

Reglement KD00908975

Biosafety concept according to ESV and SAMV

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Validity of the plant safety concept

This plant safety concept was adopted by the management of the University Children's Hospital Zurich - Eleonore Foundation on 14. Juni 2021 (german version). In the present and all future versions, only the designation Children's Hospital Zurich will be used. It forms the binding framework for implementation of the statutory requirements which have to be complied with during activities involving pathogenic or genetically modified organism in contained systems (Level 2)).¹ The plant safety concept incorporates the measures adopted by Children's Hospital Zurich for occupational safety and for the safety of people, animals and the environment.

The plant safety concept of Children's Hospital Zurich which is presented here is based on the document *Safety concept according to ESV and SAMV for Level 2 laboratories – Template for plant-specific additions*² and the corresponding guideline of the Federal Office for the Environment (FOEN)³. The various templates for operating instructions and rules of conduct have been adapted to the particular plant and are listed in the Annexes together with the already existing company documents containing performance standards for environmental and occupational safety or for quality assurance.

The plant safety concept will be updated whenever the risk situation changes, especially if new working methods are adopted, new organisms are handled, new items of equipment which are relevant to biological safety are introduced, existing premises are used for different purposes or new rooms are used, though also if, in accordance with activities, the use of processes, rooms etc. has been discontinued (see Chapter 5.1).

Safety objectives

Work in the laboratories of Children's Hospital Zurich involves the use of pathogenic and genetically modified organisms. In the course of this work, it is never possible to rule out entirely a potential risk to people, animals and the environment. Children's Hospital Zurich takes the necessary safety measures to protect people, animals and the environment from negative effects.

As an employer, Children's Hospital Zurich acknowledges its responsibility for occupational safety and the protection of its employees' health and, accordingly, takes the necessary measures.⁴

¹ A plant where work is done with pathogenic or genetically modified organisms falls within the scope of the Containment Ordinance (ESV, SR 814.912) and the Ordinance on the protection of personnel from hazards due to microorganisms (SAMV, SR 832.321). The scopes of these ordinances complement each other and contribute to protection of the environment, protection of the population and protection of the health of individual employees.

² *Safety concept according to ESV and SAMV for Level 2 laboratories – Template for plant-specific additions*; 24 pages plus an annex of 30 pages; published by: Federal Office for the Environment (FOEN); obtainable from: <http://www.bafu.admin.ch/> » Topics » Biotechnology » National activities » Contained use » Implementation guides for the use of organisms

³ *Richtlinie: Betriebliches Sicherheitskonzept nach ESV*; published by: Federal Office for the Environment (FOEN); 2008; obtainable from: <http://www.bafu.admin.ch/> » Topics » Biotechnology » National activities » Contained use » Implementation guides for the use of organisms

⁴ The company defines its protection targets to prevent accidents at work as well as harmful and annoying effects on the environment and the population.

Children's Hospital Zurich has recorded its protection objectives with regard to occupational safety and environmental protection explicitly in its mission statement.⁵

-Mission statement

Document A

At the moment the document is only available in German, if you have any questions please contact your supervisor, Human Relations or BSO.

Safety organization

Responsibility and liability

The University Children's Hospital Zurich is a public-benefit private institution supported by the Eleonore Foundation. The company's highest governing body, the executive management, assumes overall responsibility for all safety matters and thus for environmental protection as well as occupational safety and health protection within the organization.⁶

The company management accepts operational responsibility for ensuring the safety of people and the environment as well as safety at the workplace.⁷ It ensures that the plant safety concept is implemented and followed and has established the organizational structure necessary for this purpose. The company management has entrusted at least one person with the task of monitoring biological safety and has set out the precise details concerning status, duties and responsibilities in the job description. The necessary financial and human resources have been made available.

The company management makes the following clear: As a matter of principle, Children's Hospital Zurich shall be liable to third parties. It may exercise a right of recourse against employees who contravene safety provisions deliberately or through gross negligence, thereby inflicting harm on the company or on third parties, for which the plant is liable. The following applies to all persons who bear responsibility for safety aspects in the company: The responsibility of persons under criminal law is derived from their sphere of responsibility in relation to observance of safety rules. Only those persons who, by virtue of their position, are able to prevent hazards through their own intervention can be held accountable as guarantor under criminal law. This is the case if they have failed to intervene where intervention would have been appropriate and possible for them.

⁵ The drawing-up of the plant safety concept may act as a trigger for formulating a company mission statement and for incorporating the safety principles set out in chapter 2.

⁶ There is an occupational safety interface to Guideline No. 6508 of the Federal Coordination Commission for Occupational Safety (Richtlinie über den Beizug von Arbeitsärzten und anderen Spezialisten der Arbeitssicherheit; EKAS 6508.d – 10.98 ; address for orders: <http://www.suva.ch/> > Direktzum Thema > Infomittel (Waswo) → SUVA - enter Order No. 6508 or direct https://www.sapp1.suva.ch/sap/public/bc/its/mimes/zwaswo/99/pdf/06508_d.pdf

⁷ According to Article 7 Paragraph 4 of Ordinance 3 from the 18th of August 1993 to the Employment Act (ArGV 3, SR 822.113) the following applies: "The rules regarding responsibilities in the plant do not exempt the employer from his responsibility to protect health."

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Organization chart

The organization chart shows the persons responsible for safety and the safety officers⁸ with their associated functions.

- Organization chart: [Document B](#)

At the moment the document is only available in german, if you have any questions please contact your supervisor, Human Relation or BSO.

Duties of the Biosafety Officers (BSO)⁹ and of the Laboratory and Project Managers

The status, duties and responsibilities of the Biosafety Officers and of the Laboratory and Safety Managers are set out in the job requirements of the relevant employees.

A list of the duties can be found in:

- Duties of the Biosafety Officers and of the Laboratory and Project Managers: [Annex 1](#)
- Functional specifications of the Biosafety Officers: [Document C](#)

At the moment the document is only available in german, if you have any questions please contact your supervisor, Human Relation or BSO.

In this regard, Children's Hospital Zurich is guided by the appropriate guideline of the Swiss Agency for the Environment, Forests and Landscape (SAEFL)¹⁰.

List of employees

Group 2 microorganisms represent a potential hazard for employees. The Children's Hospital Zurich keeps a list of persons who work with Group 2 organisms and, if required, arranges for a health file to be compiled according to the Ordinance on the protection of personnel from hazards due to microorganisms (SAMV) (see Chapter 4.4).

- List of employees according to SAMV: [Annex 2](#)

⁸ Depending on the plant, there are various areas for which Safety Officers need to be designated: Biosafety Officers, Chemical Safety Officers, Radiological Safety Officers, Fire Protection Officers, Security Officers and Staff Medical Service.

⁹ BSO = Biosafety Officer

¹⁰ Guideline: Biosafety Officer (BSO) – Status, duties and responsibilities. Published by: Swiss Agency for the Environment, Forests and Landscape (SAEFL), 2005; obtainable from: <http://www.bafu.admin.ch/> » Topics » Biotechnology » National activities » Contained use » Implementation guides for the use of organisms or direct: <http://www.bafu.admin.ch/php/modules/shop/files/pdf/phpjYQ7Xf.pdf>

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Emergency organization: planning and incident management

Emergency telephone numbers and contacts for safety issues

Emergency telephone numbers and contact details of persons who can provide information on safety matters are available in every laboratory. Employees of the Universitäts-Kinderspital Zürich have access to a smartphone issued by the hospital, which they can use to notify the incident response service. This is of central importance for rapid incident management.

-Emergency telephone numbers and contacts for safety issues.

[Annex 3](#)

Emergency planning: action in the event of incidents in the laboratory and emergency situations

When organisms are being used, emergency situations of various degrees of seriousness may arise owing to spillage of infectious material, release of aerosols, injuries, fire, explosion and escape of water.

Whilst minor incidents are, in general, dealt with by the person(s) who caused them – with the assistance of the Biosafety Officers if appropriate – the emergency services must always be alerted in the case of serious incidents.

Minor incidents	Emergency situation
1. Get an overview (stay calm)	1. Leave the danger area (stay calm)
2. Inform BSO	2. Alert emergency services; Tel. 112
3. Contain the contaminated area	3. Secure the area & rescue people
4. Disinfect and/or decontaminate	4. Take initial measures, extinguish etc.

- Emergency planning: action in the event of incidents in the laboratory:
SOP KD00887804 Biological spill clean up procedures for BSL1 and BSL 2 labs

[Annex 4](#)

Report sheet for laboratory incidents

In the event of a laboratory incident involving Class 2 activities, the precise circumstances leading to contamination of the body or to an injury – even if only a minor one – must be recorded. All laboratory incidents must be reported to the BSO and the supervisor.

Incidents must be recorded by completing in the KD0002117 CIRS: Critical Incident Reporting System. → Merkblatt KD0002117 CIRS: Critical Incident Reporting System.¹¹

- KD0002117 CIRS: Critical Incident Reporting System
- KD00986557: Biosafety: Report sheet for laboratory incidents

Annex 5

In addition, printed reporting sheets for laboratory incidents are available in the laboratories; these are used by the BSO to determine the causes of incidents in order to initiate measures for risk reduction and prevention. These incidents are discussed with the Head of Safety and Environment and the BSO at regular meetings and any further measures are discussed and defined. The completed reporting sheets are recorded in the CIRS system and kept for at least 5 years

Health file

In order to ensure rapid availability of the various employees' occupational health data, these data are collected together in the so-called health file.

Children's Hospital Zurich keeps a health file for those employees for whom a medical examination has become necessary as a direct result of their work. This could involve either medical diagnoses and measures after an occupational accident or laboratory incident or after other forms of exposure to microorganisms or if there is good reason to suspect an infectious disease acquired during occupational activity, or preventive measures such as a vaccination¹².

The following details are recorded in the health file (according to Art. 14(3) SAMV)¹³:

- reasons for the particular medical precautions;
- investigations into the employees' immune status;
- vaccinations given;
- results of medical examinations after accidents and incidents or other forms of exposure to microorganisms or if there is good reason to suspect an infectious disease acquired during occupational activity.

The health file is kept by the doctor called in, either as a separate dossier or as a component/ folder in an already existing medical history, if, for example, the person examined also consults the same doctor privately. The form and layout of the health file are left to the doctor who has been called in¹⁴.

¹¹ For this purpose it is also possible to use the "Ereignisprotokoll" (incident report) – SNAIF, Order No. 66100/1.d, which enables a laboratory incident to be recorded in more detail. Order address: <http://www.suva.ch/> > Direkt zum Thema > Infomittel (Waswo) → SUVA - enter Order No. 66100/1 or direct https://www.sapp1.suva.ch/sap/public/bc/its/mimes/zwaswo/99/pdf/66100_1_d.doc

¹² In this connection, a vaccination is the most important example of "a particular occupational health measure".

¹³ In the event of any queries, it is possible to contact SNAIF's Occupational Health Department; Tel. 041 419 57 60.

¹⁴ The doctor called in does not necessarily have to be an occupational health specialist, but may, according to SAMV, also be a company doctor or an independent medical examiner. What is crucial, however, is that this person knows the work situation and the working conditions, so that a link to the workplace can be established during the health assessment and the necessary plan of occupational health measures can be drawn up. In this regard, compare Art. 2.4 of guideline 6508 of the Federal Coordination Commission for Occupational Safety concerning the calling-in of occupational health doctors and other occupational safety specialists ("Beizug von Arbeitsärzten und anderen Spezialisten der Arbeitssicherheit"); order address: <http://www.suva.ch/> > Direkt zum Thema > Infomittel (Waswo) → SUVA - enter Order No. 6508 or direct https://www.sapp1.suva.ch/sap/public/bc/its/mimes/zwaswo/99/pdf/06508_d.pdf

If other work-related medical examinations (e.g. concerning radiation protection) are also carried out by the doctor involved, these shall be included or combined in the same personal dossier.

