Friedrich-Alexander-Universität
Medizinische Fakultät



**Nikolas Fiebiger Center**
**Glückstrasse 6, 91054 Erlangen**

# Operating instructions

## General laboratory regulations

These laboratory regulations contain general rules of conduct for handling hazardous substances. For the handling of hazardous substances and for dangerous activities, the substance- or activity-related operating instructions with their specific information also apply.

These laboratory regulations and the substance- or activity-related operating instructions must be observed as binding rules for all work.

These laboratory regulations are supplemented by DGUV Information 213-850 "Safe working in laboratories". Each employee must ensure that he/she is familiar with DGUV Information 213-850.

The handling of substances whose non-hazardousness cannot be established beyond doubt must be carried out in the same way as the handling of hazardous substances.

If the measures specified here cannot be implemented due to insufficient equipment at the workstations, please contact your laboratory management.

## 1. hazardous substances

Hazardous substances as defined by the Regulations on Hazardous Substances (GefStoffV) are substances and mixtures (products) that exhibit one or more hazardous characteristics: They are, for example, toxic, irritant, corrosive, carcinogenic, highly flammable or environmentally hazardous. Hazardous substances also include preparations or products from which hazardous substances may be formed or released during use.

Absorption into the human body can occur through the lungs, through the skin, and through the mucous membranes and digestive tract, depending on the properties of the substance.

Hazard pictograms and signal words according to GHS regulation
(permitted since 20.01.2009, mandatory from 01.06.2015):

Hazard pictograms:


1. Carcinogenicity, germ cell mutagenicity, toxicity to reproduction (CMR: carcinogenic, mutagenic, toxic to reproduction).
2. Specific Target Organ Toxicity (STOT)

Signal words:
DANGER for the serious hazard categories
CAUTION for the less serious hazard categories

## 2. Investigation

Before handling a substance, the user must determine whether it is a hazardous substance on the basis of the safety data sheet, the labeling or other sources of information (e.g. hazardous substance databases, chemical catalogs). Furthermore, it must be determined whether a less hazardous substance is available for the intended purpose.
For the handling of the hazardous substance, an activity- or substance-related operating instruction must be prepared.
A list of the hazardous substances present and used must be kept in the laboratory and in the storage rooms and must be kept up to date. The list must contain the hazardous substance designation, the hazard characteristics, the quantity kept in stock and the area of use.

The manufacturer/distributor usually provides safety data sheets for the hazardous substances or makes them available for download. The safety data sheets for the individual hazardous substances must be collected in their current version and kept accessible to the laboratory personnel.

## 3. Protective measures and rules of conduct

Dangerous work must not be carried out alone. During this work, at least one other person must be available within calling distance. This regulation must be observed in particular for work outside normal working hours.

Obvious defects in safety-related equipment must be reported immediately to the supervisor. Hazardous conditions are to be eliminated immediately, as far as possible.

If tests are carried out that require constant supervision, the workplace may only be left if another instructed person takes over the supervision.

Make sure that gas taps of flammable gases are closed after the end of operation, furthermore electrical devices are switched off.

Cleanliness and order in the workplace are important criteria for safe working in the laboratory.

Eating, drinking, snorting and smoking in the laboratory is prohibited. This prohibition is intended to prevent the unintentional ingestion of hazardous substances via contaminated food.

Avoid inhalation of vapors and dusts and contact of hazardous substances with skin and eyes.

Gaseous, dusty or hazardous substances with a high vapor pressure must always be handled in the fume hood. The front sashes of the fume hoods must be closed as far as possible. So-called CMR substances are obtained in accordance with requirements, if possible in very small quantities. Pure substances may only be weighed and dissolved under the fume hood. Handling of CMR substances in aqueous solution is also permitted outside the fume hood.

The functionality of the fume cupboards must be detectable (by means of corresponding permanently installed displays or a makeshift solution for air flow measurement, see fume cupboard operating instructions). Defective fume cupboards must not be used. In case of damage or malfunction of the fume cupboards, the operating technology department (tel. -27777) must be informed.

Heating cabinets from which gases, vapors or mists may escape in hazardous concentrations or quantities must be connected to a continuously effective ventilation system or placed under a fume hood.

It must never be pipetted by mouth.

