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A Proposal for Responsible Conduct of GM Technology Research and Development*

Genetically modified (GM) technology is an inevitable result of the rapid development of modern science and technology. With broad application prospects in fields such as medicine, industry, agriculture, environmental protection, energy and new materials, it will certainly provide new development space for human society. However, as with other high technologies, its nonstandard R&D activities and misuse might raise safety risks. For this reason, the Presidium of Academic Divisions of the Chinese Academy of Sciences (CASAD) calls on practitioners of GM technology research and development (including basic and applied research, and product development), and those involved in the research and development of safety monitoring, evaluation, and detecting techniques to retain a high sense of responsibility and to widely promote professional ethics, conduct research properly, fulfill social responsibility, facilitate public communication and support the sound development of GM technology.

1. General Principles

Given their special position and role, scientists should assume responsibility in two aspects. One is to ensure the development of GM technology best benefits human development and social progress. The other is the consciousness of perceiving injustice and avoiding risks. Therefore, the responsible conduct of GM technology research and development should stick to the following general principles:

● Responsibility. Scientists engaged in GM technology research and development should be responsible for their own activities. They should concern themselves with the social effects of the application of the technology, and make conscientious efforts to improve people's health, and secure environmental safety and national security.

● Sustainability. In light of the code of ethics, GM technology research and development should ensure safety, lift resource restraints, protect biodiversity and the ecological environment, and expand its applications in medicine, agriculture, environment and other industries.

● Serving the Nation and Society. GM technology research and development and their evaluation should serve the strategic needs of national development, promote socioeconomic development, improve human health and food security, and create an environment for the sustainable existence and development of human beings.

2. Responsibilities in Research Activities

Those engaging in GM technology research and development should conscientiously observe the laws and regulations, technical specifications and management systems concerning GM organism safety management, and abide by relevant international conventions on bio-safety. They should develop and apply GM technology in a responsible manner. While advancing knowledge and promoting development, they should also pay close attention to the social and environmental effects of its applications, anticipate potential risks and avoid negative impacts. The responsibilities of scientists in the process of GM research include:

● Normalizing Research Process. For the planning

*A translation of the original document of CASAD in Chinese. In case of any discrepancies between the English and Chinese versions of this document, the Chinese version shall prevail.

and execution of restricted field testing, enlarged field testing and productive testing of GM organisms, researchers should ensure they proceed in a safe and orderly manner by observing the national GM organisms safety regulations, class-based safety administration measures and requirements, and safety operation specifications in this regard.

● Strengthening Safety Management. In line with the safety regulations in laboratories and testing areas, researchers should participate in regular training and assessments, make regular checks on the executive records and results of plan implementation and experiment (trial) performance, and maintain records of safety management. The archives should include safety management responsibility systems, safety supervision records in laboratories and test fields. They should keep files for reference on personnel and materials management, including the realignment, training and assessment of practitioners, their records of exit and entry, and the logs of inbound and outbound delivery of materials.

● Containment. In the process of storage, transfer, transportation, destruction and inactivation of GM organisms, appropriate safety management and prevention measures should be taken with specific equipment or premises. Before treating and disposing the wastes of GM organisms classified as Class II, III and IV, reliable measures should be adopted to destroy them or make them inactive, so as to prevent them from spreading and contaminating the environment. The release, residues and risks of GM organisms must be reported to local administrative authorities without delay, and immediate and effective measures should be taken to facilitate their control and elimination.

● Promoting Safety Research. To avoid or minimize risk factors in the early stage of technology development, efforts should be made to strengthen research into the effects of GM crops on human health and the ecosystem, and into safe GM technology systems. In the process of GM research and development, priority should be given to the generative process of GM products, and the potential risks posed by gene products within them and the possibility of gene transfer.

● Safety Evaluation. Researchers should assume the responsibility of making conscientious safety assessments of their research results, promote the development of detection and monitoring technologies for GM products, build up the safety evaluation ability of GM technology and products, and increasingly improve GM safety management.

3. Social Responsibilities

In consideration of the increasingly close relationship between science and society, scientists should take social responsibility for their research findings. They play an important role in supporting decision-making, risk management and science communication concerning GM technology, and related social applications. They should be a careful and conscientious consultant in the process of approval and decision making, a fair and rational evaluator in the process of risk management, and an honest and frank communicator with the public. Their social responsibilities should include:

● Decision-Making Consultation. Scientists should actively participate in the discussion of relevant policy issues, providing comprehensive, accurate, authentic and objective advice for decision-making. Priority should be given to the ethical, legal and social issues in the research, development and application processes of GM technology. In discussions, they should put forward reasonable grounds or evidence, offer convincing arguments or conclusions, and serve as honest brokers to promote social understandings and expand the scope of policy choices.

● Science Communication. Being faithful to the facts and evidence, researchers should respect the public's right to know and communicate with the public on GM safety issues in appropriate ways. They should engage in science popularization by using multiple methods and channels, improve communication abilities, and promote basic knowledge of GM technology and its safety management. They should raise public knowledge, and take the initiative and effort to understand public perceptions and concerns during the communication process.

● S&T Ethical Education. Scientists should place importance on S&T ethics in education, guiding students and young researchers to pay attention to ethical issues, informing them of basic ethical norms of scientific research, and cultivating their sense of responsibility.

● Avoidance of Conflicts of Interest. When entrusted with research projects, achievement appraisals and safety evaluations, scientists should be practical and realistic, objective and accurate. They should free themselves from being affected by potential interests, treat for-profit commercial research with caution, and avoid the possible negative results of conflicts of interest.

4. Action Guidelines

In the research, development and application of GM technology, scientists should uphold research norms, maintain awareness of S&T ethics, and conscientiously reflect on potential ethical, social and legal issues based on their academic specialty. They should carry out safety self-examinations regularly to ensure responsible scientific research.

● Upholding Research Integrity. Efforts should be made to firmly oppose plagiarism, falsification, fabrication and other forms of research misconduct. In the activities of GM frontier research and technology development, researchers should comply with the norms of scientific publication, and refrain from publishing immature results in order to unilaterally pursue publication as a priority or seeking a scoop through improper means. Misconduct should be promptly reported to the authorities.

● Following Safety Regulations. Researchers should observe national laws and regulations on GM organism research, and trial safety evaluations and safety management. Before conducting any GM research and experiments, they should seek approval from the appropriate administrative authorities according to their safety categories. In the process of experiments, strict implementation of required safety measures must be ensured. With regard to research results, especially physical results, restricted field testing, enlarged field testing, productive testing and commercial production should be done in accordance with regulations. The control measures for every aspect should be implemented in accordance with regulations.

● Working with Peers. Encouraging colleagues and students to comply with relevant regulations. Serious ethical issues in technology development or application should be promptly reported to the relevant administrative authorities. If there is any doubt concerning the ethics of a problem, discussions should be held with peers, including scholars in humanities and social sciences if necessary.

● Carrying Out Safety Checks. Scientists should plan and carry out supervision and inspections regularly, and correct violations without delay. They should conscientiously accept the supervision and inspection of relevant administrative authorities, and actively cooperate with supervisors and inspectors to perform their duties according to laws.

● Accepting Social Supervision. Under the premise of respecting intellectual property rights and complying with confidentiality requirements, research in this regard needs to be open to the public, to ensure that the public can understand its basic purpose, progress and results. Also, scientists should conscientiously accept social supervision.