PONTIFICIA
UNIVERSIDAD
CATÓLICA
DE CHILE

Self-Instruction Manual

Safety and Security in Laboratories

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Safety and Security in Laboratories

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CONFIRMATION OF RECEIPT

Self-Instruction Manual of **Safety in Laboratories**

I _____,

I.D. _____, hereby declare having received and read the self-instruction manual of Safety in Laboratories of Pontificia Universidad Católica de Chile, containing the following:

- Information about the risk agents that could exist in laboratories.
- Basic safety measures needed for working in laboratories.

Likewise, in this act I commit to comply with and respect all the safety measures contained in this document.

Signature _____

Date _____

Print and sign this page once you have read the document.

Remember that you cannot work in a laboratory without having previously read this information.

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1. / General **aspects**

a) What is laboratory safety and security?

- Safety: Set of measures including work practices, safety equipment and facilities needed to protect laboratory workers and surrounding population from being exposed to biological, chemical or physical material when stored or worked with. Safety protects individuals.
- Security: Set of measures including the protection, control and follow-up of risk agents in laboratories, avoiding losses, robberies, misuse, deviation, non-authorized access or non-authorized intentional accessibility. Security protects risk agents.

b) Safety responsibilities

- **Institution:** The University is responsible for adopting necessary measures to effectively protect lives and health of all individuals inside the institutional facilities by carrying out activities that pertain to the activities performed within the University.
- **Institutional Committee for Safety and Security:** Responsible for evaluating safety and security standards for the research projects that require it. It will also be responsible for providing information and training to members of the university community.
- **Laboratory Director:** Oversees safety for all individuals working in a laboratory. The director is in charge of communicating and supervising that current national legislation and institutional regulations related to safety and security are met. When necessary, the director will be responsible for creating norms and procedures specific to his/her laboratory.
- **Laboratory Manager:** Makes sure the norms indicated by the laboratory director are complied with and implemented. If the laboratory is missing a worker, the laboratory manager must assume such role.
- **Members of the work team (professors, professionals, technicians, students, etc.):** Must comply with all the norms and protocols established by the University and the laboratory.

2. / Basic safety measures in every laboratory

All members must know the safety measures specific to their laboratories. The laboratory director will provide and evaluate knowledge of these measures. In case such information has not been provided, team members hold the responsibility of requesting it.

The following basic safety norms must be complied within all laboratories within the University:

a) What are good practices within the laboratory?

- Every individual working in the laboratory, whether they participate or not in procedures involving risk agents, must be informed of the corresponding safety measures.
- The laboratory must have visible protocols for emergencies and accidents.
- Access to the laboratory must be restricted. Type of risk must be indicated on the door.
- Eating or drinking in work areas is strictly forbidden.
- Storing food in refrigerators meant for research is strictly forbidden.
- Incorporating decorative items such as plants, photos, etc. is strictly forbidden.
- Hosting celebrations or incorporating festive decorations in the laboratory is strictly forbidden.
- All laboratory spaces must have at least one sink.
- All laboratories must have access to a safety shower and an emergency eyewash (identifying the location of the closest one is recommendable).
- All laboratories must have an updated inventory of chemical products, this inventory must include safety labels for each.
- Extension cords must not be used, unless they are really needed for a short period of time.
- Equipment or power drops must not be located near water fountains, or corrosive or flammable agents.
- When work is done, electrical devices must be turned off and gas connections must be closed.
- When a task or operation is finished, materials, reagents, equipment, etc. must be picked up and stored, in order to avoid unnecessary accumulation.
- Desk supplies or books must not be placed on work tables, since contaminated paper is difficult to sterilize or disinfect.

b) What personal practices should be adopted in the laboratory?

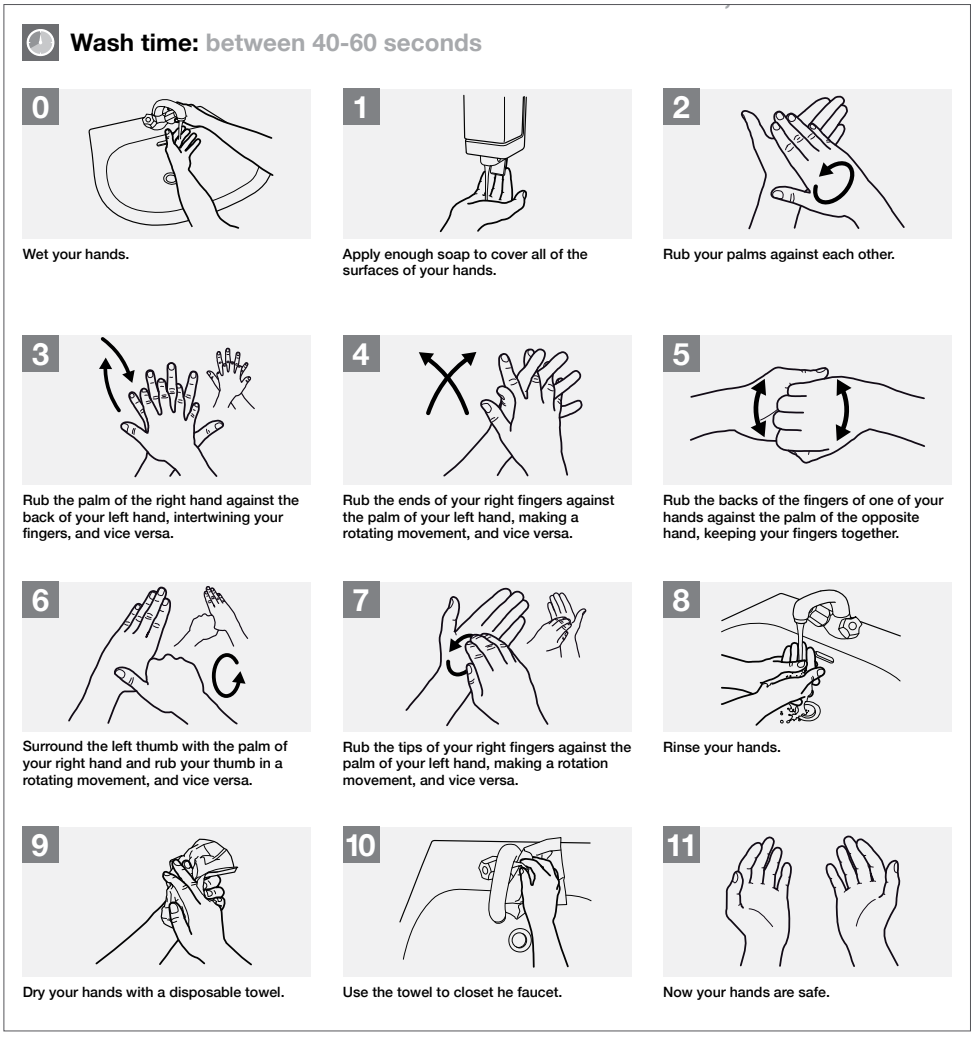
- Lab coats must be worn.
- In general, gloves and eye protection must be used when working in a laboratory.
- Pants or long dresses must be worn as well as closed shoes.
- Hands must be washed after finishing every procedure, when switching to a new procedure and when exiting the laboratory.
- Work attire such as lab coats and gloves must not be worn outside the laboratory.
- Bringing your hands to your face, hair or glasses when working in the laboratory is strictly forbidden.
- Gloves must be thrown away before touching another clean object such as a cell phone, computer, door knob, etc.

- Devices for pipetting must be used, whereas the mouth must never be used for such purposes.
- Long hair must be tied back and faces must be clear of obstruction.
- Putting on makeup is forbidden within the laboratory.
- It is recommendable to avoid using bracelets, ring or wide sleeves while carrying out experimental procedures.
- Contact lenses should not be used in the laboratory.

c) How to correctly wash your hands

- Hands must be washed frequently, each time one enters or exits the laboratory, and each time one switches to another task.
- Only use water and soap to wash your hands, drying them with disposable paper.
- Hand sanitizers do not replace washing your hands. You may only use this product when exiting the laboratory quickly in case of an emergency. There must be hand sanitizer dispensers at each exit.

BELOW IS THE CORRECT WAY TO WASH YOUR HANDS.



Source: Manual de Bioseguridad en Laboratorio (Biosafety Manual for Laboratories), OMS, third edition. 2005.

d) How to separate clean and dirty areas in the laboratory

Laboratories must separate and indicate the following areas:

Clean areas: Areas where there is no contamination, these can be subdivided into two groups:

- Areas where there is no risk of contamination for individuals:
  - Gloves are not needed for these areas or equipment.
  - For example: desktop work stations.
- Sterile areas: Areas where there should be no contamination in order to correctly perform procedures:
  - Gloves should be used in these areas, and sometimes additional elements that keep the area sterile.
  - For example: areas used to prepare procedures and drugs, or areas used to store clean or sterile material.