Glass bottles must not be carried by the neck. For transport (e.g. from the cellar storage), stable transport trolleys, bassinets, buckets with handles and the like must be used. In any case, glass bottles must be secured against falling over during transport.

Bunsen burners and other devices operated with fuel gas may only be connected with DVGW-tested hoses (test badge on hoses or hose nozzle).

When using liquefied gas (propane, butane) as fuel gas: Only cartridge burners with screw-in cartridges may be used. A maximum of 1 liquid gas cylinder with a filling weight of no more than 1 kg may be present in the laboratory, spare cylinders in the laboratory are not permissible, and the total number of cylinders must be limited to what is absolutely necessary. Liquid gas cylinders may not be present in rooms below ground level, nor may equipment be operated with liquid gas.

Basin siphons are to be kept filled with water to seal the wastewater lines against the negative pressure prevailing in the laboratory.

## 4. labeling and storage of hazardous substances

Hazardous substances must not be kept or stored in containers that could lead to confusion with foodstuffs.
The containers must be labeled according to their contents (common, written substance name, ingredients if applicable, hazard symbol with hazard designation, H and P phrases).
Stand-up bottles containing hazardous substances in a quantity required for manual use must be labeled with at least the substance name, if applicable with the ingredients of the preparation, and the hazard symbols.

Very toxic and toxic substances must be kept under lock and key and only accessible to experts.

Flammable liquids and highly flammable or highly flammable hazardous substances may only be stored in refrigerators or freezers if their interior is explosion-proof (see DGUV Information 213-850, Section 5.2.9.

The quantity of flammable liquids present in the laboratory is to be limited to the daily requirement. Quantities exceeding the daily requirement are to be stored either in safety cabinets according to DIN EN 14470-1 or in storage rooms designed for this purpose.
If the daily demand is increased, the flammable liquids must be stored in a protected place, if possible in safety cabinets according to DIN EN 14470-1.

Flammable liquids should be stored for hand use in containers with a maximum volume of 1-l. In case of increased daily demand, glass containers up to a volume of 2.5 liters, metal containers up to a volume of 10-l or plastic containers up to a volume of max. 5-l are also permissible.

**When decanting ethanol denatured with 1% MEK (CAS No. 64-17-5) in room U1.043, ensure good ventilation/extraction at the workplace. This means that for decanting, the switch of the extraction system must be set to the extraction nozzle. After completion, set to general room ventilation again.**

The supply of gas cartridges and spray cans with highly flammable propane/butane as propellant gas must be limited to the daily requirement. Larger quantities must be stored in the storage room for compressed gas cylinders or in safety cabinets for compressed gas cylinders, spray cans also in storage rooms or safety cabinets for flammable liquids.

Substances which may react dangerously with each other in the event of leakage or release must not be stored in the immediate vicinity of each other. Contact with each other can be prevented, for example, by placing them in separate collection trays.

When storing hazardous substances in the laboratory, DGUV Information 213-850 and TRGS 526 must be observed.

## 5. Work and protective clothing

Appropriate clothing must be worn in the laboratory:

- sufficiently long lab coat made of at least 35% cotton with long, tight-fitting sleeves
- sturdy, closed and sure-footed footwear.

Street clothing made of plastic fabric (e.g. also nylon stockings) should not be worn in the laboratory, as an increased hazard is to be expected in the event of fire due to their burning and melting behavior.

In addition, the following protective equipment must be worn:

- Protective goggles with side shields as soon as hazardous substances are worked with in the laboratory (also by other persons); spectacle wearers must wear a pair of goggles, basket goggles or a face shield over their goggles. Protective goggles with corrective lenses are very suitable; the procurement of such goggles must be discussed with the laboratory management (it may be possible for the health insurance fund to cover a proportion of the procurement costs, although higher personal contributions may be necessary).

