal Report

Prepared for: John Doe

July 10, 2023

CARNELIAN
Health Services

Welcome to Your GxGutHealth Personal Report

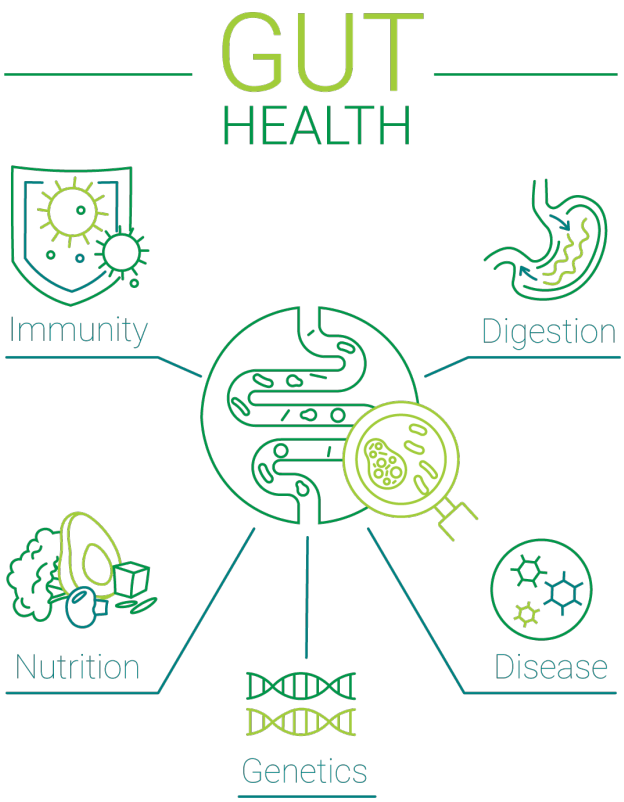
July 10, 2023

Congratulations!

You're about to receive innovative insights about your body that, until now, have never been available. Your gut microbiome is a community of tiny organisms in the digestive system that help digest food, absorb nutrients, support the immune system, and ultimately impact overall health. Your report will provide you with the information that you need to understand the health of your gut microbiome and which specific nutrients can help you to optimize your gut microbiome on a very personal and individual level.

What Is Microbiome Testing?

Gut microbiome testing is like a detective mission for your body. It involves using a stool sample to uncover information about the bacteria and other tiny organisms living in the gut. With today's advanced technologies, we can identify these tiny communities living within the gut microbiome, and by comparing multiple samples, we can find patterns that may be linked to your health or certain conditions. This ultimately enables us to give you personalized advice on how to make it even better. It's like getting a special plan to help your body's tiny inhabitants thrive.



Why Is Your Microbiome Important?

The gut microbiome is important in several ways, including playing a role in digestion and absorption of food, immune system regulation, hormone regulation, protection against pathogens, and energy metabolism. In this report, we assess how your gut microbes are working together and with your body to optimize your health, and where appropriate, identify specifically where you could improve your nutrition to optimize the health of your microbes, thereby improving the health of your body.

My **Recommendations**

Based on the results of your gut microbiome test, we've provided specific information that can help rebalance your gut microbes, moving them toward a healthier state and increasing your overall wellness. Our first recommendation is a *personalized supplement* that contains all the essential nutrients identified for better microbial balance. This page outlines the recommended personalized supplement information and how to order them.

Our second recommendation is specific *foods to target* and *foods to limit* to optimize your diet and promote the overall health of your gut microbiome. The food recommendations are on the following page.

Your Personalized Supplements

Each of the individual nutrients needed to optimize the health of your gut microbiome have been combined into a unique daily formula specific to you. Your *GxGutHealth Personalized Supplements* are provided to you in powder form contained in individual sachet packets. You simply mix one packet per day with water or your favorite drink. The sachet packets are provided in a 30-day supply in a resealable bag, and you can order up to 3 months' supply. Ask your practitioner about trying these personalized supplements that are targeted to your specific gut microbiome.

