Scientific Research Personnel

Q: What's your opinion about bacterial therapeutics?

A :

Yu Fu: There exists many successful cases about bacterial therapeutics, which I think is a good aspect of it. However, it is still not that convincing because some problems people concerning about are remained to be solved, for example, the underlying mechanisms are unknown.

Shushan Gao: Microbial therapy has developed some new drugs in the treatment of cancer. It is promising in this respect, but now materials science and pharmaceutical technology are constantly developing, and the microbial therapy related drugs I know are very mature. Less, even the first phase and the second phase of the clinical are not much. At this stage, its advantages do not seem to be large.

Ping Zhu: In recent years, there have been researches on gut microbes at home and abroad, and there have been attempts to deliver beneficial enteric microbial preparation long capsules to patients, and to improve the intestinal flora of patients to achieve the purpose of treating certain diseases. But at present it may be in the experimental stage.

Xingzhong Liu: I personally have reservations about microbial therapy. Especially through genetic editing, the engineering bacteria have the treatment of diseases. I am a natural ecologist. I don't think there should be too much intervention in nature and ecology.

Qiwen Hu: Very recognized for microbial therapy, understanding and practice of microbial therapy. Examples of the use of Lactobacillus lactis for the construction of therapeutic strains have been used in the United States and have entered clinical trials.

Q: What factors do you think will hinder the development of microbial therapy?

A:

Yu Fu: I think that at some basic level, the mechanism of action of microbial therapy is not clear: how does the microbe reach the site of the

disease without causing any immune response? More serious considerations and further exploration are needed.

Shushan Gao: First of all, I think that when the technology is not very mature, the competitive effect and efficiency of microbial therapy is not very competitive. Secondly, the safety aspect is actually a big problem. For example, the intestinal flora is very complicated, then Whether your microbial treatment engineering bacteria will affect it, how the impact is solved. If we can match this with other new materials to match traditional small molecule drugs, personally think that microbial therapy is not necessary.

Ping Zhu: I think microbial therapy needs to carefully consider the following issues. The first one is, when the bacteria is used as a drug-loading system, what kind of drug does it carry? How many drugs can it carry? How does it carry the drug (first, the drug is not toxic to the bacteria itself, and secondly, the drug can be in the bacterial cell) The cumulative concentration?)? The second is that if the bacteria is used as a gene delivery system, the foreign gene is delivered to the target organ and the gene is normally expressed, and the expression product is used for therapeutic purposes, which may be feasible. Multi-reference gene therapy experience.

Qiwen Hu: The consideration of biosafety is a very important aspect. Another very important consideration is the expression and secretion of related proteins: Is it necessary to secrete? Can it be properly folded after adding a signal peptide? Can the secreted protein be able to play? Normal function?

Q：Our project this year is also a universal platform for improving safety of bacterial therapeutics. Do you think such a security platform is necessary, and are there any questions with our design?

A：

Yu Fu: I think a safe platform is necessary, but I will talk about your design. You have designed a suicide system. If the microbe does not reach the lesion and commit suicide, will it have any residue? These residues will not Will cause the body's immune response? This is what I think the design

needs to be treated with caution.

Shushan Gao: Your design is still very interesting. There are some issues I am concerned about here. Will heating to 40℃， affect the normal metabolism of the original intestinal flora. For example, this bacterium originally expresses protein A, and after heating, it expresses protein B that was not originally present, which may adversely affect the human body or the bacteria. The protein expressed by the toxin and antitoxin genes designed in the loop will not affect the normal flora in the intestinal tract after the death of the bacteria, killing some normal bacteria. Since it is in the intestines, I think it may be safer to consider drugs that help to express higher dominant proteins in the gut or to express only those that are metabolized by intestinal bacteria.

Ping Zhu: Your design actually has a certain innovative spirit. The security aspect is indeed a relatively important part. It is necessary to boldly explore how to achieve the best results.

Qiwen Hu: The consideration of biosafety is a very important aspect. For your targeted design, the application of in vivo heating at 42 °C is controversial and may have adverse effects on patients. However, it is recommended to apply 42 °C to the skin surface for the treatment of skin diseases.