Standard Operating Procedures (SOPs)

By Laboratory Safety Committee of Chulabhorn International College of Medicine, Thammasat University

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CICM–LS–SA-001

Laboratory Use and Safety

Version History

Author	Version	Date Approved	Desecription of change
Asst.Prof.Teva Phanaksri, Ph.D.	1	27 Dec 2023	New version

Name of holders/possessors of this SOP

No.	Name
1	Laboratory Safety Committee of Chulabhorn International College of Medicine

1. Objective

To be a guideline for conducting research in the Chulabhorn International College of Medicine Research Laboratory

2. Scope

This standard operating procedure (SOP) serves relevant personnel to study and understand the conduct of research in the Chulabhorn International College of Medicine Research Laboratory.

3. Principle

Safety policies and procedures are essential for keeping people safe and productive in the workplace. Effective management will help to limit the risk of accidents and have an effective response to events. Therefore, the SOP and practice are required for relevant personnel.

4. Definitions and abbreviations

4.1 BSL1 refers to Biosafety level 1.

4.2 CICM-BCC refers to the Biosafety Control Committee of Chulabhorn International College of Medicine, Thammasat University.

4.3 ESPReL refers to Enhancement of Safety Practice in Research Laboratories in Thailand.

5. Responsible persons

5.1 Laboratory Safety Committee of Chulabhorn International College of Medicine, Thammasat University

5.2 Biosafety Control Committee of Chulabhorn International College of Medicine, Thammasat University

5.3 Laboratory Committee of Chulabhorn International College of Medicine, Thammasat University

5.4 Research Supporting Office, Chulabhorn International College of Medicine, Thammasat University

5.5 Operator of Chulabhorn International College of Medicine, Thammasat University

5.6 Operating personnel of Chulabhorn International College of Medicine, Thammasat University

5.7 Investigators

6. Documents

6.1 Biological safety laboratory application form (CICM-BCC-FA-001)

6.2 Research project and Laboratory application and approval form (CICM-BCC-SA-001 Rev.0.02)

6.3 Use of biological safety laboratory form (CICM-BCC-SA-002 Rev.0.02)

7. References

7.1 Occupational Safety, Health and Environment Act, B.E. 2554

7.2 Pathogens and Animal Toxins Act, B.E. 2558

7.3 Notification of the Ministry of Public Health entitled Place of Production or Possession of Pathogens and Animal Toxins, B.E. 2561

7.4 Safety Guidelines for Laboratories

7.5 ESPReL (Enhanced Safety and Protection for Research Laboratories)

8. Operating Procedure

8.1 Access to the Research Laboratory

8.1.1 The Research Laboratory's access must comply with the document CICM-BCC-SA-001 Rev.0.02

8.1.2 Biological safety-related research has to comply with the document CICM-BCC-SA-002 Rev.0.0

8.1.3 Arrange equipment and tools appropriately on bench and keep clean

8.1.4 Wear closed shoes while working in the laboratory

8.1.5 Wear proper lab coat or gown

8.1.6 Put (long) hair up while working

8.1.7 Smoking is not permitted in the laboratory

8.1.8 Avoid wearing lab coat or gloves outside the laboratory or in an unrelated laboratory working space (e.g., laboratory office)

8.1.9 Avoid working alone

8.1.10 Food and drink are strictly forbidden in the laboratory (this includes breath mints and chewing gum)

8.1.11 Do not use any food containers to store samples or chemicals

8.1.12 Do not use contact lenses while working in the laboratory

8.1.13 Irrelevant work or cosmetic activities are not permitted in the laboratory

8.1.14 Avoid touching clean objects while wearing gloves, such as door knobs or mobile phone

8.1.15 A warning sign has to be provided while working with each instrument, including the worker's name and phone number

8.1.16 Always wash your hands before leaving the laboratory

8.1.17 The use of chemicals in the laboratory has to be done as follows:

1. When handling chemicals, put on proper personal protective equipment (such as nitrite gloves, a lab coat, a chemical protective mask, and safety glasses) and follow the safety data sheet
2. Always open concentrated acids in the fume hood
3. Always open or close respiratory-harmful substance containers in the fume hood, such as chloroform, formaldehyde, glutaraldehyde, xylene, phenol etc.
4. Do not store all chemicals in/under the fume hood
5. Always clean the fume hood after finishing your work
6. Avoid directly pouring concentrated acids or alkalis into sinks

7. All workers are required to complete risk assessment using the CICM-LS-SA-006 form. When using highly hazardous substances like cyanide or hydrogen fluoride, laboratory personnel must be informed.
8. The chemicals used in the laboratory must be updated on a regular basis by the principal investigator or responsible researcher.

CICM–LS–SA-002

Chemical data management and Storage

Version History

Author	Version	Date Approved	Desecription of change
Aporn Bualuang, Ph.D.	1	27 Dec 2023	New version

Name of holders/possessors of this SOP

No.	Name
1	Laboratory Safety Committee of Chulabhorn International College of Medicine

1. Objective

To provide guidelines and criteria for using the laboratory in accordance with research laboratory safety standards. For the safety of users and the environment.

2. Scope.

Enable relevant personnel to understand the guidelines and methods used in the laboratory to comply with the safety standards of the research laboratory. For the safety of users within the Chulabhorn International College of Medicine laboratory.

3. Principles

For operations within the research laboratory of the Chulabhorn International College of Medicine, following the framework of elements of a safe laboratory. It consists of seven interrelated components: 1) Safety management system 2) Chemical management system 3) Waste management system 4) Physical characteristics of laboratories, equipment, and instruments 5) Hazard prevention and remediation system 6) Basic knowledge of laboratory safety and 7) Information and document management. To ensure safety for researchers, collaborators, and the community.

4. Definitions and Abbreviations

ESPreL refers to the project implemented by the National Research Council of Thailand (NRCT) to improve the safety standards of research laboratories in Thailand. (Enhancement of Safety practices in research laboratories in Thailand)

5. Responsible person

5.1 Chulabhorn International College of Medicine Laboratory Safety Committee

5.2 Chulabhorn International College of Medicine Laboratory Management Committee

5.3 Chulabhorn International College of Medicine Occupational Safety, Health, and Work Environment Committee

5.4 Research, Promotion, and Academic Development

6. Related documents

Safety Guideline for Laboratory

7. Reference

Lab Safety Inspection Manual, Second Edition

8. Operational processes

8.1 Chemical data management

8.1.1 Data records of received chemicals must be recorded in the chemical recording system, as follows:

- Bottle ID
- Chemical name
- CAS No.
- Hazard classification
- Bottle volume/weight
- Supplier/manufacturer
- Grade
- Price
- Location
- Received date
- Open date
- Expired date

8.1.2 Chemical information recording system

Using ChemInvent2015, researchers or designated personnel record data (import, export) with regular updates.

8.1.3 Chemical Clearance

Can be divided into 3 sub-categories:

1) Substances that are not needed mean substances that are no longer needed.

2) Expired substances according to the label mean substances that have expired as specified by the manufacturer, which is shown on the chemical bottle label.

3) Expired substances mean substances that cannot be used. Apart from the expiry date, consider chemical and physical properties of substances, such as chemicals changing color from the original, etc.

Researchers or designated personnel inspect the inventory of chemical bottles every 6 months (March and September). And place unused chemicals in the rest area and dispose of them through the waste management system.

8.2 Chemical storage

The general requirements for the storage of laboratory chemicals are as follows:

8.2.1 Store chemicals according to chemical incompatibility groups for classification based on incompatibility. There are two standards: (1) Department of Industrial Engineering Announcement and (2) Chemical Segregation (Hazard class) of Lawrence Berkeley National Laboratory (Berkeley Lab), U.S. Department of Energy, which separate solid and liquid chemical storage cabinets. As shown in (Attachment No 1.)