Dirty areas: Areas that could be contaminated.

- Gloves must always be used in these areas to handle equipment and instruments.
- For example: Work areas, areas where materials are cleaned or pre-cleaned, as well as temporary storage areas for contaminated materials.

Laboratories must define such areas, as well as parts of the laboratory such as doors, keyboards, equipment, etc. that can be handled without gloves.

3. / Risks in the laboratory

Risks in the laboratory, called *risk agents*, can be categorized as follows:

CHEMICAL	BIOLOGICAL	PHYSICAL
• Toxic • Corrosives • Irritating • Hazardous to the environment	• Microorganisms • Human and animal samples • Genetically modified organisms	• Ionizing radiations • Non-ionizing radiation • Fire • Electricity

All of these risk agents can be worked with, as long as the appropriate safety measures are used. These measures include:

- Good laboratory practices;
- Personal protection elements
- Protection equipment;
- Other.

In order to work safely, it is important for all laboratory members to identify the risks to which they are exposed, and to comply with the safety measures presented to them.

3.1. Chemical Agents

Chemical reagents come with two sources of information: a label on the container, and a safety sheet. Safety measures based on what these sources indicate must be followed.

a) How to identify whether the chemical reagents you are working with are hazardous

Different types of labels are commonly found (depending on the country/region) on chemical reagents used in a laboratory:

CHILEAN NORM NCh.1411/4:

Identifies risks related to reagents in four main categories: health (blue), flammability (red), reactivity (yellow) and special risks (white). Degrees of severity are identified for each section with a number from 0 (no risk) to 4 (severe risk).

HEALTH	FLAMMABILITY	REACTIVITY	SPECIAL RISKS
4: Fatal 3: Severe harm 2: Harm due to continuous exposure 1: Mild harm or irritation 0: Not hazardous	4: Extremely flammable 3: Can light up at room temperature 2: Can light up when heated 1: Must be pre-heated to burn 0: Not combustible	4: Can detonate under normal conditions 3: Can detonate when knocked or due to heat 2: Possible drastic chemical change 1: Unstable if heated 0: Stable	OXI: Oxidizing ~~W~~: Do not use water ALK: Alkaline

(OLD) EUROPEAN UNION NORM:

The following is the most commonly known signage in our country, and probably the one we will mostly find in laboratories. Hazardous products are indicated with the following symbols:

				
E Explosive	**O** Oxidizing	**F+** Extremely flammable	**F** Easily flammable	**C** Corrosive
				
T+ Very toxic	**T** Toxic	**Xn** Harmful	**Xi** Irritating	**N** Hazardous to the environment

Products with European Union signage must also include useful information on their labels, such as the following:

- **Indication of hazard:** Under the symbol, indicating the hazard in words.
- **Risk phrases (R phrases):** Describe the type and intensity of the hazards presented by a substance or mix.
- **Safety phrases (S phrases):** Measures that must be taken to reduce or avoid negative effects caused by a hazardous product or mixture are recommended.

GLOBALLY HARMONIZED SYSTEM (GHS):

The GHS was created in order to use the same criteria to define when a substance or mixture is hazardous, as well as to facilitate communication of hazards worldwide with a common system. The GHS defines physical, health and environmental hazards for chemical products and introduces new symbols:

PHYSICAL HAZARDS				
				
Explosive	Compressed gasses	Flammable Liquids	Oxidizing Liquids	Corrosive to metals

HEALTH HAZARDS

Acute toxicity

Skin corrosion/
acute eye injuries

Carcinogenic/
germ mutagenic/
toxic to reproduction/
respiratory sensitizer/
aspiration hazard/
toxic to target organs

Skin, eye or respiratory
irritation/
skin sensitizer/
narcotic

HAZARDOUS TO THE ENVIRONMENT

Hazardous to the aquatic environment

Hazardous to the ozone layer

Products with GHS labeling must also have other useful information on their labels, such as the following:

- **Warning word:** Conveys a warning about the magnitude of the hazard. Words that are used are:
  - HAZARD: High hazard degree.
  - ATTENTION: Medium hazard degree.
  - NO WORD: Low hazard risk. Absence of hazard words does not indicate absence of hazard.
- **Indication of hazard:** Identified as H2_, H3_, H4_ and are phrases assigned to a hazard class and category that describe the nature of such for the corresponding hazardous product, including the degree of hazardousness, when applicable. For example:
  - Extremely flammable liquids and vapors;
  - Can cause cancer;
  - Causes harm to public health and to the environment by destroying the ozone layer.
- **Caution recommendations:** Are identified with P and are phrases describing recommendations to minimize or prevent adverse effects caused by exposure to a risk product, or by inappropriate handling or storage of a hazardous product. For example:
  - Keep away from heat sources;
  - Wash your hands carefully after handling;
  - Do not throw away into the drain.

The following two special factors must be kept in mind:

- A symbol may refer to more than one hazard, and the labeled reagent may not be hazardous at all those levels. For example, the benzene label has the starred heart symbol to indicate: Can cause cancer, causes harm to organs after prolonged or repeated exposure, can be fatal when ingested and penetrated into the respiratory pathways. These are 3 hazards out of 6 hazards associated to this symbol.

- The absence of a symbol does not indicate the absence of a hazard. For example, benzene does not have a symbol indicating a hazard to the aquatic environment, but the hazard description indicates that it is Toxic to aquatic organisms.

Therefore, it is crucial to not only look at the symbols, but also the hazard descriptions and caution recommendation.

b) Where to find further information about the chemical reagents you are working with

The safety sheet contains further information about a reagent. Before you begin to use a chemical product, you must read the sheet to clearly identify the following:

Necessary personal protection elements.

- If something should be handled under a hood.
- Disposal methods.
- First aid measures, etc.

Every reagent in the laboratory must have its own safety sheet available. If a sheet is not available, you can download it from the manufacturer's website, making sure that the catalog number of the reagent coincides with the one on the safety sheet.

Safety sheets have defined sections that provide all the necessary information to work with a reagent:

1	**Identification of the product**	a) Product identification. b) Other means of identification. c) Recommended use of the chemical product and restrictions. d) Supplier information (name, address, telephone, etc.). e) Telephone number in case of emergency.
2	**Identification of the hazard or hazards**	a) Classification of the substance/mixture and any national or regional information. b) Elements on the label. c) Other hazards that are not in the classification.
3	**Composition/ information about the components**	**Substances:** a) Chemical identity. b) Common name, synonyms, etc. c) CAS number and other unique identifiers. d) Impurities and other stabilizing additives contributing to the classification of the substance. **Mixtures:** The chemical identity and concentration or ranges of concentration of all hazardous components according to the established criteria, and which are present at levels higher than the limits of concentration.
4	**First aid**	a) Description of necessary measures, based on different types of exposure. b) Symptoms/most important effects, acute and delayed. c) Indication of the need to receive immediate medical attention and required special treatment, if needed.
5	**Firefighting measures**	a) Appropriate (and non appropriate) extinguishing methods. b) Specific chemical product hazards. c) Special protecting equipment and precautions for firefighting equipment.
6	**Measures in case of accidental spilling**	a) Individual precautions, personal protection equipment and emergency procedures. b) Environmental precautions. c) Methods and materials for isolation and cleaning.

7	**Handling and storage**	a) Precautions for safe handling. b) Conditions for safe storage, including incompatibilities.
8	**Exposure control/ personal protection**	a) Control parameters: limits and cut-off values for occupational or biological exposure. b) Appropriate engineering control. c) Individual protection measures, such as personal protection equipment.
9	**Physical and chemical properties**	Such as physical state, color, odor, fusion point/freezing, boiling point, flammability, flammability limits, density, pH, viscosity, solubility, vapor pressure, etc.
10	**Stability and reactivity**	a) Reactivity. b) Chemical stability. c) Possibility of hazardous reactions. d) Conditions that must be avoided. e) Incompatible materials. f) Products of hazardous decomposition.
11	**Toxicological information**	a) Information about possible types of exposure. b) Symptoms related to physical, chemical and toxicological characteristics c) Immediate, delayed and chronic effects.
12	**Ecotoxicological information**	a) Ecotoxicity (aquatic and land). b) Persistence and degradability. c) Bioaccumulation potential. d) Ground mobility. e) Other adverse effects.
13	**Product Disposal**	Description of waste and information about how to safely handle them and their disposal, including disposal of contaminated recipients.
14	**Transportation information**	a) NU number. b) Official transportation by the United Nations c) Type(s) of risk(s) during transportation. d) Packaging group/container, if applicable. e) Hazards to the environment. f) Bulk transportation. g) Special precautions.
15	**Regulatory information**	Specific stipulations related to safety, health and the environment for the corresponding product.
16	**Other information**	

c) How to store chemical reagents

The following indications must be considered when storing chemical reagents:

- Reagents must never be stored in alphabetical order, frequency of use or technique. They must be stored based on the following chemical incompatibility chart:

							
	✓	✗	✗	✗	✗	✓	✗
	✗	✓	✗	✗	✗	✗	✗
	✗	✗	✓	✗	✓	✓	✗
	✗	✗	✗	✓	✗	✗	✗
	✗	✗	✓	✗	✓	✓	✗
	✓	✗	✓	✗	✓	✓	✗
	✗	✗	✗	✗	✗	✗	✓

- Shelves must have means to prevent rollovers (metal door or bar).
- Reagents on shelves must never be above eye level, considering 1.60 meters to be the average height of the population.
- Heavy containers must be placed on lower shelves, ideally at floor level.
- Acids and strong bases must be placed on shelves that are at floor level.

