International Agency for Research on Cancer

World Health Organization

IARC Safety Manual

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FOREWORD

Health and safety in the workplace are of fundamental importance at IARC. Our commitment is not only based on regulatory requirements but also reflects the Agency's dedication to the health and well-being of our staff. Therefore, this new edition of the Safety Manual is an important support element for the Agency in our mission to prevent cancer.

Laboratory research activities are evolving rapidly, creating new safety challenges. It is therefore necessary to update our Safety Manual on a regular basis. In addition, health and safety at work require active participation from all staff and visitors, who are asked to read the manual carefully and follow its recommendations.

Lastly, I would like to thank the Occupational Health and Safety Committee for its special contribution, and the vital role it has in this partnership.

Dr Christopher P. Wild

Director

The International Agency for Research on Cancer (IARC) is a member organization of the United Nations, located in the city of Lyon. IARC fights cancer by bringing together expertise in laboratory sciences, epidemiology, and biostatistics. IARC's scientific teams are supported in their daily work by administrative and internal services staff, as well as external companies, which handle building management and maintenance.

Organized by branch, IARC has about 250 full-time staff (as of 1 September 2018) at its headquarters in Lyon. Including early career and visiting scientists (ECVS, which include external researchers, doctoral and postdoctoral students, and trainees), the total is approximately 350 people (as of 1 September 2018).

IARC is made up of three buildings:

- the Tower (abiding by rules set for establishments open to the public and high-rise buildings with 14 floors)
- BRC (Biological Resources Centre)
- Latarjet.

Laboratories are located on floors 6, 7, 8, 9, 10, and 13 of the Tower, and on the ground floor of BRC. Facilities include general laboratories, cell-culture laboratories, a histology laboratory, and an L3 laboratory.

SMH/S4 and S08 are shared laboratories in the basement of the Tower that have benches and microbiology safety cabinets for receiving, sorting, aliquoting, handling, and shipping biological specimens.

Laboratory services, directly or indirectly related to the safety of laboratory personnel, are also described in this manual.

Depending on their nature, biological samples can be stored in liquid nitrogen, in freezers and refrigerators, or at room temperature. Liquid

nitrogen storage is available in the BRC building (Rooms E01, E02, and E03), and freezer storage is located in the basement of the Tower (Rooms SMHS1, S15, and S18).

Room E21 in BRC is reserved for storing biological specimens, such as blood samples on blotting paper, histological slides, and paraffin blocks, at room temperature.

Due to the layout of the Tower, occasional space for room-temperature or freezer storage can be allocated in laboratories for samples in use.

IARC GENERAL SAFETY AND SECURITY GUIDELINES

SAFETY AND SECURITY GUIDELINES

1. Safety and Security Staff

1.1 Director of Administration and Finance

The Director of Administration and Finance, Tamas Landesz, is responsible for staff safety and security, and assigns ASO to manage building security issues.

1.2 Administrative Services Office (ASO)

The ASO Security Team is in charge of building maintenance to ensure everyone's safety. ASO is at the disposal of staff and visitors in case of emergency, and is trained to take the necessary steps.

1.3 Security guards

IARC is protected by a 24/7 security service, including public holidays, that is provided by an external company called SERIS. Security guards are stationed at the reception desk, and can be contacted directly using the red telephone located on each floor.

Security guards on duty:

- Reception: a guard is on duty from 8:00 am to 5:00 pm
- Security station on Avenue des Frères Lumière: a guard is on duty from 8:00 am to 2:00 pm
- Security station on Cours Albert Thomas: a guard is on duty from 8:00 am to 9:00 am
- Main security station: two guards are on duty from 5:00 pm to 8:00 am on weekday evenings, and 24 hours/day on the weekend.

1.4 IARC Safety Team

IARC has a safety team trained in first aid, available every working day from 8:00 am to 5:00 pm. They can be reached by pressing the red emergency button on the floor involved or by using the red telephone located on any floor.

The team has 10 members:

- ASO Group Head — Elisabeth Françon
- Maintenance Technician — Bruno Amara
- Laboratory Maintenance Technician — Thomas Cler
- Clerk (Reception) — Yannick Condomines
- Administrative & Laboratory Clerk — Henri Cordier
- Maintenance Technician (Space) — William Goudard
- Clerk (Reprography) — Michel Javin
- Maintenance Technician (Electronic) — Hafed Lamouchi
- Assistant (Building Safety & Security) — Jean-Alain Pedil
- ASO Group Secretary — Valérie Rut

1.5 Emergency wardens

Emergency wardens have been appointed for each floor of all IARC buildings in case of an evacuation. The names of wardens are listed on the evacuation plans next to the lifts and in stairwell exits in the Tower, and in the corridors of BRC and Latarjet.

The floor warden ensures that everyone has been evacuated, confirms the status of their floor to the IARC Safety Team, and provides the number of evacuees, if required.

1.6 Staff Physician

The IARC Staff Physician is responsible for the medical surveillance of all staff, which includes monitoring work conditions and workplace accidents, and evaluating potential risks, where necessary in conjunction with the Occupational Health and Safety Committee.

The Staff Physician is on site at IARC three days per week, on Monday afternoons, Tuesdays, and Thursdays.

1.7 Laboratory Safety Officer

Stéphanie Villar is the Laboratory Safety Officer responsible for handling laboratory safety matters at IARC.

1.8 IARC Occupational Health and Safety Committee (OHSC)

The OHSC has 17 members and a secretary:

- Chairperson — Michael Korenjak
- Staff Physician — Michel Baduraux
- Laboratory Safety Officer — Stéphanie Villar
- ASO Group Head — Elisabeth Françon
- 4th Floor Representative — Priscilia Chopard
- 6th Floor Representative — Christine Carreira

- 7th Floor Representative
- 8th Floor Representative — Aurelie Salle
- 9th Floor Representative — Sandrine Chopin Mckay
- 10th Floor Representative — Nathalie Forey
- 13th Floor Representative — Béatrice Vozar
- Biological Resources Representative — Elodie Caboux
- Latarjet Representative — Jérôme Vignat
- Epidemiology Group Representative — Véronique Bouvard
- Laboratory Maintenance Technician — Thomas Cler
- Assistant (Building Safety & Security) — Jean-Alain Pedil
- Staff Representative
- Secretary — Isabelle Poncet

The OHSC plays an advisory role in maintaining and improving work conditions and safety at IARC.

The Committee meets every three months, but can be convened in an emergency by contacting the Chairperson or the Laboratory Safety Officer.

Laboratory safety and work conditions at IARC are discussed during these meetings.

Members of IARC personnel are welcome to contact any member of the Committee directly by email or the whole Committee through the distribution list if there is a health or safety issue that they would like to discuss.

The minutes of each meeting are available on the OHSC intranet page. The Committee can make practical recommendations to personnel, or provide policy advice to Group Heads and the Director.

1.9 Workplace first aid and rescue

In addition to the IARC Safety Team, two staff members – Catherine Chassin and Carine Biessy – are trained in workplace first aid and rescue procedures.

1.10 Role of staff in ensuring safety at IARC

The safety and security of the Agency is everyone's responsibility.

The following safety and security guidelines must be followed by everyone:

Be alert when entering and exiting the site.

Ensure that you do not let external, unknown people enter the site; only staff members, visitors registered for meetings, and approved service providers should have access.

If in doubt, please immediately inform the security guard at ext. 8181 and/or the IARC Safety Team using the red telephone or emergency button located on each floor.

Please report all technical problems, even minor ones, to aso-tech@iarc.fr.

2. IARC Staff Access

2.1 Badge access system

The Agency has a badge access system for improved security. Among other things, the system controls access to the car park and entry to all three buildings on site: the Tower, the Biological Resources Centre (BRC), and Latarjet.

A credit card-sized badge that contains a miniature low-frequency transmitter is programmed for each staff member to allow access to the premises.

At controlled access points, the badge holder should present their badge in front of the card reader. If the badge code is accepted, the system's signal light will change from red to green and access is granted. A central database tracks access approval information on an ongoing basis.

It is important that each staff member uses their own badge when entering and exiting IARC buildings, so that the number of people in any location is known in case of an emergency.

All newcomers to IARC, whatever their role, must complete a training course on general safety procedures at the Agency. A questionnaire related to the course must then be completed and validated by the Laboratory Safety Officer before obtaining a personal access badge, which is issued by ASO.

If a staff member forgets their badge, they should ring the intercom at the entrance located on Cours Albert Thomas and sign in at reception as a visitor to gain access to the site.

Any loss of a badge should be immediately reported to ASO by email at reception@iarc.fr.

2.2 Entering and exiting IARC

Staff can access the IARC site (the Tower, BRC, and Latarjet) via Cours Albert Thomas and Avenue des Frères Lumière.

Badge access for pedestrians and cyclists:

- Gate located on Cours Albert Thomas: 24/7
- Gate located on Avenue des Frères Lumière: weekdays from 8:00 am to 7:00 pm.

For safety purposes, please respect the pedestrian footpath and gate access controls.

2.3 Vehicle access to the car park

The Agency's car park is reserved for staff members during work days. Please drive carefully when entering and exiting the car park due to frequent pedestrian traffic.

Vehicles can enter the car park by:

- Badge access at the gate/barrier located on Cours Albert Thomas on work days from 7:30 am to 9:00 am. Early arrivals before 7:30 am require email notification to be sent the previous day by 5:00 pm at the latest to Jean-Alain Pedil, Building Safety & Security Assistant;
- Badge presentation to the security guard at the gate/barrier located on Avenue des Frères Lumière on work days from 9:00 am to 2:00 pm;
- Late arrivals after 2:00 pm must enter via the gate/barrier on Avenue des Frères Lumière after ringing the intercom.

Vehicles can exit the car park via the gate/barrier on Avenue des Frères Lumière on badge presentation to the security guard before 2:00 pm, and by badge scan from 5:00 pm to 7:00 pm. Outside these time slots, please ring the intercom and ask for the gate to be opened.

For specific questions about vehicle access, or to ask permission to park your vehicle overnight or on the weekend, please send an email to the ASO Group Head Elisabeth Françon and/or to Jean-Alain Pedil.

Please report any major issues related to site safety and security to ASO.

2.4 Access to laboratories and biological specimens

Access to the Agency's laboratories and/or biological specimens is reserved for staff who have been trained and recruited for this purpose. Staff members must undergo a hepatitis B virus (HBV) vaccination/serology verification by the Staff Physician, as well as complete training on laboratory best practice, given by Stéphanie Villar.

Under no circumstances may staff recruited for administrative or data-processing functions perform laboratory work.

2.5 Relaxation room

A recliner is available in the auditorium (in the Russian interpreter booth) for general resting purposes, and is not to be used for workplace accidents or medical emergencies.

To gain access to the room, please ask reception for the key. Because the room is isolated, a mobile phone is required to call for help if needed.

2.6 Nursing room

When the auditorium is not in use, the interpreter booth, which is equipped with a refrigerator, can be used by new mothers for nursing purposes. The key for the booth is available at reception.

2.7 Use of badges

In addition to controlling access to the car park and the Agency's buildings, the badge system also controls access to certain restricted storage and computer rooms and laboratories.

Badge access is required for:

- Loading gate area
- Bicycle shed
- Computer rooms 403, 406, 407, and 408
- 805 carcinogen room
- L3 laboratory 901
- Bacteriology laboratory 919
- L2 laboratory 920
- SS/SMH radioactive storage room
- S05 storage room
- SS/SMHS1 cold storage room
- SS/S15 cold storage room
- S19 storage room
- E01 BRC nitrogen storage room
- E02 BRC nitrogen storage room
- E03 BRC nitrogen storage room.

Requests for entry to a restricted-access laboratory or laboratory storage room must be sent by email to Stéphanie Villar. Please send other access requests to the ASO Secretary, Valérie Rut.

In addition to access privileges, badges are required to use the printers and can be used as a method of payment in the cafeteria.

Badges can either be clipped to a piece of clothing or attached to a lanyard worn around the neck.

Staff should wear their badge in a visible manner at all times, and not leave it in their vehicle, office, or pocket.

All visitors to the Agency, even those present for a short period of time, must register at reception and visibly wear a “Visitor” badge for the

duration of their stay. Visitors should be accompanied by an IARC staff member at all times.

2.8 Building access during non-working hours

Outside normal working hours, staff must enter through the gate located on Cours Albert Thomas and register with the security guard on duty on the ground floor of the Tower.

BRC and Latarjet are protected by an intruder alarm system that is activated:

- at night from 8:00 pm to 7:00 am
- on weekends
- on public holidays.

During the above-mentioned times, staff must sign in with the security guard in the lobby of the Tower to gain access to BRC and Latarjet.

Staff working in BRC and Latarjet must remember to close the windows and let the security guard know when they leave, so that the alarm system can be reactivated.

If working on site at the Agency during non-working hours, it is important for safety reasons to let the security guard know where you will be working (which office or laboratory) and the amount of time you plan to stay, so that they can verify safety and security when they make their rounds.

3. Visitor Access

3.1 Foreword

Visitors whose length of stay does not exceed one month must complete the "IARC Visitor's Registration" form, which must be sent at least 24 hours before their arrival to reception@iarc.fr by the secretary of the group to be visited. (Full information on the process can be found in the SOP103). However, there are some special cases (commercial visits, technical visits, repair and maintenance visits, participation in a meeting, etc.) for which a simple email is sufficient. This email must be sent by the Group Secretary to reception@iarc.fr at least 24 hours before the visitor's arrival, and include the date of the visit, the name and surname of the visitor, the name of their company/institution, the location and purpose of the visit, as well as the name, surname, group, and telephone number of the staff member supervising the visit.

It is important to always remind the visitor of the ban on smoking throughout the site and to transmit to each visitor the general safety instructions.

3.2 Access guidelines

For visitors whose length of stay is less than seven days:

- Access is only permitted on working days and exceptionally weekends for meeting participants or for technical call-outs.
- Access is only possible through the entrance gate located on Cours Albert Thomas. An initial identity check of the person will be made through the intercom.
- Visitors must access reception by passing through the interlocking security doors.

- Visitors must undergo a screening check by a security guard, followed by metal detector screening, if necessary (body, luggage, suitcases, bags, etc.).
- Visitors must provide a form of identification that will be kept at reception for the duration of their visit; in exchange, they will receive a visitor access badge.
- Visitors must fill in the reception log to record their arrival and departure times. The visitor badge must be displayed so that it is entirely visible and must be worn throughout the duration of the visit.

The visitor should be collected from reception by the member of IARC personnel responsible for the visit.

Visitors for less than seven days may not move about the site alone. They must be accompanied by a member of staff of the group that organized the visit and must be escorted to reception at the end of the visit.

For visitors of more than seven days and less than one month:

- Visitors for more than seven days are required to undertake the safety training available on the intranet, followed by a safety briefing with the laboratory safety officer, in order to acquire a special IARC visitor badge, valid from Monday to Friday from 08:00 am to 6:00 pm for the exact duration of their visit. A refundable deposit of €25.00 will be required.
- This limited access badge will enable the visitor to move about the site unaccompanied. Please note that the badge must be returned to reception before 4:30 pm on the last day of the visit.

