

International Workshop

**The Risk and Governance of Emerging Biotechnology:
From Europe to China**

STS Center of Institute for the History of Natural Sciences, CAS

13 April 2016
Academic Reporting Hall
Institute for the History of Natural Sciences, CAS, China
55 Zhongguancun East Road,

The Risk and Governance of Emerging Biotechnology:

From Europe to China

Program

9:00 Welcome

Session 1 Chair GAO Lu

9:10-10:10 Jane Calvert Edinburgh University

Synthetic biology as a topic for the social sciences and humanities

10:10-11:10 Robin Williams Edinburgh University

Responsible Research and Innovation: ELSI-fication and beyond?

11:10-11:30 Coffee Break

Session 2 Chair Xiaobai SHEN

11:30-12:30 Liu Yidong IHNS, CAS

**Ruin-causing Knowledge and Scientific & Technological Crisis:
The Biggest Challenge Confronted by Human Beings**

12:30-13:30 Lunch

Session 3 Chair: FANG Xiang

13:30-14:30 Xiaobai SHEN Edinburgh University

(How) Can regulatory systems travel ?

14:30-15:30 ZHOU Yinhua Sun Yat-Sen University

Markets and professional cultures in conflict in stem cell innovation

15:30-15:45 Coffee Break

Session 4 Chair: Jane Calvert

15:45-16:45 FANG Xiang Sun Yat-Sen University

From the body to the Society—take ostomy patients as an example

16:45-17:45 GAO Lu Institute for the History of Natural Sciences, CAS

**How to raise a new born baby: From Asilomar Conference to
Washington DC Gene Editing Summit**

Abstracts

Jane Calvert: Synthetic biology as a topic for the social sciences and humanities

Social scientists have been part of UK synthetic biology from its early stages. It was in 2008 that I was first invited to join a synthetic biology network. Since then I have been involved in a range of different activities, including interdisciplinary research projects, policy initiatives, and collaborations with artists and designers. In this presentation I discuss some of these experiences, and reflect on how they fit into the broader synthetic biology landscape, in the UK and beyond.

I describe my approach to exploring the social dimensions of the field, which involves taking engineering seriously, examining the metaphors that are used, and asking what it means to govern an uncertain future. I also discuss the notion of responsible research and innovation, which is rising in prominence in European research programmes. I then focus on the technical, social and conceptual issues that I find particularly salient in the synthetic yeast project, including its design principles, its internationally collaborative nature, and the attention it draws to the spatiality and temporality of living things. I end by reflecting on the role the social sciences and humanities could play in synthetic biology in the future.

Robin Williams: Responsible Research and Innovation: ELSI-fiction and beyond?

'Responsible Research and Innovation' (RRI) proposes the engagement of diverse stakeholders alongside technical specialists to ensure that research and innovation take into account effects and potential impacts on the environment and society.

RRI builds upon and seeks to overcome problems encountered in earlier efforts to address the Ethical Legal and Social Implications (ELSI) of emerging technosciences like genomics and nanotechnology. It sought to resolve concerns that this kind of involvement might become routine and limited in scope and influence (ELSI-fiction). Some of these problems seem to resurface in RRI exercises. Researchers from Science, Technology and Innovation Studies have been discussing how to respond to these challenges.

LIU Yidong: Ruin-causing Knowledge and Scientific & Technological Crisis: The

Biggest Challenge Confronted by Human Beings

The speaker invented the concept of “ruin-causing knowledge” and the “research mode of ruin-causing knowledge” to replace the “research mode of double-edge sword”(Liu,1999,2000,2002,2007,2011,2012,2013,2014,2015). For the first time in the world, LIU proposed and demonstrated that the biggest crisis facing mankind is the crisis of science and technology. The core is that the increase and proliferation of ruin-causing knowledge is irreversible, unstoppable, and cannot be counteracted. The risk of destruction confronted by human beings is constantly accumulating and enhancing, and there will bound to be a catastrophic disaster when it reaches a certain level. In consideration of the speed and situation of scientific and technological development, there is a strong possibility that there will be a disaster in the short and middle term. Because of the progression of the risk is irreversible, the risk of a disaster will be bigger and bigger until the disaster finally comes. This is the biggest challenge and opportunity confronted by knowledge production. The challenge will lead to scientific revolution.