8.2.2 Keep corrosives bottles (both acid and alkali) at a low level (store the acid below the visible level), separate acids and bases in different cabinets, and equip an auxiliary container according to the requirements of the laboratory.

8.2.3 Separation of organic acids and inorganic acids

8.2.4 Store flammable and explosive articles separately from other types of chemicals and keep them in the chemical storage cabinet designated by the laboratory.

Liquids that are corrosive and have flammable properties should be stored as flammable substances, such as acetic acid (glacial), etc.

8.2.5 Store nitric acid (concentrated) separately from other acids.

8.2.6 Chemical shelves should be in good condition, that is, sturdy, non-rotting or rusting, non-bent, and with baffle edges.

8.2.7 The chemical storage cabinet shall be marked with its owner's name and be accompanied by danger signs.

8.2.8 Do not place chemicals in the corridor.

8.2.9 Chemical storage areas must be clearly labeled.

8.2.10 Highly hazardous chemicals must have special control systems to ensure user safety, such as being stored in cabinets with padlocks.

8.2.11 Do not permanently store chemicals in a fume hood.

8.2.12 Keep flammable substances away from heat sources, ignition sources, flames, sparks, and sunlight.

8.2.13 Store gas tanks with firm fixing devices. All idle gas tanks must be equipped with cylinder heads or guards to protect the cylinder heads. Idle gas tanks should be in the storage area for old gas tanks and clearly marked. Gas tanks should be far away from heat sources, fire sources and main passages. Oxygen tanks should be far away from gas tanks for flammable gases and flammable items.

8.2.14 The storage of oxidizing and peroxide-forming substances must be carried out as follows: Keep away from sources of heat, light, and sparks. Store the oxidant in a glass container or inert container and use a suitable lid. The peroxide container must have a sealed lid. Regularly inspect the peroxide. Keep in designated chemical storage cabinets in the laboratory.

8.2.15 Storage of reactive substances such as substances that are sensitive to polymerization, such as alkene monomers. / Substances that are sensitive to reactions when in contact with water / Substances that can ignite on their own / Substances that are sensitive to

friction or shock, etc. The requirements are as follows: There must be a clear warning label. In front of the cabinet or area where reactive substances are stored, warning signs prohibit the use of water on reactive substances. Keep water-reactive substances away from water sources in the laboratory. Keep in the chemical storage cabinet designated by the laboratory.

8.2.16 Store chemicals in appropriate containers according to the types of chemicals:

- Use original container.
- Do not store hydrofluoric acid in glass containers as it can corrode the glass.
- Do not store peroxide-forming substances in glass containers with screw caps or glass lids.
- Never store alkaline solution with high pH value in glass container because it will corrode the glass.

8.2.17 All containers containing chemicals must have appropriate labels:

- Indicate the name of the substance.
- The original container containing chemicals must have complete and clear labels.
- Use the full name of the chemical on the label and issue a hazard warning.
- Indicate the date when the chemical was received and the date when the chemical was first used.
- If it is a self-made inventory solution or working solution, please provide the solution name, detailed contents (if possible) and preparation date.

8.2.18 Keep safety data sheets (SDS) of hazardous chemicals.

Attachment No.1

Table 1 Storage of chemicals and hazardous materials

ประเภทการจัดเก็บ		1	2A	2B	3A	3B	4.1A	4.1B	4.2	4.3	5.1A	5.1B	5.1C	5.2	6.1A	6.1B	6.2	7	8A	8B	10	11	12	13
วัตถุระเบิด	1	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ก๊าซอัด ก๊าซเหลว หรือก๊าซที่ละลายภายใต้ความดัน	2A	-	17	4	-	-	-	-	-	-	-	-	10	-	-	-	-	18	5		-	5		
ก๊าซภายใต้ความดันในภาชนะบรรจุขนาดเล็ก(กระป๋องสเปรย์)	2B	-	4		1	1	-	-	-	-	-	-	10	-	2	2	-	18	4	4	6	6	6	6
ของเหลวไวไฟ	3A	-	-	1	17		-	-	-	-	-	-	-	-		-	-	18	9	9		3		
	3B	-	-	1			12	4	-	4	-	-	-	7			-	18						
ของแข็งไวไฟ	4.1A	-	-	-	-	12	17	12	-	-	-	-	-	14	-	-	-	-	12	12	12	12	12	12
	4.1B	-	-	-	-	4	12		4	4	-		-	13	8	-	-	18						
สารที่มีความเสี่ยงต่อการลุกไหม้ได้เอง	4.2	-	-	-	-	-	-	4		4	-	-	-	-	-	-	-	18	4	4	4	4		
สารที่ให้ก๊าซไวไฟเมื่อสัมผัสกับน้ำ	4.3	-	-	-	-	4	-	4	4		-	-	-	-	-	-	-	18	4	4	4	4	4	
สารออกซิไดซ์	5.1A	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-
	5.1B	-	-	-	-	-	-	-	-	-			10	-	15	15	-	18	11		11	11		
	5.1C	-	10	10	-	-	-	-	-	-	-	10	17	-	-	-	-	18	10	10	10	10	10	10
สารเปอร์ออกไซด์อินทรีย์	5.2	-	-	-	-	7	14	13	-	-	-	-	-	17	-	-	-	-	-	-	16	16	16	16
สารติดไฟที่มีคุณสมบัติความเป็นพิษ	6.1A	-	-	2			-	8	-	-	-	15	-	-			-	18				3		
สารไม่ติดไฟที่มีคุณสมบัติความเป็นพิษ	6.1B	-	-	2	-		-	-	-	-	-	15	-	-			-	18				3		
สารติดเชื้อ	6.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
วัสดุกัมมันตรังสี	7	-	18	18	18	18	-	18	18	18	-	18	18	-	18	18	-		18	18	18	18	18	18
สารติดไฟที่มีคุณสมบัติการกัดกร่อน	8A	-	5	4	9		12		4	4	-	11	10	-			-	18						
สารไม่ติดไฟที่มีคุณสมบัติการกัดกร่อน	8B	-		4	9		12		4	4	-		10	-			-	18						
ของเหลวติดไฟ ที่ไม่อยู่ในประเภท 3A หรือ 3B	10	-	-	6			12		4	4	-	11	10	16			-	18						
ของแข็งติดไฟ	11	-	5	6	3		12		4	4	-	11	10	16	3	3	-	18						
ของเหลวไม่ติดไฟ	12	-		6			12			4	-		10	16			-	18						
ของแข็งไม่ติดไฟ	13	-		6			12				-		10	16			-	18						

โดยหลักการการจัดเก็บแบบคละสามารถกระทำได้ | ตัวเลข จัดเก็บคละได้โดยมีเงื่อนไข | - ให้จัดเก็บโดยวิธีแยกบริเวณ

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According to the announcement of the Department of Industrial Works

Table 2

Chemical Segregation (Hazard class) of Lawrence Berkeley National Laboratory (Berkeley Lab), U.S. Department of Energy

เกณฑ์ที่ 3: Chemical Segregation (Hazard class) ของ Lawrence Berkeley National Laboratory (Berkeley Lab), U.S. Department of Energy

ที่มา Chemical segregation (Hazard class,) Lawrence Berkeley National Laboratory (Berkeley Lab), U.S. Department of Energy [ออนไลน์] เข้าถึงได้จาก http://www.lbl.gov/ehs/chsp/html/storage.shtml สืบค้นเมื่อวันที่ 12 มีนาคม 2555

	Acids, inorganic	Acids, oxidizing	Acids, organic	Alkalis (bases)	Oxidizers	Poisons, inorganic	Poisons, organic	Water-reactives	Organic solvents
Acids, inorganic			X	X		X	X	X	X
Acids, oxidizing			X	X		X	X	X	X
Acids, organic	X	X		X	X	X	X	X	
Alkalis (bases)	X	X	X				X	X	X
Oxidizers			X				X	X	X
Poisons, inorganic	X	X	X				X	X	X
Poisons, organic	X	X	X	X	X	X			
Water- reactives	X	X	X	X	X	X			
Organic solvents	X	X		X	X	X			

หมายเหตุ X = เข้ากันไม่ได้

Reference: ESPReL Laboratory Safety Assessment Manual

CICM–LS–SA-003

Waste export and management

Version History

Author	Version	Date Approved	Desecription of change
Adithep Hansakon, Ph.D.	1	27 Dec 2023	New version

Name of holders/possessors of this SOP

No.	Name
1	Laboratory Safety Committee of Chulabhorn International College of Medicine

1. Objective

To provide guidance for the management of waste within the laboratories of Chulabhorn International College of Medicine, Thammasat University, Rangsit campus, in accordance with safety standards for the safety of users and the environment.