Safety documentation for emergency services

In order to be able to ensure a reliable response in the event of a fire or other incidents, Children's Hospital Zurich has informed the emergency services about its activities and the corresponding premises. The information required has been put together in direct consultation with the local emergency/disaster services and authorities.

This information consists of:

- a) hazard plans / plan of the locality (fire zones; access routes; premises where work is carried out with organisms; storage locations and stored quantities of organisms as well as of radioactive isotopes or of flammable or explosive chemicals)
- b) project list¹⁵
- c) protective measures required according to the response plan

• Safety documentation:

Document D

Risk assessment

Compulsory reporting of activities

The risks of an activity and the reporting and authorization requirements according to ESV (Art. 8–10) and SAMV (Art. 5 and 6) are established at an early stage. To this end, before the start of the activity, the project managers report to the BSO all new activities, major changes (e.g. use of new organisms with significantly different characteristics) or significant new knowledge concerning safety-related aspects of an ongoing activity.

Children's Hospital Zurich also informs the authorities of the end of an activity.

Project list and inventory of biological agents

The BSO has an overview of the activities involving organisms at Children's Hospital Zurich and sets them all out in a project list.¹⁶

• Project list:

Annex 6

The project list is updated at least every six months and whenever there are new reports and applications.

¹⁵ Note Chapter 5 in this connection.

¹⁶ One possibility is to coordinate this overview of activities (Template 6) with the details for the project-specific list according to Art. 13 SAMV (for the attention of the Swiss National Accident Insurance Fund and the Factory Inspectorate) and to draw up a combined project list.

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Safety measures and rules of conduct

Access control and labelling of the Level 2 working area

Access to Level 1 and 2 laboratory premises is restricted to an authorized group of persons and is governed by the containment concept of University Children's Hospital Zurich.

- Rules on access to the Level 2 working area: [Annex 7](#)

Nonetheless, it shall always be ensured that, in the event of an incident (e.g. fire), the emergency services are able to access the area quickly and safely and the escape routes are available for use.

The entrance areas to the laboratories are labelled and warning signs (restricted access and warning of a hazard due to organisms) are in place. With regard to the labelling of laboratories and equipment with the "biohazard" warning symbol, Children's Hospital Zurich is guided by the principles of the template specified below.

- Meaning and use of the "biohazard" warning symbol: [Annex 8](#)

Instructions of safe working

Operating instructions and rules of conduct (Standard Operating Procedures, SOPs)

Rules concerning various aspects of occupational safety and environmental safety at Children's Hospital Zurich are set out in operating instructions, work instructions or the so-called Standard Operating Procedures (SOPs).

General SOPs are saved in the Infopoint (e.g. Autoclave). Group specific SOPs are saved on the group specific server.

[Infopoint Wichtige Infos für Forschende](#)

Laboratory safety rules

Children's Hospital Zurich adheres to the legally binding "Principles of good microbiological practice" according to Annex 3 of SAMV.

The laboratory rules applicable to Children's Hospital Zurich are based on these "Principles of good microbiological practice", which have been adapted and supplemented for the particular plant.

- Laboratory rules: [Annex 9](#)

Use of the Class 2 microbiological safety cabinet

In order to prevent the harmful formation of aerosols during centrifugation and the dispersal of organisms, Children's Hospital Zurich adheres to the instructions of the centrifugation manufacturer and uses appropriate aerosol-tight covers with its rotors.

- Use of microbiological safety cabinet [Annex 10](#)

Biological safety during centrifuging

In order to prevent the harmful formation of aerosols during centrifugation and the dispersal of organisms, Children's Hospital Zurich adheres to the instructions of the centrifugation manufacturer and uses appropriate aerosol-tight covers with its rotors.

Prevention of infectious disease transmissible by blood¹⁷

In order to prevent infectious diseases, the pathogens of which can be transmitted by blood or other body fluids, special safety precautions apply to the handling of relevant samples.¹⁸

- Measures to prevent infectious diseases transmissible by blood: Annex 11

Training / information to ensure safety at work

At Children's Hospital Zurich, training is an important element for ensuring the safety of people and the environment. The regular employee appraisal, containing specific measures for advancement as an integral component, serves as the basis for continuing training tailored to the particular person.¹⁹

- Introduction to work: Document F1
- Employee appraisal: Document F2
- Support and training: Document F3

At the moment the document is only available in German, if you have any questions please contact your supervisor, Human Relation or BSO.

Standards for laboratory cleaning

Disinfection and cleaning – hygiene plan

The hygiene plan helps towards personal safety at work and also minimizes the escape of organisms into the environment.

- Disinfection and cleaning (hygiene plan): Annex 12

Factors such as the spectrum of activity, concentration used and exposure time are crucial for optimized use of cleaning agents and disinfectants. Only disinfectants which are effective for dealing with the organisms to be rendered inactive may be used and the manufacturer's instructions on use must be followed.

The directions for use, safety data sheets and the in-house instructions on use concerning the products used at Children's Hospital Zurich are listed in separate documentation.

¹⁷ If no work is done with the relevant organisms in a particular plant, the whole of Chapter 6.2.5 can be omitted.

¹⁸ Explanatory information can be found in Verhütung blutübertragbarer Infektionen im Gesundheitswesen; 2869/30; order address: <http://www.suva.ch/> > Direkt zum Thema > Infomittel (Waswo) -> SUVA - enter Order No. 2869/30; or direct https://www.sapp1.suva.ch/sap/pub-lic/bc/its/mimes/zwaswo/99/pdf/02869_30_d.pdf

¹⁹ Introduction to work, employee appraisal, support and continuing training are regulated as a component of QA Management at (company name).

- List of documentation concerning all disinfectants used:

Document G

Safety instructions for the cleaning service

The safety instructions to be followed during the cleaning of laboratories are recorded in a leaflet and the Children's Hospital Zurich cleaning personnel has received appropriate instruction.

- Safety during the cleaning of laboratories by the cleaning service:

Annex 13

Special safety precautions are followed in respect of the handling of waste which could contain pathogens of infectious diseases transmissible by blood or other body fluids. See Chapter 6.2. in this regard.

Disposal of biologically contaminated waste

Disposal plan

Correct disposal of contaminated waste is a key requirement for minimizing or preventing the escape of organisms from a laboratory and thereby averting a risk to people and the environment. The separate disposal plan contains detailed information on how the handling of waste is organized.²⁰⁺²¹

- Disposal plan for biologically contaminated waste:

Annex 14

Inactivating biological waste by autoclaving

The operation of the autoclave is set out in operating instructions.

- Autoclave operating instructions:

Document H

Purchase, servicing and maintenance of equipment

Declaration of conformity and manuals

Children's Hospital Zurich ensures that the machinery (equipment) used in its plant complies with the applicable safety provisions. Therefore, when purchasing new equipment, it insists that the declaration of conformity²² and

²⁰ See also the implementation guide issued by SAEFL: BULETTI M. 2004: Entsorgung von medizinischen Abfällen. Vollzug Umwelt. Swiss Agency for the Environment, Forests and Landscape, Berne. 72 pp.; Order No.: VU-3010-D. Obtainable from: <http://www.bafu.admin.ch/> » Documentation » Publication » Waste or direct: <http://www.bafu.admin.ch/php/modules/shop/files/pdf/phpi9yclR.pdf>

²¹ See also the Statement of the Swiss Expert Committee for Biosafety: Waste disposal in medical microbiology diagnostic laboratories, 10 pages, Revised edition, August 2006; Swiss Expert Committee for Biosafety, c/o Swiss Agency for the Environment, CH-3003 Berne; obtainable from: <http://www.efbs.admin.ch/> » Documentation » Statements on permit application » Closed Systems; or direct: http://www.efbs.admin.ch/uploads/media/e-empfehlung-abfallentsorgung-2006_02.pdf

²² With a declaration of conformity the manufacturer or supplier (the so-called "distributor") confirms that the basic safety and health requirements have been met and the machine sold has been built according to the state of the art. In the event of an accident due to a technical fault in the machine, the distributor is liable and the purchaser, therefore, better protected.

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the manual²³ are also supplied and files these documents in an orderly way in a place where they are accessible.²⁴

Equipment documents with declaration of conformity:

Documents I

Responsibility for servicing and maintenance of equipment

At Children's Hospital Zurich all items of technical equipment are serviced regularly, so that, apart from the quality of the research and diagnostic results, the safety of the workforce and, generally, the protection of people and the environment can be ensured. Service plans for individual items of equipment and the rules concerning responsibilities are set down in writing.²⁵

- Service plan and responsibility for maintenance of equipment:
- Service contracts :

Annex 15

Documents J

Transportation of organism or infectious biological agents

With regard to in-house and external transportation of organisms or infectious biological agents, Children's Hospital Zurich adheres generally to the statutory requirements and follows the relevant national and international transport regulations²⁶ on labelling and packing.

If a sample containing organisms is transported outside the plant for diagnostic or research purposes, the smallest quantities and lowest concentrations of cells possible are packed at Children's Hospital Zurich for reasons of safety.²⁷ The subsequent goods are transported with the appropriate labelling.

If, as a special case, wastes involving a risk of contamination (e.g. tissue waste, waste containing blood, secretions or excreta, blood bags and banked blood) or strong-smelling or nauseating wastes are transported, the labelling and packing regulations listed below.

Transport of organism is documented in the following SOP in the infopoint:

SOP KD00887799 Transport of biological agents and organism

²³ The machine or item of equipment must also be supplied with a **manual** (with details regarding installation, operation, rectification of faults and maintenance) which is used to instruct the employees.

²⁴ Explanatory information can be found in the leaflet: Sicherheit beginnt beim Einkauf!; SNAIF; February 2000, Order No.: 66084.d; https://www.sapp1.suva.ch/sap/public/bc/its/mimes/zwaswo/99/pdf/66084_d.pdf

²⁵ If a plant has already established clear rules concerning these aspects by way of its Quality Assurance Management, a reference to the relevant chapters in the Quality Assurance Manual or Quality Management Manual shall suffice.

²⁶ International transport regulations: "UN Recommendations on the Transport of Dangerous Goods, Model Regulations".

²⁷ The dispatch of concentrated organisms in the form of cultures belonging to Group 2 or 3 and to Category A according to the international regulations, must be carried out by the company's Dangerous Goods Safety Adviser or under his supervision and the relevant packing and labelling regulations must be complied with. Regarding the function of the Dangerous Goods Safety Adviser, refer to the Ordinance on Dangerous Goods Safety Advisers for the transport of hazardous materials by road, rail and waterways (Verordnung vom 15. Juni 2001 über Gefahrgutbeauftragte für die Beförderung gefährlicher Güter auf Strasse, Schiene und Gewässern [SR 741.622](#) (Gefahrgutbeauftragtenverordnung, GGBV).

Disposal plan for biologically contaminated waste are used

Annex 14

Table 2

In summary, the following applies:

UN Nummer	Official description	Hazard label	ADR packing instruction	Field of application
UN 3373	Biological substances category B	Class 6.2	P 650 ²⁸	Group 2 (possibly 3) and Category B microorganisms ²⁹
UN 3245	Genetically modified microorganisms	Class 9	P 904 ³⁰	Group 1 microorganisms ³¹
UN 1845	Carbon dioxide, solid (dry ice), only to be named in the case of transportation by air	Class 9		Packing material
UN 1977	Nitrogen, refrigerated liquid	Class 2.2		Packing material

Detailed and regularly updated information on the transportation of organisms can be found on the homepage of the Biosafety Section of the Canton of Zurich's Office of Waste, Water, Energy and Air (WWEA) as well as in the information brochure *Transport biologischer Stoffe und Organismen* (Transportation of biological substances and organisms), published by Fachstelle Biologische Sicherheit Ost (FBSO) (version of March 2018).³²

Chemical safety

The person responsible for chemical safety at the Kinderspital Zürich is listed in the organizational chart of the Safety Commission and can be accessed at the InfoPoint. Their reference number is KD00016189.

