Fu Jen Catholic University Department of Food Science Laboratory Safety Rules

2024/8/1

sign :

Fu Jen Catholic University

Department of Food Science

Laboratory Safety Rules

I. <u>Basic Rules</u>

1. All graduate students, thesis students, and full- and part-time research assistants new to the laboratory must undergo safety training as well as participate in safety drills to properly operate the safety sling and emergency cabinet.

Researchers conducting an experiment involving an animal or human subject must first obtain an authorization permit. (Please note that the University only provides training for experiments involving animals; please arrange training off-campus if you will be performing research on a human subject. You may refer to https://www.citiprogram.org/).

- 2. Familiarize yourself with the laboratory environment and the locations of safety equipment, such as emergency showers, emergency eye-wash stations, fire extinguishers, first aid kits, and safety ladders. Report an incident to the laboratory supervisor immediately. Ensure that you are familiar with all emergency response measures and how to operate safety equipment.
- 3. It is prohibited to smoke, eat, drink, apply makeup, or fool around in a laboratory. Do not place food or drinks in refrigerators or storage areas which contain chemicals or reagents. Do not put book bags, books, clothing, jackets, or other items on work surfaces.
- 4. Wear a laboratory coat and safety glasses/goggles when in a laboratory. Anyone with long hair is advised to wear a hair net/cap or tie their hair up in back. Minimize the risk that hair could become contaminated or catch fire.
- 5. Do not remove instruments, materials, or chemicals from the laboratory. Please use instruments with care. Keep the work area tidy at all times and clean and wipe it down after an experiment. Clean up spilled chemicals or reagents immediately.

6. The last person to leave the laboratory should turn off the air conditioner and lights. Remember to wash your hands before leaving.

II. Experiments with Common Chemicals

- 1. Before using a chemical, carefully inspect the label, warnings, and check the Material Safety Data Sheet (MSDS), Globally Harmonized System of Classification and Labeling of Chemicals (GHS), or the Merck Index. Determine whether the chemical poses a risk to human health. Return the chemical to its original place after use.
- 2. Clearly label a recently prepared reagent. The following details must be written on the label: contents, concentration, warnings, and date of preparation. Minimize the risk of contamination do not pour unused reagent back into the original container.
- 3. Wear gloves when using a volatile, corrosive, or toxic solvent (e.g., methanol, acetone, acetic acid, chloroform, hydrochloric acid, sulfuric acid, β-mercaptoethanol, formaldehyde, phenol, etc.). Measure and prepare the solvent in the fume hood and then cover the solvent with a lid immediately. If a reagent is accidentally spilled, clean it up immediately. Wear gloves and a surgical mask when retrieving poisonous or carcinogenic substances such as acrylamide (a neurotoxin), ethidium bromide (a mutagen), and SDS (a dust). Make sure that other areas do not become contaminated. Make frequent hand washing a regular habit after removing gloves.
- 4. If you come in contact with bacteria or a pathogen, sterilize the affected body part immediately. Dispose of all contaminated objects or sterilize them with an antibacterial agent. Collect objects which will be sterilized in the autoclave and place them in the designated receptacle. Do not dump solid culture media or agar down a drain or into a sewer.
- 5. When preparing an acid or base reagent, always add the acid or base slowly into water. Never add water to a reagent since this could cause a spill and severe burns.
- 6. Dispose of used chemicals and reagents in accordance with regulations. Do not dump them down the drain or put them in the regular garbage. (Please refer to Fu Jen Catholic University

Laboratory Waste Disposal Flow Chart.)

III. Experiments with Restricted Chemicals

- 1. Store toxic chemical substances in a locked chemical safety cabinet. The laboratory supervisor safeguards the key to the chemical safety cabinet.
- 2. Before retrieving a toxic chemical substance, first make a record in the log book and sign your name.
- 3. Store and dispose of toxic and hazardous waste in accordance with regulations. The use of toxic and hazardous substances must be recorded and routinely reported.

