

BASIC GUIDE TO LABORATORY HEALTH AND SAFETY



November 2017

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Basic Guide to Health & Safety



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Thanks to Catherine Mark for her great work in the translation of this document

1 INTRODUCTION

This guide is a **welcome document** for new personnel who undertake activity in the laboratories of the Centro Nacional de Biotecnología (CNB-CSIC). It provides a simple summary of the basic health and safety standards to be followed in the laboratory.

Complete detailed information on chemical and biological safety and radiological protection is provided in the **CNB Laboratory Health and Safety Manual**.

All CNB personnel are required to know and **comply with the regulations indicated in this guide** and in the more comprehensive manual. **All personnel receive an updated copy of the guide.** Both this guide and the manual can also be consulted on the CNB website, in the Biosafety Service section:

<http://www.cnb.csic.es/index.php/es/investigacion/servicios-cientificos/proteccion-radiologica-y-bioseguridad>

Both this guide and the manual are updated periodically based on the types of hazardous agents found in the CNB, and on regulatory changes as well as technical developments in radiological protection and biological and chemical safety.

Fernando Usera Mena
Head, CNB Biosafety Service

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2 GENERAL INFORMATION

It is very important that all CNB personnel know:

- ➡ **The location and use of safety devices:** emergency showers and eyebaths, alarm buttons, emergency telephones, fire extinguishers, etc.
- ➡ **General safety rules** for the handling of materials and equipment
- ➡ The availability of the online **CNB Laboratory Health & Safety Manual**
- ➡ This guide, the comprehensive manual, and other technical documents regarding health and safety are available in the **Biosafety Service section** of the **CNB website**
<http://www.cnb.csic.es/index.php/es/investigacion/servicios-cientificos/proteccion-radiologica-y-biosecuridad>

➡ The **functions of the Biosafety Service** are as follows:

- Conducting biological, chemical and radiological **risk assessment**
- Editing **radiological protection and biological and chemical safety standards**
- Providing **training and information** on health and safety for **personnel exposed to hazards**
- **Direct management and control** of the Radioactive Facility (IR; Lab 350) and the Biosafety Level 3 Laboratory (NCB3; Lab 150)
- **Assuring compliance** with health and safety standards in the laboratories
- Collaboration in **medical surveillance and dosimetry** of exposed personnel
- **Response to incidents, accidents and emergency situations**
- **Internal management of hazardous waste:** toxic, biological and radioactive

➡ The **Biosafety Committee** is comprised of a representative from each department, technical personnel responsible for those services that incorporate a biological containment area, and the head of the Biosafety Service. Its functions are:

- To conduct **risk assessments** of biological agents and genetically modified organisms
- To **evaluate** the suitability of the **biocontainment infrastructure** in CNB laboratories
- To **report** the results of risk assessments and of all relevant biosafety considerations to the **CNB Director**

➡ The functions of **group leaders** and **heads of services** are:

- Group leaders and heads of service are **directly responsible for their personnel** in all aspects of occupational risk prevention
- **To collaborate with the Biosafety Service** in all aspects of health and safety in their laboratories, **including accidents and emergency situations**

HOW TO CONTACT THE BIOSAFETY SERVICE (Office 340):

- **CALL EXTENSION 4305 OR 4541**
- **CALL MOBILE PHONE EXTENSION** (internal calls) **63042**
- **ADVISE RECEPTION TO NOTIFY THE BIOSAFETY STAFF**

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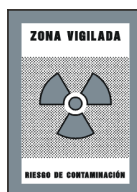


LABORATORY SAFETY SIGNS

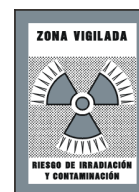
SUPERVISED AREA



Radiation hazard



Contamination hazard



Radiation and contamination hazard

CONTROLLED AREA



Radiation hazard



Contamination hazard



Radiation and contamination hazard



Radioactive



Low temperature



High voltage



General danger



Laser radiation



Strong magnetic field



Non-ionizing radiation



Biohazard



Flammable materials



Explosion risk



Toxic



Corrosive



Oxidizing



Irritant



First aid



Safety shower



Eyebath



Evacuation routes/exits



Fire extinction materials



Fire extinguisher



Fire hose



Fire alarm button

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3 PERSONAL INCIDENTS AND ACCIDENTS

SERIOUS OR POTENTIALLY SERIOUS ACCIDENTS:

CALL 112 AND REQUEST IMMEDIATE MEDICAL ATTENTION

MINOR ACCIDENTS:

1. **Provide FIRST AID** (see procedures below)

2. **NOTIFY the Biosafety Service IMMEDIATELY for advice.** On holidays and outside working hours (9:00-17:00 h), notify by phone in the following order:

1. Fernando Usera Mena (mobile phone): 687 542 369
2. Emergencies, Biosafety Service (mobile phone): 628 415 776

3. MEDICAL ASSISTANCE:

Students: student medical service / insurance contracted by the CNB / family physician

CSIC employees: mutual accident insurance contracted by the CSIC

Non-CSIC staff: mutual accident insurance provider contracted by the employer

IMPORTANT:

CSIC mutual accident insurance: request the medical assistance form from the Human Resources Service

CNB accident insurance: call 902 448844 and indicate policy number 0551480497991

EMERGENCY TELEPHONE NUMBERS

SERIOUS OR POTENTIALLY SERIOUS ACCIDENTS

112

Biosafety: Mon-Thu: 9-17 h; Fri: 9-14:30 h	Extensions:	4541 / 4305 / 63042 (internal)
Biosafety: outside working hours / holidays	1. Fernando Usera	687 542 369
	2. Biosafety Service	628 415 776 / 63043 (internal)

Physical Security Service	Sócrates Gutiérrez	Ext. 4512
	Reception	Ext. 4500

CSIC employees	FREMAP mutual accident insurance	900 61 00 61
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External employees, students and visitors	Appropriate insurance provider (see above)	
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CSIC Occupational Risk Prevention Service	Health Surveillance Service	915 681 933/32
	General Information	915 680 004

NATIONAL INSTITUTE FOR TOXICOLOGY 24-HOUR EMERGENCY TELEPHONE	915 620 420
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FIRST AID PROTOCOL

⇒ **Basic procedure:** wash the affected area with running water

- **Cuts and punctures:** use pressure to encourage the wound to bleed under running water for 5 minutes
- **Minor burns:** cool the area under running water for 10 min; do not use creams or salves

- **Biological contaminants:** wash and apply a cutaneous disinfectant (betadine, alcohol) and cover

- **Radioactive contaminants:** use "Radiacwash" towelettes or the cutaneous decontaminant supplied by the Biosafety Service. If there is a wound, use disinfectants; do not use decontaminants for radioactivity.