Storage / quantities

As a general target, chemicals will only be kept in the laboratories of Children's Hospital Zurich in the quantities necessary for uninterrupted daily working. Highly flammable liquids are kept in suitable marked cupboards or cupboard compartments. The long-term storage facility is located outside the laboratories and complies with the

²⁸ For packing instructions P650, search for P650 in the following PDF document: http://www.unece.org/trans/danger/publi/adr/adr2007/English/04-0%20E_Part%204.pdf

²⁹ See UN Regulation 2.2.62.1.4.2 http://www.unece.org/trans/danger/publi/adr/adr2007/English/02-0%20E_Part%202.pdf

³⁰ For packing instructions P904, search for P904 in the following PDF document: http://www.unece.org/trans/danger/publi/adr/adr2007/English/04-0%20E_Part%204.pdf

³¹ These are GMOs which do not correspond to the definition of potentially infectious substances, but are nonetheless able to modify animals, plants or microbiological substances in a way that does not normally result from natural reproduction (quoted from ADR).

³² https://awel.zh.ch/content/dam/audirektion/awel/biosicherheit_neobiot/biosicherheit_in_betrieben/transport/Transportvorschriften%202018.pdf

fire regulations. The relevant guidelines of the Federal Coordination Commission for Occupational Safety³³ are complied with. The person responsible for chemical safety at the Children's Hospital Zurich is listed in the organization chart of the Safety Commission and can be called up at the Infopoint and the following KD00016189.

When handling and storing chemicals, Children's Hospital Zurich follows the stipulations of the relevant safety data sheets which are filed in an orderly manner.

- Safety data sheets of the chemicals used:

Document K

Disposal

Chemical wastes, strong acids and alkalis, and (chlorinated) organic solvents are collected in accordance with the applicable rules³⁴ and disposed of according to VeVA³⁵. Children's Hospital Zurich has an appropriate collection point and operating number for the handover of hazardous waste.

- Weisung KD00003505 Entsorgung

At the moment the document is only available in German, if you have any questions please contact your supervisor, Human Relation or BSO.

Radiation protection – use of ionizing radiation³⁶

Rules on the use of ionizing radiation and handling of isotopes are set out in separate operating procedures and work instructions and are based on the regulations in force³⁷ and the recommendations given in the Experts' Course of the Paul Scherrer Institute (PSI).

The persons responsible for radiation protection are listed in the organization chart of the safety committee KD00016189 for open sources.

The University Children's Hospital Zurich has defined the handling of ionizing radiation in the following superordinate document (Weisung KD00873710 Ionisierenden Strahlen in den Laboratorien: Umgang). These documents are available at Infopoint.

University Children's Hospital Zurich has a permit for handling ionizing radiation:

³³ Chemische Laboratorien (Guideline No. 1871 of the Federal Coordination Commission for Occupational Safety)
Brennbare Flüssigkeiten – Lagern und Umgang (Guideline No. 1825 of the Federal Coordination Commission for Occupational Safety)
Säuren und Laugen (Guideline No. 6501 of the Federal Coordination Commission for Occupational Safety)
Order address: <http://www.suva.ch/> > Direkt zum Thema > Infomittel (Waswo) -> enter appropriate number.

³⁴ As footnote ³⁶

³⁵ Ordinance on the Movement of Waste (Verordnung vom 22. Juni 2005 über den Verkehr mit Abfällen; VeVA; SR 814.610).

³⁶ If no work is done with ionizing radiation or with isotopes in a particular plant, the whole of Chapter 6.9 can be omitted.

³⁷ Radiation Protection Act (Strahlenschutzgesetz vom 22. März 1991 (StSG, SR 814.50)), Radiation Protection Ordinance (Strahlenschutzverordnung vom 22. Juni 1994 (StSV, SR 814.501)) and Ordinance on the Use of Open Sources of Radiation (Verordnung vom 21. November 1997 über den Umgang mit offenen radioaktiven Strahlenquellen (SR 814.554))

Biosafety concept according to ESV and SAMV | Inhalt genehmigt von: Matthias Baumgartner | erstellt von: Nicole Meili | Version vom 30.04.2025 | verantwortlicher Dokumentenmanager: Nicole Meili | letztmals geprüft am: 27.01.2026

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Work instructions for handling isotopes are drawn up by the research groups for their own purposes and managed independently. These work instructions are checked in advance by a radiation protection expert.

Planning, building, modification, demolition and relocation

One of the tasks of the Safety Officers is to submit to the company management the applications for changes to the safety precautions in line with the latest scientific and technical developments, even though this might mean structural modifications or a new building.

The relevant Safety Officers are always consulted whenever new building work or structural modifications are carried out at University Children's Hospital Zurich and whenever technical changes are made to safety-related facilities.³⁸

Specially adapted safety precautions, especially to decontaminate the laboratories and the technical facilities, are taken at the appropriate time for structural modifications, change of use, demolition and relocation. If, despite prior decontamination, it is impossible to rule out risks due to organisms completely, this aspect will be covered explicitly in the steps for dealing with incidents for the particular phase of building with an increased risk due to organisms (e.g. removal of filters etc.).

³⁸ Safety aspects such as fire prevention, rules on access or environmental and occupational safety are closely linked to planning and construction. Constructional measures are often a prerequisite for technical safety precautions. Constructional and technical safety measures which are considered together with the proposed operating procedures at the planning stage ensure trouble-free operation in the future.

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Annex 1: Duties of the Biosafety Officers and of the Laboratory and Project Managers

1. Duties of the cross-organizational Biosafety Officer (Super-BSO)

- The BSO regularly undertakes further training.
- The BSO draws up an operational safety concept for biological safety in accordance with the ESV and ensures that the concept is regularly updated with regard to structural measures and concept changes that affect the entire company.

The Super-BSO ensures³⁹:

- The access regulations have been clearly regulated by the BSO and the company so that only authorized persons have access to the laboratories. This includes level 1 and 2 laboratories.
- Emergency measures were drawn up for the buildings together with the Head of Safety and Environment (emergency plan).
- Coordination with other areas of safety.
- Permit applications are submitted to the federal biotechnology contact point in the Ecogen tool. This enables the BSO to maintain an overview of existing applications at the Kispi. The notification and documentation is prepared by the project leaders and sub-BSOs.
- Further training is offered by the organizational unit.

2. Duties BSO (floor)

As the Children's Hospital has a large number of groups with different activities that are involved in both research and diagnostics, BSOs have been appointed on each floor. These serve as a further point of contact for the cross-organizational BSOs.

- - If necessary, they can be contacted by telephone via a joint call group, for example in the event of spills or questions regarding approval applications.
- - These individuals have several years of experience in their respective fields of research and are familiar with the basic concepts of biosafety.
- - These BSOs undergo regular further training
- - They provide assistance in drawing up SOPs and offer support on all aspects of biosafety and dealing with emergency measures

3. Duties Sub-BSO/Lab Manager

- The Sub-BSO regularly participates in continuing education and training.
- The Sub-BSO contributes to the operational biosafety concept in accordance with the ESV and informs the cross-organizational BSO of any updates, in particular regarding the list of current projects.

The Sub-BSO ensures:

³⁹ Ensures i.e. either by way of responsibility at a higher level or by way of direct responsibility.

- ensure that employees receive basic training for their work and work-related instruction with regard to safety when dealing with biological material (at least once a year) and provide information – if appropriate together with the BSO – about dangers, necessary protective measures and incidents and accidents (Art. 12, SAMV);
- ensure that the correct protective equipment is available and, if necessary, make sure that rules are in place for maintaining and cleaning it;
- ensure that microbiological waste is disposed of correctly;
- agree the working arrangements with the cleaning service regarding the cleaning of designated areas, if the cleaning service is given this task;
- keep a project-specific list of employees in accordance with Art. 13 of SAMV. This contains details on the nature of the activities, type of organisms used, number of people exposed, names of the people working with Group 2 organisms, accidents and incidents which have occurred;
- arrange for a health file to be made out by *“the occupational health doctor called in, the company doctor or an independent medical examiner”* for all employees for whom **“special protective medical measures are required”** in accordance with Art. 14 of SAMV; ensure that the in-house rules concerning the dispatch and transportation of biological material are complied with.

4. Duties and responsibilities of Projectleader

- compliance with safety regulations and the principles of microbiological practice by laboratory personnel.
- the correct disposal of microbiological waste.
- the creation, updating and enforcement of the operating instructions, which serve to ensure environmental and occupational safety with work regulations and rules of conduct.
- the organization and control of health monitoring in accordance with Art. 13 and Art. 14 of the SAMV.
- submitting notifications and permit applications to the Federal Biotechnology Contact Point and the BSO.
- recording all activities involving genetically modified or pathogenic organisms.

The laboratory or project managers:

- - ensure the training and work-related instruction of employees with regard to safety in handling biological material (at least once a year) and provide information - possibly in cooperation with the BSO - on hazards, necessary protective measures and on incidents and accidents (Art. 12, SAMV).
- - ensure that the correct protective equipment is available and ensure that - if necessary
- necessary - their maintenance and cleaning are regulated.
- - ensure the correct disposal of microbiological waste.
- - ensure consultation with the cleaning service regarding the cleaning of the specified areas, if this is commissioned.
- - keep a project-specific list of employees in accordance with Art. 13 of the SAMV. This provides information on: Type of activities, type of organisms used, number of exposed persons, names of persons working with group 2 organisms, accidents and incidents that have occurred.
- - In accordance with Art. 14 of the SAMV, arrange for a health file to be drawn up by *“the occupational physician, the company physician or a medical officer”* for all employees for whom *“special occupational health protection measures are required”*.
- ensure compliance with the company's internal regulations when shipping and transporting biological material.

Annex 2: List of employees according to SAMV

The list of employees is kept in accordance with the PEP (personnel deployment planning) in which all employees are recorded, including students at all academic levels (BSc, MSc) who do not receive a salary from the University Children's Hospital Zurich. This list is kept up to date by the laboratory or project manager and can be accessed at any time.

New members must be reported to the BSO.

Access to the laboratory areas is controlled via badge readers, allowing access to be managed in a targeted manner.

Annex 3: Emergency telephone numbers and contacts for safety issues

Area of responsibilities	Phone	Body responsible
Emergencies: Ambulance REA	144	<u>Internal</u> emergency services
Emergencies: technical issues	3333	<u>Internal</u> emergency services
Emergency: Fire Ambulance	118 144	<u>External</u> emergency services
Emergencies: Intoxication; Effect of chemicals	145 044/ 251 51 51	Toxicological Information Centre

Safety officers of the company

Can be viewed at the Infopoint under the following document: Reglement KD00016189 Arbeitssicherheit und Gesundheitsschutz. At the moment the document is only available in german, if you have any questions please contact your supervisor, Human Relation or BSO.

Annex 4: Emergency planning: Procedure for laboratory incidents

1. General rules on procedure for incidents

As a basic rule, the notices in laboratories and other company premises regarding escape routes, fire-fighting equipment and manual alarm buttons must be followed.

