

# Safety Officers at our Institute



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# General procedure in case of lab accidents

## Notfälle im Labor – was tun? Emergencies in the Lab – What to Do?

### Verätzung / Chemical Burn

<b>Leicht</b> - kleinstmöglich, nur Hautrötung <b>Slight</b> - small area, only red skin	<b>Schwer</b> - großflächig - JEDE Verätzung mit HF / Fluorwasser - JEDE Verätzung der Augen <b>Severe</b> - large area - EVERY burn by HF / hydrofluoric acid - EVERY chemical burn of the eyes
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**888**  
044 342 11 88

**Sofortmassnahmen**  
mind. 10 min mit Wasser spülen und Erste Hilfe leisten (Selbstschutz beachten!)  
(Betriebs-/Sanität über Unfallhergang und Art der Kontamination informieren)

**Emergency Procedure**  
rise with water for at least 10 min and provide first aid (protect yourself!)  
inform first aid team / paramedics about incident and kind of contamination

### Verschüttung – Freisetzung – ausser Kontrolle geratene chemische Reaktion / Spill – Release – Chemical Reaction out of Control

<b>Leicht</b> - Verschüttung: kleine Mengen, innerhalb Kapelle, nicht-giftige oder nicht-CMR-Stoffe, biologisches Material innerhalb des Labors <b>Slight</b> - spill: small amount, inside fumehood, non-toxic or non-CMR chemicals, biological material inside a lab	<b>Schwer</b> - Verschüttung: grosse Mengen, ausserhalb Kapelle, giftige oder CMR-Stoffe, biologisches Material ausserhalb des Labors, Chemikalien oder biologisches Material in Bodenablauf - Freisetzung: giftige, ätzende, brennbare oder überfleckende Gase - chemische Reaktion ausser Kontrolle (Überhitzung, Gefahr von Brand / Explosion, etc.) <b>Severe</b> - spill: large amounts, outside fumehood, toxic or CMR chemicals, biological material outside of a lab, chemicals or biological material in drain - release: toxic, corrosive, flammable or smelly gases - chemical reaction out of control (overheating, risk of fire / explosion, etc.)
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**888**  
044 342 11 88

**Sofortmassnahmen**  
Bereich absperren. Falls möglich: weiteren Austritt bzw. Ausbreitung der Verschüttung verhindern (Selbstschutz beachten!)  
Interventionskräfte über Unfallhergang und verweirte Substanzen informieren

**Emergency Procedure**  
secure the area. If possible: avoid further spreading of the spill / release (protect yourself!)  
inform intervention teams about incident and released / spilled substances

### Verbrennung – Kälteverbrennung / Thermal Burn – Cold Burn

<b>Leicht</b> - 1. Grad (Hautrötung), kleinstmöglich <b>Slight</b> - 1 <sup>st</sup> degree (red skin), small area	<b>Schwer</b> - 2. Grad (Blasen, Nekrosen) - 1. Grad (Hautrötung), großflächig - 1. Grad (Hautrötung), large area - Hände oder Füsse <b>Severe</b> - 2 <sup>nd</sup> and 3 <sup>rd</sup> degree (blisters, necrosis) - 1 <sup>st</sup> degree (red skin), large area - EVERY burn on face, on hands or feet
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**888**  
044 342 11 88

**Sofortmassnahmen**  
mind. 10 min mit Wasser kühlen und Erste Hilfe leisten (Selbstschutz beachten!)  
(Betriebs-/Sanität über Unfallhergang informieren)

**Emergency Procedure**  
cool with water for at least 10 min and provide first aid (protect yourself!)  
inform first aid team / paramedics about incident

**ETH** zürich

Stab Sicherheit, Gesundheit und Umwelt (SGU)

### Personen-Kontamination / Contamination of a Person

(mit Chemikalien oder biologischem Material) / (with chemicals or biological material)