Sachet Packet

Supplement Facts

Serving Size: 1 Packet (Approx. 4.3g)

Amount Per Serving		% Daily Value
Calories	5	
Total Carbohydrate	1 g	<1%*
Dietary Fiber	1 g	5%*
Vitamin K	100 mcg	83%
Vitamin B6 (Pyridoxal 5 Phosphate)	12 mg	728%
Folate	399 mg DFE (235 mcg folic acid)	100%
Biotin	2174 mg	7246%
Pantothenic Acid (Calcium D-Pantothenate)	103 mg	2063%
Sodium	77 mg	3%
VitalGut Blend Three Citrus pectin, Avena sativa (Oat bran), Inulin, R-Lipoic Acid	2549 mg	†

*Percent Daily Values are based on a 2,000 calorie diet.
†Daily Value not established.

Other ingredients: Natural Flavor (Pomegranate Grape), Malic Acid, Citric Acid, Stevia Leaf Extract, Silica, Grape Skin Extract (for color).

Do not use this product if you are taking warfarin/coumadin without consulting a physician.

DIRECTIONS: Empty one packet (approx. 4.3g) into 6-8 oz of water, then shake vigorously and drink.

INDIVIDUAL PACKET NOT FOR RESALE

Why Personalized Supplements?

Your gut microbiome is constantly changing and affects many aspects of your overall health and wellness. With the personalized supplements driven by your gut microbiome test, we can continue to provide varying formulas to your varying lifestyle by constantly adjusting the formula based upon the most recent gut health test.

- *Supplement formula based upon **your** gut microbiome needs*
- *Individual sachet packets for daily consumption – perfect for travel*
- *Impact of Personalized Supplements can be measured with future gut microbiome test*

My **Recommendations**

In addition to personalized supplements, an essential component of gut microbiome balance is understanding which foods to prioritize and which to limit in your diet. Based on your gut microbiome analysis, the following lists outline recommended foods to incorporate and those to reduce. For optimal results, integrating both the personalized supplements and these dietary recommendations into your routine is the most effective approach. However, even adopting just one of these strategies can yield noticeable benefits.

Your Recommended Foods

- Vegetables (Swiss Chard, Kale, Sweet Potatoes, Asparagus, Mushrooms)
- Fruits (Kiwi, Avocado, Pomegranate, Apricot, Grapes)
- Legumes (Black Beans, Kidney Beans, Navy Beans, Soybeans, Peas)
- Grains (Buckwheat, Brown Rice, Rye, Whole Wheat, Oats)
- Nuts & Seeds (Chia Seeds, Walnuts, Flaxseeds, Almond)

Your Foods to Limit

- Animal Protein (Salmon, Sardines, Poultry, Fish)

My **Overall Gut Health**

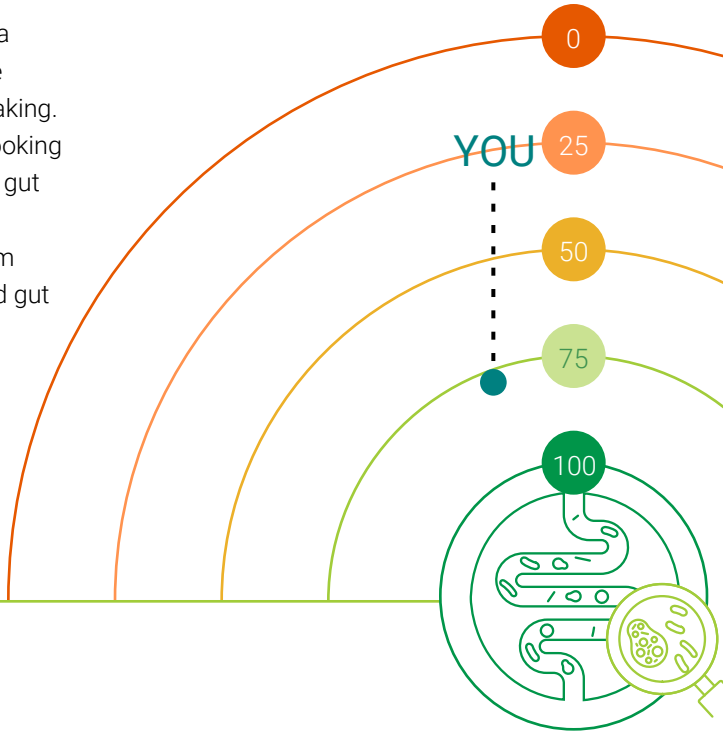
your score

75.3

My Overall Gut Score

What does my score mean?

