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From Bacteria to People: Slavery in Disguise

Analysis by Tessa Lena | October 27, 2023

STORY AT-A-GLANCE

- Today, genetically modified microbes are a major medium for the industrial production of chemical substances, foods, medicines, therapeutic proteins, etc.
- The term to watch out for is "precision fermentation"
- The National Bioengineered Food Disclosure Standard does not require these foods to be labeled as GMO because they do not contain the genetically engineered organisms, they are just produced by them
- Microorganisms, including genetically modified ones, also play a role in industrial production
- Another growing area is bacterial biosensors. They are based on programing bacterial cells (typically through genetic engineering) to recognize and generate a measurable signal in response to a specific molecule

"Small Organic Robots"

We are in a strange spot. For a long time, our culture has been assuming that nature is our property and our slave. An unruly and hostile slave — a slave to be tamed, dominated, and abused — as long as we can get away with it and feel good about ourselves as we dominate.

A component of that mindset is that human beings are viewed by the most powerful people in society as their slaves, too. You may be middle class or even upper middle

class … they don't care. In their mind, you are their toy, exist for them. And as it goes, whatever the masters do to nature or to the animals, they do to the people next.

For example, as more and more people moved to cities, we were told to adopt the habit of necessarily chipping, vaccinating, and neutering our pets. It is all for their own good, right? Well, it started with chipping pets but now … I digress.

This story is about the bacteria. When they talk about programmable bacteria or "bacteria with programmable DNA," I see it as dual threat, On the one hand, I can't help but think about the fact that to our masters, human beings on the ground are no different than bacteria. People are a resource to them — and they are not shy about their desire to program biological life, including human life. That much, we know.

Secondly, we don't know anything about the long-term safety of the products produced with genetically modified bugs. And today, genetically modified microbes are a major and still growing medium for the industrial production of chemical substances, foods, medicines, therapeutic proteins, and so on. And allegedly, manufacturers don't even need to label such products as GMO.

Bioengineered Food: An Interlude

"Bioengineered" is the latest term for GMO. Here is a quote from the page on the U.S. Department of Agriculture website that contains manufacturer FAQs. I am using their words verbatim so that we can get rules and definitions straight out of their mouth.

> ***Q: What records are sufficient to verify that a food is sourced from a non-bioengineered crop?***
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> - *A variety of records may be sufficient to verify a food is sourced from a non-bioengineered crop. A non-exhaustive list includes: organic certification, records that show a non-BE crop variety was used, and records that show a food originated in an area where that specific BE food is not produced.*
>
> ***Q: What is the threshold for bioengineered substance, and how is it measured?***

- *The threshold is designed to recognize the realities of the supply chain and acknowledge that BE and non-BE food and ingredients are often grown, harvested, transported, and processed in close proximity to one another. Because of this reality, even when a non-BE ingredient is used, there may be a trace amount of a BE substance that remains on shared equipment.*

- *The threshold exempts food in which no ingredient intentionally contains a bioengineered substance and allows for the inadvertent or technically unavoidable presence of a BE substance, of up to five percent, in each ingredient.*

Q: I'm a regulated entity that may qualify for the very small food manufacturers exemption. How do I calculate my total revenue?

- *The Standard at 7 CFR 66.5(b) exempts very small food manufacturers from the BE disclosure requirements. At 7 CFR 66.1, very small food manufacturers are defined as any food manufacturer with annual receipts of less than $2,500,000 USD.*

  This amount includes all food and non-food receipts. Food manufacturer is defined as an entity that manufactures, processes, or packs human food and labels the food or food product for retail sale.

Q. What is a validated refining process?

- *A validated refining process is one that has been demonstrated to make modified genetic material undetectable when followed. Validation is confirmed through testing and through maintenance of processing records.*

- *AMS has published a guidance on validation and to select a test method. Both the guidance documents and relevant FAQs* ***can be found under detectability testing****.*

Q. Once I have validated that a refining process makes modified genetic material undetectable, do I need to continue to test that process?