Xiaobai SHEN : (How) Can regulatory systems travel?

This paper considers what may be involved in attempts to extend regulation across national and cultural boundaries.

Globalisation in essence is ‘imitative’. Western model of regulating science and technology are being widely disseminated in the name of ‘harmonisation’ of international regimes of governance. However we have an inadequate understanding of the deep paradoxes surrounding such ‘top-down state initiated imitation’. The paradoxical outcomes of these imitative attempts present a major impediment confronting globalisation efforts in terms of both today’s challenges in organising them and understanding the process involved. The phenomena of imitation have not been properly studied in part because effective analytical frameworks are lacking.

The early French sociologist, Gabriel Tarde, developed an analytical framework for understanding phenomena of imitation, which regards the mimicry across social distance a fundamental social act at the same time a source of unintended outcomes. Tarde observes that imitation occurs at the “optical point” “where we are near enough

to have all the illusion of the scenery without being near enough to be aware of the stage machinery” (1903: 392).

Drawing on historical attempts to regulate economic life (in particular the attempt to globalise regulatory regimes - for example for risk governance or for intellectual property - by encouraging developing economies to adopt Western regimes - the paper argues that this imitation effort liable to generate unproductive is inherently prone to have unanticipated outcomes

ZHOU Yinhua: Markets and professional cultures in conflict in stem cell innovation

The global stem cell therapy market is serviced by a supply of treatments generated by two quite different models of stem cell innovation: scientific innovation and medical innovation. The former is characterised by hypothesis driven research, the scientific method and randomised controlled trials. The latter contains elements of these features but is mainly characterised by the clinic based provision of new, scientifically-unproven stem cell based therapies to patients responding to national and international demand from patients. These two innovation models occasionally contradict with each other in the case of stem cell market, as the stem cell based medical innovation led by the clinicians, particularly in the emerging economies is perceived as negative business-oriented phenomenon by scientific community and regulators, such as the critique of stem cell tourism. This research conducts studies on the conflicts generated by scientific and medical cultures and regulatory frameworks to help understand the nature of innovation models in stem cell science, as well as in the global stem cell market.

FANG Xiang: From the body to the Society—take Ostomy patients as an example

Cutting the body is the main form of modern western surgery. However, the great medical achievements left patients to deal with their “damaged” bodies. This research takes the hospital as the field to explore patients’ turning bodies, patients’ perception and construction of their bodies, and ostomy patients’ interaction with the society. Douglas’ concept about risk and culture, Foucault’s arguments about power and body, and also Agamben’s concept of ‘Homo Sacer’ have been used to construct the theoretical framework. Data have been collected by ethnography fieldwork research.

The research finds out that ostomy patients are alive biologically but have been excluded by themselves from their social lives.

GAO Lu: How to raise a new born baby: From Asilomar Conference to Washington DC Gene Editing Summit

When confronting a new technology with powerful ability, even their scientists parents don't know how to raise such a new baby. Such as the emerging CRISPR technology, lots of scientists referred to the Asilomar Conference 40 years ago. In 1975, a group of mostly US scientists met at an iconic conference in Asilomar, California, and set stringent guidelines for moving forward with powerful new research tools that enabled the mixing of DNA between species. Forty years later, it took a much more diverse group to reach a much less definitive agreement: a recommendation not to stop human-gene-editing research outright, but to refrain from research and applications that use modified human embryos to establish a pregnancy.

Comparing the two conference, what changed, and in what kind of means? Beyond the framework of the Washington Gene Editing Summit, what should China draw from the governance of biotechnology of western, especially how to leave the GM experience into a CRISPR era? Based on the Third-wave Theory of Collins and Evans, this research tried to generate discussion on the new modes of science communication and governance in China which will involve more actors from social scientists, also the prepared public.

