

(revised December 2015)

# **LABORATORY SAFETY AND MANAGEMENT**

## **Department of Biochemistry and Biophysics**

### **Stockholm University**



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## **SIGNATURE FOR LABWORK AT DBB**

Everyone doing laboratory work at the Department must read the regulations and instructions on "**Laboratory safety and management**" in full.

Before starting your work, sign this paper, **thereby verifying that you know the rules and instructions understand them and will work accordingly.**

Date:

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

I hereby certify that \_\_\_\_\_ has read and understood the regulations that apply to DBB lab work.

Name of mentor: \_\_\_\_\_

Signature: \_\_\_\_\_

**Hand in the signed document to the Secretariat**

## GOOD WORKING PRACTICE AT A GLANCE

You must always be sure that you know how to handle an instrument correctly, a chemical etc. *before* you start using it. This is especially important when working with radioactive materials and toxic chemicals. If you are not sure, ask someone who knows, or consult this booklet! Also note that some instruments/techniques demand a “driving license” for use (e.g. NMR, MS instruments, Biacore) – consult the person in charge. Furthermore, work with GMO (gene-modified organisms) demands permission for many types of genes/clones – consult the group leader.

Always leave an instrument or a working bench, the autoclave room, etc. in the condition you would like to find it!

Do not expose others to hazard!

Take care of your waste properly!

Use lab coats when working in the lab.

Do **not** wear lab coats or rubber gloves in offices/lunch/coffee rooms. Do **not** wear rubber gloves when opening doors, going to the toilet, using keyboard or telephone etc.

Always report accidents or incidents to **Margareta Sahlin**  
[margareta.sahlin@dbb.su.se](mailto:margareta.sahlin@dbb.su.se)

Be sure you know:

- where the fire extinguishers, fire blankets are located.
- that you can recognize the sound of the fire alarm.
- where the emergency showers and eye showers are located.
- where the first aid boxes are located.
- the evacuation plans, study the escape routes.
- where the FIRST AID AND CRISIS PLAN, DBB (persons at DBB who have medical training) on the wall in every lab.

Always report instruments or installations that do not function, to the person in charge!

Take your responsibility to make the department a safe, efficient and enjoyable workplace for everyone!

## WORKING ALONE IN THE LAB

Undergraduate students, including those doing a degree project (“examensarbete”) are not allowed to work in the laboratories unless someone else (teacher, PhD-student) in the same research group is present. He/she can be in the lab or in the office.

When working alone in the lab after working hours and during weekends, you should make sure that someone else present in the department knows that you are there.

Make sure we don't get any unwanted visitors in the department.

- close and lock doors when you leave
- don't let anyone into the department or the building unless you are absolutely sure that they have the right to be there.

## GENERAL SAFETY RULES

### Workplace

1. Lab coats should be worn in the lab.
2. Fume hoods and workbenches should be kept free from equipment that is not being used.
3. Fume hoods are first and foremost working areas. Avoid using them as storage areas for chemicals and equipment. Special ventilated cupboards and rooms are provided for solvent storage.
4. Keep the fume hood as far closed as is practical when working. Close the hood when not working in it (but never totally block the air flow).
5. Mop up all spillages on the floor. Even water makes the floors slippery!
6. Spillages of chemicals must be dealt with immediately. Contaminated surfaces must be treated appropriately. Confer safety data sheet for the chemical substance.
7. Acids, bases, flammable substances: check that there is Vermiculite available to clean up liquid spills.
8. Due to the risk of cuts, never put glass, metal waste or other sharp objects into the waste paper bins. Collect sharp objects into marked containers.

### Hand and skin hygiene

1. If chemicals come in contact with the skin, the most appropriate action is nearly always to rinse with water.
2. Never handle chemicals directly. Use a spatula or similar tool.
3. Wash your hands thoroughly with soap and water after finishing work and after every contact with chemicals.
4. Rubber gloves protect only against substances that cannot pass through rubber, for example, aqueous salt solutions. Non-polar substances can easily pass through rubber gloves, in which case there is no protection. Solvent-resistant gloves can be purchased from SU-Butiken (shop at floor 2).

Take a look at:

[http://www.shieldscientific.com/include/USER\\_FileUpload/files/Articles/readingt herunes-2007-uk.pdf](http://www.shieldscientific.com/include/USER_FileUpload/files/Articles/readingt herunes-2007-uk.pdf)

[http://www.nordicbiolabs.se/MediaBinaryLoader.axd?MediaArchive\\_FileID=f04234a5-34f8-44cf-b2a0-b19330f14ba6&FileName=Kunskapsartikel+Eng%C3%A5ngshandskar+och+EU direktiv.pdf](http://www.nordicbiolabs.se/MediaBinaryLoader.axd?MediaArchive_FileID=f04234a5-34f8-44cf-b2a0-b19330f14ba6&FileName=Kunskapsartikel+Eng%C3%A5ngshandskar+och+EU direktiv.pdf)

Someone from VWR could come in for a glove seminar without cost, if we want it.

5. Be aware of possible contamination pathways e.g. your keyboard and your cellphone.

## **Air hygiene**

1. All strongly smelling, volatile or poisonous chemicals must be handled in a fume hood.
2. Rinse contaminated glassware in the hood before taking it out.
3. Take particular care when performing chromatography, the equipment which often does not fit in a fume hood.
4. Check that the traps in the drains are filled with water. The drains are ventilated outwards, and the negative pressure in the labs causes unused traps to dry out, allowing labs to cross-contaminate one another. Drains not regularly in use can be filled with a layer of glycerol.

## **Oral hygiene**

1. Pipetting by mouth is forbidden.
2. As is smoking indoors and near the entrances.
3. And eating and drinking in the lab.

## **Eye protection**

1. Use safety glasses whenever appropriate – this includes when using phenols, strong acids, strong bases and liquid nitrogen. Use full-face shielding when working with sources of UV radiation.
2. Everyone should have their own pair of safety glasses.
3. Remember that contact lenses prevent the eye from being properly rinsed in the event of an accident.
4. Learn how to operate the eye showers. Access to these must not be obstructed.
5. Always contact a doctor following injury caused by contact with chemicals.

## **Accident awareness**

Take note of:

1. where the first aid boxes are located.
2. where the emergency showers and eye showers are located. These must not be blocked.
3. the evacuation plans, study the escape routes.
4. where the fire extinguishers, fire blankets and alarms are located.
5. the FIRST AID AND CRISIS PLAN, DBB (persons at DBB who have medical training) on the wall in every lab, also found under the heading **LEGISLATION AND LINKS**.
6. The telephone number in case of **emergency** is **112**.

## **Fire risks**

1. All work with volatile solvents should take place in a fume hood.
2. Never handle solvents near open flames or hot objects.



3. The majority of fires in chemistry laboratories occur when a volatile solvent is heated in an open beaker. Avoid this!
4. Minor fires, such as alcohol catching fire in small beakers, are best handled by suffocating the fire.
5. Avoid working with open flames on workbenches. If necessary, check that no-one in the vicinity is using ether or any other volatile solvent. Rubbing alcohol should not be used near open flames. Ensure that all the alcohol evaporates from your hands and other surfaces before approaching/use of open flames.
6. Hot burning flames can be difficult to see in sunlight. Never leave a burner unattended.
7. Use gas tubing made of black butyl rubber (or other suitable material). Special tubing for LPG (liquefied petroleum gas, Swedish = gasol) can be purchased from SU-Butiken (shop at floor 2).
8. Each time you connect/disconnect a gas cylinder/the central system with **flammable gas** or other **hazardous gas** make sure there are **no** (hazardous) **leaks** (borrow a gas leak detector from SU-Butiken, shop at floor 2)
9. Volatile solvents must be stored in the ventilated cupboards when not in use. Storage cupboards must be kept closed. Large amounts of solvents should be stored in a ventilated storage room or a safety storage cabinet – see special section for details (ORGANIC SOLVENTS p. 21).
10. Ether, petroleum ether and similarly volatile liquids may not be poured down the drains. Restrictions on other solvents are also in force – see special section for details (ORGANIC SOLVENTS p. 23).
11. Take care when disposing of solid chemicals that have been used to dry solvents (for example, calcium chloride).
12. Do not heat solvents in ovens.
13. Do not heat oil above its flash point.
14. Remnants of catalysts (e.g. platinum, palladium, nickel) should be immediately discarded into separate containers.
15. Beware of the risk of static electricity build-up when pouring solvents into large (> 5 L) containers, which can cause explosions. If necessary, use a funnel with a chain that reaches to the bottom of the container.
16. Buy a new refrigerator if it is old, there might be a potential risk of fire in old refrigerators and freezers. Icy freezers should be defrosted because of the increased fire risk. Cardboard boxes, Styrofoam boxes (combustible) on top of the refrigerators are also a fire risk. Vacuum the back of the refrigerator and freezer if needed (once a year, cleaning day).
17. It's **not allowed** at all to store **flammable** liquids, **ethers** and other **peroxide-forming** chemicals in the **refrigerator/freezer** except if it has been designed and manufactured to eliminate ignition sources!!! **Diethyl ether is extremely flammable** and is often one of the most dangerous fire hazards often found in the laboratory. This is due to its high volatility and extremely low flash point. Electrical arcs from equipment motors and switches or from static electricity discharges may ignite ether vapors. Most flammable liquids have vapors that are heavier than air and may travel surprisingly long distances to an ignition source and flash back. Every other year there is a new story of a university lab destroyed as a result of a refrigerator fire.
18. **Ethers, tetrahydrofuran, dioxane, and several other flammable solvents have the additional hazard of forming unstable peroxides over time**, especially with exposure to air. When sufficiently concentrated (e.g. around a container cap or

through distillation) detonation can occur. Because of their tendency to form peroxides on contact with air, date containers upon receipt and at the time they are opened. Many organizations require peroxide formers to be either disposed of, or tested, within three to six months after opening. If unopened, they should always be disposed of by the expiration date on the container.

## **Peroxide-forming chemicals**

Take a look at:

<https://internwebben.ki.se/en/peroxide-forming-chemicals>

<https://internwebben.ki.se/en/node/12440>

<https://internwebben.ki.se/sv/peroxidbildande-kemikalier>

<https://internwebben.ki.se/sv/node/12220>

## **Electrical safety**

1. Use only grounded equipment.
2. Do not use cables in poor condition.
3. Never handle electrical equipment with wet hands.
4. After moving equipment to/from cold rooms, allow time for any condensation to evaporate at the new temperature.

## **Glassware**

1. Never use cracked glassware.
2. Never cork a flask by pushing with the palm of the hand.
3. Be careful when drying glassware with compressed air.
4. Be careful when removing corks, bungs or tubing from glassware.
5. It is better to cut off a stuck rubber tube than risk cutting yourself.
6. Do not pour hot liquids into thick-walled glassware such as measuring cylinders.

## **Vacuum work**

1. Only glassware specifically designed for evacuation may be used – never ordinary conical flasks.
2. Always use a safety flask when working with vacuum.
3. Protect the air intake/outflow of pumps and desiccators. It is possible to buy suitable netting.
4. Always break the vacuum before stopping the pump.
5. Learn how to open a stuck desiccator lid.
6. Be careful when releasing air into a manometer under vacuum.
7. Never leave a vacuum distillation apparatus unattended.

## High pressure work

1. Never lubricate oxygen valves.
2. Never use flammable gaskets with oxygen valves.
3. Always be sure what a cylinder contains, and make sure that the label is readable.
4. Cylinders must always be chained. Transport them properly using a carrier.
5. Never use a cylinder without a pressure reducing head.
6. Only use appropriate connectors; for example, never connect brass pipes to ammonia cylinders, only use the correct head valve on an oxygen cylinder. Avoid any home-made parts.
7. Close the main valve when the cylinders are not being used.
8. Do not empty cylinders completely. This is because of the risk of condensation forming or other contamination. Moreover, the suppliers take an extra charge if cylinders are completely empty.

## Autoclaves

1. ONLY those persons who visited the information seminar “How to use the Autoclaves” or have seen the movie “Autoclaves at DBB - some routines for the common use” will have access to the autoclave room.
2. To watch the movie and get access to the autoclave room contact Ann-Britt Rönnell, [ann-britt.ronnell@dbb.su.se](mailto:ann-britt.ronnell@dbb.su.se)
3. To report malfunctions e-mail [autoclaves@dbb.su.se](mailto:autoclaves@dbb.su.se) , then Ann-Britt Rönnell, Håkan Thorén and Matthew Bennett will take care of it.
4. It is not allowed to let someone in who does not have access.

