STANDARD OPERATING PROCEDURES (SOP)

Version 2

prepare by

Institutional Biosafety Committee of Chulabhorn International College of Medicine, Thammasat University

Contents

SOP-BCC-01 Decision of research project, laboratory, and laboratory access permission **Approval date** **21 DEC 21**

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(Miss.Supawadee Kheowkae)
Person responsible for document system control

(Assc.Prof.Veerachai Thitapakorn,Ph.D.)
Head of research laboratory

1. Objective

To serve as a guideline for SOP-BCC, to operate according to the consideration of biosafety level and for selection of the appropriate laboratory for research projects.

2. Scope

For SOP-BCC and the operators to educate to the standards of biosafety level and appropriate laboratory selection for research projects following the law of Pathogens and Animal Toxins Act, B.E. 2558 (2015).

3. Principle

To serve the safety of researchers, co-researchers, and the public. This guideline aims to operate the research projects that study microorganisms, biological substances, and microbial samples which are pathogens listed under the law of Pathogens and Animal Toxins Act, B.E. 2558 (2015) and Ministry of Public Health announcement approximately characteristic of a place of production or the possession of pathogens and animal toxins B.E. 2561.

4. Terminology and abbreviation

4.1 BSL1 represents a biosafety laboratory level 1

4.2 BSL2 represents a biosafety laboratory level 2

4.3 CICM-BCC refers to Institutional Biosafety Committee of Chulabhorn International College of

Medicine, Thammasat University.

4.4 TU-IBC refers to Institutional Biosafety Committee, Thammasat University.

5. Responsibilities

5.1 Institutional Biosafety Committee of Chulabhorn International College of Medicine, Thammasat University

5.2 Laboratory committee of Chulabhorn International College of Medicine, Thammasat University

5.3 Research Supporting Office

5.4 Operator of Chulabhorn International College of Medicine, Thammasat University

5.5 Operation personnel of Chulabhorn International College of Medicine, Thammasat University

5.6 Researchers

6. Related documents

6.1 Application of biosafety laboratory level consideration form (CICM-BCC-FA-001)

6.2 Application of biosafety laboratory level 2 form (CICM-BCC-FA-002)

6.3 Biosafety laboratory level 2 report form (CICM-BCC-FA-003)

7. References

7.1 The law of Pathogens and Animal Toxins Act, B.E. 2558 (2015)

7.2 Ministry of Public Health announcement approximately characteristic of a place of production or the possession of pathogens and animal toxins B.E. 2561.

7.3 Ministry of Public Health announcement on the study of disease control, protection, and treatment B.E. 2561.

8. Procedures

8.1 Principal investigator who belong to Chulabhorn International College of Medicine

8. 1. 1 Principal investigator will be the person who considers and selects the appropriate biosafety laboratory level for a research project.

8.1.1.1 BSL2 Room A is suitable for activities related to samples derived from humans or animals, such as blood, plasma, serum, tissues, organs, or animal carcasses that may be contaminated with biological agents, pathogen of Group 2 and 3*, and animals toxin of Group 1 and 2 that cause diseases in humans or animals according to the Pathogens and Animal toxins Act. Moreover, intracellular pathogen that require host cells for growth, such as Plasmodium and Neisseria can be conducted in this room.

8.2.2.2 BSL2 Room B is suitable for activities related to the cultivation of cells without biological agents, pathogens, and toxins from animals, and the use of host cells that may be contaminated with biological agents, disease-causing organisms of Group 2 and 3*, and toxins from animals of Group 1 and 2 that cause diseases in humans or animals according to the Pathogens and Animal toxins Act.

8.2.2.3 BSL2 Room C is suitable for activities related to diseases of Group 2 and 3*, and toxins from animals of Group 1 and 2 that cause diseases in humans or animals according to the Pathogens and Animal toxins Act.8.1.2 In the case of BSL1, the researcher can do the research without any requirement.

8.1.2 BSL1 can be conducted in BSL1

8. 1. 3 In the case of BSL2, the principal investigator submits the research project name, accompanied by a TU-IBC approval document, to the Operation personnel of Chulabhorn International College of Medicine, Thammasat University.

8.2 Principal investigators who are persons from other faculty or college, but with a co-investigator belonging to the Chulabhorn International College of Medicine.

8.2.1 The principal investigator submits the request document, proposal and related documents. to the dean of Chulabhorn International College of Medicine.

8.2.2 CICM-BCC reviews the project with a minimum of two committee members acting as reviwer for the biosafety level and laboratory room.

8.2.3 Upon approval, a certification letter will be issued for the use of the BSL 2 laboratory.

8.3 Principal investigators who are persons from other faculty or college and do not have a co-investigator belonging to the Chulabhorn International College of Medicine

8.3.1 The principal investigator submits the request document, proposal and related documents. to the dean of Chulabhorn International College of Medicine.

8.2.2 CICM-BCC reviews the project with a minimum of two committee members acting as reviwer for the biosafety level and laboratory room.

8.2.3 Upon approval, a certification letter will be issued for the use of the BSL 2 laboratory.

8.3.4 The office of research, services, and administrative support will provide a quotation of laboratory fees for that research project.

8.4 The office of research, services, and administrative support informs the operators, operation personnel, and the secretary of the CICM-BCC of operation of the research following the Pathogens and Animal Toxins Act, B.E. 2558 (2015).

8.5 After the laboratory is conducted, the operation personnel (researchers) must be submits the application of biosafety laboratory level 2 report form specifying the microorganism name, microorganism volume, number of products, and collection site.

8.6 All equipment and BSL-rooms will be reserved by using the research laboratory and lab equipment reservation system (online system) before doing any laboratory work.

(For document control officers)

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(Miss.Supawadee Kheowkae) (Assc.Prof.Veerachai Thitapakorn,Ph.D.)

Person responsible for document system control Head of research laboratory

1. Objective

To be a guideline for research operations in the BSL1 Research Laboratory of the CICM

2. Scope

Guideline for eligible persons to study and understand research operations in the BSL1 Research Laboratory of the CICM, in accordance with the Pathogens and Animal Toxins Act, B.E. 2558 (2015)

3. Principle

The use of Group 1 Pathogens and Biosafety Level 1 in CICM research has to be followed the Pathogens and Animal Toxins Act, B.E. 2558 (2015), and the Notification of the Ministry of Public Health B.E. 2561 (2018) on Characteristics of the Place of Production or Possession and Operation of Pathogens and Animal Toxins, ensuring the safety of operators, co-workers, and the community.

4. Definitions and abbreviations

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

4.2 BSL1 refers to a biosafety laboratory level 1.

5 Responsible personnel

5.1 Institutional Biosafety Committee of Chulabhorn International College of Medicine, Thammasat University.

5.2 Laboratory committee of Chulabhorn International College of Medicine, Thammasat University.

5.3 Research Supporting Office.

5.4 Operators of Chulabhorn International College of Medicine, Thammasat University.

5.5 Operation personnel of Chulabhorn International College of Medicine, Thammasat University.

5.6 Researchers.

6. Related Document

6.1 Form to request approval for access to BSL2 laboratories (CICM-BCC-FA-002)

7. References

7.1 Pathogens and Animal Toxins Act, B.E. 2558 (2015)

7.2 Notification of the Ministry of Public Health Re: Characteristics of the Place of Production or Possession of and Operations on pathogens and animal toxins B.E. 2563 (2020).

8. Operational processes

8.1 Eligible work in a BSL1 Laboratory.

8.1.1 Research without pathogens.

8.1.2 Use of Group 1 Pathogens in research without genetic engineering.

8.1.3 Use of Group 1 Pathogens in research with genetic engineering, which combines at least two different types of DNAs that pose a low risk.

8.1.4 Specimens derived from healthy humans and animals, such as blood, serum, plasma, body parts, organs, tissue, etc., are required for consideration and evaluation by the CICM-BCC.

8.1.5 Group 2 Pathogen-infected specimens derived from humans and animals such as blood, serum, plasma, body parts, organs, tissues, etc, which are clearly scientifically proven to be without contamination of pathogens, are required for consideration and evaluation by the CICM-BCC.

8.1.6 Group 2 Pathogen-infected specimens derived from humans and animals, such as blood, serum, plasma, body parts, organs, tissues, etc., which are

disinfected by chemical and physical methods or others with ensured inactivation of pathogens, are required for consideration and evaluation by the CICM-BCC.

8.2 Inform the operator and operations personnel before operating research in the CICM Research Laboratory BSL1.

8.3 Researchers must operate the research under the supervision of the operator and operational personnel.

8.4 Researchers must operate the research strictly in accordance with the Pathogens and Animal Toxins Act, B.E. 2558 (2015) and related notifications from the Ministry of Public Health.

8.5 Use of human and animal specimens in research, such as blood, serum, plasma, body parts, organs, tissues, etc., should be operate in a biological safety cabinet (BSC).

8.6 Close-toed shoes are mandatory.

8.7 During research operation, researchers must use personal protective equipment, including a lab coat, gloves, mask, and/or eye protection suitable for each task.

8.8 After research operation, biological samples must be inactivated before putting in a biohazard waste container.

8.9 After research operations, researchers must use a suitable technique to decontamination before leaving the laboratory.

8.10 In case of biological spill, following the biological spill response as described in CICM-BCC-SA-008.

8.11 Do not operate acidic, basic or flammable substances within biological safety cabinet (BSC)

8.12 Do not allow persons who do not operate research to enter the laboratory

8.13 Do not directly use mouth suction to transfer substances with a pipette

8.14 Items unrelated to research are not allowed to bring into the laboratory

8.15 Food and drink are prohibited

8.16 Do not wear or remove contact lenses in the laboratory

8.17 Do not apply cosmetics in the laboratory

8.18 Do not use a mobile phone and touch a clean area such as a doorknob while wearing gloves

8.19 Use an elbow to push door holders or a foot to push a door carriage for sliding the door

8.20 Wash hands before leaving the laboratory

8.21 Unauthorized persons are strictly forbidden to enter the laboratory

(For document control officers)

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(Miss.Supawadee Kheowkae)
Person responsible for document system control

(Assc.Prof.Veerachai Thitapakorn,Ph.D.)
Head of research laboratory

1. Objective

The guideline for biosafety level 2 laboratory (BSL2) research operation

2. Scope

This procedure applied to all users who intend to work in BSL2 laboratories of the Chulabhorn International College of Medicine, to review the guideline prior to conducting research. This procedure has been developed with regard to the Pathogens and Animal Toxins Act, B.E. 2558 (2015).