A healthy gut goes beyond just the bacteria present or absent. It also looks at what the bacteria are making and are capable of making. All of these factors come into play when looking at overall gut microbiome health, and your gut score takes all of these factors into consideration. This score is on a scale from 0-100, with 100 being a perfectly optimized gut health score.



* Curious how this score or the Alpha Diversity score is calculated? Check the last few pages in this report for our Definitions and FAQs!

Alpha Diversity

Your Alpha Diversity Level is

OPTIMAL

Your Alpha Diversity Score is

74.8

0 100 optimal

Alpha diversity refers to the diversity of microorganisms within a single sample, such as the gut microbiome. It provides insight into the richness and evenness of species present in that sample. A higher alpha diversity indicates a more varied and balanced bacterial community, which is often associated with better overall gut health and general well-being.

Your Top 5 Gut Bacteria

		% Gut Bacteria
1	Related Bacteria (group of 12)	20.8%
2	Phocaeicola	16.1%
3	Bacteroides	11.9%
4	Alistipes	10.1%
5	Faecalibacterium	6.8%

My **Health Scores**

The gut microbiome can influence multiple areas of our health. The following health scores indicate how the microbes within your gut are interacting with each other and with your body to impact or contribute to specific areas of your health. A higher score indicates a more positive contribution.

Health Score Determination

Each Health Score is calculated by taking relevant phenotype scores, referencing scientific literature for the category and comparing to a healthy cohort dataset. Please reference the bibliography at the end of this report for links to this literature. Please see the FAQs for an example of the inputs into one of the Health Scores.

Your health score will be a numerical value ranging from 0 to 100, with the green-shaded region indicating the beginning of the optimal range.

Heart Health

The Heart Health score assesses substances produced by the gut bacteria that can impact how healthy your heart is. These substances have been linked to conditions that affect heart health.

your score
50.1

Gut Barrier Health

The Leaky Gut score assesses substances produced by gut bacteria that are linked to a weakened gut barrier. This can lead to harmful substances leaking into the bloodstream, potentially causing health problems.

your score
40.1

Respiratory Health

The Respiratory Health score assesses factors related to lung health and includes factors that potentially impact inflammatory activity in the lungs, which can impact risk of respiratory issues.

your score
30.5

My **Health Scores**

Your health is influenced by a variety of factors, from the efficiency of your metabolism to the resilience of your skin, lungs, and digestive system. The following health scores indicate how the microbes within your gut are interacting with each other and impact your digestive, skin, and metabolic health. A higher score indicates a more positive contribution.

Digestive Health

The Digestive Health score evaluates factors linked to digestive well-being. These include factors that impact inflammatory signals, immune responses, regulate energy for gut cells, and contribute to overall digestive health.

your score
20.6

Skin Health

The Skin Health score focuses on factors relevant to skin well-being, including the production of compounds shown to benefit skin health and those that influence certain skin conditions.

your score
10.9

Metabolic Health

The Metabolic Health score assesses factors influencing metabolic processes in the body, including the production of compounds that can impact glucose control, appetite regulation, and other metabolic processes.

your score
4.4

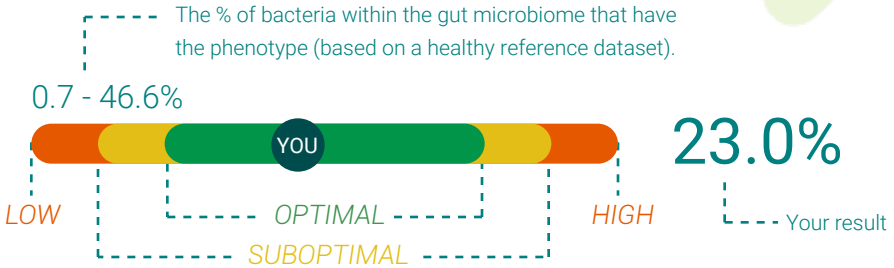
Health Score Disclaimer

These health scores are not meant to be diagnostic in nature. If there is a score that is low and you are concerned, please consult a physician.