## Centrifugation and rotors

1. Running costs for rotors and centrifuges are very high – better care means longer lifetime and lower costs.
2. Clean the rotors with mild detergents, rinse with distilled water and air dry after each session of use.
3. Keep the rotors in the cold room, or in the refrigerator in the centrifuge room.
4. Never exceed the maximum speed of the rotor. For optimal life expectancy, to not exceed 90% of maximum. Moreover, the permitted speed may be reduced when using heavy solutions such as CsCl or if the rotor is old.
5. Always fill in the log book. Note any fault in the log book and report it to [centrifuges@dbb.su.se](mailto:centrifuges@dbb.su.se)
6. If a rotor is stuck or requires other attention, obtain help from **Håkan Thorén**, [hakan.thoren@dbb.su.se](mailto:hakan.thoren@dbb.su.se) Do **not** use force.
7. If you are uncertain, then find out what to do BEFORE you do it.
8. Never operate a swing-out rotor without all the buckets in place.
9. NEVER switch buckets or lids between rotors, even apparently identical ones.
10. Never operate a screw-on rotor (e.g., JA-14, JA-20) without a lid.
11. Check overspeed disks before use.
12. Never run without intact and lubricated O-rings. Håkan Thorén, [hakan.thoren@dbb.su.se](mailto:hakan.thoren@dbb.su.se) or Matthew Benneth, [matthew.bennett@dbb.su.se](mailto:matthew.bennett@dbb.su.se) will provide replacements.

## Homogenization

1. Serious accidents have occurred when using motorized homogenizers.
2. When homogenizing, use gloves and a face shield
3. Tie back long hair.
4. Also, cover the chuck with a rubber sleeve.

## Sonication

1. Wear ear protection when using sonicators.
2. Think of others in the vicinity before operating.
3. Clean the tips thoroughly after use.

## Cryogenics

1. Wear gloves and safety glasses when handling liquid nitrogen.
2. Release tube seals before freezing sealed tubes (especially threaded tubes) or they may explode upon thawing or use CryoFlex, see below!

Plastic vials (even Nunc vials with silicon O-rings) used for storing cells in liquid nitrogen are designed to be used in the liquid nitrogen vapor phase. When immersed in the liquid phase, the liquid nitrogen frequently enters vials around the cold O-ring. When vials are removed to room temperature, the liquid nitrogen in the vial immediately begins to boil. Usually it escapes harmlessly past the seal. **Occasionally (about 1 out of 1000 vials), the seal is too tight, and the pressure causes a violent rupturing of the vial**, sending shards of sharp plastic rocketing in unpredictable directions with sufficient energy to lacerate the face and cause severe eye injury. When removing vials from liquid nitrogen, it is mandatory that you wear full face shields, pulled in to touch your chin so that shards can't fly under the shield. If they fit, wear goggles underneath the face shield.

Ideally all samples stored in liquid nitrogen should either be in the vapour phase or, if in the liquid phase, sealed in CryoFlex™ or similar (a plastic tubing that is sealed around the tube like a sausage skin). This applies even if tubes sold specifically for storage in liquid nitrogen are used. However, many samples currently in storage in DBB may already be in the liquid phase without Cryoflex and so when these samples are removed and warmed there is a possibility the tube may explode.

Biophysics have EPR Sample tubes stored in the liquid phase.

DO NOT seal the tubes!

No seal i.e. plastic caps or parafilm, will keep liquid air out.

The sealed tube might explode when brought out of the liquid N<sub>2</sub>.

Wherever possible any samples being returned to, or new samples going in to, storage in liquid nitrogen should:

either go in the vapor phase

or when it is deemed necessary to store the material in the liquid phase, we advise

the use of CryoTubes™ with an internal thread, and the correct application of CryoFlex™(NUNC CryoFlex Tubing Cat. No. 343958) to all tubes.  
(Fisher Scientific: Art nr. 1137-1625, KRYOTILLBEHÖR KRYOFLEX FP=300)  
It is a fact that no mechanical closure can be guaranteed in the liquid phase of nitrogen. This is why CryoFlex™ was introduced.

3. Pay attention to the oxygen level alarm when refilling liquid nitrogen containers at floor two.
4. Open the doors to the parking lot when refilling large liquid nitrogen containers to avoid suffocation.
5. Make sure that someone else present in the Department knows that you refilling a large liquid nitrogen container.

## **Working alone**

1. Do not work alone with carbon monoxide (CO) sources or when handling large amounts of hydrofluoric acid (HF).
2. You must be trained in the use of the following before working: trifluoroacetic acid (TFA), dicarbimide, cyanogen bromide (CNBr), cyanides.
3. Do not go into the  $-20^{\circ}\text{C}$  and  $-30^{\circ}\text{C}$  rooms without informing someone. Never close yourself into these rooms.

## **RADIOISOTOPE PRACTICE**

**This section contains the following:**

1. **General and legal guidelines for radioisotope work**
2. **Code of practice for isotope work**
3. **Waste disposal guide**
4. **Nuclide classification table**
5. **Example of a log sheet**
6. **Example of waste labels**

Safe use of radioisotopes is largely a matter of common sense and good laboratory practice.

The rules for waste disposal are open to a limited degree of interpretation as, for instance, to whether something should be left to decay before disposal. It is up to you to implement these rules intelligently.

It is your responsibility to make sure that you are aware of all regulations and guidelines before working with radioisotopes.

The major stipulation of these rules is that radioisotope work is to be contained within designated, and clearly marked, areas.

## General and legal guidelines for working with radioactive isotopes

1. Radioactive work is divided into four categories of toxicity based on the nuclide involved (A-D), and three categories depending upon the physical risks associated with the experiment (categories I-III). A full list of nuclides is appended. The common isotopes that we use fall into the following categories:

**B** –  $^{125}\text{I}$

**C** –  $^{35}\text{S}$ ,  $^{14}\text{C}$ ,  $^{32}\text{P}$ ,  $^{33}\text{P}$

**D** –  $^3\text{H}$

The physical categories can be briefly summarized as follows:

**I** Work with dusts, gases or very high levels of specific activity

**II** Work with liquids (solutions, analyses, animal experiments)

**III** Simple liquid operations (e.g., withdrawal of an aliquot from a stock solution) and closed systems.

As a general rule, no isotopes in category A are used (or allowed) in the department and no work in category I takes place; if either are being considered then advice (and **permission**) **must** be sought.

1. The following amounts of radioactivity (**in mCi**) may be handled at any one time:

	A	B	C	D
I	0.00135	0.0135	0.135	0.135
II	0.0135	0.135	1.35	1.35
III	0.135	1.35	13.5	13.5

For example, it is permissible to store 13.5 mCi of a category C isotope in a single tube, since storage and simple withdrawal are class III manipulations. The maximum amount that can be withdrawn and used in a given class II experiment is then 1.35 mCi.

2. As much work as possible (in principle all) should take place in the isotope labs. However, limitations of space makes this impractical, not least because of the central role of isotopes in biochemical research. Therefore, work in categories II and III and with nuclide types C and D (shaded above) may take place in “normal” labs, but the following rules must be obeyed:

- i. The amount concerned must be small (in the  $\mu\text{Ci}$  range).
- ii. All withdrawals from stock solutions must take place in the isotope labs.
- iii. Work with radioisotopes in the “normal” lab must be contained in an area which may not be used for other purposes at the same time, and which must be clearly **marked** (“radioactivity warning symbol” tape or signs).
- iv. All the other rules regarding isotope usage must also be adhered to.

## Code of practice for isotope work

1. Before you are allowed to work with radioactivity you have to attend a course and pass a test.  
**Radiation safety (in english)**  
**Information:**  
Compulsory course for all employees who work with open/sealed sources or X-ray.  
Obligatorisk kurs för samtliga anställda som jobbar med öppna/slutna strålkällor eller röntgen. (400 SEK/person)  
[https://secure.port.se/alphaquest/app\\_su/utbildning.cfm?id=31](https://secure.port.se/alphaquest/app_su/utbildning.cfm?id=31)
2. The department has one lab designed and designated for use with radioactive isotopes on the fifth floor, A550.
3. Accidents and other incidents concerning isotope work must be reported to **Margareta Sahlin** [margareta.sahlin@dbb.su.se](mailto:margareta.sahlin@dbb.su.se) as soon as possible.
4. Personal dosimeters must be worn at all times, when you are using high-energy sources.
5. Physical shielding (lead metal or, where appropriate, Plexiglass) must be used with all high-energy beta sources and with all gamma/X-ray sources. This includes adequate (sideways and upwards) shielding when transporting material.
6. Working areas must be monitored (Geiger counter, a new in A550) during and at the end of experiments. If no appropriate monitor is available (e.g. for  $^3\text{H}$  work), the area should be wiped with swabs (Swipe test\*) and these checked in a scintillation counter. Contamination must be dealt with immediately.  
\* [http://www.perkinelmer.com/CMSResources/Images/44-73011APP\\_ABASwipeAssays.pdf](http://www.perkinelmer.com/CMSResources/Images/44-73011APP_ABASwipeAssays.pdf)
  - Use paper filter
  - Wetting agent: water/alcohol (50/50)
  - Area: 10 cm x 10 cm
  - 10 ml scintillation liquid + 2 ml water
7. Good laboratory practice, including the use of automatic pipettes, lab coats, gloves, safety glasses and masks where appropriate, should be followed at all times. Gloves, safety glasses and decontamination equipment must be available in the isotope labs at all times. Hands must be washed and your person and clothing monitored for contamination at the end of a session. Gloves must be discarded in the isotope labs.
8. Never work directly on the bench, (preferably on a tray) but use a protective layer of plastic-coated absorbent paper. This should be disposed of as radioactive waste, and changed regularly or whenever necessary.

9. Work as much as possible in a fume hood. Always work in a fume hood when using large amounts of radioactive material of any type or where a significant risk of dust or aerosol formation exists. All work with category B isotopes (such as  $^{125}\text{I}$ ) must be carried out in the isotope lab fume hoods.
10. All materials must be labelled with name, group, nuclide, chemical, activity, date and a “radioactivity warning symbol”. All stock solutions must be stored in the isotope labs.
11. **Logs** must be **kept** of **all** radioactive materials used. This should include recording of withdrawal from stock and log sheets (see example attached) and should be kept in the same isotope lab as the stock, in the folder provided.
12. Dry radioactive waste is to be divided into burnable and non-burnable waste, and separated by isotope type. Radioactive waste must be correctly labelled (see examples) and be kept separately from other waste in appropriately shielded containers. Scintillation waste is to be kept separate from other radioactive waste.
13. Spillages and contamination must be contained and dealt with immediately, using appropriate decontamination solutions – for instance a strong phosphate solution for decontaminating  $^{32}\text{P}$ . All potentially contaminated surfaces, including the floor, must be checked. Contaminated equipment (such as pipettes) must be decontaminated immediately and thoroughly, and not left to decay. Contaminated glassware is to be soaked overnight in decon solution, rinsed and checked before return to normal circulation.
14. The cleaners do not clean the isotope labs – **you do!**

## Radioactive waste disposal

<http://www.su.se/sustainablecampus/how-to-do/waste-management/laboratory-waste/radioactive-waste-1.224909> (English)

<http://www.su.se/miljo/så-gör-du/avfallshantering/labavfall/radioaktivt-1.128683> (Swedish)

### Consult the SU Waste Management Manual

**Radioactive waste** see page 49-52

[http://www.su.se/polopoly\\_fs/1.236995.1432286876!/menu/standard/file/waste%20procedures\\_141217.pdf](http://www.su.se/polopoly_fs/1.236995.1432286876!/menu/standard/file/waste%20procedures_141217.pdf)

**Radioaktivt avfall** se s. 50-53

[http://www.su.se/polopoly\\_fs/1.221280.1422276905!/menu/standard/file/RUTIN\\_avfall\\_rev141217.pdf](http://www.su.se/polopoly_fs/1.221280.1422276905!/menu/standard/file/RUTIN_avfall_rev141217.pdf)

## Handling/storage

Radioactive substances must be stored under lock and key so that they are not accessible to unauthorized persons. The storage must be satisfactory in terms of fire



protection. The storage site must be screened off so that the dosage rate does not exceed 20  $\mu\text{Sv/h}$  in areas where people circulate or no more than 2  $\mu\text{Sv/h}$  in areas used by someone on a permanent basis. Stock solution **shall** be stored in ignition safe fridge/freezers in the isotope lab(s).

### **Liquid radioactive waste and scintillation liquids**

For example, organic and environmentally hazardous/harmful solvents such as liquid scintillation solutions must not be poured out in the slop sink for liquid radioactive waste but must instead be packed in plastic or glass bottles placed in a waste container together with a sufficient quantity of absorbent to prevent leaks.

The total activity of the waste washed out in drains from a laboratory during a calendar month must not exceed ten times the activity stated in SSMFS 2010:2.

The waste washed out at one and the same time must not exceed the activity stated in SSM FS 2010:2.

