

Led by Cheng Guo (lead author) and Brent L. Williams (senior author) this big NIH-funded study from Ian Lipkin's Columbia team at the "[Center for Solutions for Myalgic Encephalomyelitis/Chronic Fatigue Syndrome \(CfS for ME/CFS\)](#)" set out to fix some of the problems found in prior gut studies. The study "[Deficient butyrate-producing capacity in the gut microbiome of Myalgic Encephalomyelitis/Chronic Fatigue Syndrome patients is associated with fatigue symptoms](#)" was bigger (n=200), more rigorous, and used better bacterial sequencing techniques than past studies.

Ian Lipkin's team involved seemingly everyone possible (Mady Hornig, Anthony Komaroff, Susan Levine, Lucinda Bateman, Suzanne Vernon, Nancy Klimas, Jose Montoya, Dan Peterson) in this big NIH-funded study. The study was not just big – it was long as well. Study participants provided stool samples 4x's over a year and completed a multidimensional fatigue inventory each time to boot.

Plus, following past studies from this group – the study assessed the effect irritable bowel syndrome – a common but certainly not universal comorbid condition found in ME/CFS – has on gut flora. Finally, as it did in a past study, this new study added metabolomics to the mix as well.

The study also used a technique that appears to be new to ME/CFS gut studies called "[shotgun metagenomics sequencing](#)" which allows researchers to comprehensively sample all the genes in all the organisms found in a complex environment. This technique allows researchers to detect bacterial species that other methods are likely to miss.

This study provides us clearly our best look yet at the gut bacteria in chronic fatigue syndrome (ME/CFS).

## **The Irritable Bowel Syndrome (IBS) Connection**

"Both our current and prior fecal shotgun metagenomic study support the notion that IBS morbidity must be carefully considered in future ME/CFS microbiome studies". The authors

[Irritable bowel syndrome](#) (IBS) is characterized by symptoms like abdominal pain, cramping or bloating usually associated with a bowel movement, changes in the appearance of bowel movements (ranging from hard-packed feces to diarrhea), and changes in how often you're having a bowel movement. About a third of the ME/CFS patients in the study had IBS.

## A Less Diverse Ecosystem

Having IBS made a real difference. Specifically, the differences in the alpha diversity of the gut bacteria largely reflected whether one had IBS or not. **Alpha diversity** is a term borrowed from ecology that measures the richness or diversity of complex ecosystems (like a forest or a gut). Like a forest, the higher the species richness or alpha diversity of the bacteria in the gut the more resilient, healthy, and productive the gut should be

Alpha diversity isn't the only measure of gut health but it is an important one. One Ph.D. student reported that "**High gut alpha diversity** has been linked to a healthy state in so many studies that it has become common knowledge in microbiome circles."

Having IBS had a dramatic influence on alpha diversity with only the ME/CFS +IBS having a reduced alpha diversity compared to healthy controls.

Beta diversity can also be used to assess gut health. The beta diversity test compared the difference between the microbiome species found in the presumably healthier guts of the healthy controls with the ME/CFS patients with and without IBS. In contrast to the alpha diversity finding, both ME/CFS cohorts (those with and without IBS), had altered beta diversity; i.e. whether they had IBS or not, the flora in the ME/CFS patients' guts was markedly different than the flora found in the healthy controls' guts.

### "A Potential Biosensor of Human Health" Reduced

The study found that the relative abundance of two species (*E. rectale* and *Faecalibacterium prausnitzii*) and six genera (*Eubacterium*, *Faecalibacterium*, *Dorea*, *Roseburia*, *Gemmiger*) differed in relative abundance in ME/CFS compared to healthy control subjects.

*F. prausnitizi* stood out because it's been found reduced in at least one fibromyalgia and two ME/CFS studies. This odd bacterium, which does not produce spores, and moves around very little, makes up a full 5% of the bacteria found in our guts. Through its fermentation of dietary fiber, *F. prausnitizi* produces **butyrate** and other **short-chain fatty acids**, and an important anti-inflammatory product. It's been called "a potential biosensor of human health".

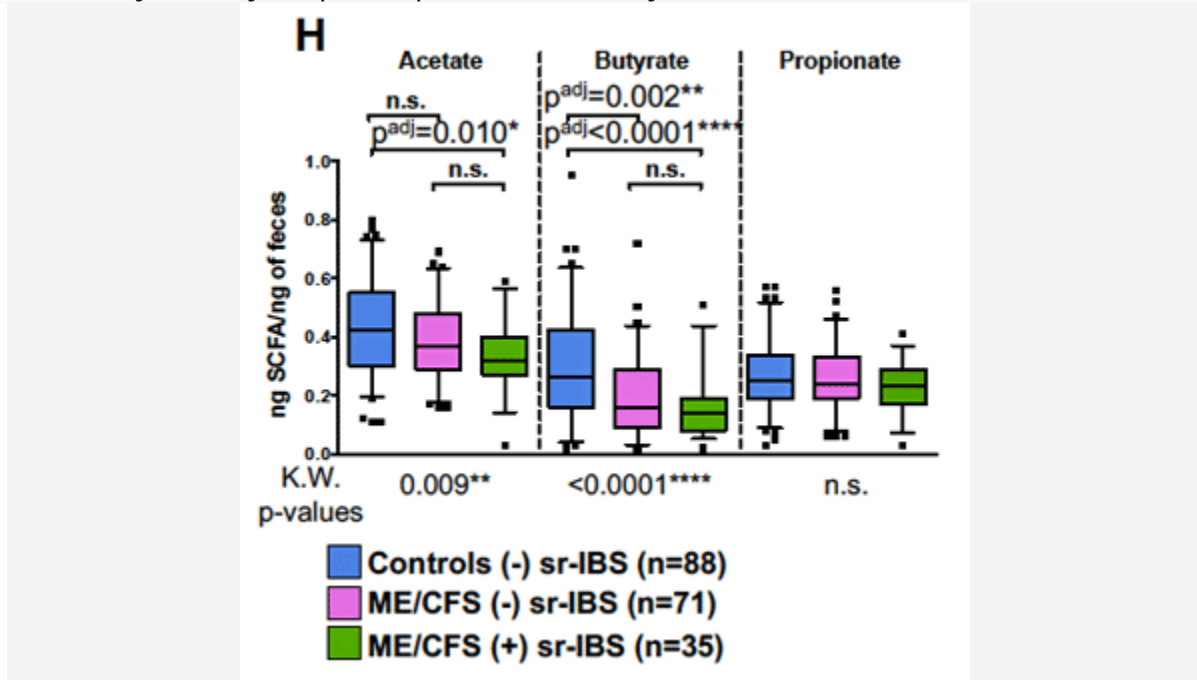
The authors noted that low fecal *F. prausnitzii* levels have been found in inflammatory bowel disease (IBD), IBS, celiac disease, colorectal cancer, obesity, in people with COVID, and in long COVID. The Flemish gut project found

that *Faecalibacterium* and *Coprococcus* bacteria were associated with higher quality of life scores, and reduced levels of *F. prausnitzii* have been associated with fatigue in inflammatory bowel disease.

## Reduced Butyrate Levels – A Seminal Gut Finding in ME/CFS

Fatigue was certainly the byword in this study as lower butyrate levels were associated with more fatigue and both general and/or physical fatigue were particularly associated with reduced levels of *F. prausnitzii*, *Coprococcus*, and a few other bacteria.

Butyrate's becoming a pretty big deal in ME/CFS gut studies. It's the primary energy source for the endothelial cells lining the gut – an interesting finding given all the focus on the endothelial cells lining the blood vessels in ME/CFS and long COVID. Given the strong possibility that leaky gut is present in ME/CFS, it's intriguing that butyrate protects the gut lining. Its support of regulatory T-cells and its anti-inflammatory activity helps keep the immune system in check as well.



Dramatically reduced butyrate levels (middle column) in ME/CFS patients (with IBS – green; without IBS – violet) compared to healthy controls.

Reduced butyrate levels in ME/CFS then, could result in an inflammatory state in the gut and a weakened gut barrier to boot; which is perhaps just the right combination to spark an inflammatory response that ranges from the gut all the way to the brain.

The deeper the researchers dug, the more solid the low butyrate finding became. A metagenomic analysis snagged one source of the butyrate problem when it found that people with ME/CFS tended to be deficient in one of the two genes (the “but” gene) used to produce butyrate using the acetyl-CoA pathway gene. A functional analysis then indicated that the bacteria using that gene were the same bacteria that people with ME/CFS were missing.

The butyrate connection got even stronger when the authors found reduced levels of a substance called acetate. Because butyrate-producing bacteria need acetate to produce butyrate, the acetate deficiency fit the bill.