- Protective gloves when handling substances which are absorbed through healthy skin or which are very toxic, poisonous, skin irritant, corrosive, allergenic, carcinogenic, toxic for reproduction or mutagenic. The gloves must be sufficiently resistant to the chemicals (resistance data can be found in the catalogs of relevant manufacturers) and comply with European safety standards ("CE" mark, pictogram, performance indices and information for use on packaging).
  The following protective gloves are available in the laboratory for handling the following substances:

  Disposable gloves are available for working with infectious material, chemicals and cell cultures:

## 6. Emergency and safety equipment

Each person working in the laboratory must be aware of the location and operation of the following equipment:

- Gas emergency stops and shut-off valves of the gas lines inside the laboratory and to the laboratory in the hallway
- Main switch (e.g. emergency stop) of the electrical power supply within the laboratory and to the laboratory
- Shutting off the water supply to the laboratory
- Emergency showers
- Emergency eye showers or eye wash bottles
- Fire extinguishers and blankets
- First aid materials
- Chemical binders (absorbent granules, mercury binders)

Interventions in the media supply are to be limited to emergencies. The employees affected by the interruption of the media supply must be informed.
It should be noted that the sudden interruption of the media supply can increase the danger under certain circumstances. Further details are regulated by activity-related operating instructions for hazardous activities.
After interventions in the gas, electricity and water supply, Dieter Hertel (tel. radio 02-9270) or the responsible technical service (fault reporting office tel. 27777) must be notified immediately.

## 7. regular inspection and maintenance

Emergency showers must be checked for proper function monthly, and emergency eye showers weekly. Emergency eye showers must be flushed weekly.
The respective laboratory manager is responsible

Fire extinguishers and extinguishing sand containers must be replaced or filled after each use. Used fire extinguishers or fire extinguishers with broken seals are to be handed in to Dieter Hertel and collected again as soon as possible.

First aid materials must be checked regularly for completeness and expiration date and supplemented if necessary. Responsible is Dr. Beate Winner

Chemical binder must be replenished or replaced after use.

Gas fittings and piping shall be tested for leaks prior to initial start-up and after retrofits prior to return to service unless type approved equipment is used. The test must be performed by a qualified person and notification will be made through the University's G Department. All lines that are not permanently technically sealed by a specialist company (e.g. connecting hoses from pressure reducers to cell culture incubators) must be tested for leaks once a month. Dieter Hertel is responsible for this.

Residual current protective devices (RCD) must be checked for proper functioning by laboratory personnel at least every 6 months by pressing the test button (Caution: This interrupts the power supply to the laboratory connections!).

## 8. Special protective measures for handling human tissues, body fluids and other potentially infectious substances.

Employees in medical, histological and microbiological laboratories must undergo regular occupational health examinations.

If you do not receive a request to do so, please contact the secretariat of your chair/institute or the

Human Resources Department of the Central University Administration. In your own interest, you should make sure that the occupational health check-ups are actually carried out.

The work surfaces must be disinfectable. Uncoated wood and cork materials cannot be disinfected.

Used instruments and laboratory equipment made of glass or pointed and sharp objects must be soaked in disinfectant solution before cleaning.

When handling alcoholic disinfectants, the substance-related operating instructions must be observed.

Wearing jewelry, watches, and wedding rings on hands and forearms is prohibited while handling potentially infectious material.

Further information can be found in the respective operating instructions for activities involving biological agents.

## 9. special protective measures for handling compressed gases and cryogenic gases (cf. also substance-related operating instructions)

Compressed gas cylinders must not be stored in the laboratory. The number of compressed gas cylinders must be limited to what is absolutely necessary. If it is unavoidable for the progress of the work, there may be a maximum of one spare cylinder for a compressed gas cylinder connected for emptying.

If there is an increased risk of fire in the laboratory (e.g. due to activities involving flammable liquids), pressurized gas cylinders must be installed in such a way that they are protected from the effects of fire (e.g. behind brickwork or in a safety gas cylinder cabinet in accordance with DIN EN 14470-2).

For very toxic, poisonous and carcinogenic gases, small pressurized gas cylinders or "lecture bottles" are to be preferred. Basically, the containers with these gases are to be set up extracted (in a fume hood or in an extracted safety gas cylinder cabinet).

Pressurized gas containers with flammable gases must be set up with extraction (e.g. small gas cylinders in a fume hood, otherwise in extracted safety gas cylinder cabinets). Extraction can only be dispensed with if explosion protection measures have been taken in the protective area around the pressurized gas container (=explosion hazard zone).

Compressed gas cylinders may only be transported with the protective cap screwed on (i.e. without the pressure reducing valve) and chained to a transport cart for steel cylinders. Larger gas cylinders over 6 kg total weight or 2-l volume should not be carried by hand.