2. Minor incidents and emergency situations

Minor incidents are, in general, to be dealt with by the person(s) who caused them – if appropriate with the assistance of the Biosafety Officers (BSO). In the event of serious incidents, the emergency services must be alerted. In an emergency situation, the response should always follow the same pattern and proceed in a linear way.

	Minor incidents	Emergency situation
1. Keep calm	Get an overall view of the situation	Leave the danger area in the event of aerosol formation, fire
2. Alarm	Inform BSO	Alert the emergency services
3. Secure	Confine the contaminated area	Rescue
4. Act	Disinfect or decontaminate according to SOP or hygiene -plan	Extinguish etc.

3. Emergency telephone numbers

Emergency telephone numbers for external emergency services and in-house persons responsible for safety are available in separate leaflets in the laboratories and by the first-aid boxes.

KD00908653 Emergencies in the Lab – What to do

4. Emergency planning

For emergency planning, a distinction is made between the following emergency situations, because a different course of action is required in each case. This leaflet is visibly displayed in the laboratories by the washbasins, the evacuation plans and in the kitchen on each floor. There is a first aid kit on each floor in the kitchen. There is a defibrillator on floors C, E and G.

We also have a first aid room equipped with a stretcher and an emergency first aid kit. This room is located on the B floor (LLF.B+6.004).

a. Spillage of infectious material

- SOP KD00887804 Biological spill clean up procedures for BSL 1 and BSL 2 labs

There is a spill kit on each floor in the disposal room (LLF.C+6.006, D+6.005, E+6.005, F+6.005, G+6.004 and in the ASS in microbiology). The spill kit contains personal protective equipment, marking pen, shovel, pusher, tongs, distilled water, waste bag (colorless), special waste (cyto), cable ties, minigrip bag, warning

sign, ChemoSorb pad and wipes. In addition, the instruction: Biological spill clean up procedures for BSL 1 and BSL 2 lab was printed out in laminated form and deposited in the spill kit box.

b. Release of aerosols

- SOP KD00887804 Biological spill clean up procedures for BSL 1 and BSL 2 labs

c. Injuries

Weisung KD00908653 Emergencies in the Lab – What to do

d. Fire / explosion

Reglement KD00081439 Evakuationskonzept Kinderspital Zürich

We also have online training for every employee on the evacuation concept in the event of a fire or explosion.

e. Water

Reglement KD00081439 Evakuationskonzept Kinderspital Zürich

The emergency planning schedules set out below are to be understood as outline proposals which require more detail according to the particular plant and situation.

A. Spillage of infectious material involving the release of aerosols and the risk of inhalation

Contamination limited to the inside of the laboratory

SPILLAGE OF INFECTIOUS MATERIAL <u>WITH</u> RELEASE OF AEROSOLS		
1. CLEAR THE DANGER AREA	<u>Immediately evacuate all people from the danger area.</u>	
	⇒ Employees who might have been affected should, if possible, decontaminate themselves immediately; otherwise, they should remain in a separate room to prevent any further spread of the organisms.	
2. ALARM	Biosafety Officers	Tel.: 3010
	⇒ Who telephones?	
	⇒ Where did the incident occur?	
	⇒ What was released?	
	⇒ How many people are affected?	
3. SECURE	⇒ Seal off the room, switch off the ventilation, wait 60 min	
	⇒ Decontaminate people	
	⇒ Disinfect the room as instructed by the Laboratory Manager according to SOP or hygiene plan	
	⇒ Disinfect contaminated equipment etc.	
	⇒ Issue the all-clear for the room after checking that it has been decontaminated	
4. ACT	⇒ Complete report sheet for laboratory incidents	

The detailed procedure is described in the following SOP KD00887804 Biological spill clean up procedures for BSL 1 and BSL 2 labs, which can also be found with the spill kits located on each floor in the general disposal room.

B. Spillage of infectious material not involving the release of aerosols

Contamination limited to the inside of the laboratory

SPILLAGE OF INFECTIOUS MATERIAL <u>WITHOUT</u> RELEASE OF AEROSOLS		
1. ALARM	Biosafety Officers	Tel.: 3010
	⇒ Who telephones?	
	⇒ Where was infectious material spilled?	
	⇒ What was spilled?	
	⇒ How many people are affected?	
2. SECURE	⇒ Employees should <u>not leave the affected area if possible</u> .	
	⇒ The most effective way of dealing with the incident is to: • keep calm • confine the contaminated area • disinfect or decontaminate with disinfectant according to SOP or hygiene plan	
	⇒ All-clear from the laboratory Biosafety Officers or their deputies	
	⇒ Enter the incident and any injuries in the laboratory and/or health log book, as applicable	
3. ACT	⇒ In the event of injuries, complete the report sheet for laboratory incidents	

The detailed procedure is described in the following SOP KD00887804 Biological spill clean up procedures for BSL 1 and BSL 2 labs, which can also be found with the spill kits located on each floor in the general disposal room.

C. Injuries

INJURIES		
1. ALARM	Occupational Health	Tel.: 6800/2325
	Emergency number for ambulance (external)	Tel.: 144
	⇒ Who telephones?	
	⇒ Where are there injured people?	
	⇒ What happened?	
	⇒ How many people are affected?	
2. ACT	⇒ Give first aid.	
	⇒ Remove gloves and any laboratory clothing.	
	⇒ Wash hands and injured areas of skin.	
	⇒ Disinfect with hand disinfectant or 70% ethanol.	
	⇒ Complete report sheet for laboratory incidents (KD00986557)	

D. Fire / explosion

FIRE / EXPLOSION		
1. ALARM (if the fire alarm has not be set off automatically)	Fire brigade	Tel.: 118
	Biosafety Officers	Tel.: 3010
	⇒ Who telephones?	
	⇒ Where are the injured people?	
	⇒ What happened?	
	⇒ How many people are affected?	
2. RESCUE	⇒ Evacuate all people from the danger area to a predetermined assembly area via the designated escape routes.	
3. FIRE-FIGHTING	⇒ Fight the fire with fire extinguishers.	

E. Water involving the spread of organisms

WATER		
1. ALARM	Biosafety Officers	Tel.: 3010
	In the event of personal injury	Tel.: 6800/2325
	⇒ Who telephones?	
	⇒ What happened?	
	⇒ How much water escaped?	
2. SECURE	⇒ Protect material and equipment.	
	⇒ Shut off the main supply lines.	
	⇒ Clean and decontaminate surfaces.	
	⇒ Decontaminate the waste-water installations	

Annex 5: Report sheet for laboratory incidents

All incidents must be reported in accordance with the following procedure, information sheet KD0002117 CIRS: Critical Incident Reporting System. This leaflet can be found on the Infopoint.

In order to be able to record incidents directly in the laboratory, the information sheet: KD00986557 Biosafety laboratory incidents was also created and is available in the laboratories.

The BSO/Deputy BSO provides support in filling in these incidents. The BSO/Deputy BSO must be informed. Either by direct contact or by e-mail: biosicherheit@kispi.uzh.ch.

Annex 6: Project list

Purpose

The project list provides the biosafety officers with an overview of the projects in the relevant laboratory premises.

Content

The form for reporting a project to the Federal Biotechnology Contact Point contains all necessary information on buildings and rooms (building designations, room designations), on persons with responsibility or expertise (project leaders, etc.), on the classification of the organisms used in groups and on the class of activity and duration of the project.

Project list

The University Children's Hospital Zurich maintains an up-to-date project list, which is accessible on the server; all projects carried out at the Children's Hospital must be reported. The current project list can be found under the following KD000904553 at the Infopoint.

Annex 7: Rules on access to the Level 2 working area

1. Purpose

Under the Containment Ordinance (Einschliessungsverordnung / ESV), access to the Level 2 working area is restricted to an authorized group of persons and is organized as follows.

2. Rules on rights of access

1. Only persons who have received permission from the Biosafety Officers or from the Laboratory Managers and have been instructed on the safety precautions shall have access to the Level 2 laboratories.
2. Cleaning personnel shall not be allowed access to the Level 2 laboratories until they have received job-related safety instruction from the people responsible for the laboratories.
3. Visitors may only enter the Level 2 laboratory and work in it after having received prior permission from the Laboratory Manager or the Biosafety Officer, when accompanied by someone with appropriate expertise and after having been informed about the potential risks. All visits must be recorded in a visitors' book.
4. Personnel must be instructed on precautionary measures, especially when cleaning, service work or repairs are being carried out in the Level 2 laboratories.

3. Technical implementation

1. The laboratories are marked with a clearly visible "Biohazard" sign in the entrance area to show they are Level 2 laboratories.
2. Outside the laboratories there is a clearly visible "Zutritt nur für berechtigte Personen" / "No access for unauthorized persons" sign. Underneath this there is the name of the responsible Laboratory Manager as well as the names of the people authorized to enter.
3. The containment concept allows for the fact that, in the event of an incident (e.g. fire), the emergency service personnel must be able to gain access quickly and safely (fire brigade's key etc.). The escape routes will be available for use.
4. The laboratory doors must be closed during work, though they do not need to be locked. The laboratories are locked when not in use.
5. The names of authorized visitors and of outside service and repair personnel are recorded together with their status (period of validity) in a visitors' book (log sheet).

-> A template can be obtained under F0 00108 Confidentiality obligation / Access control

Annex 8: Meaning and use of the “biohazard” warning symbol

1. Purpose

The “biohazard” warning symbol draws attention to the risks due to **Group 2** (or higher) pathogenic or genetically modified organisms and serves to reduce the dispersal and uncontrolled multiplication of organisms and to protect people from unintentional infection.⁴⁰

The warning symbol is aimed at three different groups of people, with a different purpose in each case:

- It reminds employees that infectious organisms are present in a certain working area and that contamination is to be expected.
- It serves to warn plant personnel without the necessary knowledge not to enter the designated area or touch instruments and containers marked in this way.
- It serves to draw the attention of the emergency services to the protective measures to be taken.⁴¹

2. Principles for application

With regard to the placing of the “biohazard” warning symbol, the University Children's Hospital Zurich is guided by the following principles:

1. It is used sparingly to retain its signalling effect.
2. It is positioned in the entrance area to the Level 2 rooms.
3. It is also attached to equipment (e.g. to the incubator) or positioned in working areas **inside** an already marked room if there is a possibility of a higher biohazard risk there **compared with** the immediate surrounding working area.
4. It is attached to the second or third layer of packaging of a sample contained in a pack which is impermeable to liquids if this sample is stored, processed or transported **outside** a marked room.
5. It is attached temporarily to equipment (e.g. to a centrifuge) **outside** a marked laboratory if work involving Group 2 organisms is being done there **as an exception**.
6. It is attached to doors of freezers located **outside** a marked room, if Group 2 organisms are kept there.⁴²

3. Special case: handling marked wasted bags

Commercially available, autoclavable waste bags for biological waste carry a warning symbol. After this waste has been autoclaved and inactivated, the “biohazard” warning symbol on the bags is no longer applicable. So this is clear, autoclaved or inactivated waste bags must be identifiable as “autoclaved”. To this end, they are equipped with heat-sensitive indicators.

Inactivated waste must not be disposed of with the industrial waste until the “biohazard” warning symbol is no longer visible. To this end, it is hidden by a second layer in order not to unjustifiably unsettle third parties in the disposal chain.

⁴⁰ The Containment Ordinance (Einschliessungsverordnung / ESV) provides for the use of the biohazard warning symbol for laboratories of Safely Level 2 and higher.

⁴¹ The labelling of the laboratory corresponds to the similarly identified rooms in the risk plans for the premises of University Children's Hospital Zurich

⁴² If the insides of the freezers are subdivided into compartments with different doors, the warning symbol is attached to the various internal doors.

