Singapore Biorisk Code of Conduct for the Life Sciences Industry and Professionals

Developed by

Biorisk Association of Singapore

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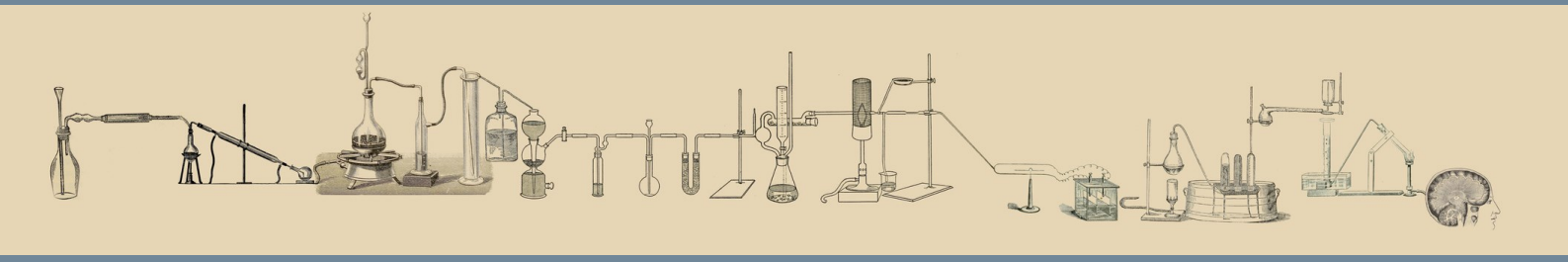
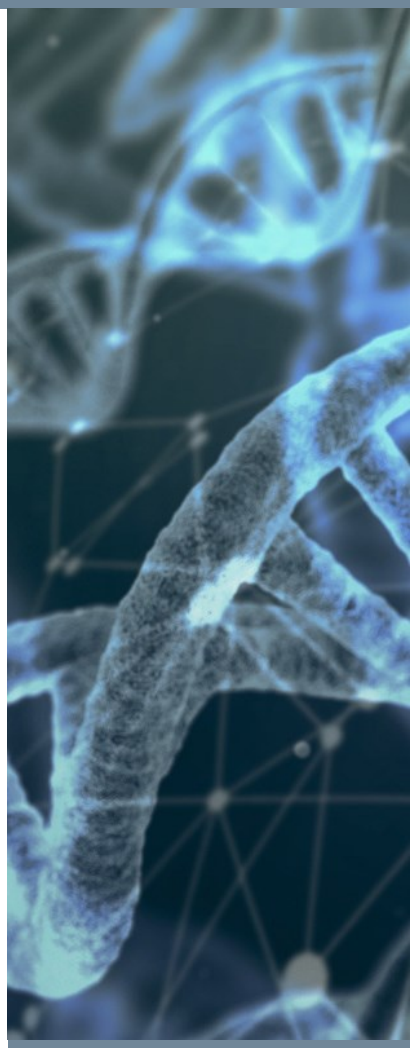
SINGAPORE BIORISK CODE OF CONDUCT FOR LIFE SCIENCES INDUSTRY AND PROFESSIONALS



SINGAPORE BIORISK CODE OF CONDUCT FOR LIFE SCIENCES INDUSTRY AND PROFESSIONALS

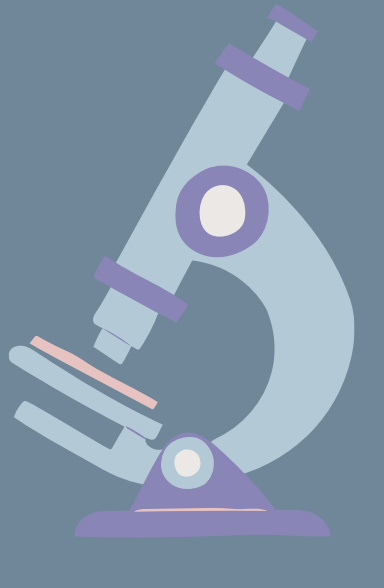
Introduction



Developments in the life sciences research have helped to advance humanity's well-being. However, such developments carry the potential risks of exposure to biohazardous materials as well as potential deliberate misuse to cause harm. Management of the benefits and the risks of life sciences research thus calls for such work to be conducted in a responsible manner.

