
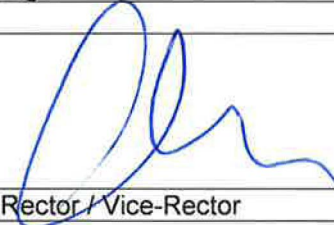


<b>General Laboratory Safety Rules and Regulations</b>			
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Reviewed by the Legal Department:	
Dr. Moritz Radler	
Name	Signature

Approved by		
		
Rector / Vice-Rector	Rector / Vice-Rector	

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## Abbreviations

SOP	Standard Operating Procedures
i.e.	For example
SDS	Safety Data Sheets
PPE	Personal Protective Equipment
HMIS	Hazardous Material Information System
etc.	et cetera

## 1. Goals & Objectives

The general laboratory safety rules and regulations aim to ensure safe and healthful working conditions as well as specify the code of conduct at laboratories located at the JKU. A code of conduct is also specified in the event of any hazardous incident as to how to handle any hazardous and toxic substances.

## 2. Areas of Application & Period of Validity

The general safety laboratory rules and regulations apply to all laboratories located at the Johannes Kepler University. Areas containing laboratories at the Johannes Kepler University Linz must be marked and identified, particularly if these laboratories carry out chemical and/or physical experiments, general experiments, scientific analyses, measurements, etc..

These general laboratory safety rules and regulations are valid and in effect until otherwise specified.

If conducting work at a laboratory that is considered particularly hazardous and that requires **special safety precautions** not included in the current safety rules and regulations for laboratories, the responsible department head for that particular laboratory must draft supplementary regulations (such as special laboratory rules and regulations) that address and provide safety guidelines and information pertaining to the particular situation and circumstances.

General safety rules and regulations must be adhered to and followed and can only be superseded if stricter rules and regulations are needed. **The minimum standard of safety as stated in the general safety rules and regulations must be maintained regardless.**

## 3. Responsibilities

The **lab manager and head of the respective organizational unit** in charge of a particular laboratory is responsible for lab safety. He/she must designate a **Chemical Hygiene Officer (CHO)** to be in charge of toxins, lasers, radiation protection, etc. and to ensure that lab operations and procedures run smoothly.

The head of the respective organizational unit is obligated to ensure that everyone adheres to his/her general laboratory rules and regulations and that all rules and regulations are implemented accordingly. He/she can designate a qualified **lab manager** to ensure all requirements regarding lab safety are being adhered to.

A **CHO** must be appointed when work involves handling hazardous and/or toxic substances, (if necessary, the lab manager can serve as CHO). The CHO must maintain the toxic substance log book, ensure that hazardous and toxic substances are properly stored, provide updated safety sheets on how to safely handle hazardous and toxic substances, and dispense substances to those authorized to work with them.

The working group leader (the person managing the lab work and in charged of a project, for example) is responsible for overseeing all work conducted in the lab as well as maintaining all safety standards.

When working in any laboratory, the responsible person in charge must be aware of his/her duties and fulfill all obligations. Job duties and obligations must be clearly defined.

Everyone in the laboratory (employees, students, guest researchers, employees from external companies, etc.) must comply with the general laboratory safety rules and regulations. Everyone must follow the laboratory supervisor's instructions (head of the organizational unit, lab manager, working group leader).

## 4. General Information

### 4.1 Access, Operating Hours

The general lab operating hours are from **Monday to Friday, 7:00 AM – 8:00 PM**. Lab work must be conducted and completed during this time. If there is lab work that must be conducted outside of the regular operating hours, you must continue to adhere to and maintain all safety rules and regulations.

Please lock and close the lab facility when no one is working in the laboratory. The last person to use the lab is responsible for closing and locking the lab.

Clearly display labels and pictograms in the lab to ensure everyone understands what hazardous substances may be in use and what types of hazards are present.

In regards to authorized access to a particular laboratory, the lab manager is responsible for regulating procedures and criteria (keys, access cards, etc.). The lab manager must keep accurate records stating who has been given authorized access and for how long.

### 4.2 Posted Notices and Instructions

The 'General Laboratory Safety Rules & Regulations' – along with any other special rules, regulations and/or instructions pertaining to individual laboratories - must be displayed and be clearly visible at all times.

As the lab manager is responsible for implementing and maintaining the safe work and lab practice policies, do not enter the lab or perform any lab work **until the lab manager responsible for that particular lab has gone over all lab safety rules, instructions, and safe work practices**.

Those working in the lab must **sign a safety agreement confirming he/she has read and understands the instructions and safety rules**.

### 4.3 Maternity Protection and Pregnancy

If you are pregnant and work actively in a laboratory environment, please immediately inform the department head and the company physician (Ext. 4496).

