AegisSafe O-Key
A construction of the orthogonal transcription-translation network for biofication and regulation
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1. Abstract

With the development of synthetic biology, one of the most important questions has to be how to express the targeted gene in a chassis organism. However, among the different carriages, the coli is not compatible with the cell of some organisms because of the different pathway. Therefore, the use of different organism plasmids is needed to meet this challenge. This is the problem that the researchers are facing in the organism system. Since this system is partially incompatibility, we aim to develop a construction of orthogonal transcription-translation networks that can solve this problem. What we need to do is to first build a construction of an orthogonal transcription-translation network. Then we need to analyze the gene expression of the network and finally, we need to test the network in the chassis organism. In our study, we have established a series of orthogonal transcription-translation networks and tested their gene expression in the chassis organism. In this way, we can solve the problem of gene expression in different organisms and develop a new chassis organism for synthetic biology.

3. O-Key for Biofication

The orthogonal transcription-translation network, O-Key, is a tool that enables the simultaneous expression of multiple genes in a single organism. This tool is particularly useful in synthetic biology, where researchers often need to express multiple genes that interact with each other. O-Key consists of two parts: the orthogonal promoter and the orthogonal ribosome. The orthogonal promoter allows the expression of a gene in the presence of a small molecule, called an orthoinducer. The orthogonal ribosome is a modified ribosome that can only translate the gene when it is present in the cell. This ensures that the gene is expressed only when the orthoinducer is present, allowing for precise control of gene expression.

6. Modeling

We constructed a series of models covering experiment process, optimization and regulation. In order to verify the effectiveness of the O-Key, we have conducted experiments on various aspects of genetic regulation, and have designed species that can be used in industry. Our methodology involves using computer modeling to design genetic circuits that can be used in industrial processes, such as biofuels and pharmaceuticals. We have also conducted modeling on the effects of genetic engineering on the environment, which has revealed some of the potential threats. We believe that our work will provide insights into the future of genetic engineering and its impact on the environment.

9. Reference

This is a list of all the references used in the document.

Experiment by Bin Liu, Linke ZHANG, Dongchang QIN, Hengqian REN, Yang J, Shu GUO, et al. [Model by Yangjie SUI, Yufei WEI] Human Practice Activity Organized by Yiling SHAO, Linlin SONG, Lingzi NI.
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