3. Principle

This SOP is a guideline for conducting research in BSL2 laboratories involving pathogenic activity, including bacteria, fungi, viruses, parasites and non-pathogenic protein particles. Any research on prions, including any sample that has been contaminated with pathogenic protein particles, is not permitted. Moreover, this SOP is also for conducting research in BSL2 laboratories with activities related to any modern biotechnology that uses genetically modified organisms including pathogens, plants, humans and animals, specimens from both humans and animals, and/ or hazardous biological substances. Bacterial and mold toxins are not permitted to carry out research on, to ensure the safety of researchers, co-workers and communities.

4. Terminology and abbreviation

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

4.2 TU-IBC refers to Institutional Biosafety Committee, Thammasat University

4.3 BSL1 refers to a biosafety level 1 laboratory

4.4 BSL2 refers to a biosafety level 2 laboratory

5. Responsible persons

5.1 Institute Biosafety Committee of the Chulabhorn International College of Medicine, Thammasat University

5.2 Laboratory committee of the Chulabhorn International College of Medicine, Thammasat University

5.3 Research supporting Office

5.4 Operator of the Chulabhorn International College of Medicine, Thammasat University

5.5 Operation personnel of Chulabhorn International College of Medicine, Thammasat University

5.6 Researchers

6. Related documents

6.1 Form to request consideration for biosafety level and laboratory (CICM-BCC-FA-001)

6.2 Form to request approval for access to BSL2 laboratories (CICM-BCC-FA-002)

6.3 Form to report access to BSL2 laboratories (CICM-BCC-FA-003)

6.4 SOP for handling and manipulation of human and animal samples that could be contaminated with Group 2 or 3 Pathogens* (SOP-BCC-04)

6.5 SOP for production, import, export, transit, sale or possession of the pathogens and animal toxins (SOP-BCC-05)

6.6 SOP for pathogen destruction (SOP-BCC-06)

6.7 SOP for waste management (SOP-BCC-07)

6.8 SOP for biological spill response (SOP-BCC-08)

6.9 SOP for accident emergency response (SOP-BCC-09)

7. References

Biosafety guidelines for modern biotechnology B.E. 2559 (2016), Technical Biosafety Committee (TBC), National Center for Genetic Engineering and Biotechnology. ISBN: 978-616-12-0476-1.

(http://www.biotec.or.th/biosafety/images/document/G01-Biosafety%20Guideline.pdf)

8. Operational processes

Guideline for BSL2 research laboratory procedures

8.1 Scope of research

8.1.1 Research involving group 1, 2, or 3* pathogens, all pathogens to be used in research must be reported to Chulabhorn International College of Medicine. The Chulabhorn International College of Medicine is responsible for the pathogen registration according to the Pathogens and Animal Toxins Act, B.E. 2558 (2015), and which require level consideration and risk assessment by the CICM-IBC.

8.1.2 Research involving group 1, 2, or 3* modified-pathogen, all pathogens to be used in research must be required risk assessment by the CICM-BCC.

BSL2 Room A

Scope of research

1. Research on human and animal specimens which may be infected with bacteria, fungi, viruses, and parasites classified as Group 1, 2 and 3* pathogens.

2. Research on human and animal specimens which may be infected with genetically engineered bacteria, fungi, viruses and parasites.

3. Research on Group 1 Animal Toxins

4. Research on cell cultures that are not contaminated with pathogens.

5. Research on cell culture which are host for viruses, parasites and other infectious agents classified as Group 1, 2 and 3* pathogens, which requires consideration and risk assessment by the CICM-BCC.

BSL2 Room B

Scope of research

1. Research on cell cultures that are not contaminated with pathogens.

2. Research on cell culture which are host for viruses, parasites and other infectious agents classified as Group 1, 2 and 3* pathogens, which is requires consideration and risk assessment by the CICM-BCC.

BSL2 Room C

Scope of research

1. Research on microorganisms that do not require host cells to multiply.

2. Research on bacteria, yeasts, and fungi classified as Group 1, 2, and 3* pathogens which requires consideration and risk assessment by CICM-BCC.

8.2 (Personal protective equipment: PPE)

8.2.1 Lab coat

8.2.2 Shoe cover for BSL2 laboratories

8.2.3 Gloves

8.2.4 Surgical mask or respirator

8.2.5 Goggles

8.2.6 Bouffant cap

8.2.7 Etc., other items that are proper to your work.

8.3 General guidelines for working in BSL2 Laboratory Rooms A, B, and C

Follow the SOP of BSL 1 laboratory, and

8.3.1 Researchers apply for a biosafety level and laboratory consideration from TU-IBC and must be approved completely prior to processing in BSL2 laboratories.

8.3.2 Reserve the rooms and instruments via online booking before accessing**.**

8.3.3 Researchers who access BSL2 laboratories are required to pass the training of SOP for biosafety of the Chulabhorn International College of Medicine, Thammasat University or the biosafety and biosecurity courses according to the Pathogens and Animal Toxins Act, B.E. 2558 (2015).

8.3.4 Researchers wear closed shoes before entering the anteroom.

8.3.5 All equipment are prepared and cleaned up before entering BSL2 laboratories. Pathogens and biological substances must be transferred through the double-wall container and put on the cart.

8.3.6 Research investigators must wear personal protective equipment (PPE) in the following order: shoe cover, hand washing, surgical mask, goggles, bouffant cap, lab coat and 2 pairs of gloves, respectively.

8.3.7 All work is ONLY done inside a biological safety cabinet.

8.3.8 Working area must be cleaned before and after every use by spraying disinfectant to tissue papers and wiping (do not spray disinfectant on the area directly).

8.3.9 After work, laboratory equipment and materials that have been in contact with pathogen-contaminated matter must be appropriately cleaned and immediately removed from laboratories according to the SOP for pathogens destruction (SOP-BCC-06) and the SOP for waste management (SOP-BCC-07).

8.3.10 Personal protective equipment must be taken off in the following order: the first pair of gloves, bouffant cap, goggle, lab coat, shoe cover, the second pair of gloves, hand washing, surgical mask, and hand washing, and disposal into the prepared infectious waste container.

8.3.11 Hands must be washed before leaving the laboratories.

8.3.12 Mouth pipetting is prohibited; mechanical pipetting devices are to be used at all times.

8.3.13 Eating, drinking, smoking, and applying cosmetics are not allowed in the laboratories.

8.3.14 Substances used in all operations or research procedures are not allowed to be spread to other areas, or the spreading must be limited to the extent possible by conducting operations/procedures using biological safety cabinets.

8.3.15 Do not use concentrated acid and alkali, and equipment that will cause a flame in the biosafety cabinet (BSC).

8.3.16 If the production of Group 2 or 3* Pathogens is intended, production protocols must follow the standard procedures for production, import, export, sale, or possession of the pathogens and animal toxins (see document SOP-BCC-05).

8.3.17 All sample tubes must be labelled, including species of pathogens, volume or number of pathogens, responsible person(s) and the date of production.

8.3.18 The pathogens and animal toxins must be stored only in the assigned area(s). Transportation of the pathogens must follow the standard procedures for production, import, export, sale, or possession of the pathogens and animal toxins (see document SOP-BCC-05).

8.3.19 As soon as the research project is completed, the involved pathogens must be completely inactivated.

8.3.20 Researchers fill the form for the handover, destruction, and inactivation of pathogens and animal toxins according to the Notification of Minister of Public Health for the termination of production, import, export, sale, transit or possession of pathogens and animal toxins B.E. 2560 to report to CICM-IBC and TU-IBC.

8.4 Special (additional) guidelines for working in BSL2 Laboratory Rooms A, B, and C

8.4.1 The principal researchers and researchers must be responsible for the conduct and the incurred damage in case of non-compliance with the standard operating procedures (SOP) of the Chulabhorn International College of Medicine, Thammasat University and/or the Pathogens and Animal Toxins Act, B.E. 2558 (2015).

8.4.2 The principal researchers and researchers must only perform the research specified in the approved proposal.

8.4.3 The principal researchers and researchers must establish policies on how to proceed with the project. The researchers must be given instructions on the hazards and things that must be done before entering the laboratory, such as vaccination, practice, etc.

8.4.4 If there is any biological spill or accident, please follow the SOP on biological spill response (SOP-BCC-08).

8.4.5 Samples used in the laboratories, such as serum or anything that may pose a risk to a person in the laboratory, should be kept in a suitable and limited access area.

8.4.6 Research on cell cultures without Group 1, 2 and 3* pathogens can be conducted in the BSL2 Laboratory Room B following the SOP for BSL2 Laboratory Room B.

SOP-BCC-04 Standard operating procedure for handling and manipulation of human and/or animal samples that could be contaminated with Group 2 or 3 Pathogens **Approval date** **21 DEC 21**

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(Miss.Supawadee Kheowkae)
Person responsible for document system control

(Assc.Prof.Veerachai Thitapakorn,Ph.D.)
Head of research laboratory

1. Objective

To serve as the standard operating procedure (SOP) for handling and manipulating human and/or animal samples that may be contaminated with Group 2 or 3 Pathogens in a research laboratory setting.

2. Scope

Provide the relevant parties with guidelines for studying and understanding the procedures for handling research samples obtained from humans and animals that may be contaminated with Group 2 or 3 Pathogens in the research laboratory of Chulabhorn International College of Medicine (CICM), in accordance with the Pathogens and Animal toxins Act B.E. 2558 (2015).

3. Principle

To comply with the Pathogens and Animal toxins Act B.E. 2558 (2015) and the laboratory's characteristics, tools, equipment, safety systems, and quality systems according to the Ministry of Public Health's notification on the characteristics of facilities for production or possession, and operations on pathogens and animal toxins B.E. 2563 (2020), in order to ensure the safety of researchers, collaborators, and the community, handling research samples obtained from humans and animals potentially contaminated with Group 2 or 3* Pathogens must be conducted in a Biosafety Level 2 laboratory with directional airflow and exhaust air ducts outside the building, along with other measures to prevent the spread of pathogens.