Under no circumstances may pregnant women be asked to do heavy physical labor/lifting or any other work that could be harmful - or carry a risk of exposure – to them or the unborn child.

The employment prohibitions according to article 3 et seq. of the maternity protection law are to be observed.

## 5. General Safety Rules & Regulations

### 5.1 General Safety Rules & Regulations

- Everyone working in the lab must conduct themselves in a responsible manner and in a way to avoid harm. When working with high-risk materials and procedures, please inform everyone in the vicinity and so that in the event of an accident, first aid can be rendered quickly.
- Before starting any work, read the information regarding hazards caused by the materials and equipment. Safety Data Sheets (SDS) must be available in both the laboratory and online in the GESTIS database.
- Any and all abuse must be reported to the lab manager immediately.

## 5.2 Safety Equipment in the Lab

The following must be available in or near the laboratory, especially if indicated:

- Telephone
- First Aid kit
- Fire extinguisher(s)
- Emergency shower, eye wash station
- Respirator and the proper filter (will be removed)
- Emergency exit(s), escape route(s)
- How to activate the fire alarm

Everyone working in the laboratory must be aware of where these are located and, if necessary, how to operate safely. The lab manager is responsible for regularly checking that the safety equipment is there, functional, and that any used materials have been replaced. All of the above-mentioned protection and safety devices must be visible at all times and accessible. Do not hang or attach objects in the lab facility.

## 5.3 Personal Protective Equipment (PPE)

When in the lab, all faculty, students, staff, and visitors must wear the appropriate, authorized personal protective equipment (PPE).

- Protective eyewear (goggles, UV goggles), protective gloves and face shields are to be worn when working with impact hazards to protect against dusts, potential splashes or sprays of hazardous liquids.
- Hand protection must be worn when working under certain conditions (such as heat or cold, ...). When wearing protective gloves, do not touch other objects such as door handles, books, etc.
- When grinding and/or polishing or working with certain chemicals, wear a respirator to avoid inhaling any airborne hazards such as particulates (dusts, fog, mists, smoke, sprays) and gases/vapors.

## 5.4 Fire and Explosion Protection

Fire safety regulations at the JKU state the following:

- Fire protection systems in place must never be disabled for any reason. Do not block access to fire extinguishers, fire compartment doors, and exits. Do not wedge or block doors in the event of a fire.
- Work with flammable materials or equipment, such as open flames or heat-generating laboratory equipment, may only be carried out with the approval of the responsible fire protection officer or his/her representative. If necessary, keep fireguards in place even while working.
- In the event of fire, activate the fire alarm and call emergency fire services. If the fire alarm sounds, stop all work immediately and proceed to a marked door or exit and evacuate the building.

## 5.5 Tidiness, Organized Workspace, and Waste Disposal

### 5.5.1 Tidiness

- When working in the lab, maintain a clean and tidy workspace. Messy workspaces, dirty counter space and equipment endanger the next user.

- In general, the 'polluter pays' principle applies, meaning that each person is responsible for cleaning his/her own workspace, counterspace, containers, beakers, and any equipment and machines.
- Keep your work space clean and tidy. Clean and properly dispose of any spilled material. Keep containers clean on the outside so they can be handled safely.
- Clean up any greasy or oily contamination on the floor and ensure there is no danger of slipping.
- Wash your hands before and after any laboratory work.

### 5.5.2 Organized Workspace

- Any equipment in use should be clearly arranged and easily accessible in your workplace.
- Eating, drinking, and using tobacco products is **not** permitted in the lab at any time.
- Be alert and keep an eye on any stored and kept chemicals and other hazardous substances for safety (solvent cabinet, acid cabinet, etc.). Only the daily requirement may remain in the work area. Hazardous substances must also be labeled with the hazard symbol. Do not store or keep hazardous substances in a container that could be mistaken for food.
- Toxic substances must be stored in a locked in the Poisons Cabinet. The Chief Hygiene Officer is responsible for labeling all containers: content, the responsible person(s), and the date.

### 5.5.3 Waste Disposal

Laboratory waste must be separated and disposed of in accordance with waste management guidelines.

- In general, the appointed Chief Hygiene Officer is responsible for disposing laboratory wastes. Otherwise, those who generate (hazardous) laboratory waste are responsible for its disposal.
- All chemicals, reaction mixtures, and reaction residues no longer in use must be disposed of immediately.
- Waste should be minimized when possible. If there are large quantities of any chemical can be re-used (such as solvents), please save if possible. With regard to circumstances, waste containers should be small in order to reduce the risk of danger.
- Broken laboratory glass, pipettes, cannulas, etc. must be collected separately. Please dispose of any broken or damaged glassware immediately.
- Hazardous waste must be de-activated immediately so that it no longer poses any threat. A supervisor must be on hand to make sure the de-activation process has been safely completed.
- Laboratory waste containers must be durable and able to hold substances for a longer period of time. Always use the appropriate disposal cannister/disposal container! If a solution has been contaminated and/or has been put in the wrong container, you must notify a supervisor immediately.
- Any empty containers that had once contained a hazardous substance - particularly a flammable liquid - must be cleaned thoroughly before being used again or being disposed of.

