 <b>BOKU</b> Institute of Colloid and Biointerface Science	<h1>Laboratory regulations of the Institute of Colloid and Biointerface Research</h1>	
	<b>General part</b>	Page 1 of 12 Update from 27.05.2024 Version 2.2 en

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## 1. Emergency telephone numbers

Fire department	122
Police	133
Rescue	144
Euro emergency call	112
Poisoning information center	01-406 43 43
Gas emergency call	128
BIG Hotline	01-47654-270
BIG on-call telephone Muthgasse	01-47654-30800

## 2. Scope of application

These laboratory regulations apply to the entire area of the Institute of Colloids and Interfaces with immediate effect. They apply to all employees, apprentices, students, interns, guests, and external company representatives (service technicians, etc.).

All new employees are **demonstrably informed of** these laboratory regulations/safety guidelines and the information sheet on fire protection when they are handed the keys or start work before entering the laboratory area of the Institute. The documents are also published on the Institute of Colloids and Interfaces' homepage and available from the Institute of Colloids and Interfaces' secretariat.

All new employees are instructed by the **institute management** in the area of safety. The introduction to work-specific safety precautions and practical laboratory rules is provided by the laboratory manager responsible for this area. **New employees undertake to follow and comply with** the laboratory regulations/safety guidelines.

New employees must be equipped with appropriate protective materials (safety goggles, lab coats, etc.).

In the laboratories of the Institute of Colloids and Biointerfaces, personal protective equipment must be worn in all work areas without exception. (See point 6)

**Compliance with** the laboratory regulations of the Institute of Colloids and Biointerfaces is the **responsibility** of the **Institute's management**.

These laboratory regulations have the status of service instructions. For external persons, this applies as equivalent house rules.

## 3. General information

The operation of laboratories must always be as safe, low-energy, waste-free, and environmentally friendly as possible.

New employees are trained in the following order:

1. Safety training by institute management
2. General laboratory training by institute management
3. Specific laboratory training by the responsible personnel (Annex I)
  - a. Chemistry
  - b. Microbiology (BSL1 and BSL2)
  - c. Biochemistry and physical chemistry
  - d. Cell culture
  - e. Cryo lab

For the use of individual devices or equipment for which specific instruction is required, separate training is provided by the person responsible for the device. In principle, instruction is required for every device and every workstation.

All employees may only use areas for which the specific training has been successfully completed or is relevant to the project. The laboratory and equipment managers carry out the specific training courses, but the institute management is responsible for the implementation of safety policies in the laboratories.

New laboratory instructions are given annually (Annex II). In addition, laboratory and equipment managers give instructions after incidents (e.g., after accidents, misconduct, and new installations of work equipment).

Obvious safety deficiencies, near misses, and accidents involving persons and/or the environment must be reported immediately to the safety officers and the institute management for further action.

#### **4. In case of danger**

In an emergency (e.g., evacuation alarm), work operations must be stopped immediately. If necessary, dangerous work processes should only be secured if this does not put people in further danger or if a possible shutdown does not increase the danger (e.g., turning off the gas supply [depending on the situation, turning off may also be appropriate], turning off the cooling water, turning off the fume cupboard or the power supply, etc.). Exiting must take place via the escape routes provided for this purpose.

#### **5. Basic specifications for laboratory and building**

Unauthorized persons are prohibited from entering the laboratory rooms.

Persons from outside the institute (e.g., service companies, company representatives, building services, etc.) must register with the laboratory manager before entering a laboratory. They must be equipped with PPE appropriate to the situation (if necessary, this can also be prescribed to the external company) and instructed on safety-relevant points in a verifiable and comprehensible manner.

**Pregnant women** and breastfeeding mothers must not come into contact with hazardous substances or only carry out certain activities. If you suspect or know that you are pregnant, please contact the **occupational health** department and the institute management. Take these instructions seriously! (Of course, the following also applies in this case: individual solutions in consultation with the institute management will be offered at a later date).

All persons working in the laboratory must ensure order and cleanliness in laboratories (in their respective work areas). Cleanliness means safety.

Escape routes and traffic routes must be kept clear of objects of all kinds under all circumstances. Safety equipment such as emergency showers, eye showers, first aid kits, wall hydrants, media shut-off valves, fire extinguishers, etc., must never be obstructed and must always be recognizable and accessible.