2. Scope

The relevant personnel should understand the guidelines, criteria, and methods for managing waste generated from research and teaching activities conducted in accordance with the safety standards for laboratory safety at Chulabhorn International College of Medicine, Thammasat University, Rangsit campus, under the project for Enhancement of Safety Practice in Research Laboratory in Thailand (ESPReL).

3. Principle

To ensure that the operations within the research and teaching laboratories of the Chulabhorn International College of Medicine, Thammasat University align with the framework of the components of a safe laboratory, consisting of 7 interconnected components: 1) Safety Management System, 2) Chemical Management System, 3) Waste Management System, 4) Physical Characteristics of the Laboratory, Equipment, and Tools, 5) Prevention and Response to Hazards, 6) Basic Safety Knowledge for Laboratory Safety, and 7) Data and Document Management, to ensure safety for researchers, collaborators, and the community.

4. Term and Abbreviation

ESPReL= Enhancement of Safety Practice in Research Laboratory in Thailand

5. Responsibilities

5.1 Laboratory Safety Committee of Chulabhorn International College of Medicine

5.2 Laboratory Committee of Chulabhorn International College of Medicine

5.3 Occupational Safety, Health, and Environment of Chulabhorn International College of Medicine

5.4 Office of Research and Support

5.5 Researcher

6 Related document

6.1 CICM-BCC-SA 007 Rev.0.02 Standard Operating Procedure for the Management of Laboratory Waste, Chulabhorn International College of Medicine, Thammasat University

7 Reference

7.1 ESPReL (Enhanced Safety and Protection for Research Laboratories) บนเส้นทางระบบมาตรฐานความปลอดภัยห้องปฏิบัติการ

7.2 คู่มือการประเมินความปลอดภัยห้องปฏิบัติการ ฉบับแก้ไขเพิ่มเติม ครั้งที่ 2
Lab Safety Inspection Manual, Second Edition

8 Procedure

The disposal of waste generated from research and teaching activities conducted in the laboratories of Chulabhorn International College of Medicine, Thammasat University, Rangsit campus, is divided into various types, including general waste, infectious waste, chemical waste, and hazardous waste. The disposal of waste is carried out according to the standard operating procedure for managing laboratory waste at the Chulabhorn International College of Medicine, Thammasat University (CICM-BCC-SA 007 Rev.0.02). This includes the following four key points: 1) Waste Data Management, 2) Waste Collection and Storage, 3) Waste Minimization, and 4) Waste Treatment and Disposal.

8.1 Waste Data Management

8.1.1 Waste Data Recording System

A waste data recording system is used in the laboratory to record and track waste. The Faculty has implemented an electronic waste data recording system using Google Forms for online data entry, as detailed in the attached Document 1. The recorded data includes the following information:

- Name of the data recorder
- Contact number
- Chemical waste/material
- Hazard pictogram
- Waste Track ID
- Waste types
- Chemical status
- Container
- Quantity (kilograms or liters)
- Input date
- Waste storage room

Storage building, waste types, hazard pictograms, and waste track IDs can be verified according to Document 2.

8.1.2 Data Reporting After data entry via the electronic system, the laboratory generates reports on the waste data to track the movement of waste generated within the laboratory. The report includes the following information: waste track ID, chemical waste/material, waste types, waste status, waste quantity, container packaging, quantity, and entry date, as shown in Document 3. (Waste disposal reports are updated every three months.)

8.2 Waste Collection and Storage

The laboratory of Chulabhorn International College of Medicine, Thammasat University, follows specific procedures for collecting and storing waste based on the type of waste, as outlined in the standard operating procedure for managing laboratory waste at the Chulabhorn International College of Medicine, Thammasat University (CICM-BCC-SA 007 Rev.0.02). For sharp waste, chemical waste, and electronic waste and light bulbs, specific collection and storage guidelines are followed.

8.2.1 Sharp waste

1) Sharp waste is placed in containers with tightly sealed lids made of durable, non-breakable materials that are resistant to chemical reactions and do not leak.

2) These containers are collected and stored in the sharp waste storage area at the Chulabhorn International College of Medicine, Thammasat University, for further disposal by the appointed company.

8.2.2 Chemical Waste

1) Different types of chemicals should be separated before being placed in containers that are compatible with the chemicals to be discarded. The containers must have chemical waste labels as shown in Figure 1. Container and label defects should be inspected regularly every 3 months. The waste should be packaged in containers at a quantity not exceeding 80% of the container's capacity. The information on the label includes the following structure for waste data:

- Chemical waste/material name
- Hazard pictogram
- Waste Track ID
- Waste types
- Waste compounds
- Quantity (Kg or L)
- Name of the data recorder
- Contact number
- Laboratory name (floor, building)
- Waste packing start date
- Waste packing end date
- Note

Figure 1: The chemical waste label.

2) Dispose of chemical waste at the designated chemical waste collection point on the campus, taking into consideration the chemical incompatibility.

3) In cases where it is not possible to separate chemical waste by type, identify the type and quantity before disposing it into containers compatible with the chemicals you intend to discard. Then, bring it to the chemical waste collection point.

4) For the management of chemical waste that is contaminated with heavy metals, follow the designated disposal times as provided by the research department (researchers must inform the responsible personnel before using heavy metals to determine the disposal time and method for waste contaminated with heavy metals).

5) For the storage of flammable waste in laboratories, you can store up to 38 liters in dedicated flammable storage cabinets.

6) The maximum total amount of waste allowed to be stored in the laboratory should be defined. For example, in compliance with United States regulations, waste can be stored in a laboratory that contains less than 55 gallons (approximately 200 liters) for up to 90 days, and for over 55 gallons for up to 3 days.

7) Define the storage duration for waste in the laboratory:

- For waste ready for disposal (80% container volume): Should not be stored for more than 90 days.

- For waste not filling the container (less than 80% container volume): Should not be stored for more than 1 year.

8) The management of chemical waste will be carried out by companies contracted for this purpose. Examples of generated chemical waste in laboratories include:

- Used chemicals or solvents
- Waste from analytical or testing processes
- Expired or degraded chemicals
- Residual samples from analytical and testing processes
- Containers or materials contaminated with chemicals
- Water used to rinse containers or materials contaminated with chemicals.

8.2.3 Electronic Waste and Light Bulbs

1) Dispose of them in the specialized waste disposal bins at the chemical waste collection point.

2) The management of electronic waste and light bulbs will be handled by contracted companies.

8.3 Waste Reduction

Laboratories follow practices for waste reduction, focusing on minimizing the use of starting materials (reduce) and emphasizing waste reduction at the source. This can be achieved by reducing the amount of chemicals used in reactions or minimizing the scale of experiments (small-scale) and using substitute materials (replace), such as using non-hazardous chemicals in place of hazardous ones. In addition, laboratories can reduce waste by implementing processes like Reuse, Recovery, and Recycling.