The same summation rule as for waste for combustion applies to releases to drains. Each discharge must be washed down with plenty of water. At every discharge point there must be a clearly visible sign saying that liquid radioactive waste may be washed down the drain.

NOTE: Solvents containing NPE (nonyl phenol ethoxylate), such as scintillation liquids like Optiphase 'Hisafe' 2 are listed in Council Directive 2003/53/EC and must not be discharged into any water system in the European Community and must always be sent for final disposal by combustion.

Flammable scintillation solutions must always be packed in small plastic and glass bottles with an aggregate volume of no more than 1 litre per waste container.

Absorbent must be added to the vessel; the quantity must correspond to a capacity to absorb at least double the quantity (2 litres) of liquid.

For non-flammable liquid scintillation solutions, no more than 5 litres may be packed in a waste container with a sufficient quantity of absorbent.

### **Radioactive substances in the form of sealed radiation sources**

Under the regulations (SSM FS 2010:2) sealed radiation sources with an activity quantity of no more than 50 kBq may be sent for waste combustion. If there is the slightest uncertainty about the activity of the sealed radiation source to be disposed of, contact the University's radiation protection expert Mats Jonsson (08-790 9123, [matsj@kth.se](mailto:matsj@kth.se)) or Mats Hansson at the Section for Safety [*Sektionen för Säkerhet*] (08-16 2251, [mats.hansson@su.se](mailto:mats.hansson@su.se)).

### **Hand-over/transport**

Radioactive waste in accordance with these restrictions can be deposited on Thursdays at 10.30–11.00 in the Radioactivity waste room (floor 2/A205) opposite the SU Shop. The waste contractor then transports the waste for destruction.

Radioactive waste that does not meet the restrictions according to these instructions and SSMFS 2010:2 must be taken charge of by Studsvik Nuclear AB. In such cases the University's radiation protection expert, Mats Jonsson (08-790 9123, [matsj@kth.se](mailto:matsj@kth.se)) and/or SEKA Miljöteknik radiation protection expert, Patrik

Karlsson, (070-795 00 27, [patrik.karlsson@sekamiljoteknik.se](mailto:patrik.karlsson@sekamiljoteknik.se)) must always be contacted since other requirements under the ARD-S transport regulations and requirements concerning reporting to the permit authority must also be complied with.

**Strålsäkerhetsmyndighetens föreskrifter om hantering av radioaktivt avfall och utsläpp från verksamhet med öppna strålkällor SSMFS 2010:2 (Aktivitetsgränser för utsläpp i avlopp och avfall till förbränning)**

<http://www.stralsakerhetsmyndigheten.se/Global/Publikationer/Forfattning/SSMFS/2010/SSMFS-2010-2.pdf> (not found in English)

### Dry waste

1. Waste is to be sorted into burnable and non-burnable waste and ideally also by isotope category (as above). Remember, however, that although  $^{32}\text{P}$  and  $^{14}\text{C}$  (for instance) are in the same regulatory category it may be more practical to separate them.
2. Waste must be properly labelled. Each container should have a single radioactive waste label that indicates name, institution, phone number and signature, and a single hazardous waste label, also correctly filled in. All waste is disposed of via the **stores on floor 2**. Access to the radioactive waste storage area can only be obtained during working hours and all deliveries must be recorded to store personnel. Sealable bins for this purpose can be obtained from the stores; waste may also be stored in cardboard hazardous waste boxes. Both must be lined with a plastic bag.
3. Medium-activity waste is defined as that which contains more than 10 mCi of  $^3\text{H}$  or  $^{14}\text{C}$ , or which contains more than 1 mCi of an isotope with  $t_{1/2} < 2$  years, or which contains more than 0.1 mCi of an isotope with  $t_{1/2} > 2$  years (not counting  $^3\text{H}$  or  $^{14}\text{C}$ ), and must be labelled as such.

### Scintillation waste

Waste scintillation fluid is to be disposed of as described below. Scintillant waste is stored on **floor 2** – the same rules apply as for dry radioactive waste. Consider separating this waste into different categories for ease of disposal. Remember that a Bq/ml (the legal definition) is 600 dpm for a vial with 10 ml of scintillant.

1. Aqueous scintillant with a radioactive content of  $< 1$  Bq/ml of any isotope or  $< 10$  Bq/ml of  $^3\text{H}$  or  $^{14}\text{C}$  may be disposed of down the drains.
2. Aqueous scintillant with a radioactive content of  $> 1$  Bq/ml of any isotope or  $> 10$  Bq/ml of  $^3\text{H}$  or  $^{14}\text{C}$  is to be disposed of as **radioactive** waste.
3. Organic scintillant with radioactive content of  $< 1$  Bq/ml of any isotope or  $< 10$  Bq/ml of  $^3\text{H}$  or  $^{14}\text{C}$  is to be disposed of as **scintillant** waste.
4. Organic scintillant with radioactive content of  $> 1$  Bq/ml of any isotope or  $> 10$  Bq/ml of  $^3\text{H}$  or  $^{14}\text{C}$  is to be disposed of as **radioactive** waste.
5. Scintillation waste must be kept separately from dry waste. Glass and plastic vials should not be mixed.

## Liquid waste

In principle all liquid waste can be disposed of down the drains, accompanied by a large volume of water, unless it should be treated as chemical waste (or environmentally dangerous waste), in which case it should be disposed of through the stores, as for solid waste. A maximum of 20  $\mu\text{Ci}$  per occasion/10 mCi per day may be disposed in this manner.

Storage of short-half-life isotopes (e.g.  $^{32}\text{P}$ ) for local decay before disposal is permitted. It is possible to store these in lead chambers in the Radioactivity waste room (floor 2/A205) – talk to the store person for details.

Contact the departmental radiation safety officer (currently **Margareta Sahlin**, [margareta.sahlin@dbb.su.se](mailto:margareta.sahlin@dbb.su.se)) for more details on any of these matters.

**Department of Biochemistry and Biophysics  
Stockholm University**

**ISOTOPE LOG**

Compound:	Nuclide:
Arrived (date):	Batch activity date:
Isotope category:	Half-life:
Storage location:	Supplier:
Group/person:	Specific activity:
Radioactive amount:	
Initial amount:	

Date	Person	Volume removed	Volume remaining

An analogous log can also be kept within the (SU on-line) **KLARA chemical register system** - ask your research-group representative – but the paper version should be present as indicated above. How to use KLARA see info under the heading **LEGISLATION AND LINKS**.

## TOXIC CHEMICALS

Toxic chemicals (e.g. potassium cyanide) should be stored in a locked cupboard.

Wear gloves when you handle toxic chemicals. Note that ordinary rubber gloves protect against polar substances, e.g. water solutions of salts, but they do not protect against apolar substances that can penetrate rubber. Special, solvent-resistant gloves can be obtained at SU-butiken (shop at floor 2)

Take a look at:

[http://www.shieldscientific.com/include/USER\\_FileUpload/files/Articles/readingtherunes-2007-uk.pdf](http://www.shieldscientific.com/include/USER_FileUpload/files/Articles/readingtherunes-2007-uk.pdf)

[http://www.nordicbiolabs.se/MediaBinaryLoader.axd?MediaArchive\\_FileID=f04234a5-34f8-44cf-b2a0-b19330f14ba6&FileName=Kunskapsartikel+Eng%C3%A5ngshandskar+och+EUDirektiv.pdf](http://www.nordicbiolabs.se/MediaBinaryLoader.axd?MediaArchive_FileID=f04234a5-34f8-44cf-b2a0-b19330f14ba6&FileName=Kunskapsartikel+Eng%C3%A5ngshandskar+och+EUDirektiv.pdf)

Toxic chemicals should be handled in a fume hood. This is important not only for volatile substances, but also for chemical powders that produce fine dust particles – use respiratory protection!

Do not expose other people to toxic chemicals! If you spill something, clean up after yourself immediately!

Note that acrylamide and bisacrylamide are very toxic and may cause allergy. Avoid handling acrylamide as a powder; aqueous stock solutions or preweighed aliquots are available from many manufacturers. Acrylamide waste should be polymerized.

Note that ethidium bromide is a powerful mutagen. Agarose gels and buffers containing ethidium bromide should be handled as hazardous chemical waste (see below).

A list of carcinogenic chemicals is found on the following links. Chemicals in group A must not be handled. For group B special permission is required. Note that dimethyl sulphate (used in Maxam-Gilbert sequencing of DNA) is included in group B.

Take a look at:

### **Chemical Hazards in the Working Environment** AFS 2014:43

<https://www.av.se/en/work-environment-work-and-inspections/publications/foreskrifter/kemiska-arbetsmiljorisker-afs-201443-provisions/>

p. 28-30 Group A and B

Group A – Carcinogenic substances which may not be handled.

Group B – Carcinogenic substances, sensitizing substances and substances toxic to reproduction which may only be handled following permission from the Swedish Work Environment Authority.

## **Provisions on sanction charges entered into force on 1 July 2014**

A-substance without permission 400 000 SEK

B-substance without permission 150 000 SEK

## **CMR chemicals (carcinogenic, mutagenic and reproductive toxic)**

In AFS 2014:43 § 38-44 it is stated that the handling of CMR chemicals is subject to special rules and require specific routines. For example, before work starts it is a requirement to carry out a documented investigation whether it is possible to replace a CMR substance to a less hazardous substance. Responsible for safe handling of hazardous chemicals is the employer (prefect, principal investigator, manager) and in case of exposure at levels that may pose a risk to health, the employer must establish a register of the persons who have been exposed and the estimated exposure levels. This record shall be kept for 40 years. Therefore, it is important to make accurate risk assessments and to develop procedures so that the handling of CMR substances is performed in such a way that exposure does not occur.

CMR classified chemical product are those marked with hazard statements and/or risk phrases

H350: May cause cancer

H340: May cause genetic defects

H360: May damage fertility or the unborn child

R45: May cause cancer

R46: May cause inheritable genetic damage

R49: May cause cancer by inhalation

R60: May impair fertility

R61: May cause harm to the unborn child

Take a look at: (recommended!)

### **CMR classified chemicals**

<https://internwebben.ki.se/en/cmr-classified-chemicals>

**Enligt svensk lag skall all information finnas på svenska. Av denna anledning finns info också på svenska i detta viktiga avsnitt:**

### **Kemiska arbetsmiljörisker AFS 2014:43**

<https://www.av.se/globalassets/filer/publikationer/foreskrifter/kemiska-arbetsmiljorisker-foreskrifter-afs2014-43.pdf>

s. 30-32 Grupp A och B

Till grupp A hör cancerframkallande ämnen som över huvud taget inte får hanteras (med något mycket speciellt undantag, som cancerforskning, och då först efter tillstånd av Arbetsmiljöverket)

I grupp B finns cancerframkallande, sensibiliserande ämnen och reproduktionsstörande ämnen som får användas först efter tillstånd av Arbetsmiljöverket.

### **Vägledning till kemireglerna**

<https://www.av.se/globalassets/filer/publikationer/vagledning/vagledning-for-tillampning-av-foreskrifterna-om-kemiska-arbetsmiljorisker-afs201109.pdf>

## **Tillstånd och anmälan för kemiska ämnen**

<http://www.av.se/teman/kemitillstand/>

Arbetsmiljöverkets nya **sanktionsavgifter** trädde i kraft 1/7 2014

Innehav utan tillstånd:

A-kemikalie: ca 400 000 sek; B-kemikalie: ca 150 000 sek

### **Sanktionsavgifter s. 26-27**

<https://www.av.se/globalassets/filer/publikationer/foreskrifter/kemiska-arbetsmiljorisker-foreskrifter-afs2014-43.pdf>

## **CMR ämnen (cancerogena, mutagena och reproduktionsstörande)**

I Arbetsmiljöverkets AFS 2014:43 § 38-44 framgår att det ställs särskilda krav vid hantering av CMR-klassade kemiska produkter. Till exempel så skall det göras en utredning ifall det går att byta ut ett CMR-ämne mot ett mindre farligt ämne innan arbete påbörjas och om personer blivit exponerade för ett CMR-ämne som kan innebära risk för ohälsa så skall arbetsgivaren (prefekten, gruppledaren) upprätta ett register över de personer som blivit exponerade samt uppskattad exponeringsnivå. Detta register skall sparas i 40 år. Därför är det viktigt att göra noggranna riskbedömningar samt att ta fram rutiner så att hantering av CMR-ämnena utförs på ett sådant sätt att exponering inte sker.

CMR-klassade kemiska produkter är produkter angivna med följande faroangivelser och/eller riskfraser:

H350: Kan orsaka cancer

H340: Kan orsaka genetiska defekter

H360: Kan skada fertiliteten eller det ofödda barnet

R45: Kan ge cancer

R46: Kan ge ärftliga genetiska skador

R49: Kan ge cancer vid inandning

R60: Kan ge nedsatt fortplantningsförmåga

R61: Kan ge fosterskador

Se: (rekommenderas!)