For visitors to the laboratories (except observation or maintenance of equipment):

- Visitors are not allowed to use equipment in IARC laboratories unless they are vaccinated against HBV and covered by insurance from their own institution.
- If they are not immunized against HBV (excluding non-responders) and are not covered by insurance through their own institution, the visitor does not have authorization to operate laboratory equipment and may only observe.

3.3 Children

Children under 16 years are not allowed access to any of the IARC buildings, with the exception of the main lobby, the cafeteria at mealtimes, and during special events (leaving parties, thesis celebrations, etc.).

They may eat with their family, and should then be accompanied directly back to reception. Children must be registered as guests at reception when they enter the building.

Apart from these visits, children should only be present at IARC during special events, such as the Christmas Tree celebration, which take place on the ground floor of the Tower, in the auditorium, and in the main lobby. Children must always be accompanied by their IARC staff member parent.

Children are not allowed to visit their parents' office or laboratory. They must remain accompanied in authorized areas only.

3.4 Inviting family or guests for lunch

Staff can invite family or guests for lunch on work days from 12:00 pm to 2:00 pm on the 12th floor of the Tower and/or in the waiting area of the main lobby.

All family and guests are considered external visitors and must comply with the rules set out in Article 3.

3.5 Other access and parking requests

Please specify the purpose of your request and send it by email to Elisabeth Françon and/or Jean-Alain Pedil.

4. General Safety Rules

Smoking is forbidden on IARC premises and its immediate surroundings.

4.1 Stairwells in the Tower

Stairwells in the Tower are equipped with fire doors and constitute fire escapes. They serve as a safe space in case of an emergency. However, stairwells need to be used with caution because they are not equipped with cameras. Any incident or accident that takes place in a stairwell will go unnoticed until/unless a colleague happens to randomly pass by.

Therefore, only the stairwell next to reception is open for use during office hours from 8:00 am to 5:00 pm. There is not enough foot traffic during other times, making it too risky to access.

The stairwell on the west side (by the coffee machine) is for use only during evacuations.

For safety reasons, using the stairs is strictly prohibited for laboratory activities; staff wearing a lab coat or gloves, or those carrying laboratory items, ice, or solvents should not use the stairs.

4.2 Sending personal mail

Staff can send personal letters or mail via the mailbox in the hallway in the Tower near reception. The letters are picked up by the post office every work day at 3:30 pm.

4.3 Receiving personal mail and parcels

Staff are not allowed to have personal mail or parcels delivered to the Agency. Unidentified parcels and letters will not be accepted, and the postal/courier service will return or discard the items, if necessary.

4.4 Shipping and receiving biological specimens

4.4.1 Shipping biological specimens

Air transport is the most common mode of transportation for shipping biological specimens. It is subject to international rules issued by IATA (the International Air Transport Association), and follows an international classification for dangerous goods, and especially for infectious substances.

For logistical reasons, some shipments may be made by road. Road transport is governed by specific regulations for the transport of dangerous goods by road (ADR). It is important to note that air transport is the most restrictive mode of transportation.

Staff from ASO and LSB are trained and accredited to handle biological specimen shipments by air.

Before shipping samples, it is important to check whether or not they are subject to DGR (Dangerous Goods Regulations). Staff should always follow the appropriate procedure put in place by IARC. It is important to remember that the transport of dangerous goods by La Poste is strictly forbidden.

Sample classification considers the potential infectious risk (blood and derivatives), but also more specific risks (dry ice, flammable liquids, and paraffin).

Information related to the shipment of biological materials is available on the intranet. All shipments must be planned at least 48 hours in advance and submitted by email to shipments@iarc.fr.

For long-haul destinations, shipments should preferably be made on Mondays and Tuesdays.

4.4.2 Receiving biological specimens

For security reasons, any receipt of biological specimens must be declared by email to shipments@iarc.fr. The email must include information on the origin and nature of the specimen as well as any relevant documentation (such as an MTA).

When receiving biological specimens or reagents on dry ice, please store any remaining dry ice in containers available in SMHS1 and S18. It can then be used for subsequent sample handling and storage.

4.5 Theft

IARC is not insured against, and assumes no liability for, the loss or theft of personal property on its premises.

Staff should not leave valuable personal property, such as mobile phones, handbags, or wallets containing money or cheque books, unattended at any time in offices or laboratories, including in unlocked desks or cupboards. Similar precautions should be taken for office equipment such as calculators and laptops.

Nothing of value should be left visible inside your vehicle, which should be locked when parked.

In the event of a valuable personal item going missing, the loss should be reported to ASO immediately.

4.6 Domestic animals

Domestic animals are not allowed in any building at IARC.

4.7 Storing food and drinks

It is strictly forbidden to store food and/or drinks in laboratory cold rooms, fridges, or freezers.

For use by all staff, refrigerators are available in the kitchen on the ground floor of the Tower, and in Room 1201 on the 12th floor as well as on the ground floors of BRC and Latarjet.

Refrigerators are also available for storing food and/or drinks in (non-laboratory) “clean” rooms located on several floors. Staff using these facilities are asked to kindly help keep the space clean by regularly throwing out any expired goods.

Food can be stored at room temperature in offices, as long as it is kept in airtight containers to avoid attracting insects or rodents.

4.8 General use of office space

IARC premises are reserved for professional activities; please act with respect to ensure their sustainability.

5. Instructions for Cleaning Staff

An external company is hired to clean IARC premises under the supervision of ASO Secretary Valérie Rut for cleaning of common areas and meeting rooms, and Stéphanie Villar for cleaning of laboratories and laboratory-related storage spaces.

Two teams undertake cleaning at IARC:

- The evening cleaning crew cleans floors and empties office wastebaskets. For laboratory levels, office wastebaskets are emptied first, followed by those in the laboratories (the bag containing general waste should never be taken into the laboratory). Laboratory floors are washed with disposable mops, which are then discarded in contaminated waste containers. To avoid risk of contamination, mops are not re-soaked in the wash bucket after cleaning the laboratory floor.
- The evening crew also removes boxes left in front of the service lift and takes recycling to the basement.
- The day cleaning crew has specific priorities set by the floor laboratory staff representative for laboratory cleaning, and by Valérie Rut for meeting room and common area cleaning. The cleaning crew wear lab coats while cleaning laboratories.

The day-time cleaning schedule is available on the intranet, with the name of the contact person and the list of tasks to be performed; however, the list is not exhaustive, and can change or be updated.

Please contact Stéphanie Villar at ext. 8513 for questions related to laboratory cleaning, or Valérie Rut at ext. 8502 for cleaning issues related to meeting rooms and non-laboratory common areas.

The person responsible for laboratory cleaning must ensure that:

- hygiene and safety rules are followed (laboratory gloves and coats are worn, special cleaning products are used, etc.)
- laboratory cleaning processes are up to date.

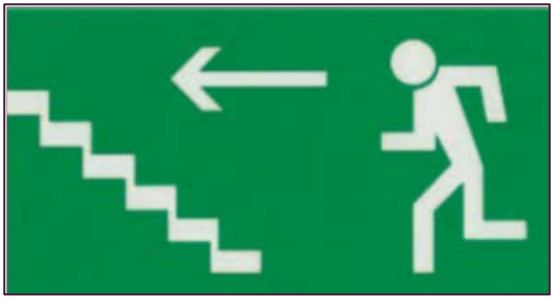
Laboratory staff are responsible for clearing workbenches and cupboards if further cleaning is requested. The cleaning crew does not clean or disinfect laboratory equipment, and they do not close, remove, or dispose of laboratory waste containers.

Certain areas are cleaned more thoroughly two or three times per six months under the supervision of the floor manager. Windows are cleaned once a year by an external company, and the cleaning date is communicated to staff by Valérie Rut, via Group Secretaries. Laboratory staff are responsible for moving equipment and clearing workbenches to make windows accessible for cleaning, if necessary.

EMERGENCY PROCEDURES

1. Evacuation

Only use the stairs in case of an emergency!



In case of emergency (fire, flood, earthquake, etc.) at IARC, an alarm with varying pitch will sound. On hearing the alarm, all staff should immediately evacuate their office or laboratory, and make their way as quickly as possible, without running, to the nearest exit using only the stairs. Do not return to collect personal items, and leave cumbersome objects behind.

Please remember that, in order to minimize confusion, you should leave the building as quickly as possible via the stairs if you hear the fire alarm.

Emergency wardens are responsible for supervising evacuation and ensuring that everyone on their floor has heard and obeyed the alarm. If you are on the phone when the alarm goes off, briefly explain the situation to your caller and hang up immediately.

Emergency wardens should confirm that their floor has been evacuated as they go through reception on the ground floor of the Tower, and then proceed to the assembly point.

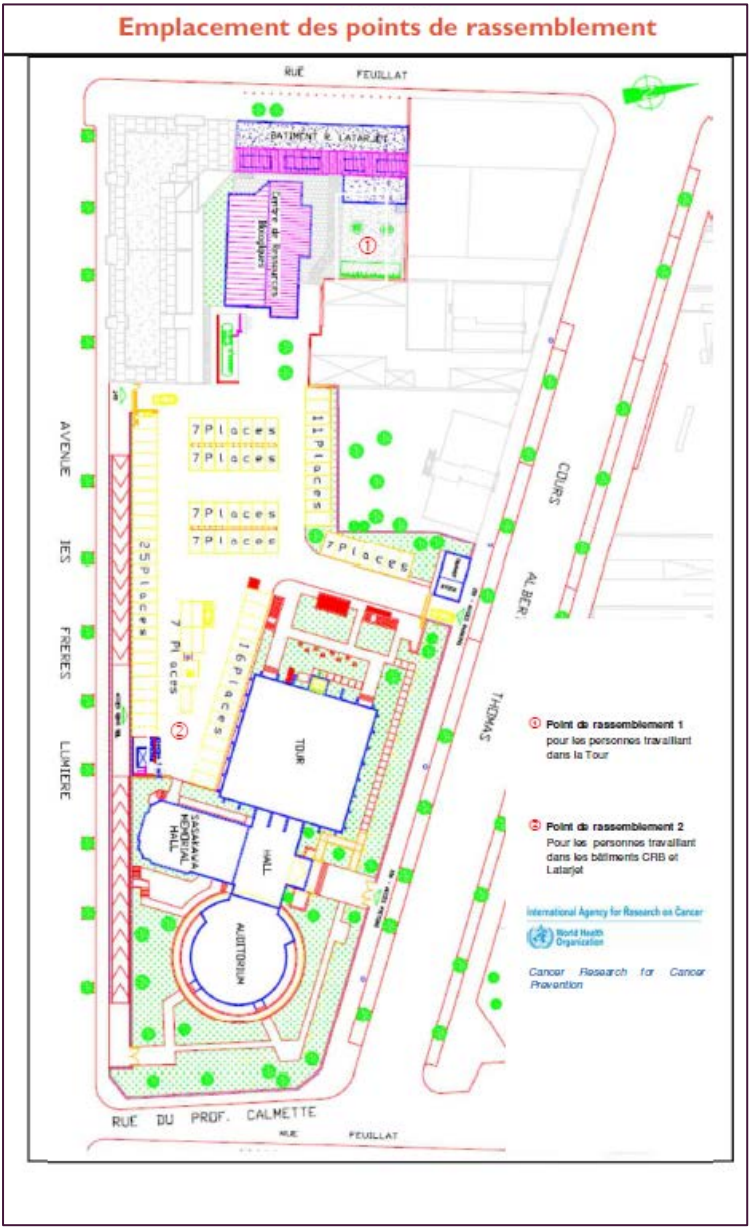
Those who are disabled, collapse, or suffer a panic attack during an evacuation should be guided or carried to the safety of the stairwell by two to four other staff members, and assisted to the ground floor. Reception should immediately be notified if someone is injured, so that emergency services can be alerted for help.

Once evacuated, staff should proceed to the appropriate emergency assembly point.

For personnel who work in the Tower, the assembly point is next to the bicycle shed outside the Latarjet building.

For personnel who work in BRC or Latarjet, the assembly point is in the car park (see map below).

Emergency Assembly Point Locations



Staff must remain at the assembly point until they have obtained further instructions from the IARC Safety Team. All safety instructions must be obeyed.

Staff vehicles will remain in the car park until the danger has passed.

All vehicles should be parked properly in marked parking spaces in the car park to allow easy access for fire fighters and other emergency vehicles in case of an emergency.

Staff are encouraged to familiarize themselves with the location of fire extinguishers and emergency exits, as well as safety instructions and the names of emergency wardens on their floor.

To accustom staff to the sound of the alarm, it is activated for 15 seconds at noon on the first working Monday of each month in the Tower, and periodically in BRC and Latarjet.

2. Accidents and Incidents

Anyone who witnesses:

- an explosion or fire
- a bodily injury, person fainting, etc.
- an electrocution (quickly cut the power supply if possible)
- a corrosive, biologically active, or radioactive substance being spilled or splashed

...must break the glass over the red emergency button to alert the IARC Safety Team, who are trained in first aid.

The red emergency button can be found next to the lifts in the Tower, opposite the stairwell in BRC, and near the emergency exits (two per floor) in Latarjet.

Activating the red emergency button does not sound an alarm but immediately alerts members of the IARC Safety Team, who are trained in first aid, to take the necessary precautions to protect staff and to contact the fire brigade or S.A.M.U. (French medical emergency services), if necessary.

Before 8:00 am and after 5:00 pm, the alarm notifies security guards at reception, who know how to proceed in case of an accident.

If the red emergency button does not work or for non-emergency incidents, please call the switchboard or a security guard directly by picking up the red telephone located on each floor, near the first-aid cabinet.

If necessary, the IARC Safety Team or the Staff Physician will contact the appropriate medical services.

In exceptional circumstances, and only if the first two procedures have not worked, call one of the following numbers for help:

Emergency Hotline	112
Poison Control Centre	04 72 11 69 11

Please remain with the injured person until help arrives.

If further medical assistance is needed, the person must be taken to hospital either by ambulance, or be accompanied by the S.A.M.U. or the fire brigade.

In the event of an accident on the way to or at work, staff must complete an accident report form and, if applicable, collect a safety data sheet (SDS) related to the chemical involved.

The staff member involved in the accident may be accompanied to hospital by a colleague. A member of the IARC Safety Team will notify the person's emergency contact listed in the Personal Information Portal.

The administrative procedure for declaring an accident is as follows:

- Any staff member who has an accident is required to complete form WHO 417 and have the external attending doctor fill in form WHO 418. These forms are available from Human Resources (HRO) on the 2nd floor of the Tower (Office 216) or by clicking on the links above. Forms

can also be obtained, before being transferred, from the IARC Safety Team or security guards (during non-office hours).

The staff member must give form WHO 417 to their Group Head, who will report the details of the accident, and in particular:

- if the staff member was on duty during the incident
- what their particular duties were at the time of the accident, the circumstances, the date, and the location.

The Group Head may submit their report on a separate sheet of paper attached to form WHO 417. The duly completed form should then be sent to HRO.

