

Can genetically engineered bacteria ward off a hangover?

We all know that alcohol is bad for you — like really bad for you — and a night of heavy drinking can leave us wishing the next day was our last. Supposed hangover remedies are easy to come by, but most of them are based on a lot of wishful thinking and very little science.

A new startup company called [ZBiotics](#) is taking a [scientific approach](#) to detoxifying alcohol through an unconventional hangover prescription based on live, genetically engineered bacteria.

When alcohol is broken down in our bodies, it's converted into a compound called acetaldehyde and then into acetate, which is basically vinegar. This happens in the gut and in the liver. Unfortunately, our guts aren't very good at dealing with this stuff. The process tends to stop half way, leading to a buildup of acetaldehyde, which is far more toxic than alcohol itself.

ZBiotics engineered a bacterium with an enzyme that breaks down acetaldehyde into acetate. It's packaging it as a drinkable "probiotic" that contains live cultures of these bacteria that drinkers can swill before a binge.

I say "probiotic" in quotes, because ZBiotic's product isn't supposed to work in the same way as most probiotics are marketed. There are a ton of supplements and health foods boasting "live and active" cultures of bacteria or yeast. These so-called probiotics are supposed to help with everything from bowel movements to bad moods. But do they actually work?

The idea behind probiotics is that the bacteria you ingest team up with the good bacteria already in your body and they become a great big happy family. The trouble is, there's [very little evidence](#) that this actually happens. Most of the time, when we ingest bacteria they pass right through our digestive tract.

Additionally, microbiomes are different person to person, and even in the same person over time. No microbial cocktail could possibly act as a silver bullet for any health problems.

"The probiotic hypothesis is broken," explained Zack Abbot, founder and CEO of ZBiotics.

Abbot imagines the gut microbiome as a tiny bacterial party. One person's gut might be more like a wild fraternity party, while another's is a coffee-shop gathering of hipsters. To think that a probiotic will have the same effect gut to gut is like assuming that the same person could be the life of the party at both the frat house and the coffee shop.

So where does this leave ZBiotics? Unlike most probiotics, ZBiotics' bacteria don't have to colonize the gut to do their thing. They simply float down the river of your digestive journey and do one thing specifically along the way — produce enzymes to break down acetaldehyde. Unfortunately, there's no solid evidence that this actually happens either.

Abbot says the engineered bacteria are champions at breaking down acetaldehyde in a test tube, but he's refreshingly cautious about making any claims that haven't been proven in clinical trials. Those trials

would be too expensive for a small startup company like Abbot's, so like most probiotics, ZBiotics is heading to supermarket shelves without them. That means you'll soon be able to try the first genetically engineered probiotic for yourself.

Acetaldehyde is one of the many factors believed to contribute to hangover symptoms. But Abbot cautioned that ZBiotics "is not a get out of jail free card" that can promise a hangover-free morning. Hangovers are made up of a whole lot of nasty symptoms from a suite of different causes. These include dehydration, inflammation, poor sleep and all sorts of other byproducts, in addition to acetaldehyde.

It is a scientific impossibility for one substance to treat all the symptoms of a hangover. The scientists at ZBiotics hope that their souped-up bacteria can be combined with strategies like alternating alcoholic drinks with water in order to slightly reduce the toxic effects of alcohol. So while ZBiotic's acetaldehyde-antagonizing bacteria can't prevent hangovers, they just might take the edge off, or at least keep you from reaching for that hair of the dog to seek release from your misery.

In the future, Abbot said, Zbiotics wants to "use genetic engineering to create a benefit for consumers." And not just consumers of alcohol. The decision to start with a hangover treatment was a practical one. There are a lot fewer regulations for a product like that than for medical treatments. With the revenue from its first product, Zbiotics plans to apply its approach to a variety of health and nutrition issues. Which means that going forward, genetically engineered bacteria could make up an important part of the pharmaceutical market.

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