### **CMR klassificerade kemikalier**

<https://internwebben.ki.se/sv/cmr-klassificerade-kemikalier>

### **Occupational Exposure Limit Values:**

<https://www.av.se/globalassets/filer/publikationer/foreskrifter/engelska/occupational-exposure-limit-values-provisions-afs2011-18.pdf>

### **Hygieniska gränsvärden:**

[http://www.av.se/dokument/afs/afs2011\\_18.pdf](http://www.av.se/dokument/afs/afs2011_18.pdf)

Waste containing toxic chemicals (e.g., heavy metals, phenol, acrylamide, ethidium bromide) must be delivered to the **Chemical waste room** (floor 2/KÖL M212) as hazardous chemical waste (**Farligt avfall**).

For details see the Waste section:

[http://www.su.se/polopoly\\_fs/1.236995.1432286876!/menu/standard/file/waste%20procedures\\_\\_141217.pdf](http://www.su.se/polopoly_fs/1.236995.1432286876!/menu/standard/file/waste%20procedures__141217.pdf) , p. 42-44

Chemicals

<http://www.su.se/sustainablecampus/how-to-do/waste-management/laboratory-waste/chemicals-1.224903>

[http://www.su.se/polopoly\\_fs/1.221280.1422276905!/menu/standard/file/RUTIN\\_avfall\\_rev141217.pdf](http://www.su.se/polopoly_fs/1.221280.1422276905!/menu/standard/file/RUTIN_avfall_rev141217.pdf) s. 43-45

Kemikalier

<http://www.su.se/miljo/så-gör-du/avfallshantering/labavfall/kemikalier-1.128679>

## ORGANIC SOLVENTS

### Storage:

Amounts on the lab benches (e.g. for daily consumption) should be kept as low as possible. 50 l solvents per “fire cell” (brandcell) are allowed to be stored in the specially designated, ventilated cupboards. Storage cupboards must be kept closed. Large amounts of solvents should be stored in a ventilated storage room or a safety storage cabinet.

It's **not allowed** at all to store **flammable liquids, ethers** and other **peroxide-forming** chemicals in the **refrigerator/freezer** except if it has been designed and manufactured to eliminate ignition sources!!! Every year or two there is a new story of a university lab destroyed as a result of a refrigerator fire.

**Diethyl ether** is **extremely flammable** and is often one of the most dangerous fire hazards often found in the laboratory. This is due to its high volatility and extremely low flash point. Electrical arcs from equipment motors and switches or from static electricity discharges may ignite ether vapors. Most flammable liquids have vapors that are heavier than air and may travel surprisingly long distances to an ignition source and flash back.

**Ethers, tetrahydrofuran, dioxane, and several other flammable solvents have the additional hazard of forming unstable peroxides over time**, especially with exposure to air. When sufficiently concentrated (e.g. around a container cap or through distillation) detonation can occur. Because of their tendency to form peroxides on contact with air, date containers upon receipt and at the time they are opened. Many organizations require peroxide formers to be either disposed of, or tested, within three to six months after opening. If unopened, they should always be disposed of by the expiration date on the container.

Take a look at: (recommended!)

<https://internwebben.ki.se/en/peroxide-forming-chemicals>

<https://internwebben.ki.se/en/node/12440>

<https://internwebben.ki.se/sv/peroxidbildande-kemikalier>

<https://internwebben.ki.se/sv/node/12220>



## Waste:

The following solvents can be flushed down in the fume hood at a rate of 1 liter per lab and day. Rinse carefully with (plentiful) water afterwards!

Acetone  
Acetonitrile  
Acetic acid  
Ammonia  
Formaldehyde  
Glycerol

More information of other liquids that can be flushed down the drain can be found in:

### **Procedures for the disposal of liquid chemical residues and aqueous solutions**

[http://www.su.se/polopoly\\_fs/1.236898.1432209877!/menu/standard/file/procedures\\_disposal\\_of\\_liquid\\_150323.pdf](http://www.su.se/polopoly_fs/1.236898.1432209877!/menu/standard/file/procedures_disposal_of_liquid_150323.pdf)

### **Rutiner för hantering av flytande kemikalierester och vattenlösningar**

[http://www.su.se/polopoly\\_fs/1.231135.1427898149!/menu/standard/file/rutiner\\_kemikalievlopp\\_rev420150326.pdf](http://www.su.se/polopoly_fs/1.231135.1427898149!/menu/standard/file/rutiner_kemikalievlopp_rev420150326.pdf)

You are not allowed to throw away ether or petroleum ether or other peroxide-forming chemicals in the sink because of the explosive risk and all ether waste is to be tested for peroxides before delivery to the Chemical waste room (floor 2/KÖL M212).

Take a look at: (recommended!)

<https://internwebben.ki.se/en/peroxide-forming-chemicals>  
<https://internwebben.ki.se/en/node/12440>

<https://internwebben.ki.se/sv/peroxidbildande-kemikalier>  
<https://internwebben.ki.se/sv/node/12220>

Phenol and chloroform waste should be delivered to the Chemical waste room (floor 2/KÖL M212).

All other solvents not allowed to pour out in the drain should be delivered to the waste storage room in glass bottles or waste bins labelled with an appropriate, explanatory label. (Always tell the personnel when you leave any waste so that nothing will be left in the corridor).

All flammable solvents should be handled in the fume hood.

Most solvents penetrate ordinary rubber gloves so use special protective gloves that can be bought from SU-butiken (shop at floor 2)

Take a look at:

[http://www.shieldscientific.com/include/USER\\_FileUpload/files/Articles/readingtherunes-2007-uk.pdf](http://www.shieldscientific.com/include/USER_FileUpload/files/Articles/readingtherunes-2007-uk.pdf)

[http://www.nordicbiolabs.se/MediaBinaryLoader.axd?MediaArchive\\_FileID=f04234a5-34f8-44cf-b2a0-b19330f14ba6&FileName=Kunskapsartikel+Eng%C3%A5ngshandskar+och+EUdirektiv.pdf](http://www.nordicbiolabs.se/MediaBinaryLoader.axd?MediaArchive_FileID=f04234a5-34f8-44cf-b2a0-b19330f14ba6&FileName=Kunskapsartikel+Eng%C3%A5ngshandskar+och+EUdirektiv.pdf)

For more detailed information about waste ask **Margareta Sahlin**, [margareta.sahlin@dbb.su.se](mailto:margareta.sahlin@dbb.su.se) (the departmental safety officer) or **Britt-Marie Olsson**, [bmo@dbb.su.se](mailto:bmo@dbb.su.se)

## **WORKING WITH ANIMALS**

**FYI 2015 no one at DBB works with animals.**

### **License:**

You are not allowed to conduct animal experiments without permission from the Ethical Committee for Experimentation with Animals (djuretiska nämnden). Such a license is applied for by the project leader and signed by an approved director for the animal house (presently Tore Bengtsson at the Department of Molecular Biosciences, The Wenner-Gren Institute (MBW))  
This license must be renewed every 3 years.

### **Ordering:**

Order forms are available in the animal house. Fill in the form and give it to the staff there.

All animals used in the animal house should be ordered in this manner.

Animals used in experimental research should be ordered from an approved breeder.

### **Labelling cages:**

The cages should be marked with

- a) The number of your approved license
- b) Your name
- c) The name of your department

### **In the animal house:**

Use protective clothing: lab coat, shoe covers and hair protection. This will prevent allergenic substances (hair, etc.) from leaving the animal house.

Furry animals should not to be taken to laboratories.

Keep dead animals in the freezer.

Keep radioactive dead animals in a special compartment in the freezer. Note on the freezer: isotope, amount, date and name.

Always clear up benches and cupboards after yourself, and contact the animal house staff if you have any questions.

### **Accidents:**

If you work with animals, you should be vaccinated against tetanus (stelkramp).

One vaccination gives you protection for about 10 years. If an animal bites you and you do not know if your protection against tetanus is satisfactory, contact the nearest health care center (Vårdcentral).

## **WASTE DISPOSAL GUIDE / AVFALLSHANTERING**

### **Consult the SU Waste Management Manual:**

[http://www.su.se/polopoly\\_fs/1.236995.1432286876!/menu/standard/file/waste%20procedures\\_141217.pdf](http://www.su.se/polopoly_fs/1.236995.1432286876!/menu/standard/file/waste%20procedures_141217.pdf)

You can also find info here at Sustainable Campus:

<http://www.su.se/sustainablecampus/how-to-do/waste-management/laboratory-waste>

### **Avfallsrutiner för SU:**

[http://www.su.se/polopoly\\_fs/1.221280.1422276905!/menu/standard/file/RUTIN\\_avfall\\_rev141217.pdf](http://www.su.se/polopoly_fs/1.221280.1422276905!/menu/standard/file/RUTIN_avfall_rev141217.pdf)

info hittar du också på Miljöwebben:

<http://www.su.se/miljo/sa-gor-du/avfallshantering/labavfall>

Hazardous waste should to be collected into the special cardboard boxes lined with a heavy plastic bag or into sealable plastic containers, obtainable from SU-butiken (shop at floor 2). The container must be marked with the appropriate label, correctly filled in adhesive labels, found in the Chemical waste room (floor2/KÖL M212) In addition, radioactive waste must have an extra “radioactive waste” label. Delivery of waste to the stores can only be done during working hours.

**Chemical waste room (floor 2/KÖL M212):** Wednesdays/Fridays 10.30-11.00

**Room for radioactive waste (floor 2/A205):** Wednesdays 09.45-10.15

Contact:

SEKA Miljöteknik AB:

Daniel Sellberg, [daniel.sellberg@sekamiljoteknik.se](mailto:daniel.sellberg@sekamiljoteknik.se) , 070-795 00 26

Patrik Karlsson, [patrik.karlsson@sekamiljoteknik.se](mailto:patrik.karlsson@sekamiljoteknik.se) , 070-795 00 27

## **Types of waste at Stockholm University**

### Household waste

Household waste  
Compostable  
Food waste

### Industrial waste

Glass containers  
Laboratory glass  
Laboratory plastic  
Metals  
Furniture  
Plastic  
Paper for recycling  
Separable waste  
Stretch-wrap and shrink-wrap  
(pallet packaging)  
Wood  
Toner cassettes  
Corrugated cardboard and  
paper containers/packaging

### Hazardous waste:

Animal products  
Antibiotics  
Batteries  
Biological agents  
Electrical and electronic waste  
(Electric waste)  
GMMs  
GMOs  
Human by-products  
Chemicals  
Refrigerators and freezers  
Light sources  
Narcotics/narcotic chemicals  
Radioactive waste  
Sharps

## **ANTIBIOTICS**

see Classification/separation, Handling/storage ,  
SU Waste Manual p.34

[http://www.su.se/polopoly\\_fs/1.236995.1432286876!/menu/standard/file/waste%20procedures\\_141217.pdf](http://www.su.se/polopoly_fs/1.236995.1432286876!/menu/standard/file/waste%20procedures_141217.pdf)

or

<http://www.su.se/sustainablecampus/how-to-do/waste-management/laboratory-waste/antibiotics-1.224813>

klassificering/sortering:

SU Avfallsrutiner s. 34

[http://www.su.se/polopoly\\_fs/1.221280.1422276905!/menu/standard/file/RUTIN\\_avfall\\_rev141217.pdf](http://www.su.se/polopoly_fs/1.221280.1422276905!/menu/standard/file/RUTIN_avfall_rev141217.pdf)

eller

<http://www.su.se/miljo/så-gör-du/avfallshantering/labavfall/antibiotika-1.128662>

## LABORATORY GLASS

see p. 45 SU Waste Manual

[http://www.su.se/polopoly\\_fs/1.236995.1432286876!/menu/standard/file/waste%20procedures\\_141217.pdf](http://www.su.se/polopoly_fs/1.236995.1432286876!/menu/standard/file/waste%20procedures_141217.pdf)

or

Laboratory glass

<http://www.su.se/sustainablecampus/how-to-do/waste-management/laboratory-waste/laboratory-glass-1.224905>

se s. 46-47 i SU Avfallshantering

[http://www.su.se/polopoly\\_fs/1.221280.1422276905!/menu/standard/file/RUTIN\\_avfall\\_rev141217.pdf](http://www.su.se/polopoly_fs/1.221280.1422276905!/menu/standard/file/RUTIN_avfall_rev141217.pdf)

eller

Laboratorieglass

<http://www.su.se/miljo/så-gör-du/avfallshantering/labavfall/laboratorieglass-1.128681>

Laboratory glass is divided into the following categories:

- Contaminated laboratory glass (whole or broken);
- Non-contaminated laboratory glass not used as containers (whole or broken);
- Non-contaminated laboratory glass used as containers (whole or broken).