Form WHO 418 must be completed by the attending doctor and then sent to the medical services section at IARC, who will forward the file to the medical department in Geneva.

If a third party is engaged in the liability, form WHO 800 must also be completed.

- All early career or visiting scientists (ECVS) are insured by the Cigna insurance company.

In the event of an accident, medical emergency, or hospital transfer, the staff member involved must create an account on the Cigna website, after requesting registration of their personal information by email to insurance@who.int. This service also covers coordination for hospitalization or medical evacuation.

By obtaining a username and password, the staff member involved can fill in the Cigna declaration form and directly submit the corresponding invoices for reimbursement.

If a staff member is unwell but does not need to go to hospital, they can:

- Use the bed available in the staff medical room with consent from the Staff Physician if he/she is on site, and if not, then with consent from the IARC Safety Team. The staff member must be accompanied by a colleague until they feel well enough to leave the medical room. The name of the person, as well as the name of the colleague keeping them company and the date and time of entry and exit must all be recorded by a member of the IARC Safety Team in the notebook reserved for this purpose at reception;
- Be escorted home by a colleague after getting approval from the Staff Physician or the IARC Safety Team;
- Be picked up by a family member or close friend who was contacted by the Staff Physician or the IARC Safety Team.

3. Reporting an Accident or Incident

Anyone who has an accident or incident at IARC must complete a declaration form, which is available on the intranet. This information will help the Staff Physician and the Laboratory Safety Officer identify the cause and propose solutions to prevent the situation from reoccurring.

4. First-Aid Supplies and Equipment

Having first-aid and safety equipment available can be very useful in the event of an accident.

Red fire extinguishers **using water or CO_2** can be used to put out paper fires, or electrical and solvent fires, respectively. They are available on every floor throughout IARC. Fire-safety training is offered annually to familiarize staff on how to use them.

Important: Never use a fire extinguisher to put out a fire on a person, because the pressure of the spray is very strong and could cause injury.

Fireproof blankets are available in the corridors of each laboratory floor, and can be used to extinguish clothing fires.

Safety showers are available on each laboratory floor for emergency washdowns in case a staff member is splashed or contaminated by corrosive chemicals. These green portable safety showers can also be found on the 13th floor of the Tower and on the ground floor of BRC.

Emergency defibrillators are located in the hallway on the ground floor of the Tower, and in the ground floor corridors of both BRC and Latarjet.

First-aid kits are available on each floor and at reception.

First-aid kits are available on every floor, and are equipped with only the basic necessities.

- **Wounds**: Breathable stretch gauze (Nylex Fix™ 7 m x 4 cm) to wrap around compresses, Biseptine™, Dakin™ cleaning solution, sterile compresses (5 x 5 cm), disposable gloves, antiseptic gel, strip bandages, and pre-cut bandages
- **Miscellaneous**: Scissors and small garbage bags for waste

On each laboratory floor:

- **Eye contaminations**: Eye rinsing solution; in addition, eye wash kits are available in the hallway of the 13th floor of the Tower
- **Mild burns**: Biafine™ cream

First-aid supplies are managed by Jean-Alain Pedil, Building Safety & Security Assistant. To help ensure there is enough in stock, please report any use of Dakin™ solution so that it can be replaced.

More extensive first-aid supplies can be obtained by contacting reception or a security guard on duty in the Tower.

- **Wounds**: breathable stretch gauze (Nylex Fix™ 7 m x 4 cm) to wrap around compresses, emergency haemostatic dressing (Thuasne™ brand) for bleeding wounds, Bisontine™, sterile compresses (5 x 5 cm), Dakin™ cleaning solution, disposable gloves, antiseptic gel, Leukomed™ sterile adhesive bandages (7 x 5 cm), pre-cut bandages, Scholl Tubegauz Bandage™ tubular gauze with applicator, Steri-Strip™ bandage strips
- **Mild burns in laboratories**: Biafine™ cream
- **Bruises and swelling**: Coheban™ compression band, Arnica (arnica oily macerate) cream, cold pack
- **Eye irritations**: Dacryosérum™ single-dose eye-rinsing solution
- **Pain relief**: 500 mg paracetamol tablets (note how many taken; maximum 2 at a time).
- **Stomach pain or upset:** Maalox™ oral suspension sachets
- **Miscellaneous:** a notebook tracking all supplies dispensed from the first-aid kit at reception must be filled in; tweezers for splinters and small garbage bags for waste are also available.

MEDICAL SERVICES AT IARC

The IARC Staff Physician provides medical services for IARC personnel. He/she is located in Office R10 on the ground floor of the Tower, at ext. 8426.

Please contact his/her secretary Isabelle Poncet in Office 506 or at ext. 8027 for further information.

1. Scheduling a Medical Appointment

To schedule an appointment, please send an email to MedicalServices@iarc.fr. To make sure your request is treated in a timely fashion, use only this email address and do not send an email directly to the secretary or physician.

2. Medical Consultations

The Staff Physician provides consultations for the following:

- Pre-recruitment medical examinations
- Periodic medical examinations, full medical examinations, biological examinations (blood and urine tests) for staff:
    - Under the age of 40 years: a full medical examination every two to three years
    - Age 40 to 55 years: a full medical examination every two years
    - Age over 55 years: a full medical examination every year

The frequency of these examinations is determined by the Staff Physician, depending on the person's health and risk factors. Laboratory personnel undergo yearly medical examinations, regardless of age.

The Staff Physician also performs:

- End-of-contract medical examinations
- Return-to-work medical examinations after an absence of three weeks or more, maternity leave, or a work accident

When medical examinations are due, staff are notified and sent the necessary documents. An appointment can then be arranged with the Staff Physician.

Other services:

- Medical advice related to business trips
- At least one full medical examination for ECVS staff who work a minimum of six months in a laboratory at IARC
- Medical surveillance for ECVS staff with problems at work or serious illnesses
- Vaccination programmes against influenza
- The Staff Physician also coordinates with medical services at WHO for:
  - special prescriptions (not routinely covered by the WHO Health Insurance)
  - follow-up for accidents incurred at work or while commuting to work.
- The Staff Physician validates staff sick leave requests.
- Pregnancy announcements.

All female laboratory staff are required to inform the IARC Staff Physician about their pregnancy as soon as possible.

Except those who work in a laboratory, female staff should declare their pregnancy to the Staff Physician before they reach 20 weeks.

3. Laboratory Accidents

Procedures to follow in case of a laboratory accident can be found in the following chapters:

- Accidents involving exposure to blood or biological fluids
- Accidents involving chemicals
- Accidents involving carcinogens
- Accidents involving nitrogen
- Radioactive contamination

IARC LABORATORY RULES

LABORATORY SAFETY

1. General Guidelines

Only trained staff, specifically hired to carry out research or work with biological specimens in the laboratory, may do so.

In addition to adopting good preventive and safety practices, vaccinating personnel against certain infectious agents provides an additional means of protection.

Vaccination against hepatitis B virus (HBV) is mandatory for all staff working in IARC laboratories, regardless of their role (technician, research assistant, student, researcher, etc.). When necessary, a vaccination certificate (confirming up to six doses) for non-responders should be provided.

Non-responders are allowed to work in the laboratory under certain conditions, defined by the Staff Physician. They will be monitored at least once per year for serum markers of HBV.

Staff are also strongly encouraged to inform the Staff Physician, on a confidential basis, if their state of health puts them at risk by working with chemical or biological substances or being exposed to infectious agents.

With the help of their supervisor, new laboratory staff must complete a form titled "Commitment to be undertaken by all new personnel working in the IARC laboratories", which outlines the tasks to be performed.

Laboratory personnel must undergo special training given by the Laboratory Safety Officer, Stéphanie Villar. After the training session, a document is provided summarizing the code of conduct in the laboratory. This document must be signed by both the staff member and the Group Head, and serves as an agreement that commits staff to respect the rules set in IARC laboratories.

Before staff can work in the L3 laboratory, they must first consult with the Staff Physician and complete training with the Laboratory Safety Officer.

Laboratory staff who work with carcinogens may do so in Room 805, but only after they have completed specific training on the topic with the Laboratory Safety Officer.

All incidents, even minor ones, must be reported to the Staff Physician or the Laboratory Safety Officer via an incident report.

2. Laboratory Safety Representatives

Safety representatives are appointed by Group Heads on each laboratory floor to help ensure compliance with good practice. Representatives also serve as a point of contact for each floor to identify needs, organize equipment maintenance, schedule interventions, receive packages, etc.

Laboratory Safety Representatives

BMA	Anne-Sophie Navionis	Béatrice Vozar
MMB	Michael Korenjak	
EGE	Cyrille Cuenin	Aurélie Salle
ICB	Cecilia Sirand	Sandrine McKay-Chopin
GCS	Nathalie Forey	Amélie Chabrier
LSB	Sophie Guillot	Elodie Colney
WCT	Christine Carreira	
GEP	Priscilia Chopard	

Laboratory work is a team effort, in which the safety of each staff member is closely linked not only to their work practice but also to that of their colleagues.

3. Good Laboratory Practice

Listed below are best practice guidelines to respect in the laboratory, which are mostly common sense and should be followed to reduce the risk of exposure in laboratories.

- Laboratory coats and gloves must be worn at all times.
- It is strictly forbidden to eat, drink, or store food in the laboratory.

- It is also forbidden to store food or drinks anywhere in laboratory work areas. Cold rooms must not contain food or drinks.
- Listening to music using earphones is prohibited.
- Mobile phone use should be kept to a minimum, and never while wearing laboratory gloves.
- It is prohibited to apply cosmetics while in the laboratory.
- Laboratory gloves are not fully waterproof and must be changed regularly, and immediately in case of contamination.
- Wearing laboratory coats and gloves is prohibited in offices, the cafeteria, lifts, stairwells, the lobby, or the car park.
- It is important for staff to wash their hands regularly in a clean sink, especially after working with biological substances or having worn gloves, and when leaving the laboratory.
- Safety glasses, a face shield (visor), and other protective equipment is mandatory to protect the eyes and face from being splashed by corrosive liquids or impacted by objects or artificial ultraviolet radiation.
- Open-toed footwear is prohibited in the laboratories and biological specimen storage rooms.
- Workbenches and pipettes should be cleaned with disinfectant and/or 70% ethanol at the end of each use, or immediately in case of contamination.
- Laboratories must be kept clean, tidy, and free from anything that does not involve laboratory work. Workbenches should not be cluttered, and should only contain essential equipment or tools for conducting routine work and ongoing research.
- Staff should regularly clean biosafety cabinets (MSPs), fume cupboards, centrifuges, and all laboratory equipment with a decontaminant and/or 70% ethanol.
- Leave shared workbenches clean and with all necessary equipment to start an experiment.

- Replace boxes of pipette tips and tubes when they are empty, and put them in the appropriate container (racks designated for washing or recycling).
- Notify the person in charge of supplies when a reagent or item is almost finished.
- Water baths, centrifuges, hoods, etc. should be cleaned regularly by all staff working in the laboratory.
- Cardboard boxes should not be stored in cell-culture rooms or cold rooms, to prevent contamination.
- Solid or liquid laboratory waste must be collected and disposed of in suitable containers.
- Groups are responsible for defrosting freezers regularly, and at least once per year for freezers with temperatures of −20 °C. Ice must be regularly removed from freezers at −80 °C.
- Laboratory reagents and equipment are not permitted in stairwells.
- When laboratory work requires moving to a different floor, staff must remove their laboratory coat and gloves, and then take the red lift, using a suitable container to transport any laboratory materials.

For safety reasons, staff should avoid working alone in the laboratory during non-office hours. Staff who have to perform research during weekends, holidays, or evenings should try to be accompanied by a colleague. Always inform the security guard of the time and location of where you will be, so they can adapt their rounds and verify your safety and security.

4. Personal Protective Equipment

4.1 Laboratory coats

For the safety of all staff members, it is mandatory to wear fastened lab coats while working in the laboratory.

Lab coats must be removed before leaving the laboratory, and should be hung on the coat rack. Lab coats are purchased by IARC, and feature an inside pocket to hold a badge that allows it to scanned without risk of contamination when entering a restricted access zone.

Lab coats are not named, but they are sorted by size and rotated in use for cleaning, which is handled by an external service provider.

Green coats should be worn in cell-culture laboratories, while white coats can be worn in normal laboratories and biological sample storage rooms.

Staff must wear lab coats for all work done in the laboratory, and can obtain one in Room S18 (used for lab-coat storage), if needed.

After emptying the pockets, staff should bring their used lab coat to the basement and place it in the laundry cart for washing. Coats are collected by an external cleaning company on Thursday mornings, and clean ones are dropped off at the same time.

To ensure that there are sufficient clean lab coats available each week, please switch coats and drop off soiled items for cleaning on Wednesdays before the cleaning company collects them on Thursdays.

Before leaving IARC, laboratory personnel are responsible for dropping off their lab coats for cleaning.

Disposable coats are available for specific activities, such as working with carcinogens in Room 805 or the L3 laboratory.

4.2 Laboratory gloves

Gloves must be worn at all times while working in the laboratory.

Nitrile gloves available in IARC laboratories are not all of the same quality, and this depends on their thickness. Please remember that laboratory gloves are not fully waterproof, and it is important to change them regularly in case of contact with solvents or risk of contamination.

Grey gloves offer protection for standard laboratory work. When working with solvents or carcinogens in the L3 laboratory, orange/purple gloves are more suitable because of their thickness.

Gloves must always be removed before touching uncontaminated objects (such as telephones, door handles, electrical switches, etc.) and body parts (hair, face, etc.) to avoid risk.

After use, gloves should be disposed of in contaminated waste bins even if they appear clean. Please wear clean gloves when working on a computer in the laboratory.

Gloves should never be worn outside the laboratory or laboratory storage areas.

Always remember to wash your hands in a clean sink after removing gloves and before leaving the laboratory.

4.3 Masks and safety glasses

Certain laboratory experiments require the use of safety glasses. The Laboratory Safety Officer provides all new laboratory staff with a pair of safety glasses or goggles. During these experiments, staff should not wear contact lenses.

Safety glasses must be worn:

When handling any of the following substances:

- Liquid nitrogen (mask recommended)
- Strong acids, such as hydrochloric acid, sulfuric acid, nitric acid, trichloroacetic acid, glacial acetic acid, etc.
- Strongly basic solutions, such as sodium hydroxide, potassium hydroxide, etc.
- Corrosive agents, such as phenol, etc.
- Halogenated solvents, such as dichloromethane, chloroform, etc.
- Organic solvents, such as acetone, isoamyl alcohol, etc.
- Radioactive isotopes
- Carcinogenic compounds
- Biological fluids
- Chlorine bleach

When working with any of the following equipment:

- High-performance liquid chromatography (HPLC) systems, when injecting, and carrying out any operation involving the disconnection of a solvent system under pressure
- Rotary evaporators, lyophilizers
- Speed-vac evaporators
- Ultra-centrifuges

Masks or safety glasses are mandatory for all laboratory work that involves increased risk, including danger of projection, explosion, or implosion.

