

OCCUPATIONAL HEALTH AND SAFETY IN RESEARCH AND STUDENT LABORATORIES



This document is a summary of the complete file which can be consulted on-line

<http://prevencio.uib.cat/>

**Health and Safety Service of the
University of the Balearic Islands**

GENERAL HEALTH AND SAFETY RULES

- Make sure you use properly anything you use during your work (machines, tools, substances, etc.).
- Immediately tell your superior and the Health and Safety Service of the hazards you detect at work, as well as any accidents or incidents that may occur.
- Keep an eye on health and safety in the workplace, as well as on any third parties your activities actions or omissions may affect.
- In general stick to the occupational health and safety regulations and the directives of the UIB and the Health and Safety Service in terms of prevention.
- Wash your hands before leaving the laboratory and whenever you come into contact with chemical products or biological materials.
- Do not smoke, drink or eat in the laboratory.
- Do not wear shorts, sandals, miniskirts or tights in the laboratory. You must always wear closed shoes, your white coat must be fastened and your hair tied back. Never leave the building with your white coat on. Do not take laboratory clothing home. You may use the UIB white coat laundry service.
- Never pipette by mouth. Use a manual or automatic pipette bulb or syringe.
- Never use laboratory recipients or fridges to hold drinks or food, or keep chemical products in recipients for foodstuffs (water bottles, etc.).
- Work inside the fume cupboard when handling chemical products, especially if they are volatile, toxic powder, reactions that produce fumes and gases, etc.
- Use appropriate personal protective equipment (gloves, goggles, masks, etc.).
- Keep the laboratory tidy. You must clean your work area daily without leaving personal objects on the laboratory benches. Keep them in the offices or cupboards.
- Pick up and clean up immediately all liquid, chemical product or biological sample spills, no matter how small they are.
- To access high places, use hand ladders. Never climb on top of a chair, bench or any other unstable object.
- On finishing work and before leaving the laboratory, check that no machine or equipment has been left on (baths, gas, lights, etc.).
- In order to know the risks of each chemical product, consult their chemical safety data sheet. Pay special attention to carcinogens, mutagens and teratogens. You will find specific procedure for handling these products at the following address:

<http://prevencio.uib.cat/Especialitats/Riscs-als-laboratoris/>

RISK ASSESSMENT

You must include all necessary health and safety measures in your experiments:

- Identify the possible dangers for each experiment, by consulting the safety data sheets for all products to be used, by reviewing the experiment with your supervisor or another experienced person or by consulting the Health and Safety Service.

















- Once you know the risks, apply the appropriate prevention measures: work inside the fume cupboard, use personal protective equipment, etc.
- Be prepared to take action in case of a possible accident or emergency: locate the appropriate material to pick up any spills or waste, emergency showers and eyewash, extinguishers, exits, list of emergency telephone numbers, etc.





SIGNS

In order to guarantee everyone's safety (colleagues, cleaning staff, laboratory technicians, maintenance, external staff, etc.):

- Label all recipients and dilutions of chemical products, indicating the concentration and hazard pictograms that appear on the original bottle.
- Indicate hazardous areas (where dangerous materials are used) as well as contaminated material and appliances.
- Put up a very visible sign to warn of danger, indicating the corresponding preventive measures.

Updated safety labels

HEALTH EFFECTS				PHYSICAL-CHEMICAL				ENVIRON MENTAL
								
Toxic (T) Very toxic (T+)	Harmful (Xn) Irritant (Xi)	Corrosive (C)		Flammable (F, F+)	Oxidizing (O)	Explosive (E)		Hazardous to the environment
								
Toxic hazard	Carcinogen Mutagen Teratogen Sensitizer Specific toxins	Noxious and irritating	Corrosive	Flammable	Oxidizing	Explosive	Compressed gas	Hazardous to the environment

			
Radioactive	Biohazard	Laser hazard	Danger of suffocation

HANDLING LOADS

- Never lift loads over 25 kg. If necessary, ask for help or use a hand truck.
- Never carry loads with two hands when going up or down stairs.
- To lift a load correctly, bend your knees and push up using your legs, keeping your back straight

at all times. Avoid twisting.

- Transport chemical products using a hand truck or trays with handles, never use your hands.



PERSONAL PROTECTIVE EQUIPMENT (PPE)

By legislation, PPE must be used when necessary:



Eye and face protection:

- Safety goggles must provide lateral protection and must be worn when working with chemical products, radioactive substances, microorganisms, ultraviolet light or laser. They must also be used when working with appliances that can produce projections (vacuum, cut, etc.).
- Do not use contact lenses in the laboratory, as it is very difficult to take them out if a chemical substance comes into contact with your eye. Use safety goggles on top of your prescription glasses.

Hand protection:

- Use gloves that are appropriate for each type of chemical product. You may consult a compatibility table for gloves and products at [this website](#).
- Never touch other objects with gloves (doors, telephones, etc.) so as not to contaminate them.

Hearing protection: compulsory on exposure to noise levels higher than 90 dB a day. Recommended for working with noisy equipment, and whenever possible they should be kept on premises separate from the workplace.