### Handling/storage

Contaminated laboratory glass that may contain chemical residues, microorganisms, or radioactive substances should be handled based on of the type of contamination. This waste should be marked with waste labels and packaged in approved containers, i.e. the “container for hazardous waste”, article number 6344-038, or the “container for infectious waste/and or sharps”, article number 6342-050

Non-contaminated laboratory glass that has not been used as containers should be placed in the laboratory glass recycling container (the green barrels) at the department.

Non-contaminated laboratory glass **that has been used as containers** must be empty, well cleaned, and evaporated, and then placed in the recycling container for colored or clear glass at the **waste management centre** room B206 (for colored and non-colored glass, fluorescent tube-lights, low-energy bulbs, conventional light bulbs, halogen and led lights, unsorted small batteries and autoclaved biological agents that have been inactivated and classified as household waste) opposite SU-butiken (shop at floor 2)

Receptacles for non-contaminated laboratory glass (green barrels) must have a liner bag. The bag should be sealed and the lid closed prior to transportation. After use, the container should be washed if necessary.

### **Marking/labelling**

Receptacles for non-contaminated laboratory glass that has not been used as containers should be labelled "Laboratory glass". Contaminated laboratory glass should be labelled based on the type of contamination.

### **Delivery/transport**

Contaminated and non-contaminated laboratory glass that has not been used as containers can be delivered on Wednesdays and Fridays at 10:30-11:00 to room M212 at KÖL, Svante Arrhenius väg 16F. The contractor will then transport the waste for destruction or disposal in a landfill.

Non-contaminated laboratory glass that has been used as containers will be collected by the waste contractor at the waste management centre and transported to the recycling centre underneath Aula Magna.

In addition to the dry waste containers above, SU-butiken (shop at floor 2) sell plastic jugs suitable for collecting waste liquids:

Jugs, UN-approved. Article no: 6305-10–6305-005 NB! Do not fill the jug to more than 80 per cent.

### **BATTERIES**

There is a collection point outside the workshop ("verkstaden") on the 5<sup>th</sup> floor. You can also leave unsorted small batteries at the **waste management centre**, room B206, opposite SU-butiken (shop at floor 2)

### **FLUORESCENT TUBE-LIGHTS, LOW-ENERGY BULBS, CONVENTIONAL LIGHT-BULBS, HALOGEN AND LED LIGHTS**

Are collected in containers at the **waste management centre**, room B206 opposite SU-butiken (shop at floor 2)

### **AUTOCLAVED BIOLOGICAL AGENTS**

that have been inactivated and classified as household waste are collected in the **waste management centre**, room B206 opposite SU-butiken (shop at floor 2)

### **HAZARDOUS WASTE / FARLIGT AVFALL**

**Some examples of suitable packaging that can be ordered from the SU Shop/ Service som SU-butiken tillhandahåller för avfallet**

#### **container for glass waste:**

Kartong för glasavfall med svart säck

6343-038

**container for hazardous waste:**

Kartong för avfall med svart säck 6344-038

**plastic jugs (UN-approved) suitable for collecting waste liquids:**

Dunk, PE, med lock 5l, för farligt avfall 6305-005

Dunk, PE, med lock 10l, för farligt avfall 6305-010

Dunk, PE, med lock 25l, för farligt avfall 6305-025

**Rigi-Box Eco-Safe (yellow bin) container for infectious waste/and or sharps:**

Plastemballage för farligt avfall (gul), 50 lit 6342-050

**Infectious and/or sharp. ADR-approved containers:**

Kanylburk, 0,5 liter 3900-001

Kanylburk, 2 liter 3900-002

The container must be marked with the appropriate label, correctly filled in adhesive labels, found in the Chemical waste room (floor2/KÖL M212) In addition, radioactive waste must have an extra "radioactive waste" label

**Speciella etiketter** "Farligt avfall/Hazardous waste" **MÅSTE** klistras på avfallsförpackningar ifyllda med innehåll, institution och namn. Rullar med etiketter finns i avfallsrummet, rum M212/KÖL.

Farligt avfall

Radioaktivt avfall

## GENERAL INFORMATION CONCERNING ACCIDENTS

### KLARA

Information (e.g. Safety Data Sheets) concerning all **chemicals** used in the Department is available in the KLARA register – ask your group representative or Britt-Marie Olsson (KLARA administrator DBB). How to use KLARA see info under the heading **LEGISLATION AND LINKS**.

All employees must to know where this information is kept.

### Chemical register

A register of chemical products in use and stored in the lab must be maintained according to Regulation (SFS 1998:901) concerning the practitioners' self-inspection. This should include information about the scope and use of the product and details of the product's health and environmental hazards.

Stockholm University uses the program KLARA to register all chemical products [https://secure.port.se/alphaquest/app\\_su/pcmain.cfm](https://secure.port.se/alphaquest/app_su/pcmain.cfm).

KLARA includes references to legislation concerning each chemical product. Each department should have one or more persons in charge to register the chemicals used in the department. These must undergo inventory training in KLARA. The register should be updated annually at a minimum; the inventory period is 2/1-28/2 each year. However, regular registration in connection with purchasing is recommended. Chemicals that are no longer used should be disposed of regularly.

### **Chemical Handling Procedure**

[http://www.su.se/polopoly\\_fs/1.208382.1428392414!/menu/standard/file/chemical%20handling%20procedure.pdf](http://www.su.se/polopoly_fs/1.208382.1428392414!/menu/standard/file/chemical%20handling%20procedure.pdf)

A general Classification List is also available at the Swedish Chemicals Inspectorate The Swedish Chemicals Agency's ("Kemikalieinspektionen") Classification and labelling regulations (KIFS 2005:7) but only in Swedish, see:

Kemikalieinspektionens föreskrifter om klassificering och märkning av kemiska produkter

[http://www.kemi.se/Documents/Forfattningar/KIFS/K05\\_7.pdf](http://www.kemi.se/Documents/Forfattningar/KIFS/K05_7.pdf)

### **Rutin för kemikaliehantering**

[http://www.su.se/polopoly\\_fs/1.165130.1391171437!/menu/standard/file/Rutin%20%20kemikaliehantering\\_140122.pdf](http://www.su.se/polopoly_fs/1.165130.1391171437!/menu/standard/file/Rutin%20%20kemikaliehantering_140122.pdf)

Se också Kemikalieinspektionens föreskrifter om klassificering och märkning av kemiska produkter:

[http://www.kemi.se/Documents/Forfattningar/KIFS/K05\\_7.pdf](http://www.kemi.se/Documents/Forfattningar/KIFS/K05_7.pdf)

### **SAMIR**

All employees must **report all accidents and narrow escapes** that occur in the Department **to the SU-system SAMIR**- Säkerhet - Arbetsmiljö - Miljö – Inrapportering (Safety-Work environment-Environment-Reporting).

You do not have to logon to report. ([www.su.se/Samir](http://www.su.se/Samir))

[https://secure.port.se/alphaquest/app\\_su/pcmain.cfm?verkid=%22%23Z%24%20%0A](https://secure.port.se/alphaquest/app_su/pcmain.cfm?verkid=%22%23Z%24%20%0A)

and to **Margareta Sahlin**, [margareta.sahlin@dbb.su.se](mailto:margareta.sahlin@dbb.su.se)

Broken equipment, etc., that only needs minor repairs are to be reported directly to **Håkan Thoren**, [hakan.thoren@dbb.su.se](mailto:hakan.thoren@dbb.su.se).

All employees must know where the emergency showers, eye showers and fire extinguishers are located and how these are used.

Proper **courses** are given on a regular basis by the security unit of SU:

<http://www.su.se/medarbetare/service/krishantering/sakerhet/sakerhetsutbildning/utbildningar-vid-sektionen-for-sakerhet-1.3630>

(e.g. Fire safety and practical firefighting exercise.)



## IMPORTANT TELEPHONE NUMBERS:

In emergency situations, call: **112**

For poison information (**not** emergency) call Swedish Poison Information Centre (“Giftinformationscentralen”): **08-331 231** (office hours, otherwise 112 as above), see also <http://www.giftinformation.se/>

**Danderyd Hospital** (in Mörby, closest hospital):

**08-123 550 00**

For information on what to do and where to turn **first contact 1177 Vårdguiden** (Health Care Guide) on telephone **1177** or visit their website [www.1177.se](http://www.1177.se).

**St Erik Eye Hospital** (the one for eye damage)

Always call St Erik Hospital’s Emergency Department first (ögonakuten): **08-672 31 00**

See also FIRST AID AND CRISIS PLAN, DBB (persons at DBB who have medical training) on the **wall in every lab**, also found under the heading **LEGISLATION AND LINKS** (last pages)

**If you work with Hydrogen fluoride, Bromine (Br<sub>2</sub>), Cyanide, Acrylamide and Phenol you have to write a risk assessment for your experiment and include how to handle any accidents. See below!**

## EYE DAMAGE

All chemicals should be regarded as potentially harmful. Always rinse with water if you get anything in your eye.

The eye must be open when rinsing with water!!  
Carefully remove contact lenses.

### **Acids and bases (not hydrogen fluoride) when eye damage**

Rinse eyes immediately with water for 15 minutes.

Call St. Erik Eye Hospital’s Emergency Department (ögonakuten): 08-672 31 00

### **Hydrogen fluoride, bromine (Br<sub>2</sub>), when eye damage**

Rinse eyes immediately with water for 15 minutes

Get immediate transport to a hospital (emergency: St Erik Eye Hospital is the one for eye damage). During transport, the eye should be continuously rinsed using a water bottle.

Always call St. Erik Eye Hospital’s Emergency Department (ögonakuten) first:  
08-672 31 00

### **Blinding light (for example, UV)**

Cover the eyes

Go to the hospital (emergency)

## **SKIN DAMAGE**

All chemicals should be regarded as potentially harmful. Always rinse with water if your skin has been exposed to any chemical or solvent.

### **Acids or bases (not hydrogen fluoride) when skin damage**

Rinse the skin with water and remove all contaminated clothing.

Contact 1177 Vårdguiden (Health Care Guide) on telephone 1177 for information on what to do and where to turn.

### **Hydrogen fluoride when skin damage**

Rinse the skin immediately with water and remove contaminated clothing.

Rub the contaminated skin area with 2% calcium gluconate gel and continue to rub until the pain diminishes or the doctor attends.

(if you work with HF make sure you have 2% calcium gluconate gel)

### **Bromine (Br<sub>2</sub>) when skin damage**

Rinse the skin immediately with water and remove contaminated clothing.

Wash the wounded area carefully with 5% sodium thiosulfide or soap and water.

(if you work with Bromine make sure you have 5% sodium thiosulfide)

Take victim immediately to hospital, call 112 for transport to a hospital.

### **Cyanide when skin damage**

If the affected person can breathe, administer oxygen, quickly moving to an area where fresh air is.

Quickly take off clothing that may have cyanide on it.

Any clothing that has to be pulled over the head should be cut off the body instead of pulled over the head. If you are helping other people remove their clothing, try to avoid touching any contaminated areas, and remove the clothing as quickly as possible. As quickly as possible, wash any cyanide from the skin with large amounts of soap and water.

If the affected individual cannot breathe, give artificial respiration, with a respiration mask to protect the helper.

Call 112 for transport to a hospital.

### **Acrylamide when skin damage**

Rinse the skin immediately with water and remove contaminated clothing.

Contact 1177 Vårdguiden (Health Care Guide) on telephone 1177 for information on what to do and where to turn.

### **Phenol when skin damage.**

Rapid and immediate skin decontamination is critical to minimize phenol absorption. Anyone assisting the victim should wear protective clothing and gloves.

Rinse the skin immediately with water and remove contaminated clothing.

Rub the contaminated skin area repeatedly with polyethylene glycol 400 or glycerol.

(if you work with Phenol make sure you have polyethylene glycol 400 or glycerol)

Contact 1177 Vårdguiden (Health Care Guide) on telephone 1177 for information on what to do and where to turn.

## **Burns**

Minor burns are rinsed with water until the pain decreases. Do not puncture blisters. Major burns are covered with sterile compresses and the victim is transported to the hospital. Risk for shock exists (see shock).

## **INHALATION OF TOXIC GASES AND CHEMICALS**

Note that some gases have a retarded effect!!! Always keep a person who has been exposed to any toxic substances under observation.

### **Hydrochloric acid (HCl), Sulphur dioxide (SO<sub>2</sub>), Hydrogen sulfide (H<sub>2</sub>S), Nitrogen dioxide (NO<sub>2</sub>), Chloride (Cl<sub>2</sub>) when inhaled.**

Give oxygen and artificial respiration when needed. Immediately move the person fresh air.