The following products should be stored special:

- **Highly toxic products:** They must be stored in a specific area or cabinet, conveniently labeled, locked and with a usage log. For example, sodium azide. See Appendix 1.
- **Flammable products:** These products must be stored in protected metallic cabinets, known as RF15 and RF30, which should be at floor level. For example, methanol.
- **Corrosive products:** These products must be stored in protected metallic cabinets. For example, sodium hydroxide.
- **Psychotropic drugs:** They must be stored in a specific area or cabinet, conveniently labeled, locked and with a usage log. For example, ketamine. See Appendix 2.

d) Are there other safety measures to follow?

Yes. You must also consider the following:

- When you heat tube directly with fire, the tube must be tilted at a 45 degree angle with tweezers.
- Always use racks and stands.
- Hold test tubes with your fingers and never with your hands.
- Never carry tubes or products in your coat pockets.
- Never smell or inhale substances.
- Never touch or taste chemical products.
- Make sure materials cool down before taking them with hands.

When preparing solutions:

- All solutions prepared in the laboratory must have the following on a label: name of the solution, person who prepared it, elaboration date and safety symbols, if applicable.
- Containers for other products must never be reused without removing the original label.
- Do not place labels over each other.

When transferring liquids to other containers:

- Always transfer small amounts of liquid, if possible, to avoid the continuous use of heavy bottles. Otherwise, use a specific area to transfer.
- Transfer flammable substances away from heat sources.
- Transfer toxic, irritating and corrosive substances with appropriate protection wear according to the risks associated to the product.
- Avoid spilling by using funnels, measuring spouts and siphons.

When working with toxic substances or substances that are harmful when inhaled:

- You must use the appropriate chemical extraction hood, depending on whether it is an acid or an organic vapor.
- Correct functioning of the hood must be assessed annually and a record of such must be kept.
- If an extraction hood is not available, and the safety sheet indicates that respiratory protection is needed, safety masks with appropriate filters must be used (surgery masks do not count as safety elements).
- Masks require an N95 filter in the case of dealing with a substance in powder form, and an R95 filter in case the substance generates mist.
- Masks with specific chemical filters must be used when working with substances that generate gas or vapor.
- All masks thta are used must be certified.

3.2. Biological agents

There are or may be risks from the following different sources:

- Microorganisms.
- Human biological samples.
- Animal biological samples.
- Environmental samples.
- Cell cultures.
- Vegetables.
- GMOs
- Materials of unknown origin

The hazardousness of a biological agent is directly related to how it is handled, which is why the following is crucial:

- Know the hazardous agents, substances and products in the laboratory.
- Know the established work methodology and safety protocols.
- Know the laboratory equipment and how to use it safely.
- Know the norms related to biological safety and emergency responses.
- Follow and ensure compliance of the above by personally getting involved in risk prevention.

a) How are microorganisms classified?

Microorganisms are the most important sources of risks. They must all be classified in order to apply safety measures.

To this end, an international classification chart was established, which uses roman numbers to identify the risk group to which a specific microorganism belongs.

CLASSIFICATION OF INFECTIOUS MICROORGANISMS BY RISK GROUP

GROUP I	GROUP II	GROUP III	GROUP IV
E.coli K12 *Bacillus subtilis*	*Enteropathogenic E. coli* Hepatitis Virus	Hantavirus HIV *M.tuberculosis*	Ebola Virus Variola Virus (smallpox)
Low probability to cause diseases in humans or animals	Can cause severe infection Limited population risk There are effective preventive and therapeutic measures	Tend to cause severe infections Generally not contagious among humans There are effective preventive and therapeutic measures	Tend to cause severe infections Can be transmitted among humans directly or indirectly There are generally no effective preventive and therapeutic measures

If you are unsure abourt the risk group to which a specific microorganism belongs, please visit the following webpage: http://www.phac-aspc. gc.ca/lab-bio/res/psds-ftss/index-eng.php.

b) How are other biological agents classified?

The above classification is only use for microorganisms. Human biological samples must be classified as limited information samples.

c) What are the safety measures needed to work with biological agents?

Laboratories are classified into different biosafety levels, where corresponding safety measures are indicated for practices and infrastructure with which laboratories must comply. The international classification uses Arabic numerals (1, 2, 3, 4) to identify safety levels.

The following chart shows safety measures for biosafety levels at the University:

CLASSIFICATION OF LABORATORIES ACORDING TO BIOSAFETYT LEVEL		
CONTAINMENT LEVEL	**LABORATORY PROCEDURES**	**SAFETY EQUIPMENT**
1	• Restricted access • Lab coat, gloves and protective goggles • Other personal protection elements according to safety sheet (*)	Protection equipment for chemical agents, if needed
2	• Restricted access • Lab coat, gloves and protective goggles • Warnings of biological risk on door	• Class II safety cabinet is recommendable when working with infectious samples • Autoclave is recommendable in the laboratory
3	• Controlled access • Protective clothing for all procedures • All materials must come out disinfected • Air flow towards the interior, controlled ventilation and air vent with HEPA filter • Double door entrance • Additional measures if required	• Class II safety cabinet for all procedures • Autoclave in the laboratory, double door recommended

* All laboratories in biosafety level I must consider the same information as a chemical laboratory, and must only have special processes for the disposal of biological waste due to environmental impact.

There are several strategies to determine biosafety levels:

- The biosafety level must be correlate with the microorganism's risk group.
- Human samples: Level of biosafety should be 2. It can be considered level 1 only in some cases where urine and/or saliva are worked with.
- Commercial cell lines: Level of biosafety should be indicated by the supplier.
- Primary cultures: The same level of biosafety based on the origin of the culture (human or animal samples) shall be applied.
- When working with animal samples of rodents or lagomorphs that come from areas free of specific pathogens, the level of biosafetyshall be 1.
- When working with animal samples of rodents or lagomorphs that come from unspecified areas, the level of biosafety shall be 2.
- When working with animal samples of amphibians and/or fish, the level of biosafetyshall be 1.
- When working with contaminated animals, the level of biosafety shall depend on the microorganism with which it is infected.
- When working with environmental microbiological samples, the level of biosafety shall generally be 1.
- When working with recombinant DNA or genetically modified microorganism (GMOs) a risk evaluation should be performed in order to establish the biosafety level. The Committee shall validated such level.

d) What are the general BSL2 safety measures?

- Access to the laboratory must be limited to authorized personnel (it is important to distinguish that in a level 3 laboratory there is also controlled access).
- The biological risk symbol must be on the door. See Appendix 3.
- The personal protection elements required for the lab work must be indicated on the door.
- All work surfaces must be cleaned and disinfected on a daily basis, and any time leaks/spilling occurs. The disinfection method shall depend on the biological agents worked with. When using sodium hypochlorite, it must be prepared each day.
- When handling biological agents, signage and labeling for areas and equipment (clean and dirty areas) must be considered.
- Carrying samples within the laboratory must be done so that splattering does not occur in case of a fall (in racks or closed boxes, etc.).
- Carrying samples outside the laboratory must be done by means of triple packaging.
- Pregnant women or individuals with degrees of immunosuppression must be informed of the risks associated to their work. By communicating their condition to the laboratory Director, the tasks that they may not perform due to safety issues shall be assessed while in the condition.
- Protective clothing must be worn at all times, and personal protection equipment needed for the lab work must be used.
- Laboratory clothing must not be used outside the laboratory (cafeteria, library, etc.).
- Gloves made of waterproof material such as nitrile or latex must be used.
- Gloves must be thrown away as contaminated waste before leaving the work area. Never leave with gloves on, or pick up the phone, touch the computer or paper.
- Safety goggles must be used (even when using eyeglasses), which should be appropriate for the type of risk at hand when working in the laboratory, and especially when there is a risk of splattering.
- When choosing safety goggles, other risks such as impacts of objects, UV light, etc. should be considered.
- Certified facial masks (P3 o N95) must only be used when necessary.
- Visitors who exceptionally Access the laboratory must adopt the same precautions as the rest of the personnel.
- When sterilizing is necessary, moist heat sterilization under pressure (autoclave) is recommended.
- When aerosol formation is a risk and infectious agents are worked with, the general norm is to use appropriate biosafety cabinets.

e) How to work in a biosafety cabinet?