## The Gist

- Ian Lipkin’s group presented the findings of the largest gut study ever done in ME/CFS.
- The study found that having ME/CFS and irritable bowel syndrome – reduced the “alpha diversity” or richness of their gut flora – resulting presumably in less productivity and resilience. Just having ME/CFS, on the other hand, did not.
- As several other studies have found the bacteria that produce butyrate – an anti-inflammatory that provides essential energy resources to the endothelial cells linking the gut wall – were deficient in ME/CFS. Low levels of butyrate were associated with greater fatigue as well.
- With this study, three different methodological approaches have identified low butyrate levels in ME/CFS patients’ guts – making it one of the more solid findings in all of ME/CFS.
- Low levels of butyrate could result in inflammation, weakened gut linings, and leaky gut – potentially producing systemic inflammation that reaches all the way to the central nervous system.
- This also makes this study the third to find reductions of a specific butyrate producer called *F. prausnitizi*. Low levels of *F. prausnitizi*, which has been called a potential biosensor of health, have been found in a number of chronic diseases including IBS, IBD, and fibromyalgia.
- Because acetate is needed to produce butyrate, the reduced acetate levels found made sense as well.
- What was causing the higher-than-normal levels of bacteria in ME/CFS patients’ feces was unclear.

- Recent studies which have shown that reduced activity levels are associated with reduced levels of butyrate bacteria suggest one reason why butyrate-producing bacteria may be low in ME/CFS.
- People with ME/CFS could be caught in a kind of low butyrate “loop” where low butyrate levels spark inflammation, which produces fatigue thus reducing activity levels, reducing butyrate levels further, etc.
- Given that, it’s possible that increasing gut butyrate levels in ME/CFS could reduce inflammation, reduce fatigue, increase activity levels, etc.
- An upcoming blog will focus on increasing butyrate levels.

Digging even further into the butyrate mystery, the authors found that one of the four butyrate-producing pathways – the dominant one called the CoA pathway – was responsible for the butyrate deficiency found.

The fact that three different techniques (qPCR, metabolomics, metagenomics) have now found low butyrate-producing bacteria in ME/CFS makes the butyrate gut finding possibly one of the most solid findings in ME/CFS.

The fact that more people with ME/CFS than healthy controls (10%-2%) were taking supplements (prebiotic fiber) which should have *enhanced* their levels of butyrate-producing bacteria present only increased the mystery about the low butyrate levels studies have consistently found in ME/CFS.

## **Bacteria Packed Feces**

Another interesting finding concerned the fact that the feces of the ME/CFS patients were packed with more bacteria than normal. The authors discarded antibiotic use, acute malnutrition, and inflammatory bowel diseases as possible causes and suggested several possibilities: low levels of FODMAPs (fermentable oligo-, di-,539 mono-saccharides, and polyols) foods, small intestinal bacterial overgrowth (SIBO), greater bacterial “washout” or the loss of bacteria that adhere to the mucosal walls.

FODMAPS diets can be helpful in IBS and SIBO appears to be common in ME/CFS. (The idea of malnutrition was intriguing – at least to this layman’s mind – given that the metabolomic findings in ME/CFS mirror those found in starvation and the possibility that the cells of ME/CFS patients may be starving in the midst of plenty. Could people with ME/CFS also not be utilizing all the nutrients in their food?)

## The Activity Question

We don't know why the butyrate-producing bacteria are so low in ME/CFS but low levels of physical activity may come into play. [Recent studies](#) (mostly done on rodents) indicate that physical exercise stimulates the same butyrate-producing bacteria that are deficient in ME/CFS.

## [Beating the Bloat: FODMAPS – the Best Diet for Irritable Bowel Syndrome](#)

It's not clear why this is so but numerous possibilities (reduced gut motility, reduced blood flows to the gut, circulation of bile acids, etc.) exist. The association this study found between reduced butyrate levels and fatigue could, then, be caused by the lower activity levels that more fatigued people with ME/CFS engage in. (On the other hand, low butyrate levels are found in many diseases (inflammatory bowel disease (IBD), IBS, celiac disease, colorectal cancer, obesity) in people with COVID which do not feature the extreme activity limitations found in ME/CFS.) Clearly, we need gut studies that also assess activity levels to address this issue.

It's clear to me personally, though, that low activity levels are not responsible for all the gut perturbations in ME/CFS as I am not deconditioned (and have the Oura stats to prove it), yet I still intermittently suffer from irritable bowel syndrome.

In a sense, the activity question doesn't matter. Given that the guts of people with ME/CFS and perhaps fibromyalgia and long-COVID patients have low butyrate levels which could result in gut inflammation, leaky gut problems, and perhaps even systemic and neuroinflammation – the question is what to do about them?

It's possible that people with these diseases are caught in a kind of low butyrate loop: their lowered activity levels (or something else) resulted in reduced levels of butyrate-producing bacteria – which then produced inflammation and leaky gut (particularly as a result of exercise), which resulted in more fatigue and less exercise, which further reduced their butyrate levels, and on and on.

One way out of this loop might be to increase butyrate levels, thus reducing the inflammation and leaky gut (particularly after exercise) allowing people with ME/CFS to be more active, resulting in more butyrate production, higher activity levels, etc

1. Don't want to ruin your upcoming post, Cort, but I just read that eating nuts can increase butyrate-producing bacteria. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7468923/> Don't know if that will work for me/cfs folks.

Reply



• **Cort Johnson** on November 10, 2021 at 2:13 pm



Reply



• **Ghassan** on November 11, 2021 at 11:28 am

I have been taking probiotics for few months now resulting in reduced inflammation and muscle pain but still fatigued and stressed specifically at mornings.

I was wondering if there is any specific probiotic I should take, I keep reading about different probiotics that don't seem to be in any of the products that I see in the pharmacy! Any advice much appreciated.



• **Vacelia Goodman** on November 13, 2021 at 3:26 am

Not well



• **Danielle** on November 13, 2021 at 8:15 am

This is fascinating and makes sense. I completely cured my sons seizures, severe epilepsy LGS diagnosis, by switching to the low glutamate diet and removing all triggers Onfi, Keppra, Trazadone, Miralax, and Epidiolex, and baclofen.

Dr. Kathleen Holt out of American University has published studies showing huge improvements made for fibromyalgia patients and gulf war illness patients. See link and search for videos she has made talking about the benefits. <https://www.american.edu/cas/health/nutrneurolab/studies.cfm>

I did the diet for a week and by day 3 my fibro pain was melting away. It is just hard to stay on when tired and can't cook and I have a sweet tooth. I wonder if Kathleen and Columbia could connect, bet there is a lot of overlap with their research. Kathleen is wrapping up a pediatric epilepsy study soon that was

showing promising results with the Low Glutamate for pediatric epilepsy patients.

It all starts in the gut.



• **Laurence Schechtman** on November 10, 2021 at 8:41 pm

Can increasing butyrate or butyrate producing bacteria cure or ameliorate Chronic Fatigue? That's what I want to know.

And it shouldn't be hard to find out. Just give people with CF, who also have low butyrate, a supply of the substance, and/or of the bacteria, and compare them with placebo fed people.

We already know there is an ASSOCIATION. Now let's discover the direction of the CAUSALITY.

I will be happy to volunteer for the Clinical Trial.

[Reply](#)



• **Carole Rushing** on November 14, 2021 at 9:29 am

I have been Gluten free , Soy free, and dairy free as much as possible for 3 years. Definitely can tell a difference. You do what you have to do to feel better. I also take a Good Probiotic 2 times a day. AM and PM. One is Klaire Labs Pro 5. The other is Master Supplements Theralac. Also

Pure Encapsulations COQ10 120 mg 2 times daily. I have not had Red meat in 4-5 years. Some Chicken with no gravy or crap Baked. These are things you can do for your self. But you do have to stay with it. I do not drink or smoke , no cokes , no orange juice . But I do eat oranges.



- **Kay** on November 15, 2021 at 6:44 pm

Butyrate is MADE in the gut. You can't supplement it effectively.



- **Zapped** on November 22, 2021 at 1:28 pm

<>

FWIW, I've recently been hit hard with new IBS symptoms, after 35 years with CFSME. I was surprised when my gastroenterologist specifically prescribed "Align," vs other. This is from label:

Supplement Facts

Serving Size: 1 Capsule

Servings Per Container: 63

Amount Per Capsule

Bifidobacterium longum subsp.

longum 35624TH+

20 matt

† Contains one billion live probiotic cells / CF when manufactured and provides effective level of ten million probiotic cells / FU until at least the “best by” date.

†+ Daily Value (DV) not established.