Phenotype Key

Name of phenotype
(for example Butyrate producers)

Phenotype



Phenotypes are groupings of gut bacteria that contribute to or perform specific biological functions that impact your overall health. This section shows your current levels of four (4) major phenotypes and how they impact your health and how they compare to a 'Healthy Reference Range'. See the FAQs at the end of the report for more detail.

Phenotype Short Chain Fatty Acid Producers

Short chain fatty acids (SCFA) are the beneficial products of carbohydrate fermentation that are associated with a diverse microbiome and overall health. The percentage of SCFAs producers is shown below.

Butyrate producers

Butyrate is produced by microbial fermentation and plays an integral role in maintaining digestive health by regulating geneexpression, cell differentiation, gut tissue development, immune modulation, oxidative stress reduction, and more.

17.1%

Propionate producers

Propionate is known to have a significantly positive impact on the immune system, including improving lung health and increasing resistance to infection. It is typically converted to glucose in the liver and may prevent some lipogenic effects of acetate.

67.1%

Acetate producers

Acetate production is tightly regulated within the microbiome. It is largely utilized for cholesterol synthesis and lipogenesis, and excessive production combined with insufficient butyrate production can lead to fat gain, particularly around the liver.

81.0%

Phenotype Sugar Utilization

Polysaccharides and mono/oligosaccharides are utilized for biosynthesis and energy metabolism in gut-colonizing bacteria. The percentage of sugar utilizers is shown below.

FOS utilizers

Fructo-oligosaccharides (FOS) is a prebiotic with positive impact on the diversity and abundance of the microbiome. Dietary sources of FOS are onions, garlic, chicory and artichokes. Bacteria who utilize FOS can be helpful in weight loss and correcting constipation.

39.3%

Arabinose utilizers

Arabinose is a prebiotic that promotes diversity within the microbiome. Dietary sources of arabinose are whole grains, apples and citrus fruits and fermented foods. Bacteria who utilize arabinose can be helpful with blood sugar balancing, metabolic syndrome.

43.8%

Inositol utilizers

Inositol is important for microbiome adaptation and diversity. Dietary sources are fiber rich foods, such as beans, nuts and seeds, citrus and melons. Inositol can be beneficial for metabolic syndrome, lipid imbalances, insulin resistance.

6.7%

Lactose utilizers

Lactose intolerance is a common medical problem marked by bloating, diarrhea, abdominal pain, or cramping, resulting from a reduction in the lactase enzyme. Colonic bacterial adaptation can significantly improve symptoms of intolerance.

47.5%

Phenotype Vitamin Production

B Vitamins are precursors of nearly all metabolic coenzymes universally essential in all lifeforms. With the exception of B12, which is dispensable for some bacterial species, all B vitamins that are not able to be produced must be retrieved through exogenous sources. The percentage of vitamin producers is shown below.

Thiamine (B1) producers

Thiamin is a water-soluble B vitamin that plays a critical role in energy metabolism, particularly in the brain and nervous system,as well as in the growth and function of cells. Some bacteria are able to produce thiamin, while others are not.

63.0%

Riboflavin (B2) producers

Riboflavin is a B-vitamin that is a component of two important coenzymes required for energy production and fatty acid metabolism, as well as metabolism of drugs and steroids. Some bacteria are able to produce riboflavin, while others are not.

84.2%

Niacin (B3) producers

Niacin is a B-vitamin required for the coenzyme NAD, which is involved in more than 400 enzymatic reactions in the body. Noteably, NAD works to convert food into energy for our cells. Some bacteria are able to produce niacin, while others are not.

85.5%

Pantothenate (B5) producers

Pantothenate is a B-vitamin that plays a major role in energy production, particularly the breakdown of fatty acids. It may play arole in reducing lipid production in certain individuals. Some bacteria are able to produce pantothenate, while others are not.

75.9%

Phenotype Vitamin Production

B Vitamins are precursors of nearly all metabolic coenzymes universally essential in all lifeforms. With the exception of B12, which is dispensable for some bacterial species, all B vitamins that are not able to be produced must be retrieved through exogenous sources. The percentage of vitamin producers is shown below.