- Bunsen burners should not be used in the cabinets, because the flame creates a set of problems such as flow turbulence, damage to filters, etc. If you use platinum handles an electric burner is preferable, however if you have disposable handles that is even better.
- UV light is not recommended as a germicide. It could be used as a secondary method of disinfection, and must be disconnected before work begins.
- All cabinets must be correctly installed and inspected by the manufacturer at least once a year.
- It is necessary to identify the procedures that can be performed outside the cabinet, since the majority of them produce aerosols (centrifugation, sonication, mixing, shaking, opening containers with pressures different from ambient pressure, injections of fluids from pipettes or syringes, insertion of hot handles or needles into cultures, etc.).

f) How to work carefully with sharp objects

- Hypodermic needles and syringes are dangerous tools that must be handled with caution to avoid accidental injection or the generation or aerosols of infections agents or those that are potentially infectious.
- The use of Hypodermic needles and syringes should be limited. Needles should not be used if there is a reasonable alternative.
- If syringes are needed those that are already assembled should be used, where the needle is an integral part of the syringe
- Never recap the syringe and needle after using it, and do not manipulate it in any other way such as bending or breaking it, etc.
- Sharp objects should be eliminated right away in appropriate containers after they are used. These containers must be near the work area and filling them up excessively should be avoided.
- • If pinching or cutting occurs, the wound must be cleaned with running water for several minutes, favoring bleeding. It must then be washed energetically with water and soap. The incident must be immediately communicated to the person in charge of the lab.

When working with biohazardous agents:

- Fill the syringes carefully to avoid the formation of air bubbles, and if they are formed, the content must be eliminated ideally in a biosafety cabinet.
- Plugged pipettes (with cotton, etc.) must always be used, making sure to discharge the content on the wall of the recipient or in any case at the greatest possible distance.
- Reusable contaminated pipettes must be decontaminated before being washed and disposable pipettes (Pasteur, etc.) must be thrown away in a rigid container to be eliminated as waste.

3.3. Physical agents

a) How to work with autoclaves

Remember that Supreme Decree number 10 of 2014 establishes that nobody can operate autoclaves without a license from the Regional Ministerial Secretary of Health.

- Use special gloves to protect from heat.
- The equipment should not be opened if the manometer is at "0" and vapor has not been released.
- Check if the autoclave has a manometer and thermostat, as well as a safety valve and a fast disconnection system.
- Register the pressure and temperature of each process.
- Control the sterilization capacity of the autoclave once a month according the manufacturer recommendations.
- Preventive maintenance must be carried out on the equipment with the frequency according the manufacturer recommendations.
- Water should be changed regularly according to the manufacturer's instructions.

b) How to work with centrifuges

To avoid contaminationand accidents due to aerosols, the following is recommended:

- Perform the rotor balance procedure with precision in order to avoid accidents.
- When opening do not force of the centrifuge and follow the recommendations of the supplier.
- Old centrifuges that do not have a safety closure system must not be used. New centrifuges have this system. Centrifuges must not be opened while in operation.
- The lab manager or director must be immediately notified when a tube is accidentally broken and its contents are poured into the bucket.
- In case tubes with biological fluids are broken, you must wait at least 15 minutes before opening the centrifuge to decant aerosols and then wash with the appropriate disinfectant.

c) How to work with heat or flame generating equipment or devices

- Never place this equipment close to cabinets with flammable compounds.
- To avoid accidents, it is recommendable to reduce the use of open flames as much as possible in the laboratory.
- When a burner is not in use, it must be turned off and the gas valve must be closed.
- If the burner is in use it must be never left unattended. They must be turned off when exiting the laboratory, except when another person expressly becomes responsible for it.
- Connection hoses have expiration dates. They must be inspected periodically and replaces when anomalies are observed or when indicated by the expiration date.
- Electric burners (with no flame) are preferable.

d) How to work with UV radiation

Safety measures must be established according to the characteristics of the sources:

- If used in a room or cabinet, external switches must be used with a light that indicates when the UV is on.
- Individuals working with transilluminators, for instance, must use eye protection such as safety goggles, screens, opaque gloves, etc.
- In any case, hazards signs, limited access and time limits for the UV to be on must be present.

e) How to work in facilities with gas cylinders

- Cylinders must be stored in appropriate places, always in vertical position and on flat floors.
- The areas where the cylinders are stored must indicate the name of the stored gas, as well as hazard signs.
- Full and empty cylinders must be stored separately.
- If gases are incompatible, the cylinders must be stored separated by physical obstacles such as walls or furniture.
- Cylinders must not be stored near easily flammable or corrosive substances.
- Stored cylinders, even those that are empty, must have hoods or protectors and their valve must be closed.
- Cylinders must be perfectly fixed with chains or a system that avoids tipping.
- Only authorized personnel can perform maintenance and repair work on the installations.

f) How to work with -80°C freezers or cryogenic liquids

- Lab coats, protective goggles and insulating gloves must be used. Contact with the skin or eyes could cause severe burns.
- Transferring cryogenic liquids that could be flammable inside the laboratory must be avoided. Decanting must be done far from sources of ignition.

g) How to work with lasers

- If used in a room or cabinet: external switches must be used with a light indicating when the laser is on.
- Safety goggles must be used according to the type of laser.

h) How to work with ionizing radiation

- The lab worker handling radioisotopes in second or third category installations must have a license from the SEREMI (Regional Ministerial Secretary) of Health. When working with a first category installation, the person must have a license from the Chilean Commission on Nuclear Energy.
- The installation where radioisotopes are worked with must be authorized as a second or third category installation by the SEREMI (Regional Ministerial Secretary) of Health, and as a first category installation by the Chilean Commission on Nuclear Energy.
- Individuals working with ionizing radiation must have a dosimeter, which should be sent for measurement. Dosimeter control must be performed by a service provided by the SEREMI (Regional Ministerial Secretary) of Health, based on a positive technical report provided by the Chilean Institute of Public Health.
- Safety measures shall be specific to the type of radiation used and must be stipulated by the laboratory.

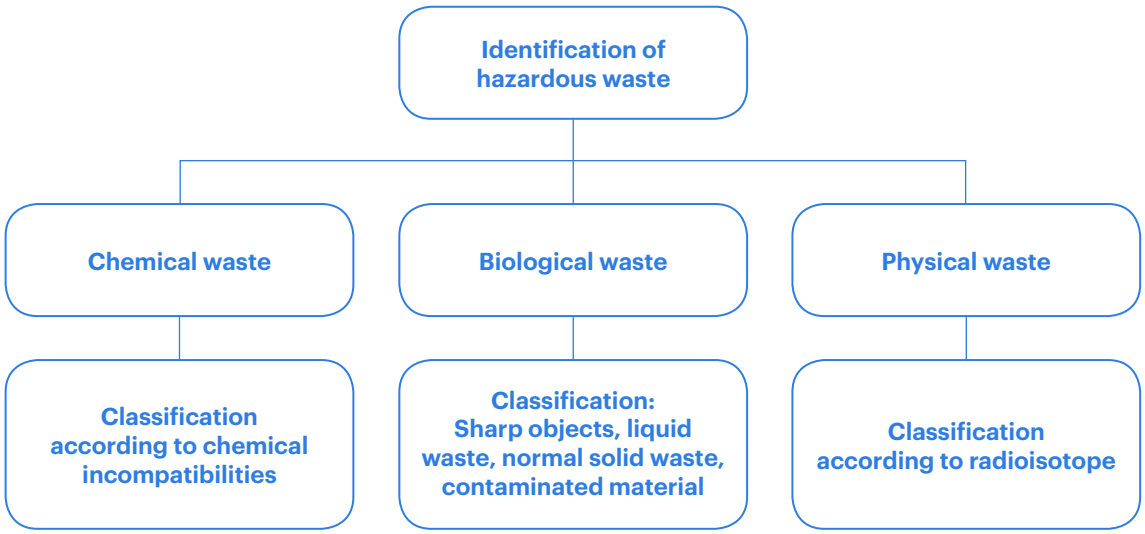
i) Are there other physical risks?