⇒ **Showers and eyebaths:** for skin or eye contamination, remove clothing IMMEDIATELY and use the emergency showers and eyebaths in the corridors or in the laboratory sinks (extension building)

⇒ **First aid kits:** on each floor next to the lifts (main building), next to the service lifts (extension building), in biosecurity labs, the radioactivity installation, and Reception

⇒ **Decontaminants, germicide, and change of clothing:** these are found in the **emergency cupboards** in the corridors on all floors in the main building and the extension building



4 DECONTAMINATION OF SURFACES AND MATERIALS

Use the personal protective equipment and decontamination material in the emergency cupboards located in the corridors.

Radiation decontaminants: Every radiological unit must stock Radiacwash towelettes and Decon90 (corrosive to metals). The Biosafety Service will provide cutaneous decontaminants and Desox18 and Desup33 decontaminants, appropriate for metals and very effective.

Biosafety Service contact numbers

09:00-17:00 h	Extensions:	4541 / 4305 / 63042 (internal)
Outside work hours	1. Fernando Usera	687 542 369
	2. Biosafety Service	628 415 776 / 63043 (int.)

✓ **General decontamination procedure:**

- **Small spills** can be cleaned up with **paper towels**. If the spill is a **very dangerous substance**, **notify the Biosafety Service** to organize decontamination.
- If a **large volume** is spilled, isolate the area, restrict access, and notify the **Biosafety Service**.
- If a **large volume** of radioactive or chemical material is spilled, absorb it with **vermiculite**. Wash the contaminated surface with standard detergents or with Decon90 (for radioactivity) to eliminate the contamination completely.
- The spilled substance and all clean-up materials should be treated as hazardous waste.

✓ **Biological decontamination:**

- For small spills inside biosafety cabinets, spray with germicide and clean up with paper towels.
- If the spill occurs outside a containment system, spray it with Virkon (in the emergency cupboards) and **allow it to act for 20 minutes**. Clean up the spill using vermiculite or paper towels, and wash or mop the area again with Virkon



Chemical decontamination

✓ **Radioactive decontamination**

- Decontaminate by **scrubbing from the edges to the centre** of the contaminated area and dry with paper towels.
- **Monitor**. If contamination persists, **repeat the process** as often as necessary.
- The material can also be submerged in a container filled with decontaminating solution.
- **If the contamination cannot be completely eliminated, notify the Biosafety Service.**
- Any material that cannot be decontaminated should be stored as radioactive waste until it has decayed or is transferred to ENRESA (^3H or ^{14}C contamination).



5 MEDICAL AND DOSIMETRIC SURVEILLANCE

The Biosafety Service **monitors all personnel working in the laboratories**. This control facilitates risk assessment for each work place and is essential for correct management of specific medical surveillance and dosimetry, as well as for training in prevention and personal protection.

Current legislation on the prevention of occupational risks requires **specific medical surveillance of all workers**. To this end, the Occupational Risk Prevention Service will initially and periodically evaluate the specific risks associated with each work place. **The Biosafety Service collaborates with the Occupational Risk Prevention Service in this assessment.** Specific medical surveillance of personnel is carried out by the **Health Surveillance Service** of the Occupational Risk Prevention Service. For CSIC employees, the Biosafety Service informs the Health Surveillance Service of the specific risks to which each employee is subject. The Biosafety Service will collaborate similarly with the prevention services of companies or external entities within a framework to **coordinate business activities**.



VACCINATION AND PROPHYLAXIS

Where there is **risk of exposure to biological agents** for which **vaccines or other prophylactic methods** are available, the health surveillance service must make them available to exposed personnel, as well as written information on the advantages and disadvantages of treatment.

- **Tetanus vaccine:** laboratory personnel who regularly use **cutting materials or sharps**.
- **Hepatitis A and B vaccine:** personnel who work with **human or animal biological material** *in vivo* or *in vitro*
- **Other vaccines:** **personnel who work with samples** that contain pathogens for which there are **appropriate prophylactic methods**.

6 TRAINING AND INFORMATION

In accordance with **Procedure 1000** of the Spanish General Government Administration, the CNB operates a programme that provides welcome and initial information as well as work place-specific theoretical training and information for all laboratory personnel. The **Biosafety Service** offers **initial training in health and safety** for new personnel, with **periodic follow-ups**. The Biosafety Service also trains all other **internal or external personnel** who might be affected directly or indirectly by **hazardous agents** in CNB laboratories. Each research line or support service is

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responsible for **initial and periodic practical training** of its staff, in collaboration with the Biosafety Department.

In addition, **the** Occupational Risk Prevention Service conducts periodic general information and training programmes for all laboratory personnel and specific courses and seminars for certain work places.

The Biosafety Service specifically **labels** and delimits **all risk areas**, posting **safety standards and procedures** where necessary in the laboratories.

Through the Biosafety Service, the CNB management **informs exposed personnel**, prevention delegates, and the Occupational Risk Prevention Service of any work-related incidents or accidents. At the request of the exposed personnel or their representatives, it will also report on the list of risk-exposed personnel and the result of **risk assessments** carried out by the Biosafety Committee or by the Biosafety Service. Through the Biosafety Service and the Risks Prevention Unit, the CNB management will likewise **coordinate management of business activities** with respect to external personnel affected by risk-associated activities carried out in the laboratories.

7 RISK-SENSITIVE PERSONNEL

- ✓ **Especially risk-sensitive personnel** are those more vulnerable to risks that arise from their work in the laboratory due to personal characteristics or physiological condition.
- ✓ **Pregnant or lactating personnel** who work in the laboratory are advised to **communicate their status to the Biosafety Service and the Occupational Risk Prevention Service**, to allow a specific risk assessment of their work places as well as **health surveillance** that considers their physiological condition.
- ✓ The procedure is similar for **any especially risk-sensitive personnel**, with specific evaluation of his/her condition.



- ✓ If risk assessment and/or health surveillance detect incompatibilities with certain risk agents, **adaptation to or a change of work place** will be carried out if deemed necessary.
- ✓ Pregnancy and lactation are incompatible with exposure to **carcinogenic, mutagenic and reprotoxic agents**, or to **pathogenic biological agents of risk groups 2, 3 and 4**.