4.4 Protection against UV radiation

For laboratory work involving eye exposure to ultraviolet (UV) radiation, special UV safety glasses or UV visors must be worn. This type of safety equipment is available near the UV-emitting equipment. The safety glasses given to newly hired staff are also equipped with anti-UV protection.

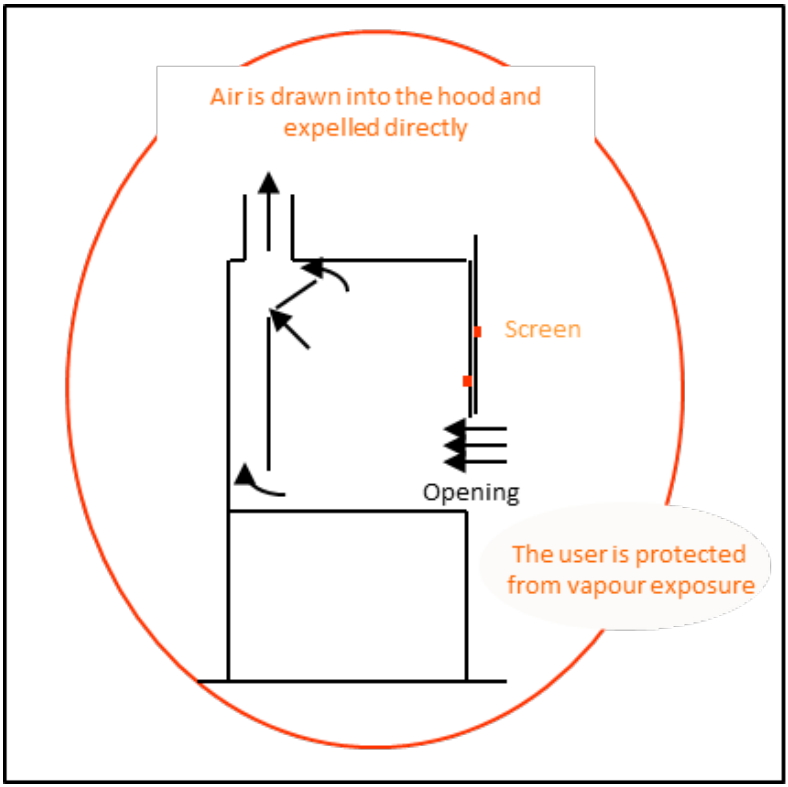
5. Protective Equipment

Laboratory equipment (exhaust hoods, chemical hoods, and biosafety cabinets) is tested annually by an external company to ensure that it is in working order. The dates of these tests are listed on the front of the equipment and on the intranet.

5.1 Exhaust hoods

Many laboratories at IARC have exhaust hoods to protect laboratory personnel from exposure to solvent vapour, by releasing air from the hood directly outside.

All laboratory experiments that might generate toxic vapors must be done in an exhaust hood.



For greater protection, lower the front sash as much as possible (the maximum height allowed depends on the alignment of the two arrows on the side) and leave a 10 cm-wide space behind the glass, all along the length of the exhaust hood.

Exhaust hoods must not be overloaded with excessive equipment or bulky appliances, which may disturb airflow and reduce protection.

All device installations in an exhaust hood must be validated with the manufacturer and the Laboratory Safety Officer to avoid airflow disturbance, and therefore prevent backflow of solvent vapours into the laboratory.

Due to the age of the equipment, using the evacuation systems at the back of the exhaust hoods is strictly forbidden.

A red light and/or buzzer indicates a malfunction. If this occurs, staff must stop all work and immediately send an email notification to aso-tech@iarc.fr.

In the absence of a ventilated solvent cabinet, exhaust hoods can be used as storage space for solvents regularly used in laboratories. However, the quantity of bottles stored should be limited to avoid overloading the exhaust hoods.

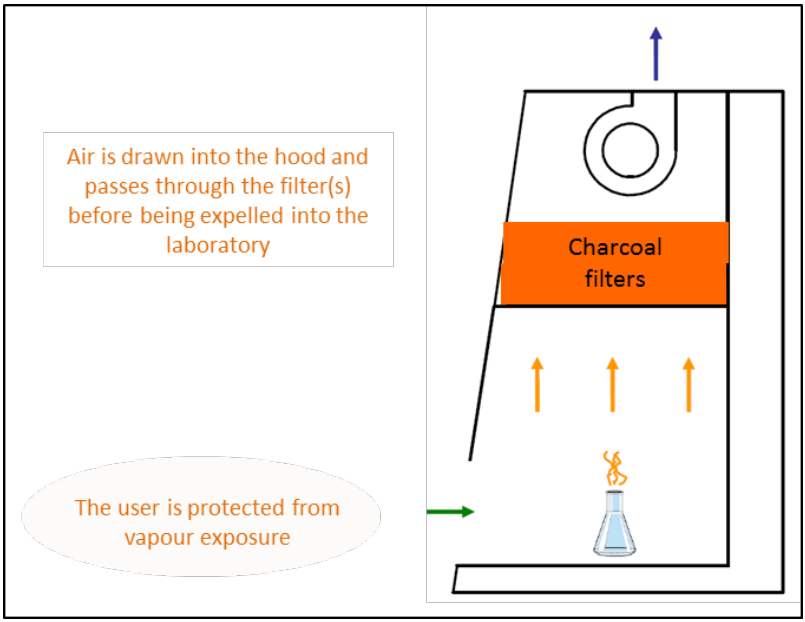
As a reminder, solvent supplies must be kept in the basement storage room, and only bottles used daily may be stored in laboratories.

5.2 Chemical hoods

Chemical hoods are available in several IARC laboratories.

In place of exhaust hoods, chemical hoods protect laboratory staff against solvent vapour by filtering the air through charcoal filters before it is released into the lab.

It is important to ensure that the filters in place work properly and are adapted to the substances being used.



Chemical hoods should never be used to store solvents.

5.3 Biosafety cabinets (Class II)

Biosafety cabinets are available in several IARC laboratories, notably in cell-culture rooms and laboratories reserved for work with biological samples.

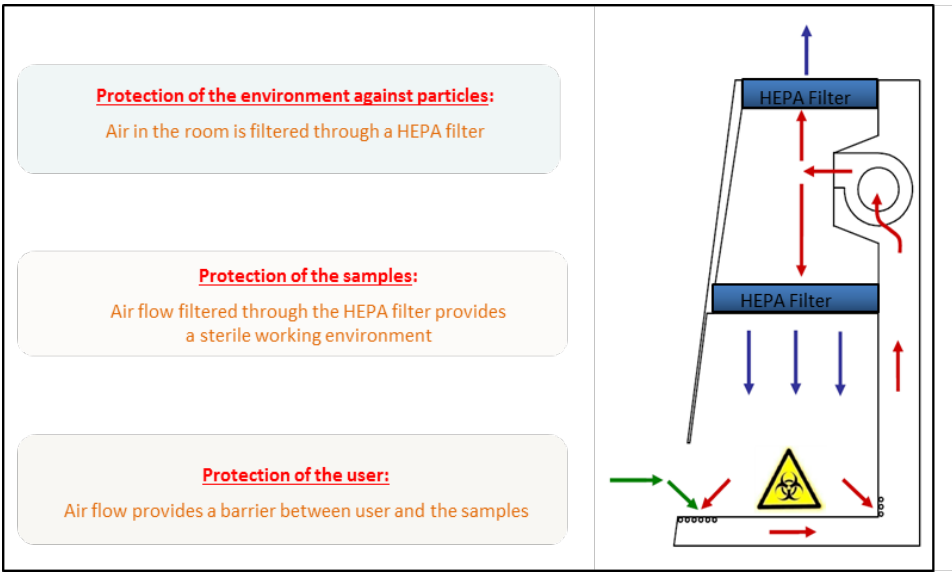
The cabinets are equipped with HEPA filters that trap particles with sizes equal to or larger than 0.2 microns. The HEPA filters filter downward airflow, ensuring that the hood is sterile and the specimens are protected. The air released into the laboratory also passes through a HEPA filter, which provides environmental protection against particles.

Caution: HEPA filters do not remove chemicals or solvent vapours, which are released into the laboratory. Incoming and downward airflow on the

samples provide a barrier that protects the user from the specimens being handled.

Biosafety cabinets protect the environment, the user (from biological risks), and the specimens involved in the experiment.

It is forbidden to work in a microbiological safety cabinet if the malfunction alarm is activated. An email should immediately be sent to aso-tech@iarc.fr.



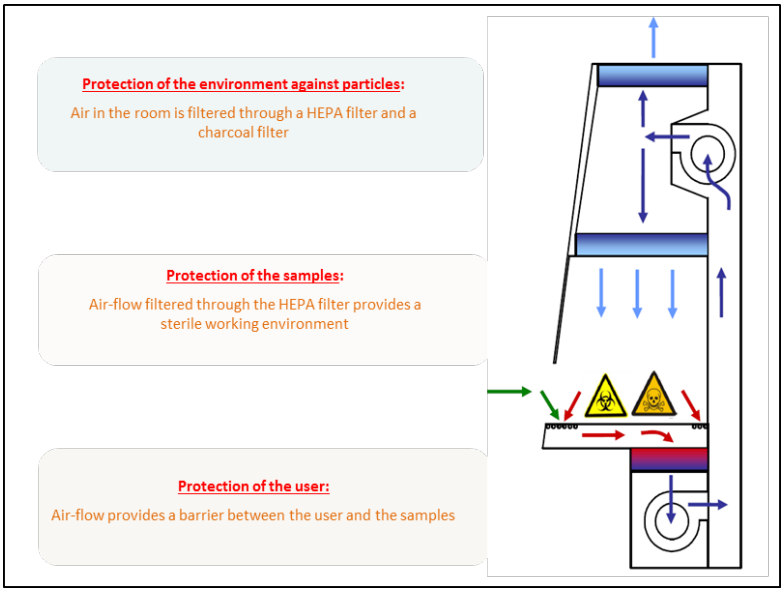
Biosafety cabinets must be used whenever the experiment involves cell cultures or biological samples.

Shared laboratories in the basement of the Tower SMH/S4 and S08, accessible to all laboratory staff, are equipped with laboratory workbenches and biosafety cabinets for receiving, sorting, aliquoting, handling, and shipping biological specimens.

Please contact the Laboratory Safety Officer at ext. 8513 for more information.

5.4 Cytosafe biosafety cabinets

The Cytosafe cabinet is both a microbiological safety cabinet and an exhaust hood. In addition to the usual features of a biosafety cabinet, it has an extraction system and a charcoal filter that traps chemical vapours before air is released.



In addition to protecting specimens during handling, the Cytosafe cabinet protects the user from biological and chemical risks.

Located in Laboratory 805, the Cytosafe microbiological safety cabinet should be used for handling carcinogenic substances.

LABORATORY EQUIPMENT

1. Overview

At IARC, laboratory equipment that requires specific attention is divided into two categories: equipment that poses a risk to the user (burns, electrocution, radiation, etc.) and equipment that is likely to be damaged if misused. Some instruments may fall into both categories.

Staff needing to use laboratory equipment must obtain information from a trained operator on how to use it, operational protocols, and potential hazards.

Some equipment cannot be used without first completing a training session given by a trained operator or the manufacture.

Therefore, only a limited number of laboratory personnel can operate specific equipment (microtomes, digital scanners, mass spectrometers, etc.).

Other equipment is available for use by several Groups and can be booked via a reservation system; it is important to check the reservation system before using any equipment.

Microwave ovens are available in IARC laboratories to heat aqueous solutions, and should not be used to heat food or organic solvents. Metal objects should never be put in the microwave oven.

Heating aqueous solutions in hermetically sealed glass bottles in a microwave oven may cause an explosion. To avoid risk when preparing agarose gels, please make sure the bottle or glass container is covered with a paper towel, and not an airtight stopper, so that gas can escape.

Laboratory equipment should be cleaned regularly by users with a Surfa'Safe™ type detergent. Cleaning should especially take place after substances have been splashed or sprayed on the equipment.

2. Equipment in Operation during Non-Work Hours

2.1 Equipment in continuous operation

All equipment left in continuous on-mode (cold rooms, incubators, etc.) must be labeled with the name and telephone number of at least two contact people in case a problem arises.

The Group Head is responsible for ensuring that contact names and phone numbers listed on laboratory equipment are kept up to date.

All freezers are connected to an alarm system that allows the person on call to be notified in case of a problem. If a freezer is not part of the on-call system, it must (like incubators or cold rooms) be labelled with the name and telephone number of at least two contact people in case of an incident.

2.2 Other situations

Sometimes laboratory work needs to be carried out at night, at weekends, or on public holidays.

For remote monitoring and malfunction alerts when the user is absent, laboratory equipment must be identified with coloured tape that lists the name of the person using the instrument.

When working outside office hours, the following information must be provided to security guards, either directly or via the Building Safety & Security Assistant, Jean-Alain Pedil: the laboratory room number, equipment name, name of the person conducting the experiment, working conditions, if necessary, and telephone number of the person in charge. This information allows security guards to verify that everything is in order during their rounds and to reach the contact person in case of a problem. It is important to update the information as needed.

In some cases, an equipment malfunction may present a risk and/or result in damage to the device itself. It can also lead to the loss of valuable specimens or compromise the outcome of a series of experiments; this may be avoided if the person is contacted quickly.

3. Obsolete and Out-of-Order Equipment

All obsolete or out-of-order laboratory equipment should be disinfected with Surfa'Safe™ before being discarded. A decontamination certificate must be completed and attached to the instrument.

- If the equipment has a purchase value of less than 3000 euros, a removal request can be sent directly to ASO.
- If the equipment has a purchase value of more than 3000 euros, it must be deleted from inventory before a removal request can be made. To do this, the Group must fill in and send an asset disposal request form to inventory@iarc.fr and wait for approval from the Property Survey Committee (PSC) before submitting a removal request.

If the equipment is obsolete but still in working order, it can be given to another IARC Group or an external party. Before the equipment is removed, it should be decontaminated, deleted from inventory, if necessary, and approved by PSC.

See the "How To..." guide for more information.

LABORATORY COLD STORAGE

1. Cold Rooms

Food and drink must not be stored in laboratory cold rooms, even temporarily.

To prevent the growth of certain micro-organisms, nothing should be left on the floor. Cardboard boxes are prohibited in cold rooms, and all breakable bottles should be placed in plastic or metal trays in case of breakage.

Each cold room must be maintained by the IARC Group that uses it. The rooms are cleaned and decontaminated annually by an external cleaning company.

Group Heads have selected personnel, to be contacted by the security guards, who are responsible for managing equipment breakdowns that happen during non-work hours. If a problem arises, contact information is listed on each cold-room door. This information must be checked regularly by the Group, and updated if necessary.

2. Freezers and Refrigerators

2.1 Equipment monitoring

Cold storage equipment at IARC is identified by:

- ID number
- Inventory number

- An orange label that lists the Group name, temperature, and temperature-control system

Freezers for temperatures at −20 °C, −40 °C, and −80 °C are controlled by a temperature monitoring system (Sirius or GTC) that alerts the guard on duty at reception and Elodie Caboux, Biobank Process Management Assistant, if the critical temperature is exceeded.