- Vacuum pumps and aspirators must have their corresponding traps and filters.
- Thermoregulator baths must be cleaned once a week and disinfected on a monthly basis.

4. / Waste management

Waste management involves a process that must be carried out according to the guidelines of each school within this university. This manual contains recommendations, but you must always comply with additional regulations stipulated by your school.

Waste can be classified as follows:



a) Chemical waste disposal

Chemical waste must be separated according to hazard and incompatibilities until removed by a specialized external company.
Chemical waste must be stored in resistant plastic or glass containers, closed and correctly labeled, always following the chemical incompatibility chart.

Chemical waste must be categorized as follows:

- Halogenated organics.
- Non-halogenated organics.
- Aromatic non-halogenated organics and phenols.
- Organic liquids with heavy metals.
- Non-organic liquids with heavy metals.
- Acids without sulfurs, cyanides or heavy metals.
- Acids with sulfurs, cyanides and heavy metals.
- Organic acids.
- Bases without sulfurs, cyanides or heavy metals.
- Bases with sulfurs, cyanides and heavy metals.
- Organic bases.
- Non-organic solids.
- Organic solids.

Special recommendations:

Formalin and formaldehyde dissolutions:

- They must be stored for their availability separated from other waste.
- Tubes and sharp tips that have been in contact with reagents must be included as hazardous waste.

Ethidium bromide gels:

- Must be stored individually in sealed plastic bags to reduce handling and contact with other reagents.

Organic dissolvents:

- Keep halogenated dissolvent waste separated from that which is non-halogenated.
- Separate organic dissolvents from aqueous dissolutions when possible.
- Do not mix strong non-organic acids or oxidants with each other or with organic compounds.

Acids and bases:

- Keep acids separate from waste from other dissolvents and bases.
- Keep acids, bases and aqueous dissolutions with heavy metals separate from other waste.
- Avoid mixing acids and strong bases in the same container, because this will cause a strong exothermic reaction.

Mercury dissolutions:

- Keep waste containing mercury salts separarate.

Reagents that must not be mixed with another reagent under any circumstances:

- Nitric acid at more than 40% concentration.
- Perchloric acid.
- Hydrogen peroxide at more than 52% in weight.
- Nitro-hydrochloric acid.
- Chlorates and nitrates.

Highly toxic waste:

- Keep this waste in separate containers.

Chromatography adsorbent:

- Keep silica gel in plastic bags or in a polyethylene container.
- Do not store with liquid waste or paper, plastic, gloves, etc.

Photographic developer and fixer:

- The majority of developers are highly diluted solutions that are not hazardous and can be eliminated in the drain.
- Used photographic fixer contains silver and must be eliminated as separate hazardous waste.

Polychlorinated biphenyls:

- It is recommended that they be stored separately from other toxic waste.

Explosive material:

- Explosive material such as dry picric acid or dissolvents contaminated with peroxides must be kept separate from other types of waste and must be placed in metallic containers.

Pesticides:

- Insecticides, herbicides and fungicides must be handled in separate containers for their correct disposal.

b) Biological waste disposal

- Liquid samples such as urine, blood and byproducts can be eliminated through the drain;
- Culture media can be inactivated with chlorine and then eliminated in the drain. When volumes are high, they can be autoclaved and then eliminated in the drain.
- Solid biological samples such as animal samples, biopsies, etc. must be stored in yellow bags that have the biological hazard symbol on them, and stored at -20°C that has a specific area for waste, until it is removed by a specialized external company.
- Solid waste contaminated with biological liquids (such as cotton, tubes, tips, etc.) must be eliminated in yellow bags for biological waste.
- Every object contaminated with biological samples must be eliminated in yellow bags for biological waste.
- Every disposable object contaminated with infectious material must be appropriately disinfected before taking them out of biosafety cabinets, so as to then be removed in yellow bags for biological waste.
- Every reusable object contaminated with infectious material must be appropriately disinfected before taking them out of biosafety cabinets, and later sterilized before using them again.
- Sharp objects contaminated with biological samples must be kept in special containers for such purposes, and the limit of the container must never be exceded.
- All waste bins for biological waste must have a pedal and signage for biological hazard.

c) Radioactive waste disposal

The storage protocol and final disposal will differ depending on the activity and half-life of the radioisotope. The above must be specified depending on the type of work carried out in the installation.

5. / Appendices

Appendix 1

LIST OF HIGHLY TOXIC PRODUCTS

CAS #	CHEMICAL SUBSTANCE
145-73-3	7-Oxabicyclo[2,2,1]heptane-2,3-dicarboxylic acid
298-04-4	Phosphorothiothionic acid, O,O-diethyl ester
298-00-0	phosphorothioic acid, 0,0- dimetil 0-(4-nitrophenyl) ester
297-97-2	0,0-Diethyl 0-pyrazinyl phosphorothioate
5344-82-1	1-(o-Chlorophenyl)thiourea
75-55-8	1,2- Propyleneimine
309-00-2	1,4,4a,5,8,8a- hexahydro-1,2,3,4,10,10- hexachloro-1,4,4a5,8,8a,-hexahydro- 1alpha, 4 alpha, 4abeta, 5alpha, 8alpha 8abeta- 1,4,5,8-dimetanonaftalene
465-73-6	1,4,4a,5,8,8a-hexahydro (1alpha,4alpha,4abeta,5beta,8beta,8abeta)-1,2,3,4,10,10-hexachloro-1,4,5,8-dimetanonaftalene
72-20-8	1a, 2, 2a, 3, 6, 6a, 7, 7a, -octahydro- (1aalpha,2beta,2abeta, 3alpha, 6alpha,6abeta,7beta,7aalpha)-3,4,5,6,9,9-hexachloro-2,7:3,6- dimethyl [2,3-b]oxyrene, and metabolites
60-57-1	1a, 2, 2a, 3, 6, 6a, 7, 7a-octahydro(1a alpha, 2 beta, 2a alpha, 3 beta,6beta,6aalfa,7beta,7aalpha)-3,4,5,6,9,9-hexachloro- 2,7:3,6- dimethyl [2,3-b] oxirene
591-08-2	1-acetyl-2-thiourea
598-31-2	1-bromo-2-propanone
86-88-4	1-naphthalenyl- thiourea
88-85-7	2-(1-methylpropyl)-4,6-dinitrophenol)
357-57-3	2,3-dimethoxy estricnina-10-one
51-28-5	2,4- dinitrophenol
131-74-8	2,4,6-trinitrophenol, ammonium salt (R)
131-89-5	2-cyclohexyl-4, 6-dinitrophenol
5344-82-1	2-chlorophenyl-thiourea
640-19-7	2-Fluoroacetamide
75-86-5	2-Hydroxy-2- methylpropanenitrile
75-55-8	2-methylaziridine
75-86-5	2-Metil lactonitrile
116-06-3	2-methyl-2-(methylthio)-0-[(methylamino) carbonyl] oxima propanal
534-52-1	2-methyl-4,6-dinitrophenol and its salts
107-18-6	2-propen-1-ol

CAS #	CHEMICAL SUBSTANCE
107-02-8	2-Propenal
107-19-7	2-propyn-1-ol
54-11-5	3-(1-methyl-2-pyrrolidinyl)pyridine (S) and salts
39196-18-4	2 butanone, 3,3-dimethyl-1-(methylthio)-0-[(methylamino)carbonyl]oxyme
76-44-8	3a,4,7,7a-tetrahydro-1,4,5,6,7,8,8heptachloro-4,7-Methane- 1H-indene
542-76-7	3-Chloro-propane nitrile
542-76-7	3- Chloro-propane nitrile
115-29-7	3-oxide-1,5,5a,6,9,9a-hexahydro- 6,7,8,9,10,10-hexachloro-6,9- methane- 2,4,3,-benzodiazepine
534-52-1	4,6-dinitro-o-cresol and salts
51-43-4	4-[1-Hydroxy-2-(methylamino) ethyl]-1, 2-benzenediol (r)
504-24-5	4-aminopyridine
106-47-8	4-Chlorobenzenamine
81-81-2	4-Hidroxi-3-(3-oxo-1-phenylbutyl)-2H-1-benzopyran-2-one and saltds, when in concentrations higher than 0.3%
100-01-6	4-nitrobenzenamine
504-24-5	4-pyridinamine
2763-96-4	5-(aminomethyl)-3(2H)-isoxazolone
2763-96-4	5-(aminomethyl)-3-isoxazolol
62-38-4	Phenylmercury acetate
7778-394-4	arsenic acid h3aso4
62-74-8	fluoroacetic acid sodium salt
311-45-5	fosfóric acid, diethyl 4- nitrophenyl ester
60-51-5	phosphorodithioic acid, 0,0- methyl-[2-(methylamino)-2-oxoethyl] ester
298-02-2	phosphorodithioic acid, 0,0-diethyl S-[2-(ethylthio)ethyl] ester
55-91-4	fosforo fluorhydric acid, bis (1-methylethyl) ester
56-38-2	phosphorothioic acid, 0,0-dietil 0-(4-nitrophenyl) ester
297-97-2	phosphorothioic acid, 0,0-diethyl 0- pyrazinyl ester
52-85-7	phosphorothioic acid, 0-[4- [(dimethylamino) sulfonyl] phenyl] 0,0-dimethyl ester
628-86-4	fulminic acid, mercury salt (2+) (r,t)
74-90-8	hydrocyanic acid
16752-77-8	Ethanimidothioic acid, n-[[(methylamine)carbonyl]oxi]-methyl ester
12039-52-0	selenious acid, ditalium (1+) salt
7446-18-6	sulfuric acid, ditalium (1+) salt
107-49-3	phosphoric acid, tetraethyl ester
757-58-4	tetrafosforo acid, hexaethyl ester