4. Definitions and abbreviations

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

4.2 BSL2 refers to a biosafety level 2 laboratory

5. Responsible personnel

5.1 Biosafety Control Committee of the Chulabhorn International College of Medicine, Thammasat University

5.2 Laboratory committee of the Chulabhorn International College of Medicine, Thammasat University

5.3 Research supporting Office

5.4 Operator of the Chulabhorn International College of Medicine, Thammasat University

5.5 Operation personnel of the Chulabhorn International College of Medicine, Thammasat University

5.6 Researchers

6. Related document

6.1 Not available

7. References

7.1 Pathogens and Animal toxins Act, B.E. 2558 (2015)

7.2 Ministry of Public Health Notification on the Characteristics of Facilities for Production or Possession, and Operations on Pathogens and Animal Toxins B.E. 2563 (2020).

8. Operational processes

8.1 The operation date/time for each laboratory room, instrument, and equipment must be booked via the online booking system before working.

8.2 Handling of research samples obtained from healthy humans and animals such as blood, serum, plasma, tissues, organs, or others must be conducted within a Biosafety Level 2

cabinet (BSC class II) in BSL 1 or BSL 2 Room A laboratories, subject to evaluation and risk assessment by CICM-BCC.

8.3 Handling of research samples obtained from either humans or animals which are infected with Group 2 pathogens such as blood, serum, plasma, tissues, organs, or others, which have clear scientific evidence or indications confirming the absence of pathogen contamination in the samples, must be conducted within a Biosafety Level 2 cabinet (BSC class II) in BSL 1 or BSL 2 Room A laboratories, subject to evaluation and risk assessment by CICM-BCC.

8.4 Handling of research samples obtained from either humans or animals infected with Group 2 pathogens such as blood, serum, plasma, tissues, organs, or others, which have undergone pathogen inactivation via chemical or physical methods and are confirmed to be free of active pathogens must be conducted within a Biosafety Level 2 cabinet (BSC class II) in BSL 1 or BSL 2 Room A laboratories, subject to evaluation and risk assessment by CICM-BCC.

8.5 Handling of research samples obtained from either humans or animals are infected with Group 2 pathogens that can be transmitted to humans or animals, including blood, serum, plasma, tissues, organs, or others must be conducted within a Biosafety Level 2 cabinet (BSC class II) in BSL 2 Room A laboratories, subject to evaluation and risk assessment by CICM-BCC.

8.6 Increasing the quantity of pathogens from research samples obtained from either humans or animals are infected with Group 3 pathogens, including but not limited to blood, serum, plasma, tissues, organs, or others are not permitted.

8.7 Handling of research samples obtained from either humans or animals are infected with Group 3* pathogens, including blood, serum, plasma, tissues, organs, or others, in case of increasing volume of virus from research samples up to a maximum of 30 milliliters per occasion or culturing of bacteria from research samples up to a maximum of 5 milliliters or 3 culture plates per occasion. This must be subject to evaluation and risk assessment by CICM-BCC, and information regarding the controlled pathogens must be maintained following the standard practices for the production, import, export, sale, transit or possession of the pathogens and animal toxins SOP-BCC-05.

8.8 Handling research samples obtained from humans or animals infected with Group 3* pathogens, including blood, serum, plasma, tissues, organs, or others that have undergone pathogen inactivation via chemical or physical methods, and ensuring the pathogens are inactivated, must be conducted within a Biosafety Level 2 cabinet (BSC class II) in BSL2 laboratories, subject to evaluation and risk assessment by CICM-BCC.

8.9 In cases where the outcomes of the operation involve the production of Group 2 or 3* pathogens, procedures must adhere to the standard practices for the production, import, export, sale, transit or possession of the pathogens and animal toxins (SOP-BCC-05).

8.10 It is required to label the pathogen's name, quantity or volume, producer, and production date on the container tubes.

8.11 The collection of pathogens and animal toxins shall be carried out in designated areas only and the transfering of pathogens and animal toxins shall adhere to the standard practices for the production, import, export, sale, transit or possession of the pathogens and animal toxins (SOP-BCC-05).

8.12 Upon completing the research project, pathogens must be rendered non-viable and non-infectious. Generate a report on the delivery, destruction, and post-destruction verification of pathogens or animal toxins in compliance with the Ministry of Public Health's notification on the cessation of production, import, export, sale, transit, and possession of pathogens and animal toxins B.E. 2560 (2017), to be submitted subsequently to CICM-BCC and TU-IBC for notification.

8.13 In case of storing pathogen requirement for future research studies, pathogens must be listed in the registration or possessing under the license of the possession of pathogens and animal toxins of the Chulabhorn International College of Medicine, Thammasat University.

8.14 In case of the pathogens obtained from the research operation are not listed in the registration or covering by the license for the possession of pathogens and animal toxins of the Chulabhorn International College of Medicine, Thammasat University,

8.14.1 In case of researchers intend to destroy pathogens, they must conduct the destruction following the standard practices for pathogen destruction (SOP-BCC-06) and bio-waste management (SOP-BCC-07). The destruction results are reported to responsible operator or operational personnel within 24 hours using the reporting format specified in the Ministry of Public Health's notification on the cessation of production, import, export, sale, transit, and possession of pathogens and animal toxins B.E. 2560 (2017).

8.14.2 In case of researchers intend to store pathogens, they must inform the responsible operator or the operational personnel within 24 hours. Herein, CICM-BCC will consider the registration document submission and request for a license to possess pathogens and animal toxins or the destruction of pathogens.

(For document control officers)

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(Miss.Supawadee Kheowkae)
Person responsible for document system control

(Assc.Prof.Veerachai Thitapakorn,Ph.D.)
Head of research laboratory

Institutional Biosafety Committee of Chulabhorn International College of Medicine, Thammasat University

Title:	**Production, Import, Export, Sale and Possession of Pathogens and Animal toxins**					**Document control**	**Page : 1 / 10**
						SOP-BCC	**05 REV.2**
Prepared by	Asst. Prof. Dr. Aungkana Krajarng and Dr. Mayurachat Kaewmanee	**Reviewed by**	Asst.Prof. Dr.Tullakorn Plengsuriyakarn	Approved by	Prof. Dr. Adis Tasanarong	**Approved date**	2 January 2024

1. Objectives

To serve as a guide on how to produce, import, export, sell and possess pathogens and animal toxins for research projects aimed to be conducted at the 8th floor research laboratory, Co- operative Learning Center, Chulabhorn International College of Medicine, Thammasat University, Rangsit campus, by the CICM-BCC.

2. Scope

This is for studying and understanding how to produce, import, export, sell and possess pathogens and animal toxins for research projects aimed to be conducted at the 8th floor research laboratory, Co-operative Learning Center, Chulabhorn International College of Medicine, Thammasat University, Rangsit campus, provided by the CICM- BCC in accordance with the Pathogens and Animal toxins Act, B.E. 2558 (2015).

3. Principle

The activities related to the production, import, export, sale, transit, and possession of pathogens and animal toxins are regulated by the Pathogens and Animal Toxins Act, B.E. 2558 (2015). Therefore, any research project intended to be conducted at the 8th-floor research laboratory, Co-operative Learning Center, Chulabhorn International College of Medicine, Thammasat University, Rangsit campus, must comply with the Act. Furthermore, those activities shall follow the act and the guidelines of conduct created by the CICM-BCC and TU-IBC, by using the principle of advance notification of both donor and recipient. The transportation of pathogens and animal toxins must comply with the Pathogens and Animal toxins Act, B.E. 2558 (2015), the Hazardous Substance Act, B.E. 2558 (2015), and other related legislations, including land, water, and air transportation, both domestic and international. Additionally, packaging must adhere to the standard criteria prescribed by the Pathogens and Animal toxins Act, B.E. 2558

4. Definitions and abbreviations

4. 1 CICM- BCC refers to the Institutional Biosafety Committee of the Chulabhorn International College of Medicine, Thammasat University

4.2 TU-IBC refers to the Institutional Biosafety Committee, Thammasat University

5. Responsible personnel

5. 1 Institutional Biosafety Committee of the Chulabhorn International College of Medicine, Thammasat University

5.2 Laboratory committee of the Chulabhorn International College of Medicine, Thammasat University

5.3 Research supporting Office

5.4 Operator of the Chulabhorn International College of Medicine, Thammasat University

5.5 Operation personnel of the Chulabhorn International College of Medicine, Thammasat University

5.6 Researchers

6. Related documents

6. 1 The notification of the department of medical sciences on the notice of transfer, destruction and examination after destruction of pathogens and animal toxins

6. 2 The notice of transfer, destruction and examination after destruction of pathogens and animal toxins in accordance with the notification of the ministry of health on the finishing of production, import, export, sale, transit and possession of pathogens and animal toxins, B.E. 2561 (2018).

7. References

7.1 The Pathogens and Animal toxins Act, B.E. 2558 (2015)

7.2 The notification of the Ministry of Public Health on characteristics of the place of production or possession, and conduct of pathogens and animal toxins, B.E. 2561 (2018)

7.3 The Hazardous substance Act, B.E. 2562 (2019)

7.4 The notification of the Ministry of Public Health on transportation, transfer, destruction and inactivation of pathogens and animal toxins, B.E. 2561 (2018)

7.5 Other related notifications issued on hazardous substances.

7.6 The notification of the Department of Medical Sciences on the properties of outer packaging for the transportation of group 2 pathogens, B.E. 2562 (2019)

7.7 The notification of the Ministry of Public Health on the safety assessment of the technology used in production of pathogens and animal toxins, B.E. 2561 (2018)

8. Operational processes

Procedures shall be in accordance with the Pathogens and Animal toxins Act, B.E. 2558 (2015) and other related ministerial notifications. The procedures must be approved by the CICM-BCC and the TU-IBC. A person who intends to produce, import, export, sell and possess pathogens and animal toxins, must specify the pathogens and animal toxins in the pathogens list in a received certificate of notification or license of the CICM. The production, import, export, sale and possession of group 3 and group 4 pathogens, and group 2 and group 3 animal toxins are prohibited.

The use of group 3* pathogens intended to be under control can be conducted in BSL-2 laboratories enhanced with the following conditions:

1) In the case of disease diagnosis without culturing pathogens, the procedure can be conducted in BSL-2 laboratories in accordance with the principles of Good Microbiological Practice.