In order to promote a **culture of responsibility** and to guard against such potential exposure and misuse, all scientists, research institutions and industry players in Singapore are strongly encouraged to incorporate elements from this Biorisk Code of Conduct for Life Sciences Industry and Professionals in their **institutional and company practices, protocols, and guidelines.**

This Biorisk Code of Conduct has been developed by the Biorisk Association of Singapore with support from the Singapore Ministry of Health and the European Union Chemical, Biological, Radiological and Nuclear Risk Mitigation Centres of Excellence Initiative. It lays down principles for the life science research industry and professionals to examine the implications and possible applications of their research work and to balance the pursuit of scientific knowledge with their ethical responsibilities to society.

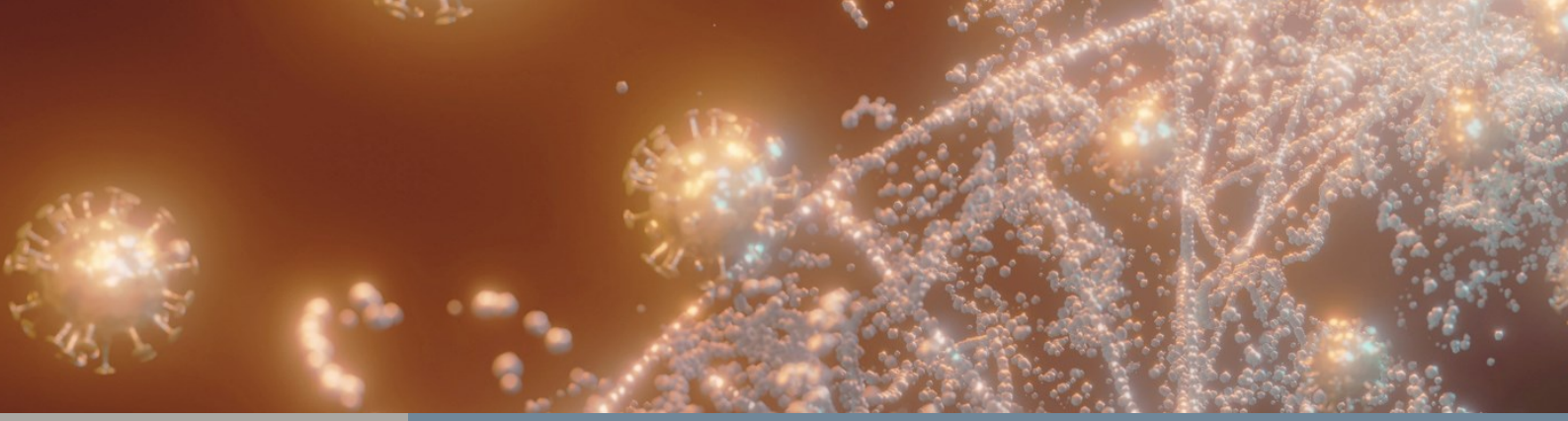


1. TERMS AND DEFINITIONS

	TERMS	DEFINITIONS
1.1.	**Bioethics:**	The study of the ethical and moral implications of biological discoveries, biomedical advances, and their applications as in the fields of genetic engineering and drug research. *(adapted from: World Health Organisation (WHO) Laboratory Biosecurity Guidance 2006)*
1.2.	**Biohazardous Material:**	Any material comprised of, containing, or that may contain biological agents and/or their products or derivatives, such as toxins, nucleic acids (including synthetic biological materials). *(adapted from: ISO 35001:2019 Biorisk management for laboratories and other related organisations)*
1.3.	**Biological Agent:**	Any microbiological entity, cellular or non-cellular, naturally occurring or engineered, capable of replication or of transferring genetic material that may be able to provoke infection, allergy, toxicity or other adverse effects in humans, animals, or plants. *(adapted from: ISO 35001:2019 Biorisk management for laboratories and other related organisations)*
1.4.	**Biorisk:**	The probability or chance that a particular adverse event involving a biohazardous material may occur (e.g., accidental infection or unauthorised access, loss, theft, misuse, diversion or intentional release). *(adapted from: WHO Laboratory Biosecurity Guidance 2006)*
1.5.	**Biosafety:**	Describes the containment principles, technologies and practices that are implemented in laboratories to prevent the unintentional exposure to biohazardous materials, or their accidental release. *(adapted from: WHO Laboratory Biosecurity Guidance 2006)*

