

47-2020-14927 | Enhancing Industry's Microorganisms Through Adaptive Lab Evolution
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Category	Life Science & Biotech, Research
Keywords	Microbial Evolution
Current development stage	General list: TRL1 Basic Principles Observed
Collaboration Opportunity	Sponsored Research with an option to License Research Results

Background

Microbial experimental evolution uses various techniques that allow microbes (bacteria or fungi) to evolve more rapidly so that they adapt to their new environment. This technique can be used to impart novel traits into existing microbes in order to enhance their productivity.

The Technology

The technology combines experimental evolution techniques with computational biology to evolve microbes with desired new functions in food, nutrition and ecology.

Dr. Yona focuses on evolving microbes to create more nutritious fermented foods as well as therapeutic probiotics for the human gut microbiome. Specifically, his lab evolves microbes to remove excess harmful molecules from foods and by extension, the human body (e.g. cholesterol).

In order to discover new avenues for probiotic therapeutics Dr. Yona's lab also investigates the relationship between the human microbiome and nutritional intolerance. For example, he studies the effect of the microbiome on symptoms of lactose intolerance with the aim of developing probiotics to treat people who suffer from the disorder. Furthermore, his lab is working on developing microbes for the next generation of fermented foods, including the ability to produce yogurts from plant-based milks.

Project Opportunities

Any industry in which microbes (bacteria, yeast etc.) are used can potentially benefit from directing microbes into evolving towards a specific trait. For example:

- Brewing yeasts can be adapted to remove off-flavors and increase flocculation capacity
- Baking yeasts can be adapted to 'wake-up' at lower temperatures, or freeze better
- Non-Dairy Yogurt bacteria can be evolved to take advantage of plant-based substrates instead of dairy based substrates
- Probiotic microbes can be adapted to have novel traits

Opportunity

Dr. Yona is looking for industry partners who are interested in imparting particular traits in their microbes. By supplying the researcher's lab with your specific strains of microbes and a particular wish list of traits, Dr. Yona's lab can induce the microbes into evolving so as to impart on them those specific traits.

Patent Status

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