- Reuse: For example, reusing Coomassie blue dye for protein staining in gels.
- Recovery: Separating and collecting materials that can be used again from waste materials, such as recovering solvents like ethanol or hexane.
- Recycling: Using materials again, even though their physical state may change, the chemical composition remains the same. For example, recycling glass.

8.4 Waste Treatment and Disposal

The institution arranges for the disposal of chemical waste with licensed waste management companies every October. These companies must be licensed by the Department of Industrial Works, Ministry of Industry. The laboratory has a pretreatment system that can treat mildly hazardous waste before discharging it into the public wastewater system (as shown in attachment document No. 4). However, certain types of chemical waste should not be disposed of down the drain or wastewater system, including:

- Highly flammable materials and water-insoluble solvents, such as ethyl ether, hexane, and acetone.
- Toxic and carcinogenic substances, such as acrylamide, mercury, and ethidium bromide (EtBr).
- Water-reactive chemicals, such as sodium metal.

Attachment document No.1

Laboratory chemical waste data record form

Chulabhorn International College of Medicine, Thammasat University

System for recording information on chemical waste used within the laboratory

In order to record and track the movement of all chemical waste, an electronic data recording system is used within the laboratory. This data recording is done in an online format by scanning the QR code and then entering the information into a table for chemical waste disposal. The disposal process for chemical waste will follow the Standard Operating Procedure (SOPs) guidelines.

Figure 1 QR Code for recording disposal information.

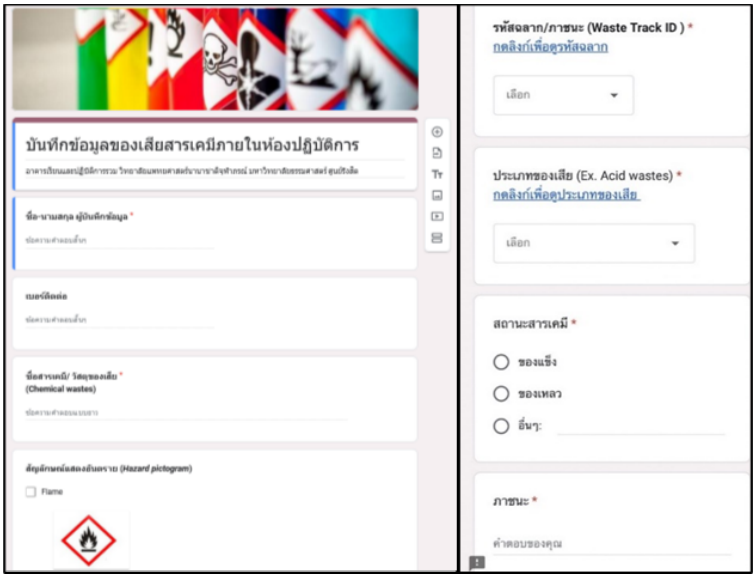


Figure 2 Form for recording waste disposal information by scanning a QR code.

Attachment document No.2

Hazardous Waste Classification System

Chulabhorn International College of Medicine, Thammasat University

Type	Groups of waste
1	Acid waste means waste that has a pH value lower than 7 and contains more than 5% mineral acids such as sulfuric acid, nitric acid, and hydrochloric acid, etc.
2	Alkaline waste means waste that has a pH value higher than 8 and has more than 5% alkali in the solution, such as carbonate, ammonium hydroxide, sodium hydroxide, etc.
3	Waste that can be burned - Flammable waste means waste that can be burned, such as organic solvents. Alcohols, esters, aldehydes, ketones, organic acids, amines, amides, pyrimidines, quinolines, including cleaning solutions. - Flammable water means waste that is an organic liquid with more than 5% water mixed in it, such as oil, combustible substances, alcohol, phenol, organic acids, amines, aldehydes, etc., mixed with ≥5% water.
4	Oily waste (oil / petroleum products) means waste that is an organic liquid such as fats obtained from plants and animals, fatty acids, vegetable and animal oils. Petroleum waste includes gasoline, kerosene and lubricating oil.
5	Explosive waste means waste or compounds that, when exposed to heat, friction, impact, contact with water, or high pressure, may explode. Examples are nitrates, nitramines, chlorates, nitroperchlorates, picrates, azides, diazo peroxides, acetylides and acetic chlorides.
6	Oxidizing agent waste refers to waste that has the property of accepting electrons which may cause a violent reaction with other substances, causing an explosion. Examples include hydrogen peroxide, permanganate salts and hypochlorite salts.
7	Reducing agent waste refers to waste that has the ability to donate electrons. This may cause a violent reaction with other substances, causing an explosion. Examples are hydrazine and hydroxylamine.
8	Salt waste means waste that has salt properties or waste that is a product of the reaction of an acid with a base, such as sodium chloride or ammonium sulfate.
9	Waste containing heavy metals other than mercury as an ingredient, such as barium, cadmium, lead, copper, iron, manganese, zinc, cobalt, nickel, silver, tin, antimony, tungsten, vanadium, etc.

Type	Groups of waste
10	Fluoride and/or phosphate waste (liquid), such as hydrogen fluoride solution or phosphoric acid.
11	Halogen waste means waste that is an organic compound of the halogens, such as carbon tetrachloride (CCl_4), chlorobenzene (C_6H_5Cl), chloroethylene, bromine mixed with solvents, etc..
12	Combustible waste means waste that can catch fire easily and must be separated from sources of fire, heat, chemical reactions, flames, electrical appliances, electrical plugs. Examples are acetone, benzene, carbon disulfide, cyclohexane, diethyl ether, ethanol, methanol, methyl acetate, toluene, xylene and petroleum spirits.
13	Toxic waste means toxins, dangerous chemicals, carcinogens, as well as certain expired chemicals and chemicals that have deteriorated in quality. All these chemicals are harmful to health.
14	Used glass bottles/chemical bottles refers to empty glass or plastic bottles that used to contain both liquid and solid chemicals.
15	Broken glassware/chemical bottles means glassware, broken glass bottles, broken or damaged test tubes.
16	Battery waste refers to batteries that have reached the end of their useful life and cannot be recycled.
17	Waste or packaging contaminated with chemicals, e.g., gloves contaminated with a reagent.
18	Aspiration hazard, e.g., formaldehyde-containing waste. May be highly toxic and/or carcinogenic.
19	Organic waste contaminated with microorganisms, e.g., bacterial cultures.
20	Unknown waste which cannot be specified.

Symbols and codes to classify waste types

Chulabhorn International College of Medicine, Thammasat University

สัญลักษณ์	รหัสของเสีย	ประเภทของเสีย
	W001 W002	Acid wastes Base wastes
	W003 W004	Flammable wastes /Flammable water Oil/ Petroleum waste
	W005	Explosive waste
	W006 W007	Oxidize agent waste Reduce agent waste
	W008 W009 W010 W011 W012 W013 W014 W015 W016 W017	Salt waste Heavy metal ions Phosphorus / Fluoride Halogen waste Combustible waste Toxic waste Used glass bottles/chemical bottles Broken glassware/chemical bottles Battery Garbage contaminated with other chemicals
	W018	Aspiration Hazard Carcinogen Toxic to the reproductive system Dangerous to the respiratory system
	W019	Organic waste
	W020	Unknown

Attachment document No.3

Waste movement report

Chulabhorn International College of Medicine, Thammasat University

รายงานข้อมูลของเสียสารเคมีภายในห้องปฏิบัติการ

หน่วยงาน....วิทยาลัยแพทยศาสตร์นานาชาติจุฬาภรณ์... อาคารเรียนและปฏิบัติการรวม ชั้น 8

ห้องปฏิบัติการวิจัย ผู้รับผิดชอบ จุฑาภรณ์ พลวัฒน์ เบอร์ติดต่อ 02-5644444 ต่อ 4554

รายงานครั้งที่ ...../2566 วันที่ ...../...../.....