2) In the event of culturing 30 mL or less of pathogens, the procedure can be conducted in BSL-2 laboratories enhanced in accordance with the Pathogens and Animal toxins Act, B.E.

2558 (2015) and the notification of the ministry of health on characteristics of the place of production or possession, and conduct of pathogens and animal toxins, B.E. 2561 (2018).

3) Culturing more than 30 ml pathogens at once is prohibited.

Projects approved by the CICM-BCC and the TU-IBC shall strictly adhere to the notification of the ministry of health on characteristics of the place of production or possession, and conduct of pathogens and animal toxins and the Pathogens and Animal toxins Act, B.E. 2558 (2015), with additional guidelines as follows:

8.1 Production and possession

8.1.1 Group 1 pathogens intended to be under control

8.1.1.1 Production of 1,000 L or 200 kg pathogens or less shall be conducted in containers with labels indicating the pathogens' information, namely their scientific name and date of production and packaging. A list and the amount of the produced pathogens shall be recorded.

8.1.1.2 Production of more than 1,000 L or 200 kg pathogens is prohibited.

8.1.2 Group 2 pathogens intended to be under control

8.1.2.1 Production of 10 L pathogens or less can be conducted. Production information, namely production amount, production number and place of storage (box, freezer, place inside freezer, etc.), shall be recorded and indicated on the container. The pathogens' information, namely their scientific name and date of production/packaging shall be labelled in English on the container. In addition, a list and the amount of the produced pathogens shall be recorded.

8.1.2.2 Production of more than 10 L pathogens is prohibited.

8.1.3 Group 3* pathogens intended to be under control

8.1.3.1 Production of 30 ml pathogens or less can be conducted. A person who intends to produce the pathogens shall notify the operator or operation personnel before the

production. Production information namely, production amount, production number and place of storage (box, freezer, place inside freezer, etc.) shall be recorded and indicated on the container. The pathogens' information, namely their scientific name and date of production/packaging shall be labelled in English on the container. In addition, a list and the amount of produced pathogens shall be recorded.

In case of production or possession of pathogens and animal toxins, the pathogens and animal toxins shall be placed in double layers of container as follows:

1) Innermost container is completely closed, anti-liquid leakage and durable.

2) Outermost container is completely closed, anti-liquid leakage and durable. This container shall provide sufficient space in case of leakage from the inner container.

Note The amount or volume of produced or possessed pathogens and animal toxins must not be more than what has been notified.

8.2. Import and export

8.2.1 A person who intends to import or export the pathogens shall notify the CICM-BCC and the TU-IBC of the recipient 7 days before transferring. The material transfer agreement must be approved by both donor and recipient before the transfer. When the transferring is done, the person shall report according to the notice of transfer, destruction and examination after destruction of pathogens and animal toxins under the notification of the ministry of health on the finishing of production, import, export, sale, transit and possession of pathogens and animal toxins B.E. 2561 (2018).

8.2.2 Group 1 pathogens intended to be under control

8.2.2.1 In case of import or export of pathogens and animal toxins, the pathogens and animal toxins shall be placed in triple layers of container as follows:

1) Innermost container is completely closed, anti-liquid leakage and durable.

2) Medium container is completely closed, anti-liquid leakage and durable. This container shall provide sufficient space in case of leakage from the inner container.

3) Outermost container is made of cardboards, plastics, metals or any durable materials which can be completely closed.

8. 2. 2. 2 Pathogen information, namely scientific name and date of production/packaging shall be labelled in English on the container.

8. 2. 2. 3 Amount and number of produced or possessed pathogens shall be recorded.

8.2.3 Group 2 pathogens intended to be under control

8.2.3.1 Follow as described in 8.2.2.1 and 8.2.2.2, the outer package standard must have a width, length, and height of not less than 10 cm and must have the qualifications or have equivalent qualifications as follows:

1) Resistance to falls and shocks from heights

2) Resistance to piercing force

3) Resistance to stacking

8.2.3.2 The outer container of the package must display the Department of Medical Sciences symbol, and documents or marks certifying by an agency that has the ability to test the properties according to the United Nations recommendations on testing the properties of packages containing hazardous substances, category 6.2. In addition, the outside of the package in 8.2.3.1 must display at least the following details:

1) Name, address, telephone number of the recipient who has got the certificate of notification or license

2) Name, address, and telephone number of the recipient

3) Biological hazard symbol

4) Symbol showing the orientation of the package

Note: Symbols shall be used in accordance with international standards and include warning messages in Thai or English as appropriate.

8.2.3.3 Packaging

1) In the case of the transported item being a liquid, there must be enough absorbent material to absorb all the liquid if the inner container breaks or leaks.
2) In the case of there is more than 1 glass tube in the inner container included in the same middle container. Put shock-proof material between glass tubes before being packed into the middle container. If transported outside the location, put shock-proof materials in the space between the middle container and the outer package.
3) In the case of using refrigerant

- Ice: The outer package must be made of a material that prevents leaks.
- Dry Ice: The middle layer of the container must be able to withstand the extreme cold of dry ice. The outer package must be made of a material that can relieve the pressure created by the sublimation of dry ice.
- Liquid nitrogen: The inner container, middle layer container, and outer package must be able to withstand the extreme cold of liquid nitrogen.

Note: In the case of using refrigerant, which is dry ice and liquid nitrogen, labeling of outer packaging must display symbols of hazardous substances according to international standards with warning messages in Thai or English as appropriate.

8.2.3.4 Provide information on pathogens or animal toxins in possession with type, number of containers indicating the number or quantity, date of manufacture, and place to store pathogens or animal toxins which can be traced back.

8.2.4 Group 3* pathogens intended to be under control

8.2.4.1 Follow as described in 8.2.3.1 – 8.2.3.4 and

8.2.4.2 Arrange to have Pathogen Safety Data Sheets (PSDS) providing information of sort, source, vector, transmission, pathogenesis, symptoms, treatment and preventive vaccine, personal protective equipment, first aid and methods of disposal and destruction.

8.3 Transportation

Follow the notification of the Ministry of Health on the transportation, transfer, destruction, and inactivation of pathogens and animal toxins by notifying the CICM-BCC and the TU-IBC of the recipient 7 days before transfer. The material transfer agreement must be approved by both donor and recipient before the transfer.

8.3.1 Enclose pathogens declaration with the transfer.

8.3.2 Arrange to have the advance appointment of the transfer date between donor and recipient. The donor shall provide information on transferring pathogens, name of donor, name of recipient, contact number, and date and time of transfer. A list of the transferred pathogens must be specified in a certificate of notification or request permission to possess the pathogens of the donor and recipient.

8.3.3 Transfer pathogens to the recipient or assigned person in permitted areas only.

8.3.4 Domestic transport shall follow as described in 8.3.1 - 8.3.3 and also other related legislations.

8.3.4.1 Land transportation shall follow the criteria, procedures, and conditions prescribed by laws of hazardous substance, land transportation, and railway and highway management.

8.3.4.2 Water transportation shall follow the criteria, procedures, and conditions prescribed by laws of hazardous substance and water transportation in the Kingdom of Thailand.

8.3.4.3 Air transportation shall follow the criteria, procedures, and conditions prescribed by laws of hazardous substance and aviation.

8.3.5 International transport shall follow as described in 8.3.1 – 8.3.4 and other related legislations as follows.

8.3.5.1 Land transportation shall follow the criteria, procedures, and conditions prescribed by laws regarding hazardous substances and the criteria, methods, and conditions specified by the country of origin, transit, and destination.

8.3.5.2 Water transportation shall follow the criteria, procedures, and conditions prescribed by laws regarding hazardous substances and shipment and the criteria, methods, and conditions specified by the country of origin, transit, and destination.

8.3.5.3 Air transportation shall follow the criteria, procedures, and conditions specified by the
International Air Transport Association (IATA).

8.4. Transportation of pathogens and animal toxins within the faculty

8.4.1 Transportation of pathogens and animal toxins within the faculty means the transportation of pathogens and animal toxins within the 8th floor research laboratory, Co-operative Learning Center, Chulabhorn International College of Medicine.

8.4.2 Onsite transportation of pathogens and animal toxins from BSL-1 to BSL-2 shall occur using a double-layer container. The inner container shall be completely closed, anti-liquid leakage, and durable. The outer container shall be made of cardboard, plastics, metals, or any durable materials that can be completely closed. Use a moving cart that is strong, with impact resistance, able to support weight, and durable for disinfectants, and there is a protective edge around the cart to prevent falling.

8.4.3 Transport and/or storage of pathogens and animal toxins at provided areas by CICM as follows:

8.4.3.1 4-degrees Celsius refrigerator and -20-degrees Celsius freezer in BSL-2.

8.4.4.2 -80-degrees Celsius freezer in BSL-1 and BSL-2. Due to access control, a person who intends to store pathogens and animal toxins in this freezer shall notify the operator or operation personnel before conducting the transportation and storage.

8.4.4 Other transportation outside the 8th floor research laboratory, CICM, follows section 8.3 Transportation as shown above.

(For document control officers)

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2	1	2 Jan 24	Update all document		

(Miss.Supawadee Kheowkae) (Assc.Prof.Veerachai Thitapakorn,Ph.D.)

Person responsible for document system control Head of research laboratory

Title:	**Destruction of pathogenic microorganisms**					**Document control**	**Page: 1 / 4**
						SOP-BCC	**06 REV.2**
Prepared by	Asst. Prof. Dr. Veerachai Thitapakorn	**Reviewed by**	Asst.Prof. Dr.. Tullayakorn Plengsuriyakarn	**Approved by**	Prof. Dr. Adis Tasanarong	**Approved date**	2 January 2024

1. Objective

To provide a procedure and guideline for destruction of pathogenic microorganisms

2. Scope

This procedure applied to all users who work for or are related to the Chulabhorn International College of Medicine (CICM) laboratory on the 8th floor, Co-operative Learning Centre, Thammasat University, Rangsit Campus, in response to biological spills when they occur. This procedure has been developed regarding the Pathogens and Animal Toxins Act, B.E. 2558 (2015)

3. Principle

According to the Pathogens and Animal Toxins Act, B.E. 2558 (2015) and the Notification of Ministry of Public Health: Characteristics of the place of production or possession of pathogens and animal toxins, tools, equipment, accompanying documents, labels, containers or packages for each group of pathogens and animal toxins B.E. 2561 (2018), the destruction of pathogenic microorganisms has to be conducted to ensure and prevent the accidental release of pathogens or animal toxins to users, colleagues and communities, by using proper methods of destruction which include waste and nucleic acid product management.