CAS #	CHEMICAL SUBSTANCE
3689-24-5	tiodi phosphoric acid, tetraethyl ester
7803-55-6	vanadic acid, ammonium salt
107-02-8	acrolein
116-06-3	aldicarb
309-00-2	aldrin
122-09-8	alpha, alpha, dimethylphenethylamine
122-09-8	benzeneethamine alpha alpha-dimethyl
86-88-4	alpha-naftil thiourea
107-18-6	allyl alcohol
506-61-6	argentate (1-), Bis (ciano -C), potassium
26628-22-8	sodium azide
151-56-4	aziridine
108-98-5	benzenethiol
7440-41-7	beryllium
598-31-2	bromoacetone
357-57-3	brucine
13463-39-3	nickel carbonyl Ni(Co)4 (t,r)
460-19-5	cyanogen
542-62-1	barium cyanide
592-01-8	Calcium cyanide
592-01-8	Calcum cyanide Ca(Cn)2
557-21-1	Zinc cyanide Zn(Cn)2
544-92-3	Copper cyanide
544-92-3	Cianuro de cobre CuCn
107-12-0	Ethyl cyanide
74-90-8	Hydrogen cyanide
557-19-7	Nickel cyanide Ni(Cn)2
506-64-9	Silver cyanide Ag(Cn)
506-61-6	Silver and potassium cyanide
151-50-8	Potassium cyanide K(Cn)
143-33-9	Sodium cyanide Na(Cn)
___	Cyanides (salts soluble in cyanide), not otherwise specified
107-20-0	chloroacetaldehyde
100-44-7	chloromethyl benzene
100-44-7	Benzyl chloride

CAS #	CHEMICAL SUBSTANCE
506-77-4	cyanogen chloride
506-77-4	cyanogen chloride (Cn)Cl
81-81-2	camphene and salts, when at concentrations greater than 0.3%
541-53-7	thioimidodicarbonic diamide [(H2n) C(S)]2nH
696-28-6	dichlor phenylarsine
542-88-1	dichloromethyl ether
75-44-5	carbonic dichloride
60-57-1	dieldrin
692-42-2	diethyl arsine
311-45-5	diethyl p-nitrophenyl phosphate
55-91-4	diisopropylfluorophosphate (dFP)
60-51-5	dimethoate
88-85-7	dinoseb
10102-44-0	nitrogen dioxide
298-04-4	disulfoton
75-15-0	carbon disulfide
541-53-7	dithiobiuret
115-29-7	endosulfan
145-73-3	Endothall
72-20-8	endrin
72-20-8	endrin and metabolites
51-43-4	epinephrine
57-24-9	Strychnine -10- one and salts
57-24-9	Strychnine and salts
460-19-5	ethanedinitrile
151-56-4	ethylenimine
52-85-7	famphur
103-85-5	phenylthiourea
7782-41-4	Fluorine
640-19-7	fluoroacetamide
298-02-2	phorate
7803-51-2	phosphine
20859-73-8	aluminum phosphide (r, t)
1314-84-7	zinc phosphide Zn3P2, when in concentrations greater than 10% (r, (r,t)
7803-51-2	hydrogen phosphide

CAS #	CHEMICAL SUBSTANCE
75-44-5	Phosagene
628-86-4	mercury fulminate (r,t)
76-44-8	heptachlor
757-58-4	hexaethyl tetraphosphate
79-19-6	hydrazinecarbothioamide
624-83-9	methane isocyanate
624-83-9	methyl isocyanate
465-73-6	isodrin
62-38-4	Mercury, phenyl (acetate-0)
298-00-0	methyl parathion
60-34-4	methylhydrazine
16752-77-8	methomyl
591-08-2	n-(amino thioxo methyl)-acetamide
54-11-5	nicotine and salts
55-63-0	nitroglycerin (r)
62-75-9	n-methyl-n-nitroso-methanamine
4549-40-0	n-methyl-n-nitroso-vylamine
4549-40-0	n-nitroso n-methyl vinyl amine
62-75-9	n-nitrosodimethylamine
152-16-9	octamethyl pyrophosphoramide
152-16-9	octamethyl diphosphoramide
542-88-1	oxibis chloromethane
1327-53-3	arsenic oxide As2O3
1303-28-2	arsenic oxide As2O5
20816-12-0	arsenic oxide As2O4, (t-4)
1314-32-5	thallium oxide Tl2O3
1314-62-1	vanadium oxide V2O5
10102-43-9	nitric oxide
56-38-2	parathion
106-47-8	p-chloroaniline
1303-28-2	arsenic pentoxide
131-74-8	ammonium picrate (r)
100-01-6	p-nitroaniline
107-12-0	propanenitrile
107-19-7	propargyl alcohol

CAS #	CHEMICAL SUBSTANCE
12039-52-0	thallium selenite (i)
630-10-4	selenourea
7446-18-6	thallium sulfate (i)
78-00-2	tetraethyl plumbane
3689-24-5	tetraethyl dithiopyrophosphate
78-00-2	lead tetraethyl
107-49-3	tetraethyl pyrophosphate
509-14-8	tetranitromethane (r)
20816-12-0	Osmium tetroxide
39196-18-4	tiofanox
108-98-5	thiophenol
79-19-6	thiosemicarbazide
8001-35-2	toxaphene
75-70-7	trichloroethanol
1327-53-3	arsenic trioxide
7803-55-6	ammonium vanadate
81-81-2	warfarin and salts, when at concentrations greater than 0.3%

Appendix 2: List of psychotropic drugs

DRUGS: LIST 1

4-MTA	α - miel-4-methylthio phenethylamine
Brolamfetamine	
Cathinone	alpha-aminopropiophenone
DET	n,n-diethyltriptamine
DMA	dl-2,5-dimetoxi-alpha- methylphenethylamine
DMHP	3-(1,2- dimethylheptyl)-1-hydroxi-7,8,9,10-tetrahydro-6,6,9-trimethyl-6H dibenzene [b,d] pyran
DMT	n,n-dimethyltryptamine
DOB	2,5-dimetoxi-4- bromoamphetamine 58
DOET	dl-2,5-dimetoxi-4-ethyl-alpha-methyl- phenylethylamine
Ethylamine	
Triptamine	3-(2-aminoethyl)indole
Phencyclidine	And its analogs 1-(1- phenylcyclohexyl) piperidine, - TCP 1-[1-(2-tienil) cyclohexyl] piperidine, - PHP o PCPY 1-(1- phenylcyclohexyl) pyrrolidine; - PCE n-ethyl-1 phenylcyclohexylamine
Phenethylamine	
Phenmetrazine	3-metil-2- phenylmorpholine
Glutethimide	2-ethyl-2- phenyl glutarimide
Lefetamine SPA	(-)-1-dimethylamin-1,2- diphenylethane
Lysergide	(LSD,LSD 25) n,n-diethyl-d-lysergamide(diethylamide) from d-lysergic acid)
MDA	3,4- methylenedioxyamphetamine
MDEe, n-ethyl MDA	(+/-) – n-ethyl - a - methyl –3,4-(methylenedioxy) phenethylamine
MDMA	dl-3,4-methylenedioxi-n, alpha- dimethylphenethylamine
Mecloqualone	3-(o- chlorophenyl)2-methyl-4-(3H) quinazolinone
Mescaline	3,4,5- trimethoxyphenethylamine
Methaqualone	2-methyl-3-o-tolyl-4(3H)- quinazolinone
MMDA	dl-5- methoxy-3,4- methylenedioxy-alphaa-methyl-phenyl
N-hydroxi MDA	(+/-)-n-[a-methyl-3,4-(methylenedioxy) phenethyl] Hydroxylamine
Parahexyl	3- hexyl-1- hydroxy -7,8,9,10-tetrahydro-6,6,9-trimethyl- 6H-dibenzo [b,d] pyran
PMA	4-methoxy-alpha- methylphenethylamine
Psilocybin	3-(2-(dimethylamino)-ethyl)1H-indol-4-ol phosphate
Psilocin	3-(2-(dimethylamino)ethyl)-4-hydroxi-indole
STP, DOM	2-amino-1-(2,5- dimethoxy-4-methyl) phenyl propane
Tetrahydrocannabinols	(all isomers) $\Delta 6^{a}$ (10^{a}), $\Delta 6^{a}(7)$, Δ 7, Δ 8, Δ 9, Δ10, Δ 9(ii) and their stereochemical variants