รหัสฉลาก/ภาชนะ (Waste Track ID)	ชื่อสารเคมี/ วัสดุของเสีย (Chemical wastes)	ประเภทของเสีย	สถานะของเสีย	ภาชนะบรรจุ	ปริมาณ (Kg/L)	วันที่บันทึกข้อมูล

Attachment document No.4

Types of laboratory waste, storage, treatment, and disposal

Chulabhorn International College of Medicine, Thammasat University

Waste ID	Meaning	Examples	Storage	Treatment/Disposal
W001	Acid waste pH < 7 concentration > 5%	Sulfuric acid Nitric acid Hydrochloric acid	Use original container or containers made from PP or PE plastic with a tight lid.	Neutralize and pour into sink. If there is sediment, filter the waste water. Then send the sediment for disposal.
W002	Alkaline waste pH > 8 concentration > 5%	Sodium carbonate Ammonium hydroxide Sodium hydroxide	Use original container or container made of PP or PE plastic with a tight lid.	Neutralize and pour into sink. If there is sediment, filter the waste water. Then send the sediment for disposal.
W003	Waste that can be burned - Flammable waste means waste that is an organic liquid that can be burned. - Flammable water means waste that is an organic liquid with more than 5% water mixed in it.	- Alcohols, esters, aldehydes, ketones, organic acids, amines, amides, pyrimidines, quinolines - Oil, alcohols (incl. Phenol), organic acids, amines, aldehydes, etc., mixed with water	Use original container or container made of PP or PE plastic with a tight lid.	Send to appropriate waste disposal company.
W004	Oil/Petroleum products	Waste oil containing fatty acids, oils, vegetable oils, animal oils, petroleum oil, gasoline, kerosene, lubricating oil	Use original container or container made of PP or PE plastic with a tight lid.	Send to appropriate waste disposal company.
W005	Explosive waste means waste or compounds that, when exposed to heat, friction, impact, mixed with water, or high pressure, may explode.	Nitrates, nitramines, chlorates, perchlorates, picrates, azides, diazo compounds, peroxides, acetylides	Use original container or container made of PP or PE plastic with a tight lid.	Send to appropriate waste disposal company.
W006	Oxidizing agent waste means waste that has the property of accepting electrons. This may cause a violent reaction with other substances, leading to an explosion.	Hydrogen peroxide Potassium permanganate Sodium hypochlorite	Use original container or container made of PP or PE plastic with a tight lid.	Add appropriate reducing agent, then neutralize. / Send to a company for disposal.
W007	Reducing agent waste refers to waste that has the ability to donate electrons. This may cause a violent reaction with other substances, causing an explosion.	Hydrazine Hydroxylamine	Use original container or container made of PP or PE plastic with a tight lid.	Add appropriate oxidizing agent, then neutralize. / Send to a company for disposal.
W008	Salt waste or waste that is a product of the reaction of an acid with a base.	Sodium chloride Ammonium sulfate	Use original container or container made of PP or PE plastic with a tight lid.	Send to appropriate waste disposal company.
W009	Waste containing heavy metals (ions) other than mercury.	Barium, cadmium, lead, copper, manganese, iron, zinc, cobalt, nickel, silver, tin, antimony, tungsten, vanadium	Use original container or container made of PP or PE plastic with a tight lid.	Neutralize and precipitate / absorb with chelating resin / send to a disposal company.

Waste ID	Meaning	Examples	Storage	Treatment/Disposal
W010	Waste containing phosphorus or fluoride (liquid).	Hydrofluoric acid Silicon fluoride Phosphoric acid	Use original container or a container made of PP or PE plastic with a tight lid.	Precipitate with calcium solution / send to a disposal company.
W011	Halogen waste means waste that is an organic compound of a halogen element.	Carbon tetrachloride Bromine in organic solvents	Use original container or container made of PP or PE plastic with a tight lid.	Send to appropriate waste disposal company.
W012	Combustible waste means waste that can catch fire easily and must be separated from sources of fire, heat, chemical reactions, flames, electrical appliances, electrical plugs etc.	Acetone, benzene, carbon disulfide, cyclohexane, diethyl ether, ethanol, methanol, methyl acetate, toluene, xylene, petroleum spirits	Use original container or container made of PP or PE plastic with a tight lid.	Send to appropriate waste disposal company.
W013	Toxic waste means toxins, dangerous chemicals and carcinogens.	Expired chemicals Chemicals that have deteriorated in quality Chemicals that are harmful to health	Packed in a PE container with a tight-fitting lid. Attach label indicating the type of danger.	Send to appropriate waste disposal company.
W014	Used glass bottles/chemical bottles made of glass or plastic	Amber glass bottles containing acids and alkalis Glass bottles containing flammable substances. Plastic bottles containing chemicals	Clean before storing or reusing.	Waste disposal company, if necessary
W015	Broken glassware/chemical bottles	Broken or damaged glass bottles, glassware, or equipment made from glass.	Packed in a PE container with a tight-fitting lid.	Appropriate waste disposal or recycling company
W016	Battery that has reached the end of its useful life and cannot be recycled.	Alkaline batteries	Put into container with a lid.	Appropriate waste disposal company
W017	Waste or packaging contaminated with chemicals	Tissues, gloves, rags, masks, or packaging contaminated with chemicals	Packed in a PE container with a tight-fitting lid.	Appropriate waste disposal company
W018	Toxic substances (Aspiration Hazard) refer to toxic/carcinogenic wastes that can be breathed in.	Formaldehyde	Packaged in a tea-colored glass container, tightly closed and labeled (Danger!).	Appropriate waste disposal company
W019	Organic waste means waste that is contaminated with microorganisms, including disease-causing germs.	Solid culture media Microbial culture gel	Do not store. Disinfect before disposal.	Kill pathogens by autoclaving at 121 ^{O}C.
W020	Unknown waste that cannot be specified.	Unlabeled or insufficiently labeled bottle with an unknown substance	Packed in container with a tight lid.	Appropriate waste disposal company

CICM–LS–SA-004

Chemical transportation

Version History

Author	Version	Date Approved	Desecription of change
Asst. Prof. Sophida Sukprasert, Ph.D.	1	27 Dec 2023	New version

Name of holders/possessors of this SOP

No.	Name
1	Laboratory Safety Committee of Chulabhorn International College of Medicine

1. Objective

As a guideline for emergency response including physical and chemical aspects, such as chemical spills in a laboratory, in order to reduce the risk and severity of the emergency.

2. Scope

Researchers who conduct research in the laboratory must be aware of emergency response procedures for both physical and chemical hazards. This includes regularly inspecting and checking the facility and maintaining the equipment for emergency preparedness. In case an emergency occurs, a post-event evaluation of the emergency response procedures is necessary to make improvements for future emergency preparedness.

3. Principle

Safety is the most important thing for preventing and responding to any emergency or accident that may occur. This is to reduce the risk resulting from unexpected events, and this is also part of safety practices within a laboratory. The causes of accidents in research laboratories include the following:

Physical hazards, such as damage to the laboratory or equipment malfunctions, can lead to accidents or incidents.

Chemical hazards, such as chemical leaks or chemical explosions.

Those researchers who conduct research in laboratories must be well-informed about emergency response procedures. Training should provide knowledge and practical guidance on responding to various emergency situations effectively. Personnel should be capable of responding to and managing emergency situations as they occur. After the emergency is resolved, it is essential to conduct a post-incident evaluation for improvement in the emergency response procedures.

