

Safety Manual



School of Biological Sciences

National Institute of Science Education and Research (NISER), Bhubaneswar
February 2013

Compiled by
Biological Sciences Safety Committee

PREFACE

This manual supplements the National Institute of Science Education and Research (NISER), Bhubaneswar, safety guidelines. The following sections are meant to provide general laboratory safety procedures in the School of Biological Sciences (SBS). Each laboratory has its unique environment, and lab-specific hazards must be addressed by each principal investigator. It is each laboratory professional's duty to conduct their work in a responsible manner, and to take all necessary precautions to protect themselves and others in the area from exposures to hazardous materials. Thus it is very important that all PIs/students/staff members of SBS read, understand and follow the guidelines mentioned in this handbook before planning and carrying out laboratory experiments.

You are required to sign and return the declaration issued with this manual to the scientific officer stating that you have read it and will follow the SBS safety guidelines. If you do not understand any part of this handbook then you must ask your supervisor or the SBS safety regulation committee members for help.

IN CASE OF ACCIDENT

It is always wise to follow all lab safety rules. In spite of precautions, some equipment and chemicals in a biology laboratory can cause serious harm. Apply your common sense and do the following in case of accident.

- **Report Exposure Incident ASAP:** Do not panic. Notify Principal Investigator to initiate accident or exposure incident report. Seek medical assistance immediately
- **Needle puncture/ cut wounds:** Wash the affected area with antiseptic soap and warm water for 15 min
- **Mucus membrane exposure:** Flush the affected area with water for 15 minutes
- **Eye exposure:** Wash eyes with plenty of water until you feel better

- **Common Hazard Symbols**



Biohazard



Ionizing Radiation



*Ionizing
Radiation*



Nonionizing Radiation



Mutagen



Carcinogen



Flammable



Oxidizing



*Harmful or
Irritant*



Corrosive



Dangerous to the environment



Explosive

Know more on hazard symbols from http://en.wikipedia.org/wiki/Hazard_symbol

GENERAL SAFETY AND PERSONAL PROTECTIVE MEASURES

DO ALWAYS

- **wear personal protective equipment (PPE) such as a full sleeve lab coat, covered shoes and gloves while working in the lab.** Use protective eyewear when required (handling chemicals or heating a reagent). Confine long hairs and loose clothing
- **locate safety equipment** in the labs and building (telephones, eye-washers, showers, fire extinguishers, first aid boxes). Know all the emergency exits too
- **read MSDS before handling reagents** and know hazard symbols (as shown in the previous section) by heart
- open reagents in a fume hood which are known to give off harmful vapours or are toxic for inhalation
- **immediately report to electric section if you notice loose electrical connections.** Do not touch electrical equipment with wet hands
- **radioactive materials should be handled in presence of a trained personnel and with proper precautions**
- **know experimental protocol and reagents well ahead of time** as this will help you to understand what you will have to do and will keep you informed about any potential harmful reagent or procedure . Remain careful and alert
- **label properly any reagent that you handle/prepare.** Otherwise, others may have to suffer. Unlabeled reagents must be thrown away
- **keep your work bench/work space neat and tidy.** This will help to quickly clean up any spillage. Clean your work space and wash your hands before leaving lab
- **enter your name and time of use in log book before using an equipment and after using it.** Note down if you have noticed anything wrong as that helps in avoiding mishaps and report it
- **dispose sharp objects, biohazardous materials and toxic chemicals in proper receptacles and bins**

If you are not sure about any chemical, reagent or sample, treat that as potential hazardous material and use PPE. Always use your common sense as that can save you and others from major accidents

DON'T EVER

- wear lab coat and gloves in public places
- touch doors or refrigerator handles with gloved hands (wear gloves only at the time of experiments)
- use contact lenses in the lab as that may lead to serious eye injury (common chemicals such as ethanol, isopropanol react with contact lenses) and cause eye infection
- eat or drink in the lab
- store food/drinks inside lab refrigerators
- taste or smell chemicals or substances
- use your mouth for pipetting (use pipette aids)
- handle broken glass with bare hands

- pour hazardous chemicals down the drain
- hoard flammable solvents in large quantity inside lab
- operate lab equipment without permission
- run experiments unattended (in case you have to leave the lab there must be a note with following points written on it- your name, experiment being done and contact numbers of you and your PI)
- perform experiments after working hours/overnight without permission
- work alone in the lab (there must be at least one person (your PI or a friend) informed/present there)
- leave any heated material unattended
- place flammable substances near heat

LABORATORY WASTE BINS/ RECEPTACLES

- **Sharp objects, biohazardous materials and toxic chemicals must be disposed of in proper containers.** We have specific bins installed in all labs
- **Containers must be clearly labelled** with details of contents and the name of the person transferring the waste
- **Containers designed for solids must not be used for liquids and vice versa**
- **Containers must not be overfilled.** Bins must not be full beyond 3/4th of their volumes

BIOSAFETY LEVEL

Know biosafety level of the microorganism that you handle and take necessary precautions. NISER is equipped with biosafety level 2 (BSL2) hoods and experiments involving BSL2 agents must be done only there.

BIOHAZARDOUS WASTE & AUTOCLAVING

Biohazardous wastes are generated from work with infectious agents, non-human primate or human-derived materials. Examples include culture plates and stocks of microorganisms, human blood, body fluids, tissues (unfixed), human tissue cultures (unfixed) and other infectious wastes that may cause disease.

Decontaminate biohazardous or infectious material is by steam sterilization (autoclaving). **Specific requirements of cycle time and temperature must be met and log book entry must be done** while autoclaving.

Solid biohazardous waste must be autoclaved in sealed (with air exchange opening) clear autoclave bags in upright position and then disposed of as regular trash.

Contaminated tissue culture plastic waste such as plastic pipette tips, serological pipettes, and disposable labware other than sharps must be disposed in biohazard waste bins. Plastic wares used to handle patient samples or pathogens known to cause human disease must be autoclaved in sealed bags before putting them back in regular biohazard waste bins

SHARPS

Sharp objects such as needles, scalpels and lancets (or any agent that can puncture skin) must always be placed in **red plastic sharps containers**. **Glass Pasteur pipettes, capillary tubes, slides and coverslips and any agent that are likely to break resulting in sharp end, can be disposed in sharp waste containers.**

Broken glasses, if not contaminated, can be thrown in any ordinary cardboard box, lined with a regular plastic waste bag. Once full, the bag top should be sealed and the box should be labelled as waste laboratory glassware.

ANIMAL CARCASSES

Carcasses, tissues, body parts, blood or other animal body fluids that are intentionally infected with pathogens, inoculated with human derived tissues, fluids or cell lines, or euthanized animals previously held at BSL-2 containment or higher must be put in red plastic bags and sealed before transfer to the designated storage area located in the vivarium cold room or freezer. Non-infected animal body parts, blood and gauze, cotton etc. visibly contaminated with animal blood must be put in black plastic bags and stored in the vivarium cold room or freezer.

ANIMAL BEDDING AND CAGES

Cages used for animals that were infected with pathogens, inoculated with human-derived materials or otherwise considered BSL-2 agents, must be autoclaved before bedding disposal and cage cleaning.