- When collecting and disposing waste, please keep waste containers clean so they can be handled safely. Please wear protective gloves when handling waste containers.
- All waste containers must be labeled properly (content, name of responsible persons). Keep a log that contains information on who added what and how much to the container.
- All disposal containers must be checked regularly as to how full they are, to ensure they are not leaking, and that they are in good working order. Bring full containers to the university's central collection point.
- If mercury spills (i.e. if a thermometer breaks) use a mercury collector and dispose of the mercury in the receptacle provided for that purpose.

## 5.6 Working Alone and Rules for Unattended Equipment

### 5.6.1 Working Independently and Alone

Working independently means working alone without other people in close proximity.

In general, lab work is to be conducted during operating hours and is only permitted when **at least one additional person is within sight and calling distance**. Working alone is an exception to the rule and requires special permission by the department head. Approval is granted only in accordance with these directives and other relevant instructions.

The following applies:

The safety of the person working alone must be considered and ensured. Rules must be in place in case there is an accident (working under a higher risk of accident) or in the event someone becomes suddenly ill (working without a higher risk of accident but in an isolated work area) and first aid cannot be rendered in a timely manner because contact to others is restricted.

Working independently and alone is only permitted when

- delayed assistance in the event of an accident does not result in consequential damages,
- timely (albeit delayed) assistance provided by qualified organizational and/or technical safeguards can be ensured and
- the person working alone is sufficiently informed and instructed.

If these conditions cannot be met, then working alone is **not permitted!**

If the lab work is particularly hazardous and the maximum time period from the point of accident to providing assistance is very short (from zero to a few minutes, such as in the event of suffocation or loss of consciousness due to being exposed to chemicals/gases, etc.) then working alone is not permitted!

All activities that do not permit working alone but have been approved due to individual circumstances are to be put in writing by the head of the respective sub-unit.

### 5.6.2 Unattended Equipment

If there are experiments that require equipment to run for a prolonged period (i.e. overnight) but the equipment cannot be continuously supervised, the equipment must be legibly labeled and, if applicable, include the following information:

- Name of the experiment manager
- Phone number (work and home)
- Reagents used, including additives and reaction medium
- Reaction start time (day/hour)
- Expected reaction time

The equipment must be observed under the intended conditions of use until it can be ensured that these conditions can be maintained without further re-adjustment and without any further supervision.

Hoses must be firmly attached to the connection nozzles and additionally secured using hose clamps. Please make sure all tubes and hoses are in good, working condition.

## 5.7 Work Equipment

- Only work equipment that complies with all applicable safety and health requirements in regard to construction, design, and all other protective measures may be used in the lab.
- All work equipment must be used according to the operating instructions and guidelines and with the necessary care. Before operating any devices or equipment, users should be trained in advance on how to use the equipment properly.
- You may only operate equipment and machines that have been properly and demonstrably maintained. Always check the system, machine, equipment or device before each use. Do not use any equipment that appears to be damaged.
- In order to prevent any work-related accidents, potentially dangerous sections of machinery or equipment that contain moving parts – such as drives, shafts, v-belts, and the like - are to be secured using protective coverings, linings, or casings.

## 6. Special Safety Measures

### 6.1 Liquid Nitrogen

- When dispensing liquid nitrogen, make sure the room is well ventilated. If the room is not well ventilated, there is a danger that air will be displaced by the nitrogen, leading to an oxygen-deficient atmosphere and death by asphyxiation.
- When using liquid nitrogen, make sure that the vessels are suitable as a build-up of pressure caused by evaporation could lead to an explosion.

### 6.2 Chemicals

- All chemicals used in the chemical lab must be labeled properly and contain the name of the responsible supervisor. When procuring chemicals, take the corresponding data safety sheet available from the designated folder. Chemicals must be stored in the cabinets. The safety data sheets must be read and understood before opening any chemicals.
- Before working with any unfamiliar materials and chemicals, learn about the possible toxicity and be aware of other safety risks.
- When pipetting liquids, do not immerse the pipettes in the original containers – use a beaker. Never use your mouth to do the work of the suction bulb or syringe!
- All containers containing chemicals – including spray bottles – must be made of the proper materials and labeled according to content.