Furthermore, regular inspections of emergency response procedures, locations, and equipment should be conducted to ensure they are always ready for use in case of emergencies.

4. Terms and Abbreviations

ESPReL= Enhancement of Safety Practice in Research Laboratory in Thailand

5. Responsibilities

5.1 Laboratory Safety Committee of Chulabhorn International College of Medicine

5.2 Laboratory Committee of Chulabhorn International College of Medicine

5.3 Occupational Safety, Health, and Environment of Chulabhorn International College of Medicine

5.4 Office of Research and Support

6 Related documents

None

7 References

7.1 ESPReL (Enhanced Safety and Protection for Research Laboratories) บนเส้นทางระบบมาตรฐานความปลอดภัยห้องปฏิบัติการ

8 Procedures

8.1 Transportation of chemicals in the laboratory

8.1.1 Persons carrying chemicals must be equipped with appropriate personal protective equipment.

8.1.2 Close the lid of the container containing the chemicals; if necessary, it can be sealed with parafilm.

8.1.3 Use the laboratory trolley when moving multiple bottles of chemicals simultaneously.

8.1.4 Use a basket or secondary container to move chemicals. It must be a non-breakable container made of rubber, steel, or plastic that can hold chemical bottles.

8.1.5 Move flammable liquid chemicals in support containers with shockproof material.

8.1.6 Use rubber tanks to move acidic corrosives and solvents.

8.1.7 Move incompatible substances in separate support containers.

8.2 Transportation of chemicals outside the laboratory

8.2.1. Use a stable, secure container and mobile device that are not easy to break and have a chemical bottle neck.

8.2.2 Use a laboratory trolley with a barrier to protect the chemical bottles.

8.2.3 Move incompatible substances in separate support containers.

8.2.4 Use a cargo elevator to move chemicals and hazardous objects between floors.

8.2.5 Use chemical absorbents or shockproof materials (e.g., Vermiculite) to move flammable liquids and chemicals outside the laboratory.

8.3 Transportation of waste

8.3.1 The general principle is similar to the transportation of chemicals inside and outside the laboratory.

8.3.2 Use a car lift to move chemicals and hazardous objects between floors at times when no one is in use.

8.3.3 Persons carrying chemicals must be equipped with appropriate personal protective equipment.

CICM–LS–SA-005

Emergency response

Version History

Author	Version	Date Approved	Desecription of change
Nawarat Posuwan, Ph.D.	1	27 Dec 2023	New version

Name of holders/possessors of this SOP

No.	Name
1	Laboratory Safety Committee of Chulabhorn International College of Medicine

1. Objective

Guideline for emergency response including physical and chemical aspects, such as chemical spills in a laboratory, in order to reduce the risk and severity of the emergency.

2. Scope

Researchers who conduct research in the laboratory must be aware of emergency response procedures for both physical and chemical hazards. This includes regularly inspecting and checking the facility and maintainance of the equipment for emergency preparedness. In case of an emergency, a post-event evaluation of the emergency response procedures is due in order to make improvements for future emergency preparedness.

3. Principle

Safety the most important consideration for preventing and responding to any emergency or accidents that may occur. This is to reduce risk resulting from unexpected events and this is also a part of safety practices within a laboratory. The causes of accidents in research laboratories include:

Physical Hazards such as damage to the laboratory or equipment malfunctions that can lead to accidents or incidents.

Chemical Hazards such as chemical leaks or chemical explosions.

Those researchers who conduct research in laboratories must be well-informed about emergency response procedures. Training should provide knowledge and practical guidance on responding to various emergency situations effectively. Personnel should be capable of responding to and managing emergency situations as they occur. After the emergency is resolved, it is essential to conduct a post-incident evaluation for improvement of the emergency response procedures.

Furthermore, regular inspections of emergency response procedure, locations, and equipment should be conducted to ensure they are always ready for use in case of emergencies.

4. Terms and Abbreviations

ESPReL= Enhancement of Safety Practice in Research Laboratory in Thailand

5. Responsibilities

5.1 Laboratory Safety Committee of Chulabhorn International College of Medicine

5.2 Laboratory Committee of Chulabhorn International College of Medicine

5.3 Occupational Safety, Health, and Environment of Chulabhorn International College of Medicine

5.4 Office of Research and Support

6 Related documents

6.1 CICM BCC SA 008 Revise 0.02 Biological spill response

6.2 CICM BCC SA 009 Revise 0.02 Emergency response

7 Reference

7.1 ESPReL (Enhanced Safety and Protection for Research Laboratories) บนเส้นทางระบบมาตรฐานความปลอดภัยห้องปฏิบัติการ

8 Procedures

8.1 Emergency Management Guidelines

For general emergencies, chemical accidents, biological incidents, electrical accidents, and chemical spills, follow the CICM BCC SA 008 Revise 0.02 Biological spill response and CICM BCC SA 009 Revise 0.02 Emergency response

8.2 Chemical Spill Management Guidelines

8.2.1 In the event of a chemical spill, inspect personal protective equipment for the spill of acidic or alkaline chemicals. Remove PPE and place contaminated PPE at the area of the spill.

8.2.2 In cases where chemicals have spilled onto the body, follow the procedures outlined in CICM BCC SA 009 Revise 0.02 for handling emergencies. If acids or alkaline chemicals have spilled on the face, take the affected person to an emergency eye wash station (Eye shower) or use a shower to rinse the face or body with running water. If medical advice is required, contact the Emergency Department of Thammasat Chalermprakiet Hospital at 02-926-9112.

8.2.3 Inform the person involved in or witnessing the incident to notify the responsible personnel or designated emergency responders for managing chemical spills.

8.2.4 Manage chemical spills using a Chemical spill kit.

8.2.5 The emergency responder should wear Personal Protective Equipment (PPE) including:

8.2.5.1 Thick Neoprene gloves or Nitrile gloves (as specified in Table 1). Use Thick Neoprene gloves when the specific chemical is not listed in Table 1.

8.2.5.2 Face shield or Chemical safety goggles if the chemical poses a danger upon contact.

8.2.5.3 Chemical respirator or medical mask if the chemical poses a respiratory hazard.

8.2.5.3 Gown or Coverall suit to protect the body.

8.2.5.4 Shoe cover to protect the feet.

8.2.6 Place a "Do not enter" sign outside the laboratory.

8.2.7 Place a "Chemical spill" sign in the area of the spill.

8.2.8 Manage the spilled chemical as follows:

8.2.8.1 If the chemical is flammable or explosive and an organic substance, check for sources of ignition or heat and shut them down if found and if possible. Then proceed with step 8.2.8.4.

8.2.8.2 If the chemical is an acid, neutralize with sodium bicarbonate. Measure the pH using an indicator strip and then proceed with step 8.2.8.4.

8.2.8.3 If the chemical is an alkali, neutralize it with ascorbic acid or citric acid. Measure the pH using an indicator strip and then proceed with step 8.2.8.4.

8.2.8.4 Absorb the chemical with absorbent material from the outside to the inside of the spill.

8.2.8.5 Place the absorbent material in hazardous waste bags.

8.2.8.6 Remove PPE including gloves, gown, coverall, and shoe cover and place them in plastic bags marked as hazardous waste.

8.2.8.7 Remove face shield or goggles and place them in a separate plastic bag for cleaning and reuse.

8.2.8.8 Put on a new pair of Nitrile gloves and place the hazardous waste in designated waste collection areas for disposal by chemical waste disposal companies.