- *No, once a process has been validated through testing and a regulated entity maintains records showing the validated process is followed, the process does not need to be tested again unless significant changes are made to that refining process.*

And another quote:

> ***Q. If a raw material has processing aids that are not labeled in the ingredient list on our finished product, would that be subject to disclosure under the Standard? For example, we use a vitamin D that has a corn oil carrier. We label the vitamin D on our finished product, but not the corn oil. If we know the vitamin D is not a bioengineered food, does the finished product need a BE disclosure because of the corn oil carrier?***
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> - *The definition of bioengineered food, at 7 CFR 66.1, excludes incidental additives that are present in food at an insignificant level and that do not have any technical or functional effect in the food, as described in 21 CFR 101.100(a)(3). Incidental additives, when used in accordance with this definition, are not required to be included on the ingredient list.*
>
>   *If the corn oil you are using as a processing aid is considered an incidental additive as defined in 21 CFR 101.100(a)(3), then it does not require a bioengineered food disclosure.*

Are you impressed with these labeling standards? I am not.

Precision Fermentation

Precision fermentation is a technique in which microorganisms are genetically reprogrammed to produce specific, customized molecules that can serve as new food ingredients, industrial chemicals, therapeutic proteins, vaccines, etc. Although the long-term effects of such products are unknown, from the industry standpoint, precision fermentation is considered beneficial as it is potentially cheaper and more scalable than producing chemicals directly from plants, etc.

According to **Forbes**, it's a "new food technology that is rapidly entering the mainstream. Products such as **milk protein**, animal fats, **collagen**, honey, lobster, **egg whites** and more are receiving hundreds of millions of investor dollars … These products are being marketed to a young consumer base that wants **sustainable, climate-friendly** foods that buck the system and promise a better tomorrow." Hmmm, but is it so?

> *"Precision fermentation technology is a form of synthetic biology … that typically requires the use of genetically engineered microorganisms, which are cultivated in brewery-style fermentation tanks. The little critters, usually yeast, algae or bacteria, are programmed through a range of in-vitro nucleic acid techniques such as CRISPR, gene editing or cloning.*
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> *They produce or excrete a particular sellable material, usually edible fats or proteins that are biologically similar to animal products. These end products can be further processed into ingredients or finished CPG items."*
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> *"The … new **National Bioengineered Food Disclosure Standard** would not require these foods to be labeled as GMO because they do not contain the genetically engineered organisms, they are just produced by them. Such products would therefore not qualify for Non GMO Project Verification. Because some may be considered novel foods, it is not clear how they will be labeled or **regulated in Europe**.*
>
> *And since they are animal-free, they may be considered vegan, but will still need to have the same allergen labeling as their animal-based counterparts."*

What about the cell culture medium? Is it really as neutral and insignificant as we are led to believe?? Even Forbes has question. "Is the nutrient bath derived from corn or soy, typically genetically modified to withstand **high dosages of herbicides**? Are there supply chains in place to provide such nutrient media at scale? […] How much waste material is produced by such microorganisms relative to sellable product?

This includes metabolic wastes, as well as the leftover steep once the spent microbes and consumable material have been filtered out. How will such wastes be disposed of

and who is ultimately responsible for it?"

Oh stop asking silly questions, says the industry. According to Food Navigator, in its 2020 report on precision fermentation in dairy, RethinkX predicted that the technology would make protein production "five times cheaper by 2030 and 10 times cheaper by 2035 than existing animal proteins."

The "promotional brochure" for the products made with precision fermentation would have you believe that they are natural and safe. Precision fermentation, however, is "nothing like its natural counterpart … It uses genetically engineered microorganisms, such as yeast and bacteria, that are fermented in brewery-style tanks under high-tech, pharmaceutical grade sterile conditions.

This is because these cultures are highly susceptible to contamination which would ruin the entire batch … The long-term outcomes are completely unknown … But it's all serving the underlying agenda, which is total control and world domination … These fake, ultraprocessed foods give the globalists unprecedented power and control over human health, and they're using stealthy marketing techniques."

"Natural Products"

"Natural products" is also a formal term to describe a particular type of metabolite, the secondary metabolite. According to this Harvard University article, some organisms, such as plants, fungi and bacteria, are able to create a class of molecules called secondary metabolites, or natural products.