Pyridoxine (B6) producers

Pyridoxine is a B-vitamin required for coenzymes that play a role in enzymatic reactions mostly concerning protein metabolism,immune function, and brain development during pregnancy. Some bacteria are able to produce pyridoxine, while others are not.

74.9%

Biotin (B7) producers

Biotin is a B-vitamin that plays a critical role in energy production, histone modification, gene regulation, and cell signaling. Signs of deficiency include skin rashes, hair loss, and brittle nails. Some bacteria are able to produce biotin, while others are not.

58.5%

Folate (B9) producers

Folate is a B-vitamin that is required to synthesize DNA, metabolize amino acids, enable methylation, and prevent anemia, as well as protect against neural tube defects in pregnancy. Some bacteria are able to produce folate, while others are not.

78.2%

Cobalamin (B12) producers

Cobalamin is a B-vitamin that is important in synthesizing DNA and red blood cells, brain and nervous system function, and metabolism. It is required to prevent magaloblastic anemia. Some bacteria are able to produce cobalamin, while others are not.

40.4%

Phenotype Amino Acid Production

Amino acids are indispensable for microbiome health. Bacteria that are not capable of producing amino acids require exogenous sources from the diet or other bacteria. The percentage of amino acid producers is shown below.

Cysteine producers

Cysteine is a nonessential sulfur containing amino acid in the methionine - homocysteine pathway and one of three amino acids that build glutathione. Cysteine is beneficial as an antioxidant, assists with collagen formation and immune system regulation.

91.0%

Tryptophan producers

Tryptophan is an essential amino acid with an important role in the gut-brain axis (GBS). Tryptophan is important in the production of neurotransmitters that regulate mood, particularly depression, and intestinal barrier integrity

76.4%

Histidine producers

Histidine is an essential amino acid and precursor to histamine. Histidine and its derivatives have important roles in the immune response, blood clotting pathways, and detoxification.

91.5%

FAQs/Definitions

1. How is the Overall Gut Score calculated?

The Overall Gut Score is a proprietary algorithm utilizing several inputs, including the Alpha Diversity score. The Overall Gut Score is the most comprehensive score in the report. It includes the following inputs: Alpha Diversity score, level of butyrate producers and a score comparing the sample to an 'ideal' gut microbiome. An 'ideal' gut microbiome is defined as the one having the abundances of bacteria (that were observed in the analyzed sample) equal to the "typical" (more precisely, the median) values from the reference dataset. The reference dataset that was used is defined below.

2. How is the Alpha Diversity Score calculated?

There are two aspects to the Alpha Diversity score methodology. First, there is a raw value that is calculated using the Faith's Phylogenetic Diversity (FBD) method. The second aspect is comparing this raw value from the FBD method to other healthy and non-healthy samples (from the Reference Dataset defined below) and determining where your FBD raw value compares against cohort samples. This comparison generates a score that tells the person where they fall in the curve on a scale of 0-100. EXAMPLE: If a person receives a 23.8 score, that means 76.2% of persons had a healthier score and 23.8% had a less healthy score.

3. Are the Overall Gut Score and Alpha Diversity Score correlated?

The two scores should track together since one is an input to the other, however there could be instances where the rate of change is different. This is because the Alpha Diversity is only one of the inputs into the Overall Gut Score.

4. How are the Six Health Scores calculated?

The Health Scores are calculated using the following inputs: Select phenotypes (specific to the Health Score) are calculated and compared to associations found in scientific literature between specific gut microbiome components and health outcomes. In its simplest terms, a Phenotype is a grouping of bacteria in the gut that perform/contribute to a specific biological function. See below for links to the literature related to the Health Scores.

5. What should I do if I am concerned about my health score(s) being low?

The scores in this report are not meant to be a medical diagnosis. If you have concern about a score, please consult with a medical professional.

FAQs/Definitions

6. If the Overall Gut Score and/or the Alpha Diversity Score improves (increases) will the Health Scores improve?

If the Overall Gut Score improves and/or the Alpha Diversity improves, it is expected (but not guaranteed) that there will be an overall improvement in all health scores. However, there may be some that do not improve or do not improve at the same rate.

7. What is the Reference Dataset that is mentioned?

The dataset used for many of the scores in this report is The American Gut Project. An open platform for Microbiome data contribution and research with thousands of microbiome gut datasets.