1. TERMS AND DEFINITIONS

	TERMS	DEFINITIONS
1.6.	**Biosecurity:**	Describes the control, protection and accountability for biohazardous materials within laboratories, in order to prevent their loss, theft, misuse, diversion unauthorised access or international unauthorised release. *(adapted from: WHO Laboratory Biosecurity Guidance 2006)*
1.7.	**Code of Conduct:**	A formal statement of values and professional practices which defines the expectations and directs the actions of a group of individuals (be it an occupation, academic field, or social doctrine, etc) with a common focus (in this case, life sciences related activities). It also serves as a persistent reminder of moral and ethical responsibilities for the group. *(adapted from: WHO Laboratory Biosecurity Guidance 2006)*
1.8.	**Dual Use:**	Knowledge and technologies generated by legitimate life sciences research that may be appropriated for illegitimate intentions and applications. *(adapted from: WHO Responsible Life Sciences Research for Global Health Security 2010)*
1.9.	**Life Sciences:**	Life sciences comprise all sciences that deal with organisms (which may include microorganisms, humans, animals and plants), and including but not limited to biology, biotechnology, genomics, proteomics, bioinformatics, pharmaceutical and biomedical research and techniques. *(adapted from: WHO Responsible Life Sciences Research for Global Health Security 2010)*
1.10.	**Toxin:**	Any poisonous substance that is produced and extracted from any micro-organism as well as synthetic form of such substances. *(adapted from: Singapore Biological Agents & Toxins Act)*



2. PURPOSE & INTENT

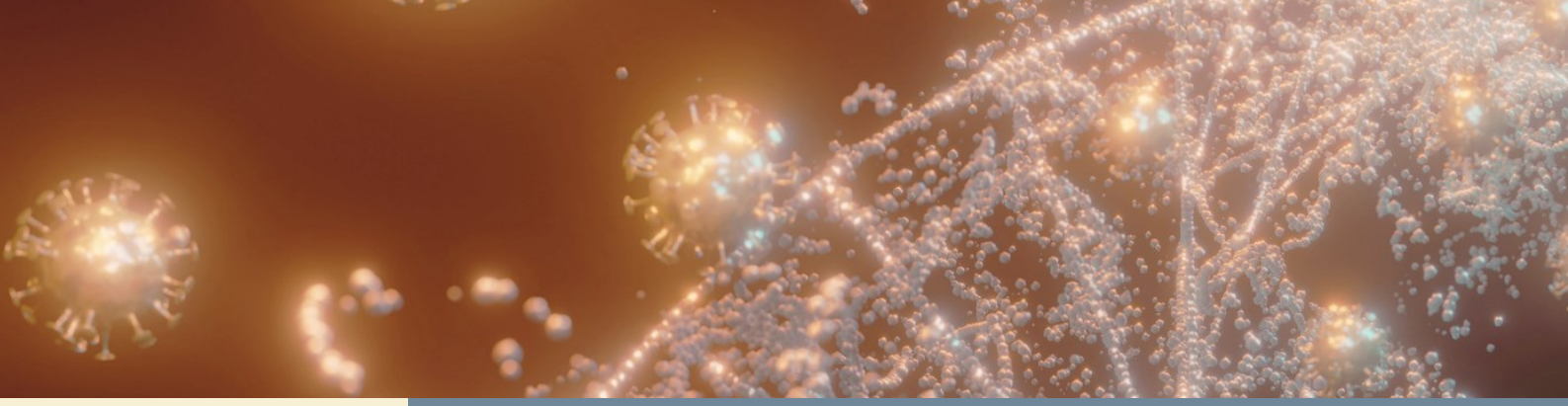
2.1. All personnel involved in the dealing (e.g., handling, using, storing, transferring) of biohazardous materials are to:

2.1.1. **comply with all applicable national acts and regulations** (e.g., Biological Agents and Toxins Act, Infrastructure Protection Act, Workplace Safety and Health Act, Strategic Goods (Control) Act, Animals & Birds Act);

2.1.2. **adhere to best practices** stated in international and local standards/guidelines (e.g., WHO Laboratory Biosecurity Guidance, WHO Laboratory Biosafety Manual, Guidelines on the Care and Use of Animals for Scientific Purposes, National Advisory Committee for Laboratory Animal Research, Singapore Biosafety Guidelines for Research on Genetically Modified Organisms, Guidance on Regulations for the Transport of Infectious Substances); and

2.1.3. adhere to the best practices in line with **international conventions and treaties** (e.g., Biological and Toxin Weapons Convention, UN Security Resolution 1540, International Health Regulations) in a responsible manner;

2.1.4. abide by national standards/guidelines, in the event of discrepancies/disagreement between international and national standards/guidelines.

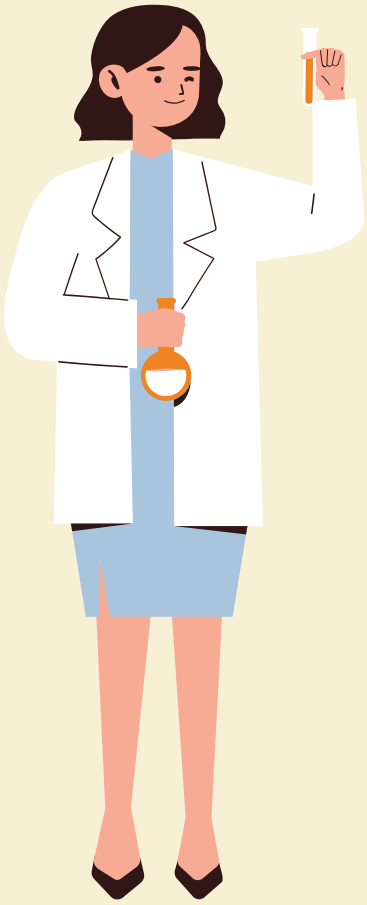


2. PURPOSE & INTENT

2.2. **All professionals and funding bodies** overseeing and/or involved in life sciences research and dissemination of scientific information are aware of the dual use implications of their work and the need to prevent any potential malicious misuse of such biohazardous materials, related information and technologies.

2.3. All professionals in life sciences as well as private industry **providing nucleic acids synthesis** to act according to the ethical principle of professional integrity and responsibility.

3. TARGET GROUP



The Biorisk Code of Conduct is intended for:

3.1. **Technical professionals** engaged in life sciences research and **organisations**, institutions and companies where relevant biohazardous materials are dealt with (e.g., produced, manipulated, manufactured, distributed, managed, stored, stockpiled, shipped, transported, researched, educated or trained in life sciences).

3.2. **Management professionals** and institutions with biorisk management oversight of life sciences research, manufacture, transport, storage and use of biohazardous materials.

3.3. **Authors, reviewers, editors and publishers** of life sciences publications and administrators of websites dedicated to life sciences.

3.4.**Funding bodies** supporting life sciences research.

4. ENABLERS

4.1. Ethical Standards

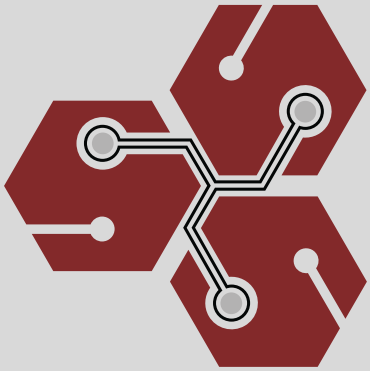
Respect for human life and relevant social ethics should be the overarching basis of life sciences research. Those involved in life sciences research should have a higher obligation to conduct their work for peaceable outcomes that benefit humankind, to encourage responsible conduct in life sciences research and to guard against the misuse of science for malicious intents, including environmental damage.