When transporting cryogenic liquefied gases (e.g. liquid nitrogen or helium) in the elevator, it must be ensured that no persons can ride or board the elevator. The prohibition of using the elevator (boarding, riding) is indicated by signs in the elevator or on the transparent inner glass door of the elevator.

Compressed gas cylinders must be secured against falling over at the installation site using chains, pipe clamps or similar. They must be protected from direct exposure to heat (i.e. minimum distance of 0.5 m from radiators and other heat sources such as gas chromatographs).

All fittings or parts of pressurized gas containers that may come into contact with oxidizing or fire-promoting gases (e.g. oxygen, nitrous oxide, compressed air) must be kept free of oil, grease and glycerine (be careful when applying greasy skin care products to hands!). Otherwise there is a risk of fire!

Valves of compressed gas cylinders for flammable and oxidizing gases must be opened slowly to prevent valve fires or ignition of the gases.

Pressure gauges on pressure reducers may only be changed by specialists (Linde AG, Vogelweiherstr. 73, 90441 Nuremberg, tel. no. 0911-42 380). The employees of the institute are strictly forbidden to manipulate the pressure gauges.

After completing the work, the main valve must be closed and the reducing valve relieved.

Regular inspection of the gas cylinders by experts (usually at the filling plant) must be ensured. The inspection period is stamped on the neck of the cylinder. In the case of pressurized gas cylinders with an expired inspection period, the laboratory management/supervisor must be informed.

## 10. Waste reduction and disposal

Hazardous substances must not be added to wastewater under any circumstances.

To reduce the amount of waste, preference should be given to using only small quantities of substances.

Reactive residues, e.g. alkali metals, peroxides, hydrides, Raney nickel, are to be converted properly into less hazardous substances (cf. substance-related operating instructions).

Collection containers for hazardous waste must be labeled with the substance name, the ingredients if applicable, and the hazard symbol according to the substance or mixture property.

Within the laboratory, hazardous waste must be stored under the same safety conditions that apply to virgin hazardous materials (see Section 4). For flammable liquids, the restrictions on container sizes also apply (cf. Section 4)

Hazardous waste must be packaged and declared for disposal in accordance with the specifications of the Environmental Management and Technical Safety Department of ZUV. The same applies to pressurized gas cylinders to be disposed of.

Pointed, sharp and fragile objects must be collected in stab-proof and form-proof containers and given to the waste.

## 11. principles of behavior in hazardous situations

The current situation in the building (as of 08.2023) with restricted function of the ventilation system provides for a special mode of operation. To ensure 8 times the air circulation per hour in the laboratory rooms, normal work is possible only in laboratories that are not marked by "room with restricted ventilation". Working with hazardous substances is prohibited in the rooms so marked. To check the 8-fold air exchange in the released laboratories, the current ventilation performance is checked at monthly intervals.
In addition, all digestories/fume hoods in all laboratories have been equipped with additional measuring devices that indicate acoustically and visually whether the output is sufficient for safe working. Corresponding operating instructions have been prepared and attached to each fume hood. Work under the fume hood is only permitted if the indicator shows safe working. If the air exchange rate is insufficient, the fume cupboard is blocked and the Technical Service (tel. 27777) is contacted.

In case of uncontrolled release of hazardous substances, the specific information in the substance-related operating instructions applies! Only general principles of conduct can be stated in these laboratory regulations:

Spilled substances must be taken up with suitable means (absorbent granulate, mercury binder, if necessary dry with broom and shovel) and disposed of as hazardous waste.
In the case of volatile substances, ensure good ventilation.
In case of uncontrolled release of flammable liquids or gases, there is a risk of fire and explosion. The measures from the substance-related operating instructions must be taken immediately.

In case of uncontrolled escape of hazardous gases / vapors / dusts or in case of fire:

- Keep calm and avoid hasty, ill-considered action!
- Remove injured persons from the danger zone. Make sure that you protect yourself.
- Immediately extinguish clothing fires preferably with an emergency shower or fire extinguisher, if necessary also with a fire blanket. Caution: Persons caught in fire tend to flee in panic!
- Immediate **EMERGENCY CALL:** Fire department **tel. 112**, if necessary with reference to "chemical accident". If necessary, activate fire alarm. The fire department must also be alerted in the event of

minor fires**.**
- Inform the fault reporting office of the technical service: **Tel. -27777**.
- If possible, cut off gas supply to the room (if necessary via skin shut-off in the corridor).
- Close doors and windows, avoid drafts.
- Extinguish minor fires with fire extinguisher, dry sand, fire blanket; ensure own safety.
- In case of gas leakage and larger fires, leave room immediately, close doors. Warn persons in neighboring work areas, ask them to leave the room if necessary.
- Do not use an elevator in case of fire! The further procedure is regulated by the fire department.