Keep the exposed person warm and quiet, even if he/she does not show any symptoms of injury at the time.

All persons that have or have had any symptoms of injury should be transported to a hospital.

Call 112 for transport to a hospital.

### **Hydrogen fluoride (HF) when inhaled.**

Make the exposed person blow his or her nose.

Keep the injured person warm and quiet even if he/she does not show any symptoms of injury at the time.

Call 112 for transport to a hospital.

### **Bromine (Br<sub>2</sub>) when inhaled.**

If breathed in, move person into fresh air. If not breathing, give artificial respiration.

Keep the exposed person warm and quiet even if he/she does not show any symptoms of injury at the time.

All persons that have or have had any symptoms of injury should be transported to a hospital.

Call 112 for transport to a hospital.

### **Carbon monoxide (CO) when inhaled**

Administer oxygen and artificial respiration when needed.

Access fresh air immediately and call 112 for transport to a hospital.

### **Cyanide when inhaled**

Quickly moving to an area where fresh air is available is highly effective in reducing exposure to cyanide gas.

Quickly take off clothing that may have cyanide on it.

Any clothing that has to be pulled over the head should be cut off the body instead of pulled over the head. If you are helping other people remove their clothing, try to avoid touching any contaminated areas, and remove the clothing as quickly as possible.

As quickly as possible, wash any cyanide from the skin with large amounts of soap and water.

If the affected individual cannot breathe, give artificial respiration, with a respiration mask to protect the helper.

Immediately call 112 for transport to a hospital.

### **Acrylamide when inhaled**

If respirable acrylamide is inhaled move the victim to fresh air immediately.

Have the victim blow his or her nose, or use a soft tissue to swab particles from the nostrils.

If the victim is not breathing, clean any chemical contamination from the victim's lips and perform CPR. If breathing is difficult give oxygen.

Keep the exposed person warm and quiet.

Call 112 for transport to hospital.

### **Phenol when inhaled**

Inhalation and dermal exposure to phenol is highly irritating to the skin, eyes, and mucous membranes in humans.

Remove to fresh air.

Keep the exposed person warm and quiet.

Get medical attention immediately, call 112 for transport to hospital.

## **INGESTED POISONS**

All chemicals should be regarded as potentially toxic and the poison center (**Giftinformationscentralen**) should always be contacted (**112**) if a chemical has been consumed. In non-emergency situations, call

**08-331 231** (during office hours) for information see also:

<http://www.giftinformation.se/>

### **Larmvägar vid akuta förgiftningar**

**Vid förgiftningstillbud – ring 112** och begär Giftinformationen – dygnet runt.

Sjukvården har tillgång till speciella telefonnummer.

I mindre brådskande fall och för övriga frågor om förgiftningar – ring dagtid: 08-33 12 31, Giftinformationscentralen <http://www.giftinformation.se/>

### **Cyanide when ingested**

Quickly moving to an area where fresh air is available is highly effective in reducing exposure to cyanide gas.

If the exposed person is **fully conscious**, induce vomiting.

Quickly take off clothing that may have cyanide on it.

Any clothing that has to be pulled over the head should be cut off the body instead of pulled over the head. If you are helping other people remove their clothing, try to avoid touching any contaminated areas, and remove the clothing as quickly as possible.

As quickly as possible, wash any cyanide from the skin with large amounts of soap and water.

If the affected individual cannot breathe, give artificial respiration, with a respiration mask to protect the helper.

Call 112 for transport to hospital.

### **Bases, acids and ammonia when ingested**

Do **not** induce vomiting!

Give milk or water (ca 500 ml) immediately to drink.

Transport the exposed person to a hospital immediately.

Call 112.

### **Salts of heavy metals when ingested**

(e.g., arsenic, barium, lead, mercury)

Induce vomiting.

Transport the exposed person to a hospital immediately, call 112.

### **Phenol when ingested**

Do **not** induce vomiting!

If the person is **fully conscious**, give water or milk to drink or a tablespoon of e.g. olive oil immediately.

Never give anything by mouth to an unconscious person.

Get medical attention immediately, call 112 for transport to a hospital.

### **Acrylamide when ingested**

If the person is fully conscious, rinse his/her mouth with water immediately and then give the person large quantities of water.

After the water has been swallowed, try to get the person to vomit.

Do not make an unconscious person to vomit.

Get medical attention immediately, call 112!

## **INJURIES CAUSED BY ELECTRICITY**

### **Electrical injury**

Disconnect the electricity immediately by turning off the main switch or by causing a short circuit.

Keep the injured person warm and quiet. Give artificial respiration if needed.

Transport the injured person to a hospital. Call 112.

## **SHOCK**

Shock can arise from several causes, e.g., from burns, poisoning or major bleeding. The condition is serious and implies that there has been a strong effect on the blood circulation.

### **Shock Symptoms**

Paleness, cold sweat on the forehead and in the palms, ache and indisposition.

### **Shock Treatment**

Place the person in shock with his/her feet high and in a warm room free from drafts. Keep the respiratory pathways free by placing the person in shock in a recovery position.

Keep the person in shock warm with blankets, etc.

**Never** give the person in shock anything to drink!!

Call the ambulance immediately, call 112. **Never** leave the person in shock alone.

## HOW TO INDUCE VOMITING

Vomiting must **never** be induced in an unconscious person or when acids, bases or petroleum products have been consumed.

Vomiting is induced by giving the individual a glass of milk or water and then putting two fingers in his/her throat as deep as possible and keeping them there until vomiting is induced. Do not stop even if the person starts to choke.

## AUTOMATED EXTERNAL DEFIBRILLATOR (AED)

With simple audio (in Swedish) and visual commands, AEDs are designed to be simple to use for the layman, and the use of AEDs is taught in first-aid, CPR and AED training.

Application to [jan.ekstrom@su.se](mailto:jan.ekstrom@su.se) , 08-16 35 45

### Here you will find Defibrillators (Hjärtstartare) Arrhenius Laboratory:

Corridor outside kitchen A445, floor 4  
Magnéli Hall  
House C entrée floor 3

### Map of where you will find Defibrillators at Campus Frescati :

[http://www.su.se/polopoly\\_fs/1.116727.1357127459!/menu/standard/file/Karta%20ampus%20Frescati.pdf](http://www.su.se/polopoly_fs/1.116727.1357127459!/menu/standard/file/Karta%20Campus%20Frescati.pdf)

När man tar ut hjärtstartaren ur skåpet går ett larm till väktaren samt medarbetare på Sektionen för Säkerhet. När ni påbörjat D-HLR larma 112 samt skicka ut en person som möter upp ambulans.

#### Vad är en hjärtstartare?

Hjärtstartaren har funnits inom sjukvården under lång tid. De senaste åren har det kommit små användarvänliga apparater för icke sjukvårdsutbildade personer. Hjärtstartaren ger talande instruktioner till dig, på svenska, som hjälpare för att utföra hjärt- lungräddning, HLR. Hjärtstartaren analyserar sedan patientens hjärtrytm och rekommenderar om elstöt ska ges eller ej. Hjärtstartaren är intelligent och det går inte att skjuta ström i någon som inte behöver det.

#### Vem kan använda hjärtstartaren?

Hjärtstartaren kan vem som helst använda, i väskan finns en tydlig instruktionsbok hur man ska göra samt maskinen "pratar" och ger instruktioner. Det finns inga krav idag på utbildning. Dock bör man kunna hjärt- och lungräddning samt utbilda sig på hjärtstartaren, det tar bara några timmar.

#### Utbildning

För den som önskar finns det en utbildning i hur man använder hjärtstartaren, utbildningen tar 4 timmar och kostar 375 kr/person. Anmälan görs till, [jan.ekstrom@su.se](mailto:jan.ekstrom@su.se) , 08-16 35 45.

## LEGISLATION AND LINKS

Much of our rules are determined by, or connected to legislation as stated in a number of "rule collections" from governmental departments and institutes. Below is listed a number of the most important ones, and their web links (and most often with both English and Swedish language variants).

### **Swedish Work Environment Authority ("Arbetsmiljöverket")**

<http://www.av.se/> and <http://www.av.se/inenglish/>

### **AFSar listade i nummerordning**

<http://www.av.se/lagochratt/afs/nummerordning.aspx>

### **Provisions and General Recommendations in English (some AFSes in English)**

<https://www.av.se/en/work-environment-work-and-inspections/publications/foreskrifter/>

### **Kemiska arbetsmiljörisker AFS 2014:43**

[https://www.av.se/globalassets/filer/publikationer/foreskrifter/andringsforeskrift/afs2014\\_43.pdf](https://www.av.se/globalassets/filer/publikationer/foreskrifter/andringsforeskrift/afs2014_43.pdf)

### **Vägledning till kemireglerna**

<https://www.av.se/globalassets/filer/publikationer/vagledning/vagledning-for-tillampning-av-foreskrifterna-om-kemiska-arbetsmiljorisker-afs201109.pdf>

### **Chemical Hazards in the Working Environment AFS 2011:19, AFS 2014:43**

<https://www.av.se/globalassets/filer/publikationer/foreskrifter/engelska/chemical-hazards-in-the-working-environment-provisions-afs2011-19.pdf>

### **Checklista Riskbedömning – för hantering av kemiskt ämne**

<https://www.av.se/globalassets/filer/checklistor/hantering-av-kemiskt-amne-riskbedomning-checklista-2011-03-15.pdf>

### **Risk assessment chemicals: Recommended!**

### **Risk assessment- examples, Intro KLARA risk assessment 2015**

<https://internwebben.ki.se/sv/riskbedomning-kemikalier>

<https://internwebben.ki.se/en/risk-assessment-chemicals>

### **Hygieniska gränsvärden AFS 2011:18**

[http://www.av.se/dokument/afs/afs2011\\_18.pdf](http://www.av.se/dokument/afs/afs2011_18.pdf)

### **Occupational Exposure Limit Values AFS 2011:18**

<https://www.av.se/globalassets/filer/publikationer/foreskrifter/engelska/occupational-exposure-limit-values-provisions-afs2011-18.pdf>

### **The SIN-list (Substitute It Now!)**

<http://www.chemsec.org/what-we-do/sin-list>

### **Swedish Chemicals Inspectorate (Kemikalieinspektionen)**

<https://www.kemi.se/en/>

( <http://www.kemi.se/> )

### **Kemikalieinspektionens föreskrifter om klassificering och märkning av kemiska produkter KIFS 2005:7 Classification and Labelling Regulations**

[http://www.kemi.se/global/lagar-och-regler/kifs/kifs-20057/k05\\_7.pdf](http://www.kemi.se/global/lagar-och-regler/kifs/kifs-20057/k05_7.pdf)

### **Klassificering och märkning enligt KIFS 2005:7- ett regelverk som successivt kommer att ersättas med CLP**

<http://www.kemi.se/global/faktablad/faktablad-om-klassificering-och-markning-enligt-kifs.pdf>

Från den 1 juni 2015 ska märkningen av kemiska produkter följa kraven i EU:s CLP-förordning; CLP = classification, labelling and packaging.