If an alarm is activated during office hours, technical staff will take action immediately and ask those involved to transfer the contents to a backup freezer, if necessary.

During non-office hours, freezers for temperatures at −20 °C, −40 °C, and −80 °C are managed by an on-call system, or, if needed, can be monitored by security guards, who check on equipment in continuous operation during their rounds.

Refrigerators, however, are not connected to a monitoring system, and must be checked regularly by laboratory staff for proper functioning.

2.2 Defrosting and decontaminating freezers and refrigerators

Groups are responsible for carrying out equipment maintenance at least once per year, including:

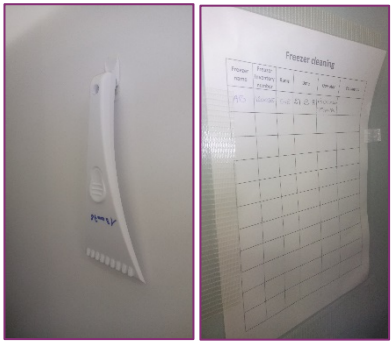
- *Defrosting and cleaning −20 °C freezers*
- *Cleaning refrigerators*

Ice that accumulates on the doors, sub-doors, and door seals of −80 °C freezers must be removed regularly.

Cleaning can be carried out using Surfa'Safe™.

To reserve a backup freezer or refrigerator during cleaning periods, please contact Elodie Caboux at ext. 8039.

Before defrosting or cleaning a freezer, please contact the Laboratory Maintenance Technician Thomas Cler (ext. 8081), a security guard at reception (ext. 9), or Elodie Caboux (ext. 8039) to inform them of any change in temperature.



A scraper is attached to the side of each freezer (−20 °C, −40 °C, and −80 °C). Please return it after use. A cleaning tracking sheet is also attached to each freezer and must be filled in after each cleaning or defrosting (more information is available on the intranet).

If a freezer or refrigerator is contaminated with a biological or chemical substance, it must be decontaminated immediately, and a notification must be sent to Stéphanie Villar (Laboratory Safety Officer) or Jean-Alain Pedil (Building Safety & Security Assistant), or to Elodie Caboux if it involves SMHS1, S18, or S15.

2.3 On-call system

During non-office hours, a rotating contact system has been put in place to help monitor freezers.

Groups who wish to include freezers to be monitored must provide the name or names of those responsible. The commitment is one week, and rotation takes place on Monday.

In case of breakdown or alarm, during non-work hours, the contact person should be reachable at any time so security guards can alert them via the mobile number provided. The person should, if necessary, be able to reach IARC within one hour of the call to transfer contents to a backup freezer (available in SMHS1, S15, and S18).

After a malfunction, the contact person must complete an "incident report" form provided by security staff. The report gives information on the breakdown, the freezer, and the location of samples transferred. It should be given to Jean-Alain Pedil during the night shift, and must be counter-signed by the Group Head and then returned to LSB.

It is the Group's responsibility to repair or replace the broken freezer. They must also return the backup freezer in less than a month. A maintenance check is performed regularly on backup freezers, and any unidentified samples are thrown away.

At the end of each on-call week, the contact person must:

- Transfer the phone to the person responsible for the following week,

- Complete the on-call report by listing the dates and any interventions that took place, if applicable.

Compensation and/or a lump sum may be given according to professional category.

Staff category	Compensation per week of on-call duty	Compensation for on-site displacement due to on-call duty
GS	1 day	50 euros
P	Not applicable	50 euros
ECVS	1 day	50 euros

TRANSPORTING LABORATORY MATERIALS

Sometimes it is necessary to move between different laboratories to perform an experiment, collect samples or reagents, etc.

When moving between floors, taking the stairs is strictly forbidden for safety reasons. Staff wearing lab coats or gloves, or carrying laboratory supplies, ice or solvents should not be in the stairwells.

When moving from one place to another during a laboratory experiment, staff must use special transport containers and take the red lift. Laboratory supplies must be packed in dual containers (e.g. tubes placed in a closed box or on a closed rack) before being placed in a special cooler.

Lab coats and gloves must be removed before entering the red lift, after everything has been packed according to the safety instructions. Transport containers are stored in cabinets located in the hallway in front of the red lift.

Please remember that containers should not be brought into laboratories, and should be handled/transported without wearing a lab coat or gloves.

If you do not use the trolley provided for this purpose, the transport container should be placed on the floor of the hallway adjacent to the laboratory.

LABORATORY SERVICES

1. Histopathology Laboratory

The histopathology laboratory is located on the 7th floor of the Tower. It offers services to create tissue sections that can be stained using haematoxylin and eosin (H&E) or immunohistochemistry, and then analysed using a range of imaging equipment. The laboratory also provides access to expertise in pathology offered by several groups at IARC.

The following services are currently available in the histopathology laboratory, but others may be added:

- Tissue preparation, fixation, paraffin-embedding/block creation
- OCT coating
- Block re-embedding
- Cryostat tissue sectioning
- Microtome tissue sectioning
- Routine and special staining
- Immunohistochemistry/chromogenic in situ hybridization (CISH)
- Immunofluorescence/fluorescence in situ hybridization (FISH)
- Immunohistochemistry CINtec® P16 kit
- Slide scanning using an Aperio Leica SCN400 Digital Scanner
- Slide scanning using a Glissando Digital Scanner

For safety reasons, IARC groups do not have direct access to equipment in the histopathology laboratory. All experiments are done by a research assistant specializing in histopathology.

For more information on laboratory activities and procedures, please click here.

2. Mycoplasma Testing

A quarantine room exists to control potential contamination of cell lines by mycoplasma.

Under the supervision of the Laboratory Safety Officer, Stephanie Villar, LSB conducts mycoplasma testing on Tuesdays and cell thawing on Fridays.

All cell lines received at IARC that have not yet been tested for mycoplasma must be tested in the quarantine room before entering a cell-culture room.

If you wish to test or thaw cells, please send an email to cells@iarc.fr indicating the number of specimens, name of the cell line(s), and passage

number before 4:00 pm on Thursdays for testing, and before 4:00 pm on Mondays for defrosting.

3. Common Laboratory Store

A common laboratory store is available on the ground floor of the Tower (Rooms S03/S04) and is managed by Henri Cordier, Administrative & Laboratory Clerk.

The store offers laboratory, molecular biology, and cell-culture supplies, as well as refills for the glassware washing service shared by all Groups. Under the supervision of Stéphanie Villar, Henri Cordier is in charge of restocking inventories, as required.

Please bring a purchase order to the store during opening hours (9:30 am to 11:00 am daily) to collect any laboratory supplies you may need.

The list of supplies available is not exhaustive and may be updated according to needs and activities. If you would like to add a product to the list, please feel free to contact Stéphanie Villar by email.

4. Common Chemical Store

A long-term supply of solvents used by various IARC Groups is stored in the basement near the loading dock. Absolute ethanol, 96% ethanol, and 70% modified alcohol (in 1-litre and 5-litre sizes) as well as methanol and isopropanol (in 1-litre size) are also stored in the same room.

Solvents can be collected daily from 10:00 am to 10:30 am and 2:00 pm to 2:30 pm. Please contact Bruno Amara (ext. 8389) or, in his absence, Thomas Cler (ext. 8081) for assistance.

5. Glassware Washing Service (8th Floor)

LSB provides a glassware washing service for all IARC laboratories under the supervision of Stéphanie Villar.

The service is located in Rooms 803 and 804, and remains locked for security reasons when staff are not present. For specific requests, contact the glass washing team at laverie@iarc.fr.

Each morning, the person on duty collects glassware and plasticware used by IARC laboratories. Please make sure that glassware has been rinsed of contaminants before putting it in the wash cart.

Glassware is washed, dried, and sterilized, if necessary. Plasticware is refilled, sterilized, and stored in the relevant laboratories.

Other minor tasks, such as sterilization of cell-culture media or specific solutions, should be requested before 5:00 pm on the previous day, by email to laverie@iarc.fr. See How To for more information.

Selected staff in each laboratory are allowed to enter the glassware washing room when it is closed, to collect water, equipment, or autoclaved solutions.

Access is through Room 803, and a notebook must be filled in to record each visit (name of the person, reason for visit, date, time, and comments).

6. Pipette Verification

Henri Cordier provides an internal pipette verification service under the supervision of Stéphanie Villar. Located in Room 602, the service allows laboratory groups to easily monitor the equipment they are using.

P1000, P200, P100, P20, and P10 pipettes can be tested. P2 pipettes must be checked and calibrated by an external company.

Each laboratory group, in turn, gets priority for pipette verification for one month. Floor safety representatives are responsible for providing pipettes to Henri Cordier on a daily basis for verification. The goal is to keep things moving, and once verification is complete, the pipettes are returned to the relevant floor, with a verification certificate sent by email.

If the pipettes do not pass the verification, minimum maintenance is carried out (change of seal, lubrication) followed by another test. If the result is still not satisfactory, they must be sent to an external company for full calibration.

LABORATORY INTERVENTIONS

Laboratory staff may often be required to test/calibrate equipment and follow up on maintenance issues.

Laboratory safety representatives must be notified of any laboratory maintenance on their floor.

This allows them to inform the Group in advance to vacate or decontaminate the laboratory, where possible, so that experiments are not interrupted.

The laboratory safety representatives or staff members accompanying the maintenance worker are responsible for reminding them of basic safety rules and providing them with gloves and a lab coat (old green models), if necessary.

Lab coats for this purpose are stored in a cupboard across from Office R09 on the ground floor of the Tower. White lab coats are available for guests in IARC laboratories. The IARC staff member supervising the guest is responsible for providing them with a lab coat if they do not have their own.

The staff member must also drop the lab coat off in the basement for cleaning when the laboratory work is done.

ASO staff should wear green lab coats that are identified with a badge during laboratory interventions. Do not use lab coats reserved for laboratory staff. Additional badges can be requested from the Laboratory Safety Officer, Stéphanie Villar.

BIOLOGICAL SUBSTANCES

At research institutes like IARC, a risk of infection or contamination exists for both laboratory personnel and those around them, when biological substances or agents are being collected or used.

Therefore, it is in everyone's best interest that health and safety precautions are strictly followed when working with biological agents (bacteria, viruses, yeasts) or biological specimens (cells, blood and blood derivatives, secretions or organs of human or animal origin), to minimize the risk of contamination or infection.

All work involving biological agents and specimens must be done in laboratories equipped to provide the appropriate level of containment, and special precautions must be taken to inactivate potential disease-causing agents (viruses, bacteria, fungi) that can be found in biological substances.

Before starting work involving viruses, bacteria, cells, or other biological substances, staff must be aware of the risks and protection required, as well as any special instructions for decontamination and disposal of waste in the laboratory.

1. Collecting Biological Specimens

Zisis Kozlakidis, Head of the Laboratory Services and Biobank Group (LSB), manages resources for the collection of biological specimens, with help from the Biobank Process Management Assistant, Elodie Caboux.

Biological specimens are located in various shared storage rooms in the basement of the Tower and BRC, or temporarily on laboratory floors.

Biological samples in liquid nitrogen are stored in Rooms E01, E02, and E03 in BRC, and freezer storage and backup freezers are available in Rooms SMHS1, S15, and S18 in the Tower.

Room E21 in BRC is reserved for room-temperature storage of biological specimens, such as blood samples on blotting paper, histological slides, or paraffin blocks.

All biological specimens (including human tissue, animal tissue, and cell lines) stored at IARC must be recorded in the internal biological sample management database: SAMI (Sample Management for IARC Biobank).

The purpose of this database is to keep track of the biological specimen inventory and their internal or external whereabouts.

2. Using Biological Substances

This chapter outlines circumstances that may lead to accidental infection, and explains measures to minimize risk.

2.1 Blood, plasma, serum, and other biological fluids

Handling of blood products should always be treated with caution. Samples, even “control” samples, might be contaminated with hepatitis or even

human immunodeficiency virus (HIV). In addition, the serology of many samples is unknown.

Any biological sample may be contaminated with an infectious agent.

A lab coat, gloves, and safety glasses must be worn when working with blood samples.

Working in a biosafety cabinet is strongly suggested. Please contact the Laboratory Safety Officer, Stéphanie Villar, for access to shared rooms with this type of hood.

Gloves should be changed regularly and whenever they may have been contaminated by a sample. These measures are for your protection, and help prevent contamination of equipment and materials, as well as cross-contamination of samples.

If the outside of a tube appears to be contaminated, it must be wiped with a tissue soaked in detergent before opening. The tissue should then be thrown in the bin for contaminated materials, located under the hood.

Work surfaces and pipettes should be decontaminated with an Eligerm type detergent after each experiment, and during the experiment if necessary.

Once the gloves have been removed, don't forget to wash your hands.

2.2 Tissue sections

Various laboratory techniques involve working with tissue sections. Tissues are often fixed with formalin and then embedded in paraffin. Therefore, the risk of contamination is low, but lab coats and gloves must be worn, and working in a hood is strongly suggested.

Working with frozen sections involves a much greater risk, because viruses and other infectious agents are not inactivated. It is essential to work in a biosafety cabinet in these situations.

2.3 Cell lines

Cell lines from human and animal samples are routinely prepared and cultured in IARC laboratories. They must be handled in laminar-flow hoods (biosafety cabinets) that meet European safety standards and those set for L2 laboratories. Gloves and green lab coats are reserved for these laboratories, and must be worn at all times.

Special attention should be paid when preparing lymphoblastoid lines with the Epstein–Barr virus (EBV). Work should be done in the L2 laboratory in Room 920, because it is equipped with additional safety features, compared with an ordinary L2 laboratory. It is strongly recommended that anyone preparing or working with these types of cell lines be aware of their immunological status (to be verified with the Staff Physician) and take all precautions necessary.

3. Genetically Modified Organisms (GMO)

Any experiment involving the use of GMOs is subject to authorization from the Commission of Genetic Engineering, which is part of the French Ministry of Higher Education, Research and Innovation.

IARC has overall authorization for research being conducted in its laboratory groups. This authorization is valid for a period of five years, after which it must be renewed. Depending on the agents involved, the level of containment required is determined according to the Commission's classification system, and therefore the type of laboratory necessary for performing the experiment.

Stéphanie Villar must be informed before the start of any work involving the use of new GMOs, so that she can submit authorization changes, if necessary.

4. Main Sources of Contamination

The main causes of contamination of laboratory staff are negligence and overconfidence during routine experiments. No matter how experienced you are, please remember that an accident can happen at any time.

The main sources of contamination are listed below.

4.1 Aerosols

Working with biological specimens can generate highly contaminating aerosols, which, when inhaled, are one of the main causes of infection in the laboratory.

Aerosols can easily be produced during laboratory experiments by opening or closing tubes, pipetting, filtrating, sonicating, inoculating infectious agents, etc.

Be careful not to open tubes facing you, even under a hood. When biological fluids are projected onto mucous membranes (eyes, nose, or mouth), it can lead to contamination in the same way as onto damaged skin.