These requirements are set out in more detail in the disposal concept.

4. Appearance and form of the warning symbol and safety symbol

University Children's Hospital Zurich uses the European symbol / both hazard symbols in its plant.



European biohazard warning symbol⁴³



International biohazard symbol
(with or without text)

⁴³ **Order address:** www.suva.ch/de-CH/material/Produkte/warnzeichen_biogefaehrdung_172961_4284_4284/.

Annex 9: Laboratory rules

Basic rules for safe working in a laboratory used for microbiology or molecular biology

1. Windows and doors of the working areas are closed during work.
2. It is forbidden to drink, eat, smoke or take snuff in the workrooms; cosmetics are not to be applied there. Foods must not be kept in the working area.
3. A laboratory coat or other prescribed protective clothing must be worn while working with toxic or carcinogenic materials or with microorganisms in workrooms. Specifically, that means:
 - Contaminated gloves must be cleaned or replaced immediately.
 - When using gloves, care must be taken to ensure that no organisms or hazardous substances are dispersed as a result of telephoning, opening doors of whatever kind, using water taps etc.
 - In the working area, protective glasses with side protection and, if possible, a cover above the eyes should be worn while working with hazardous biological or chemical substances; people who wear glasses may wear prescription safety glasses or eye protection over their normal glasses. The wearing of eye protection is not necessary for work in a safety workbench.
 - Protective clothing must be removed when leaving the working areas.
 - Gloves must not be worn outside the laboratory.
4. Mouth-pipetting is forbidden; pipetting aids must be used.
5. The use of syringes and cannulae must be kept to the absolute minimum. They must be disposed of properly after use⁴⁴.
6. During all manipulations, care must be taken to ensure that aerosol formation is prevented as far as possible.
7. Upon completing the work and before leaving the working area, an employee must wash his hands carefully and, if appropriate, disinfect and grease them, paying attention to protection of the skin.
8. The working areas should be cleared up and kept clean. The benches must be disinfected before and after use according to the hygiene concept. Only the equipment and materials actually needed must remain on the workbenches. Stocks are stored only in the designated areas or cupboards.⁴⁵
9. The identity of the microorganisms used is checked if there is a certain probability of contamination by pathogenic organisms or if it is required to assess the potential risk. *The principles of identification testing are governed by separate operating instructions at (company name).*
10. With regard to work involving microorganisms, employees are to be instructed verbally and in relation to the particular place of work (according to their prior knowledge) before the commencement of the work.⁴⁶
11. Vermin must be controlled regularly.
12. The keeping and use of personal items (e.g. bags, mobile telephones etc.) in the working area must be kept to a minimum.
13. Contaminated equipment must be autoclaved or disinfected before being cleaned.
14. Waste containing pathogens must be collected according to the requirements of the disposal concept and rendered inactive by autoclaving or disinfection.

⁴⁴ See also template *Measures to prevent infectious diseases transmissible by blood* and the SUVA publication "Verhütung von Berufskrankheiten in diagnostisch-mikrobiologischen Laboratorien" / Order No.: 2869/27d

Order address: <https://www.suva.ch/material/Dokumentationen/verhuetung-von-berufskrankheiten-in-diagnostisch-mikrobiologischen-laboratorien>

⁴⁵ The guidelines of the Federal Coordination Commission for Occupational Safety are complied with:

– *Chemische Laboratorien* (Guideline No. 1871 of the Federal Coordination Commission for Occupational Safety)

– *Brennbare Flüssigkeiten – Lagern und Umgang* (Guideline No. 1825 of the Federal Coordination Commission for Occupational Safety)

– *Säuren und Laugen* (Guideline No. 6501 of the Federal Coordination Commission for Occupational Safety)

Order address: www.ekas.admin.ch/ » Dokumentation » EKAS Richtlinien » **Aktuell gültige EKAS-Richtlinien oder direkt** www.ekas.admin.ch/index-de.php?frameset=208

⁴⁶ The general operating instructions, laboratory guidelines and (operating) instructions relating to specific substances, organisms and activities must be read and implemented before the commencement of work.

15. If infectious material is spilled, the contaminated area must be shut off and disinfected immediately. Safety-related laboratory incidents must be reported to the Biosafety Officers.⁴⁷
16. First-aid instructions for accidents involving pathogenic organisms must be accessible immediately in the working area. All accidents must be reported to the relevant managers and the Biosafety Officers.⁴⁸
17. Expectant and nursing mothers must not work with infectious human pathogenic microorganisms or materials containing such microorganisms. The exceptions are set out in the Maternity Protection Ordinance.⁴⁹
18. Before working with hazardous chemical substances and before carrying out tests in which hazardous substances could be released, the potential risks must be established and the necessary safety measures taken. With regard to activities involving hazardous chemicals, the relevant precautions set out in the safety data sheets must be observed and the rules on the handling of these substances (e.g. ethidium bromide, cytotoxins etc.) set out in precise detail in specific operating instructions.
19. Work with foul-smelling or toxic substances and highly flammable gases must only be carried out in the fume hood. The additional safety measures required in the particular case must be observed.
20. Flammable liquids which need to be stored in cool conditions and extremely flammable and highly flammable substances must be kept only in refrigerators or freezers with an intrinsically safe interior.
21. Pressurized (gas) cylinders must always be secured by tying or chaining (e.g. to the laboratory bench) to prevent them from falling over. They must be transported only on the vehicles designated for this purpose.
22. With regard to work involving radioactive isotopes, the relevant laboratory rules for work with ionizing radiation must be observed.

⁴⁷ In this regard, pay attention also to template *Emergency planning: action in the event of incidents in the laboratory and Report sheet for laboratory incidents*.

⁴⁸ See footnote 47.

⁴⁹ Exceptions are possible if an occupational health specialist examines the working situation and detects no additional danger. Regarding the legal background, see Art. 62 of Ordinance 1 to the Labour Act (Verordnung 1 zum Arbeitsgesetz / ArGV1; SR 822.111) and Art. 10 and 17 of the Maternity Protection Ordinance (Mutterschutzverordnung / MuSchV; SR 822.111.52).

Annex 10: Use of the Class 2 microbiological safety cabinet

Background

Class 2 safety cabinets ensure that people, product and the environment are protected. About 70% of the air is recirculated in the compartment; 30% of the air is discharged into the surrounding air through high-performance filters. Accordingly, this volume of 30% is constantly extracted from the laboratory, thereby contributing to occupational safety and the protection of health.

Good microbiological practices are essential even in the safety cabinet, since such cabinets protect only against aerosol contamination and not against contact contamination. Accordingly, the employee's hand must remain within the safety cabinet during work and must not be brought up to the face.



Dangers for humans and the environment

Danger of release of biological substances from the cabinet **as a result** of incorrect working procedures.

Precautions and rules of conduct



*Avoid draughts in the working area; to this end, keep windows and doors closed during work in the safety cabinet. Do not position the cabinet too close to doors.
 Switch on the equipment approx. 10 (to 30) minutes before the start of work.*

Avoid draughts in the working area; to this end, keep windows and doors closed during work in the safety cabinet. Do not position the cabinet too close to doors.



Switch on the equipment approx. 10 (to 30) minutes before the start of work.

Use personal protective equipment: at least laboratory coat.

When working with particularly problematic chemical or biological agents, also use eye protection and disposable gloves (latex or nitrile). (Refer to the specific operating instructions required for this purpose).

Prevent aerosol formation as far as possible even under the safety cabinet.

Prevent disturbances to the laminar air flow as far as possible:

- *no rapid or violent movements;*
- *only bring bulky items of equipment into the safety cabinet if absolutely essential and remove them immediately after use;*
- *do not store any unnecessary items in the safety cabinet – only introduce material and equipment to the extent absolutely necessary for the work;*
- *do not use Bunsen burners over extended periods – only ignite as required, using a sensor or foot switch;*
- **do not cover air holes.**

All equipment brought into the safety cabinet must be cleaned and disinfected beforehand. Items of equipment removed from the safety cabinet must first be disinfected and, if necessary, then cleaned (in this sequence).

The working surface of the safety cabinet must be cleaned and disinfected at the end of the work. Waste must be disposed of, Pasteur pipettes on hoses must be removed and vacuum hoses must be disinfected (see operating instructions on hygiene and waste disposal). If flammable disinfectants are stipulated, disinfect only by wiping with quantities of less than 20 ml in order to prevent any explosion.

If work is not being carried out on the safety cabinet, it can be switched to stand-by in order to save energy. This prevents contamination of the workroom from the laboratory air.

If work involving potentially hazardous biological substances has been carried out, the equipment must be switched off only by an authorized person. The sterility of the inside should be monitored from time to time

by placing open Petri dishes lined with nutrients there. If microorganism growth occurs on the nutrients, the Laboratory Manager and the responsible person must be informed in accordance with the service plan.



Malfunctions and danger

Safe operation is only possible if the green light is showing and the front sash is down. Never ignore alarm signals.

The cabinet does not offer any protection against harmful gases and vapours.

In the event of a complete functional failure during work with potentially dangerous biological substances work must be stopped (in a controlled manner). The managers and the Biosafety Officers must be informed immediately.

In the event of a visual and acoustic alarm, the cause of the malfunction must be established – if necessary, with the help of the operating instructions – and, if possible, corrected by the relevant person himself (e.g. by positioning the front sash correctly). If it is not possible to correct the malfunction or if attempts are unsuccessful, the responsible person must be notified in accordance with the service plan.

If there is an indication that the preliminary filter or the HEPA filter needs to be replaced (alarm signal without warning tone), work must be continued and the responsible person notified in accordance with the service plan, so that new filters can be ordered.

If there is a similar signal with a warning tone, the work must be ended in a controlled manner and the responsible person must be notified in accordance with the service plan.

Safe operation is only possible if the green light is showing and the front sash is down. Never ignore alarm signals.

The cabinet does not offer any protection against harmful gases and vapours.

In the event of a complete functional failure during work with potentially dangerous biological substances work must be stopped (in a controlled manner). The managers and the Biosafety Officers must be informed immediately.

In the event of a visual and acoustic alarm, the cause of the malfunction must be established – if necessary, with the help of the operating instructions – and, if possible, corrected by the relevant person himself (e.g. by positioning the front sash correctly). If it is not possible to correct the malfunction or if attempts are unsuccessful, the responsible person must be notified in accordance with the service plan.

If there is an indication that the preliminary filter or the HEPA filter needs to be replaced (alarm signal without warning tone), work must be continued and the responsible person notified in accordance with the service plan, so that new filters can be ordered.

If there is a similar signal with a warning tone, the work must be ended in a controlled manner and the responsible person must be notified in accordance with the service plan.



Accidents and first aid

Rinse an open wound, allow it to bleed if possible and spray it immediately with disinfectant. Apply more disinfectant if necessary and allow it to act according to the instructions, though at least for 30 minutes.

If necessary, alert the first-aid centre or a doctor. Pay attention to *Emergency planning: action in the event of incidents in the laboratory*. Complete *Report sheet for laboratory incidents* and inform managers and Biosafety Officers.

Annex 11: Measures to prevent infectious diseases transmissible by blood

1. Background

This leaflet is aimed at people employed at the University Children's Hospital who work with blood and other body fluids, especially laboratory personnel and cleaning service staff.

Infectious diseases, pathogens of which are contained in the blood, can be transmitted by blood or other body fluids which contain blood: e.g. through stab wounds, cuts, splashes into the eyes and onto the mucous membranes of the mouth as well as through contact with broken skin (open wounds).

Blood and body fluids containing blood must always be regarded as infectious!

