

Are Probiotics 'Nobiotics'?



By Josh Bloom — September 12, 2018



Will Probiotics Be The Latest Trend To Be Flushed? Original Photo: YouTube [1]

Q: What's the difference between science and the fashion industry?

A: Both are prone to trendiness, but the fashion industry is comprised of attractive individuals.

A bit oversimplified, but not without more than a grain of truth. Science and medicine are trendy. The next great discovery is always around the corner. There's always one in the queue waiting to go bust. Here are a few examples of overblown or discredited scientific and medical "advances":

- Cold fusion
- Human genome curing all diseases
- Beta-amyloid/Alzheimer's
- Combinatorial chemistry revolutionizing drug discovery
- Pharmacologically raising HDL
- Nanomaterials as miracle drug delivery vehicles
- Anti-aging science (e.g, Resveratrol)
- **The microbiome as the solution to human ills**

The last one may have taken a hit last week when two papers **(1,2)** were published in the journal *Cell* which evaluated the results of a small study of whether probiotics, which rival antioxidants in food and dietary supplement hype, have a beneficial effect in the gut. The answer - not much. Eran Segal, Ph.D., of the Department of Immunology at the Weizmann Institute of Science in Israel, and colleagues looked at what happened in humans and mice after administration of probiotics. Not all that much.

A group of 25 healthy human volunteers **(3)** was divided into probiotic-treated and placebo groups

in a four-week trial. Both groups were given colonoscopies before, and three weeks into the trial (4). (Let's have a show of hands for all of you who are willing to volunteer to have two colonoscopies in three weeks. Didn't think so. But preparations are getting better. (See [Your Next Colonoscopy May Be More Fun Than Golf](#) [2]).

In the first study, humans and mice who were not being treated with antibiotics were given probiotics.

1. Probiotics were able to colonize the guts of some people (these are called "persisters,") but not others.

"Surprisingly, we saw that many healthy volunteers were actually resistant in that the probiotics couldn't colonize their GI tracts." Eran Elinav, MD, PhD

2. Mice have an indigenous biome which is resistant to colonization by the probiotics.

The second paper examined the effects of probiotics on mice and humans that were given antibiotics first. Would the probiotics repopulate the intestinal flora? In this study, 21 participants, none of whom was currently taking probiotics, were given a broad spectrum antibiotic for one week. were divided into three groups. One group got a placebo ("watch and wait.") The second got four weeks of the same 11 probiotics used in the first study. The third group received Autologous Fecal Microbiota Transplantation (aFMT), which is also called a fecal transplant. Each group was given two endoscopies and two colonoscopies. The results were unexpected:

1. In the group that received probiotics, the return to normal intestinal flora was significantly delayed - by months - compared to the group that did not take probiotics. The probiotics inhibited the return to the normal biome.
2. The aFMT recipients' had a normal biome within a few days.

"...[C]ontrast, empiric probiotics induce a marked and persistent inhibition in the indigenous microbiome and host gene expression reconstitution toward their naive pre-antibiotic configuration, even when compared to a 'watchful waiting' approach."

Although this was a very small study, its results are clear. In the absence of antibiotic therapy, some people were colonized by probiotics, but we do not know whether this is beneficial, harmful, or neither. But when taken to restore the normal flora which was depleted by antibiotics, probiotics prevented the reestablishment of normal biomes for months.

Will the use of probiotics now be now flushed down the toilet?

Who better to ask than American Council advisor Dr. David Seres, who is the Director of Medical Nutrition at Columbia University Medical Center:

The fact that probiotics probably have no benefit is no news to anyone who follows the huge amount of research surrounding them. The importance of these new studies is that they point out how trendy science may have a risk. While not proof positive, these studies tell us that we had better be far more careful with stuff that sounds like a good idea. In biology, things that sound good are more often wrong. Wrong isn't a real concern when there's no harm done (other than to the wallet of the consumer), but wrong is a terrible thing when people are hurt.

David Seres, M.D. 9/12/18

NOTES:

- (1) "Personalized Gut Mucosal Colonization Resistance to Empiric Probiotics Is Associated with Unique Host and Microbiome Features" [VOLUME 174, ISSUE 6](#) [3], P1388-1405.E21, September 06, 2018
- (2) "Post-Antibiotic Gut Mucosal Microbiome Reconstitution Is Impaired by Probiotics and Improved by Autologous FMT" [VOLUME 174, ISSUE 6](#) [3], P1406-1423.E16, September 06, 2018
- (3) The researchers opted for colonoscopies rather than just using stool samples because colonoscopy gives a more accurate picture of what's going on in the gut. And maybe because they weren't the ones getting the colonoscopies.
- (4) Mice were also used in the same study.
- (5) The probiotics used were *Lactobacillus acidophilus*, *Lactobacillus casei*, *Lactobacillus casei* sbsp, *paracasei*, *Lactobacillus plantarum*, *Lactobacillus rhamnosus*, *Bifidobacterium longum*, *Bifidobacterium Bifidum*, *Bifidobacterium Breve*, and *Bifidobacterium Longum* sbsp. *Infantis*

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Links

- [1] <https://www.youtube.com/watch?v=HpA4ldGoHRQ>
- [2] <https://www.acsh.org/news/2016/10/18/your-next-colonoscopy-may-be-more-fun-golf-10321>
- [3] [https://www.cell.com/cell/issue?pii=S0092-8674\(17\)X0019-6](https://www.cell.com/cell/issue?pii=S0092-8674(17)X0019-6)