4.2. Raising Awareness

4.2.1. Allocate resources for the education and training of professionals in the life sciences to prevent the risk of misuse of biohazardous materials, science and technology, and to align with national biosafety and biosecurity legislations and regulations and other relevant national and international standards, guidelines, conventions and treaties;

4.2.2. Respect the themes of laboratory biosafety, biosecurity and dual use potential of biohazardous materials in their related knowledge, methodologies, technology, equipment and information in life sciences laboratories and professional journals, websites and other form of communications; and

4.2.3. Advocate the importance of **individual integrity** and ethical responsibility in life sciences activities.



4. ENABLERS

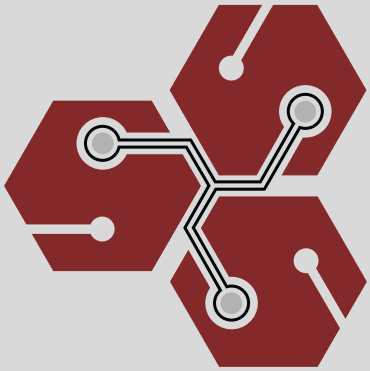
4.3. **Research and Sharing** of Knowledge

Review and monitor life sciences research activities with regards to bioethics, biosafety and biosecurity to ensure that legitimate benefits are being sought and that they outweigh the risks and harm, through:

4.3.1. Carrying out **effective risk assessments** (biosafety, biosecurity and dual use potential) and management for all stages of the life sciences research life cycle (e.g., initial conceptualization and development of project proposals, reviewing the project proposal for funding/ allowing to conduct the research/experiments, result analyses, dissemination of research information) by the relevant and competent stakeholders;

4.3.2. Practising **safe work procedures** and adhering to Codes of Practices (where applicable) at all times to ensure the safety of workplace and co-workers, the protection of the community and the environment;

4.3.3.Minimising the unintended risks that may have arisen from the **publication or sharing of sensitive information** such as scientific knowledge, methodologies and technologies leading to inadvertent consequences that may pose a risk; and



4.3.4.**Selecting collaborators** meticulously based on their reliability and sense of responsibility and where appropriate, training collaborators to recognise dual use research so as to manage them accordingly.

5. Oversight and Accountability

5.1. Strengthen **mechanisms for oversight** of:

5.1.1. professionals engaged in life sciences research;

5.1.2. organisations, institutions and companies where relevant biohazardous materials are handled and managed;

5.1.3. authors, editors and publishers of life sciences publications; and

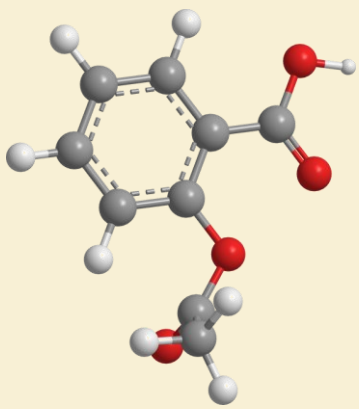
5.1.4. technologies with potential of dual use concerns; and

5.1.5. entities mentioned in the Target Group.

5.2. Strengthen **organizational culture** that emphasizes biosafety and biosecurity, and provide an environment to promote a culture of responsibility and integrity in life sciences and prevent its misuse;

5.3. Foster **individual responsibility** in maintaining the research integrity including refrain from engaging in potentially dangerous research or publication and complying with laboratory biosafety and biosecurity legislation, regulations, guidelines, standards, policies and procedures in biorisk management; and

5.4. Protect **whistle blowers** and ensure that they do not suffer any adverse effects from their actions.



6. Internal and External Communications

6.1. **Communicate biorisks** to all relevant stakeholders effectively;

6.2. Incorporate security measures for internal and external e-mails, posts, telephone calls and data storage concerning information about biohazardous materials of biosecurity concern and potential dual use materials and/or related information and technologies.

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