## 12. first aid principles

Substance-specific information on first aid after contact with hazardous substances is contained in the substance-specific operating instructions, in the safety data sheets and in the "Information for first aid after exposure to hazardous chemical substances" (GUV-I 8504).

In case of accidents with hazardous substances that have led to health impairments, an accident report must be made in the secretary's office of the chair/institute.

**Trained first responders:** s. Item 14

After **skin contact**: Use emergency shower or rinse with plenty of water. Wash off poorly water-soluble substances with polyethylene glycol (e.g. from Merck, BASF or Roticlean E from Roth) and rinse with water. In case of irritation, chemical burns or contact with skin-resorptive substances, seek medical treatment.

After **eye contact**: Rinse affected eye with eye wash, eye rinsing bottle or under abundant running water for at least 15 minutes with spread eyelids, protecting uninjured eye from contact with rinsing liquid. During first aid, have emergency physician/rescue service alerted.

After **ingestion**: Immediate medical treatment. If necessary, collect vomit and present to physician together with chemical packaging or safety data sheet.

After **inhalation**: Remove to fresh air.
For bronchial irritants: Immediately after the accident and then at intervals of 2 hours, inhale 400 µg (equivalent to 4 sprays of 100 µg each) of beclomethasone 17,21-dipropionate metered-dose inhaler or, better, autohaler (e.g. Ventolair®, Junik®). Observe correct handling (head position, inhalation and exhalation phase)! Further treatment by the arriving physician. (Ventolair® and Junik® are available only on prescription. Prescription by FAU company medical service possible).

After **contact with clothing**: Remove wetted clothing, clean with suitable agents or allow to air out in the open.

Information on poisoning:

**Munich Poison Control Center** (Clinical Toxicology, Klinikum rechts der Isar TU Munich)

**Tel. 089 / 19240**

## 13. emergency call

**Fire** **112**

**Accident** **112**

from any telephone within the telephone network.

Place an EMERGENCY CALL according to the following scheme:

| | |
|---|---|
| **WHERE** did the accident happen | Location |
| **WHAT** happened | Fire, chemical burn, fall, etc. |
| **HOW MANY** injured | Number |
| **WHAT** injuries | Type and location on the body |
| **WAI**T | until the call is ended by the rescue control center. There may be important questions to answer. |

## 14. important call numbers / alarm signals:

Institute Management: Prof. Dr. med. Thomas Brabletz

**Safety Officer:** BBS S1 Dr. Martin Sachs
BBS S2 Prof. Dr. Dirk Mielenz

| **First responders:** | **Tel** | | | **Room** |
|---|---|---|---|---|
| Prof. Dr. med. Thomas Brabletz | 29104 | | | 01.031 |
| Prof. Dr. med. Beate Winner | 39301 | | | 00.072 |
| Prof. Dr.rer.nat. Claudia Günther | 45240 | | | 00.032 |
| Stefanie Brey | 39301 | | | 02.076/77 |
| Stephanie Reischl | | | | 00.076/77 |
| Dr. rer. nat. Martin Sachs | 29112 | | | 02.033 |
| Andrea Schneider | 39317 | | | 02.078 |
| Cornelia Stoll | | | | 02.062 |
| Wencke Wallusch | 29100 | | | 0.1032 |
| Dieter Hertel | Radio 02-9270 | | | 00.066 |

Poison Control Center Munich 089 / 19240

Internal emergency room -35420
Surgery Emergency Room -33260 / -33255

Eye Clinic (Emergency Room / Head Clinic Gate) -34338/- 33001/ -33002

Skin Clinic Emergency Room -35420

Company medical service -23666

Occupational safety -26051/ -26054

Hazardous Waste Disposal (Environmental Management and Technical Safety)- 25080 / -25083

**Signal fire alarm** loud continuous tone

**Signal evacuation alarm** loud continuous tone

**Fire 112**

**Accident 112**

Erlangen, August 11, 2023 ..... ...
(Signature of the management)

Attachments:

- Discharge of hazardous substances into the sewer system
- Information sheet for informing women about possible hazards and employment restrictions during pregnancy and while breastfeeding.