Attachment document

Table 1) Suitable gloves for handling hazardous chemicals

Chemical	Recommended Gloves	Chemical	Recommended Gloves
Acetic acid	Nitrile, Neoprene	Glutaraldehyde (<5%)	Latex, Nitrile
Acetone	Latex, double glove	Guanidine Solutions	Latex, double glove
Acetonitrile	Nitrile, double glove	Heptanes	Nitrile
Acrylamide	Nitrile	Hexane	Nitrile
Ammonium Hydroxide	Nitrile	Hydrochloric acid	Nitrile, Neoprene, Latex
Benzene	ChemTek, Viton, Silver Shield	Hydrogen peroxide (2 – 30%)	Nitrile, Neoprene
Butanol	Latex, Nitrile	Isopropanol (2-propanol)	Nitrile, Latex
Buffers	Latex, Nitrile	2-Mercaptoethanol	Nitrile
Carbon Disulfide	Nitrile	Mercury, Inorganic	Nitrile, Latex
Carbon Tetrachloride	ChemTek, Viton, Silver Shield	Methanol	Nitrile, Neoprene
Chemotherapy Drugs	Latex or Nitrile, double glove	Methylene Chloride	ChemTek, Viton, Silver Shield
Chloroform	ChemTek, Viton, Silver Shield	Nitric Acid	Nitrile
Cidex	Latex, Nitrile, Neoprene	Osmium Tetroxide	Nitrile, double glove
Clear Rite	Nitrile	Perchloric Acid (70%)	Nitrile
Cryogenic Liquids	Cryogenic Gloves	Phenol	Nitrile, Neoprene
Cyclohexane	Nitrile	Phenol/Chloroform/Amyl Alcohol	ChemTek, Viton, Silver Shield
Dimethyl Formamide	Neoprene, Latex	Phosphoric acid	Nitrile, Latex
Dimethyl Sulfoxide	Nitrile	Sodium Hydroxide	Nitrile, Neoprene, Latex
1,4-Dioxane	Butyl, Silver Shield	Sulfuric Acid (50%)	Nitrile, Latex
Ethanolamine	Nitrile	Sulfuric Acid (98%)	ChemTek, Butyl, Silver Shield
Ethidium Bromide (10%)	Nitrile, Neoprene	TEMED	Nitrile, double glove
Ethyl Acetate	Latex, double glove	Tetrahydrofuran	Silver Shield, ChemTek
Ethanol	Nitrile, Neoprene	Trichloroacetic Acid	Nitrile, Viton
Ethyl Ether	Nitrile	Trifluoroacetic Acid	Neoprene, Silver Shield
Formaldehyde (37%)	Nitrile, Neoprene, Latex	Xylene	Nitrile, double glove
Formic Acid	Nitrile, Latex		

Modified from Thai-Safetywiki

https://thai-safetywiki.com/การเลือกถุงมือตามชนิดส/

Table 2) Standards of chemical protective clothing

Table of CE Types for Chemical Protective Clothing

CE standards identify different groups or "Types" of chemical protective clothing. These "Types" relate to the hazard type the clothing is suitable to protect against

Type	Pictogram	Description	EN Standard Reference*[1]
Chemical Protective Clothing		This pictogram is legally required on all certified protective clothing to indicate suitability for chemical protection. The other pictograms shown below are not legally required, but are commonly used to indicate the protective "Type" on garment labels.	Referenced in the individual "type" standard listed below
Type 6		Protection against light, aerosol sprays of liquid chemicals	EN 13034
Type 5		Protection against hazardous dry particles	EN 13982
Type 4		Protection against sprays ("shower" type sprays) of liquid chemicals	EN 14605*[3]
Type 3		Protection against strong jet sprays of liquid chemicals	EN 14605*[3]
Type 2		Protection against hazardous chemicals in gas or vapour form (Non – "gas-tight" clothing) **NOTE: type 2 has now been deleted*[2].**	EN 943-1&2 (Part 2 for Emergency Teams)
Type 1		Protection against hazardous chemicals in gas or vapour form ("Gas-Tight" clothing)	EN 943-1&2 Part 2 for Emergency teams

Notes:
*1 EN standards are published with specific dates and products should always be certified to the latest version. Dates have been omitted here for clarity and to avoid dating of the information. Latest standard dates can be identified at https://shop.bsigroup.com/
*2 In the latest (2015) version of this standard, the Type 2 classification was withdrawn so no longer exists. A product certified to this standard after 2015 should not be classed as Type 2.
*3 Note that Chemical protection types 3 & 4 are defined in the same standard EN 14605.

CICM–LS–SA-006

Risk Management

Version History

Author	Version	Date Approved	Desecription of change
Asst.Prof.Teva Phanaksri, Ph.D.	1	27 Dec 2023	New version

Name of holders/possessors of this SOP

No.	Name
1	Laboratory Safety Committee of Chulabhorn International College of Medicine

1. Objective

To be a guideline for the assessment of risks while working in the Chulabhorn International College of Medicine Research Laboratory

2. Scope

This SOP is applied to all investigators to assess the potential risks in the Chulabhorn International College of Medicine Research Laboratory.

3. Principle

There are several hazards associated with laboratory work, including those related to chemicals, biologicals, and physical threats, that could be harmful to the investigators. All levels of risk assessment, including individual, project, and laboratory risks, are necessary for documentation in order to lower the risk while working in the laboratory and to ensure that investigators are aware of and comprehend safety when working with risk activities.

4. Definitions and abbreviations

4.1 CICM-BCC refers to the Biosafety Control Committee of Chulabhorn International College of Medicine, Thammasat University.

4.2 ESPReL refers Enhancement of Safety Practice in Research Laboratory in Thailand.

4.3 SOP refers to standard operating procedures

5. Responsible persons

5.1 Laboratory Safety Committee of Chulabhorn International College of Medicine, Thammasat University

5.2 Biosafety Control Committee of Chulabhorn International College of Medicine, Thammasat University

5.3 Laboratory Committee of Chulabhorn International College of Medicine, Thammasat University

5.4 Research Supporting Office, Chulabhorn International College of Medicine, Thammasat University

5.5 Operator of Chulabhorn International College of Medicine, Thammasat University

5.6 Operating personnel of Chulabhorn International College of Medicine, Thammasat University

5.7 Investigators

6. Documents

6.1 Laboratory risk assessment form (CICM-LS-FA-001)

6.2 Risk management form (CICM-LS-FA-002)

6.3 Hazard identification form (CICM-LS-FA-003)

7. References

7.1 Occupational Safety, Health and Environment Act, B.E. 2554

7.2 Pathogens and Animal Toxins Act, B.E. 2558

7.3 Notification of the Ministry of Public Health Entitled the Place of Production or Possession of Pathogens and animal Toxins, B.E. 2561

7.4 Enhanced Safety and Protection for Research Laboratories

7.5 Risk Management of Safety Laboratory, 2018

8. Procedures

8.1 Each investigator working in the research lab is required to complete the risk assessment.

8.2 All principal investigators are required to complete the CICM-LS-FA-001 risk assessment form to assess the possible risk of the project.

8.3 All investigators are required to complete the CICM-LS-FA-001 risk assessment form to assess the possible risk of the tasks.

8.4 For any new project involving the operation of research in the laboratory, the CICM-LS-FA-001 form must be completed and submitted alongside forms of biological safety, animal care and use, and/or human ethics (if any). An assessment form will be sent to the laboratory staff.

8.5 The laboratory head or laboratory staff are required to fill out the CICM-LS-FA-001 assessment form for assessing potential risks in the laboratory.

8.6 For any projects operated in the laboratory before the announcement of this SOP, all principal investigators and investigators are required to complete the CICM-LS-FA-001 form to cover all possible risks of the tasks or projects.

8.7 Risk assessment is required for all new projects worked on in the research laboratory (according to 8.4).

8.8 Individual, project, and laboratory risk assessments must be updated from the most recent assessment in the event that the task or project's level of risk increases.