- When working with low-toxic substances (acetone, isopropanol, ethanol, hexane, etc.), work under a fume hood only. There are extra safety precautions in the chemical rooms when working with very toxic chemicals (such as, for example, chlorinated solvents and nanomaterials). This includes either a) Increasing the speed of airflow under the fume hood, and b) ensuring unauthorized individuals do not enter the chemical laboratory, and wearing the appropriate respirator. Both may only be done after consulting with a poison control expert.
- When diluting acids, add acid to water and stir in one direction; never reverse direction (danger of splashing!).
- In accordance with Occupational Health and Safety Regulations in the Workplace (VGÜ), employees may only work with heavy metals and other potent, toxic chemicals on a regular basis after successfully passing an aptitude test. Those who work regularly with these substances must be medically examined at regular intervals. In addition, long-term activity with toxic and hazardous substances must be reported to the Johannes Kepler University's company physician.
- Unused substances - regardless of whether they are acids, lyes, or solvents – may not be poured back into the original bottle (risk of contamination!).
- Chemicals, etching solutions, and other solvent mixtures should not be stored in the fume cupboard. For example, if special solvents (such as various etching solvents) are used more than once, ensure that the chemicals are stored and sealed in an appropriate container and labeled properly (date, composition, and the name of the user).

### 6.3 Compressed Gas

- Only the absolute necessary number of compressed gas tanks can be in the lab at any one time. Prevent the gas tank from falling over by properly restraining it using chains or clamps. To lower any risk of fire, cylinder fittings and valves must be kept free of any oil, grease, and glycerine. This applies particularly to oxygen, chlorine, and compressed air!
- Flammable gases must be stored upright in safety cabinets.
- Always screw a cylinder cap on to any gas cylinder not in use or when transporting. When transporting, make sure the valve is closed, the regulator has been removed, and the safety cap is securely in place. Cylinders may only be transported using a special cart or dolly designed to transport steel cylinders. After working with a gas tank, make sure the manual valve is closed and the regulator is removed.

## 7. In Case of Emergency

### 7.1 General Information

Keep calm and avoid acting rash or careless!

Raise alarm verbally or by activating the fire alarm and alert emergency services (fire, police, ambulance, in-house services, department head, and faculty members)

Emergency Telephone Numbers:

Fire:	122	In-House:	8122
Police:	133	In-House:	8133
Ambulance:	144	In-House:	8144

Protect people over property: assist injured persons and render first aid, help evacuate anyone who is in danger.

Stop the experiment at once; disconnect the gas or power supply (main switch).

If there are any incidents involving hazardous materials, contact a doctor immediately.

Any violation of health and safety regulations, near accidents, and each and every work injury must be reported to a supervisor in charge.

## 7.2 In the Event of Fire (R-A-C-E)

If you see fire or smoke, do not panic. Remain calm and remember **RACE**.

**RESCUE** – Rescue any people in immediate danger (only if it is safe to do so).

**ALARM** – Raise alarm verbally or by activating the fire alarm, alert emergency services

**CONTAIN** – If possible, close all doors and windows to contain the fire (only if it safe to do so).

**EXTINGUISH** – Try and extinguish the fire using appropriate firefighting equipment; extinguish fire on clothing by smothering with a blanket, using water, or rolling on the ground (*stop-drop-roll*).

Stop the experiment at once; disconnect the gas or power supply (main switch).

Immediately alert employees and supervisors (department head, Operations Management).

In the event of a fire, do not use the elevator!

Proceed immediately to the nearest designated assembly point and ensure that all of your department members are there.

## 7.3 First Aid

First check to make sure you are not injured!

Stay calm and render first aid. When safe to do so, call emergency numbers and paramedics.

Some lab materials could be potentially hazardous, meaning irritating, corrosive, toxic or harmful.

Consult the safety data sheets for special first aid instructions.

Poison Control Center Vienna: 01/4064343

## 7.4 Medical Room, Company Physician and the Red Cross Office

The Medical Office (doctor's office) is located on the ground floor of the Keplergebäude Bldg. in Rm. 034 – the key is available at the in-house services office (*Hausdienst*). The company physician is available in the medical office on Mondays and Tuesdays between 9:00 - 11:00 AM in Rm. 034 (ground floor, Keplergebäude Bldg.).

The nearest Red Cross office is located in the basement of the Management Center and is open Monday – Friday from 7:30 AM – 6:30 PM.

The in-house services office (=Portier) is open 24 hours. In the event of an emergency, dial extensions **8122**, **8133**, or **8144**.

## 7.5 Additional Regulations

SOP 1301 regulations "Information Procedures in the Event of an Emergency" apply.

## 8. Contact

Department of Employee Safety and Protection  
Kopfgebäude Bldg.  
Ext. 4491