4.2 Scalpels, needles, and syringes

Getting pricked by a needle or cut by a sharp object are major potential sources of contamination in the laboratory. Scalpels and needles should be used only when necessary, and always handled with great care.

Never recap a needle or replace a used scalpel back in its original packaging. These items should be disposed of immediately after use in a Sharpsafe™ waste container.

4.3 Centrifugation

During centrifugation, buckets must be covered with lids to limit contamination in case a problem occurs (such as if a tube gets loose, breaks, or is defective). Centrifuges and buckets must be cleaned regularly and, in the case of contamination, disinfectant and modified alcohol should be used.

5. Containment Level

Unfortunately, it is impossible to assess the risks linked to the genetic manipulation of DNA, often referred to as genetic engineering or biotechnology. However, measures and recommendations have been established in many countries to limit potential hazards associated with this technology. Four levels of laboratory containment (L1 to L4) have been defined.

Regardless of the level of containment required, respecting laboratory best-practice guidelines is crucial for ensuring your safety and that of your colleagues.

5.1 L1 laboratory

A level 1 (L1) laboratory is used for working with group I biological agents: “not likely to cause disease in humans”. Experiments can be conducted openly on workbenches in L1 laboratories, and most laboratories at IARC are L1.

5.2 L2 laboratory

A level 2 (L2) laboratory is used for working with group II biological agents: “may cause disease in humans and represent a risk for staff.” L2 laboratories have restricted access, special equipment (class II laminar-flow hoods, incubators, and centrifuges), and adequate materials for disinfection and waste disposal. IARC cell-culture laboratories 602, 708, 717, 809B, 914, and 915 are L2, as is laboratory 920.

In order to work in the cell-culture laboratories, new staff must complete, in addition to the laboratory newcomers training given by the Laboratory Safety Officer, a practical training session with an experienced staff member from their Group, selected by the Group Head.

After each experiment, laboratory staff should do a general clean-up, as well as more thorough cleaning whenever the schedule indicates that it is necessary. Cleaning staff clean the floors once a week, in addition to open surfaces and the exterior of laboratory equipment. On the first Saturday of every month, floors are polished with a buffer machine.

All staff must wear green lab coats in L2 laboratories. Access is restricted to laboratory 920, and an autoclave on the same floor is reserved for working with viruses that require L2 containment. Before starting any experiment, this form must be completed and a meeting with Stéphanie Villar must take place to learn about specific procedures related to this laboratory. Badge access will then be granted for this laboratory.

5.3 L3 laboratory

A level 3 (L3) laboratory is used for working with group III biological agents: “may cause serious disease in humans and constitute serious risk to staff”, such as HBV or HIV. In addition to L2 laboratory features, L3 containment involves much more rigorous protocols to protect laboratory personnel and prevent micro-organisms from escaping into the environment.

IARC has an L3 laboratory on the 9th floor (laboratory 901), access to which is restricted to authorized personnel only. Massimo Tommasino, Head of the Infections and Cancer Biology Group, is in charge of the L3 laboratory.

Detailed information about the L3 laboratory is available on the intranet, and rules and regulations regarding access are outlined in the manual titled "Instructions for handling infectious materials and genetically modified organisms (GMO) in the L3 laboratory".

Anyone who wants to conduct an experiment that requires an L3 containment level must get permission from the Group Head, follow the "L3 Authorisation Application Procedure", and complete the tasks on the "Entry into the L3 laboratory" form, which include completing:

- A medical examination with the Staff Physician, who must give prior approval before any work in the L3 laboratory is permitted
- Theoretical training on safety procedures given by Massimo Tommasino, the manager of the L3 laboratory
- Training in best practice with Stéphanie Villar
- Three practical training sessions with Cécilia Sirand, the L3 Laboratory Technician.

The form must be scanned and sent to Stéphanie Villar and Cécilia Sirand. After the training sessions and paperwork are finalized, the Laboratory Safety Officer will then request L3 badge access for the staff member.

Staff who have not worked in the L3 laboratory for a period of six months need to contact the Laboratory Safety Officer before they resume their work.

Before starting an experiment in the L3 laboratory:

- Cells must be tested for mycoplasmas

- Form IARC-L3-Begin-An-Experiment, which evaluates the risks, must be completed and sent to Cécilia Sirand and Stéphanie Villar, who will assign an experiment identification number.

At the end of each experiment:

- All precautions must be taken to dispose of waste
- Form Work in the Laboratory - End of L3 experiment must be completed and sent to Stéphanie Villar and Cécilia Sirand.

5.4 L4 laboratory

A level 4 (L4) laboratory is used for working with group IV biological agents: "cause serious disease in humans and pose serious risk to laboratory personnel."

There is a high risk of dissemination in the environment. Only a few laboratories with this level of containment exist worldwide, and IARC does not have an L4 laboratory on its premises.

6. Accidents Involving Exposure to Blood or Biological Fluids

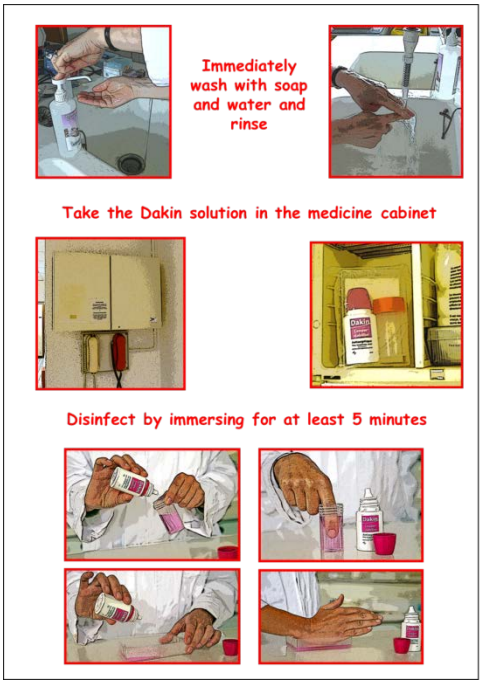
For accidents involving contact with blood or biological fluids, treatment needs to take place immediately.

The IARC Safety Team must be alerted, directly or via a colleague, by using the red emergency button or phone. The Staff Physician and the Laboratory Safety Officer must also be notified.

Before 8:00 am and after 5:00 pm, the alarm alerts security guards at reception, who know what action to take in case of an accident.

6.1 Cleaning

- In case of injury or a prick to the skin, clean the wound immediately with soap and running water, and then rinse. Do not make it bleed.
- In case of splashing on mucous membranes or in the eyes, remove contact lenses, if any are being worn, and then rinse the eye thoroughly for at least five minutes with the eye solution available in the first-aid kit on each floor or in the corridor of the 13th floor of the Tower. The eye can also be rinsed with water.
- Disinfect the wound with Dakin® solution (verify expiry date) for at least five minutes.



6.2 Assessing the risk of viral transmission

Assessing risk according to:

- deepness of the wound
- type of instrument involved
- exposed person's serology.

Viral transmission risk assessment is carried out by the organizations listed below.

The chosen organization will review the elements below and evaluate the level of infectious risk. It will also quickly initiate preventive measures, if needed.

Hospital - Hôpital Edouard Herriot Pavillon A
(24 hrs/day)
5 Place d'Arsonval, Lyon 69003
04 72 11 78 90

Hospital - Centre Hospitalier de Lyon Sud
(24 hrs/day)
165 Chemin du Grand Revoyet, Pierre-Bénite 69495
04 78 86 11 92

Hospital - Hôpital de la Croix Rousse
(Every day from 8:00 am to 7:00 pm)
103 grande rue de la Croix Rousse, Lyon 69004
04 72 07 10 56

Assessing risk from a sample of known source:

- If a biological specimen is involved, risk can be assessed very quickly with assistance from the Staff Physician (ext. 8426) or Stéphanie Villar (ext. 8513). In their absence, the IARC Safety Team can take the necessary action.
- If necessary, contaminated blood can be analysed urgently at the medical analysis laboratory located opposite IARC, located at 184 Avenue des Frères Lumière (phone: 04 78 74 03 58). A 0.6 ml sample is needed to test for HIV, HBV, and HCV.

If an HIV treatment is required, it is important to note that it will be much more effective if started within 4 hours of the incident. It is a complicated treatment with many side-effects, so it must be prescribed by a qualified physician.

6.3 Declaring an accidental exposure to blood

Accidental exposure to a biological sample (blood or other) is classified as a workplace accident, and treatment should be managed as such.

- A workplace accident report form from Human Resources (HRO) must be completed by the external physician who provided treatment.
- The incident/accident report form available on the intranet must also be filled in to allow the Staff Physician and the Laboratory Safety Officer to identify the causes of the accident, determine preventive measures to implement, and decide which actions to take.

7. Decontamination

Decontamination of cell cultures and other tools touched by biological substances is the best way to protect laboratory staff against infection. Decontamination is also necessary to protect the work environment.

- Workbenches should be cleaned and disinfected regularly with Surfa'Safe™ and 70% ethanol. Laboratory staff are responsible for keeping benches clean, and cleaning staff do not perform this task.
- Never leave glassware, tweezers, or other contaminated materials on benches. To avoid risk of contamination, non-disposable materials must be emptied and decontaminated in a detergent/disinfectant bath immediately after use and before being left for washing.

Plastic absorbent sheets (Benchkote® type paper) should be used when working with biological substances on laboratory benches, to prevent contamination. These sheets must be disposed of in contaminated waste containers.

Placing substances or samples on trays while working in fume hoods or on laboratory benches also limits contamination in case of an accident, and it helps simplify cleaning. The trays must be cleaned regularly.

CHEMICAL SUBSTANCES

Chemicals are used daily in IARC laboratories. Before using a new chemical substance, it is important to:

- understand the characteristics of the chemical;
- identify risks and potential sources of harm to avoid accidents;
- use collective and personal protective equipment suited to the risks;
- use the substance safely;
- remain vigilant when using chemicals that may contain mixtures (for more information, please see the SDS).

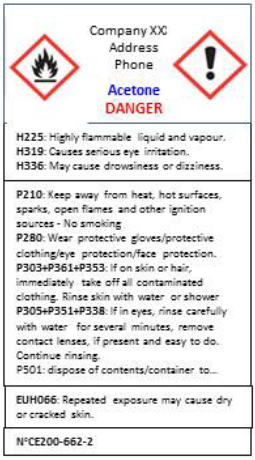
1. Labelling

Labels provide clear and concise information on precautions to take regarding risks, health and the environment when using chemicals.

Since June 2015, new regulations based on recommendations from the GHS (Globally Harmonized System of Classification and Labelling of Chemicals) have set forth new rules for the classification, labelling, and packaging of chemicals (pure and mixtures).

BEFORE

AFTER



Pictograms: Hazard Signs and Warnings

The hazard label (H) replaces the risk phrase (R). It describes the nature and level of danger.

Precautionary statements (P) replace the cautionary phrase (S). They describe how to properly store, work with, and dispose of chemicals, as well as instructions in case of leaks or accidents.

The warning label indicates the risk-level severity of the chemical:

- DANGER: high hazard
- CAUTION: medium hazard
- NO MENTION: low hazard

Additional information (EUH):

The 15 hazard classes have been redefined into 28 classes that are divided into three categories.

New hazards' classification	
Physical Hazards	Health Hazards
• Explosive • Flammable gases • Aerosols • Oxidizing gases • Pressurized gas • Flammable liquids • Flammable solids • Self-reactive substances and mixtures • Pyrophoric liquids • Pyrophoric solids • Self-heating substances and mixtures • Substances and mixtures which, in contact with water, emit flammable gases • Oxidizing liquids • Oxidizing solids • Organic peroxides • Corrosive substances or mixtures for metals	• Acute toxicity • Skin corrosion / irritation • Serious eye damage / eye irritation • Respiratory or skin sensitization • Germ cell mutagenicity • Carcinogenicity • Reproductive toxicity • Specific toxicity for certain target organs-single exposure • Specific toxicity for certain target organs-repeated exposure • Danger by aspiration **Environmental Hazards** • Hazards to the aquatic environment • Dangerous for the ozone layer

Hazard statement	Hazard statements description
H200	Unstable explosive
H201	Explosive; mass explosion hazard
H202	Explosive; severe projection hazard
H203	Explosive; fire, blast or projection hazard
H204	Fire or projection hazard
H205	May mass explode in fire
H220	Extremely flammable gas
H221	Flammable gas
H222	Extremely flammable material
H223	Flammable aerosol
H224	Extremely flammable liquid and vapour
H225	Highly flammable liquid and vapour
H226	Flammable liquid and vapour
H227	Combustible liquid
H228	Flammable solid
H229	Pressurised container: May burst if heated
H230	May react explosively even in the absence of air
H231	May react explosively even in the absence of air at elevated pressure and/or temperature
H240	Heating may cause an explosion
H241	Heating may cause a fire or explosion
H242	Heating may cause a fire
H250	Catches fire spontaneously if exposed to air
H251	Self-heating; may catch fire
H252	Self-heating in large quantities; may catch fire
H260	In contact with water releases flammable gases which may ignite spontaneously
H261	In contact with water releases flammable gas
H270	May cause or intensify fire; oxidiser
H271	May cause fire or explosion; strong oxidizer

Physical hazard

Hazard statement	Hazard statement description
H272	May intensify fire; oxidizer
H280	Contains gas under pressure; may explode if heated
H281	Contains refrigerated gas; may cause cryogenic burns or injury
H290	May be corrosive to metals
H300	Fatal if swallowed
H301	Toxic if swallowed
H302	Harmful if swallowed
H304	May be fatal if swallowed and enters airways
H310	Fatal in contact with skin
H311	Toxic in contact with skin
H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H319	Causes serious eye irritation
H330	Fatal if inhaled
H331	Toxic if inhaled
H332	Harmful if inhaled
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335	May cause respiratory irritation
H336	May cause drowsiness or dizziness
H370	Causes damage to organs
H371	May cause damage to organs

	Physical hazards
	Health hazards

Hazard statement	Hazard statement description	CMR
H372	Causes damage to organs	-
H373	May cause damage to organs	-
H340	May cause genetic defects	YES
H341	Suspected of causing genetic defects	YES
H350	May cause cancer	YES
H350i	May cause cancer by inhalation	YES
H351	Suspected of causing cancer	YES
H360	May damage fertility or the unborn child	YES
H360F	May damage fertility	YES
H360D	May damage the unborn child	YES
H360FD	May damage fertility. May damage the unborn child	YES
H360Fd	May damage fertility. Suspected of damaging the unborn child	YES
H361	Suspected of damaging fertility or the unborn child	YES
H361f	Suspected of damaging fertility	YES
H361d	Suspected of damaging the unborn child	YES
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child	YES
H362	May cause harm to breastfed children	YES
H400	Very toxic to aquatic life	-
H410	Very toxic to aquatic life with long-lasting effects	-
H411	Toxic to aquatic life with long-lasting effects.	-
H412	Harmful to aquatic life with long-lasting effects	-
H413	May cause long-lasting harmful effects to aquatic life	-

Health hazards

Environmental hazards

2. CMR: Carcinogenic, Mutagenic, and Toxic to Reproduction

Carcinogen: A substance or mixture of chemicals that induces or increases the risk of developing cancer.