Researchers believe that they play no direct role in the organism's normal growth or reproduction as removing these molecules from the organism does not result in immediate death. However, those organisms rely on natural products designed for specific tasks, such as protection against other organisms or interaction with their own species.

> *"Because these molecules are made to have an effect on other organisms in various ways, they can be very useful as therapeutics. For example, they can be*

used to kill harmful bacteria infecting humans, or even have an effect directly on human cells for various therapeutic purposes. In fact, ***most of our medicines are actually derived from or inspired by natural products****."*

"One important use of natural products is antibiotics. Ever since the serendipitous discovery of penicillin in 1928, which was a natural product from fungi that could kill bacteria … In addition to antibiotics, many bacterial natural products have other therapeutic uses.

For example, ***rapamycin****, also known as sirolimus, is made by the bacteria Streptomyces hygroscopicus, and is used clinically as an immunosuppressant, especially during a kidney transplant.* ***Bleomycin****, a natural product found from Streptomyces verticillus, is a chemotherapy drug used in the treatment for a range of cancers."*

Industrial Microbiology

Microorganisms play a significant role in industrial production, and new processes involving microbes are being researched as we speak.

For example, bacteria can potentially **"heal" concrete**. Researchers at the University of Bath are investigating how some species of Bacillus bacteria could be used to make concrete that can "heal" itself.

As a skeptical peasant with no experience in construction, I am excited about "healing" concrete but I surely hope that they test this material thoroughly to make sure that the spores they seek to mix into the concrete don't "leach" and make everything around us some kind of a GMO spore fest.

Scientific Knowledge Is Limited

Genetically modified microbes sound great for the bottom line — but do the scientists know in earnest how things work, and what leads to what? Are they sure? If we are to

believe this paper, they are not.

> *"Despite mounting evidence linking host-associated bacteria to normal development and disease in animal models and correlative evidence in humans,* ***the mechanisms by which specific bacterial functions affect mammalian or microbiome physiology (i.e., effector functions) remain largely undefined [emphasis mine]****.*
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> *The central dogma of molecular biology, traditionally outlined as the transfer of information from DNA to RNA to protein, stops short of the ultimate end point of much of the information flow in a biological system. In a significant fraction of cellular processes, the end point of information flow is not a protein but is, instead, a small molecule.*
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> *This is especially true for bacteria which rely heavily on low-molecular-weight compounds (i.e., small molecules or natural products) to interact with their surroundings. The systematic characterization of small molecules produced by human-associated bacteria will undoubtedly be key to deciphering the mechanistic details of the role the human microbiome plays in our health and disease."*

Bacterial Biosensors

According to a paper titled "Bacterial biosensors: The future of analyte detection," bacteria come with a lot of sensors — and, per Caroline Ajo-Franklin, Ph.D., a professor of biosciences at Rice University whose synthetic biology lab develops microbial biosensors, "these sensors don't just sense, they [also] tell the bacteria to do something."

The researchers are looking to "leverage those natural responses to have the bacteria tell us, as humans, what they're seeing [and] what they're feeling."

The general principle of a whole-cell microbial biosensor is to program a cell (typically through genetic engineering) to recognize and generate a measurable signal in response

to a specific molecule. When generating biosensors, scientists "co-opt these responses [with a transducer] so that instead of having cells that just make [products like] **efflux pumps**, [researchers] engineer them to create a response [the scientists] can read."

> *"Depending on the biosensor and its intended use, this response can be electrochemical or involve expression of fluorescent or luminescent reporter proteins. Whole-cell biosensors are often engineered to work only when their target molecule is present. This ability to fine-tune specificity and sensitivity has made bacterial biosensors promising analytical tools."*

Whole-cell biosensors can "provide insight on nutrient levels and organic compounds in soils, which can inform methods for managing crop growth. They can also signal the presence and levels of potentially problematic compounds."