Other ingredients:

Microcrystalline cellulose, hypromellose; Less than 2% of: magnesium stearate, caramel (color)

Contains: Milk

DIST. BY: PROCTER & GAMBLE,  
CINCINNATI, OH 45202



• **Sara** on November 10, 2021 at 10:26 pm

That's interesting about the nuts! I eat a LOT of nuts, and they definitely have not cured my CFS/ME – but I will pay closer attention to how they make me feel with regular ingestion 😊

[Reply](#)



• **Tanya** on November 11, 2021 at 1:16 pm

Same here! If nuts were a solution, I wouldn't be bed bound.



**Anita** on November 27, 2021 at 5:52 pm

I heard most beneficial are almonds and pistachios.

However, I think the caveat is to have butyrate producing bacteria in the first place. That's the hard part. It takes a long time to rehab the gut. >1 year.

There are butyrate supps that may help in the meantime whilst rehabilitating the gut.



**Naga Choegyal** on November 11, 2021 at 1:02 am

I am absolutely in tune with this report, which confirms my intuitions and current practice, as a three decade ME/CFS victim of establishment gaslighting, who long since has resorted to cutting edge research and self-care. I understand and have experienced that nuts do tend to have significant amounts of oxalate which may be irritant and also can block the absorption of nutrients.

If not consumed with great care, in moderate amounts they may cause purging and \*must\* be very well chewed ( to cream) in moderate amounts or powdered in a blender and added to smoothies.

That's my experience, and in ME/CFS, one size does not fit all.

[Reply](#)



**Mary** on November 12, 2021 at 3:24 pm

Some contend nuts must be soaked to remove irritating substances.



• **Carole Rushing** on November 14, 2021 at 9:32 am

I eat Raw Almonds all the time. The only one that does not bother me. All Natural.



• **Kaz** on November 11, 2021 at 1:02 am

Hope there's more to it than eating nuts 🤔

[Reply](#)



• **Kate** on November 11, 2021 at 2:55 am

Well it is worth a try, but I eat a lot of nuts, almost daily, and that hasn't worked for me. Unfortunately.

[Reply](#)



• **Christine Robins** on November 11, 2021 at 9:40 am

The article is a meta-analysis of 8 nut-gut studies. The authors conclude:

“The quality of the included trials was poor, with no studies experiencing low risk of bias across all domains. Overall, the strength of evidence from the meta-analyses is weak.”

[Reply](#)



• **Carole Rushing** on November 14, 2021 at 9:34 am

No one wants to hear this-but “CUT OUT THE CRAP FOOD AND DRINKS”. YOU KNOW WHAT THEY ARE!!!!!!



• **Karien** on November 11, 2021 at 10:28 am

I find that most types of nuts makes it worse. Cashews, for some reason, don't.

[Reply](#)



• **RonP** on November 15, 2021 at 12:09 am

Nuts increase Serotonin, good or bad depending, bad for me.



• **Oliver** on November 11, 2021 at 7:08 pm

Mast cell activation with nuts tho...why is there always another snake rearing its head wherever you turn with this disease

[Reply](#)



**Noah** on November 14, 2021 at 10:52 am

100



**Robert Miller** on November 13, 2021 at 7:02 pm

I wish I could eat nuts, I am unable to digest so many foods, and nuts is at the top of the list! I can digest proteins from fish & poultry. I am very limited with fruits & vegetables as well. I do best juicing both as I cannot digest them! Been fighting this for 20 plus years, but the past decade has been horrible, GI specialist after specialist, No help! Doing in depth GI & Bacteria testing to use "appropriate " Probiotics again! This part of MECfs really sucks! Thanks Cort for doing what you do to keep us all on the cutting edge of science and treatments!

[Reply](#)



**Alicia** on November 16, 2021 at 1:40 pm

These doctors are frauds.

Mold caused my plethora of digestive issues and infections and it wasn't until I got out of exposure did my

gut return to normal. To blame a person's gut for why they are sick not on the external factors that could be causing the disarray in their microbiome is misleading. Shame on them.

[Reply](#)

2.



**konijn** on November 10, 2021 at 3:04 pm

all good and well, glad to read an ME/cfs study, but what about the faecal transplants? that help some, to a certain degree? and what about the findings before and after VO2 max test/exertion the microbiome changes in ME?

i find it so bedridden that eating "a few nuts", will get me out of bed a little bit simplistic...

i even do not know what to think about the whole study in comparison to what the found before (before and after exercise, the guttransplants, etc) cort, in an other post you put the link of the women who took so many pre and pro biotics, where you have written about. i got the text but all the links in it do not work anymore. is that normal? can you help? thanks!!!

[Reply](#)



**Cort Johnson** on November 10, 2021 at 4:16 pm

There are various ways to increase butyrate levels in the gut – I didn't know about nuts until now – but I promise there are more ways 😊

Thanks for mentioning the exercise study which showed leaky gut after exercise. There's been one fascinating study (<https://pubmed.ncbi.nlm.nih.gov/26683192/>) which showed this which could really use a major update

- as it showed how exercise could be producing inflammation and fatigue and, of course, PEM.  
Here's the link to the woman who poured probiotics into her system and recovered  
- <https://www.healthrising.org/blog/2016/01/07/probiotics-cure-my-chronic-fatigue-syndrome/> - Everybody should note that some people can actually do worse on probiotics.  
The gut obviously counts in ME/CFS - we just don't know how much.

[Reply](#)



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**konijn** on November 10, 2021 at 5:03 pm

thanks cort for the link, but you had already given me that. but in the article, if i open it, there are some blue things to click on in your/her text. and it simply does not work. how can that be? you have written it. now i tried with the word "blog" in the text and a "crazy" site showed up. normally i would think it would still be a "link" to the original text that would be mentioned. does it disappear after x years?  
yes, the gut is important in ME/cfs as you write. but how...  
I saw once a webinar on gutmicrobiota and wich diet was good for wich person, it was really

personalised. it was crazy what you saw.

maybe whole our gut problems are also personalised medicine because we are all so different.

I do not know if this study is from the centers of excellence where, i really give it him, ian lipkin was the only one who stood up and several times said with that kind of money, we will not get verry far. all the rest was quite.

and with the litle money for ME/cfs, what is there still all to research on the gut? where no money is for? but thank you for a piece of hope i certainly need, like many of us do.



- **Cort Johnson** on November 10, 2021 at 5:19 pm

Hi Konjin, I believe she wrote the blog and am not sure where those links should go.

This was, I believe (but am not sure), from Lipkin's NIH-funded ME/CFS research center.



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**Naga Choegy** on November 11, 2021  
at 1:05 am

Some people may appear to do worse on probiotics due to injudicious use and the Herxheimer reaction. q.v.

Festina lente!



•

**Kaz** on November 11, 2021 at 1:06 am

My baseline is dependent upon daily probiotic intake (have been taking for 3 years now). I'd been informed this is due to the immunomodulating effects of them I.e they suppress over-active immune response. If I miss more than 3 days taking them I get very ill.



•

**Dom** on November 12, 2021 at 2:23 am

I've implemented Carol's protocol and it's been brilliant for me. But I get to a point where more probiotics don't seem to do anything. I'm constantly stuck in a bell curve of remission and relapse. Although this only occurs after vaccinations currently. I've felt pretty great taking solarray 24 strain and Dr mercolas

probiotics. I've also introduced fos, psyllium husk, garlic extract and egcg (green tea).

The thing is I now suffer from neutropenia and if my calculations are correct I'm due to become severely neutropenic in about 3 months. ME doesn't just disappear when you find something that works – it can in fact make you feel worse in other ways. It's an extremely complex disease.

Cort I also found it very interesting that you cited patients were already taking fibre but they had very low levels of the key bacteria. If so none of us would be able to rectify the missing bacteria with say biomesight suggestions because something else is causing it.

As ever I get a bit tired of seeing these studies that prove what has sometimes already been proven. We need to know why the bacteria are in such a bad way and why we can't fix it by taking more fibre and more natural extracts that are meant to help feed the right bacteria. If it works for healthy controls why doesn't it work for us?



**Lono** on November 10, 2021 at 6:44 pm

Konijn,

Apologies for the long reply. Hopefully, you're up for it. I am always reluctant to give any advice about ME/CFS symptom management. People are very sick and I am not a doctor, just another ME/CFS patient (acute onset, post Ross River virus). I would never want to make anyone worse, yet alone someone who is bedridden. However, I think I'm in a reasonably unique position to comment on ME/CFS and FMT.