8 BASIC RULES FOR PREVENTION AND PROTECTION IN THE LABORATORY

- ✓ **Order and general cleanliness are to be maintained in the work place. Accumulation of materials** should be avoided, **especially in overhead storage** and above all, those that are **heavy** and that accumulate **dust** (paper and cardboard).
- ✓ **Bench areas and specific materials** will be allocated for certain high-risk operations such as **work with cytostatics, radioisotopes, high-voltage sources**, etc.
- ✓ **Smoking is prohibited in the CNB.** Eating and drinking are prohibited in laboratories. **No food or drinks are to be stored** in the research area. Use the refrigerators and freezers located in the cafeteria or in seminar rooms. There is a designated **shared-use refrigerator** for storage of food and drink for celebrations. The key can be obtained in Reception.
- ✓ **Lockers** are available for street clothes and personal effects. To request a locker, contact General Services (extencion 4538).
- ✓ **Do not wear short (skin-exposing) clothing or sandals. Contact lenses cannot be worn** as they make decontamination impossible; use prescription eyeglasses.
- ✓ **Labcoat, gown or scrubs are compulsory and are used exclusively in the research area.** Do not wear labcoat, gown, scrubs or protective gloves in other areas; remove the labcoat or cover scrubs with a blue labcoat.
- ✓ **Mouth-pipetting** is prohibited.
- ✓ Use **protective gloves** to handle hazardous agents (basic gloves, or specific for cold, heat, sharp materials).
- ✓ Use **safety glasses** if there is risk of splashing hazardous liquids.
- ✓ Use an **anti-particle mask** if there is risk of inhaling solid particles or dangerous aerosols (weighing chemical compounds, biological aerosols).
- ✓ After any laboratory activity, **wash your hands**. Avoid handling hazardous materials if you have **lesions or sores on your hands**.
- ✓ Gloves are for manipulation of hazardous agents; **do not touch other elements such as telephones, keyboards, lift/elevator buttons**, etc.
- ✓ Avoid the use of **sharp and cutting materials** as much as possible.
- ✓ **Contaminated glassware** that is recyclable should be decontaminated and rinsed before delivery to the Washing and Sterilization Service. **Broken or unusable laboratory glassware** should be decontaminated and deposited in specific containers for glass.
- ✓ **Bottles and flasks** are transported with **both hands**, holding the container by its neck and the base. Hazardous materials are to be stored in **hermetically sealed, resistant containers** for transport outside the laboratory. **Carts** should be used for transport.



Personnel working with labcoat and gloves

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- ✓ When transporting hazardous materials and waste, use the freight or the service lifts/elevators. **The use of public lifts is prohibited.**

INOCULATION OR PUNCTURE ACCIDENTS

Needles and syringes should be disposable, and should be used only if necessary. After use, **the needle should not be separated from the syringe. Do not re-cap the needle.**

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal protective equipment and materials for waste management, containment, shielding and decontamination are **available from the warehouse**. Direct questions regarding use or acquisition of new PPE or equipment to the Biosafety Service.

SPLASHES TO THE EYES, EMERGENCY SHOWERS AND EYEBATHS

Use **protective eyewear** (safety glasses) when handling liquids that can splash into the eyes. **Each person should have their own glasses.**

Ocular contamination: immediately decontaminate the eyes for 10 min using the **eyebaths** located in the corridors (main building) or in the laboratory sinks (extension building).

Extensive body contamination: Immediately remove clothing and use emergency showers (located in all corridors).

PPE AND DECONTAMINATION MATERIALS FOR ACCIDENTS AND EMERGENCIES

The **labelled emergency cabinets** located in all corridors contain the PPE and **materials for labelling**, decontamination and waste collection, for **exclusive use** in accidents and emergencies. The **protocols of action** are inside the cabinet.



Labelled emergency cabinet with personal protective equipment and decontamination materials and media



Some PPE available at the CNB

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9 SPECIFIC CHEMICAL SAFETY STANDARDS

PRELIMINARY INFORMATION ON CHEMICAL PRODUCT HAZARDS

- **Product label:** the **hazard pictogram** indicates the type of danger, the **signal word** summarizes the level of danger: "**Danger**" for more severe hazards and "**Warning**" for less severe hazards; the **H (hazard)** and **P (precautionary)** statements indicate the specific risks and the prevention and protection norms to be adopted (**R and S statements** in the old labelling system).
- **Safety Data Sheets (SDS):** the most complete source of information on the preventive and protective measures to be adopted for each chemical product. These sheets are available in the **Biosafety Service**, or you can consult various databases on the internet. Links to some of these databases are indicated on the **CNB website** in the Biosafety Service section
- **Biosafety Service:** Consult the Biosafety Service when in doubt about rules for handling a specific compound or management of its waste.

Chemical product labelling (Globally Harmonized System)

Product identifier:
chemical name of the
substance

Signal word: "Danger" or
"Warning"

H statement: hazard
indications. Numeric code
or complete text

P statement: precautionary
advice. Numeric code or
complete text.

Palabra de advertencia

UN 1230

sample 1.06007.1000 31.12.10 11

LiCrosolv®
Reag. Ph Eur
Methanol
gradient grade for liquid
chromatography
Méthanol
Alcôle metílico
Metanol

EC-No. 200-659-6
Merck KGAA
64271 Darmstadt, Germany
Tel.: +49(0)6151 72-2440
www.merck-chemicals.com

Pictogramas de peligro

Indicaciones de peligro y
consejos de prudencia

Elementos del
etiquetado:

- Pictogramas de peligro
- Palabra de advertencia
- Indicaciones de peligro
- Consejos de prudencia

Physicochemical properties.
Purity, composition, etc.

Supplier identification: Company name,
address, and telephone

Hazard pictograms

- ✓ Always use **protective gloves** when handling hazardous chemicals. If these products are liquid, also use **safety goggles**.
- ✓ Always handle **flammable, explosive and volatile chemicals that pose inhalation hazards** in the **fume hoods** (gas extraction cabinets). If these volatile products are **carcinogenic**, also use a **filter mask** (double barrier). Handle flammables and explosives away from any heat source.
- ✓ Use **gloves, anti-particle masks, and safety goggles** when weighing hazardous solids.

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- ✓ Use **trays** to prevent the dispersion of liquid compounds.
- ✓ When using **precision balances or the Gel Doc**, follow the indications on the **instructions card** and always fill in the **usage register**.
- ✓ **Gas cylinders** must have **taps in good condition**, be **anchored** (by the Maintenance Service) and located **far from heat sources**.
- ✓ **Non-original containers** used to store chemical products must be **airtight** and **breakage- and product-resistant**. The **label** must indicate the name of the product and the type of associated hazard (flammable, explosive, corrosive, toxic, etc.).
- ✓ **Safety cabinets for flammable materials**: separate **flammable and explosive** products from products **toxic by inhalation**, and store them on different shelves.
- ✓ In the **extension building**, store **acids and bases** in the **specific module** located under the fume hoods. In the **main building**, store them in a plastic tray in a **labelled module under the laboratory bench**.
- ✓ Keep the **inventory of compounds and chemicals** in a **low, closed cabinet**. Do not store incompatible chemicals together.
- ✓ **Minimize stock of any hazardous chemicals**, especially highly flammable substances such as **alcohols**.
- ✓ **Liquid nitrogen**: use **special gloves and face shield** and work with caution with **cold cryotubes** (possible explosion/shattering). Do not store the containers in **closed spaces** (cold rooms). Follow the instructions in the **cryopreservation room**.