Respiratory protection: when you cannot handle chemical products in fume cupboards, they should be handled in well-ventilated separate rooms using respiratory protection.

Protective clothing: in the laboratory, you must **ALWAYS** wear a long-sleeved laboratory coat that reaches below your knees.

Foot protection: use closed non-slip footwear that completely covers your feet. In the laboratory, never wear open shoes, sandals, or high-heeled shoes.

UNATTENDED OPERATIONS

- Do not leave appliances on overnight or at the weekend if not absolutely necessary. In recent years there have been several fires in different UIB laboratories caused by machines that were left on unattended.

- Operations with unstable, flammable or very toxic substances must not be left unattended.
- If you leave experiments unattended, place a note by the appliance indicating the substances used, your name, and telephone number so that you can be located in case of emergency.
- Avoid working in the laboratory alone, especially outside normal work hours and if you are conducting high risk operations. Remember you will need help if you hurt yourself or get intoxicated.
- Write your name down in the concierge registration book if you are working outside normal hours (in case of emergency all the staff in the building must be accounted for).
- The main researcher is responsible for determining whether you can work alone in the laboratory.

STORAGE AND TRANSPORT OF CHEMICAL PRODUCTS

- The storage room must be well-ventilated, marked, clean and tidy and must be reviewed regularly to avoid storage of excessive or unnecessary material. Only essential products must be stored in the laboratory.
- Keep chemical products on a tray to control possible spills.
- Use the chemical safety cupboards.
- Separate chemical products according to danger and incompatibility characteristics.

BIOHAZARD

Handling microorganisms, cell cultures and biological materials can cause infectious diseases. You must know the biological agents that may be in the sample and take precise precautions (in case of doubt, you should take safety precautions).

Prevention measures: abide by the aforementioned general rules of health and safety, and:

- Avoid aerosol formation (during pipetting, centrifugation, inhalation, etc.).
- Avoid the use of needles, glass, capillary tubes and sharp objects. If you must use them, do so with extreme caution and place them in the corresponding waste containers.
- Before throwing away contaminated liquid cultures add 1 % bleach and allow to act for 20 minutes. Contaminated solids must be sterilized in autoclave or put in the black containers.

RADIOACTIVITY

- You must know the properties of the radioisotopes you are using.
- Reduce exposure time as much as possible to the minimum time necessary.
- Use personal protection equipment (screen, lab coat, impermeable gloves, safety goggles, closed footwear) and **always** carry a dosimeter.
- Once your work is finished, check for contamination of surfaces, appliances and clothing with the appropriate detector.
- Place all residues, including gloves, inside the appropriate residue container.
- In case of doubt or accident, contact the UIB supervisor of radioactive facilities: Trinidad García Barceló, Scientific Technical Service. Extension 9500.

WASTE

- Keep the production of waste at source to a minimum, by reducing the quantity of product you use, and consider reuse, recovery or neutralization of the waste.
- Use the approved, dully labelled, chemical waste containers. All laboratory staff must know each type of container and use them appropriately.
- Never pour dangerous chemical waste down the drain or in the rubbish. In case of doubt, consult the Health and Safety Service.

ACTION IN CASE OF EMERGENCY

Locate, and keep handy, the following protection measures:

- Emergency showers and eye showers.
- Fireproof blanket (to put out small fires or protect someone who is injured).
- Material for chemical spills (vermiculite and neutralizers).
- First aid kit.
- Fire safety equipment (alarms, emergency buttons and ABC powder extinguishers (for solid, liquid and gas) and CO₂ (for fires at risk of electrical fire).



SHOULD YOU DETECT AN EMERGENCY (fire, smoke, smell of gas, etc.):

Warn concierges (personally, by telephone or by breaking an MCP fire alarm). Outside normal working hours, break the MCP fire alarm (alarms will be activated) and call 112.

SHOULD YOU HEAR THE ALARMS IN THE BUILDING:

- 1º Turn off all machinery and equipment (gas, etc.).
- 2º Close doors and evacuate the building. Never use the lift or turn back.
- 3º Do not enter the building until allowed to. Never use your own vehicle so as not to get in the way of the arrival of the fire brigade and ambulances.

REMEMBER . . .

- You must inform your superior and the Health and Safety Service of any accident or incident.
- In case of accident go to the Medical Service, even in case of minor injuries.
- Do not block access to escape routes, emergency showers, eye showers, extinguishers or any other fire-fighting means.
- Place the list of names and emergency telephone numbers in a visible place (people in charge of the laboratory, concierge, Medical Service, Health and Safety Service, **112**, etc.).
- Take part in all the activities promoted by the Health and Safety Service: Training courses on emergencies, practice with the fire brigade, drills, etc.

WORKING SAFELY IS EVERYONES'S RESPONSIBILITY, FROM MAIN RESEARCHERS TO INTERNS AND LABORATORY TECHNICIANS. EVERYONE'S PARTICIPATION IS ESSENTIAL TO ACHIEVE A GOOD LEVEL OF HEALTH AND SAFETY.