The only people who work **in working areas with a high risk of infection** are those who have been instructed about possible dangers from infectious diseases in the course of their work, measures to prevent exposure, hygiene regulations, the wearing and use of protective equipment and protective clothing, and action in the event of incidents. Stab wounds and cuts are prevented by technical means and appropriate equipment.

Employees who, on the basis of experience, are exposed to a higher risk of stab wounds and cuts from items contaminated with blood or who have foreseeable contact with blood are **inoculated against hepatitis B** at the University Children's Hospital.

2. Rules of conduct for laboratory personnel

To protect yourself and others (especially laboratory personnel and cleaning staff) against infectious diseases which can be transmitted through blood, **the following basic rules of conduct** must be followed:

- Avoid stab wounds and cuts: only place protective covers over used cannulae if absolutely necessary, preferably using a mechanical aid or the one-handed technique, but never with both hands (no two-handed recapping).
- Items contaminated with blood which pose a risk of injury (e.g. used cannulae and sharp disposable utensils) must be disposed of in unbreakable, puncture-resistant and closable containers. Hand over the containers for disposal no more than 2/3 full, tightly closed and marked as a biohazard.
- Disposable gloves are to be worn for activities involving possible contact with blood or body fluids. When disposing of the gloves, turn them inside-out, so the outside, contaminated glove surface is on the inside. Wash and moisturize hands.
- Always wear eye protection and a respirator when carrying out tasks which could cause splashes.
- Disinfect and/or sterilize protective clothing and other material which might be contaminated.

3. Rules of conduct for the cleaning stuff

People entrusted with cleaning duties should be informed about the dangers of stab wounds and cuts. In particular, these people must be instructed that any refuse bag could contain items/ instruments capable of piercing or cutting and that appropriate precautions must be taken when disposing of refuse bags:

- Never press waste bags down by hand.
- When emptying waste bins, never put bare hands or even hands protected by gloves into the bins.
- Only grasp waste bags near to the closure. Waste bins without a liner must be emptied by being tipped over.
- Wear liquid-proof protective gloves and dispose of them after work – then wash hands thoroughly and moisturize them.

4. Action following an incident with possible transmission of infection

The following immediate action should be taken after an incident with possible transmission of infection:

- Wash hands and contaminated areas of skin immediately with soap and water and/or disinfect them.
- If the eyes or mucous membranes have been in contact with blood or with body fluids containing blood, rinse them immediately with plenty of water or a physiological liquid.
- In the event of an incident in which there is a risk of infection through blood (stab wound, cut, splash onto a mucous membrane or contact between blood and open, injured skin), proceed according to *Emergency planning: action in the event of incidents in the laboratory*.
- Report stab wounds, cuts and splashes⁵⁰ to the managers and Biosafety Officers without delay using the *Report sheet for laboratory incidents*.

Contact your line managers in the event of any uncertainty or if you have any questions.

➔ Arbeitsanweisung-SOP KD00001958 Verletzung mit blutkontaminiertem Nadel: Vorgehen.

At the moment the document is only available in German, if you have any questions please contact your supervisor, Human Relations or BSO.

⁵⁰ Regarded as an accident according to Art. 9 of the Ordinance on the Prevention of Accidents and Occupational Diseases (Verordnung vom 19. Dezember 1983 über die Verhütung von Unfällen und Berufskrankheiten / VUV) and must therefore be reported to the accident insurance fund.

Annex 12: Disinfection and cleaning (hygiene plan)

1. Applies to the following premises

The current room list can be found at the Infopoint KD00904939 of the University Children's Hospital Zurich.

2. Notification and spreading of information

The hygiene plan is displayed in the laboratory. Compliance is documented.

3. Significance

Compliance with the hygiene plan helps towards personal safety at work and preventive health care as well as the quality of research.

The cleaning agents and disinfectants used at University Children's Hospital Zurich are selected so that they fulfil the designated function in the hygiene plan, i.e. ensuring the effectiveness⁵¹ and user-friendliness required. The criteria of occupational safety, health protection and environmental protection are taken into account when products are selected.

Generally, the following applies:

- Always work with suitable (household) gloves when handling disinfectants (allergizing potential).
- Only use cold water to make the disinfectant solution (to prevent vapours which could irritate mucous membranes) – if necessary, mix in the laboratory fume hood.
- Observe the dilution / concentration required for use.
- Adhere to the contact times required for disinfectants to act.
- Active life of instrument disinfectants according to the manufacturer's information (renew daily if disinfectant is mixed with cleaning agent).
- Surfaces to be disinfected should normally be wiped, not sprayed.
 - After wiping on disinfectant: use the surfaces as soon as the disinfectant has dried.
- An unused, measured solution of surface disinfectant (e.g. 0.5% solution) can be kept in a closed (storage) container (e.g. spray-bottle) according to the manufacturer's information (usually 14 -28 days).

The hygiene plan of the University Children's Hospital Zurich is available at the Infopoint KD00987199 Biosafety hygiene plan as well Biosafety Instruction use of desinfectant KD00987196

⁵¹ Users must be able to demonstrate the effectiveness of a disinfectant (to third parties) – either because they follow the instructions on use exactly or because there is microbiological evidence of inactivation under the given conditions.

4. Hygiene plan (Breakdown possible either for the plant as a whole or according to laboratory or organism)

The instructions for use of disinfectants of the University Children's Hospital Zurich are available on the-Infopoint KD0098196 Biosafety Application of disinfectants.

5. Instructions for the use of disinfectants

The hygiene plan of the University Children's Hospital Zurich is available at the Infopoint KD00987199.

6. Organism use

The hygiene plan applies specifically to the rooms listed on the title page. The following group 2 organisms are used in these rooms. The classification of the organisms can be seen in the project list.

7. Instructions to the cleaning staff

The cleaning staff have been instructed to clean the floors, washbasins and door handles in all laboratories and to dispose of uncontaminated waste. The corresponding principles are set out in writing ("Safety in laboratory cleaning for the cleaning service" and "Measures for the prevention of blood-borne infectious diseases"). The remaining cleaning is carried out by the laboratory staff.

8. Cleaning plan

Daily disposal:

-Non-contaminated waste, normal waste -> must be disposed of daily.

1x per week:

-Floors, door handles and wash basins ->are cleaned 1x per week.

Annex 13: Safety during the cleaning of laboratories by the cleaning service

1. Background

Certain microorganisms trigger off diseases and many chemicals are harmful. Chemicals can, for example, be toxic, carcinogenic or highly corrosive. Many chemicals are absorbed easily through the skin or release vapours which can cause damage to the health if inhaled. Other chemicals ignite very easily.

2. 3. Identifying dangers

Safety Symbols

There are various categories of safety symbol. A distinction is made between:

- Prohibition symbols
- Warning symbols
- Instruction symbols
- Emergency action symbols
- Information symbols
- Fire-fighting symbols

In addition, there are symbols for hazardous chemicals. The SUVA brochure on safety symbols⁵² explains all the symbols and the labelling of hazardous chemicals.

Hazards due to equipment

Cables and hoses attached to equipment can be very important for correct functioning. If a cable or hose does not function correctly, the equipment may become damaged or chemicals could even escape and react in a dangerous way.

Hazards due to glassware

Broken glassware leaves behind sharp-edged splinters. These can go unnoticed for a long time, especially in places which are difficult to access (e.g. under workbenches).

3. Protective measures and rules for cleaning laboratories

For your own protection, adhere strictly to the following instructions.

1. Do not touch containers yourself – even if they are empty. The same applies to culture dishes or culture vessels containing microorganisms. **Only work on the surfaces to be cleaned if they have been cleared completely.** Inform your line managers if the surfaces to be cleaned in a laboratory are constantly obstructed.

⁵² Sicherheitskennzeichnung, SUVA, First edition: January 1985, Revised edition: February 2015, Order from: www.suva.ch/waswo Tel. 041 419 58 51
Order number 44007.d
Download PDF: <https://www.suva.ch/de-CH/material/Dokumentationen/sicherheitskennzeichnung/#uxlibrary-from-search>

2. **The working surfaces of the laboratory benches are disinfected and cleaned by the respective users themselves.**
3. **Always avoid direct contact with the water used for wiping.**
4. If you discover that liquids (chemicals or cultures of microorganisms) have been spilled onto the surfaces to be cleaned, stop cleaning unless laboratory personnel who have appropriate expertise and are present during cleaning have confirmed to you explicitly beforehand that this does not pose any risk to you.
5. Do not remain in rooms in which you discover the penetrating **smell of chemicals**, unless laboratory personnel who have appropriate expertise and are present during cleaning have assured you that there is no danger. In case of uncertainty, contact your managers or the laboratory personnel present.
6. Do not touch any **equipment, including cables and hoses**. Instead, only work in the proximity of lines in the presence of and after consultation with laboratory personnel with appropriate expertise.
7. **Do not empty any waste containers containing broken glass or chemicals**. Handle **waste containing broken fragments** with care. Note that broken glass which has been swept up and put into a waste bag can pierce through the bag unless appropriate precautions have been taken.
8. Do not empty any waste containers which contain microbiological waste. Contact your managers or the Biosafety Officers.
9. The **cleaning agents** you use also **contain chemicals**. Only use these agents in accordance with the instructions. Obtain separate advice from your line managers regarding possible dangers arising from the use of these agents (pay attention to the safety data sheet).
10. During **pregnancy** you should not be exposed to any infectious microorganisms. Nor should you be exposed to certain chemicals, which may be very dangerous in the first few weeks. That means that you must no longer work in rooms in which there might be hazardous substances. For this reason, inform your line managers of the start of a pregnancy without delay, so it can be established what work you can continue to do. (The requirements of the Maternity Protection Ordinance (Mutterschutzverordnung / MuSchV) will be observed).
11. **Eating, drinking, smoking, the taking of snuff and the application of make-up are forbidden** in the laboratories.
12. After work, wash your hands with soap and water. Care for your hands by applying a moisturizing cream. This also applies whenever you take a break from your work, e.g. a coffee break. Follow the recommendations regarding protection of the skin, cleaning of the skin and skin care.
13. Also follow the leaflet *Measures to prevent infectious diseases transmissible by blood*.

4. First aid

First aid after contact with microorganisms

1. Remove contaminated clothing (including underwear) immediately and do not use again until it has been disinfected and cleaned.

2. Wash an open wound, let it bleed if possible and immediately disinfect with PVP iodine solution (e.g. Betaisodona oral antiseptic). After that, keep moist for more than 10 minutes by repeated application.
3. If splashes enter the eye, use the eye-wash stand to rinse thoroughly. Then wash with a 5% solution of PVP iodine in water.
4. If pathogen-containing material enters the mouth, spit it out immediately.
5. Injuries must be reported immediately to the relevant line managers and the Biosafety Officers by way of the *Report sheet for laboratory incidents*.
6. If internal contact – e.g. swallowing, inhalation, incorporation through injuries – occurs, a doctor must be consulted immediately.

5. First aid after contact with chemicals

1. If chemicals or unknown solutions come into contact with skin, rinse the affected areas immediately and thoroughly under running water for at least 10 minutes. If there is no injury, use soap and water. Remove saturated clothing immediately. Keep a complete set of spare clothing ready in your locker so you can change your clothes if necessary. If chemicals have entered the eye, use the eye-wash equipment which is available in every laboratory. Contact a doctor in consultation with the person in charge.
2. If you sense sudden reddening, itching or burning on your skin, stop working immediately and wash the affected areas of skin thoroughly, but without scrubbing, with soap and water, as described above.
3. After thorough rinsing and washing, contact your line managers, the Safety Officers or, if they are not available, any person present in the building. Further advice regarding emergencies and telephone numbers can be found by any telephone. Do not apply any ointments or anything similar to your skin. (When they are absorbed they can also draw any chemicals present into the skin with them.)
4. Allow cuts to bleed for a moment. Find someone to help you. Then dress the wound. First-aid material can be found in all rooms displaying a sign with a white cross on a green background on the door.