Old labelling

Category 3 carcinogen R40	Category 2 carcinogen R45 or R49	Category 1 carcinogen R45 or R49

R40: Limited evidence of a carcinogenic effect.
R45: May cause cancer.
R49: May cause cancer by inhalation.

New labelling

Category 2 carcinogen H351	Category 1B carcinogen H350	Category 1A carcinogen H350

H350: May cause cancer.
H351: Suspected of causing cancer.

Mutagen: A substance or mixture of chemicals that can induce mutations in human germ cells that are transmissible to offspring.

Old labelling

Mutagenic Category 3 R68	Mutagenic Category 3 R4	Category 1 carcinogen R46

R46: May cause heritable genetic damage.
R68: Possible risk of irreversible effects.

New labelling

Mutagenic Category 2 H340	Mutagenic Category 1B H340	Mutagenic Category 1A H341

H340: May cause genetic defects.
H341: Suspected of causing genetic defects.

Toxic to reproduction: Harmful effects on sexual function and fertility, and negatively impacts the development of offspring.

Old labelling

Toxic for reproduction Category 3 R62 and/or R63	Toxic for reproduction Category 2 R60 and/or R61	Toxic for reproduction Category 1 R60 and/or R61

R60: May impair fertility.
R61: May cause harm to the unborn child.
R62: Possible risk of impaired fertility.
R63: Possible risk of harm to the unborn child.

New labelling

Having effects on or via breastfeeding H362	Toxic for reproduction Category 2 H361	Toxic for reproduction Category 1A or 1B H360

H360: May damage fertility or the unborn child.
H361: Suspected of damaging fertility or the unborn child.
H362: May cause harm to breastfed children.

WARNING: the pictogram below does not systematically imply CMR risk.

Related uses:

- affects the functioning of certain organs;
- causes serious lung damage that can lead to fatality;
- causes respiratory allergies.

3. SDS: Safety Data Sheet

A safety data sheet (SDS) provides technical information about a chemical product. It includes 16 required sections divided into three categories: hazards, general information, and measures for contamination prevention and response.

It provides information on:

- hazards related to using a chemical product;
- measures to be taken in case of emergency;
- appropriate medical monitoring, if necessary.

There are four key sections:

- Hazard identification: pictogram, hazard label, precautionary statement, and warning label
- Exposure controls/personal protection
- Physical and chemical properties: essential for implementing proper storage
- Stability and reactivity: information on handling and storing the chemical.

SDSs for chemicals used at IARC can be found on the intranet by using the search engine. If a new chemical is ordered, please send the SDS by email to sds@iarc.fr.

4. Solvents

Commonly used flammable solvents pose the greatest fire hazard in laboratories. To limit risk, only small quantities of frequently used flammable solvents are available in IARC laboratories.

Laboratory experiments involving solvents must be carried out in an exhaust hood or chemical hood. Solvents should never be handled directly on laboratory workbenches.

Solvents should be stored in cabinets with filters or in exhaust hoods, to limit the exposure of laboratory personnel to solvent vapours.

Remember not to overload the exhaust hoods, to avoid disturbing airflow.

A special area is reserved in the basement near the loading dock for long-term storage of flammable solvents, to minimize the amount present on laboratory floors. However, because this storage area is relatively small, and subject to regulations, it is advisable not to store large amounts in this space, to limit the heat potential.

To ensure that maximum limits (600 litres) are respected, all flammable solvent orders must be signed by Jean-Alain Pedil, the Building Safety & Security Assistant, before being sent to SUP.

5. Accidents Involving Chemicals

It is essential to read the information on the label and the SDS, because in rare cases water may be incompatible, depending on the chemical involved.

If a trip to the hospital is necessary, the person accompanying the victim must bring along the SDS of the chemical involved in the accident.

5.1 Spills

- Evacuate the laboratory.
- Close the laboratory door and limit access.
- Alert the IARC Safety Team using the red emergency button.
- Contact the Laboratory Safety Officer Stéphanie Villar.
- Put on a protective mask, if instructed by the IARC Safety Team or Stéphanie Villar.
- Open the windows if you are in BRC.
- Start all fume cupboards or extraction systems in the room.
- Confine the spill to avoid spreading.
- Add vermiculite.
- Exit the laboratory and wait for the IARC Safety Team or Stéphanie Villar to pick up the vermiculite containing the chemical and dispose of it in a contaminated solid waste container.
- Close the container and have it removed immediately.
- Do a thorough clean, if determined necessary by the IARC Safety Team or Stéphanie Villar.

5.2 Fires or explosions

- Immediately alert the IARC Safety Team using the red emergency button.
- Use first-response equipment (fire extinguisher, etc.).
- Trigger the alarm system to evacuate personnel.

5.3 Asphyxiation or intoxication

- Immediately alert the IARC Safety Team using the red emergency button.
- Prevent anyone from entering the area.
- Trigger the alarm system to evacuate personnel.

The IARC Safety Team will contact emergency services, and take note of any specific requirements, such as where the accident took place, what type of chemicals were involved (if known), and how many people were affected.

5.4 Splashes on skin, eyes, or clothes

Immediately alert the IARC Safety Team using the red emergency button.

If the splash affected a limited area, rinse the area with plenty of water for at least 15 minutes after clothing is removed, if necessary.

If the splash affected a bigger area or spread out over the body, the victim should be put under the safety shower, then rinse and undress in the shower. Continue to rinse for at least 15 minutes.

If eyes are splashed, rinse thoroughly with water and then with the eye-rinse solution available in the floor's first-aid kit or in the corridor on the 13th floor. Keep the eye open for at least 15 minutes.

If necessary, the IARC Safety Team will contact emergency services.

5.5 Chemical burns

- Immediately alert the IARC Safety Team using the red emergency button.
- Rinse the affected area thoroughly with running water under a tap or safety shower for at least 15 minutes.

Never undress the victim.

If necessary, the IARC Safety Team will contact the emergency services.

5.6 Internal contamination

- Immediately alert the Safety Team using the red emergency button.

The IARC Safety Team will make the necessary arrangements to transport the person to the nearest hospital (Hôpital Edouard Herriot).

Before 8:00 am and after 5:00 pm, the alarm will alert guards at the security station, who will know what action to take in case of an accident.

WORKING WITH CARCINOGENS

To work with carcinogens, laboratory personnel must undergo theoretical and practical training with the Laboratory Safety Officer, Stéphanie Villar, who will explain the specific safety instructions to be followed and then request badge access to Room 805, where all carcinogens are tracked and stored.

Only the minimum amount of carcinogens necessary for experiments should be purchased and synthesized.

For safety reasons, volatile carcinogens are not allowed in IARC laboratories.

When working with carcinogens, it is extremely important that laboratory personnel avoid exposing themselves and others to these compounds. Personal protective equipment must be worn at all times when working with carcinogens.

Disposable lab coats, orange nitrile gloves, shoe covers, and face masks are available in Room 805 SAS. In exceptional circumstances, trousers and caps must also be worn for greater protection.

Personal protective equipment (lab coats, gloves, masks, shoe covers, etc.) should be disposed of in the yellow cardboard containers after each use. Please remember that gloves do not provide full protection. They must be changed regularly, and immediately after accidental contamination.

Room 805 is equipped with two hoods: an exhaust hood and a Cytosafe hood for handling carcinogens. However, they do not function properly if operated at the same time.

1. Handling Carcinogens

Upon receipt, the product must be:

- Placed in Room 805
- Added to the list of IARC carcinogens, which is on the refrigerator door, including the registration number or code, product name, source, reference, quantity, storage conditions (room temperature, +4 °C, −20 °C), the name of the person in charge and their Group, and the date of receipt
- Placed in a bottle or box that has a legible registration code; inventory is updated regularly by Stéphanie Villar
- Unwrapped and stored in a freezer, refrigerator, or box at room temperature.

Pure substances must never be removed from Room 805, which is reserved for storage, weighing, and dilution.

Carcinogen synthesis, purification, or dilution must only be done in the Cytosafe hood available in the laboratory. It is prohibited anywhere else on IARC premises.

Only diluted carcinogen solutions can be transported to other laboratories. Each user must bring the equipment and solvents required for dilution to Room 805.

Carcinogen flasks must be prepared in the Cytosafe hood using disposable spatulas, and be closed before being weighed. If a solution requires a specific concentration, the volume of diluent must be precisely adapted according to weight.

The use of electrostatic powders (aflatoxins, bromomethyl benzanthracene, etc.) raises a more serious problem. Although no method is perfect, laboratory personnel should avoid drafts, use face masks, and wear cotton gloves.

One method for handling these compounds is to buy pre-weighed quantities and dissolve the carcinogen in an appropriate solvent. The problem is then limited to the handling of liquid stock solutions.

All waste must be disposed of properly.

When a carcinogen is finished, the empty bottle should be discarded and the product should be removed from the list of stored carcinogens.

Every time work is performed in Room 805, laboratory staff must fill in the logbook located by the airlock with their name and Group name, the date, and the nature of the experiment.

If a substance has expired, please add it to the list of expired and unused substances and notify Stéphanie Villar.

2. Transporting Carcinogens within IARC

When exiting Room 805, flasks or bottles containing diluted carcinogen solutions must be clearly labelled, tightly closed, and placed in metal transport containers. These metal containers, available in Room 805, are resistant to shock and dilution solvents, and must be returned after use.

To transport diluted carcinogens from one floor to another, the user must store the solution in double containers and take the red lift.

When finished working with carcinogens, laboratory personnel must:

- Close the carcinogen container securely and put it back in its place
- Close the prepared dilution tightly and place it in a metal container
- Clean the hood, and decontaminate the workbench and any equipment used, if necessary
- Turn off the hood
- Place the metal container at the entrance of the airlock
- Throw away the disposable lab coat and gloves
- Fill in the logbook by the airlock, listing your name, as well as the substance name, code number, and volume used
- Put the metal container inside the transport container
- Take the diluted solution directly to the laboratory using the red lift, if it is located on a different floor

Diluted solutions should be stored in the laboratory in well-marked, airtight containers. Each flask should be properly labelled with the product name, dilution solvent used, concentration, date, and user name.

3. Accidents Involving Carcinogens

In case of an accident involving carcinogens in Room 805 or elsewhere in the building, isolate the contamination as much as possible and refer to the instructions for accidents involving chemicals.

If an accident takes place during transportation, isolate the contamination zone, call for help by pulling the red emergency button located next to the lift, and decontaminate the area as quickly as possible.

4. Handling Diluted Solutions in Other Labs

Even if solutions are diluted, they must always be handled with caution, and liquid waste must be disposed of carefully.

Laboratory personnel must wear personal protective equipment (lab coat and gloves) and perform the work using the appropriate safety equipment.

When treating cell cultures with diluted carcinogens, the same microbiological safety station should always be used. Aspirating cultures must be done using single-use pipettes and never via hood aspiration systems. Liquid waste must be disposed of in special containers for carcinogens.

More information on handling waste can be found in the chapter on waste management.

USING NITROGEN OR FLAMMABLE GASES

1. Using Nitrogen Liquid or Gas

Nitrogen is a colourless, odourless, non-toxic gas that is naturally present in air at 78%.

Although nitrogen is lighter than air, the density of its vapour is greater than that of air. Therefore, the vapour settles to the ground before mixing with air.

At IARC, nitrogen is available:

- on the ground floor of BRC in liquid or gas form for storing biological samples (such as vials or tubes containing blood, plasma, serum, tissues, biological fluids, cell lines, etc.) in tanks
- on the 7th, 10th, and 13th floors of the Tower (Rooms 717, 1001, and 1301) in gas cylinders for laboratory equipment use
- on the 13th floor of the Tower (Box 10), where there is a nitrogen generator for laboratory equipment.

1.1 *Identifying risks*

	Risk of asphyxiation (low level of O_2)		Risk of burns

Two key risks when handling nitrogen are:

- **Asphyxiation by anoxia** – oxygen in the air decreases due to the increase in nitrogen
- **Cryogenic burns** – liquid nitrogen has a boiling point of −196 °C.

Explosion is an additional risk (1 litre of liquid nitrogen generates 680 litres of nitrogen gas); therefore, liquid nitrogen must be transported in special non-airtight containers.

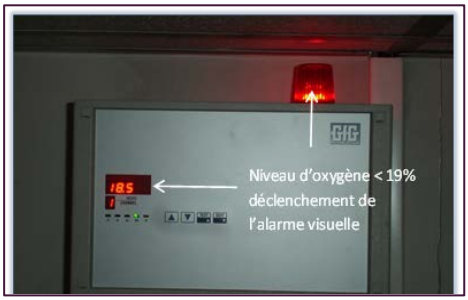
1.2 *Shared protective equipment*

Nitrogen tanks are available in Rooms E01, E02, and E03 in BRC.

Nitrogen cylinders and a generator equipped with an oxygen detector, which is in constant on-mode, are available in Rooms 1001, 1301, and Box 10 (13th floor) in the Tower.

A **visual alert** is triggered if the oxygen level falls **below 19%,** and an **audible alarm** sounds when it drops **below 17%.**

As a reminder, 21% is the normal level of oxygen in the air.



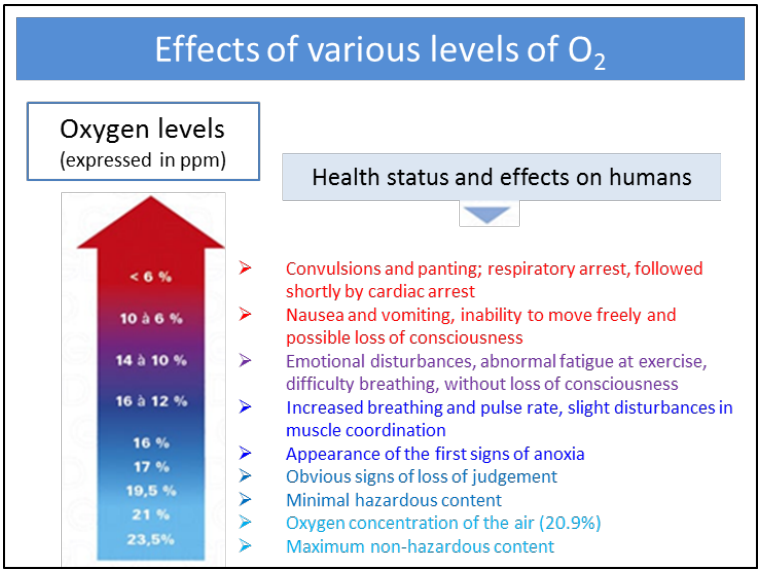
Room 717 is a cell-culture room that has a tri-gas incubator, and therefore a nitrogen cylinder, equipped with an individual oxygen detector.

Checking the battery level periodically is important to ensure that any nitrogen leakage in the room that causes a decrease in oxygen is detected immediately.