I wrote a summary of my FMT experiences here (in the comments section) and it has more detail:

<https://www.healthrising.org/blog/2021/08/11/gulf-war-illness-herbs-gut-chronic-fatigue-fibromyalgia/>

The more of these study results I see, the more I feel my experiences are representative of these studies. My message would be that you cannot underestimate how powerful FMT treatment can be for ME/CFS symptom management. In my experience, it works within 24 hours. But it has to be done safely.

I live in Australia, where FMT is constrained but not banned. I've seen multiple different professors of gastroenterology about FMT and ME/CFS. This includes Prof Tom Borody's clinic in Sydney. Finding his case study paper was the first time I learned of the ME/CFS and FMT link and dramatic symptom improvement. So I haven't gone the quack option on this at all.

I've also done the full spectrum of FMT approaches. This includes "backyard" enemas (working with my general practitioner in regards to the safety aspects like donor screening) through to the hospital colonoscopy FMT procedures. A recent conversation with my current,

outstanding gastroenterologist (a Harvard trained researcher and clinician) backs up my experience. That is, enema FMT seems to be as effective as colonoscopy. A lot of clinics use a combination of both protocols. I believe donor quality is paramount – I elaborate on that in the above linked blog comments. More specifically, I believe a single athletic donor is more preferable to the diversity of microbiome delivered through multiple-donor-FMT products typically found in a clinic. See the above section on “The Activity Question” for why that might be the case – i.e. exercise stimulation of butyrate-producing bacteria. I don’t think microbiome diversity is the core driver of symptom improvement when using FMT for ME/CFS. By contrast, microbiome diversity probably is key for treating many other GI diseases, e.g. CDI (the “original” clinical use of the FMT procedure). One significant difficulty is that FMT is still effectively a research protocol for ME/CFS. It may not even be accessible in some countries, at all. Additionally, there is significant expense going down the FMT clinic route. The “backyard” enema approach is on time and on budget. I mention this because this is a major consideration for many long term ME/CFS sufferers. However, FMT carries unacceptable risk if not co-ordinated with a health care provider (e.g. for donor screening, avoiding bowel perforation). I might be being completely irresponsible by saying this, but no one can stop you doing it. The core product is readily available and likely to remain so. But in the day and age of Covid-19 (amongst many other reasons), you’d be mad to go it alone without proper medical service provider support.

For me, my FMT experience all started with a microbiome scan. I’ll send Cort my original American Gut scan results

- maybe that can be made available on HealthRising somewhere. My microbiome was a mess. So I reasoned I was a contender for FMT. Perhaps now with this more detailed information (i.e. the above study results), more specific conclusions about microbiome diversity and constituents relative to ME/CFS symptoms could be deduced from microbiome scans.

The fact that symptom reduction does wane over time post FMT (for me at least) always made me believe there was something "upstream" causing problems for the microbiome in ME/CFS. The CoA pathway influence on butyrate-producing bacteria makes sense to me. I wonder how many ME/CFS patients have had (like me) an appendectomy? The appendix is (amongst other things) meant to act as a reservoir for bacteria when recolonising after different GI events.

Finally, recently my gastroenterologist recommended butyrate supplements. As I understand it, the problem is getting the supplement to the right place in the gut without it being destroyed along the way. I'm going to appear obsessed by saying this, but I wonder if enema delivery of butyrate would help for ME/CFS? It would be about a lot more pleasant than FMT, relatively speaking, though perhaps not as long lasting. Butyrate enemas seem to have a history of research in ulcerative colitis treatment, e.g.:

<https://pubmed.ncbi.nlm.nih.gov/1612357/>

Reply



• **konijn** on November 10, 2021 at 7:35 pm

@lono, i could not use the replay button.

thank you so much for the effort it took to write this all!!!



**kaz** on November 11, 2021 at 2:35 am

I too had an appendectomy and loosely theorised a few years ago (when I read and a new theory at the time on the usefulness of the previously considered 'useless' organ) that having it removed was the source of my problems with M.E. Added to this was the fact that the only thing other than diet that helps me is regularly taking powerful probiotics (if i miss a few days I start to go down hill quickly) – essentially supplementing what the appendix had reserves of. In retrospect it is quite clear than since it was removed at the age of 16 i would catch colds very easily; in my 20's it was at it's worst, getting colds and mild flu's every other other month whilst at college. When I was 30 i had a stressful job that tipped me over the cliff and the rest is my history with M.E.

I looked into FMT treatment here in the U.K a few years back, but the most reputable clinic seemed to have some bad reviews, or were sourcing their the donors unscrupulously, or something, i forget the exact reason. The other option involved being put in touch with donors via a kind of community website setup up by a Redditor, but that seemed too risky, and today post-Covid even more so.



- **kaz** on November 11, 2021 at 2:49 am

Quick Q. I had this microbiome test done

– <https://atlasbiomed.com/uk> – apparently the results didnt flag anything very bad. Is this test reliable?



- **Kate** on November 11, 2021 at 3:30 am

Kaz, can you possibly share which products you are taking and how much? I would love to try. Thank you so much,



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**Kaz** on November 11, 2021 at 3:56 am

Hi Kate, i've tried lots of different probiotics (prebiotics make me worse), and it was through trial and error that I found the right formula/approach – some like S Boullaardi had a horrible effect that took a while to correct. I tried a range of narrow spectrum/low-count probiotics to see if I could target a specific issues, but none of those worked. The only ones that seemed to help me were high spectrum large bug count ones, and those took about a month to kick in and do something. I currently take Bio Cultures Complex 120 Billion CFU by Aavalabs and before that i took Renew Life Colon Care (until they changed the formula). I would never endorse them being used because ive read that some have bad experiences with them. I was first introduced to them by a professional who prescribed a low bug count one (Bio-Kult Advanced Multi-Strain). Perhaps dipping your toe in with the low strenght ones would be a way to start? It is so very personal and it took me a few years to work out what was working – there's no quick route through it unfortunately.

Besides these products I would first just focus on diet. For me the biggest breakthrough came with eliminating all carbs and sugar from my diet. I am essentially paleo, but with some dairy thrown in, and I do not eat any fruit (other than lemons/limes). Only green vegetables, chicken/fish, nuts and goats cheese/cultured yoghurt – red meat I find to be inflammatory, and even fish is questionable these days – and not caffeine at all – even decafe tea/coffee has trace ammounts of caffeine in that really mess with me. I only drink Roiboos tea now. Whaever you do, do it slowly and monitor your reponses/act accordingly, it really is (unfotunately) trial and error and no health care professioanl ive consulted with has been able to do more than ive done through slow and careful testing



• **Christine Robins** on November 11, 2021 at 9:19 am

What's "FMT"? I don't see this term in either Cort's article, or your own.



- **Jason** on November 11, 2021 at 9:36 am

Does anyone know of where in the US you can go to give FMT a try?  
Thank you Lono for all the detailed info



- **Lono** on November 11, 2021 at 1:58 pm

Kaz,  
That question is a bit above my pay grade. A molecular pathologist might be able to answer it. The company you mentioned does 16S rRNA analysis. There is also metagenomics. Here is an article comparing the two techniques (in chickens):

<https://www.nature.com/articles/s41598-021-82726-y#Sec7>

Here is a post about metagenomics (less technical):

<https://insight.microba.com/blog/how-does-metagenomics-work-solving-the-puzzle-of-your-gut-microbiome/>



- **Lono** on November 11, 2021 at 5:17 pm

Christine,  
Faecal (or Fecal) Matter (or  
Microbiome) Transplant.  
And about as weird as it sounds, for  
those new to the concept. But when  
you've been sick enough for long  
enough, results dwarf weirdness.



• **Carole Rushing** on November 14, 2021  
at 9:41 am

Lono- Thank you for the great Post.  
So interesting. You cannot eat what  
you want to and get better. This is my  
bottom line.

3.



**Matthias** on November 10, 2021 at 3:13 pm

Interesting study.

I guess the big question is whether these things are contributing to the  
symptoms of the illness, or rather are a secondary factor.

[Reply](#)



• **Cort Johnson** on November 10, 2021 at 3:56 pm

I think even if low butyrate is a secondary factor it  
probably is contributing to the symptoms. It does, after  
all, promote inflammation and has been found in other  
chronic diseases. So many things are off in ME/CFS that

its hard to know what the source is but improving any of them would help I would think

[Reply](#)



• **sunie** on November 11, 2021 at 8:06 pm

Cort, what if this is like the dauer vs dying enigma.

while it may be normal to have more butyrate, what if there is a reason to not increase it?

sort of like hibernation state keeps person alive



• **Naga Choegyal** on November 11, 2021 at 1:15 am

I believe it's a chicken/egg situation; whichever was first. It's a circular concatenation of cause/effect and the important thing to do is to disrupt the vicious circle and apply the remedies when and where applicable.