6. Training

It is stipulated that you must be instructed verbally, on the basis of these operating instructions, before taking on the cleaning service in laboratories where you are exposed to possible dangers from chemicals or microorganisms.

Annex 14: Disposal plan for biologically contaminated waste

1. Purpose

This disposal plan sets out rules for handling biologically contaminated waste. The inactivation of contaminated waste is a key aspect for minimizing the escape of organisms from the laboratory and thus preventing risks to people and the environment.

Inactivation techniques which may be used are vapour sterilization (autoclaving), and (dry) heat sterilization.

The guidance document KD01189218 – Entsorgung von Biosicherheitsabfällen / Guidance Document – Disposal of Biosafety Waste outlines the general procedures for the handling and disposal of all biosafety waste generated.

2. Disposal room (LLF.V+6.014)

Biological hazardous waste generated in the laboratories is transported to the V floor for temporary storage. Transportation is carried out using a leak-proof transport trolley via the freight elevator directly to the designated waste disposal room.

In the disposal room, the waste is stored in a lockable, leak-proof collection container until it is collected by the internal transport service. Both the individual waste containers and the collection container are labelled with the biohazard symbol. The internal transport service subsequently transfers the waste directly for inactivation by autoclaving.

To prevent cross-contamination and ensure safe waste management, the disposal room is divided into clearly defined areas. The separation of biological hazardous waste from other waste streams is ensured through organizational measures and permanent floor markings. This prevents biological hazardous waste from coming into contact with or being mixed with other waste materials.

Access to the disposal room is restricted to authorized personnel. All affected employees have been informed of and trained in the applicable waste disposal procedures, the identification and labeling requirements for biological hazardous waste, the access restrictions, and the necessary safety measures.

3. Disposal of biologically contaminated waste

Disposal of waste involving risk of injury (sharps) as special waste

Waste involving risk of injury (*sharps*) is not disposed of with the normal industrial waste, but as special waste. If it has come into contact with infectious material, it is first rendered inactive.

Coding according to VVS (VeVA) as special waste

LVA Code ¹	Waste description
18 01 01	Waste involving risk of injury (sharps)

¹ LVA: Lists for the Movement of Waste (Abfall-Code der Verordnung des UVEK vom 18. Oktober 2005 über Listen zum Verkehr mit Abfällen; SR 814.610.1)

ADR/SDR classification as dangerous goods:

Class	Category	UN number	PG ³	Exemption limit acc. to ADR - GGBV
6.2	B	3291	II	333 kg or litres

Disposal plan for solid waste

	Solid waste	How	When / frequency	Who
Description of waste and collection	Principles of solid waste separation	Glass waste is to be collected separately from plastic waste and from waste involving risk of injury.		Lab staff
	Contaminated consumables involving risk of injury (<i>sharps</i>): e.g. syringes, scalpels and injection needles	Collect in puncture-proof, non-transparent, dense plastic containers which can be closed tightly and, when closed, cannot be reopened.	As required, but before the point when collecting containers can no longer be closed safely.	Lab staff
	Cultures of microorganisms (e.g. agar plates, plastic cell culture bottles with no culture medium)	Collect together or separately in autoclavable bags in strong, leak-proof, lidded containers.	As required or when bags are, at most, 2/3 full; do not compress!	Lab staff
	Contaminated consumables with no risk of injury (pipette tips, plastic pipettes, Eppendorf tubes, plastic containers, disposable gloves)			Lab stuff
Diagnostic samples (blood samples, secretions, excreta, tissue samples etc. in plastic tubes)				
Labelling		Label all waste containers or bags with the biohazard warning symbol. Wastes with a risk of injury must be labelled as such (e.g. "Beware needles"). A temperature-sensitive indicator must be attached to waste containers and bags before they are autoclaved.		
Storage	Temporary storage in the laboratory	Open containers and small bags (up to max. 2 litres) may be stored briefly in the bio-safety workbench, though they must be disposed of in bigger bio-safety bags at least once a week. Full, closed biohazard plastic bags are to be stored temporarily in a container.	As required	Lab stuff
Transport	Transport to the treatment site	Containers must be brought to the autoclave by the most direct route and the material must be inactivated without delay and with further temporary storage.	2x Day	
Inaktivierung	Charging the autoclave	The autoclave must be charged and operated by personnel with appropriate expertise.	Daily	
	Monitoring inactivation	Collect and archive autoclave logs.	Saved on server	
	Servicing the equipment	The autoclave must be serviced in accordance with the service plan.	1/ year	
Disposal	Disposal of autoclaved waste	Glass waste which is not a problem and is comparable with domestic waste (e.g. broken culture tubes) is disposed of with the industrial waste in suitable packing with the necessary safety precautions to prevent injuries (cuts). Waste involving risk of injury (<i>sharps</i>) is disposed of as special waste (see Chap. 2.1).		

Solid waste	How	When / frequency	Who
	Waste involving no risk of injury is to be disposed of with the normal industrial waste. Inactivated waste is only disposed of with the industrial waste when the “ Biohazard ” warning symbol is no longer visible. To this end, it is covered by a second layer of packaging.		

Disposal plan liquid waste

	Liquid waste (supernatant cultures)	How	When / frequency	Who
Description / collection	Principles of waste separation	Cell culture media and perfusion solutions are to be collected separately.		Lab stuff
	Types of containers	Suction bottles (e.g. 2-litre) are to be used for culture media; perfusion solutions are to be collected in plastic canisters (e.g. 10-litre). Collect supernatant media after centrifuging (e.g. in 1-litre bottles).		
Labelling	Labelling	A temperature-sensitive indicator must be attached to bottles containing culture media before inactivation.		
Storage	Temporary storage in the laboratory	Cell culture media and perfusion solutions are to be stored temporarily in a safe place in the laboratory prior to final disposal.		
Transport	Transport to the treatment site	The waste must be taken to the autoclave by the most direct route and the material must be inactivated without delay and with further temporary storage.	daily	
Inactivation	Charging the autoclave	The autoclave must be charged and operated by personnel with appropriate expertise (select special programme for liquids). Collect and archive autoclave logs.	Stuff was trained by Super-BSO	
	Monitoring inactivation			
	Servicing the autoclave	The autoclave must be serviced in accordance with the service plan.	1/ year	
Disposal	Disposal of the inactivated waste	Inactivated liquid waste must be disposed off by way of the waste water from the building in compliance with the water protection legislation.	Daily Due to the different antibiotics used in the laboratory work, the waste is collected as hazardous waste and then taken away by a specialized company.	

2. Disposal of revolting, nauseating or strong smelling wastes

Very strong-smelling, nauseating or revolting wastes (waste containing blood etc.) are disposed of as special waste in accordance with VeVA.⁵³ Infectious waste is inactivated beforehand.

Coding according to VeVA⁵⁴ as special waste:

LVA Code*	Waste description
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⁵³ In this regard, see pp 6 and 14ff. of the Recommendation of the Swiss Expert Committee for Biosafety: on the Treatment and Disposal of Waste in Contained Systems, 2009 (updated April 2017); Swiss Expert Committee for Biosafety, c/o Swiss Agency for the Environment, CH-3003 Bern; obtainable from: https://www.efbs.admin.ch/inhalte/dokumentation/empfehlungen/Empfehlungen_aktuell/Abfall_EFBS_E.pdf

⁵⁴ Ordinance on the Movement of Waste (Verordnung vom 22. Juni 2005 über den Verkehr mit Abfällen (VeVA, SR 814.610))
See: <http://www.bafu.admin.ch/> » [Topics](#) » [Waste](#) » Legislation » Acts and Ordinances

18 01 02	Waste involving risk of contamination (e.g. tissue waste, waste containing blood, secretions and excreta, blood bags and banked blood)
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* LVA: Lists for the Movement of Waste (Abfall-Code der Verordnung des UVEK vom 18. Oktober 2005 über Listen zum Verkehr mit Abfällen; SR 814.610.1)

ADR/SDR classification as dangerous goods:

Class	Category	UN number	PG*	Exemption limit acc. to ADR - GGBV
6.2	B	3291	II	333 kg or litres

3. Animal waste

Waste from small animals arising from Class 2 activities according to the Containment Ordinance (Einschliessungsverordnung / ESV) and containing genetically modified or pathogenic organisms is, as a basic rule, inactivated on-site and then disposed of in accordance with the legislation on environmental protection or animal epidemics (depending on the nature of the waste, according to VTNP or according to VeVA).

Temporary storage until disposal must take place under cool conditions (at least +4°C, ideally at -20°C) in a place which is only accessible to specialist staff.

For disposal and transport according to the animal epidemic legislation, the dead animals or parts thereof must be marked clearly, accompanied by a document containing information on the origin and nature of the material and its destination and incinerated in an authorized disposal facility (see Annex I to the Ordinance on the disposal of animal by-products (VTNP)).

For disposal and transport as special waste, an accompanying document (for small quantities a collective list) is made out according to VeVA and LVA as of 1 January 2006) and entries required under ADR are added to it or an additional ADR transport document is completed.

Coding according to VeVA as special waste

LVA Code*	Waste description
18 02 98	Animal waste involving risk of contamination (e.g. tissue waste, waste containing blood, secretions and excreta, blood bags and banked blood, contaminated carcasses of [test] animals)

* LVA: Lists for the Movement of Waste (Abfall-Code der Verordnung des UVEK vom 18. Oktober 2005 über Listen zum Verkehr mit Abfällen; SR 814.610.1)

ADR/SDR classification as dangerous goods

Class	Category	UN number	PG*	Description
6.2	B	3291	II	Clinical waste, unspecified, n.o.s. (animal waste)

* PG = Packing Group

4. Interfaces

With regard to the disposal of biologically contaminated waste, the interfaces with other safety and disposal concepts are regulated as follows:

- **Radioactivity:** Safety Level 2 biological waste containing radioactivity must first be rendered completely inactivate with sufficient disinfectant and then sent to the appropriate radioactive waste.
- **Chemicals:** Safety Level 2 biological waste containing toxic and carcinogenic chemicals must first be rendered completely inactive with sufficient disinfectant and then sent to the appropriate special waste.
- **Waste separation / recycling:** Wherever possible, the waste must be separated into various groups of substances. Reusable materials must be recycled.

Annex 15: Service plan and responsibility for maintenance of equipment

1. Purpose

Well-functioning appliances serve to ensure the quality of work results, the safety of employees and, in general, the protection of people and the environment. This requires regular maintenance. Maintenance is part of appliance maintenance and means the technical servicing of an appliance. All equipment maintenance includes cleaning and disinfection; however, these are regulated separately in the hygiene plan.

2. Overview of devices and responsibility for maintenance

The University Children's Hospital Zurich maintains a device database in which all diagnostic, research and teaching devices are stored. Research and teaching equipment is implemented as soon as possible. The periodic maintenance of the equipment is planned and documented there. Maintenance contracts for autoclaves and safety safety cabinets are in place.

3. Device-specific maintenance plan

The exact details of the device, as well as the location, maintenance intervals, the service company and the results/outcomes of the maintenance are recorded in the device database.

4. Access control for service personnel

Visitors may only enter and work in the level 2 laboratory with the prior permission of the biosafety officer or the laboratory management under expert supervision and after being informed of the existing risk potential. Staff must be instructed accordingly and protective measures must be taken if necessary, especially when carrying out service work and repairs in level 2 laboratories. All visits must be recorded in a guest book.