> *"In addition to nutrients and toxic compounds, bacterial biosensors can be designed to respond to … other bacteria. Microbes secrete all sorts of metabolites, many of which could serve as target analytes. For instance, microbial biosensors that detect quorum sensing molecules secreted by bacterial pathogens can signal the presence of **disease-causing microbes in water**, or in human samples **to help diagnose infections**."*
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> *"Bacterial biosensors may provide useful intel into the health of human patients. A **recent study** described a biosensor made from the environmental bacterium, Acinetobacter baylyi, that can detect DNA from cancer cells in vitro and in a mouse model. This study provides a basis for the application of microbial biosensors in cancer detection and diagnosis.*
>
> *Scientists have also created ingestible biosensors that can **detect bleeding** or **inflammatory biomarkers** in the gut to monitor intestinal health; the signals from these internal microbial devices can be transmitted to external devices, like cellphones, thus illustrating how biosensors can be paired with existing digital technologies to facilitate data collection and analysis."*

My two cents? On the one hand, it is wonderful to be able to detect pollutants around us (assuming it works). It could be wonderful but … but the problem is that as usual, the scientists have no clue about what'll happen in the long term. Will these so called "small organic robots" help with one thing and break ten other things? And how will we even clean up? Scientists don't seem to care. Investors laugh at the very thought. And who will be stuck with the bill? Our bodies. Us.

Graphene Oxide in the Brain: Yay

Speaking of having no clue, this 2023 paper titled, "Graphene Oxide Attenuates Toxicity of Amyloid-β Aggregates in Yeast by Promoting Disassembly and Boosting Cellular Stress Response," talks about using graphene oxide to help with Alzheimer's disease.

What a great idea! The approach is based on the ability of GO nanoflakes to counter the aggregation of misfolded amyloid-β (Aβ) peptides in the brain. But what if those misfolded proteins are the brain's response to infection?

After all, the "infectious" theory of Alzheimer's disease has been known for some years, and infection and resulting inflammation could be prominent factors in developing AD. Then want? Are we just going to bathe the brain in GO nanoflakes until the person drops dead? Not to mention GO toxicity, conductivity, and the Internet of Things. Jeez.

> *"Alzheimer's disease (AD) is the most prevalent neurodegenerative disease, with the aggregation of misfolded amyloid-β (Aβ) peptides in the brain being one of its histopathological hallmarks. Recently, graphene oxide (GO) nanoflakes have attracted significant attention in biomedical areas due to their capacity of suppressing Aβ aggregation in vitro.*
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> *The mechanism of this beneficial effect has not been fully understood in vivo. Herein, the impact of GO on intracellular Aβ42 aggregates and cytotoxicity is investigated using yeast Saccharomyces cerevisiae as the model organism. This study finds that GO nanoflakes can effectively penetrate yeast cells and reduce Aβ42 toxicity.*

Combination of proteomics data and follow-up experiments show that GO treatment alters cellular metabolism to increases cellular resistance to misfolded protein stress and oxidative stress, and reduces amounts of intracellular Aβ42 oligomers. Additionally, GO treatment also reduces HTT103QP toxicity in the Huntington's disease (HD) yeast model.

The findings offer insights for rationally designing GO nanoflakes-based therapies for attenuating cytotoxicity of Aβ42, and potentially of other misfolded proteins involved in neurodegenerative pathology."

Desire for Control … and Us

It looks like a lot of this synthetic madness is driven by the desire to control. The desire to control plays an important role in our culture and in our medical paradigms. All in all, we are living under the rule of crazy maniacs who seek absolute control! It's a very distorted, neurotic, joyless rule.

The crazy maniacs — the dominators, the power-seeking psychological type — have been behind every big atrocity, every not so great reset for centuries on end, every major abuse. And they are not letting go.

Yes, I believe that what's driving the not so great reset is desire for control. That desire has been driving our civilization for quite a while. It is very logical that the people who want to have control seek to replace the natural world with a synthetic world. In a synthetic world, they can impose their rules. A synthetic world, they can control — or at least try. So what do we do?

I believe that what we do is stay vigilant, educate ourselves, keep things in perspective, and insist on the legitimacy of our love of life. The aspiring masters want us to be afraid and sad. They want us to hold our head down and to be slaves. But we are not slaves! And if we do absolutely everything from the position of love — strong, confident, non-push-over love — we will prove not just with our words but with our actions that we are not slaves. Because slaves, we are not.

About the Author

To find more of Tessa Lena's work, be sure to check out her bio, **Tessa Fights Robots**.