Maybe we did contract M.E. post-infection...was the infection a consequence of low immune function thanks to microbiome deficiency? 🤔

[Reply](#)



4.

**Joy Kay** on November 10, 2021 at 3:21 pm

I wonder why that study used almonds and pistachios? I eat alot of walnuts and pecans.

[Reply](#)



• **Marsha T Wallace MD** on November 10, 2021 at 3:49 pm

Almonds (more than 10 ) ,cashews and pistachios ARE the highest in FODMAP while pecans and walnuts are low.

[Reply](#)



• **Merry** on November 10, 2021 at 4:19 pm

Pistachios & almonds are no-nos on FodMap

[Reply](#)



• **Dom** on November 12, 2021 at 2:25 am

Your forgetting about glycophosphate too. Take enough of the non organic nut and if your in America your going to be poisoning yourself at some point.



5. **Josh** on November 10, 2021 at 3:30 pm

Can one not just take butyrate supplements?

[https://bodybio.com/products/butyrate?currency=USD&variant=34379613044871&gclid=EAlaIQobChMIjMKAkuyO9AIV9MuGCh3tMgUEEAQYBCA BEgLDNvD\\_BwE](https://bodybio.com/products/butyrate?currency=USD&variant=34379613044871&gclid=EAlaIQobChMIjMKAkuyO9AIV9MuGCh3tMgUEEAQYBCA BEgLDNvD_BwE)

[Reply](#)



**Galia Shapiro** on November 10, 2021 at 5:15 pm

Josh and others:

My liver fried out twice this past year but I was on Body Bio butyrate.

How did I feel then- I don't know..Too many other variables.

I DO test low for butyrate and have low diversity.

The experts who reported this study said they didn't know if taking butyrate could be negative. I am certainly no expert but cannot see why it would be negative.

I just reordered fresh BodyBio.

People complain the capsules are smelly...

I don't anticipate swallowing these caps. to be a gourmet experience.

The sulphur-like odor is (to me) no big deal at all.

It does not regurgitate on me.

I'll try to remember to post again later, in case it is helpful.

Mast cell activation is very bad right now..

That which was tolerated now is not.

So hopefully butyrate will be ok.

I

[Reply](#)

6.



**Wayne** on November 10, 2021 at 3:32 pm

Very interesting. Thanks Cort.

In one of my previous Gut/stool tests the results for Aerobic bacteria were: "E-coli 0.09%," and the reference range was "70-90%".

Most of the aerobic bacteria should have fallen into one of 4 groups, but it didn't.

There was 99.83% "Other" bacteria noted.

Also, the "Aerobe/anaerobe index was only 0.3, where as the reference range was 1.0-2.0

I had severe malabsorption at that time, that was improved with digestive enzymes.

[Reply](#)



•

**konijn** on November 10, 2021 at 4:02 pm

wayne, may i ask wich gut/stool test you had? and is on the result of it written wich digestive enzymes to take and wich malabsptions you had? I live in belgium, 98-99% bedridden so if i can, i send my stool to there. but i need to know wich malabsorptions and digestive enzymes to take to show to my gp.

And may i ask, did you feel better afterwards? a bit, much, a lot? ofcourse i do not know on wich level you function. And if better, what symptoms got better?  
thanks a lot!!!

[Reply](#)



•

**Jeremy** on November 10, 2021 at 7:56 pm

I took butyrate supplement and shortly after began feeling extremely sick...sore throat, fatigue worsen, pains, developed congestion, drainage and severe coughing. Super intense and hard to deal with, and matches the same symptoms I had in 2001 when I had my "triggering event" that put me into the world of CFS. Had a similar experience with LDN. Could not tolerate, so had to stop. I believe my guy is severely out of balance but in order to fix it wld need such an intense immune response that I almost need to be hospitalized in order to go through it.

[Reply](#)



7.

**Bob Lavender** on November 10, 2021 at 4:14 pm

Such an interesting article Cort. As a long term ME/CFS patient I have recently undertaken gut permeability tests, expecting to see "leaky gut syndrome". To my doctor's surprise the test revealed "poor nutrient uptake from the small intestine". This article certainly gives me a deal of hope for future research in the role of the gut in ME/CFS.

[Reply](#)



•

**Cort Johnson** on November 10, 2021 at 4:22 pm

Ha! Poor nutrient uptake from the small intestine....Fascinating. What was treatment recommendation?

[Reply](#)



• **RjW** on November 11, 2021 at 11:18 am

Poor nutrient uptake is currently on my radar; I read recently that candida overgrowth can cause a film to the stomach lining which reduces absorption of nutrients?!



• **konijn** on November 10, 2021 at 5:05 pm

may i ask wich tests? thank you!!!

[Reply](#)



8.

**Edith Bouvier** on November 10, 2021 at 4:14 pm

I am on a Amino Acid compounding prescription because I cannot digest or synthesize protein. It contains butyrate. The reason I know this, is because the compounding pharmacy issued me the mix one time that was missing butyrate because of a shortage issue and they advised me to buy it in supplement form & take it with my Amino Acids. I found the Genestra brand Butyrate complex from an online health food site. I can't remember what site, but a person could do a internet search to find it in your own Country.

[Reply](#)

9.



**befuddled** on November 10, 2021 at 4:19 pm

Why does all the ME/CFS research continue to ignore that parasites exist, and they can and will cause the same symptoms?

[Reply](#)



•

**Cort Johnson** on November 10, 2021 at 4:22 pm

I don't know why parasites are not studied as I would think the same: they're pathogens, can interfere with nutritional absorption, cause gut problems. Giardia is classified as a parasite and studies show it can cause ME/CFS. This is a small field – and it shows.

[Reply](#)



•

**Chris Pfeiffer** on November 10, 2021 at 6:35 pm

I always wondered if the Giardia aided in the move to CFS or whether it was the antibiotics used to treat Giardia (Flagyl or metronidazole)



•

**Carole Rushing** on November 14, 2021 at 12:28 pm

The Parasites are a big issue. Most Physicians do a stool test and say no. When you know and see them. I do not get it. The Probiotics I take do wonderful with this issue. As tests do not always show it up. That may sound crazy but I have had at least 10-12 tests. They all say no on Parasites. This is from diff Labs???

[Reply](#)

10.

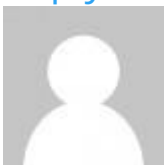


**Ange** on November 10, 2021 at 4:39 pm

I was diagnosed with ME/CFS in early 2016 after getting dengue fever, a kidney infection, taking antibiotics that then gave me gut problems followed by some other virus, all within a four-month period. I was moderate to severe over a 4 year period, trying everything I could to finally see some progress and then another year to get to 95% recovered. Around the 4 1/2 year mark, I found a naturopath that specialised in gut issues. He found SIBO and it took just under a year to resolve PEM, POTS, restless legs, and chronic pain and somewhat improve my brain fog. I recently did an elemental heal diet (gut healing) and my brain fog seems resolved now. To help with insomnia I used CBD oil. It wasn't a quick fix and I know people recover in all different ways but I still highly recommend anyone who has ME/ CFS to try to fix your gut as a way to heal.

[Reply](#)

11.



**Learner** on November 10, 2021 at 4:57 pm

According to my microbiome testing, I have good butyrate production. What did they find out about oxalates? Were oxalate degrading bacteria killed off by patients' use of antibiotics, which can cause a cascade of health problems?

Reply



• **Cort Johnson** on November 10, 2021 at 5:20 pm

They did not find increased antibiotic use in the ME/CFS patients – so discarded that as a source of their microbiome issues. I didn't see anything about oxalates. Acetate, however, was reduced.

Reply



• **sunie** on November 11, 2021 at 8:16 pm

there is a researcher studying college students and trying to see which eventually get cfs me would not there be info to show looking back if gut issues were pre or post?



12.

**Chris Pfeiffer** on November 10, 2021 at 6:34 pm

Hi,

The gut issue is at the heart of Ken Lassen's blog <https://cfsremission.com/>

He has succeeded in restoring his health through gut alteration.

In other notes, I improved my health significantly with and FMT 1.5 years ago, however in the last 3 weeks, I have been wiped out again to a level I had not felt since before the FMT.

I worked with Dr Cheney and he recommended the BodyBio liquid butyrate (but it gets expensive)

Dr Cheney

[Reply](#)



• **konijn** on November 10, 2021 at 7:38 pm

thak you verry much, am desperate

[Reply](#)



• **Chris Pfeiffer** on November 21, 2021 at 12:46 pm

Hi Konijin,

I feel your desperation. I am in the midst of my worse relapse in 8 years, but I am pretty sure I can get much better again, although there are days currently where I wish I were dead.