8.9 Investigators who have identified a risk that occurs in the laboratory are required to inform a laboratory office by using the CICM-LS-FA-003 hazard identification form.

8.10 In the event of a dangerous incident occurring in the laboratory, the laboratory officer, eyewitness, or assignee must report the incident using the CICM-LS-FA-002 risk management form.

CICM–LS–SA-007

Safety training for cleaning staff

Version History

Author	Version	Date Approved	Desecription of change
Kanta Pranweerapaiboon, Ph.D.	1	27 Dec 2023	New version

Name of holders/possessors of this SOP

No.	Name
1	Laboratory Safety Committee of Chulabhorn International College of Medicine

1. Objective

To serve as a guideline for promoting awareness, understanding, and safety among the cleaning staff in the research laboratories of the Chulabhorn International College of Medicine, Thammasat University.

2. Scope of Work

Cleaning Staff in Research Laboratories, Chulabhorn International College of Medicine, Thammasat University.

3. Principle

Provide appropriate and continuous fundamental knowledge to the cleaning staff, enabling them to safely perform laboratory and chemical-related work. This includes the ability to prevent and respond to emergencies, thereby reducing the risk of accidents during their duties.

4. Definitions and abbreviations

ESPReL = Enhancement of Safety Practice of Research Laboratory in Thailand

PPE = Personal Protective Equipment

5. Persons in charge

5.1 Committee on Laboratory Safety, Chulabhorn International College of Medicine, Thammasat University.

5.2 Committee on Biosafety Control, Chulabhorn International College of Medicine, Thammasat University.

5.3 Laboratory Management Committee, Chulabhorn International College of Medicine, Thammasat University.

5.4 Research Promotion and Development Unit

5.5 Operations Manager, Chulabhorn International College of Medicine, Thammasat University.

5.6 Laboratory Operations Personnel, Chulabhorn International College of Medicine, Thammasat University.

5.7 Researchers

6. Related documents

6.1 Application Form for Biosafety Laboratory Approval (CICM-BCC-FA-001)

6.2 Research Project Evaluation, Laboratory Access Approval, and Laboratory Usage Approval (CICM-BCC-SA-001)

6.3 Use of Biosafety Laboratory (CICM-BCC-SA-002)

7. References

7.1 Safety Guideline for Laboratory

7.2 ESPReL (Enhanced Safety and Protection for Research Laboratories) on the laboratory safety standard system pathway.

8. Operating procedures

Conduct regular safety training for cleaning staff, at least once a year, as follows:

8.1 General safety information in the laboratory, with a focus on the process of wearing personal protective equipment (PPE) to prevent contact and infection from airborne particles.

8.1.1 Clean hands using a product with alcohol content for at least 20-30 seconds or use soap and water for 40-60 seconds.

8.1.2 Wear appropriate laboratory work attire.

8.1.3 Wear a face mask.

8.1.4 Use eye protection or face shield.

8.1.5 Wear gloves.

8.1.6 Proceed with the assigned tasks.

8.2 General safety information in the laboratory, specifically the process of removing personal protective equipment (PPE) to prevent contact and infection from airborne particles:

8.2.1 Prepare a bag for storing used PPE.

8.2.2 Remove gloves, avoiding contact with the outer surface of the gloves.

8.2.3 Remove laboratory work attire by pulling it away from the body, avoiding contact between the laboratory work attire and inner clothing.

8.2.4 Clean hands using a product with alcohol content for at least 20-30 seconds or use soap and water for 40-60 seconds.

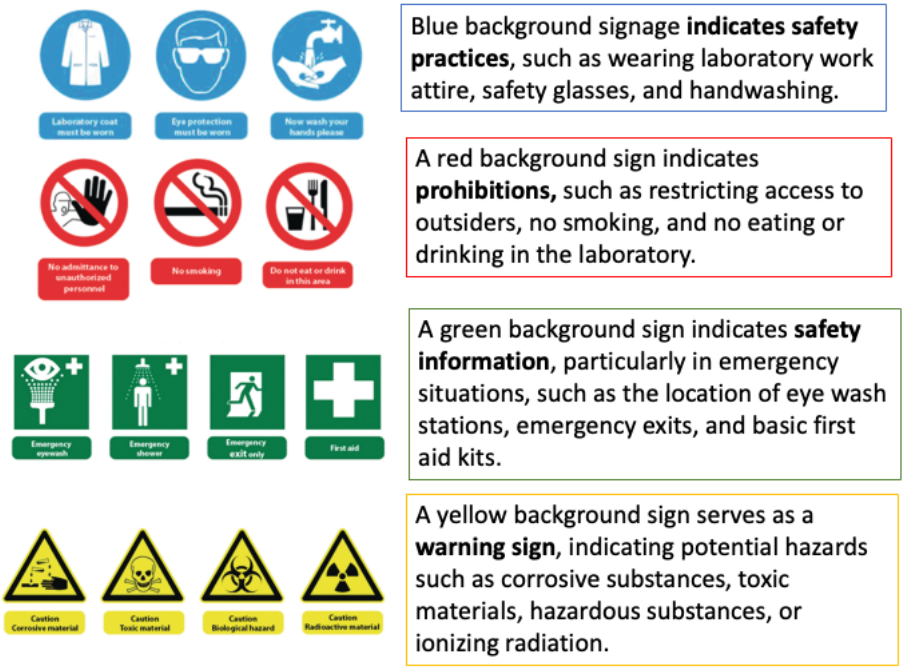
8.2.5 Remove eye protection.

8.2.6 Remove the face mask.

8.2.7 Dispose of the bag containing contaminated PPE according to the laboratory's SOP.

8.2.8 Clean hands again using a product with alcohol content for at least 20-30 seconds or use soap and water for 40-60 seconds.

8.3 General safety information in the laboratory, especially regarding relevant signs and symbols:



Blue background signage **indicates safety practices**, such as wearing laboratory work attire, safety glasses, and handwashing.

A red background sign indicates **prohibitions,** such as restricting access to outsiders, no smoking, and no eating or drinking in the laboratory.

A green background sign indicates **safety information**, particularly in emergency situations, such as the location of eye wash stations, emergency exits, and basic first aid kits.

A yellow background sign serves as a **warning sign**, indicating potential hazards such as corrosive substances, toxic materials, hazardous substances, or ionizing radiation.

8.4 Prevention and response to emergency situations

Employees can assess initial risks and effectively prevent and respond to dangers and emergencies. Appropriate actions may include:

Response to emergency situations

Accidents	First aid guidelines
Cut by a sharp object	If there is a small amount of bleeding, use a first aid kit to stop the bleeding by applying a bandage to the wound. If there is a significant amount of bleeding, continue to apply pressure to control the bleeding and transport the patient to the hospital.
Scalding hot water	Leave the heat, rinse the wound with normal-temperature water to reduce heat, cover the wound with a clean cloth, and transport the injured person to the hospital.
Exposure to chemicals	Rinse the skin immediately with a large amount of clean water. If there is significant exposure to the chemical, promptly transport the individual to the hospital and provide information about the chemical.
Substances get into eye	Wash with clean water for at least 1 5 minutes to dilute or remove the substance, and promptly seek medical attention.
Inhale vapors or gases	Take the injured person to an open and well-ventilated area. If there is a loss of consciousness, provide basic life support and immediately seek medical attention.
Ingesting chemicals	Seek medical attention immediately, and bring a sample of the substance or remember the name of the chemical to inform the doctor.
Electric shock	Cut off the electrical power. Do not touch the person at risk with bare hands. Use an insulating material to push the injured person away from the incident area. Provide basic first aid and seek medical attention.

In the event of a chemical spill, follow emergency response procedures.