IV. Instruments

- 1. Instruments must be booked in advance. Follow instructions when using an instrument.
- 2. Be familiar with the functions and accessories of an instrument prior to using it. It is strictly prohibited to dismantle an instrument or its components and accessories. Do not make adjustments to the instrument without permission. Pay attention to the proper voltage (i.e., 110V or 220V) and do not operate an instrument with wet hands.
- 3. Centrifuge tubes must be arranged symmetrically and with weight equally distributed. Make sure the rotor is secure. When operating the refrigerated centrifuge, make sure the lid is tight to keep the temperature low and prevent the formation of frost.
- 4. Make sure you are familiar with how to operate a microwave, autoclave, electromagnetic plate, or dry bath in advance prevent explosions and burn injuries.
- 5. Keep alcohol solvents and flammable materials (e.g., methanol, ethanol, ether, gas) inside the laminar flow cabinet away from flames or fire sources. If there is a fire, remain calm and handle the situation. If alcohol or ether catches fire, use foamite or a wet towel to cover it; do not use water.
- 6. A liquid culture of bacteria must be disposed of properly even if it does not contain a pathogen, since the culture may contain drugresistant properties. Dispose of it only after high pressure

sterilization (e.g., autoclave). If you get splashed by bacteria during an experiment, wash the affected body part with water and then wipe it with a 75% alcohol solution. If bacteria spill onto the floor or work surface, wipe the area with a 10% bleach solution.

V. <u>Safety Management</u>

- 1. Smoking is strictly prohibited in and around laboratories.
- 2. Every laboratory must have an MSDS Sheet for all chemicals used inside. Read the MSDS before using a chemical.
- 3. Many chemicals are incompatible other chemicals. If mixed together, they may produce heat, hazardous gas, a strong reaction, ignite or explode. Please refer to Occupational safety and health administration, Ministry of Labor (http://psm.osha.gov.tw/hwripsm/public/chemicals.action.)
- 4. Know where the nearest fire extinguisher, eye-wash station, emergency shower, and first aid kit are located. Know how to use all safety equipment.
- 5. All laboratories contain pressurized dry chemical fire extinguishers which may be used on the following types of fire: Class A (general combustibles, paper), Class B (flammable liquids), and Class C (electrical fires).
- 6. Maintain proper air flow and ventilation in laboratories at all times.
- 7. All containers and bottles containing chemicals must be clearly labeled. Empty containers must also be clearly labeled. Clearly label a recently prepared reagent. The following details must be written on the label: contents, concentration, warnings, date of preparation, and the name of the person who prepared it.
- 8. Clearly mark a solution you have prepared yourself. To avoid contamination, do not pour any unused substance back into its original container.
- 9. Alkali metals (e.g., sodium [Na], potassium [K]) and yellow phosphorous react with water. They can ignite, explode, and produce severe burns upon making skin contact. Alkali metals must be stored under oil. Alkali metals are soft place an alkali metal on paper towel and cut it with a knife. Place an alkali metal in alcohol to destroy it. When necessary, freeze it. Receptacles used to store alkali metals cannot be disposed of as regular garbage. Do not wash

these receptacles with water even after empty because there may still be residue inside.

- 10.Store flammable liquids in a certified storage cabinet. When using highly flammable liquids (e.g., acetone, ether), ensure that all nearby flames and heat sources have been extinguished.
- 11.Do not use mercury in a carpeted area. If mercury leaks out, vacuum it up (with an aspirator bottle or similar instrument) and do your best to clean the area.
- 12.Neutralize leaked acid by sprinkling sodium bicarbonate onto it and then wash the area with water. If a strong acid leaks, first clean it with water and then with a diluted acetic acid.
- 13.Clean up leaked flammable solvents immediately.
- 14.Set up a warning sign when performing a risky experiment or when handling hazardous chemicals.
- 15. Chemical shelves and other storage units must be stable and secure to prevent potential accidents caused by earthquakes.
- 16.All emergency equipment must be routinely inspected (at least once per month).
- 17.When performing target and routine inspections of laboratory facilities, the categories and forms must be based on Fu Jen Catholic University Laboratory Health and Safety Routine Inspection Forms.

VI. Violations and Liability for Damaged Equipment

- 1. A first-time violation will result in a warning. A second violation will result in loss of authorization to use the instrument for a period of two weeks. A third violation will result in suspension from the laboratory.
- 2. The operator of an instrument will be held financially responsible for any damages caused by misuse or negligence.

VII. Other Regulations

1. Safe use of electrical equipment: please refer to Article 15 of Workplace Health and Safety Rules.

- 2. Safe transportation and storage of high-pressure gas cylinders: please refer to Chapter 4: Health and Safety Standards of the Workplace Health and Safety Rules.
- 3. Prevention of mechanical accidents: please refer to Chapter 4: Health and Safety Standards of the Workplace Health and Safety Rules.