8. What is the BEST method for me to improve my gut microbiome scores?

The best approach to enhancing your gut health is to ensure that you are providing the required nutrients to the bacteria that impact certain health conditions, many of which are listed in this report. Whether you focus on food intake, supplements or utilize our GxGutHealth Personalized supplements that are designed for you based upon the analysis of your gut test, the only way to know if your gut is improving is to stick to the regimen and RE-TEST! After 60 (minimum) or 90 days, take another gut test and compare your various scores and see the improvement.

9. If my gut scores improve after my second test, why would I need to keep taking the GxGutHealth Personalized Supplements?

If your scores improve, one of the reasons is that the GxGutHealth Personalized Supplements are providing the required vitamins and micronutrients to help them improve. If you stop taking them, the chances are likely that lifestyle and genetic factors will lead your gut microbiome back to an unhealthy state.

10. Will my GxGutHealth Personalized Supplements change after my second test?

It is very possible. The GxGutHealth Personalized Supplements will provide much needed vitamins and micronutrients and if your gut is healthier, the formula may change to address other deficiencies found in the analysis.

FAQs/Definitions

11. What kinds of lifestyle activities can affect my gut health?

Your diet and lifestyle obviously affect your gut health but so many other factors are involved. If you are stressed from work, your gut changes. If you move your place of residence, your gut changes. If you take antibiotics, your gut changes. If you travel, your gut changes. If you are on a diet, your gut changes. Think of the GxGutHealth Personalized Supplements to assist your gut in adjusting to your life events.

12. Why is this Gut Microbiome Report different from others on the market?

The phenotypic bioinformatic analysis of the sample results is backed by over a decade of proprietary curation, incorporating a comprehensive understanding of phenotypes and their interactions. Additionally, the personalization component of the GxGutHealth Personalized Supplements is uniquely positioned in the market, offering a tailored approach that recognizes the individuality of each person's gut microbiome—unlike standardized formulations that overlook this critical factor. Finally, we strongly recommend retesting to monitor progress and optimize outcomes over time.

Links to Related Studies

HEALTH SCORES - HEART HEALTH

Eur J Clin Nutr 76, 489–501 (2022).

Role of the gut microbiome in chronic diseases: a narrative review

https://www.nature.com/articles/s41430-021-00991-6

Vijay, A., Valdes, A.M.

Chronic stress (Thousand Oaks, Calif.) vol. 6 24705470221076390. 8 Feb. 2022, doi:10.1177/24705470221076390

The Role of Lipopolysaccharide-Induced Cell Signalling in Chronic Inflammation

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8829728

Page MJ, Kell DB, Pretorius E.

Front. Pharmacol., 01 February 2022, Sec. Gastrointestinal and Hepatic Pharmacology, Volume 12 - 2021. doi: 10.3389/fphar.2021.837509

Role of Butyrate, a Gut Microbiota Derived Metabolite, in Cardiovascular Diseases: A comprehensive narrative review

https://www.frontiersin.org/journals/pharmacology/articles/10.3389/fphar.2021.837509

Amiri Parichehr , Hosseini Seyed Ahmad , Ghaffari Samad , Tutunchi Helda , Ghaffari Shamsi , Mosharkesh Erfan , Asghari Samira , Roshanravan Neda

HEALTH SCORES - GUT BARRIER HEALTH

Progress in Neuro-Psychopharmacology and Biological Psychiatry, Volume 107, 2021, 110240, ISSN 0278-5846, doi: 10.1016/j.pnpbp.2020.110240.

Gut microbiota-derived vitamins – underrated powers of a multipotent ally in psychiatric health and disease

https://www.sciencedirect.com/science/article/pii/S027858462030556X

Leszek Rudzki, Trevor W. Stone, Michael Maes, Błażej Misiak, Jerzy Samochowiec, Agata Szulc

Clinical Nutrition, Volume 42, Issue 2, 2023, Pages 61-75, ISSN 0261-5614, doi: 10.1016/j.clnu.2022.10.024.

