Bio Agri Zero
Borbála Moravcsik
IGEM – assignment and and reasons of interest

Problem
We are on a good path to transform our food systems, we started dialogues about the redistribution of supply chains–local and seasonal production, about circulative food systems and about more intelligent technologies, to protect our lands. But how can we transform our intestinal tract to the phase before we exhausted it with many contaminant additives and reached a phase when almost all of us suffers from intolerances in some forms… How our lands are exhausted of chemicals, our bodies as well, our health as we know is based on our diet. A damaged intestinal tract, has an affect on the whole system of our bodies. Our gut' health is our health. I want to see in our near future regenerated intestinal systems that are ready for regenerated food systems.

Hypothesis
How our lands are exhausted of chemicals, our bodies as well, our health as we know is based on our diet. A damaged intestinal tract, has an affect on the whole system of our bodies. Our gut' health is our health.

Question
How can I use a gut a bacteria – E.coli to change the human genome which is responsible for regenerating enzymes?

Context

Metabolic enzyme deficiency: Inborn error of metabolism (IEM) is a group of disorders characterised by a single gene defect, which blocks some vital steps in the normal metabolic pathway ensuing in deposition of substrate or insufficiency of the product for normal organ functions. Diagnosis is of foremost choice not only for treatment and prognosis but also for genetic counselling. Enzyme deficiency is thought to be genetically inherited almost always in a recessive fashion, as it is mainly the result of "loss-of-function" mutations. This can be inherited either as autosomal recessive (both of the parents do not have disorder but each of them carries faulty gene and delivers it to the child) or as X-linked recessive (only the mother carries the affected gene on the X chromosome and conveys it to the child)[1]

The gut microbiome: Bacteria makes up the majority of the flora of the large intestine, accounting for up to 60 percent of the dry matter in the stool. Somewhere between 300 and 1,000 species live in the intestines, with most estimates putting the number around 500. In any case, it is likely that about 30 to 40 species make up 99% of the bacteria. The gut flora also includes fungi, animal protozoa and archaea (mainly Methanobrevibacter smithi).[2]

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[1] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4804091/ – 2021.11.12

[2] [2] https://hu.wikipedia.org/wiki/Bélflóra– 2021.11.12.

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The connection

- Chemical signals from gut bacteria influence gene regulation in the gut lining, chemical messages from bacteria can alter chemical markers throughout the human genome.
- E. coli live in our intestines, where they help our body breakdown the food we eat as well as assist with waste processing, vitamin K production, and food absorption

The Method

- Most normal / healthy gut systems consist non pathogen E.coli or reproduce in laboratory
- Extract the gut bacterias from a healthy humans' stool
- Examine if they are non pathogen
- Use this bacteria in host organisms for enzyme reproduction