Working in the fume hood



Safety cabinet for flammable materials



10 SPECIFIC BIOSAFETY STANDARDS

Based on the risk associated with biological agents and genetically modified organisms (GMO) and thus, the containment infrastructure needs for each type of laboratory, the following classification has been established in the CNB:

➡ **Biosafety Level 1 laboratories (NCB1):** basic research laboratories and most support service laboratories

➡ **Biosafety Level 2 laboratories (NCB2):** *In vitro* culture laboratories 180, 480, 10, 13.3 and 36; laboratories for work with bacteria and fungi: part of 211, 223, 280.2 and 20; part of the Confocal Microscopy Service; Animal Facility quarantine, barrier (SPF) and inoculated animals areas; greenhouse NCB2

➡ **Biosafety Level 3 laboratory (NCB3):** laboratory 150

Specific regulations for NCB1 and NCB2 laboratories:

- ✓ In **NCB1 laboratories**, no work is to be done with **cell lines, tissues, fluids or blood of human origin or from other primates** (human pathogen risk group 2). There may be exceptions for certain techniques (cytometry, microscopy, etc.), which must be processed by the **Biosafety Committee**.
- ✓ **Access to NCB1 laboratories** will be controlled by heads of laboratories or services, in collaboration with the Biosafety Service.
- ✓ **Good microbiological practices** will be followed in **NCB1 labs**, with monitoring for possible culture contamination, avoidance of aerosol formation as much as possible, and disinfection of work surfaces at least once a day.
- ✓ **Access control in NCB2 laboratories:** in **shared-use** laboratories, the access door will have a fingerprint and security card reader, and access will be **controlled** by the Biosafety Service. In **laboratories exclusive to a single research line or service**, the access door will at least have a security lock and access will be **controlled** by the head of the research line or service, in collaboration with the Biosafety Service.
- ✓ To access **NCB2 areas**, staff must be **trained and proficient** and have undergone **specific health surveillance**. There may be access restrictions for **pregnant or lactating women**, as well as for other workers especially **sensitive to biological risk**. These cases will be evaluated by the **Occupational Risk Prevention Service**.
- ✓ In **NCB2 laboratories**, the use of **specific work clothes** (green labcoats) is mandatory. **Change labcoats** in the access lock or, if there is none, inside the laboratory next to the access door. **Washing and sterilization of labcoats** (external laundry) is supervised by the **Washing and Sterilization Service** for shared-use laboratories, and by **personnel** of the research line or service in exclusive-use laboratories.
- ✓ In the **Animal Facility**, personnel must wear **area-specific scrubs and shoe covers** in the conventional and quarantine zones, and **high protection overall, shoe protectors, gloves and mask** in the barrier and inoculation zones.
- ✓ All potentially hazardous biological material must be manipulated in **biosafety cabinets**. Avoid using **Bunsen burners** and **accumulation of materials** in the interior of the cabinet so that **laminar flow is not interrupted**. For microbiology, **microincinerators** can be used for inoculating loops. **Avoid covering the perforated strip on which the arms are supported** so that frontal protection flow is not interrupted.

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- ✓ Use **protective gloves** for infectious samples. When there is no biosafety cabinet for protection, use **safety glasses** when working with infectious liquids and/or an **anti-particle mask** if there is risk of infectious aerosol production.
- ✓ In **NCB2** laboratories, all **work surfaces must be decontaminated** with a broad-spectrum germicide after each manipulation or an accidental spill.



Access lock for a tissue culture laboratory



Working in a biosafety cabinet

**AVOID THE USE OF SHARP OR CUTTING OBJECTS AS MUCH AS POSSIBLE.
RULES FOR USE OF NEEDLES AND SYRINGES:**

- ➔ Use needles only when necessary
- ➔ Use the special safety needles available in the warehouse
- ➔ Never separate the needle from the syringe; dispose of the set in the sharps container
- ➔ Never recap or reuse the needle

Specific rules for the **Animal Facility** are indicated in the Health and Safety Manual in the laboratories and in the Animal Facility Standard Operating Procedures (SOP). All **new personnel** who will work in the **Animal Facility** will receive a **specific training course** on the handling of experimental animals.

The **specific rules** for the **NCB3 laboratory** are indicated in the Operating Regulations and Emergency Plan of the laboratory and in the NCB3 laboratory-specific SOP of the Biosafety Service.

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11 SPECIFIC RADIATION PROTECTION STANDARDS

General standards:

- ✓ Use the **radioactive materials logs** found in Radioisotope Laboratory 350 and all radiological zones of the Radioactivity Installation (RI).
- ✓ **Shielding:** methacrylate or PVC for β -emitters except ^3H , and leaded methacrylate or leaded glass for γ -emitters. **Double containment:** trays and plasticized bench-liner.
- ✓ **Detection:** Geiger-Müller monitors for β -emitters and solid scintillation monitors for γ -emitters. **Monitor** before, during, and after each operation. Any contamination must be **eliminated immediately**. For ^3H , detection is by **smear**; contact the Biosafety Service for more information.
- ✓ **Personal dosimeter:** obligatory use except if only ^3H is used
- ✓ Use **screw-cap** vials and tubes for radioactive samples
- ✓ **Radioactive samples and waste** must be stored with **shielding and labelled**.



Radiological area in a research laboratory

Standards for the radiological areas of research laboratories:

Maximum activity levels per laboratory and radioisotope

Isotope	Activity	Isotope	Activity	Isotope	Activity	Isotope	Activity
^3H	5 mCi	^{35}S	2 mCi	^{32}P	1 mCi	$^{131}\text{I}^*$	200 μCi
^{14}C	5 mCi	^{33}P	2 mCi	$^{125}\text{I}^*$	200 μCi	^{51}Cr	200 μCi

Activity levels per assay

Isotope	Activity	Isotope	Activity	Isotope	Activity	Isotope	Activity
^3H	2 mCi	^{35}S	1 mCi	^{32}P	500 μCi	$^{131}\text{I}^*$	100 μCi
^{14}C	2 mCi	^{33}P	1 mCi	$^{125}\text{I}^*$	100 μCi	^{51}Cr	100 μCi

(*) ^{125}I and ^{131}I cannot be used unless they have been incorporated into non-volatile, chemically stable molecules

- ✓ Each area must have a **supervisor** who holds a **Supervisor or Operator licence** and collaborates with the Biosafety Service.
- ✓ Authorized areas will be **marked, covered with plasticized bench-liner, and delimited**. The material to be used for radiolabelling must be marked. **Sufficient materials** must be available for shielding, containment, detection and decontamination.
- ✓ Somewhat **volatile** radiolabeled compounds such as ^{35}S -methionine must be handled exclusively in **fume hoods**.

Standards for NCB2 laboratories nº 180 and 480

- ✓ The Biosafety Service is responsible for **access to and use of** these facilities. **Activity limits per experiment** are identical to those for basic laboratories.
- ✓ **No vials, samples or radioactive waste can be stored** in these laboratories. After labelling, transport these materials to the appropriate radiological area. **Shielding, containment and detection material** will be supplied by each radiological area.