4. Definition and Abbreviation

4. 1 CICM- BCC refers to the Institutional Biosafety Committee of the Chulabhorn International College of Medicine, Thammasat University.

4.2 TU-IBC: Institutional Biosafety Committee, Thammasat University

5 Responsible personnel

5. 1 Institutional Biosafety Committee of the Chulabhorn International College of Medicine, Thammasat University

5. 2 Laboratory committee of the Chulabhorn International College of Medicine, Thammasat University

5.3 Research Supporting Office

5.4 Operator of the Chulabhorn International College of Medicine, Thammasat University

5.5 Operation personnel of the Chulabhorn International College of Medicine, Thammasat University

5.6 Researchers

6. Related documents

6. 1 Notification of the Ministry of Public Health: The destruction or handover of pathogens or animal toxins to other persons receiving B.E. 2561 (2018)

6.2 Notification of the Department of Medical Sciences: A certificate of notification for the destruction or handover of pathogens or animal toxins to other persons receiving

6. 3 A certificate of notification for destruction or handover of pathogens or animal toxins to other persons receiving from the Notification of Ministry of Public Health: Termination of the production, import, export, sale, transit or possession of pathogens or animal toxins B.E. 2561 (2018)

7. References

7.1 Pathogens and Animal Toxins Act, B.E. 2558 (2015)

7. 2 Notification of the Ministry of Public Health: Characteristics of the place of production or possession of pathogens and animal toxins of pathogens and animal toxins B.E. 2561 (2018)

7.3 Ministerial Regulation Hygienic Waste Management B.E.2545 (2002)

7.4 Ministerial Regulation Hygienic Waste Management (No.2) B.E.2564 (2021)

8. Operational processes

Destruction of pathogenic microbes can be performed with chemicals, heat, an autoclave, and by burning following the Notification of Ministry of Public Health: The destruction or handover of pathogens or animal toxins to other persons receiving B.E. 2561 (2018) and the Notification of Department of Medical Sciences: A certificate of notification for the destruction or handover of pathogens or animal toxins to other persons receiving.

8.1 Destruction by chemicals

8.1.1 Reduce contamination or decontamination by using 0.5 – 1% of sodium hypochlorite prepared by diluting a 5% sodium hypochlorite stock solution. Alternative chemical agents with scientific documentation of microbial destruction can also be used.

8.1.2 Fresh preparation for use within 1 hour.

8.1.3 Immerse for 30 minutes.

8.1.4 In case of immediate discarding, dilute the used sodium hypochlorite 10-fold: then this agent can be poured into a drainage pipe sewer.

8.1.5 Follow instructions and safety data sheets in case of alternative chemical agents.

8.2 Destruction by heating

8.2.1 This method is used for pathogenic multicellular eukaryotes only.

8.2.2 Boil at 100°C for 10 – 30 minutes.

8.3 Autoclave

8.3.1 According to the Ministerial Regulation Hygienic Waste Management (No.2) B.E.2564 (2021), an autoclave must pass the spore test daily and be standardized yearly.

8.3.2 For cleaned glassware and plastic ware, sterilize by autoclaving at 121°C, 1.15 bar (or 16.9 psi) for 15 minutes.

8.3.3 For waste, sterilize by autoclaving at 134°C, 2.25 bar (or 33 psi) for 35 minutes.

8.3.4 For endospore-forming or heat-resistant microbes, sterilize by autoclaving at 134°C, 2.25 bar (or 33 psi) for 35 minutes.

8.3.5 The sterilized wastes must be placed in the waste collecting area for further destruction process by the assigned company.

8.4 Incineration

8.4.1 This method is used for infectious and non-infectious sharps waste. It was burning at a temperature of at least 760°C and afterwards burning at 1,000°C by an outsourced company.

8.5 After finishing the process, fill a form of notification which follows the Notification of Ministry of Public Health: destruction or handover of pathogens or animal toxins to other persons receiving B.E. 2561 (2018), then notify the CICM-BCC and the TU-IBC.

(For document control officers)

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(Miss.Supawadee Kheowkae) (Assc.Prof.Veerachai Thitapakorn,Ph.D.)

Person responsible for document system control Head of research laboratory

Institutional Biosafety Committee of Chulabhorn International College of Medicine, Thammasat University

Title:	**Solid waste management**					**Document control**	**Page : 1 / 6**
						SOP-BCC 07	**REV.02**
Prepared by:	Asst. Prof. Dr. Sompong Tabunhan	**Reviewed by:**	Asst. Prof. Dr. Tullayakorn Plengsuriyakarn	**Approved by:**	Prof. Dr. Adis Tasanarong	**Approved date:**	2 January 2024

1. Objective

To serve as a practical guideline for solid waste management.

2. Scope

For relevant persons to study and understand the process of waste management in the laboratories of the Chulabhorn International College of Medicine, in accordance with the Pathogens and Animal Toxins Act, 2015.

3. Principle

In order to comply with the Pathogens and Animal Toxins Act, B.E. 2558 (2015) and the characteristics of the operating location, tools or equipment, safety system, and quality system in accordance with the Notification of the Ministry of Public Health prescribing the characteristics of the manufacturing location or possession and operation of pathogens and animal toxins, B.E. 2561 (2018). In addition, to ensure the safety of researchers, co-workers, and the community. Therefore, it is necessary to manage solid waste by dividing it into different types, including general solid waste, infectious waste, chemical waste, and sharp waste. The operation is not permitted in cases of radioactive waste, animal carcasses, or hazardous waste.

4. Abbreviations and definitions

4. 1 CICM-IBC refers to the Institutional Biosafety Committee of Chulabhorn International College of

Medicine, Thammasat University.

4.2 TU-IBC refers to the Institutional Biosafety Committee of Thammasat University.

5. Responsibilities

5.1. Institutional Biosafety Committee of the Chulabhorn International College of Medicine, Thammasat University

5.2 Laboratory committee of the Chulabhorn International College of Medicine, Thammasat University

5.3 The research support office

5.4 Operator of the Chulabhorn International College of Medicine, Thammasat University

5.5 Operation personnel of the Chulabhorn International College of Medicine, Thammasat University

5.6 Researchers

6. Related documents

6.1 Standard practice for disinfection (CICM-IBC-SA-006)

7. References

7.1 Pathogens and Animal Toxins Act, B.E. 2558 (2015)

7.2 Notification of the Ministry of Public Health prescribing the characteristics of the manufacturing location or possession and operation of pathogens and animal toxins, B.E.2561 (2018)

7.3 Ministerial regulations of the Ministry of Public Health on the elimination of infectious waste, B.E. 2545 (2002)

7.4 Ministerial regulations of the Ministry of Public Health on the elimination of infectious waste, 2nd edition, B.E. 2564 (2021)

8. Procedures

Management of general solid waste, infectious waste, sharp waste, chemical waste, and electronic and battery waste.

8.1 General solid waste

8.1.1 Discard the waste into the general waste container, with a volume of no greater than three-fourths of the bag.

8.1.2 Housekeepers daily collect general waste and store in the trash area in order to continue elimination by Thammasat University.

8.2 Infectious waste

8.2.1 Discard the waste into the infectious solid waste container, with a volume of no greater than three-fourths of the bag.

8. 2. 2 Housekeepers daily collect infectious waste and transport by cart in a completely closed container of durable material, not easily broken and not leaking. keep it in the infectious trash area which provided at the washing room of the Chulabhorn International College of Medicine Laboratory.

8. 2. 3 Decontamination of the infectious waste by autoclaving at 134 ℃, 2. 25 bar (33 psi) pressure for 35 minutes. The spore test method is done twice a week to ensure that the autoclaves used for waste decontamination are operating effectively.

8. 2. 4 Housekeepers collect sterilized infectious waste and keep it in the provided trash area. Sterilized infectious waste will be eliminated by the assigned company authorized by the ministerial regulations of the Ministry of Public Health on the elimination of infectious waste.

8. 2. 5 In the case of infectious waste that has undergone decontamination with a chemical, it should be discarded according to the instructions provided for

that chemical waste management. This waste will be eliminated by the assigned company.**** ESPReL

8.3 Sharp waste

8.3.1 Discard in a sharp waste container with a tight closing lid, made from durable material that is not easily broken and not leaking.

8.3.2 Store sharp waste in the provided trash area at the washing room until the time for elimination by the assigned company.

8.4 Chemical waste

8.4.1 Discard the different types of chemicals by specifying their name and volume before discarding them into a chemical-resistant container. Store it in the designated chemical waste area located in the washing room.

8.4.2 In case of an unspecified type of chemical, please specify its name and volume before discarding it in the chemical-resistant container. Store it in the designated chemical waste area located in the washing room.

8.4.3 For handling of chemical waste that is contaminated with heavy metals, please proceed by bringing it to the chemical waste disposal point as scheduled assigned by research affairs. (Investigators/researchers must notify

the operator before using heavy metals. This aims to determine the process of disposal of chemical waste contaminated with heavy metals.)

8.4.4 Chemical waste will be eliminated by the assigned company.

8.5 Electronic waste and battery

8.5.1 Discard it in the electronic waste container which provided at the chemical trash area in the washing room.

8.5.2 Electronic waste and battery will be eliminated by the assigned company.

(For document control officers)

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(Miss.Supawadee Kheowkae) (Assc.Prof.Veerachai Thitapakorn,Ph.D.)