TMA	dl-3,4,5-trimethoxy-a-methylphenylethylamine
TMA	dl-3,4,5- trimethoxy-alpha- methylphenylethylamine

DRUGS: LIST II

2-CB	4-bromo-2,5 dimethoxyphenethylamine [a,d]Cycloheptene – 5 il) amino] heptanoic)
Amphetamine	2-amino-1-phenylpropane and optical isomers
Amineptine	(7 -(10, 11-dihydro 5H – dibenzo) Cycloheptane – 5 il) amino] heptanoic acid)
Amfepramone	(dietilpropion) 2-(dimethylamino)-propiophenone
Cathine	(norpseudoephedrine) d-threo-2-amino-1-hydroxy-1-phenylpropane
Dexamphetamine	2-amino-1- phenylpropane
Phendimetrazine	3,4 dimethyl-2- phenylmorpholine
Fenethylline	dl-3,7-dihydro-1,3-dimethyl-7-(2a(1-methyl-2-phenyl-ethyl)animoa - ethyl)-1-1H-purin 2,6-dionia
Fenproporex	dl-3(a-methylphenethylamine propionitrile
Phentermine	a a-dimethylphenethylamine
Ketamine	2-(2-chlorophenyl)-2-(methylamino)-cyclohexan-1-one 76
Levoamphetamine	1-alpha-methylphenylamine
Levomethamphetamine	1-n,alpha-dimethylphenylamine
Mazindol	5-(p-chlorophenyl)-2,5-dihydro-3H-imidazo 2,1-a iso indol-5-ol
Methamphetamine	(desoxyephedrine) 2-methylamino-1-phenylpropane
Methylphenidate	methyl esterfrom a -phenyl-(2-piperidyl acetic acid)
Methamphetamine racemate	n a-dimethylphenethylamine
Zipeprol	a-(a,-methoxybenzyl)-4-(b-methoxyphenethyl)-1-piperidineethanol

DRUGS: LIST III

Allobarbital	5,5-diethylbarbituric acid
Amobarbital	5-ethyl-5-(3-methylbutyl) barbituric acid
Aprobarbital	5-allyl-5-isopropyl- barbituric acid
Barbital	5,5-diethylbarbituric acid
Brallobarbital	5-allyl-(2-bromo allyl)- barbituric acid
Buprenorphine	21-cyclopropyl-7-alpha-(S)-1-hydroxi- 1,2,2-trimethylpropyl-6, 14-endo- ethanol-6,7,8,14-tetrahydro oripavine
Butalbital	5-allyl-5-isobutyl-barbituric acid
Cyclobarbital	5-(1-cyclohexen-1-ol)-5-methyl- barbituric acid
Phenobarbital	5-ethyl-5-phenyl barbituric acid
Flunitrazepam	5-(o-fluorophenyl)-1,3-dihydro-1-methyl-7-nitro-2H-1,4- benzodiazepin-2-one)
Hexobarbital	5,(1-cyclohexyl)-1,5-dimethyl barbituric acid

Mephobarbital	5-ethyl-1-methyl-5-phenyl barbituric acid
Meprobamate	2 methyl-2-propyl-1-3- propanediol bicarbonate
Metabarbital	5,5 diethyl-1-methyl barbituric acid
Pentazocine	1,2,3,4,5,6-hexahydro-6-11-dimethyl- 3-(3-methyl-2- butanol)-2, 6-methano-3 benzoxazocine-8-ol
Pentobarbital	5-ethyl-5-(1-methylbutyl) barbituric acid
Proxibarbal	5-allyl-5-B-hydroxypropyl- barbituric acid
Secbutabarbital	5-sec-butyl-5-ethylbarbituric acid
Secobarbital	5-allyl-5-(1-methylbutyl) barbituric acid

DRUGS: LIST IV

Acecarbromal	n- acetyl-n-bromo diethyl acetal-urea
Alprazolam	8-chloro-1- methyl-6-phenyl-4H-s-triazolo [4,3-a] [1,4]benzodiazepine
Aminores	2-amino-5-phenyl-2-oxazoline
Benzphetamine	n-benzyl-n, a-dimetilphenetilamine
Bromazepan	7-bromo-1,3-dihydro-5-(-2-pyridyl)-2H- 1,4 benzodiazepin-2-one
Bromisoval	a-bromo-b- dimethyl propan oilurea
Brotizolam	2-bromo-4-(2-chlorophenyl)-9 methyl-6H-thieno [3,2-f] [1,2,4] triazolo [4,3-a 1,4] diazepine
Butallylonal	5(2-bromoallyl)-5-sec-butyl barbituric acid
Butobarbital	acido-5-butil-5-etilbarbiturico
Camazepam	7-cloro-1,3-dihydro-3-hydroxy-1-methyl-5- phenyl-2H-1,4- benzodiazepin-2-one dimethylcarbamate (ester)
Carbamate	ethynyl-benzyl-carbamate
Carbromal	n(-α-bromo-b-ethyl-butyl-urea)
Clobazam	7-chloro-1-methyl-5-phenyl-1H-1,5 benzodiazepine- 2,4(3H,5H)-dione
Clobenzorex	(+) - n-(o-chlorobenzyl)- a methyilphenethylamine
Chloralodol	2-methyil-4-(2,2,2-trichloro-1-hydroxietoxi) 2-pentanol
Chloralosa	1,2 -o (2,2,2-trichloro ethylene)-a-d glucofuranose
Clorazepate	7-chloro-2,3-dihydro-2-oxo-5-phenyl-1H-1,4-benzodiazepine-3-carboxylic acid
Chlordiazepoxide	7-chloro-2-(methylamino)-5-phenyl-3H-1,4- benzodiazepine-4-oxide
Chlorphentermine	1-(p-chlorophenyl)-2 methyl-2-aminopropane
Clotiazepam	5-(o-chlorophenyl)-7-ethyl-1,3-dihydro-1-methyl-2H-tieno [2,3-e]-1,4-diazepine-2-one
Cloxazolam	10-chloro-1 1b-(o-chlorophenyl)- 2,3,7,1 1btetrahydrooxazolo[3,2d] [1,4] benzodiazepine-6(5H)-one
Clonazepam	5-(o-chlorophenyl)- 1,3-dihydro-7-nitro-2H- 1,4-benzodiazepine-2-one
Delorazepam	7-chloro-5-(o-chlorophenyl)-1,3-dihydro-2H- 1,4- benzodiazepine-2-one
Dextromethorphan	(+) 3-methoxy-n-methylmorphinan