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- ✓ Record all data for labelling performed in tissue culture laboratories, including incubator and cabinet numbers, in the **radioactive materials register** of the laboratory of origin.
- ✓ **Laboratory 480** has an **area for radioactive work with the harvester**, with a maximum of 5 mCi for ^3H . Users must fill out the specific radioactive materials register. The radioactive waste generated can be stored in the area.

Standards for the central laboratory of the Radioactivity Installation

Activity limits per assay

Isotope	Activity	Isotope	Activity	Isotope	Activity	Isotope	Activity
^3H	25 mCi	^{33}P	25 mCi	$^{131}\text{I}^*$	10 mCi	^{55}Fe	20 mCi
^{14}C	25 mCi	^{32}P	20 mCi	^{51}Cr	10 mCi	^{22}Na	2 mCi
^{35}S	25 mCi	$^{125}\text{I}^*$	10 mCi	^{45}Ca	25 mCi		

- ✓ The **Biosafety Service controls access** by shared-use magnetic cards. Wear a labcoat and a dosimeter for access, even if no radioactive material will be used. Fill in the **reservation form** located at the entrance as well as the **laboratory use register**.
- ✓ The laboratory has the **necessary materials** for protection, containment, shielding, detection and decontamination. Follow the Biosafety Service instructions.
- ✓ Radioisotope **fume hoods** will be used for **activity (A) ≥ 1 mCi** per assay, or when using volatile radioactive compounds such as ^{125}I Na. There are **additional workstations** for low-activity, non-volatile radioisotopes. Use the **sink** to **wash contaminated material**, **never to eliminate radioactive waste**.
- ✓ There is an **emergency shower and eyebath, washbasin, and first aid kit** at the laboratory entrance. To use, follow the Biosafety Service instructions.

Irradiation of cultures and experimental animals

- ✓ The **Biosafety Service controls access** to the γ -irradiator at all times. Irradiation is carried out by the **Biosafety Service**. Users should contact the service **one day in advance** to schedule irradiation, and are responsible for transporting the samples to be irradiated.

ACQUISITION AND INTERNAL MOVEMENT OF RADIOACTIVE MATERIAL

Request by **external purchase order** and present in the Biosafety Service before 14:00 h (2 p.m.).

- ➡ **Orders are checked** to ensure they do not exceed RI activity limits and are ordered from an authorized supplier. The RI Supervisor approves by signing, and the **Purchasing Department processes the order**.
- ➡ On **receipt of the radioactive material** in the warehouse, the Biosafety Service transports it to the central radioisotope laboratory, **records the material** in the central laboratory's radioactive material entry/exit register, and signs for reception.
- ➡ When the material is **collected**, the user will be recorded in the register. They can then use the material in the central laboratory or in the laboratory radiological areas. In the latter case, they must record the entry of the material, its handling, and waste transfers in the radioactive material register in their area.
- ➡ Radioactive material can be **moved internally between authorized radiological areas** provided entries and exits are recorded in the appropriate registers.

Basic Guide to Health & Safety



12 TOXIC, BIOLOGICAL AND RADIOACTIVE WASTE HANDLING

- ✓ **Hazardous waste cannot be disposed of** in the same way as **urban waste**. These materials must be **separated** and packaged as indicated in the attached tables.
- ✓ **Toxic and radioactive liquid waste cannot be poured down the drains**. **Biological liquid waste** can be disposed of in the sink in **NCB1** and **NCB2** laboratories, provided it has been previously inactivated with a **broad-spectrum germicide** for at least **20 minutes** (e.g., a 1/10 solution of commercial bleach).
- ✓ Before use, **waste containers and bags** must be **identified** by a **label** that indicates the specific type of waste.

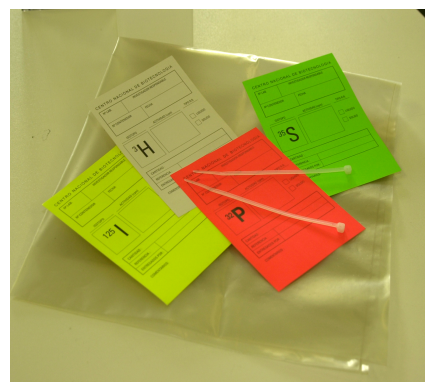
 UN3077	NOMBRE PRODUCTO: Material sólido contaminado CODIGO Q5/D15/S34/C41/CS1/HS/AB71(7)/B01000 LER: 150202 CMO: 3077
	PRODUCTOR RESIDUO: Con. Sup. Invest. Científicas CSIC C/ Darwin, 3 28049 Madrid 91.585.45.41 91.585.45.06
	FECHA ENVASADO: DESTINO: Gestión y Valorización Integral Centro, S.L. Camino del Valle, 12. P 2 77026272770 28090 Arganda del Rey 91.872.24.63 91.872.13.12
	RIESGO: HPS S.O.S. Nacional: 112 ZONA ALMACEN: DCS Nº:

 NO SYMBOL	Higiénica de Biosanitarios, S.L. Avenida de la encina, 26 - P.1. El Tempranar / 28942 - Fuenlabrada / Madrid 010010001 - Residuos Biosanitarios Código LER: 1801037 - Residuos cuya recogida y eliminación es objeto de requisitos especiales para prevenir infecciones. Características de peligrosidad: H373 - Irritante
	PELIGRO
	NO SYMBOL
	UN 3291

Specific labels for toxic sólids, biological waste



Approved label for transport of cytotoxic material



Specific labels for radioactive waste

- ✓ In the **main building**, full **toxic liquid waste** containers or those in use are stored in the module beneath the **fume hoods**, labelled with a skull. In the **extension building**, laboratories have a **specific labelled module** for this type of waste.
- ✓ Waste-producing laboratories must provide specific, approved 30-L or 60-L **containers** for **biological and toxic** solid waste, as well as covered **bins** lined with a bag for low-activity **radioactive** solid waste. Bins and containers should be kept out of **high-traffic areas**.
- ✓ **Litter bins** for low-activity radioactive waste must be **marked** on the lid with the **specific label for the contaminating radioisotope**. As an exception, waste contaminated with ^{35}S and ^{32}P can be mixed in the same bin; in this case, labels for both radioisotopes are used.
- ✓ Containers for biological and toxic material will be **marked on a single side, which is visible**. Containers for biological solid waste will have three identifications: the **dangerous goods class**, the **waste category**, and the **BIOHAZARD** label with the **biosafety rosette**.