<http://echa.europa.eu/regulations/clp/understanding-clp>

### **Klassificering och märkning enligt CLP**

<http://www.kemi.se/global/faktablad/faktablad-clp.pdf>

**PRIO-databasen** Prioriteringsguiden verktyg att användas vid tänkt användning av nya kemikalier eller för hjälp vid substitution:

<http://www.kemi.se/prio-start>

### **PRIO a Tool for Risk Reduction of Chemicals**

<http://www.kemi.se/en/prio-start>

### **Rutin för kemikaliehantering, SU**

[http://www.su.se/polopoly\\_fs/1.165130.1391171437!/menu/standard/file/Rutin%20f%C3%B6r%20kemikaliehantering\\_140122.pdf](http://www.su.se/polopoly_fs/1.165130.1391171437!/menu/standard/file/Rutin%20f%C3%B6r%20kemikaliehantering_140122.pdf)

### **Chemical Handling Procedure, SU**

[http://www.su.se/polopoly\\_fs/1.208382.1428392414!/menu/standard/file/chemical%20handling%20procedure.pdf](http://www.su.se/polopoly_fs/1.208382.1428392414!/menu/standard/file/chemical%20handling%20procedure.pdf)

### **Medical Products Agency (Läkemedelsverket)**

<http://www.lakemedelsverket.se/>

### **Läkemedelsverkets författningssamling, föreskrifter om förteckning över**

**narkotika:** <https://lakemedelsverket.se/overgripande/Lagar--regler/Lakemedelsverkets-foreskrifter---LVFS/>



[http://www.lakemedelsverket.se/upload/lvfs/LVFS\\_2011-10.pdf](http://www.lakemedelsverket.se/upload/lvfs/LVFS_2011-10.pdf)

[http://www.lakemedelsverket.se/upload/lvfs/konsoliderade/LVFS\\_2011\\_10\\_konsoliderad\\_tom\\_2013\\_1.pdf](http://www.lakemedelsverket.se/upload/lvfs/konsoliderade/LVFS_2011_10_konsoliderad_tom_2013_1.pdf)

**Läkemedelsverkets föreskrifter om kontroll av narkotika**

[http://www.lakemedelsverket.se/upload/lvfs/LVFS\\_2011-9.pdf](http://www.lakemedelsverket.se/upload/lvfs/LVFS_2011-9.pdf)

[https://lakemedelsverket.se/upload/lvfs/konsoliderade/LVFS\\_2011\\_9\\_konsoliderad\\_tom\\_LVFS\\_2012\\_2.pdf](https://lakemedelsverket.se/upload/lvfs/konsoliderade/LVFS_2011_9_konsoliderad_tom_LVFS_2012_2.pdf)

**Innesluten användning av genetiskt modifierade mikroorganismer AFS 2011:02**

[http://www.av.se/dokument/afs/afs2011\\_02.pdf](http://www.av.se/dokument/afs/afs2011_02.pdf)

**Contained Use of Genetically modified Micro-organisms AFS 2011:02**

<https://www.av.se/globalassets/filer/publikationer/foreskrifter/engelska/contained-use-of-genetically-modified-micro-organisms-provisions-afs2011-2.pdf>

**Mikrobiologiska arbetsmiljörisiker – smitta, toxinpåverkan, överkänslighet AFS 2005:01**

[http://www.av.se/dokument/afs/afs2005\\_01.pdf](http://www.av.se/dokument/afs/afs2005_01.pdf)

**Microbiological Work Environment Risks – Infection, Toxicogenic Effect, Hypersensitivity AFS 2005:01**

<http://www.av.se/dokument/inenglish/legislations/eng0501.pdf> not found in English

**Webportal för Genteknikmyndigheter (Regulation of Activities involving GMO's)**

<http://www.gmo.nu/>

**Universitetets rutin för hantering av GMO**

<http://www.su.se/medarbetare/service/krishantering/sakerhet/biosakerhet>

**RECOMMENDED:**

**Biosäkerhet**

<https://internwebben.ki.se/sv/biosakerhet>

**Biosafety**

<https://internwebben.ki.se/en/biosafety>

## **The Swedish Board of Agriculture (Jordbruksverket)**

<http://www.sjv.se/>

### **Jordbruksverkets författningssamling**

<http://www.jordbruksverket.se/forfattningar/forfattningssamling.4.5aec661121e2613852800012537.html>

### **Statens Jordbruksverks föreskrifter om befattning med animaliska biprodukter och införsel av andra produkter, utom livsmedel, som kan sprida smittsamma sjukdomar till djur och människor SJVFS 2014:43**

(Alla produkter från djurriket som inte är avsedda som livsmedel definieras som animaliska biprodukter, d v s även proteiner >10 kD (exkl. Antikroppar, cellkulturer eller andra proteiner som är affinitetsrenade och ligger i saltvattenlösning) och serum av animaliskt ursprung.)

<http://www.jordbruksverket.se/download/18.174c24d814add5946047d5ba/1421132227247/2014-043.pdf>

### **Föreskrifter om ändring i Statens jordbruksverks föreskrifter (SJVFS 2007:29) om innesluten användning av genetiskt modifierade växter, SJVFS 2009:89**

<http://www.jordbruksverket.se/download/18.72e5f95412548d58c2c80004327/1370041159539/2009-089.pdf>

### **Gravida och ammande arbetstagare AFS 2007:05**

<https://www.av.se/globalassets/filer/publikationer/foreskrifter/gravida-och-ammande-arbetstagare-foreskrifter-afs2007-5.pdf>

### **Skyltar och signaler AFS 2008:13**

[http://www.av.se/dokument/afs/afs2008\\_13.pdf](http://www.av.se/dokument/afs/afs2008_13.pdf)

## **Swedish Radiation Safety Authority (Strålsäkerhetsmyndigheten)**

<http://www.stralsakerhetsmyndigheten.se>

Statens strålskyddsinstitut (SSI) var en svensk statlig myndighet som sorterade under Miljödepartementet. 1 juli 2008 upphörde SSI efter att ha sammanlagts med Statens kärnkraftinspektion (SKI) till den nya myndigheten Strålsäkerhetsmyndigheten.

### **SSMFS 2008:28; föreskrifter om laboratorieverksamhet med radioaktiva ämnen i form av öppna strålkällor: (klassificering av radionuklider enligt radiotoxicitet)**

<http://www.stralsakerhetsmyndigheten.se/Global/Publikationer/Forfattning/SSMFS/2008/SSMFS2008-28.pdf> (not found in English)

**Strålsäkerhetsmyndighetens föreskrifter om grundläggande bestämmelser för skydd av arbetstagare och allmänhet vid verksamhet med joniserande strålning SSMFS 2008:51**

<http://www.stralsakerhetsmyndigheten.se/Global/Publikationer/Forfattning/SSMFS/2008/SSMFS2008-51.pdf>

**The Swedish Radiation Safety Authority's regulations concerning basic provisions for the protection of workers and the general public in practices involving ionising radiation, SSMFS 2008:51**

<http://www.stralsakerhetsmyndigheten.se/Global/Publikationer/Forfattning/Engelska/SSMFS-2008-51E.pdf>

**Strålsäkerhetsmyndighetens föreskrifter om hantering av radioaktivt avfall och utsläpp från verksamhet med öppna strålkällor SSMFS 2010:2**

**(Aktivitetsgränser för utsläpp i avlopp och avfall till förbränning)**

<http://www.stralsakerhetsmyndigheten.se/Global/Publikationer/Forfattning/SSMFS/2010/SSMFS-2010-2.pdf> (not found in English)

**SSMFS 2014:4 Strålsäkerhetsmyndighetens föreskrifter och allmänna råd om laser, starka laserpekare och intensivt pulserat ljus**

<http://www.stralsakerhetsmyndigheten.se/Global/Publikationer/Forfattning/SSMFS/2014/SSMFS-2014-4.pdf>

**Artificiell optisk strålning AFS 2009:07**

[http://www.av.se/dokument/afs/afs2009\\_07.pdf](http://www.av.se/dokument/afs/afs2009_07.pdf)

**NMR**

**Bruker's NMR safety guidelines:**

<http://ccc.chem.pitt.edu/wipf/Former%20Group%20Members/Safety/NMR%20Safety.pdf>

**Ensamarbete AFS 1982:03**

<https://www.av.se/globalassets/filer/publikationer/foreskrifter/ensamarbete-foreskrifter-afs1982-3.pdf>

**Belastningsergonomi AFS 2012:02**

[http://www.av.se/dokument/afs/afs2012\\_02.pdf](http://www.av.se/dokument/afs/afs2012_02.pdf)

**Arbetsplatsens utformning AFS 2009:02**

[http://www.av.se/dokument/afs/afs2009\\_02.pdf](http://www.av.se/dokument/afs/afs2009_02.pdf)

**Workplace design AFS 2009:02**

<https://www.av.se/globalassets/filer/publikationer/foreskrifter/engelska/workplace-design-provisions-afs2009-2.pdf>

## **Swedish Civil Contingencies Agency, Myndigheten för samhällskydd och beredskap (tidigare Räddningsverket)**

formellt Statens räddningsverk (SRV), var en 1986 inrättad svensk statlig myndighet, som från 1 januari 2009 har ersatts av Myndigheten för samhällskydd och beredskap. MSB är en expertmyndighet på bland annat brandskydd

<https://www.msb.se/> <https://www.msb.se/sv/Om-MSB/Lag-och-ratt/>

### **Brandfarliga och explosiva varor på laboratorium (2005)**

[https://www.msb.se/Upload/Forebyggande/brandfarlig\\_explosiv/S%c3%84I%20Info/BEX-INFO%20Informationsblad%20nr%201%202005.pdf](https://www.msb.se/Upload/Forebyggande/brandfarlig_explosiv/S%c3%84I%20Info/BEX-INFO%20Informationsblad%20nr%201%202005.pdf)

### **BRANDFARLIGA VAROR Hantering på laboratorium (2013)**

[https://www.msb.se/Upload/Forebyggande/brandfarlig\\_explosiv/Handbok/Laboratorium.pdf](https://www.msb.se/Upload/Forebyggande/brandfarlig_explosiv/Handbok/Laboratorium.pdf)

### **Definition av brandfarliga varor MSBFS 2010:4**

<https://www.msb.se/externdata/rs/84efa9ee-324a-4ebc-913a-753b06e4bf0d.pdf>

### **Myndigheten för samhällsskydd och beredskaps föreskrifter om tillstånd till hantering av brandfarliga gaser och vätskor; MSBFS 2013:3**

<https://www.msb.se/externdata/rs/b9e6d354-2654-4e68-a880-12ce12217afe.pdf>

### **Sprängämnesinspektionens föreskrifter (SÄIFS 1998:7) om brandfarlig gas i lös behållare med ändringar i SÄIFS 2000:3**

<https://www.msb.se/externdata/rs/39b1785a-b858-4263-9e2c-5dd49196dda3.pdf>

### **Sprängämnesinspektionens föreskrifter (SÄIFS 2000:2) om hantering av brandfarliga vätskor med ändringar i SÄIFS 2000:5**

<https://www.msb.se/externdata/rs/5684299c-e44e-473d-b5bd-fe6a20f317a0.pdf>

### **Statens räddningsverks allmänna råd och kommentarer om systematiskt brandskyddsarbete SRVFS 2004:3**

Checklista över vanliga tekniska brandskyddsåtgärder samt över organisatoriska brandskyddsåtgärder

<https://www.msb.se/externdata/rs/51dc9127-8bb3-4bee-8606-98f694a4a5b6.pdf>

### **Statens räddningsverks föreskrifter om explosionsfarlig miljö vid hantering av brandfarliga gaser och vätskor SRVFS 2004:7**

<https://www.msb.se/externdata/rs/5a42742e-7310-4a17-aea2-7ca7bc821161.pdf>

### **Definitioner samt indelning av brandfarliga vätskor i klasser SRVFS 2005:10**

<https://www.msb.se/externdata/rs/6ee69259-94be-4194-beb9-519a4714e32f.pdf>

**ADR-S 2015 Myndigheten för samhällsskydd och beredskaps föreskrifter om transport av farligt gods på väg och i terräng**

<https://www.msb.se/externdata/rs/974f510a-4964-4c5e-b69c-ae96d32116b3.pdf>

**Förslag till Föreskrifter om ändring i Myndigheten för samhällsskydd och beredskaps föreskrifter (MSBFS 2015:1) om transport av farligt gods på väg och i terräng (ADR-S) (Remisstiden pågår till och med den 3 juli 2015 och de ändrade föreskrifterna beräknas träda i kraft i oktober 2015)**

[https://www.msb.se/Upload/Om%20MSB/Lag\\_och\\_ratt/Remisser/ADR-S/Remiss%20%C3%A4ndringsf%C3%B6reskrifter%20ADR-S%202015.pdf](https://www.msb.se/Upload/Om%20MSB/Lag_och_ratt/Remisser/ADR-S/Remiss%20%C3%A4ndringsf%C3%B6reskrifter%20ADR-S%202015.pdf)

**Systematiskt arbetsmiljöarbete AFS 2001:01**

[http://www.av.se/dokument/afs/AFS2001\\_01.pdf](http://www.av.se/dokument/afs/AFS2001_01.pdf)

**Systematic Work Environment Management AFS 2001:01**

<https://www.av.se/globalassets/filer/publikationer/foreskrifter/engelska/systematic-work-environment-management-provisions-afs2001-1.pdf>

**SAMIR- Säkerhet - Arbetsmiljö - Miljö – Inrapportering (Safety-Work environment-Environment-Reporting)**

**(Behöver ej logga in om man skall göra en anmälan/You do not have to logon to report)**

[https://secure.port.se/alphaquest/app\\_su/pcmain.cfm?verkid=%22%23Z%24%20%0A](https://secure.port.se/alphaquest/app_su/pcmain.cfm?verkid=%22%23Z%24%20%0A)

All employees must report all accidents and narrow escapes that occur in the Department to the SU-system SAMIR- Säkerhet - Arbetsmiljö - Miljö – Inrapportering (Safety-Work environment-Environment-Reporting).

Vill du rapportera miljöavvikelser eller ge förslag på förbättringar inom universitetets miljöarbete?

Gå in i det webbaserade systemet SAMIR och fyll i ett formulär. Där kan du också anmäla tillbud, arbetsskada och brott. Du får svar via e-post på din anmälan.

/ SAMIR is a reporting system for reports of crimes, near-accidents/incidents, occupational injuries/illnesses and environmental non-conformance. You will get replies to your report by email.