The existing safety equipment must be subjected to recurring and documented inspection by the building services (e.g., FM, FM-Plus, BIG, etc.) in accordance with statutory regulations.

Liquids may only be aspirated into pipettes using the appropriate suction balls or other **pipetting aids**.

**Foodstuffs**, cosmetics, and medicines must never be consumed, used, or stored in the laboratory zone or in the immediate vicinity of chemicals and biological substances.

**Smoking** in laboratory areas is strictly prohibited.

**Writing areas** in laboratories must not be covered with chemicals or objects contaminated by chemicals, solvent bottles, and the like. (**Labeling is recommended, e.g.: white-yellow**) Office work is generally prohibited in the laboratories.

Chemicals, liquid gases, etc., may only be transported with appropriate carrying aids and PPE protective equipment or secured. Carrying baskets must be used for the transportation of chemicals, and appropriate dewar containers must be used for the transportation of liquid gases.

Additional information, both in German and English, can be downloaded from the following link <http://bgi850-0.vur.jedermann.de/index.jsp> and count as a laboratory standard at BOKU.

#### **6. Personal protective equipment (PPE)**

When working with chemicals and equipment, the use of **personal protective equipment** is mandatory.

1st priority: Safety goggles! Suitable safety goggles are recommended for spectacle wearers. Prescription glasses do not count as safety glasses! Contact lenses are prohibited in laboratories (exception possible).

Always wear adapted laser safety goggles when you are in the vicinity of class 3B and 4 lasers. The goggles must be suitable for the wavelength of the laser.

A lab coat, long trousers, closed shoes, work gloves if required, skin protection ointment, respiratory protection (e.g. dust mask), hearing protection, etc. are also mandatory.

Every employee is entitled to PPE that is provided and only to be used by him/her.

## 7. Fire protection

Assistance with questions regarding fire and explosion protection can be requested from the Employee Protection and Health Department.

In addition to the current fire safety regulations, the following special fire safety guidelines apply at the Institute of Colloid and Biointerface Research:

1. These special fire safety guidelines supplement the general fire safety regulations and have been drawn up specifically for the needs of chemical laboratories. As part of their duty to cooperate, every person is obliged to behave safely in accordance with the fire safety regulations. Fire safety-relevant, safety-endangering defects, as well as other sources of danger and grievances, must be reported immediately to the fire safety officer.
2. The safe installation and operation of devices, equipment, and systems, as well as the safe handling of materials and tools, but above all, the unsupervised operation of long-term tests, is the responsibility of the operator or user. In cases of doubt, they must consult the fire safety officer in the event of a recognizable danger and determine the necessary safety measures by mutual agreement.

When procuring equipment and furnishings, as well as during conversions, care must be taken to ensure that all fire protection regulations are met during installation and operation. In case of doubt, agreement must also be reached with the fire safety officer.

3. The use of gas burners and other appliances with open flames must be supervised. Smoking is not permitted in the laboratories.
4. Containers in which chemicals are stored must be made of suitable materials and labeled according to their contents. Substances that can ignite spontaneously at normal temperatures due to the effects of air or moisture must be stored separately from other explosive, oxidizing, highly flammable, highly flammable and flammable substances in unbreakable containers or by placing them in unbreakable outer containers. Furthermore, care must be taken to ensure that substances that react dangerously with each other are stored separately.

**Flammable liquids**, i.e., liquids with a flash point of less than 100 °C, may only be used in laboratories in containers of up to 2.5 liters. The number of containers must be limited to what is absolutely necessary. In particular, the quantity outside safety cabinets must be strictly limited.

**Particularly hazardous, flammable liquids, i.e., liquids with a flash point of less than 18 C, self-igniting liquids, liquids that react with water to form flammable gases** or organic peroxides, may only be stored in safety cabinets. Flammable solvents must also be stored in safety cabinets except for containers in use.

Containers made of thin-walled glass must not be used for highly flammable liquids. No flammable liquids may be stored in non-explosion-proof refrigerators or cold rooms.