Basic Guide to Health & Safety



- ✓ **Intermediate containers** for temporary storage of solid biological or toxic material (micropipette tips, vials, etc.) **must be identified** with a label that indicates the **waste category**, as on the final containers.
- ✓ Containers for **high-activity radioactive waste** generated in the laboratories will be stored **labelled** in the **shielded modules bearing the radioactivity symbol**, beneath the fume hoods. **Maximum storage time is 1 month**, provided the maximum permitted activity level for the laboratory is not exceeded.
- ✓ **Cutting objects and sharps waste**. These can be classified as **biological**: biological risk, yellow sharps container with red cap; as **cytotoxic**: chemical risk, blue sharps container; or as **innocuous**: no risk, use a marked plastic container and eliminate the closed container as conventional waste.
- ✓ **NCB2 laboratories**. **Biological liquids**: inactivate in vacuum traps. **Biological solids**: package in approved containers and autoclave. **Cutting and sharp biological solids**: package in sharps containers and autoclave.
- ✓ **NCB2 laboratories**. If viruses or other pathogens are used, **in addition to the above**, the biological waste must be inactivated when it is generated, inside the biosafety cabinets, by **mixing with or immersion in a germicide solution**.
- ✓ Waste produced in the **Animal Facility** and the **NCB2 and NCB3** laboratories: follow the procedures indicated in the CNB Laboratory Health and Safety Manual and in the **NCB3 Laboratory Internal Regulations**. The **tables below summarize** the separation and handling of this waste.
- ✓ Waste with **several hazards** (for example, radioactive and toxic waste): **contact the Biosafety Service** to determine the most appropriate handling method.
- ✓ The **necessary material for waste handling** is available in the central **warehouse**: containers, bags, labels, closure ties, etc.

WASTE TRANSFER

- ✓ Before delivery to the Biosafety Service, **users must seal** approved biological and toxic waste containers, close radioactive waste bags with zipper seals, and completely close bottles and drums.
- ✓ **Radioactive waste**: the transfer takes place from 09:00-14:00 h (9 a.m. to 2 p.m.) in the central radioisotope laboratory (Lab 350). Users must notify the Biosafety Service in advance to request the necessary means of transport (shielded carts).
- ✓ **Biological and toxic waste**: sealed containers will be left next to the laboratory door on the day established for removal by the waste management company.
- ✓ The **Biosafety Service will inspect** the waste delivered or deposited and will reject that which does not comply with separation, packaging, labelling and closure guidelines.

Basic Guide to Health & Safety



SPECIAL WASTE HANDLING IN THE CNB

SOLID TOXIC WASTE

SOLID WASTE: NON-CUTTING, NON-SHARP



Contaminated solid material
(Mixture of contaminated solid materials and empty plastic containers)

UN3077	
Material sólido contaminado (Mixture of contaminated solid materials and empty plastic containers) (Mixture of contaminated solid materials and empty plastic containers)	
NÚMERO PRECORTADO: 020010001 - Residuos biológicos y citotóxicos Características de peligrosidad: 6.1 (Toxicidad)	NOMBRE PRECORTADO: Placas radiográficas (Mixture of contaminated solid materials and empty plastic containers)
TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 60 L Color: Rojo	TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 30 L Color: Azul
FECHA DE ENVÍO: Fecha de envío	FECHA DE ENVÍO: Fecha de envío
FECHA DE RECEPCIÓN: Fecha de recepción	FECHA DE RECEPCIÓN: Fecha de recepción

Autoradiography films

UN3077	
Material sólido contaminado (Mixture of contaminated solid materials and empty plastic containers)	
NÚMERO PRECORTADO: 020010001 - Residuos biológicos y citotóxicos Características de peligrosidad: 6.1 (Toxicidad)	NOMBRE PRECORTADO: Placas radiográficas (Mixture of contaminated solid materials and empty plastic containers)
TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 60 L Color: Rojo	TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 30 L Color: Azul
FECHA DE ENVÍO: Fecha de envío	FECHA DE ENVÍO: Fecha de envío
FECHA DE RECEPCIÓN: Fecha de recepción	FECHA DE RECEPCIÓN: Fecha de recepción

SOLID WASTE: CUTTING MATERIALS, SHARPS
Although toxic, this waste is treated as cytotoxic



UN3249	
Residuos biológicos y citotóxicos (Mixture of contaminated solid materials and empty plastic containers)	
NÚMERO PRECORTADO: 020010001 - Residuos biológicos y citotóxicos Características de peligrosidad: 6.1 (Toxicidad)	NOMBRE PRECORTADO: Placas radiográficas (Mixture of contaminated solid materials and empty plastic containers)
TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 60 L Color: Rojo	TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 30 L Color: Azul
FECHA DE ENVÍO: Fecha de envío	FECHA DE ENVÍO: Fecha de envío
FECHA DE RECEPCIÓN: Fecha de recepción	FECHA DE RECEPCIÓN: Fecha de recepción



EMPTY GLASS BOTTLES CONTAMINATED WITH TOXIC MATERIAL

UN1950	
Residuos biológicos y citotóxicos (Mixture of contaminated solid materials and empty plastic containers)	
NÚMERO PRECORTADO: 020010001 - Residuos biológicos y citotóxicos Características de peligrosidad: 6.1 (Toxicidad)	NOMBRE PRECORTADO: Placas radiográficas (Mixture of contaminated solid materials and empty plastic containers)
TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 60 L Color: Rojo	TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 30 L Color: Azul
FECHA DE ENVÍO: Fecha de envío	FECHA DE ENVÍO: Fecha de envío
FECHA DE RECEPCIÓN: Fecha de recepción	FECHA DE RECEPCIÓN: Fecha de recepción

EMPTY GAS CARTRIDGES

UN1950	
Residuos biológicos y citotóxicos (Mixture of contaminated solid materials and empty plastic containers)	
NÚMERO PRECORTADO: 020010001 - Residuos biológicos y citotóxicos Características de peligrosidad: 6.1 (Toxicidad)	NOMBRE PRECORTADO: Placas radiográficas (Mixture of contaminated solid materials and empty plastic containers)
TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 60 L Color: Rojo	TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 30 L Color: Azul
FECHA DE ENVÍO: Fecha de envío	FECHA DE ENVÍO: Fecha de envío
FECHA DE RECEPCIÓN: Fecha de recepción	FECHA DE RECEPCIÓN: Fecha de recepción

Containers located in common hallways

LABORATORY REAGENTS



UN3287	
Residuos biológicos y citotóxicos (Mixture of contaminated solid materials and empty plastic containers)	
NÚMERO PRECORTADO: 020010001 - Residuos biológicos y citotóxicos Características de peligrosidad: 6.1 (Toxicidad)	NOMBRE PRECORTADO: Placas radiográficas (Mixture of contaminated solid materials and empty plastic containers)
TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 60 L Color: Rojo	TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 30 L Color: Azul
FECHA DE ENVÍO: Fecha de envío	FECHA DE ENVÍO: Fecha de envío
FECHA DE RECEPCIÓN: Fecha de recepción	FECHA DE RECEPCIÓN: Fecha de recepción

Laboratory reagents
Expired, unused, or unknown chemical products, both solid and liquid.
Dispose of in the original container