Person responsible for document system control Head of research laboratory

Institutional Biosafety Committee of Chulabhorn International College of Medicine, Thammasat University

Title:	**Biological spill response**					**Document control**	**Page: 1 / 10**
						SOP-BCC	**08 REV.2**
Prepared by	Assoc. Prof. Dr. Veerachai Thitapakorn	**Reviewed by**	Asst.Prof. Dr.. Tullayakorn Plengsuriyakarn	**Approved by**	Prof. Dr. Adis Tasanarong	**Approved date**	2 January 2024

1. Objective

To provide a procedure and guideline for biological spill response

2. Scope

This procedure applies to all users who work for or are otherwise related to the Chulabhorn International College of Medicine (CICM) laboratory on the 8th floor, Co-operative Learning Centre, Thammasat University, Rangsit Campus, to respond to biological spills when they occur. This procedure has been developed regarding the Pathogens and Animal Toxins Act, B.E. 2558 (2015)

3. Principle

Regarding Pathogens and Animal Toxins Act, B.E. 2558 (2015) and Notification of Ministry of Public Health: Characteristics of the place of production or possession of pathogens and animal toxins, tools, equipment, accompanying documents, labels, containers or packages for each group of pathogens and animal toxins B.E. 2561 (2018), the response to biological spills has to be conducted to ensure and prevent the accidental release of pathogens or animal toxins to users, collogues, and communities by using a biological spill kit.

4. Abbreviations and definitions

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

4.2 TU-IBC refers to the Institutional Biosafety Committee, Thammasat University.

5. Responsibilities

5.1 Institutional Biosafety Committee of Chulabhorn International College of Medicine, Thammasat University.

5.2 Laboratory committee of the Chulabhorn International College of Medicine, Thammasat University

5.3 Research supporting Office.

5.4 Operator of the Chulabhorn International College of Medicine, Thammasat University

5.5 Operation personnel of the Chulabhorn International College of Medicine, Thammasat University

5.6 Researchers

6. Related documents

6.1 Incident report form of unsafe biohazard from processes or procedures of produce, import, export, sale, transit, and possession of pathogens and animal toxins.

7. References

7.1 Pathogens and Animal Toxins Act, B.E. 2558 (2015)

7.2 Notification of the Ministry of Public Health: Characteristics of the place of production or possession of pathogens and animal toxins of pathogens and animal toxins B.E. 2561 (2018)

7.3 Biosafety guidelines for modern biotechnology B.E. 2559 (2016)

8. Procedures

Guideline and procedure for spill response

8.1 Spill on the floor or ground

8.1.1 Inspect whether there is any leakage or contamination of biological substances on the body or personal protective equipment (PPE)

8.1.1.1 If there is leakage on the PPE, remove the PPE and put it in the area where the leakage of biological substances occurred

8.1.1.2 If there is leakage on the body, absorb it with tissue paper Dispose of the tissue paper in a red waste bin and clean the area with antibacterial soap. Consult a medical professional if necessary

8.1.2 Inform or notice everyone to leave the room and close the door.

8.1.3 Turn on the BSC and leave the laboratory

8.1.4 Putting up a "Do Not Enter" sign in front of a laboratory

8.1.5 Inform operator or operation personnel

8.1.6 Waiting for 30 minutes to allow aerosols to settle

8.1.7 After 30 minutes, initiate the cleanup using the spill kit (located in the Anteroom or Front cabinet). At least two individuals should be designated as the first and second spill responder

8.1.8 Put on personal protective equipment (PPE, *i.e.* mask, goggle, head cap, lab coat, double gloves, and shoes cover in the stated order

8.1.9 Putting on the Biological spill sign in front of the laboratory

8.1.10 Prepare disinfectant, 1% sodium hypochlorite solution, by mixing 200 ml of 5% sodium hypochlorite with 800 ml of water in the bottle

8.1.11 If there is any broken glass or sharps, use tongs or a dustpan and broom to remove them. Place the broken pieces into a sharps bin and dispose of it in the red bag labeled as No. 1

8.1.12 Collect any contaminated PPE (if any) and discard it into the red bag labeled No. 2. In the case of incidents occurring in BSL 1 rooms, gowns or lab coats that can be reused should be placed in a clear plastic bag for contaminated items before being placed in the red bag labeled No. 3

8.1.13 Cover spill with absorbent or tissue paper in a circular pattern from the outside towards the center of the spill and cover the area at least 0.5 meter away from the last seen spill spot

8.1.14 Gently pour appropriate amount of disinfectant onto absorbent or tissue paper from outside to inside and allow disinfectant to incubate for 20 min

8.1.15 Use tong to remove absorbent or tissue papers and put into red bag no. 2

8.1.16 Place the tongs on the disinfectant-soaked tissue paper

8.1.17 Repeat steps 8.1.13-8.1.15

8.1.18 Put tong into red bag no. 3

8.1.19 Both the first and second responders remove their outer gloves and place them in red bag No. 2.

8.1.20 Both the first and second responders remove their head cap, lab coat, and shoe covers into red bag no. 2

8.1.21 Both the first and second responders remove their goggles, place them in the clear zip bag, and then put the bag in the red bag No. 3

8.1.22 The first responder takes off inner gloves and puts them into red bag no. 2

8.1.23 The first responder takes off the mask and puts them into red bag no. 2

8.1.24 The second responder ties all the bags and moves it to the waste area of the laboratory.

8.1.25 The second responder removes the Biological spill sign and moves the spill kit box to the used spill kit area for cleaning and refilling

8.1.26 The second responder takes off inner gloves and mask and then places them into the infectious waste bin of the laboratory, respectively.

8.1.27 Both the first and second responders wash their hands with antiseptic soap or foam before leaving the laboratory.

8.1.28 Complete the incident report form for unsafe biohazards resulting from processes or procedures related to the production, import, export, sale, transit, and possession of pathogens and animal toxins. Submit the completed form to CICM-IBC.

8.2 Spill occurs inside the biosafety cabinet (only 1 pesponder is needed)

8.2.1 In case a spill occurs inside the BSC, do NOT turn off the BSC, and follow the steps below.

8.2.2 Remove the contaminated PPE and place in the red bin in the BSL2

8.2.3 begin to clean up by spill kit located in the anteroom

8.2.4 Putting up a "Do Not Enter" sign in front of a laboratory

8.2.5 In case PPE becomes contaminated, put on personal protective equipment (PPE) in the following order: mask, goggles, head cap, lab coat, double gloves, and shoe covers.

8.2.6 Prepare disinfectant, 1% sodium hypochlorite solution, by mixing 200 ml of 5% sodium hypochlorite with 800 ml of water in the bottle

8.2.7 If there is any broken glass or sharps, use tong or dustpan and broom to remove by putting into sharps bin.

8.2.8 Cover spill with absorbent or tissue paper

8.2.9 Gently pour proper amount of disinfectant onto absorbent or tissue papers from outside to inside and allow disinfectant to act for 20 min.

8.2.10 Use tong to remove absorbent or tissue papers and put into red bag no. 2

8.2.11 Place the tongs on the disinfectant-soaked tissue paper

8.2.12 Repeat steps 8.2.8-8.2.10

8.2.13 Check the leakage of biological spill into the lower part of BSC, if the spill occur, repeat steps 8.2.8-8.2.10 to clean

8.2.14 Put tong into clear plastic zip bag and then place in the red bag no. 3

8.2.15 Take off the outer gloves and put into red bag no. 2

8.1.16 Take off the lab coat, head cap, goggles, and put into red bag no. 2

8. 2. 17 Remove goggle, place them in the clear zip bag, and then put the bag in the red bag No. 3

8.2.16 Ties all the bags and moves it to the waste area of the laboratory

8. 2. 18 Remove inner glove and mask, and then place the bag in the red bin of laboratory, respectively.

8.2.19 Wash hands with antiseptic soap or foam before leaving laboratory.

8.2.20 Complete the incident report form for unsafe biohazards resulting from processes or procedures related to the production, import, export, sale, transit, and possession of pathogens and animal toxins. Submit the completed form to CICM-IBC.

8.3 In case spill occurs inside a centrifuge.

In case spill occurs inside a centrifuge with aerosol-tight bucket or rotor.

8.3.1 Press stop button, brake is not recommended. If there is no leakage, allow the aerosol to settle in the cup, loosen the lid, and autoclave the aerosol-tight cup. If there is spill leakage inside the centrifuge chamber, close the centrifuge cup, rotor, or lid and continue with step 8.3.2. If you found the tube was broken when opened the lid, closed the lid immediately.

8.3.2 Inform or notice everyone to leave the room and close the door.

8.3.3 Turn on the BSC and leave the laboratory

8.3.4 Putting up a "Do Not Enter" sign in front of a laboratory

8.3.5 Inform operator or operation personnel

8.3.6 Waiting for 30 minutes to allow aerosols to settle

8.3.7 After 30 minutes, initiate the cleanup using the spill kit (located in the Anteroom or Front cabinet). At least two individuals should be designated as the first and second spill responder

8.3.8 Put on personal protective equipment (PPE, i.e. mask, goggle, head cap, lab coat, double gloves, and shoes cover in the stated order

8.3.9 Putting on the Biological spill sign in front of the laboratory

8.3.10 Prepare disinfectant, 1% sodium hypochlorite solution, by mixing 200 ml of 5% sodium hypochlorite with 800 ml of water in the bottle

8.3.11 Remove the rotor or safety cup or bucket, place into clear plastic zip bag and sterilized by autoclaving

8.3.12 After autoclaving, move the rotor/safety cup/safety bucket to the BSC. If there is any broken glass or sharps, use tong or dustpan and broom to remove by putting into sharps bin and place into red plastic bag No. 1.

8.3.13 Clean up the centrifuge part or chamber with disinfectant-soaked tissue paper and allow at least 20 min, then remove the soaked paper with tong, and put into red bag no. 2

8.3.14 Repeat step 8.3.13

8.3.15 Put tong into red bag no. 3

8.3.16 Both the first and second responders remove their outer gloves and place them in red bag No. 2.

8.3.17 Both the first and second responders remove their head cap, lab coat, and shoe covers into red bag no. 2

8.3.18 Both the first and second responders remove their goggles, place them in the clear zip bag, and then put the bag in the red bag No. 3

8.3.19 The first responder takes off inner gloves and mask and then place them into red bag no. 2

8.3.20 The second responder ties all the bags and moves it to the waste area of the laboratory.

8.3.21 The second responder removes the Biological spill sign and moves the spill kit box to the used spill kit area for cleaning and refilling

8. 3. 22 The second responder takes off inner gloves and mask and then puts them into the infectious waste bin of the laboratory, respectively.

8.3.23 Both the first and second responders wash their hands with antiseptic soap or foam before leaving the laboratory.

8.3.24 Complete the incident report form for unsafe biohazards resulting from processes or procedures related to the production, import, export, sale, transit, and possession of pathogens and animal toxins. Submit the completed form to CICM-IBC.