**Miljöwebben SU**

<http://www.su.se/miljo/> ,

**Sustainable Campus**

<http://www.su.se/sustainablecampus/>

### **Sortera Labavfall**

<http://www.su.se/miljo/så-gör-du/avfallshantering/labavfall>

### **Sort Laboratory Waste**

<http://www.su.se/sustainablecampus/how-to-do/waste-management/laboratory-waste>

### **Avfallsrutiner för Stockholms Universitet**

[http://www.su.se/polopoly\\_fs/1.221280.1422276905!/menu/standard/file/RUTIN\\_avfall\\_rev141217.pdf](http://www.su.se/polopoly_fs/1.221280.1422276905!/menu/standard/file/RUTIN_avfall_rev141217.pdf)

### **Waste management procedures for Stockholm University**

[http://www.su.se/polopoly\\_fs/1.236995.1432286876!/menu/standard/file/waste%20procedures\\_141217.pdf](http://www.su.se/polopoly_fs/1.236995.1432286876!/menu/standard/file/waste%20procedures_141217.pdf)

### **Rutiner för hantering av flytande kemikalierester och vattenlösningar**

[http://www.su.se/polopoly\\_fs/1.231135.1427898149!/menu/standard/file/rutiner\\_kemikalieavlopp\\_rev420150326.pdf](http://www.su.se/polopoly_fs/1.231135.1427898149!/menu/standard/file/rutiner_kemikalieavlopp_rev420150326.pdf)

### **Procedures for the disposal of liquid chemical residues and aqueous solutions**

[http://www.su.se/polopoly\\_fs/1.236898.1432209877!/menu/standard/file/procedures\\_disposal\\_of\\_liquid\\_150323.pdf](http://www.su.se/polopoly_fs/1.236898.1432209877!/menu/standard/file/procedures_disposal_of_liquid_150323.pdf)

### **Antibiotika klassificering/sortering:**

SU Avfallsrutiner s. 34

[http://www.su.se/polopoly\\_fs/1.221280.1422276905!/menu/standard/file/RUTIN\\_avfall\\_rev141217.pdf](http://www.su.se/polopoly_fs/1.221280.1422276905!/menu/standard/file/RUTIN_avfall_rev141217.pdf)

<http://www.su.se/miljo/så-gör-du/avfallshantering/labavfall/antibiotika-1.128662>

### **Antibiotics , Classification/separation; Handling/storage**

SU Waste Manual p.34

[http://www.su.se/polopoly\\_fs/1.236995.1432286876!/menu/standard/file/waste%20procedures\\_141217.pdf](http://www.su.se/polopoly_fs/1.236995.1432286876!/menu/standard/file/waste%20procedures_141217.pdf)

or

<http://www.su.se/sustainablecampus/how-to-do/waste-management/laboratory-waste/antibiotics-1.224813>

### **KLARA (Inventory system for chemical products)**

#### **Chemical register**

A register of chemical products handled in activities must be maintained according to Regulation (SFS 1998:901) concerning the practitioners' self-inspection. This should include information about the scope and use of the product and details of the product's health and environmental hazards.

Stockholm University uses the program KLARA to register all chemical products  
[https://secure.port.se/alphaquest/app\\_su/pcmain.cfm](https://secure.port.se/alphaquest/app_su/pcmain.cfm).

KLARA includes references to legislation concerning each chemical product. Each department should have one or more persons in charge to register the chemicals used in the department. These must undergo inventory training in KLARA. The register should be updated at a minimum annually; the inventory period is 2/1-28/2 each year. However, regular registration in connection with purchasing is recommended. Chemicals that are no longer used should be disposed of regularly.

KLARA's main focus is to present information to users about chemical hazards and to gather information about where chemicals are being used.

Additional to this you can also perform risk assessments in the system.

You can also use KLARA to search for chemicals at the department.

## HOW TO FIND A CHEMICAL YOU NEED

Do like this:

Link to KLARA:

[https://secure.port.se/alphaquest/app\\_su/pcmain.cfm](https://secure.port.se/alphaquest/app_su/pcmain.cfm)

Logon for everyone at DBB:

For Username and Password: e-mail Britt-Marie Olsson [bmo@dbb.su.se](mailto:bmo@dbb.su.se) and ask

- Click on the English flag (upper corner to the right) if you need an English version of KLARA and click on "Chemicals" ("Kemikaliehantering")

In the middle you'll see a search function, *Search the entire database...* (*Sök i hela produktregistret...*) This search function is used if you want to quickly search for **chemicals or products in the general Chemical product register**, (you may search by product name, CAS number, KLARA ID and article number)

Here you may search for product related information, receive a summary of risk and safety information, and find relevant MSDS (Material Safety Data Sheets).

But if you want to search **for products at our department (DBB)** do like this:

- Search by selecting "Registration" ("Kemikaliehantering") from the main menu and then "Search products" ("Sök produkter")

(in order to get back to the main menu, click on the big black arrow in the left upper corner)

- Select group if you want to search for chemicals for a special group or "Search here" ("Sök här") for "Inst. för biokemi och biofysik" if you want to find the storage and Amount for each registered chemical at our department (DBB)
- To search for a chemical, it is most convenient to use the CAS number for the product. (The CAS number you will for instance find on Sigma's website: <http://www.sigmaaldrich.com>)

If you want to take a look at your group's registration (products) or someone else's group you do like this:

- Click on "Inventory/Registration" and select Group
- Click on "Arrheniuslaboratoriet Hus A" and choose "Plan" and the room's name.
- Then you will see all the storage locations in that room.
- By clicking on a storage **location** a list of all the products which are registered on the current storage space is presented.
- Product information "i"

Click on the "i"-icon to read more about the product.

By clicking on a product's "i" icon, you can display its product page, where all relevant information is presented, including links to MSDS and explanations of the lists in which they are included.

For questions:

DBB administrator:

Britt-Marie Olsson, [bmo@dbb.su.se](mailto:bmo@dbb.su.se)

Environment officer and KLARA responsible at SU:

Margaretha Åkerholm, Environment officer, [margaretha.akerholm@su.se](mailto:margaretha.akerholm@su.se)

### **Course:**

KLARA inventory officer training (in English)/ KLARA inventerarutbildning (på svenska)  
How to carry out an inventory, step-by-step, basic level - How to generate lists and reports - How to use the system to make risk assessments.

For registration:

[https://secure.port.se/alphaquest/app\\_su/utbildning.cfm?id=31](https://secure.port.se/alphaquest/app_su/utbildning.cfm?id=31)

## **OM NÅGOT HÄNDER (IN CASE OF EMERGENCY), SU**

### **När/om något händer - vanliga frågor**

<http://www.su.se/medarbetare/service/krishantering/sakerhet/nar-om-nagot-hander-vanliga-fragor-1.3027>

### **Om något händer**

[http://www.su.se/polopoly\\_fs/1.104075.1349962546!/menu/standard/file/Om%20n%C3%A5got%20h%C3%A4nder%20ny%202012%20%28Sve%29.pdf](http://www.su.se/polopoly_fs/1.104075.1349962546!/menu/standard/file/Om%20n%C3%A5got%20h%C3%A4nder%20ny%202012%20%28Sve%29.pdf)

### **In Case of Emergency, SU**

<http://www.su.se/english/staff-info/services/emergency-crisis/emergencies>

[http://www.su.se/polopoly\\_fs/1.2404.1355758589!/In%20Case%20of%20Emergency%20121106.pdf](http://www.su.se/polopoly_fs/1.2404.1355758589!/In%20Case%20of%20Emergency%20121106.pdf)

## **Första hjälpen och krisstöd AFS 1999:07**

[http://www.av.se/dokument/afs/AFS1999\\_07.pdf](http://www.av.se/dokument/afs/AFS1999_07.pdf)

## **First aid and crisis support AFS 1999:07**

<https://www.av.se/globalassets/filer/publikationer/foreskrifter/engelska/first-aid-and-crisis-support-provisions-afs1999-7.pdf>



## **Swedish Poisons Information Centre (Giftinformationscentralen)**

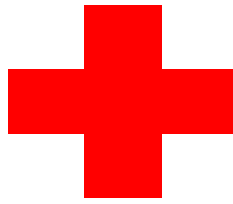
<http://www.giftinformation.se/>

should always be contacted (112) if a chemical has been consumed. In non-emergency situations, call 08-331 231 (during office hours) for information.

Ring 112 och begär Giftinformationen – dygnet runt. Sjukvården har tillgång till speciella telefonnummer.

I mindre brådskande fall och för övriga frågor om förgiftningar – ring dagtid: 08-33 12 31, Giftinformationscentralen

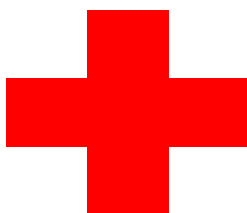
# FIRST AID AND CRISIS PLAN, DBB



<b>For accidents and medical emergencies</b>		<b>Responsible</b>
1)	Take care of the injured or affected person	everybody
2)	Alert Ambulance, Guard, Police	everybody
	Ambulance 112	
	Address main entrance: Svante Arrhenius väg 16C	
	Defibrillator:	
	Corridor outside kitchen A445, floor 4	
	Magnélisalen	
	Hus C entrance floor 3	
	Sjukvårdsupplysningen(care inquiries) 08-320100	
	Guard: 08-162216	
	during power failure: 08-164200	
	Police or fire brigade 112	
3)	Provide first aid	trained if possible
	<b>Persons at DBB who have medical training</b>	
	Pål Stenmark, ext. 3729 CPR	
	military trained in medical care	
	Martin Högbom, ext. 2110 CPR	
	Jens Danielsson, ext. 2459 CPR	
	nurse,spec.trained: defibrillator	
	emergency nurse & traumatology trained oxygen	
	Rickard Hedman, ext. 2421 CPR	
	Gustav Dallner, physician CPR	
	ext. 7826 defibrillator	
	oxygen	
	Karin Skaar, ext 2451 CPR	
	Ann Nielsen, ext. 2594 CPR +	
	obstructed airway	
	Nathalie Gonska, ext. 2445 ABC first aid	
	physiotherapist	
	Peter Nyberg, ext. 2469 ABC first aid + CPR	
	smoke diver certificate	
4)	If needed accompany the injured to the hospital or home	group member
5)	Also take care of those who witnessed or were near the incident	group member
6)	Contact relatives	group member
7)	Inform colleagues	head of dept.
8)	Make decisions concerning "special actions"	head of dept.
9)	Gather employees	head of dept.
10)	Crisis support	head of dept.
		/Feelgood
11)	Handle eventual contacts with mass media	head of dept.

See also "**In Case of Emergency**" where you will find all telephone numbers

# FÖRSTA HJÄLPEN OCH KRISSTÖD VID DBB



Vid olyckor och akuta krissituationer		Ansvarig	
1)	Tag dig an den skadade eller drabbade	samtliga samtliga	
2)	Alarmera ambulans, väktare, polis		
	Ambulans 112		
	Adress huvudentré: Svante Arrhenius väg 16C		
	Defibrillator: Korridor utanför kök A445, plan 4 Magnélisalen Hus C entré plan 3		
	Sjukvårdsupplysningen 08-320100		
	Väktare: 08-162216		
	vid strömavbrott: 08-164200		
	Polis eller Brandkår 112		
3)	Ge första hjälpen		utbildad om möjligt
	<b>Personer vid DBB som har sjukvårdsutbildning</b>		
	Pål Stenmark, ankn 3729 HLR militär träning i sjukvård		
	Martin Högbom, ankn 2110 HLR		
	Jens Danielsson, ext. 2459 HLR sjuksköterska, spec. utbild: defibrillator		
	akutsjuksköterska & traumatolog syrgas		
	Rickard Hedman, ankn 2421 HLR		
	Gustav Dallner, läkare HLR ankn 7826 defibrillator		
	syrgas		
	Karin Skaar, ankn 2451 HLR		
	Ann Nielsen, ankn 2594 HLR + luftvägsstopp		
	Nathalie Gonska, ankn 2445 ABC sjukgymnast		
	Peter Nyberg, ankn 2469 ABC + HLR rökdykarcertifikat		
4)	Följ med till sjukhus eller till hemmet om det behövs	gruppmedlem gruppmedlem gruppmedlem prefekt prefekt prefekt prefekt / Feelgood prefekt	
5)	Ta även hand om dem som varit vittne till eller nära händelsen		
6)	Ta kontakt med anhöriga		
7)	Informera arbetskamrater		
8)	Fatta beslut om "specialistinsatser"		
9)	Samla arbetstagarna		
10)	Krisstöd		
11)	Ta hand om ev. kontakter med massmedia		

Se även "**Om något händer**" där alla telefonnummer finns