5. Waste that is prone to spontaneous combustion must be collected in special containers made of non-combustible material with lids. These containers must be specially marked and emptied daily at the end of work. Spontaneously flammable waste must be kept moist. Waste that can react dangerously with water or that develops highly flammable gases and vapors must be destroyed safely. Highly flammable, highly flammable, and flammable liquids, as well as substances that develop highly flammable gases or vapors with water, acids, or alkalis, must not be discharged into wastewater pipes. When collecting waste, care must be taken to ensure that mixing different types of waste does not pose a fire hazard.
6. Wedging and tying down fire doors (marked with a corresponding sticker) is prohibited. Damage to such doors must be reported immediately to the fire safety officer.
7. In the event of a fire alarm, all appliances in operation that pose a fire risk must be adequately secured, and flammable solvents must be stored in the safety cabinets. When operating gas appliances, the gas emergency stop switch must be activated. The building must then be left

immediately in peace and quiet, and other people encountered must be made aware of the fire alarm. The fire doors must be closed when leaving the rooms.

8. If a fire breaks out, the fire alarm must be triggered by pressing the buttons located in the corridors, and **the** porter must be informed via door 1209. The porter should be informed of the nature of the incident and the room number of the affected room. The notification should be made by several people independently of each other. Until the fire department arrives, the fire is to be fought with available extinguishing agents, provided this is possible without risk. All persons not required for extinguishing work or rescue measures must leave the danger zone.

#### **8. Explosion protection**

If flammable gases or liquids are used that may lead to the formation of an explosive atmosphere, explosion protection measures must be taken. Assistance can be requested from the Employee Protection and Health Department, especially for handling open flames.



#### **9. Working with microorganisms, cell lines, and GMOs**

Work with microorganisms, cell lines, and GMOs may only be carried out in the following laboratories: 3-02/39, 3-02/21, 3-02/26, 3-02/27, 3-02/29.1, and 3-02/29. The relevant genetic engineering laws must be observed and applied and the Biological Safety Commission must be informed if work in the area of biological safety is planned. The specific regulations must be complied with: [Federal Law Gazette II No. 431/2002](#) and [Federal Law Gazette II No. 23/2001](#).

#### **The basic rules of good microbiological techniques must be applied.**

In addition, the following rules apply in the above-mentioned laboratories:

- Only persons authorized by the laboratory manager have access to the above-mentioned laboratories.
- Windows and doors must be kept closed during the work.
- Appropriate protective clothing must be worn at all times (PPE and disposable gloves disinfected with 70% ethanol).
- All work where aerosol formation is to be expected must be carried out in a safety cabinet (laminar). This must be kept clean and tidy. The work surface must be disinfected at the end of the work.
- Tightly sealed centrifuge tubes must be used for centrifugation.
- Contaminated tools must be autoclaved or disinfected before cleaning or disposal.
- Waste containing pathogens must be collected and rendered harmless by autoclaving or disinfection.
- Syringes and cannulas should only be used if necessary and must be disposed of properly. No recapping of cannulas!
- When leaving the laboratory and after any skin contact with material containing pathogens, hands must be disinfected and washed with soap. Then, skin care must be carried out.
- When working, the following sign must be used to inform the other laboratory users.

	<b>Attention! Biological Workspace</b>	
Name of Person working here: _____		
Contact number: _____		Initials: _____
Starting date working here: _____		
Expected date to end work here: _____		
Microorganism: _____		
<input type="radio"/> BSL1-Classification		<input type="radio"/> <b>BSL2</b> -Classification
Further notes: _____		

### 9.1. Additional laboratory rules for handling safety level 2 organisms in the BSL-2 laboratory

The specially marked protective clothing may only be worn in the specified rooms and must be removed when leaving the laboratory. Avoid smear contamination by touching telephone receivers, door handles, fittings, writing instruments, and keyboards with gloves. Contaminated protective clothing must be collected in bags provided for this purpose for disinfecting cleaning.

If possible, the rooms should be entered with specially designed footwear. In any case, the blue cleanroom adhesive mats must be used before entering the room.

Pathogenic microorganisms must only be transported within the company in labeled, sealed, and unbreakable containers. The surface of the containers must be disinfected before leaving the laboratory.