8.4 In case spill occurs inside the centrifuge with **non**-aerosol-tight bucket or rotor

8.4.1 Press stop button, brake is not recommended. If there is no leakage, allow the aerosol to settle in the cup, loosen the lid, and autoclave the aerosol-tight cup. If there is spill leakage inside the centrifuge chamber, close the centrifuge cup, rotor, or lid immediately and continue with step.

8.4.2 Inform or notice everyone to leave the room and close the door.

8.4.3 Turn on the BSC and leave the laboratory

8.4.4 Putting up a "Do Not Enter" sign in front of a laboratory

8.4.5 Inform operator or operation personnel

8.4.6 Waiting for 30 minutes to allow aerosols to settle

8.4.7 After 30 minutes, initiate the cleanup using the spill kit (located in the Anteroom or Front cabinet). At least two individuals should be designated as the first and second spill responder

8.4.8 Put on personal protective equipment (PPE, i.e. mask, goggle, head cap, lab coat, double gloves, and shoes cover in the stated order

8.4.9 Putting on the Biological spill sign in front of the laboratory

8.4.10 Prepare disinfectant, 1% sodium hypochlorite solution, by mixing 200 ml of 5% sodium hypochlorite with 800 ml of water in the bottle

8.4.11 Open centrifuge lid. If there is any broken glass or sharps, use tong or dustpan and broom to remove by putting into sharps bin.

8.4.12 Clean up the centrifuge part or chamber with disinfectant-soaked tissue paper and allow at least 20 min, then remove the soaked paper with tong, and put into red bag no. 1

8.4.13 Repeat step 8.4.12

8.4.14 Put tong into red bag no. 3

8.4.15 Both the first and second responders remove their outer gloves and place them in red bag No. 2.

8.4.16 Both the first and second responders remove their head cap, lab coat, and shoe covers into red bag no. 2

8.4.17 Both the first and second responders remove their goggles, place them in the clear zip bag, and then put the bag in the red bag No. 3

8.4.18 The first responder takes off inner gloves and mask and places them into red bag no. 2

8.4.19 The second responder ties all the bags and moves it to the waste area of the laboratory.

8.4.20 The second responder removes the Biological spill sign and moves the spill kit box to the used spill kit area for cleaning and refilling

8.4.21 The second responder takes off inner gloves and mask and then places them into the infectious waste bin of the laboratory, respectively.

8.4.22 Both the first and second responders wash their hands with antiseptic soap or foam before leaving the laboratory.

8.4.23 Complete the incident report form for unsafe biohazards resulting from processes or procedures related to the production, import, export, sale, transit, and possession of pathogens and animal toxins. Submit the completed form to CICM-IBC.

(For document control officers)

No	Edit No	Date	Editing details	Editing page	Editing by
1		21 DEC 21	Announcement		
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(Miss.Supawadee Kheowkae) (Assc.Prof.Veerachai Thitapakorn,Ph.D.)

Person responsible for document system control Head of research laboratory

Title:	**Responses to laboratory emergencies**					**Documents control**	Page: 1 / 13
						SOP-BCC	09 REV.2
Prepared by	Asst. Prof. Dr. Teva Phanaksri Asst. Prof. Dr. Anthicha Kunjantarachot	Reviewed by	Asst.Prof. Dr. Tullayakorn Plengsuriyakarn	Approved by	Prof. Dr. Adis Tasanarong	**Approved date**	2 January 2024

1. Objective

This document serves as a Standard Operating Procedure (SOP) and a guideline for responding to emergency that may occur in the Chulabhorn International College of Medicine (CICM) laboratory.

2. Scope

This guideline applies to all CICM personnel, including CICM-BCC and maintenance officers/laboratory user, and researcher, who will be conducted in the laboratory and maintenance at the CICM laboratory located on the 8th floor of the Co-operative Learning Center, Thammasat University, Rangsit Campus.

3. Principle

In compliance with the PATHOGENS AND ANIMAL TOXINS ACT, B.E. 2558 (2015), the Notification of the Ministry of Public Health on Characteristics of the place for production or possession of and operations on pathogens and animal toxins, B.E. 2561 (2018), and the Occupational Safety, Health, and Environment Act, B.E. 2554 (2011), the SOPs for responding to laboratory emergencies and accidents are mandatory. These SOPs must be provided to all individuals currently or intending to work in the laboratory. This measure is essential to ensure their safety and prevent potential laboratory-related harm to individuals, the public, and the environment.

4. Abbreviation and definitions

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

4.2 BSL1 refers to biosafety laboratory level 1.

4.3 BSL2 refers to biosafety laboratory level 2.

5. Responsible person(s)

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

5.2 Laboratory committee of Chulabhorn International College of Medicine, Thammasat University

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

5.4 Operators of Chulabhorn International College of Medicine, Thammasat University.

5.5 Research supporting Office, Chulabhorn International College of Medicine, Thammasat University.

5.6 Operation personnel of Chulabhorn International College of Medicine, Thammasat University.

5.7 Investigators, etc.

6. Related documents

None

7. Cited document(s)

7.1 PATHOGENS AND ANIMAL TOXINS ACT, B.E. 2558 (2015)

7.2 Notification of the Ministry of Public Health on Characteristics of the place for production or possession of and operations on pathogens and animal toxins, B.E. 2561 (2018) and

7.3 Occupational Safety, Health and Environment Act, B.E. 2554 (2011)

8. Operating procedures

8.1 General emergencies and accidents

In the event of an emergency and/or an accident that could result life-threatening injury or affecting laboratory space, follow these steps:

8.1.1 It is important for all involved parties to stay **CALM** and **COLLECTED** before proceeding further. Check if anyone (including yourself) is injured.

8.1.1.1 If there are **no or only mild injuries**, and everyone is conscious and mobile, move to a safer location and wait for help.

8.1.1.2 If someone sustains an **injury and is conscious but immobile**, they should inform their coworkers, bystanders, and/or operating personnel about the emergency/accident. Evaluate the severity of the situation. If the situation does not worsen, wait for help. Note that it is NOT recommended to move the injured person unless absolutely necessary.

8.1.1.3 If someone **loses consciousness or is unresponsive**, coworkers and bystanders should evaluate the situation and assess the injured person for basic signs of life. If it is essential to move the injured person to a safer location, do so, and then call for help, waiting for assistance. If the injured person is not breathing or has no pulse, call 1669 for emergency assistance and initiate cardiopulmonary resuscitation (CPR).

8.1.2 Notify and coordinate with the assigned emergency contact, and wait for help. Ensure that other laboratory occupants have been informed of the emergency/accident. Evacuate if needed. Notify the laboratory operator and operating personnel about the incident.

8.1.3 Fill out the CICM-BCC-FA-003 form and submit it to CICM-BCC.

8.1.4 CICM-BCC reports the incident to the Laboratory Committee and the Occupational Safety, Health, and Environment Committee of Chulabhorn International College of Medicine, Thammasat University.

8.2 Chemical accidents

CICM Biosafety Control Committee does not allow to use acids or alkalis in BSL2, including biological safety cabinet in accordance with the principle of elimination. Processing sample with acidic and/or alkali substances should be handled in the fume hood. In case of chemical spills during transportation, investigators have to handle as follows:

8.2.1 If a sufferer is responsive and movable.

8.2.1.1 If acid or alkali has splashed into the face and eyes

1) A sufferer immediately moves to the eye shower.
2) Open the eye shower cover. Water will be automatically flow out.
3) Wash the face or eye by allowing water to flow thought affected area. Do not use soap or any detergents.
4) In case of severe condition or doctor requirement, call the emergency number of Thammasat University, 02-926-9112
5) Inform the operator or operating personnel if possible, to assign the spill responder.
6) Handle for chemical spill response according to the chemical spill response using provided chemical spill kit in the cabinet at the front of the laboratory.
   6.1 Neutralize acidic substance by using sodium bicarbonate powder or
   6.2 Neutralize alkali substance by using citric/ascorbic acid
7) A coworker, eyewitness or laboratory personnel fills out an accidental report form (CICM-BCC-FA-003) to notify the CICM-BCC
8) CICM-BCC reports an incident to the Laboratory Committee and Occupational Safety, Health and Environment Committee of the CICM

8.2.1.2 If acid or alkali has splashed into the body.

1) A coworker or eyewitness wear nitrite gloves, chemical protective mask and safety glasses, respectively
2) Move the sufferer to the shower
3) Pull the eye shower pull rod, water will be automatically flowing.
4) Wash the affected area by flowing water. Do not rub or use soap or any detergents
5) In case of severe condition or a doctor requirement, call the emergency number of Thammasat University, 02-926-9112 to refer the sufferer.
6) Inform the operator or operating personnel of possible.
7) Handle for chemical spill response according to the chemical spill response using provided chemical spill kit in the cabinet at the front of the laboratory.
   7.1 Neutralize acidic substance by using sodium bicarbonate powder or
   7.2 Neutralize alkali substance by using citric/ascorbic acid
8) A coworker, eyewitness or laboratory personnel, who is informed the accidence, fills out an accidental report form (CICM-BCC-FA-003) to notify the CICM-BCC
9) CICM-BCC reports the accidence to the Laboratory Committee and Occupational Safety, Health and Environment Committee of the CICM

8.2.2 If a sufferer is unconscious or unmovable, coworker or eyewitness should handle as follows:

1) If a substance has harmful vapor, a coworker and eyewitness wear nitrite gloves, chemical protective mask and safety glasses, respectively
2) A coworker/eyewitness transports a portable eye shower to the sufferer.
3) Take sufferer's lab coat or gown off.
4) Wash by flowing water thought the affected body parts. Do not rub by using soap or any detergents.
5) In case of severe condition or a doctor requirement, call the emergency number of Thammasat University, 02-926-9112 to refer the sufferer.

6) Inform the operator or operating personnel.

7) Handle for chemical spill response according to the chemical spill response using provided chemical spill kit in the cabinet at the front of the laboratory.

7.1 Neutralize acidic substance by using sodium bicarbonate powder or

7.2 Neutralize alkali substance by using citric/ascorbic acid

8) A coworker, eyewitness or laboratory personnel, who is informed the accidence, fills out an accidental report form (CICM-BCC-FA-003) to notify the CICM-BCC

9) CICM-BCC reports the accidence to the Laboratory Committee and Occupational Safety, Health and Environment Committee of the CICM

8.3 Biological accidents

8.3.1 If a sufferer is conscious and movable.

8.3.1.1 If a biological substance has splashed onto the face and eyes

1) A sufferer immediately moves to the eye shower.