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Document A: Mission statement

This is available to all employees at the Infopoint under the titles Occupational Safety and Health Protection (AS/GS) under the following hyperlink : (KD00016189).

The directive on ecology and waste disposal can be accessed via the following link (KD00003505).

At the moment the document is only available in german, if you have any questions please contact your supervisor, Human Relation or BSO.

Document B: Organization chart (possibly list of names)

This is available to all employees at the Infopoint under the titles Security Commission under the following hy-perlink : (KD00016189)

Funktion	Person
Deeskalationsmanagement: Leitung	Yildiz Ünver
Biosafety Officer (BSO)	Nicole Meili
Chief Information Security Officer (CISO)	Sebastian Svetel
Chemikalienansprechperson	Poms Martin Dr.
Datenschutzbeauftragter	Sebastian Svetel
Direktorin HRM	Christine Tremel
Gefahrgutbeauftragter ADR/RID, IATA	Lior Merci
Anlaufstelle Konfliktmanagement	Yildiz Ünver
Leitung Sicherheit und Umwelt	Lior Merci
Stv. Leitung Sicherheit und Umwelt	Flamur Qufaj
QS-Verantwortlicher Brandschutz	Lior Merci
SIBE Brandschutz Kinder-Reha Schweiz	Dino Locher
SIBE Brandschutz Lengg, Schlieren, Circle, August-Forel-Strasse	Albin Spahic
Spezialisten der Arbeitssicherheit (Sicherheitsfachmann)	Lior Merci
Strahlenschutz: Fachstelle (Röntgenstrahlen)	Eleni Theano Samara
Strahlenschutz C-Labore	Stephan Wüest

Document C: Job descriptions of the Biosafety Officers

1. framework conditions for tasks of the organizational units with regard to BSO

1.1 Drawing up the specifications, resources and organizational classification

Organizational units that work with microorganisms appoint a biosafety officer (BSO) for biosafety and designate his/her deputy. The tasks and competencies of the BSO are defined on the basis of these specifications and, if necessary, adapted to specific requirements.

If several BSOs are employed within the same organizational unit, the organization of the cooperation must be recorded. In any case, the division of tasks and responsibilities between the BSOs and the laboratory and project managers must be defined (Annex 1).

The management of the respective organizational unit determines the financial and personnel resources for the implementation of safety precautions. The BSO has sufficient resources and time at its disposal to fulfill its tasks.

During normal operations, the BSO reports to the management of the institute or clinic and, in the event of an incident, to the internal and external incident services (Safety and Environment Department, fire department, police, ambulance service). The BSO regularly informs the management of the organizational unit about the status of biosafety.

1.2 Competence

The BSO independently implements directives and resolutions issued by the Directorate in consultation with the Biosafety Commission and the Safety and Environment Division. The BSO has the right to obtain all information required for the biosafety of the organizational unit are relevant. If necessary, the BSO is granted access to all rooms relating to biological safety.

In the event of an incident, the BSO has direct authority to issue instructions to laboratory and project managers and employees until the arrival of the incident services - on behalf of the management.

The BSO has the authority to cooperate directly with the emergency services.

Informing the media is the responsibility of the University Children's Hospital Zurich in consultation with the incident command of the emergency services involved.

2 Tasks of the biosafety officer (BSO specifications)

2.1 Normal operation applies:

- The Sub-BSO draws up - if necessary with the support of the laboratory and project managers - an operational safety concept for biological safety in accordance with the ESV and ensures that the concept is regularly updated, in particular the list of current projects.
- The specifications and corresponding templates, information sheets, etc. of the Safety and Environment Department of the University Children's Hospital are taken into account.
- The Super-BSO submits the operational safety concept to the management of the organizational unit and the head of the Safety and Environment department for approval. It comes into force through publication in the Infopoint.
- In particular, the Sub-BSO ensures - either in terms of overarching responsibility or direct responsibility - that
 - that the laboratory and project managers know and implement the principles of microbiological practice and the safety regulations. The laboratory and project managers must be informed about changes to the legal requirements and the implementation of the corresponding requirements of the Safety and Environment Department.
 - That the laboratory and project managers complete the license applications, i.e. the registration of projects and notifications of changes, and submit them to the Federal Biotechnology Contact Point and offers advisory support.
 - For the documentation of his area of responsibility for the attention of the authority (e.g. on the basis of the registration and authorization documents). This documentation includes the type of activities (type of organisms), number of exposed persons, names of laboratory and project managers, name of the occupational physician.

For the organization of the access regulation, in which only authorized persons are allowed access to the level 2 area.

- For compliance with the correct room designation (access authorizations, "Biohazard" sign for level 2 area, etc.) in relation to work with microbiological material
- For the preparation of emergency measures (emergency plan) - if necessary in cooperation with the Safety and Environment Department.
- To publicize the legal regulations, in particular regarding the correct disposal of microbiological waste and the transport and shipment of biological material. The Sub-BSO offers advisory support for correct implementation.

- The BSO ensures that the new legal requirements are taken into account and that the safety precautions regarding work with microbiological material are regularly adapted to the state of the art in science and technology. If necessary, the BSO submits the corresponding applications to the management of the clinic or institute, if necessary in cooperation with the Safety and Environment Department.
- When creating, updating and enforcing the operating instructions, which serve to guarantee the environment and occupational safety with work regulations and rules of conduct.
- In the selection of the correct protective equipment and - if necessary - in the organization of maintenance and cleaning.
- In consultation with the cleaning service regarding the cleaning of those areas that are not cleaned by the company itself.
- In the training and work-related instruction of employees regarding safety in the handling of biological material (at least once a year) and in the provision of information about hazards and incidents and accidents that have occurred in order to take the necessary protective measures (Art. 12, SAMV).
- In the organization and control of health surveillance in accordance with Art. 13 and Art. 14 of the SAMV; specifically
- When creating and maintaining a project-specific register in accordance with Art. 13 of the SAMV. This provides information on activities, type of organisms used, number of exposed persons, names of persons working with Group 2 organisms, accidents and incidents that have occurred.
- Together with the laboratory and project managers, the BSO arranges for the occupational physician to compile a health file for all employees (in accordance with the SAMV)

2.2 Incident

In the event of an incident, the Super-BSO has the following tasks:

- Cooperation with the incident services in the management of incidents
- Processing and analyzing safety-relevant incidents in collaboration with the Biosafety Commission and the Safety and Environment Department.
- After a safety-relevant incident, the BSO informs the management of the organizational unit and the Safety and Environment Department. If necessary, the BSO informs the management and the responsible authorities.

Document D : Safety documentation

Available under the Infopoint: [Infopoint Wichtige Infos für Forschende](#)

1. Hazard plans / environmental plan

Fire compartments; access routes; premises where work is carried out with organisms; storage locations and quantities of organisms, but also of radioactive isotopes or flammable or explosive chemicals.

Further documents:

- Reglement KD00081439 Evakuationskonzept Kinderspital Zürich
- building plans Infopoint

It is available under: [Infopoint Wichtige Infos für Forschende](#)

At the moment the document is only available in german, if you have any questions please contact your supervisor, Human Relation or BSO.

2. Project list

A current project list with the responsible persons. KD00908839 Biosicherheit Projektliste

3. Open radioactive sources (C-Laboratory)

An updated list of radioactive substances, their storage location and the decay storage facility.

Further Documents

- Weisung KD00873710 Ionisierenden Strahlen in den Laboratorien: Umgang

4. Necessary protective measures

The event service is subject to the same protective measures as the employees of the University Children's Hospital Zurich with regard to protective clothing; any direct contact with the microorganisms is avoided

Document E : Spec. operating instructions, work procedures and Standard Operating Procedures (SOPs)

General work regulations are stored in the Infopoint and mainly concern shared equipment. This is available in the Infopoint under [Infopoint Wichtige Infos für Forschende](#)

The research groups create their own work regulations according to their work. These are available under the respective group folder

Document F: Introduction to work / employee appraisal / support and training

1. Introduction to work

The work introduction in the respective groups is carried out by the sub-BSO. All groups have their own work instructions (SOP) to which all their employees have access. The employees are introduced to the principles of microbiological practice and the safety regulations are explained to them.

2. Employee appraisal

Infopoint: Standortbeurteilung KD00080166

3. Support and training

New group members must be reported to the biosafety officer (Super BSO). This gives the new employee access to information on biosafety. New employees are required to read the filed documents, sign a confirmation document and apply these standards accordingly.

Internal

- Biosafety meetings

Biosafety meetings are held at least twice a year with all responsible BSOs (all levels). At these meetings, the latest legal changes are discussed, internal and external audits of the laboratories are analyzed and the implementation of certain measures, emergency concepts, maternity protection, etc. are evaluated. The BSOs are also informed about changes by e-mail (BSO letter AWEL).

- Principal Investigator Meetings (project management)

Every three months, the project management is informed in meetings about the latest changes regarding biosafety or audits and the corresponding packages of measures.

- Departmental meeting

In the divisional meeting of the Children's Hospital, we have the opportunity to reach a larger group of researchers. This is used to address employee-relevant biosafety topics and to draw attention to these issues. The divisional meetings take place every three months.

- Biosafety training

From 2025, biosafety training will be held every three months by the Super BSO, which all new laboratory employees must attend. A certificate of attendance will be issued.

External

- FOEN

All BSOs are encouraged to attend the "Events and courses for biosafety officers" on the FOEN website.

The Super BSO undergoes further training at such events every year and passes on this knowledge at biosafety meetings.

- UZH

From 2025, a working group will be formed with UZH, which will meet twice a year to discuss the exchange and common topics. Courses offered by UZH on biosafety will be forwarded internally.

Document G: List of documentation concerning all disinfectants used

The safety data sheets for the disinfectants used can be found in the Infopoint. If additional disinfectants are used in the research groups, the safety data sheets are stored in the group-specific folders.

Document H: Autoclave operating instructions

Autoclave ASS

The autoclave is not operated by all employees themselves, there are selected personnel who operate the autoclave in the hospital building to destroy our waste. The staff have been trained by the BSO And the handling of the autoclave is protected by a code. There is a work instruction "Weisung KD01020669 Autoklav Bedienung".

Autoclaves F&L

The autoclaves on the floors are not used for inactivation and only liquids and solids may be sterilized in the autoclave. Only liquids and solids for sterilization may be handled in the autoclaves. The operating instructions can be found on the Infopoint.

SOP KD00847806 Autoclave: Load

SOP KD00847797 Autoclave: Instruction

Document I: Equipment documents with declaration of conformity

Equipment documents for the shared equipment in the new research tower can be found at the Infopoint [Infopoint Wichtige Infos für Forschende.](#) The group-specific devices are managed by the documentation itself.

- Abzüge Wesemann /Fume hood
- Autoclave Systec
- Desinfektionsautomat Miele / dish washer
- Eismaschine Kibernetik / Ice machine
- MilliQ Reinstwasseranlage/ high purity water device

Document J: Service contracts

Maintenance contracts were drawn up for the autoclaves, laboratory glassware cleaners, ultrapure water systems and the sterile biosafety cabinets. Equipment that requires maintenance is generally coordinated by the biosafety manager, the QM managers in the respective laboratories or the laboratory management.

Document K: Authorization from the Federal Office of Public Health

The project list also contains the respective approvals of the applications submitted in order to be able to conduct scientific research at the University Children's Hospital Zurich.

The list can be found under the Infopoint: KD00908839_Projektliste

Document L: Radiation protection and work instructions for handling isotopes

Radiation protection is regulated in directive KD00873710 "Ionisierende Strahlen in den Laboratorien: Umgang."

The work instructions for handling isotopes are stored on the respective group servers within Diagnostics and Research.