As I said above the FMT helped me like nothing else, and this recent relapse is leading me back to trying to figure out why it wasn't a better cure. So, I am now focusing on the Briggs protocol and SIBO and the information in [cfsremission.com](http://cfsremission.com) along with the goal of doing another round of FMT. I recommend starting to read the

website <https://thepowerofpoop.co>

**m/** to familiarize with the idea of FMT and the Briggs protocol. The basic steps I am looking to do are Heal the Gut, which includes removing biofilms, killing off bad bacteria, and trying to restore good bacteria (Briggs Protocol and cfsremission are good places to start) as well as diet. Patience and stress reduction are important . This is my my biggest challenge as I am going through divorce, had to move to a new city to be close to my kids, and have no friends and I am trying to keep my work from home job which has become much harder with this relapse. The next hardest part is finding and screening a poop donor, but thepowerofpoop has some more suggestions. It has to be a relationship as you are going to want to have access to this persons poop for 2 weeks to 6 months. That does not mean you do a transfusion every day for 6 months.

If others are interested in working towards this goal, I would like to find like minded people to work with and set up a group to work together as this process takes energy and a functioning brain both of which I have limited amounts of at the moment.



• **Mavis** on November 12, 2021 at 8:46 am

Was just going to mention Ken's blog.  
It was through his blog I learned of Miyarisan, a Clostridium bacteria that both prevents C. difficile AND produces butyrate. Manufactured in Japan. A bit hard to get. We take it.

[Reply](#)



13.

**DAVID John GRIFFITHS** on November 11, 2021 at 12:24 am

The science is becoming clearer that a gut dybiosis is the root cause of many neurological diseases and the understanding that the same gut dybiosis is responsible for other chronic health conditions..

There are protocols to address the gut dysbiosis. First, clear the garden of weeds and poisonous plants. This is done with an elimination diet and natural antibiotics. With a clean soil we can plant good guys. Fermented foods and lots of prebiotics. Diversity is key. Phil Spector of Kings college has shown how quickly you can change the microbiome.

The key to butyrate is fibre and resistant starch. Fibre is the key. Fibre gets broken down into short chain fatty acids. Butyrate is a SCFA..

Resistant starch is baobab powder, green bananas, reheated rice and potatoes. The starch can't be digested in the stomach but passes into the colon where its digested and butyrate is generated..

Ive healed a chronic autoimmune disease with these protocols and it continues to help my severe long covid..

[Reply](#)



• **Cort Johnson** on November 11, 2021 at 8:43 am

Thanks David for sharing that.

[Reply](#)



14.

**Gijs** on November 11, 2021 at 6:05 am

I agree with you Cort that bacteria in the gut play a role in ME. I even thought for a while that this was the cause of ME. Bacteria produce endotoxins, this could explain everything.

I also do not rule out enteroviruses as a cause.

[Reply](#)



15.

**Jennifer Haden** on November 11, 2021 at 6:07 am

I've been wondering if sodium butyrate supplements would be of any help. But I was thinking making enemas or suppositories out of them to try to get them where they should be. I wonder if anyone has tried this yet?

[Reply](#)



16.

**Janet Mosser** on November 11, 2021 at 7:24 am

look for guidance from GAPS Diet

Gut and Psychology Syndrome by Dr. Natasha Campbell-McBride, MD,

MMedSci (neurology), MMedSci(nutrition)

A careful low and slow approach to fixing the gut. Cort just published

information about the strength of using fermented foods for gut improvement and this program follows that theory but with VERY careful increments to get there.

[Reply](#)



17.

**Nico** on November 11, 2021 at 7:29 am

I just ordered butyrate today. Never heard of it before. I have intermittent IBS issues, and had it pretty severely about 5 years ago. Yesterday I read something that dandelion leaves are a good source of butyrate. Interestingly enough I've been eating dandelion leaves from the grocery store a lot in the past few months. It's like I can't get enough of them sometimes! Anyway, this is really interesting. Thank you again, Cort. Fingers crossed yet again that this may help us get even closer to answers for MECFS. Hopefully no adverse reactions to the supplement, nothing stood out for me when I did a brief side effects search. (However, 1 supplement company put a lead warning on their label for butyrate! ??? )

[Reply](#)



18.

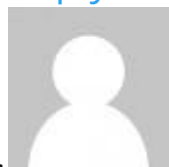
**Gijs** on November 11, 2021 at 9:59 am

what is the link with post viral fatigue and butyrate? I see no connection.

Can someone explain this?

Many patients I know had had problems with their bowels before they got ME.

[Reply](#)



19.

**Kira Sue** on November 11, 2021 at 12:17 pm

I've supplemented with butyrate and it worsens my digestive distress.

[Reply](#)



20.

**Dani** on November 11, 2021 at 1:55 pm

Hi Cort, amazing article, thank you! I would love for you to look at the link between low acetate and not only butyrate but the urea cycle as well as oxalate issues (because the body splits oxaloacetates into acetate and oxalate to get the needed acetate).

Studies have found out that acetate is produced by most of the enteric bacteria such as Lactobacillus spp., Bifidobacterium spp., Akkermansia muciniphila, Bacteroides spp., Prevotella spp., Ruminococcus spp., and Streptococcus spp and also derived through dietary input. Notably, it is a metabolite for combining with CoA to create the highly essential acetyl-CoA, which is a critical cofactor for the synthesis of every single acetylated metabolite.

eg.

Acetylcholine (involved in cognition and muscle activation).

Acetyl-L-Carnitine (involved in burning fat for energy, or "beta-oxidation pathways").

Acetylation of histones, performed by Histone Acetyltransferase (HAT) (the opposite

process of "histone deacetylase" (HDAC) – both are intricately involved in DNA

transcription.

N-Acetylserotonin (involved in neurological pathways).

.. and a vast number of others.

I'm quoting Joshua Leisk's paper "A New Hope" on CFS/ME, which you're probably familiar with. I think the low acetate is a key player in this mess.

Thank you for all your hard work man!

[Reply](#)



- **sunie** on November 11, 2021 at 8:23 pm

link to above paper

[https://www.researchgate.net/publication/350956432\\_CFSME\\_A\\_New\\_Hope](https://www.researchgate.net/publication/350956432_CFSME_A_New_Hope)

[Reply](#)



- **Mavis** on November 12, 2021 at 8:49 am

I think that's interesting because it kind of makes sense of the findings from Stanford about fermented food supplementation not increasing diversity, but increasing the hospitality of the gut TO diversity. It might be that the lactos produce the acetate that then foster other important critters.

[Reply](#)



21. **Marc K.** on November 11, 2021 at 4:01 pm

Byterate is the key. Taking byterate supplement is harsh on the digestive system, because it's an acid. So, I am 55 and have complete red, mutations from father and mother, of the FUTs gene. This gene is responsible for feeding the byterate making bacteria. I battled with chronic fatigue, especially after eating, due to very bad compromise to my gut lining, leaky gut. Itchiness, fatigue, cold extremities (feet), inability to handle thiols (sulfur) from food or supplements. Extreme chemical sensitivity. My blood brain barrier was weak. Immediate flood into my brain, if I absorbed something

into my blood stream, such as chemicals from skin lotion (absorb into blood stream; why do you think we can take magnesium supplements via dermal application?) I'd have canker sores all the time that would take 10 days to heal, and they would come so easily, too acidic of food to a slight nick in the mouth. I was a mess for majority of my life. I spent thousands on hundreds of supplements to try to solve including very expensive probiotics, all sorts of brands, prescription and not.

I was suicidal from the extreme health crisis I evolved into.

So, I now take one thing. I eliminated everything else I was trying or tried. I turned around 180 degrees and I am no longer dealing with the issues I mentioned above.

All my research led me to byterate. I experimented with ways if increasing my byterate, from potato starch, to twice baked and cooked potatoes, to probiotics for byterate, to Jerusalem artichokes, to a myriad of prebiotics. The one mack daddy that beat them all out was high quality, high fiber, green banana powder. I tried different brands and found one brand to be better than the rest. I take six tablespoons a day in a smoothie. It resolved all issues. That is a lot of banana powder. But it is all I take. Thousands in medical tests, supplements, mental gymnastics to figure out the balance daily. None of that anymore. It's miraculous for me. I won't mention the brand, because this is not about marketing. But if you want to figure it out, pay attention to the fiber content of the green banana powder. The one I take has much higher fiber content. I tried various brands and this brand really made a difference. Others were much weaker in creating the response I needed in my body. It has to be the correct prebiotic and enough of it to build up your byterate. I have experience with identifying low byterate as my main issue but attacking how to truly build it up in my system. If I miss three days of my regimen, my body starts degrading. Canker sores heal literally in one day. My dentist number my mouth and he had me bite down. He didn't see my cheek got caught and a major gash formed. He put in stiches to hold it together. My mouth healed so fast, I myself, took out the stiches the next day. Imagine what that healing capability is doing for the gut lining, for the blood brain barrier. Byterate is instrumental as the 'thing' that is used by the body to

affect the health of our gut lining. It turns on and off certain genes too. Magic stuff here and I'm proof in the pudding that this research is bang on.