LIQUID TOXIC WASTE

LIQUID TOXIC WASTE

It is preferable to use the 5-L jerrycans and 2-L bottles



Non-halogenated organic solvents, halogenated solvents, acids, bases, heavy metals, oil (motor oil), photographic developer and fixer

UN2929	
Disolventes halogenados (Mixture of contaminated solid materials and empty plastic containers)	
NÚMERO PRECORTADO: 020010001 - Residuos biológicos y citotóxicos Características de peligrosidad: 6.1 (Toxicidad)	NOMBRE PRECORTADO: Placas radiográficas (Mixture of contaminated solid materials and empty plastic containers)
TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 60 L Color: Rojo	TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 30 L Color: Azul
FECHA DE ENVÍO: Fecha de envío	FECHA DE ENVÍO: Fecha de envío
FECHA DE RECEPCIÓN: Fecha de recepción	FECHA DE RECEPCIÓN: Fecha de recepción

UN1993	
Disolventes orgánicos no halogenados (Mixture of contaminated solid materials and empty plastic containers)	
NÚMERO PRECORTADO: 020010001 - Residuos biológicos y citotóxicos Características de peligrosidad: 6.1 (Toxicidad)	NOMBRE PRECORTADO: Placas radiográficas (Mixture of contaminated solid materials and empty plastic containers)
TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 60 L Color: Rojo	TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 30 L Color: Azul
FECHA DE ENVÍO: Fecha de envío	FECHA DE ENVÍO: Fecha de envío
FECHA DE RECEPCIÓN: Fecha de recepción	FECHA DE RECEPCIÓN: Fecha de recepción



For gels ONLY

Ethidium bromide: Halogenated solvent label
Other DNA intercalators: Non-halogenated solvent label

SOLID BIOLOGICAL WASTE

SOLID BIOLOGICAL WASTE:
NON-CUTTING, NON-SHARP

SOLID BIOLOGICAL WASTE:
CUTTING MATERIALS, SHARPS



It is preferable to use the 60-L containers







Special biological waste class III

UN3291	
Residuos biológicos y citotóxicos (Mixture of contaminated solid materials and empty plastic containers)	
NÚMERO PRECORTADO: 020010001 - Residuos biológicos y citotóxicos Características de peligrosidad: 6.1 (Toxicidad)	NOMBRE PRECORTADO: Placas radiográficas (Mixture of contaminated solid materials and empty plastic containers)
TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 60 L Color: Rojo	TIPO DE EMBAJADO: Contenedor rígido de plástico Capacidad: 30 L Color: Azul
FECHA DE ENVÍO: Fecha de envío	FECHA DE ENVÍO: Fecha de envío
FECHA DE RECEPCIÓN: Fecha de recepción	FECHA DE RECEPCIÓN: Fecha de recepción






BIOSAFETY SERVICE
NOVEMBER 2017







LIQUID TOXIC WASTE			
LABEL	DESCRIPTION	EXAMPLES	CONTAINERS
NON-HALOGENATED SOLVENTS DISOLVENTES NO HALOGENADOS	Carbon compounds with no halogen elements	Ethanol, butanol, phenol, formaldehyde, toluene, xylol, xylene, acetone, propanol, methanol, dyes, acetic acid-methanol mixtures, acetonitrile-water mixtures, methanol-water mixtures, etc.	<p>Preferably, 2-L bottles 5-L jerrycans 10-L jerrycans</p> 
HALOGENATED SOLVENTS DISOLVENTES HALOGENADOS	Carbon compounds or mixtures that contain halogen elements (more than 1%)	Chloroform, phenol-chloroform, dichloromethane (methylene chloride), tetrachloroethylene, dichloroethane, carbon tetrachloride, ethidium bromide, propidium iodide	
ACIDS ÁCIDOS	Aqueous acid solutions	Hydrochloric, nitric, sulphuric acids, etc.	
BASES BASES	Aqueous base solutions	Sodium hydroxide, potassium hydroxide, etc.	
HEAVY METALS METALES PESADOS	Solutions that contain heavy metals	Solutions with silver, mercury, chrome, cadmium, arsenic, copper, zinc, etc.	
INDUSTRIAL OILS ACEITES INDUSTRIALES	Mineral oil waste	Pump and motor oils	
HALOGENATED SOLVENTS DISOLVENTES HALOGENADOS	Gel with ethidium bromide	--	<p>5-L canisters</p> 
NON-HALOGENATED SOLVENTS DISOLVENTES NO HALOGENADOS	Gel with other DNA intercalators	Gelred, Gelgreen, Sybrid Safe, Total Red, etc.	
LABORATORY REAGENTS REACTIVOS DE LABORATORIO	Containers or bottles with unknown liquids Liquid chemical products past expiry date or unused, in their original containers	--	<p>Dispose of in original containers</p> 
DEVELOPER REVELADOR	Photographic developer	--	<p>25-L jerrycans</p> 
FIXER FIJADOR	Photographic fixer	--	



Mixtures of halogenated and non-halogenated: **label as halogenated solvent**







Mixtures of halogenated, non-halogenated and heavy metals: **label as heavy metals**

SOLID TOXIC WASTE			
LABEL	DESCRIPTION	EXAMPLES	CONTAINERS
CONTAMINATED SOLID MATERIAL MATERIAL SÓLIDO CONTAMINADO	Mixture of solid materials contaminated with chemical products in all previously described groups Empty plastic chemical product containers	Paper, gloves, disposable plastic material (tips, flasks), absorbents, etc.	60-L container 
CYTOTOXIC CITOTÓXICO	Blades and sharps contaminated with chemical products	Syringes with needle, scalpel blades, glass Pasteur pipettes, slides, etc., contaminated with chemical products (cytotoxic or not)	10-L blue sharps container 
LABORATORY REAGENTS REACTIVOS DE LABORATORIO	Containers or bottles with unknown solid contents Expired or unused chemical products in their original containers	--	Dispose of in original containers 
AUTORADIOGRAPHY FILM PLACAS RADIOGRÁFICAS	Photographic film	--	30-L blue bin with clamp closure. Located in darkrooms 
CONTAMINATED SOLID MATERIAL (GLASS) MATERIAL SÓLIDO CONTAMINADO (VIDRIO) EMPTY BUTANE/PROPANE GAS CARTRIDGES CARTUCHOS DE GAS BUTANO / PROPANO GASTADOS	Empty glass bottles contaminated with chemical products Bunsen burner gas cartridges, completely empty	--	60-L containers. Located in common corridors 





Sharps contaminated with biological material or toxic chemicals: **container and label for cytotoxics**

SOLID BIOLOGICAL WASTE			
LABEL	DESCRIPTION	PACKAGING/INACTIVATION	DISPOSAL
CLASS III SPECIAL BIOLOGICAL WASTE	Not cutting or sharp: Gloves, tips, pipettes, vials, flasks, etc.	NCB1 LABORATORIES	
		Approved 30-L or 60-L container 	When full, seal the container and place it outside the laboratory door on pick-up day
		NCB2 LABORATORIES	
		Approved 60-L container 	Remove and autoclave the container without the lid (lids should not be autoclaved, as it damages the seal). In common-use NCB2 laboratories, the Washing and Sterilization Service is responsible for sterilizing and delivering these containers.
	Cutting and sharps: Syringes with needles, scalpel blades, Pasteur pipettes, glass slides, etc.	NCB1 LABORATORIES	
		Approved 3-L, 5-L and 10-L yellow containers 	When full, seal the container and place it outside the laboratory door on pick-up day
		NCB2 LABORATORIES	
		Approved 3-L, 5-L and 10-L yellow containers 	Seal and autoclave. In common-use NCB2 laboratories, the Washing and Sterilization Service is responsible for handling this waste.