The workplace must be disinfected before and after work. In the safety cabinets of the BSL-2 laboratories, UV light must also be switched on after completion of the work and disinfection. (see chapter 11.2. Biological safety cabinet)

If material containing pathogens is spilled, the contaminated area must be cordoned off and disinfected. Safety-related accidents and near misses must be reported to laboratory managers and biosafety officers.

Work with genetically modified organisms may only be carried out after thorough testing and, if necessary, official authorization.

### 10. Working with hazardous substances, especially poisons:

Poisons, in the sense of this section, are substances and preparations that are very toxic, toxic, or specially labeled.

These must only be stored in specially marked, locked rooms or boxes. They must not be stored freely and unattended in the laboratory.

Access is restricted to a defined group of people (list from the Poison Control Officer).

Furthermore, this group of people is obliged to keep a poison book. This documentation must be available for inspection on a daily basis and reflect the quantities actually in stock.

### **11. Storage of toxic and foul-smelling chemicals**

Storage must take place in designated rooms equipped with efficient ventilation and an exhaust air scrubber in accordance with the hazardous substance's properties. These rooms must be specially marked (hazardous goods symbols), and only trained personnel must be allowed access.

Only the quantities of chemicals and solvents required for daily work needs may be stored in the workplace area. The rest must be stored in designated storage rooms or chemical cabinets (separately for acids and alkalis) or solvent cabinets (for flammable liquids).

The safety cabinet must be permanently installed and protected against unauthorized access by a locking device.

Larger quantities of liquid containers must be stored in chemical-resistant drip pans. The size of the drip tray must be such that it can contain a breakage of the largest liquid container stored in it.

### **12. Working with hazardous and/or toxic substances**

Work involving the risk of the release of foul odors, volatile flammable gases, or toxic substances may only be carried out in a fume cupboard.

Flammable liquids that must be stored under refrigeration may only be stored in suitable (explosion-proof interior) and labeled refrigerators and cold rooms (explosion protection).

### **13. Waste disposal**

Flammable solvents must be collected immediately after use in the laboratory area in suitable containers (usual size 5-20 liters with solvent-proof labeling and in compliance with fire protection). As soon as these collection containers are full, they must be collected in the allocated interim storage facility for hazardous waste and, in any case, labeled in detail (origin, contents, chlorinated/non-chlorinated, hazardous goods labeling, etc.). The use of small containers in the laboratory area and subsequent decanting into large disposal canisters is permitted. The use of protective clothing, safety goggles, and protective gloves is mandatory.

Aqueous waste, halogen-free, and halogen-containing solvent waste must be collected separately.

Chemicals of all kinds, glass waste, syringe needles, sharp objects or similar objects must never be disposed of as normal waste. There is a risk of injury and contamination on the part of the cleaning/housekeeping staff. This hazardous waste is disposed of in the solid waste garbage can. Syringe needles are collected separately in special containers (yellow boxes).

The disposal of used glass containing hazardous chemical residues is prohibited. Laboratory glass is not used glass; it is residual waste. Cleaned or uncontaminated laboratory glassware must be disposed of separately in a cut-resistant container as residual waste.

Objects contaminated with harmful chemicals must be secured so that cleaning personnel are not at risk of injury when emptying the waste containers.

All biological waste must be collected in autoclavable, labeled containers and then autoclaved before it is added to the residual waste fraction.

The disposal of any hazardous waste via the sewage system is strictly prohibited.

### **14. After closing time:**

Reactions and devices without an increased safety risk that remain in operation overnight (if possible, with a safety drip tray; heating only with contact thermometer or controller) must be declared with a night **sign** (except cold storage and incubation rooms, refrigerators, autosamplers, analysis devices, etc.). This night sign (contact person with telephone number, current experiment, etc.) must be clearly visible on the fume cupboard window or near the experiment or system. General night signs are not permitted; each experiment requires its own new night sign. Equipment in continuous operation must be specially marked with the telephone number of the person responsible and instructions on what to do in an emergency.

Appliances in operation without a night panel are switched off at weekends, on public holidays, and on working days between 18:00 and 07:00.