2) Wash the face or eye by allowing water to flow thought affected area. Do not use soap or any detergents.

3) In case of severe condition or a doctor requirement, call the emergency number of Thammasat University, 02-926-9112 to refer the sufferer to the hospital.

4) If mild condition, go to see the doctor at the Emergency Department, Thammasat Hospital for conditional evaluation and treatment.

5) Inform the operator or operating personnel if possible.

6) Handle for biological spills according to the biological spill response SOP (SOP-BCC 08). Biological spill kits are available in the cabinet at the front of the laboratory and in the cabinet in the ante-room.

7) A coworker, eyewitness or laboratory personnel, who is informed the accidence, fills out an accidental report form (CICM-BCC-FA-003) to notify the CICM-BCC

8) CICM-BCC reports the accidence to the Laboratory Committee and Occupational Safety, Health and Environment Committee of the CICM

8.3.1.2 If a biological substance has splashed into the body.

1) Take off the contaminated PPE.

2) Wear the gloves.

3) Decontaminate by using a 70-75% ethanol swipe on the contaminated area.

4) In case of severe condition or a doctor requirement, call the emergency number of Thammasat University, 02-926-9112 to refer the sufferer to the hospital.

5) If mild condition, go to see the doctor at the Emergency Department, Thammasat Hospital for conditional evaluation and treatment.

6) Inform the operator or operating personnel.

7) Handle for biological spills according to the biological spill response SOP (SOP-BCC 08). Biological spill kits are available in the cabinet at the front of the laboratory and in the cabinet in the ante-room.

8) A coworker, eyewitness or laboratory personnel, who is informed the accidence, fills out an accidental report form (CICM-BCC-FA-003) to notify the CICM-BCC.

9) CICM-BBC reports the accidence to the Laboratory Committee and Occupational Safety, Health and Environment Committee of the CICM.

8.3.2 If a sufferer is responsive but unmovable.

1) Call the emergency number of Thammasat University, 02-926-9112 to refer the sufferer to the hospital.

2) While waiting for the doctor, a coworker or eyewitness wear the PPE and take off sufferer’s contaminated PPE (If possible).

3) Decontaminate by using 70-75% Ethanol on the contaminated area

4) Inform the operator or operating personnel.

5) Handle for biological spills according to the biological spill response SOP (SOP-BCC 08). Biological spill kits are available in the cabinet at the front of the laboratory and in the cabinet in the ante-room.

6) A coworker, eyewitness or laboratory personnel, who is informed the accidence, fills out an accidental report form (CICM-BCC-FA-003) to notify the CICM-BCC.

8) CICM-BCC reports the accidence to the Laboratory Committee and Occupational Safety, Health and Environment Committee of the CICM.

8.4 Laboratory accidents

In addition to chemical or biological spills (sections 8.2 and 8.3) and electrical shock (section 8.5), common accidents such as slips and falls, cuts and scrapes from sharp objects, burns, inhalation of toxic fumes, etc. could readily happen while working in the laboratory. If occurs, follow these steps:

8.4.1 Stay **CALM** and **COLLECTED** before proceeding further. Check the surroundings for possible hazards and carefully evaluate the situation for any potential harm or injury that could come after the incident.

8.4.2 Check if anyone (including yourself) is injured.

8.4.2.1 In case there is **no or mild injury** occurring, everyone is conscious and mobile, proceed as follows:

1) A person who is involved in an accident should inform coworkers or bystanders about the incident and then move to a safer area and wait for help.
2) If there is a chemical or biological spill, follow the guidelines in section 8.2 for chemical accidents and section 8.3 for biological incidents before moving.
3) Give first aid care to the injured person (first aid kit is stored in the cabinet near the entrance).

4) Inform other laboratory occupants about the incident.
5) If the injury becomes more severe or the injured person should be medically assessed, contact the emergency department of TU hospital at 02-926-9112.
6) Notify laboratory operator and operating personnel about the incident.
7) Fill out the CICM-BCC-FA-003 form and submit it to CICM-BCC.
8) CICM-BCC reports the incident to Laboratory committee and Occupational Safety, Health and Environment committee of Chulabhorn International College of Medicine, Thammasat University.

8.4.2.2 In case someone **sustains an injury and is conscious but immobile**,

1) A person who is involved in an accident should inform coworkers or bystanders about the incident and then move to a safer area and wait for help.
2) DO NOT move the injured person unless it is absolutely necessary.
3) Call 02-926-9112 (the emergency department of TU hospital) for medical assistance.
4) If there is a chemical or biological spill, follow the guidelines in section 8.2 for chemical accidents and section 8.3 for biological incidents before moving the injured person to a safer location.
5) While waiting for help, give first aid care to the injured person (first aid kit is stored in the cabinet near the entrance).
6) Inform other laboratory occupants about the incident.
7) Notify laboratory operator and operating personnel about the incident.
8) Fill out the CICM-BCC-FA-003 form and submit it to CICM-BCC.

9) CICM-BCC reports the incident to Laboratory committee and Occupational Safety, Health and Environment committee of Chulabhorn International College of Medicine, Thammasat University.

8.4.2.3 In case someone **loses consciousness or is unresponsive**,

1) A person who is involved in an accident should inform coworkers or bystanders about the incident and then move to a safer area and wait for help.
2) DO NOT move the injured person unless it is absolutely necessary. If need be, do so with extreme care. Call 1669 or 02-926-9112 (the emergency department of TU hospital) for medical assistance. Check the injured person for vital signs. If the person is not breathing or has no pulse, start CPR.
3) Check if there is a chemical or biological spill.
4) If there is NO spill, wait for help.
5) If a spill is present, follow the guidelines in section 8.2 for chemical accidents and section 8.3 for biological incidents before moving the injured person to a safer location/while waiting for help.
6) Inform other laboratory occupants about the incident.
7) Notify laboratory operator and operating personnel about the incident.
8) Fill out the CICM-BCC-FA-003 form and submit it to CICM-BCC.
9) CICM-BCC reports the incident to Laboratory committee and Occupational Safety, Health and Environment committee of Chulabhorn International College of Medicine, Thammasat University.

8.5 Electrical accidents

Electrical accidents that could take place in the laboratory include electrical burns/arc blast, electrical short circuit, electric shock. If occurs, follow these steps:

8.5.1 DO NOT attempt to touch or contact the injured person until you are certain the electrical source is fully turned off.

8.5.2 Cut the electrical supply by flipping the lever of main circuit breaker to OFF position. The electrical service panel for BSL2 is located in the ante-room.

8.5.3 If it is not possible to cut off the power source, DO NOT under any circumstance try to unplug the equipment or touch the built-in switch of said equipment. Use a dry, non-conducting object made of cardboard, plastic, or wood to separate the power source, e.g., electrical cord, away from you and the injured person. Or use a dry cloth or robe to pull the injured person out of the power source. Make sure to wear latex gloves and shoes before taking such action. It is NOT recommended to move the injured person unless it is absolutely necessary. If need be, carefully move the injured person away from the scene.

8.5.4 Assess vital signs of the injured person. Also, check for a chemical or biological spill.

8.5.5 If the injured person is not breathing or has no pulse, call 1669 or 02-926-9112 (the emergency department of TU hospital) for medical assistance and start CPR.

8.5.6 If the injured person is conscious and responsive, call 02-926-9112 (the emergency department of TU hospital) for medical assistance.

8.5.7.1 If there is NO spill, give first aid care to the injured person and wait for help.

8.5.7.2 If a spill is present, follow the guidelines in section 8.2 for chemical accidents and section 8.3 for biological incidents while waiting for help.

8.5.7 Inform other laboratory occupants about the incident.

8.5.8 Notify laboratory operator and operating personnel about the incident.

8.5.9 Fill out the CICM-BCC-FA-003 form and submit it to CICM-BCC.

8.5.10 CICM-BCC reports the incident to Laboratory committee and Occupational Safety, Health and Environment committee of Chulabhorn International College of Medicine, Thammasat University.

8.6 Fire accidents

8.6.1 If your clothes catch fire, promptly act as follows:

8.6.1.1 Do **"STOP-COVER-DROP-ROLL"**. Stop moving. It is very important not to panic and run. Running fans the flames and increases the fire. Cover your face with your hands to protect the delicate eyes and skin on the face and to protect airways from the smoke. Drop to the ground immediately and Roll backwards and forwards on the flame to smother the fire. Or use laboratory safety shower to put out the fire.

8.6.2 Laboratory fire

8.6.2.1 Small fire

1) All involved persons stay **CALM** and **COLLECTED**, evaluate the situation and surroundings, check if anyone (including yourself) is injured or gets fire burns.
2) Inform other laboratory occupants about the fire and have them evacuate from the scene.
3) Put out the fire using laboratory fire extinguishers, aiming at the base of fire.
4) If not succeed and the fire starts to get bigger, evacuate from the scene by following the emergency exit route and the fire escape plan.
5) When you are safe, notify the University's security and traffic office about the incident at 02-564-4407.

6) If you or someone else needs medical assistance, call 1669 or 02-926-9112 (the emergency department of TU hospital).

8.6.2.2 Large, raging fire

1) All involved persons stay **CALM** and **COLLECTED**, evaluate the situation and surroundings, check if anyone (including yourself) is injured or gets fire burns.
2) If possible, close the doors and windows of the room/space that is caught on fire and leave immediately. Make sure there is no one left in that room.
3) Trigger the fire alarm located near the fire exit or shout repeatedly “FIRE” to warn other laboratory occupants and have them evacuate from the scene by following the emergency exit route and the fire escape plan.
4) If possible, before leaving the laboratory, cut all electrical supplies by turning off the main circuit breaker.
5) During the escape, if you must go out into the smoke and don't have a proper mask, use a damp cloth to cover your nose and mouth and stay low to avoid smoke inhalation.
6) When you are safe, notify the University’s security and traffic office about the incident at 02-564-4407.
7) If you or someone else needs medical assistance, call 1669 or 02-926-9112 (the emergency department of TU hospital).