LIQUID BIOLOGICAL WASTE			
LABEL	DESCRIPTION	PACKAGING/INACTIVATION	DISPOSAL
NO STANDARD LABEL	Liquid culture media Small volumes of blood and other body fluids, human or animal	NCB1 LABORATORIES	
		2-L brown plastic bottles containing germicide Culture flasks and bottles with added germicide 	After 30 min with germicide, pour down the drain while diluting with abundant running water
		LEVEL 2 CONTAINMENT TISSUE CULTURE LABORATORIES	
		Collect in vacuum trap that contains germicide 	Add more germicide, wait 30 min, and pour down the drain while diluting with abundant running water. In common-use NCB2 laboratories, the Washing and Sterilization Service is responsible for maintaining vacuum traps and eliminating waste

SPECIFIC BIOLOGICAL WASTE IN THE ANIMAL FACILITY			
DESCRIPTION	LABEL	PACKAGING/INACTIVATION	DISPOSAL
Bedding and excrements	CLASS II BIOLOGICAL WASTE INCORPORABLE INTO URBAN WASTE NO STANDARD LABEL	ANIMAL FACILITY: CONVENTIONAL AND SPF AREAS	
		Load into 300-gauge green bags 	Transfer to an authorized handler for biological waste to be incorporated into urban waste
	CLASS III BIOLOGICAL WASTE	ANIMAL FACILITY: NCB2 INOCULATED AND QUARANTINE AREAS	
		Approved 60-L container 	Removed, autoclaved and packaged in 60-L black containers by the Animal Facility
Animal cadavers	NO STANDARD LABEL	ANIMAL FACILITY: CONVENTIONAL AND SPF AREAS	
		Freezer bags 	Freeze at -20°C and transfer to an authorized handler for animal cadavers
	CLASS III BIOLOGICAL WASTE	ANIMAL FACILITY: NCB2 INOCULATED AND QUARANTINE AREAS	
		Special bins with autoclave bags 	Removed, autoclaved and packaged in 60-L black containers by the Animal Facility
Syringes with needles, scalpel blades, Pasteur pipettes, glass slides, etc.	CLASS III BIOLOGICAL WASTE SHARPS	ANIMAL FACILITY: CONVENTIONAL AND SPF AREAS	
		Approved 3-L, 5-L, and 10-L yellow containers 	When full, seal containers and place them near the Animal Facility door on pick-up day
		ANIMAL FACILITY: NCB2 INOCULATED AND QUARANTINE AREAS	
		Approved 3-L, 5-L, and 10-L yellow containers 	Autoclaved and sealed by the Animal Facility. Place near the Animal Facility door on pick-up day.

SEPARATION OF RADIOACTIVE WASTE: $T_{1/2} < 100$ DAYS

CATEGORY		DESCRIPTION	CONTAINER	SHIELDING		STORAGE/TRANSFER
				BETA	GAMMA	
^{32}P ^{33}P ^{35}S ^{125}I ^{131}I ^{51}Cr	SOLIDS	Empty commercial vials (^{32}P , ^{125}I)	Leaded commercial container 	NO	NO	Deliver separately
		High-activity rigid solids (tips, plates, tubes, etc.). Cutting material and sharps (syringes + needles, scalpel blades, slides, Pasteur pipettes, etc.).	2-L white polypropylene bottle 	<ul style="list-style-type: none"> Methacrylate box ^{32}P: Methacrylate box inside a 1.5-mm lead box 	<ul style="list-style-type: none"> Lead box Leaded methacrylate container 	Temporary storage in radioactive waste modules labelled with the radioactivity symbol, located beneath the fume hoods
		Low-activity soft solids (paper, gloves, plastic, etc.)	25-L transparent polypropylene bag and closure ties 	Foot-pedal waste bin	Leaded foot-pedal waste bin	
	LIQUIDS	High- and low-activity	2-L white polypropylene bottle 	<ul style="list-style-type: none"> Methacrylate box ^{32}P: Methacrylate box inside a 1.5-mm lead box 	<ul style="list-style-type: none"> Lead box Leaded methacrylate container 	Transfer to the Biosafety Service

SEPARATION OF RADIOACTIVE WASTE: $T_{1/2} > 100$ DÍAS

CATEGORY		DESCRIPTION	CONTAINER	SHIELDING		STORAGE/ TRANSFER
				LOW-ENERGY BETA AND GAMMA	GAMMA	
^3H ^{14}C ^{45}Ca ^{55}Fe ^{22}Na	SOLIDS	Cutting materials and sharps (syringes + needle, scalpel blades, slides, Pasteur pipettes, etc.)	NEEDLES, BLADES, AND METAL MATERIALS Specific sharps container from ENRESA 	^3H , ^{55}Fe : No shielding ^{14}C , ^{45}Ca : Methacrylate container	^{22}Na : Lead box	Deliver separately to the Biosafety Service
			GLASS 2-L polypropylene bottle 			Temporary storage in radioactive waste modules located beneath fume hoods, labelled with the radioactivity symbol Transfer to the Biosafety Service
		Rigid solids (tips, pipettes, plates, tubes, etc.)	2-L polypropylene bottles 25-L transparent polypropylene bags in cardboard boxes 			
		Soft solids (paper, gloves, plastic, etc.)	Directly in 25-L transparent polypropylene bags 			
	LIQUIDS Never mix organic solvents with aqueous solutions. If a technique requires it, inform the Biosafety Service.	High-activity	2-L polypropylene bottle 	<ul style="list-style-type: none"> ^3H, ^{55}Fe: No shielding ^{14}C, ^{45}Ca: Methacrylate container 	^{22}Na : Lead box	
		Low-activity , large volume	5-L polypropylene container 	Radioactive waste modules beneath fume hoods, labelled with the radioactivity symbol	Radioactive waste modules	
	MIXED	Closed vials that contain sample and scintillation cocktail	2-L polypropylene bottle 5-L wide-mouth container 	Not normally	Not normally	