Diazepam	7-chloro-1,3-dihydro-1-methyl-5-phenyl-2H- 1,4- benzodiazepine -2-one
Estazolam	8-chloro-6- phenyl-4H-s-triazole [4,3-a] [1,4] benzodiazepine -2-one
Ethchlorvynol	1-chloro-3-ethyl-1-pentene-4-in-3-ol
Etilamfetamine	n-ethyl-a-methylphenethylamine
Ethinamate	1-carbamate de ethynylcyclohexanol
Etizolam	4-(2-chlorophenyl)-2-ethyl-9 methyl-6H-thieno[3,2-f]-s-triazole [4,3-a] [1,4]diazepine
Fencamfamine	n-ethyl-3-phenyl-2-norbornanone
Phenylcarbinol	
Fludiazepam	7-chloro-5-(o-fluorophenyl)-1,3-dihydro-1-methyl-2H-1,4-benzodiazepin-2-one
Flurazepam	7-chloro-1-[2-(diethylamine)ethyl-5]-(o-fluorophenyl)-1,3-dihydro-2H-1,4-benzodiazepine2-one
GHB	gamma-hydroxybutyric acid
Haloxazolam	10-bromo-1 1b-(o-fluorophenyl)- 2,3,7, 1 1btetrahidrooxazole [3,2-d] [1,4] benzodiazepine-6(5H)- one
Heptabarbo	5-cyclo-hep-1-enyl-5-ethyl- barbituric acid
Chloral hydrate	2-2-2-trichloroethane 1-1-diol
Holazepam	7-chloro-1,3-dihydro-5-phenyl-1-(2,2,2-trifluoroethyl)-2H-1,4- benzodiazepine -2-one
KetazolaM	11-chloro-8,12b-dihydro- 2,8-dimetil-12b-phenyl-4H-[1,3]-oxazine-[3,2-d] [1,4] benzodiazepine- 4,7(6H)-dione
Ethyl loflazepate	7-chloro-5-(o-fluorophenyl)-2,3-dihydro-2-oxo-1H-1,4- benzodiazepine-3-ethyl carboxylate
Loprazolam	6-(o-chlorophenyl)- 2,4-dihydro-2- [(4-methyl-1- piperazinyl)metilene]-8-nitro-1H imidazole [1,2-a] [1,4]
Lorazepam	7-chloro-5-(o-chlorophenyl)-1,3-dihydro-3- hydroxi-2H-1,4- benzodiazepine -2-one
Lormetazepam	7-chloro-5-(o-chlorophenyl)-1,3-dihydro-3- hydroxi -1-methyl- 2H-1,4 benzodiazepine-2-one
Medazepam	7-chloro-2,3-dihydro-1-methyl-5-phenyl-1H- 1,4- benzodiazepine
Mefenorex	n-(3-chloropropyl)-a-methyl- phentolamine
Mesocarbon	(imine of 3-(alpha-methyl phenethyl)-n-(phenylcarbamoyl) sydnone)
Metilpentinol	3-methyl-1-pentyl-3-ol
Methyprylon	3,3-diethyl-5-methyl-2,4-piperidine-dione
Midazolam	8-chloro-6- (o-fluorophenyl)-1-methyl-4H- imidazole[1,5-a] [1,4] benzodiazepine
N-ethylamphetamine	dl-n, ethyl-alpha-methylphenethylamine
Nimetazepam	1,3-dihydro-1-methyl-7-nitro-5-phenyl-2H- 1,4- benzodiazepine -2-one
Nitrazepam	1,3-dihydro-7-nitro-5-phenyl-2H-1,4- benzodiazepine -2- one
Nordazepam	7-chloro-1,3-dihydro-5-phenyl-2H-1,4- benzodiazepine -2-one
Oxazepam	7-chloro-1,3-dihydro-3-hydroxi-5-phenyl-2H- 1,4 benzodiazepine -2-one
Oxazolam	10-chloro-2,3,7,1 1b-tetrahydro- 2-methyil-11bphenyloxazole[3,2-d] benzodiazepine -6(5H) one

Pemoline	2-amino-5-phenyl-2-oxazoline-4-one
Pinazepam	7-chloro-1,3-dihydro-5-phenyl-1-(2-propinyl)-2H-1,4- benzodiazepine -2-one
Pipradrol	diphenyl-2-piperidinemethanol
Pyrovalerone	4-methyl-2-(1- pyrrolidinyl) valerophenone
Prazepam	7-chloro-1-(cyclopropylmethyl)-1,3-dihydro- 5-phenyl-2H-1,4- benzodiazepine -2-one
Probarbital	5 ethyl-5-isopropyl-barbituric acid
Prolintano	1 phenyl-2-pyrrolidilpenthane
Propylhexedrine	n, a- dimethylcyclohexane octylamine
Quazepam	7-chloro-5-(2-fluorophenyl)-1,3-dihydro-1-(2,2,2-trifluoroethyl) -1,4- benzodiazepine-2-tione
Sibutramine	1-(4- chlorophenyl)-n,n-dimethyl-alpha-(2- methylpropyl)- cyclobutane methanol
Temazepam	7-chloro-1,3-dihydro-3-hydroxi-1-methyl-5-phenyl-2H-1,4- benzodiazepine-2-one
Tetrazepam	7-chloro-5-(-1-cyclohexen-1-yl)-1,3-dihydro-1-methyl-2h- 1,4- benzodiazepine-2-one
Tranylcypromine	2 phenyl cyclopropylamine
Triazolam	8-chloro-6-(o-chlorophenyl)-1-methyl-4H-s-triazolo [4,3-a] [1,4] b benzodiazepine
Vinylbital	5-(1-methylbutyl)-5-vinyl-barbiturico acid
Zolpidem	n,n,6-trimethyl-2-p-tolyl imidazole [1,2-alfa] pyridine-3- acetamide

Appendix 3

BIOHAZARD

Restricted Access

Only Authorized Personnel

Biosafety level: _____

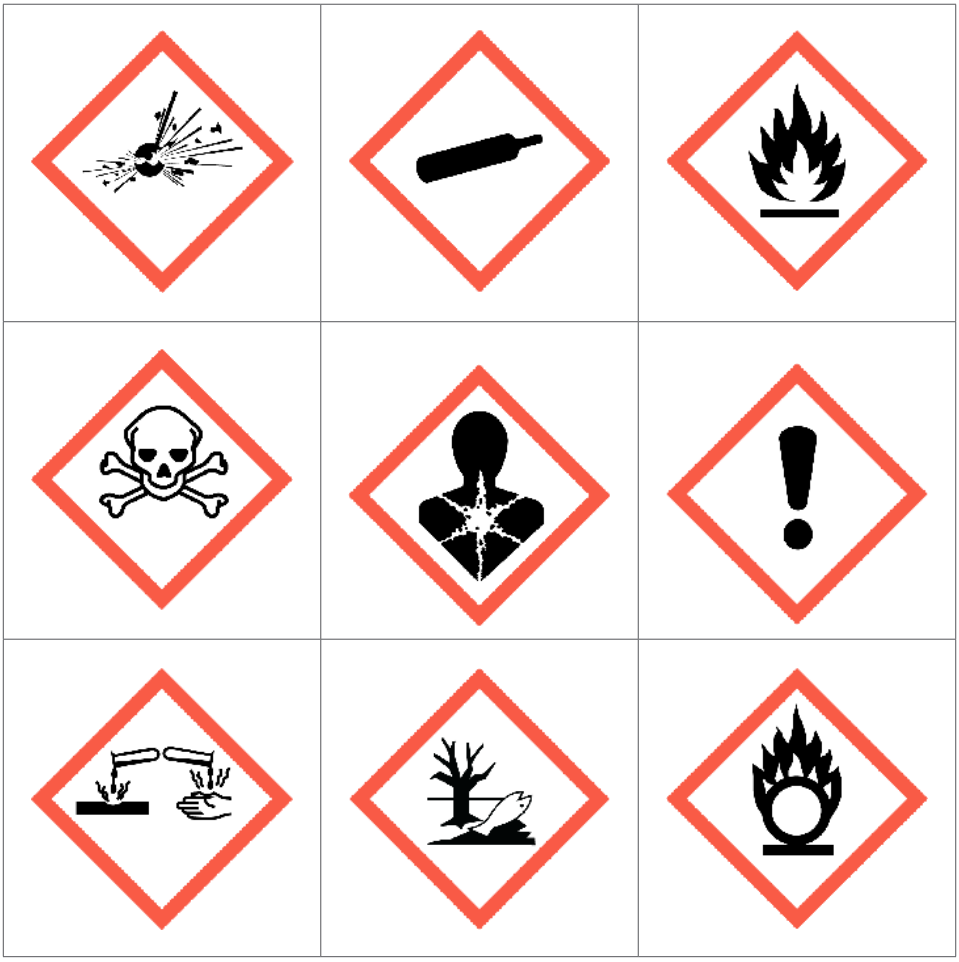
Principle Researcher: _____

In case of an emergency notify: _____

Appendix 4

E  EXPLOSIVE	O  OXIDIZING	F  EASILY FLAMMABLE	F+  EXTREMELY FLAMMABLE
T+  HIGHLY TOXIC	T  TOXIC	C  CORROSIVE	Xn  HARMFUL
Xi  IRRITATING	N  HAZARDOUS TO THE ENVIRONMENT		

Appendix 5



Appendix 6

HEALTH SHEET

Laboratory “indicate the name of your laboratory”

I. PERSONAL INFORMATION
Name:
Chilean ID #:
Birth date:
Age:
Emergency contact:
Contact number:
Emergency contact 2:
Contact number 2:

II. MEDICAL ASSISTANCE
Insurance:
In case of an emergency, transfer to:

III. RELEVANT CLINICAL HISTORY
Do you currently have a heart condition you are aware of?
Are you allergic to any anything?
Do you have a relevant chronic disease?

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