Butyrate's role in human health and the current progress towards its clinical application to treat gastrointestinal disease

https://www.sciencedirect.com/science/article/pii/S0261561422003843

Kendra Hodgkinson, Faiha El Abbar, Peter Dobranowski, Juliana Manoogian, James Butcher, Daniel Figeys, David Mack, Alain Stintzi

HEALTH SCORES - RESPIRATORY HEALTH

Eur J Clin Nutr 76, 489–501 (2022). doi: 10.1038/s41430-021-00991-6

Role of the gut microbiome in chronic diseases: a narrative review.

https://www.nature.com/articles/s41430-021-00991-6

Vijay, A., Valdes, A.M.

HEALTH SCORES - DIGESTIVE HEALTH

BMC Genomics 22, 695 (2021). doi: 10.1186/s12864-021-08004-3

The taxonomic distribution of histamine-secreting bacteria in the human gut microbiome

https://bmcgenomics.biomedcentral.com/articles/10.1186/s12864-021-08004-3

Mou, Z., Yang, Y., Hall, A.B. et al.

Links to Related Studies

Microorganisms vol. 10,6 1168. 7 Jun. 2022, doi:10.3390/microorganisms10061168

B Vitamins and Their Roles in Gut Health

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9227236

Hossain, Khandkar Shaharina et al

Eur J Clin Nutr 76, 489–501 (2022).

Role of the gut microbiome in chronic diseases: a narrative review

https://www.nature.com/articles/s41430-021-00991-6

Vijay, A., Valdes, A.M.

Microorganisms. 2023 Nov 29;11(12):2882. doi: 10.3390/microorganisms11122882. PMID: 38138026; PMCID: PMC10745905.

Evaluation of Bacterial and Fungal Biomarkers for Differentiation and Prognosis of Patients with Inflammatory Bowel Disease

https://pubmed.ncbi.nlm.nih.gov/38138026

Yoon H, Park S, Jun YK, Choi Y, Shin CM, Park YS, Kim N, Lee DH

International Journal of Molecular Sciences. 2021; 22(12):6242. doi:10.3390/ijms22126242

Interaction between Lipopolysaccharide and Gut Microbiota in Inflammatory Bowel Diseases

https://www.mdpi.com/1422-0067/22/12/6242

Candelli M, Franza L, Pignataro G, Ojetti V, Covino M, Piccioni A, Gasbarrini A, Franceschi F.

Frontiers in immunology vol. 10 277. 11 Mar. 2019, doi:10.3389/fimmu.2019.00277

Short Chain Fatty Acids (SCFAs)-Mediated Gut Epithelial and Immune Regulation and Its Relevance for Inflammatory Bowel Diseases

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6421268/

Parada Venegas, Daniela et al

HEALTH SCORES - SKIN HEALTH

Eur J Clin Nutr 76, 489–501 (2022).

Role of the gut microbiome in chronic diseases: a narrative review

https://www.nature.com/articles/s41430-021-00991-6

Vijay, A., Valdes, A.M.

HEALTH SCORES - METABOLIC HEALTH

Eur J Clin Nutr 76, 489–501 (2022).

Role of the gut microbiome in chronic diseases: a narrative review

https://www.nature.com/articles/s41430-021-00991-6

Vijay, A., Valdes, A.M.

Links to Related Studies

Frontiers in Physiology, Volume 11, 2020, doi: 10.3389/fphys.2020.567899, ISSN:1664-042X

Drug Discovery and Development of Novel Therapeutics for Inhibiting TMAO in Models of Atherosclerosis and Diabetes

https://www.frontiersin.org/journals/physiology/articles/10.3389/fphys.2020.567899

Steinke Ian, Ghanei Nila, Govindarajulu Manoj, Yoo Sieun, Zhong Juming, Amin Rajesh H.

Chronic stress (Thousand Oaks, Calif.) vol. 6 24705470221076390. 8 Feb. 2022, doi:10.1177/24705470221076390

The Role of Lipopolysaccharide-Induced Cell Signalling in Chronic Inflammation

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8829728

Page MJ, Kell DB, Pretorius E.

World journal of diabetes vol. 11,7 (2020): 293-308. doi:10.4239/wjd.v11.i7.293

Gut microbiota and diabetes: From correlation to causality and mechanism

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7415231

Li, Wei-Zheng et al