Never enter a cryogenic room if a visual or audible alarm is active.

If a visual or audible alarm is triggered while you are inside the room:

- **Leave the room immediately**
- **Do not go back into the room**



1.3 Personal protective equipment

For safety reasons, wearing skirts, shorts, and open- or semi-open-toed shoes is strictly forbidden while working in cryogenic Rooms E01, E02, and E03, including to remove vials of liquid nitrogen or to collect/deposit cells in the nitrogen gas tank.

Due to a high risk of cryogenic burns and asphyxiation, special protective equipment and nitrile gloves must be worn when collecting or depositing samples in tanks, and when performing any work involving liquid nitrogen.

			
Cryogenic gloves	Protection mask	Lab coat, trousers, and shoes should be fastened	Oxygen detector

The protective equipment listed above is available on the ground floor of BRC.

1.4 Working in BRC – Rooms E01, E02 and E03

Tanks are automatically filled three times a week (Monday and Wednesday mornings, and Friday afternoon) from the liquid nitrogen reservoir tank (20 000-litre capacity) located in front of the BRC building.

During refill, oxygen decreases due to the increase of nitrogen in the air.

It is forbidden to enter cryogenic rooms when the tanks are being refilled (Monday and Wednesday mornings, and Friday afternoon).

Laboratory personnel are responsible for monitoring oxygen levels. If a problem arises or the level is abnormally low, the Laboratory Maintenance Technician Thomas Cler (ext. 8081) or the Building Safety & Security Assistant Jean-Alain Pedil (ext. 8532) should be notified immediately.

Please respect the following guidelines before entering a cryogenic room:

- Wear trousers, closed-toed shoes, a lab coat, and a face mask.
- Attach an oxygen detector to the exterior of the lab coat (not in the pocket); detectors are available in the hallway outside Rooms E01, E02, and E03 – please verify that the device works properly before entering the laboratory.
- Fill in the logbook.
- Request access from a biobank staff member (LSB) and inform them of the estimated time required in the room.
- Check the oxygen level indicated on the detector screen above the room; if the level is below 19%, do not enter; wait for the level to rise.

1.5 Working in the Tower – Rooms 1001, 1301, and Box 10

- Check the oxygen level indicated on the detector screen above the room.

If the oxygen level is below 19%, do not enter; wait for the level to rise.

Oxygen levels can also be checked using a portable oxygen detector available from the security guard on duty at reception. However, the device must be used at the entrance of the room without anyone physically entering it.

- If a technical problem arises, Thomas Cler (ext. 8081), Jean-Alain Pedil (ext. 8532), or Engie (ext. 8872) must be notified immediately.

2. Accidents Involving Nitrogen

Factors that determine the severity of the burn and actions to be taken:

- temperature of the nitrogen
- moisture content of the contact surface
- duration and pressure
- depth, extent, and location of the burn.

2.1 Skin contact

When liquid nitrogen comes in contact with the skin (epidermis, dermis, or subcutaneous tissue), the effect is similar to that of a thermal burn.

- Immediately alert the IARC Safety Team using the red emergency button.
- Do not rub the affected area.
- Remove or loosen clothing, only if it is not stuck to the skin.
- Treat the affected area gradually by rinsing it with room-temperature water for at least 15 minutes.

- Do not apply anything on the burned area.
- Cover the area with a clean or sterile cloth.
- See a doctor.

2.2 Eye contact

When liquid nitrogen enters into contact with the eyes, the damage can be either reversible or irreversible, depending on the exposure time and volume of nitrogen involved.

- Immediately alert the IARC Safety Team using the red emergency button.
- Wash the eyes immediately under a stream of lukewarm water for at least 15 minutes, keeping the eyelids open, with the head tilted and the eye looking downward.
- See an ophthalmologist.

2.3 Nitrogen asphyxiation

If a person passes out and is unconscious in a cryogenic room, react carefully before rushing to assist the victim, because you could also be at risk.

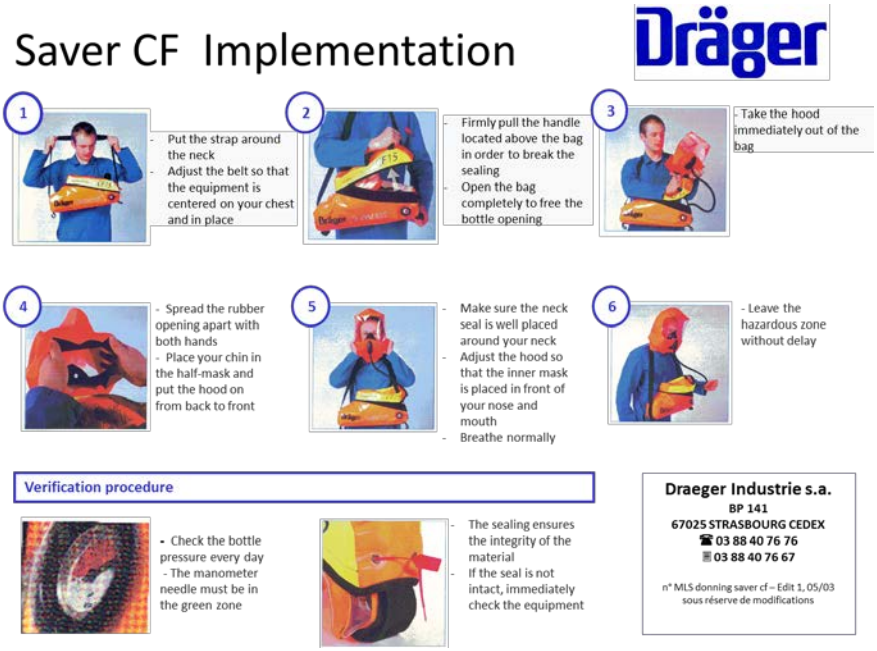
- Immediately alert the IARC Safety Team using the red emergency button.
- Open the door to help ventilate the area.
- Check the oxygen level before entering the room; if the level is below 19%, do not enter the room; wait for the level to rise.
    - If the oxygen level is sufficient (> 19%), enter the room.
    - If the oxygen level is too low (< 19%), it is forbidden to enter the room without wearing a protective hood, which can be found in the storage unit in the ground floor of BRC. The hood has a self-

contained, closed-circuit breathing device that provides sufficient oxygen for the intervention.

- Put the bag's strap around your neck and adjust it.
- Pull the handle firmly and open the bag entirely; this will trigger the opening of the oxygen bottle.
- Take the hood out of the bag and unfold it using a swift downward motion.
- Position the hood facing down and the visor facing towards you.
- Place your thumbs in the rubber opening and spread it apart.
- Place your chin in the half-mask and put the hood on from back to front.
- Make sure that the neck seal is properly placed, and adjust the hood.

Once the oxygen level is stable inside the hood, enter the room and bring the victim out into a safe environment as soon as possible.

The Staff Physician and/or the IARC Safety Team will handle the situation from there.



3. Using Flammable Gases

All cylinders and gas lines must be clearly labelled to avoid confusion as to their contents. Hydrogen used for flame ionization gas chromatography detectors must be supplied using a hydrogen generator, because hydrogen cylinders are prohibited in IARC laboratories.

Nitrogen cylinders, like those for carbon dioxide or helium, used in IARC laboratories or cell-culture rooms must be attached to the wall using safety chains. Tubing should be checked regularly to make sure there are no gas leaks. It is important to anticipate high-activity periods, and therefore higher gas consumption, and notify ASO by email (aso-tech@iarc.fr) to help avoid any supply shortages.

Using Nitrogen or Flammable Gases

As previously mentioned, laboratories with nitrogen cylinders must have oxygen detectors installed in the room, or portable devices must be available for laboratory staff to prevent the risk of asphyxia/anoxia. Groups are responsible for regularly verifying that detectors in their laboratory are in working order. All problems must be immediately reported to aso-tech@iarc.fr by email.

Flammable or toxic gases (methane, etc.) may only be used in small quantities, and with prior approval from ASO.

Using open flames or Bunsen burners is prohibited in the Tower. As long as they are used with care, small portable burners, similar to camping-type gas stoves, are allowed to be used for certain essential procedures. Fuel cartridges are kept in the solvent storage room, and can be requested from Thomas Cler or Jean-Alain Pedil during opening hours.

WASTE MANAGEMENT

1. Disposing of Non-Contaminated Solid Waste

IARC laboratories use several types of containers for non-hazardous waste.

1.1 Plastic wastebaskets

Black and brown plastic wastebaskets provided in IARC offices and laboratories are used for non-contaminated and non-hazardous waste (paper and plastic, etc.; no sharp or dangerous objects). The evening cleaning staff empties them daily.

1.2 Cardboard boxes (office-related)

Cardboard boxes provided in offices at IARC are used to collect paper for recycling. The evening cleaning staff empties them when they are full.

1.3 Cardboard boxes (laboratory and glassware washing-related)

Cardboard boxes provided in laboratories and the glassware washing area at IARC are used for broken, uncontaminated glass only. When full, the boxes must be put in front of the service lift, from where the Maintenance Technician Bruno Amara will take them to the basement for storage until they are collected by an external service provider.

1.4 Glass recycling bin

For use by all IARC staff, a bin for glass recycling provided by the City of Lyon is located in the basement of the Tower. Only clean glass should be put in the bin; bottles that contain solvent must be placed under a fume cupboard for 24 hours, to ensure that no left-over solvent remains, before being placed in the bin for recycling.

Glass contaminated with toxic, carcinogenic, or radioactive substances must never, under any circumstances, be placed in the glass recycling bin.

Bruno Amara is in charge of supplying laboratory floors with containers for waste, solvents, and CMRs. Do not hesitate to send an email to aso-tech@iarc.fr if there is a significant decrease in stock.

2. Disposing of Contaminated Solid Waste

All biological waste must be incinerated. Solid waste must be put in the DASRIA bins provided by Veolia. These include Sharpsafe™-type plastic bins and plastic-lined cardboard boxes.

Sharp or pointed objects (such as scalpels, needles, glass Pasteur pipettes, or contaminated broken glass) should be directly disposed of in Sharpsafe™ plastic bins. If the object is dirty, do not leave it on the workbench or put it back in its package.

Sharpsafe™ bins can also be used for workbench waste to dispose of any remaining disposable tips, vials, or biological samples.

Plastic-lined cardboard boxes, both small and large, are for contaminated plastic pipettes, vials, Falcons™, disposable tips, etc. Do not put sharp objects in them.

To prevent bacteria from spreading, petri dishes used for growing bacteria should be put in special bags (available from the supply store) before throwing them into the waste bins.

Bins containing contaminated laboratory materials must be properly closed and should not be overfilled. When full, leave them at the drop-off point for collection by ASO.

Bins that are overfilled or have holes in them will not be picked up for disposal, and waste must be transferred into a new bin by the Group it belongs to.

Once collected, these waste bins are stored in special 770-litre containers in the basement for removal every Tuesday morning by Veolia.

In addition to waste management and recycling, Veolia provides IARC with waste disposal equipment, as well as taking care of collecting and transporting the waste to a treatment centre. This is done via personnel certified in ADR (European Agreement concerning the International Carriage of Dangerous Goods by Road) and using a vehicle equipped to comply with these regulations. If there is overflow of biomedical waste (related to laboratory cleaning or autoclave, etc.), ASO must be notified so that he can plan for its removal.

3. Disposing of Contaminated Liquid Waste

3.1 Cell-culture media

Culture media is collected using a suction system during experiments involving cell cultures, and then stored in containers under microbiological safety cabinets. Before use, a half bottle of bleach must be poured into each container to decrease biological risk. Once the containers are full (respecting the maximum limit), they must be cleaned using a bottle of bleach, which changes the colour of the contents to yellow when decontamination is successful. The cell-culture media can then be flushed down the drain using running water.

Culture Media Containing CMR:

Culture media containing CMR after carcinogenic exposure should not under any circumstances be collected via the biosafety-cabinet aspiration system. It must instead be collected using pipettes and placed in CMR waste containers. Users are responsible for placing containers in the exhaust hood when they are full, and should contact ASO for removal.

3.2 Used organic solvents

Used solvents are collected in containers and managed by an external company. Only water or cell culture media that has been decontaminated with bleach may be put down the sink. The addition of a label indicating all discarded products in each container is essential to be in compliance with the regulations.

When full, the containers must be stored in an exhaust hood cupboard until the scheduled pickup by ASO.

3.3 Leftover reagents from kits and alcohol residues

Leftover reagents from kits and alcohol residues should never be flushed in the sink or emptied into yellow bins for contaminated solid waste. They must be collected in Falcon™ flasks and put into 5-litre solvent containers located in the fume cupboards.

3.4 CMR waste

Liquid carcinogenic waste must be collected in specifically labelled 1-litre plastic CMR waste containers. These must be stored in biosafety cabinets (cell culture) or exhaust hoods. For culture media containing CMRs, users are responsible for placing containers in the exhaust hood when they are full, and should contact ASO for removal.

3.5 Biological sample residue

Small amounts of biological substances remaining in the bottom of tubes or vials can be thrown directly into bins for contaminated solid waste.

When blood or urine residue accumulates, decontamination should take place in an exhaust hood in a container with diluted bleach. Never add a concentrated bleach solution to blood samples, because it causes a strong chemical reaction that releases chlorine gas.

When decontamination is successful, diluted bleach changes the colour of the medium to yellow. It can then be flushed down the sink with running water.

If biological sample residues are mixed with solvents, they should be treated as used organic solvents.

4. Waste generated in the L3 laboratory

All waste, whether solid or liquid, generated in the L3 laboratory must be autoclaved before disposal as contaminated or non-contaminated waste.

It is important to ask Thomas Cler to turn on the water before starting the autoclave. The autoclave can only be used by trained personnel.

During an experiment, solid waste generated in the microbiological safety cabinet (pipettes, Falcons™, initial pair of gloves, paper towels, etc.) is put in a transparent bag provided. Other solid waste (clothing, plastic packaging, etc.) goes in red bags.

At the end of the experiment, the transparent bags should be closed, placed in metal cases, and then autoclaved. Red bags should be closed and autoclaved.

Once autoclaved, solid waste is put in the DASRI waste bins (plastic-lined cardboard boxes), and collected by Bruno Amara for later disposal by Veolia, as for all contaminated waste.

Liquid waste is collected in microbiological safety cabinets in plastic containers containing water and Esculase™, then placed in a transparent bag. At the end of the experiment, the bottles and transparent bags are closed and put in metal cases, which are then autoclaved.

Once autoclaved, liquid waste is disposed of as uncontaminated waste in the sink of Laboratory 919.

5. Waste Generated in Laboratory 919

Room 919 on the 9th floor is used for culturing bacteria. Media and flasks used for bacterial culture must be autoclaved or decontaminated with diluted bleach before being discarded.

7. Eliminating Expired and Unused Substances

Stéphanie Villar and Jean-Alain Pedil organize an annual campaign to collect hazardous, expired, unused, or unidentifiable solvents and powders for removal.

Unused or expired carcinogens are also collected and disposed of by an external service provider.