LEADER Jilin_China 2022 .ZIP

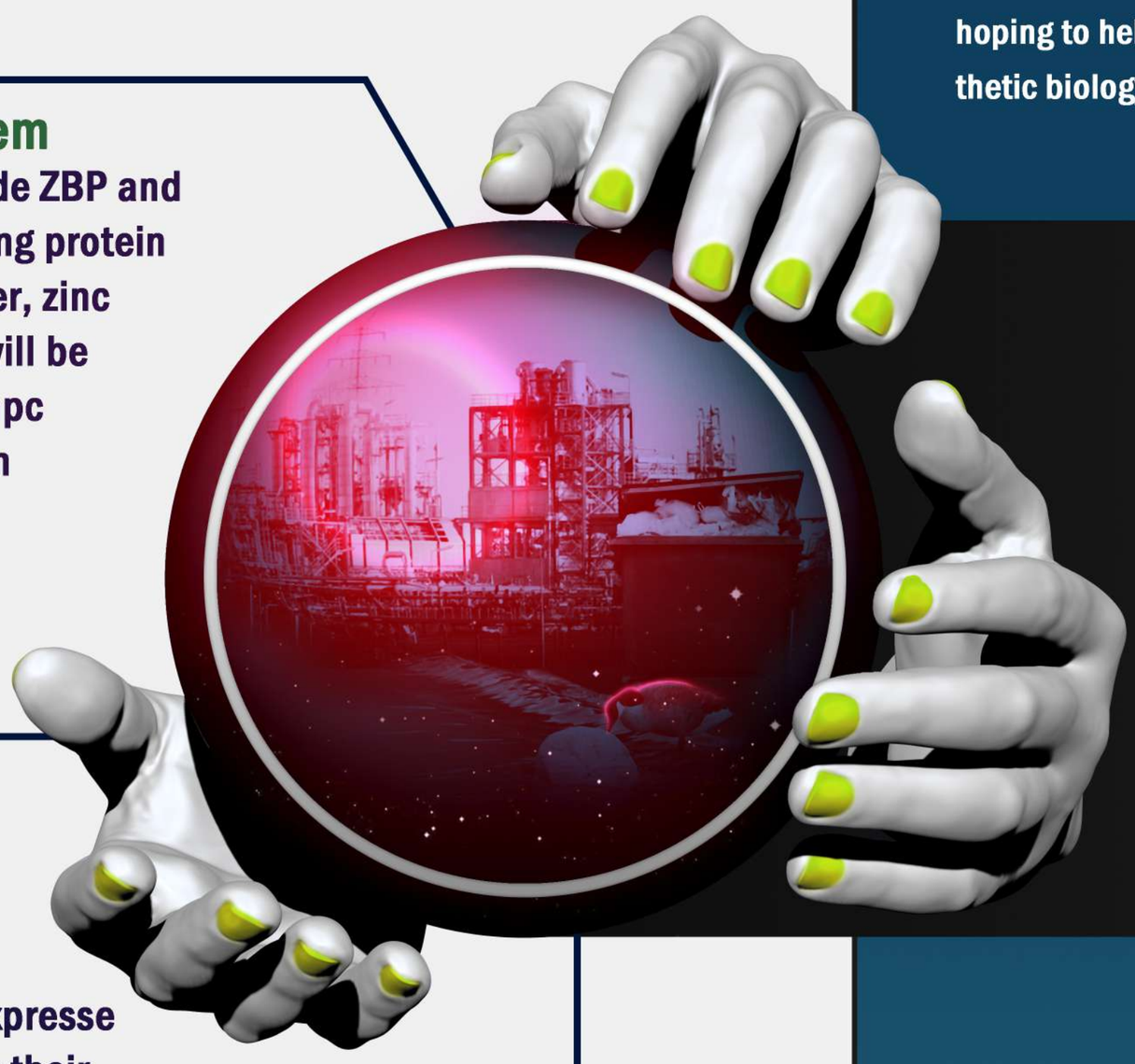
about THE DESIGN

• Ion sensor system

In order to sense copper, zinc and lead ions in the environment, we designed an induction system to sense the heavy metal ions and activate the downstream gene: CusSR and ZraSR systems can sense and respond to copper and zinc. And pbr operon was regulated by lead ions.

• Surface display system

The designed binding peptide ZBP and CBP together with the binding protein pbrR which combined copper, zinc and lead ions respectively will be expressed in fusion with Ompc and Lpp-OmpA, the common outer membrane proteins.
So that the engineered bacteria can absorpt metal ions on the surface.



• Potentiating system

Metallothioneins (MTs) are a family of heavy metal detoxication protein.
Engineered bacterias will expresse MT continuously to increase their heavy metal tolerance.
We constructe three tandem repeat MT genes to improve the expression efficiency, and adopte the SUMO fusion expression system to increase the stability and solubility of the recombinant MT proteins.

• Kill switch

The kill switch is based on the arabinose operon and RelE, which is an endotoxin that inhibits the growth of bacteria. The growth of bacteria will be inhibited in low-heavy metal ions environment.

about US

• Human Practices

2022 Jilin_China engaged in the mutual communication with broader audience. Human practices were integrated in our item in different stages from the confirmation of our project, the construction of our theoretical system to the design of our product and potential users' experience.

• Education & Communication

Our project design is based on synthetic biology. So 2022 Jilin_China hoped to inspired more people to be interested in synthetic biology. This year's Education is aimed at college students, middle school students, primary school students, people with disabilities and the public. For different groups of people, we have adopted different forms of publicity, comics, science books, videos and so on, hoping to help them understand iGEM and synthetic biology.

JILIN UNIVERSITY

SCHOOL of LIFE SCIENCE

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