



To Promote Biosafety by Risk Assessment - Workshop on Synthetic Biology and Biosafety

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02.02.2010

English translation of the Chinese *Science Times* article:
<http://news.sciencenet.cn/sbhtmlnews/2010/2/228758.html>

An Emerging Research Field

"Synthetic biology is an emerging discipline, and in order to make synthetic biology to develop healthily and meet the demand for mankind, it is critical to look into the biosafety issues." associate professor Wei Wei who is in charge of the project from the Chinese side told the reporter of "Scientific Times". The workshop of Chinese- Austrian cooperative project on biosafety on synthetic biology was held in the Institute of Botany, Chinese Academy of Science (CAS).

This cooperative project is supported by China National Natural Science Foundation and the Austrian National Science Foundation. The Chinese partner is the Institute of Botany, CAS and the Austrian partner is the Organisation for International Dialog and Conflict Management (IDC).

Dr. Pei Lei from IDC explained to the reporter of "Science Times" that synthetic biology is a multi-disciplinary science, combining biology, molecular biology, bio-engineering, chemistry, information technology and engineering science. To date, there is still no international consensus on the definition of synthetic biology. Different organizations have different definitions.

Wei Wei mentioned that in the academic setting, regarding synthetic biology, although there are some disputes, this research field receives a lot of attention in Europe and North America.

Professor Chen Guoqiang from the Department of Biological Science and Biotechnology Tsinghua University said: "the domestic research on synthetic biology already started getting hot, many researchers are working on it, perhaps one year later some applications will have come out."

Associate Professor Qiao Jianjun from Department of Biology and Pharmacy, School of Industrial Chemistry, Tianjin University pointed out that excellent work has been done taking examples from those done by Harvard Medical School. It will possibly lead the new trends in the development on new compounds, and in the future more people will participate in this field.

"From the global perspective, particularly for the recent 10 years, the growth on the quantity of synthetic biology related papers is very fast. Important progress has been achieved by synthetic biology on knowledge on biological science, construction of biological parts, devices and systems, as well as medicine, energy, enzyme production and so on." said Professor Zhao Xueming from School of Industrial Chemistry, Tianjin University "the issues related to biosafety are important. It is vital significance to the healthy development of synthetic biology and human."

Dr. Markus Schmidt, the co-founder of IDC, is in charge of this project from the Austrian side. Markus Schmidt presented examples in the workshop also what issues on biosecurity would be provoked by synthetic biology: (for example), since the genome has already been published, people could order genes of any pathogens. And this will likely cause biosecurity concerns. Therefore, the DNA synthesis of viruses (should be pathogenic agents) needs oversight.

China pays more attention on biosafety

Li Jingsong the principle researcher from the State Key Laboratory of Pathogenic Microorganism, Academy of Military Medical Sciences, said that biosafety has been received more and more focuses in China since 2003. The related laws and regulations have been released by the Department of Health, Department of Environmental Protection, Ministry of Agriculture, and Ministry of Technology. The regulations cover risk assessment and ranking on the scientific experiments. It is essential to

carry out risk assessment. Currently, the rank of protection regarding biosafety is relatively higher in China than abroad, especially to those projects involved in research on pathogens, where risk assessment is concrete.

“The domestic scientists have paid attention to the biosafety issues on synthetic biology. It is under investigation on the related techniques, laws and regulations in order to do risk assessment on synthetic biology. Taking examples from the domestic big organizations, the consciousness on biosafety is much better than 10 years ago, some work on biosafety has been done.” said Li Jingsong, “hoped that by the time this project is concluded, some related rules and measurement on biosafety will be brought up, which will provide support to make management standard in the future.”

Wei Wei said: “this project has quite some foresightedness. This kind of projects are relatively few within China. Many of our participants of the workshop are the active scientific experts in the field.”

The synthesized new pathways will bring potential risk, Wei Wei said: “(one of) our ongoing research topic is aimed at (making researchers) to consider the potential risk at the investigating stage.”

Wei Wei said that this project is a joint force of experts on risk assessment and biosafety from both Austria and China. They will refer to the assessment strategies used for genetic modified organisms and the international stratification to analyze the potential risk of applications of synthetic biology. Furthermore, through literature mining and consultation on expert, the existing biological safety control system will be assessed and the unique risk of synthetic biology will be identified. By providing an exchange platform on projects and resources of experts, (this project) is aiming to collect opinions from different sources, to recommend on biosafety measurements, evaluation and countermeasure, and eventually, to serve for the national biology safety control, which (in turn) would promote the research of synthetic biology in China, and the development of synthetic biology related fields.

The research content of this project involves five aspects: to analyze and review the current progress in synthetic biology from EU and China, and investigation on the research fields which synthetic biology may be applied to or have influence on; to investigate the issues on biosafety of synthetic biology, particular interest will be given to those differed from the tradition genetic engineering, including risk assessment and analysis methods on applications of synthetic biology; to evaluate the current framework on biosafety; to proposes the management approaches and suggestions; to provide platform for information exchange on research results among the scientific community, policy makers and the general public. It intends to provide recommendation that will be reported to the corresponding state agencies.