[Reply](#)



22.

**Marc K.** on November 11, 2021 at 4:22 pm

Corrected my misspelled words and resubmitted this post.

Byterate is the key. Taking byterate supplement is harsh on the digestive system, because it's an acid.

So, I am 55 and have complete red, mutations from father and mother, of the FUTs gene. Meaning I'm completely lacking the typical response from this gene. This gene is responsible for feeding the byterate making bacteria. I was the colic baby that no one could figure out why. My FUTs was the culprit.

I battled with chronic fatigue (body would completely drain of energy and I'd feel like I was just hit by a Mack truck, especially after eating, due to very bad compromise to my gut lining), leaky gut. itchiness, fatigue, cold extremities (feet), inability to handle thiols (sulfur) from food or supplements (cysteine would create crazy reactions in my body), extreme chemical sensitivity. My blood brain barrier was weak. Immediate flood into my brain, if I absorbed something into my blood stream, such as chemicals from skin lotion (absorb into blood stream; similar to taking magnesium supplements via dermal application.) I'd have canker sores all the time, since teenage years, that would take 10 days to heal, and they would come so easily, too acidic of food to a slight nick in the mouth. I was a mess for majority of my life. I spent thousands on hundreds of supplements to try to solve including very expensive probiotics, all sorts of brands, prescription and not.

I was suicidal at the worst point from the extreme health crisis I evolved into. So, I now take one thing. I eliminated everything else I was trying or tried. I turned around 180 degrees and I am no longer dealing with the issues I mentioned above. It's been two years now.

All my research, from 30 years, led me to byterate. My challenge, how to increase it in my body? I experimented with ways if increasing my byterate, from potato starch, to twice baked and cooked potatoes, to probiotics for byterate, to Jerusalem artichokes, to a myriad of prebiotics, to high dosage from pills. The one mack daddy that beat them all out was high quality, high fiber, green banana powder. It is a resistant starch. With it, I tried different brands, spent money, time and effort and found one brand to be better than the rest. I take six tablespoons a day in a smoothie. It resolved all issues. That is a lot of banana powder. But it is all I take. Thousands in medical tests, supplements, mental gymnastics to figure out the balance daily. None of that anymore. It's miraculous for me. I won't mention the brand, because some will think it suspicious to recommend a particular vendor. But if you want to figure it out, pay attention to the fiber content of the green banana powder. The one I take has much higher fiber content. I tried various brands and this brand really made a difference, that I physically noticed. Experience is the Mack daddy of finding out the truth, for our bodies. Others were much weaker in creating the response I needed in my body. Their ability as a resistant starch was not as powerful, for whatever reason.

It has to be the correct prebiotic and enough of it to build up your byterate. It took dna and 30 years of struggles to identifying low byterate as my main issue but attacking how to truly build it up in my system was the next step. If I miss three days of my regimen, my body starts degrading slowly.

Now, canker sores heal literally in one day. To be honest mouth cuts do not develop into canker sores anymore. They heal in a day. My dentist numbed my mouth this year, first visit after a year break from letting COVID settle a little, and he had me bite down, to test my bite. He didn't see my cheek got caught and a major gash formed. My mouth was numb, I didn't know. He put in stiches to hold it together. My mouth healed so fast, I myself, took out the stiches the next day. He was to take out the stiches a week later. Imagine what that healing capability is doing for the gut lining, for the blood brain barrier. Byterate is instrumental as the 'thing' that is used by the body to affect the health of our gut lining, our mucous membranes. It turns on and

off certain genes too. Magic stuff here and I'm proof in the pudding that this research is bang on.

[Reply](#)



• **Mavis Dixon** on November 12, 2021 at 8:52 am

A more easily sources resistant starch that may be close to banana powder (or for those who prefer to diversiy) is potato starch (uncooked, mixed in smoothies).

[Reply](#)



• **Yannick** on November 15, 2021 at 8:31 pm

Hi Mark,

I looked at most brands of green banana flour. Most of them have about 10% fiber. The only one that I found with much higher content was Jonny's Good Nature. Is this the brand that you use?

How can they get 75% fiber in their product when every other brand has 10%. Is their label truly accurate?

[Reply](#)



• **Lono** on November 17, 2021 at 1:55 pm

I've got banana trees in the back yard. Green bananas are pretty rough to eat (like chalk). I'm not sure if they are as good as the powder (in terms of the amount "active ingredient").

I've got no idea of the ease or cost of sourcing these (depending on where you live). You can peel and freeze them. I'd be 99% sure they don't then have any problems with the freezing as far the fibre goes. From frozen bananas, some sort of smoothie in a blender is probably the go. That'll be about a thousand times easier than eating them raw anyway.

[Reply](#)



• **Holly** on December 21, 2021 at 9:35 am

Marc, thank you for all your information and for sharing your story. Did you have extreme constipation with all your symptoms? Like all your gut motility was gone? Or the other way around? I've tried alot of resistant starch and hasn't worked so far, only clogged it up further. But I agree, simple is better as I was doing lots of other things with that. There can be one thing/product/amount that turns it all around, after spending tons of \$\$\$. It's so individual and timing is important.

[Reply](#)



23.

**debsw** on November 11, 2021 at 11:57 pm

Thank you for sharing this info Marc. How incredible that you managed to get to the root cause of your lifelong health problems with banana powder. Am definitely trying some!

Your insightful comment about FUT polymorphisms really struck a chord with me and reminded me about Travis Craddock's research where he looked at 23&me records for nearly 300 patients. Nearly 80% of them had

genetic polymorphisms in the genes for mucus production. I didn't realise just how important MUC2 and FUT are for maintaining a healthy gut barrier and microbiome. Gut problems have always been such a major part of my illness, plus asthma and low resilience to all sorts of viral and bacterial infections since childhood, and so genetic issues are likely.

As so many of us also have MTHFR mutations, if we have leaky guts we probably don't have the greatest ability to clean up the mess.

Careful diet seems to be essential for me. After 25 years of experimentation, my best diet seems to be veges, fruit, wholegrains, nuts, legumes, a little meat, no gluten and not much dairy or refined sugar. I guess that is something akin to a Mediterranean diet.

[Reply](#)



• **Marc K** on November 12, 2021 at 5:19 am

Thank you for sharing. My issues with sulfur have direct correlation with my genes and my sulfur channels.

Mutations. Healthy biotin levels has for some reason had a positive effect on better handling sulfur. I can eat broccoli and garlic with no effect now. I'm still avoiding whey, the runoff in sour cream. I'll eat sour cream but pour off the whey. If I eat protein bars heavy with whey I can handle one or two but multiple everyday and still my body starts reacting again. Without the healthy biotin levels and I'm a wreck for a few days as my body eliminates, processes, the sulfur. Today, I eat as much broccoli as I want, all the garlic I want and I'm reaction free.

Gene mutation is a real thing, that affects a lot of people. A well oiled sulfur channel helps get healthy levels of glutathione working in the body to help detox the body

from heavy metals and chemicals we take in through food, water, air we breathe.

[Reply](#)

24.



**Maureen Hartnett** on November 12, 2021 at 10:22 am

I have done 15 min.-45 min. of aerobic activity on my recumbent machine nearly every single day since 1994 when I was diagnosed with FM. The slow recovery of said activity was one of the ways I discovered I had FM. (It took 6 wks to recover from the damage to my muscles!) But I gradually built-up the length of my exercise program minute by minute. Over the years I never saw any connection between my gut/IBS symptoms and exercise. It seems more to do with inflammation and food..perhaps a response to mast cell activation or malabsorption. All I know is Gastroenterologists need to increase their curiosity and help their patients fight these life-hindering symptoms!

[Reply](#)



• **Marc K** on November 12, 2021 at 1:24 pm

Inflammation is caused by compromised gut lining, vicious circle. Causes it and is the result of it. Byterate reduces inflammation. Try grounding too. Greatly reduces inflammation. It's what it is known for. Touch mother earth to ground the body.

[Reply](#)



• **Tara** on November 12, 2021 at 1:50 pm

Thank you for this information Mark. I also have a very compromised gut lining and tested low for butyric acid. Did you have to build up to those 6 TBS a day of green banana powder? I'm reading online that you need to take it slow in the beginning and gradually increase it as you can experience some gas or bloating as your gut flora evolves. And what about raw green bananas or plantains themselves? Thanks.



