

Sporennet #2 - Local Enzyme Production

Universal access to basic tools in order to participate in the future bioeconomy is an important goal to achieve for biotechnology to benefit all people and the planet. Current methods to distribute enzymes necessary to do basic operations on DNA are not good enough - they require cold-chains for shipping and distributors can abuse local monopolies for profits.

A solution to this problem is being delivered with the Open Enzyme project[1] - however, all genes in the OpenEnzyme project currently are optimized for Escherichia coli. This makes long term storage of strains in distributed locations basically impossible without ultra-low -80c freezers or a lot of manual labor. A solution to the problem of freezers was proposed in Sporennet #1, and I would like to extend that distribution idea to the production of enzymes.

In addition to the current efforts by the OpenEnzyme project, I propose that FreeGenes build a couple of plasmids with useful enzymes that are designed to be directly expressed in Bacillus subtilis. These should include some control proteins such as GFP to test expression and secretion, as well as some basic useful proteins, such as T4 Ligase, Taq Polymerase, and Pfu Polymerase. For redundancy purposes, these would be synthesized with 2 different inducible promoters.

This memo will require ~10 DNA objects to test one backbone or ~20 DNA objects to test two backbones.

SporeNet #2 was initiated by Keoni Gandall (EndyLab, Stanford).

There are no patents associated with these materials.

References

[1] <https://openbioeconomy.org/projects/open-enzyme-collections/>