Employees must carry out a final check in the laboratory at the end of the working day and ensure that all equipment (except cooling and incubation rooms, refrigerators, autosamplers, analytical equipment, etc.) without a night sign is switched off, all chemicals are stored safely, the shut-off valves for gases and liquids on media columns and gas cylinders are closed, and the equipment, reaction apparatus, etc. declared with a night sign and in operation are running properly.

The night table shown here must be used:

### Overnight or Unattended Lab Reaction












**This notice must be posted on or near each reaction left unattended in a laboratory.**

**Responsible Person:** \_\_\_\_\_ **Contact number:** \_\_\_\_\_

**Starting date:** \_\_\_\_\_ **End date:** \_\_\_\_\_

**Reaction Equation & Description:** \_\_\_\_\_  
 \_\_\_\_\_

List of **hazards** present (tick if true )

										
Oxidising	Flammable	Explosive	Toxic	Corrosive	Harmful/ Irritant	Health hazard	Nature polluting	Pressure/ Vacuum	Water cooling	Heating on
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**This should be done in case of an accident:** \_\_\_\_\_  
 \_\_\_\_\_

**Further notes:** \_\_\_\_\_  
 \_\_\_\_\_

#### 15. Working alone in the laboratory (especially at night, on weekends and public holidays)

Interns, students, and apprentices may not work in the laboratory without supervision. Work outside **general working hours (7:00-18:00)** requires the supervisor to be informed in any case.

When working with chemicals or glassware at weekends and on public holidays, or between 6 p.m. and 7 a.m., all other employees must ensure that a second person who has been instructed and is present is within calling distance in the event of an emergency. Someone must always be on call or within sight to intervene immediately in the event of an incident.

#### 16. Specific rules in the chemistry, biochemistry and microbiology laboratory

**Accident prevention concerns you personally. Do not rely on others!**

You must be familiar with the company instructions (escape route, fire safety regulations, information boards, notices, emergency numbers, etc.)!

Workstations in the laboratory zone must not be overloaded with chemicals; clear work surfaces and sensible working hygiene must be observed.

Before using a chemical, every employee must have read and understood the risks and safety precautions listed in the chemical's safety data sheet. The safety data sheets (SDS) for all chemicals brought into the Institute for Biologically Inspired Materials can be accessed at any time via the computer in room 3-02/19 on the Sigma-Aldrich website<sup>1</sup> (=start page).

The **hazardous goods symbols** (pictograms), R/S phrases on chemical labels, and the corresponding safety data sheets must also be observed.

<sup>1</sup> <https://www.sigmaaldrich.com/AT/de/documents-search?tab=sds>



Explanations of the pictograms and the R/S phrases can be found on the chemical suppliers' websites, in their catalogs, and as wall charts in the laboratory area.

When working with chemicals or biological substances with an increased safety risk, **the laboratory manager and supervisor** must be **informed in advance**. Graduates, interns, students, apprentices, guests, service technicians, etc., require the immediate presence of a competent supervisor.

Before starting an experiment, all **protective measures must** be **taken** to prevent an incident. This includes protection against the spread of malodorous substances.

Spilled chemicals must be removed immediately and professionally.

Open flames or ignition sources may only be used in rooms where no **flammable substances** are in the immediate vicinity. They are prohibited in all rooms with increased hazard potential and where flammable substances are stored (explosion protection).

Flammable liquids must not be handled in the vicinity of naked flames, and storage bottles for these liquids must not be put down. The only exceptions to this rule are sterilization work within the framework of microbiological working methods.

**Tidiness** in the workplace should be a matter of course.

If the job description is unclear, find out more before you start work. **Misunderstandings** are a frequent cause of accidents.

Never interfere in the work of others without being asked - it could endanger you and others.

Never enter **restricted areas** or rooms to which access is prohibited.

Solvent containers must never be closed when completely full (at least 5% empty volume must be left).

Gas cylinders and compressed gas outlets require suitable **reducing valves**. Gas cylinders must always be secured against tipping over, and they may only be transported with a protective cap in place.

The relative density of flammable gases or vapors must be considered for ventilation devices. Vapors from flammable liquids are heavier than air. The same applies to gases other than acetylene, hydrogen cyanide, ethylene, methane, and hydrogen.

Extraction devices should be provided near the floor for gases and vapors that are heavier than air and near the ceiling for gases that are lighter than air.