Introduction of the speakers:

Dr. Jane Calvert: Reader in Science, Technology and Innovation Studies. School of Social and Political Science, University of Edinburgh. She works in the area of the sociology of the life sciences, and current research focuses on attempts to engineer living things in the emerging field of synthetic biology. Jane has been working with the synthetics biologist for several years, and has published more than 30 articles around this topic. She also participated in the policy making of synthetic biology in Europe. She was a member of the Royal Academy of Engineering's Working Party on Synthetic Biology, the UK Synthetic Biology Roadmap Coordination Group, the Hastings Center Working Group on Ethical Issues in Synthetic Biology and the Nuffield Council of Bioethics Working Party on Emerging Biotechnologies. She is currently a member of the BBSRC's BioScience and Society Strategy Panel.

Prof. Robin Williams: Director, Institute for the Study of Science, Technology and

Innovation Studies, Edinburgh University. Robin is the director of Edinburgh STS, and his personal research focuses on the social shaping of technology, highlighting the influence of a variety of actors on the design, implementation and use of ICT. A major concern has been with enterprise systems and other large, complex information infrastructures. He also involves in the research on risk governance and innovation of new and emerging science and technology, especially in relation to life sciences (where I am co-director of Innogen: the ESRC Centre for Socio-Economic Research on Innovation in Genomics). A recent collaboration with the Centre for Fire Safety Engineering, sponsored by the Ove Arup Foundation and Royal Academy of Engineering examines how better regulation and training could improve fire safety and better integrate it with other goals for our built environment (for example security, aesthetics, energy use).

Prof. LIU Yidong: Liu Yidong is a Professor in the Institute for the History of Science at the Chinese Academy of Sciences. He is the Director of the Center for Science, Technology&Society. He was a Visiting Fellow in the Department of Management at the London School of Economics and Political Science(LSE,2006-2007). His main research work concentrates on S&T strategy and IT strategy, on IT in developing countries, on History of technology, and on Science and technology studies. His chief work was ‘The Intelligence Industry Revolution: Scientific and Technological Transformation, Industrial Transformation, and Social Transformation under the Coercion of Irreversible Growth of Ruin-causing Knowledge(2007)’.

Dr Xiaobai Shen: Senior Lecturer in International and Chinese Business and Director, Edinburgh University. Xiaobai’s research is on the social analysis of technology, their markets, and the embedding broader context. She specialised in the areas of telecommunications, information and computing sectors, in particular focusing on issues concerning emerging markets. She has acted as an investigators for several large research projects in biotechnology and ICT, including GM technology in China and CIPR - collective intellectual property rights project under PRIME funded by EU commission and EU-China ICT Standards partnership.

Dr. ZHOU Yinhua: After he graduated from University of Edinburgh, he had spent 2

more years as a research fellow in the Global Biopolitics Research Centre of King's College London. He is now an associate professor of Sun Yat-Sen University. His research focus is on the innovation of life sciences and medicine, STS with particular focus on Biomedical Sciences, IT Technologies and Sociology of Medicine and Healthcare. He was a key contributor of the ESRC project *State Strategies of Governance in Biomedical Innovation: the Impact of China and India*. He has published several SCI and SSCI articles on *Regenerative Medicine, Social Science & Medicine and Science, Technology & Human Values*. He is also the reviewer of *Science, Cell Stem Cell* and *Social Science & Medicine*.

Dr. FANG Xiang: Associate professor of Department of Sociology and Social Work, Sun Yat-sen University, deputy director of the department. Graduated from Edinburgh University, her research focuses on the sociology of environment from the perspective of STS. She is the author of the book *Social Construction of Nuclear Risk in China: the Public's Participation in Civil Nuclear Issue from the Start of 21st Century*. She has published several articles around the nuclear risk in the journal such as *Public Understanding of Science*. She is also working in the department of medical humanities at Zhongshan Medical School. Recently she has been working closely with her colleague at medical school to promote the development of medical humanities in Asia. Their research interests included doctors and patients relationship, patients' self-identity, the history of medicine and so on.

Dr. GAO Lu: Graduated from STS Center of Tsinghua University, she is an associate professor in the Institute for the History of Natural Sciences, CAS. Her research focuses on the biotechnology and society, especially the participatory approach of STS in Europe. She is now involved in the project of 'the risk of Biotechnology in China'. She had published more than 20 articles about science and technology policy and STS. Lu was a visiting scholar of Edinburgh University (2008-2009) and Stanford University (2014-2015).

