Safety

**Overview**

Our team always puts experimental safety and risk control first in our projects and actions. After all, safety is the most important thing. We consider safety throughout the project, including experimental design, experimental implementation, and future impact. We strictly follow the national and relevant institutional safety regulations to ensure the safety of our experiments, and we have experienced instructors to help us control risks.

**Part & Design**

Organism

The organisms we use are DH5α and EcN（*E. coli* DH5-alphaand *E. coli* Nissle 1917 ）, which are both E. coli, and they are both low-risk organisms for humans and the environment. Of course, at the same time, we follow strict safety guidelines for microbiological experiments to ensure that the microorganisms we use do not spread.

Part

The effector genes we selected are all genes related to conventional metabolism originating from natural microorganisms, and they are harmless. At the same time, considering the potential application of probiotic products in the future, in order to further ensure safety, we have also designed capsules to isolate the engineering bacteria from the external environment as much as possible before use. And we also collaborated with Beijing University of Chemical Technology on an oxygen suicide switch to ensure that the genes we selected do not spread in the environment.

Design

In terms of specific experimental design, we strive to reduce the risks during the experimental process as much as possible. We will review a large amount of information and select safer experimental plans to conduct our experiments. This section is discussed in more detail in our safety form.

**Laboratory**

**Conditions**

First of all, in terms of experimental conditions, our laboratory has sufficient, qualified, and safe facilities that can support and guarantee our experiments. In terms of experimental areas, we have a standard microbiological laboratory of level 1 for low-side microbial (E. coli), which has an ultra-clean table, some basic protective equipment such as disposable masks, gloves, etc. Second, we also possess a moderate containment lab for experiments with higher aseptic and safety requirements, which has a professional ESCO biosafety cabinet. In terms of personal protection, our laboratory provides enough disposable medical gloves and masks for everyone to prevent inhalation of microbes and direct contact with hazardous substances.

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Risk Management

we have sufficient risk control measures. We have emergency shower devices and eye wash devices, as well as emergency medical kits to provide emergency treatment for experimental personnel when hazardous substances contact them or other injuries occur. On the walls of the laboratory, we post many reminders that emphasize laboratory safety and norms to remind experimental personnel. And we also post laboratory safety guidelines and laboratory safety center emergency contact numbers on the outer walls of the laboratory to remind everyone who enters the laboratory.

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Laboratory Access Security

For access to the entire laboratory building, people who want to enter the building must use their activated campus cards, otherwise the door cannot be opened. Only those who have submitted and approved applications to the laboratory safety center can activate their campus cards.

For access to our laboratory, our laboratory door has fingerprint and code locks. Only our team members can enter our laboratory.

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Experimental training

Of course, before we start the experiment, each of us was trained in laboratory skills, including but not limited to how to inoculate bacteria, how to use sterilization devices and how to do personal protection. So during our project, it greatly reduces risks of microbes’ harm to human body. In the last day of our training, our supervisor will examine us, and those who fail will continue to study until they pass before being allowed to enter the lab.

Waste treatment

All waste is disposed of according to the guidelines of BMBL table. Finally, the disposed experimental wastes are sorted according to Lanzhou University's waste disposal standard, stored in special waste bins, and transported to the waste disposal transfer station at the designated time for centralized disposal by the university's special laboratory staff.

**Opinion acquisition**

We will conduct interviews with experts and professors, introduce our project to them, and ask for their opinions in many aspects, including safety. We will pay attention to or improve certain safety issues based on the experts' opinions.

And we will also introduce our project to the general public and ask for their opinions and concerns about the project. We will pay close attention to the safety related issues that the public is concerned about in order to improve the project and make the overall safety of the project better.

**Guideline**

Our experiments strictly follow the relevant national laws and regulations and the regulations of relevant institutions, and are carried out under the supervision of relevant institutions and personnel.

Specifically speaking, in China, we follow <People’s Republic of China Infectious Disease Prevention and Control Law>, <Pathogenic Microbiology Laboratory Biosafety Management Regulations>, <Medical Waste Management Regulations>, <General Requirements for Laboratory Biosafety (GB19489-2008)>, <General biosafety Standard for Microbiological and Biomedical Laboratories>

At Lanzhou University, we follow Laboratory Safety System of School of Life Sciences, Lanzhou University.

In the laboratory, we also follow other specific requirements of other laboratories.

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