Vacuum, overpressure (from >1 bar), and stirring in unsuitable glassware can lead to bursting. Observe the respective glass qualities and glass wall thicknesses of the glass containers and glass apparatus.

Never use damaged glass components (risk of injury)!

Caution with oxygen enrichment in liquid nitrogen: In open applications, oxygen is condensed from the surrounding air through heat exchange, which gradually leads to enrichment with highly flammable liquid oxygen, especially in cold traps of high vacuum systems. The boiling point of liquid nitrogen is -195.8 °C, and that of liquid oxygen is -183 °C.

Immediately clean glassware, objects, etc., contaminated with toxic or foul-smelling chemicals or microorganisms using suitable decontamination or disinfectants; never put them in the dishwasher or rinse them in the sink in this state.

Glassware or other equipment contaminated with microorganisms must be either decontaminated or autoclaved. Genetically modified organisms may not be released into the environment, and hands must be adequately cleaned before leaving the laboratory.

Protective gloves should always be disposed of after work on-site. You should never be in the building with gloves or other utensils that are contaminated with chemicals.

## **17. Operation of technical equipment and devices**

If a specific SOP is available, it must be strictly adhered to. No changes may be made to the devices without the consent of the person responsible for the device.

**In principle, all devices may only be used in accordance with the SOP!**

As with all manual human activities, such movements must be learned and practiced. Skill can only be achieved with practice. This practice and the safe execution of work steps may require a lot of time - this must be available.

Inexperienced persons should train critical work steps beforehand with non-hazardous substances. This applies to working with gloves as well as, for example, activities involving new technical equipment.

### **17.1. Fume cupboards**

Work involving the use or release of toxic/flammable and/or foul-smelling gases, aerosols, solvents, or vapors must be carried out in suitable fume cupboards.

Additional absorption devices must be installed to capture any gases, vapors, and aerosols.

To ensure reliable operation, only the absolutely necessary equipment should be used in the fume cupboards, and they should not be overloaded.

As soon as insufficient extraction capacity is detected, work, especially with hazardous substances, must be stopped immediately.

### **17.2. Vacuum pumps in the laboratory**

Membrane vacuum pumps in the laboratories: These must be checked several times a day for full condensate containers and malfunctions. Correct use:

- Only rotary evaporators may be permanently connected to a central diaphragm vacuum pumping unit.
- The mobile diaphragm pumps must be used for other activities, such as evacuating suction or desiccators.
- It is strictly forbidden to suck liquids (even in small quantities) directly into the vacuum cross-linking! A liquid separator bottle (cold trap) must always be inserted between the vacuum consumer and the vacuum module.
- When operating the diaphragm vacuum pumps, their exhaust gases must always be directed into a fume cupboard.
- Only glass appliances approved for this purpose by the manufacturer may be evacuated.
- Rotary evaporators, desiccators, etc., must be fitted with appropriate burst and splinter protection.

### **17.3. Cooling water modules and gases:**

Cooling water module: Only appliances that return the cooling water to the same module may be connected to this module. One-sided water withdrawal or supply is not permitted.

All media connections for flowing media must be secured on the side of the media column as well as the equipment to prevent the media cable from slipping (e.g. with a cable tie).

Always open shut-off valves for gases and liquids slowly (avoid pressure surges)! Avoid unintentional pressure increases in closed vessels.

### **17.4. Centrifuges:**

Centrifuge beakers must be carefully tared before centrifugation. Mark tared centrifuge beakers. Never reach into a running centrifuge. Centrifuge beakers are only ever designed for a certain maximum acceleration (G-force).

When opening the centrifuge, watch out for broken centrifuge beakers and shards or unsecured or poorly secured rotors. Never reach blindly into the centrifuge when removing the centrifuge beakers. Plastic

centrifuge beakers can also break. Never overfill centrifuge beakers. Many centrifuges use inclined cup holders or swing-out rotors.

When working with hazardous substances, use tightly sealed centrifuge beakers and check for contamination when opening the centrifuge.

**17.5. Mixers (vortex mixers, shakers, and incubators):**

The movement induced in the solution causes aerosol formation in these devices. When handling hazardous substances, always close containers tightly and check for leaks.