• **Carole Rushing** on November 14, 2021 at 12:51 pm

Maureen- I was an athlete and ran 10 miles a day when I became sick in 1987. I did quit running but kept up when I could walking long distance. Also taught Yoga before. I have found after this time. I have to do most of my exercises before I get out of bed. Yoga and then walking 5 days a week. I am sure it has kept me healthier. I do what I can when I can. Even if it means breaking the times up. I know it has helped me. Thank you for your comments. I know the exercises help me think better and calmer.

[Reply](#)



25.

**Ann** on November 12, 2021 at 3:33 pm

Marc K.

I have found one source of high resistant starch green banana flour (10g) and probably it's the one you found. Then I found one more at 13g from Haiti. It's ZestofMoringa.com, but it's really expensive to get this to be shipped to Canada. I would love to support the people of Haiti, so I bought both. We'll see which works better.

[Reply](#)



26.

**Ann** on November 12, 2021 at 3:51 pm

Ha! I just realized that you'll have to search for "green banana flour" on the ZestofMoringa.com website to get past the penis enlargement products! Here's the direct link:

[https://zestofmoringa.com/search?type=product&q=green%20banana%20flour\\*](https://zestofmoringa.com/search?type=product&q=green%20banana%20flour*)

I have ordered it and we'll see what happens. I hope it helps my fibromyalgia, since I don't have a penis.

[Reply](#)

•

**Tina** on November 13, 2021 at 9:45 am

Ann~ I wish we had a laugh icon so I could reply to your comment. I too will be checking out green banana flour, but I'll be alert to any ads that may not apply to me since I am also female. Thanks for the chuckle. 😊

[Reply](#)



•

**Ann** on November 13, 2021 at 5:04 pm

Thanks, Tina, I have just discovered this blog and I thought I might be able to add something, only to see that I had linked to something that might offend some readers, so I had to make a joke out of it.

I am a retired nursing professor in British Columbia and I know now that I have probably had fibromyalgia for twenty to thirty years. A slow and insidious ramp up for me. I also now know that my mother had it and now my daughter has it.

I have so much to read here. Being an overeducated nurse, my first thoughts were modern western medicine. After being, ahem, totally screwed over by this, I realized I'm on my own. I won't go into the bazillion of things I have tried because it would fry your brain just to read the names of all of them.

Anyway, now I'm on LDN 6 mg (helps a lot, but start at .25 and don't let anyone tell you different), PEA, quercetin with bromelain (nature's benadryl, so take at night), melatonin, lots of vitamin D, microdosed psilocybin, and red light therapy. The definitive book on this has been updated and is on the web here:

<https://theenergyblueprint.com/red-light-therapy-ultimate-guide/>

At the moment, I am intrigued by this study:

<https://pubmed.ncbi.nlm.nih.gov/30076785/>

which, if it turns out to be true, would blow the lid off. It says that ubiquitin is essential for the functioning of all eukaryotic cells. *Bacteroides fragilis* is a normal member of the intestinal flora. They have discovered that some people have a *B. fragilis* variant that has undergone horizontal gene transfer and now produces a ubiquitin mimic (66% similar) to our own ubiquitin. This may cause our own immune system to attack our own ubiquitin. They conclude: "Molecular mimicry of human ubiquitin by BfUbb could be a trigger for autoimmune disease."

Wow. But how could you remove this variant? And how could you erase the immune system's memory of it?

These seem to be the big questions.

I have taught research methods to undergrads and graduate students and this looks like a well done study.

I haven't seen any follow up, but I sure wish someone would do so. I

cannot for the life of me get anyone

around here to even take a look at it, so I'm putting it out here.

Oh, yes, one more thing. Bananas. If you're really serious about this source of resistant starch, look here:

[https://www.alibaba.com/product-detail/Green-Banana-Flour-Australia-Green-Banana\\_1600083959224.html?spm=a2700.7724857.normal\\_offer.d\\_title.5cb297a4iX2dxG&s=p](https://www.alibaba.com/product-detail/Green-Banana-Flour-Australia-Green-Banana_1600083959224.html?spm=a2700.7724857.normal_offer.d_title.5cb297a4iX2dxG&s=p)

I'm going to try a small amount of green banana flour first, but if it works, I'll be ordering a couple dozen kilograms of this stuff.

27.

**FEE** on November 13, 2021 at 4:52 am

Hmmmm, this might explain why the Wahls Diet (eating 9 cups of fruit and veggies daily) isn't working for me. Have been at it for six months and boy... my bowels! Yikes. Despite having a feeling that perhaps there was a sliver of hope for about a day a week, but the other six days... pffffff.

So now I'm wondering if a low fiber diet might work better for us? It turns out that the thing I eat are mostly high in fiber such as cauliflower, leeks, carrots...

Any suggestions? Thanks y'all - hang in there.

[Reply](#)



28.

**TK** on November 13, 2021 at 9:26 am

My usual skeptical self thinks the reduced butyrate could well be another symptom of ME/CFS rather than the cause since it doesn't easily explain the sudden onset of ME/CFS or PEM. It could be a perpetuating factor (trap), but such line of thinking also requires some complicated logic. This well done study could offer another clue to the mechanisms of ME/CFS though.

[Reply](#)



29.

**Tina** on November 13, 2021 at 9:42 am

Dr. Will Bulsiewicz, a plant based GI doctor, talks a LOT about butyrate in his book Fiber Fueled. He discusses the GI tract and how to get and keep it healthy in great detail. It's worth a read. Dr. B's website is here: <https://theplantfedgut.com/> And here is a recent Q and A here: <https://www.youtube.com/watch?v=ZwvbPYz82AE> (the subject is constipation, not butyrate, but it will give you some idea of who he is.) Here is another interview where he discusses butyrate a bit. <https://darinoliem.com/82-dr-will-bulsiewicz-on-how-to-heal-your-gut-with-plant-based-fiber/>

[Reply](#)



30.

**wallace** on November 14, 2021 at 4:15 am

Great post and comments.

Is the best source of resistant starch Green bananas!?

They do seem to be a wonder food.

I have just started eating them whole. Tastes like cardboard! Two a day.

Tina fiber fueled is one of my favourite books!

[Reply](#)

31.



**Ann** on November 14, 2021 at 12:19 pm

Hi Wallace,

If you like, you can make your own green banana flour:

<https://www.thehealthyhomeeconomist.com/homemade-banana-flour-recipe/>

but you wouldn't know how much resistant starch was in it. I may resort to this, but at the moment I'm going to try some store-bought to see if it works for me.

[Reply](#)

32.



**Wallace** on November 16, 2021 at 2:47 am

Thanks Ann.

I dont see the point of buying it as a powder when Green Bananas are freely available.

Its supposed to help with restful sleep due to its high B6 content.

Does it help your sleep?

[Reply](#)

•



**Ann** on November 16, 2021 at 8:17 pm

Hi Wallace

It hasn't arrived here yet. Postal Service to Canada is like asking for it to be sent to the North Pole. When it arrives and I try it, I will post my experiences right here, so stay tuned.

## Reply



- **Ann** on November 28, 2021 at 11:01 am

Hi Wallace

Canadian Postal Service now says I will get it on December 7. We'll see. There is more flooding forecast for British Columbia. It's a mess out there.



- **Ann** on December 12, 2021 at 9:55 am

Hi Wallace:

The green banana flour arrived and I've had 2 days to check it out. Be sure to begin slowly or you'll have pain! I didn't like it because it has an odd taste, but worse, that taste keeps coming back up.

I think I'll stick to green bananas at the store. They don't taste like much but at least they don't bounce back!



33.

**Naga Choegyal** on November 20, 2021 at 3:21 am

Cort,

I can definitely ascribe occasional (even vast) amounts of antibiotics prescribed pre- and post-operational as a major factor in causing my gut

dysbiosis.

Additional to and post-dating infections of Giardia, Malaria, Bilharzia and at least 3 different dysenteries, both amoebic and bacterial.

But then, I can also trace my symptoms of ME/CFS right back to a very difficult birth closely followed by Measles Meningitis and later on, Acute Otitis Media.

Not about to relate my autobiography here, but now in the run up to my 75th birthday, I am beginning at last to heal my gut with the help of all this new knowledge.

I said once to a trusted GP, a rare gem now prematurely deceased ☹, I should be in perfect health by the time I die. ☹

Where there is Life, there is Hope.

Never despair....

Look after your microbiome and those critturs will look after you.

Let food be your medicine and medicine be your food