# Discharge of hazardous substances into the sewer system

Please alert subsequent services immediately if hazardous materials have entered the sewer system:

| | | | |
|---|---|---|---|
| Waste water representative: | Dieter Hertel | Radio | 02-9270 |
| Deputies..... Tel..... | | | |
| Institute Management: | Prof. Dr. med. Thomas Brabletz | | Tel.: 29104 |
| Fault Reporting Office Technical Service | | | Tel.: 27777 |
| City of Erlangen - Drainage | Tel.: 09 / 86 2346, 86 2345, 86 2552, 86 2691 | | |

In case of imminent danger (e.g. danger of explosion due to hazardous substances in the sewerage system) or for damage limitation:

| | |
|---|---|
| Fire department | Tel.: 112 |

The wastewater officer

- Must have in-depth knowledge of the hazardous materials used at each university facility.
- Must instruct employees and students on the prohibition of discharge of hazardous materials into the sewer system.
- must instruct the employees that in the event of a hazard, the wastewater officer or the laboratory management must be notified immediately or - if they cannot be reached - the offices listed below must be notified by the employees.
- must immediately notify the City of Erlangen - Entwässerungsbetrieb in case of discharge of hazardous substances into the sewer system.
- must additionally notify the fire department in case of imminent danger or to limit damage.
- must notify the fault reporting office of the technical service.

Nikolaus Fiebiger Center, Glückstrasse 6, 91054 Erlangen, Germany

# Teaching women about possible dangers and employment restrictions during pregnancy and while breastfeeding

Dear ladies,

for pregnant and breastfeeding women, the legislator has enacted numerous provisions to ensure health protection against hazards, excessive demands and exposure to hazardous substances at the workplace. Regulations for the protection of pregnant and breastfeeding women can be found in particular in the following statutory provisions:

- in the Maternity Protection Act (MuSchG)
- in the Maternity Protection Directive Ordinance (MuSchRiV)
- in the X-ray Ordinance (RöV)
- in the Radiation Protection Ordinance (StrSchV).

Addressed by the legal regulations is the university as employer. However, the university can only ensure the protection of pregnant or breastfeeding women at the workplace if a pregnancy is communicated as early as possible.
For your protection and the protection of your child, please inform your superior and the responsible personnel administration as early as possible about your pregnancy and the expected date of delivery (§ 5 MuSchG). The notification will be treated confidentially.

The university is obligated to inform the responsible Nuremberg Trade Inspectorate about a pregnancy, stating the name, the date of delivery, the working hours and the type of activity of the pregnant woman (§ 5 para.1 and § 19 MuSchG). This is done by the personnel department of the central university administration.

According to § 2 MuSchG, the respective university institution (e.g. chair, institute, other office) is obliged to design the workplace of a pregnant or breastfeeding woman in such a way that the life and health of the woman and child are not endangered by the professional activity. This means that local supervisors must carry out a careful assessment of the working conditions immediately after the pregnancy is announced. This assessment extends to every activity performed by the pregnant or breastfeeding woman (§ 1 MuSchRiV).

If the workplace assessment shows that the safety or health of the pregnant or breastfeeding woman is at risk, the respective university institution must initiate appropriate protective measures, such as redesigning the workplace, employment restrictions, job changes or leave of absence due to a ban on employment (§§ 1 and 3 MuSchRiV).
Employees in the work environment of a pregnant or breastfeeding woman should - with the consent of the person concerned - be informed about the existing hazards and the necessary protective measures for the woman, in order to be able to avoid hazards emanating from the employees' work behavior.

In detail, general and individual employment restrictions and prohibitions as well as working time restrictions must be observed. For important regulations concerning activities in the laboratory, please refer to the information sheets on maternity protection on the homepage of the Occupational Health and Safety Department www.as.zuv.uni-erlangen.de.

At your request, advice can be obtained from the company medical service and the occupational safety department of the ZUV at any time. You are free to involve the relevant staff council.