**17.6. Drying cabinets and ovens:**

Heat protection gloves must be worn when removing glassware from drying cabinets. Hot glass looks the same as cold glass! Plastic items must not be dried in the drying cabinet.

**17.7. Cryo applications:**

Only verifiably trained personnel are permitted to work with liquid nitrogen. When handling liquid nitrogen, the protective equipment provided for this purpose (cryogenic apron, cryogenic gloves in addition to PPE) must be worn.

**17.8. Pipettes:**

The pipettes must be stored properly in an upright position, and the calibration must be checked regularly.

**17.9. Laser**

Laboratory personnel must familiarize themselves with the laser classes (Class 1 to Class 4) and the specific hazards associated with them before using laser equipment. Only authorized personnel are permitted to operate laser systems. Certified devices in which the lasers are installed are exempt from this.

Additional protective measures, such as controlled access and suitable eye protection, are required when using Class 3B and Class 4 lasers.

The safety of personnel has the highest priority in the design and construction of experimental setups that use lasers. Appropriate shielding should minimize the risk of unintentional exposure, and safety interlocks should be used where necessary.

**17.10. Autoclaves**

There is a risk of burns from steam. The use of autoclaves is only permitted after demonstrable training.

Always check the pressure and temperature display before opening the autoclave.

Only open the lid when the temperature has dropped below 80 °C (for viscous liquids below 60 °C)!

Eye protection or face protection, thermal protective gloves, and a closed lab coat must be worn.

The autoclaves must not be operated in the event of malfunctions or unusual operating conditions. Laboratory managers and the person responsible for the device must be informed immediately.

**17.11. Biological safety cabinet (laminar)**

PPE must be worn.

The workbench must be switched on at least 10 minutes before starting work.

The interior of the workbench must be wiped out with 70% ethanol before and after use.

The front screen must always be kept at the appropriate working height and lowered after using the workbench.

Do not lean into the cleanroom workbench; do not make any hectic movements!

Do not place any contaminated materials in the cleanroom workbench, and if possible, do not work with flammable/explosive substances. Only flame if there are no flammable/explosive substances in the workbench. Only work with a safety burner and keep thermal loads as low as possible.

After completing all work, completely clear and disinfect the workbench.

In the event of a technical fault, switch off the device and report the fault to the laboratory manager and the person responsible for the device.

### **18. Labeling of chemicals, synthesis products and other samples**

Used chemical containers or neutral glass containers (not recognizable as food containers) can be used for the storage and temporary storage of chemicals/samples. An existing label must be completely covered with the new product labeling. The new label for solvents must also be covered with a transparent protective film. Chemicals in spray bottles, round-bottom flasks, Erlenmeyer flasks, solvent canisters, etc. must be labeled with the following solvent-resistant information:

- Product name and/or formula
- Name of the user
- Filling date
- In case of increased hazard potential: Hazard warnings, storage conditions
- Especially for solvent canisters: engraved tags with product name

It is prohibited to use empty food, cosmetic, and medicine containers to store chemicals and samples of all kinds.

### **19. Laboratory safety issues, accidents, and near misses:**

All incidents must be **reported**. Accidents, near-accidents, medical treatment, grievances, irregularities, etc., must be reported immediately to the first aid officers and the safety officers (see Institute homepage) as well as to the Institute management.

### **20. Environmental protection:**

The University of Natural Resources and Life Sciences is certified with an environmental management system in accordance with the Eco-Management and Audit Scheme (EMAS Regulation 761/2001) (<http://www.boku.ac.at/emas/>).

## **Annex I - Persons carrying out specific laboratory instructions**

- a. **Chemistry:** Ronald Zirbs and Ralf Jagenteufel
- b. **Microbiology (BSL1 and BSL2):** Andrea Scheberl
- c. **Biochemistry and Physical Chemistry:** Ralf Jagenteufel
- d. **Cell culture:** Amsatou Andorfer-Sarr
- e. **Cryo lab:** Guruprakash Subbiahdoss

## **Annex II - Mandatory annual safety briefings**

- a. **General and chemical safety:** Ronald Zirbs
- b. **Waste and disposal:** Ralf Jagenteufel
- c. **Biosafety:** Andrea Scheberl and Amsatou Andorfer-Sarr