<b>Schwer</b> - biologisches Material auf verletzter Haut, Augen oder Schleimhäuten - biologisches Material BSL2 (human-pathogen) oder BSL3 - großflächige Kontamination mit Chemikalien - JEDE Kontamination mit giftigen oder CMR-Chemikalien <b>Severe</b> - biological material on injured skin, in eyes or on mucous membranes - biological material BSL2 (human pathogen) or BSL3 - large-area contamination with chemicals - EVERY contamination with toxic or CMR chemicals	<b>Leicht</b> - biologisches Material BSL1 und BSL2 (nicht human-pathogen) auf unverletzter Haut - kleinflächige Kontamination auf unverletzter Haut mit Chemikalien, die NICHT giftig oder NICHT CMR sind <b>Slight</b> - biological material BSL1 and BSL2 (not human pathogen) on uninjured skin - contamination with chemicals from toxic, non-CMR on a small area of uninjured skin
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**Sofortmassnahmen**  
Chemikalien: mind. 10 min mit Wasser spülen und Erste Hilfe leisten (Selbstschutz beachten!)  
biologisches Material auf unverletzter Haut: desinfizieren  
(Betriebs-/Sanität über Unfallhergang und Art der Kontamination informieren)

**Emergency Procedure**  
chemicals: rise with water for at least 10 min and provide first aid (protect yourself!)  
biological material on uninjured skin: disinfect  
inform first aid team / paramedics about incident and kind of contamination

### Vergiftung / Poisoning

(Inhalation oder Inkorporation) / (inhalation or incorporation)

**IMMER / ALWAYS**

**Sofortmassnahmen**  
IMMER: Sanität alarmieren (0-144)  
Erste Hilfe leisten (Selbstschutz beachten!)  
(Betriebs-/Sanität über Unfallhergang und Art der Vergiftung informieren)

**Emergency Procedure**  
ALWAYS: call ambulance (0-144)  
provide first aid (protect yourself!)  
inform first aid team / paramedics about incident and kind of poisoning

### Wunde / Wound

(Schnitt, Nadelstich, Biss, etc.) / (cut, needle stick, animal bite, etc.)

<b>Schwer</b> - grasse Wunde - tiefe Wunde - stark blutende Wunde - JEDE Verletzung der Augen - JEDE Bissverletzung - JEDE Verletzung / Kontamination im BSL 3 Labor - JEDE mit biologischem Material / Chemikalien kontaminierte Wunde <b>Severe</b> - big wound - deep wound - strongly bleeding wound - EVERY injury of the eyes - EVERY wound from animal bites - EVERY injury / contamination in a BSL 3 lab - EVERY wound contaminated with biological material / chemicals	<b>Leicht</b> - kleine / oberflächliche Wunde - nicht stark blutende Wunde - Verletzungen an Schleimhäuten OHNE Kontamination mit biologischem Material / Chemikalien <b>Slight</b> - small / superficial wound - slightly bleeding wound - injuries of mucous membranes WITHOUT contamination with biological material / chemicals
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**Sofortmassnahmen**  
leichte Wunden: etwas ausbluten lassen, mit Wasser spülen, desinfizieren, Verband / Pflaster  
schwere Wunde: Blutung stillen und Erste Hilfe leisten (Selbstschutz beachten!)  
(Betriebs-/Sanität über Unfallhergang und Art der Kontamination informieren)

**Emergency Procedure**  
slight cases: let the wound bleed for a moment, rinse with water, disinfect, bandage / plaster  
severe cases: stop the bleeding and provide first aid (protect yourself!)  
inform first aid team / paramedics about incident and kind of contamination

## Emergency phone numbers for internal phones

**ETH alarm center (24 h service): 888**

In case of a life-threatening incident, directly call external emergency services:

**Fire department: 0-118**

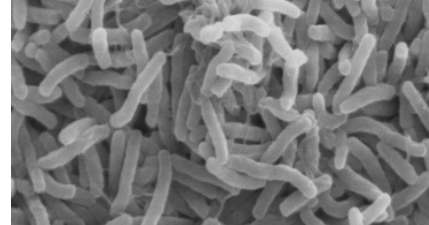
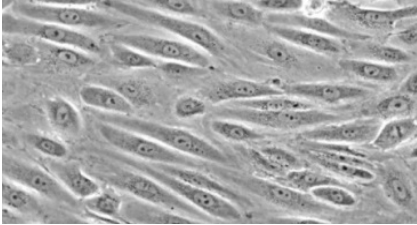
**Medical emergency / ambulance: 0-144**

**Police: 0-117**

Report any incident to:

- your PI
- safety officer

# Work with biological material at ETH



- **BEFORE** starting to work with new organisms, cell lines or material of human origin,
  - > perform a risk assessment, in consultation with the biosafety coordinator.
  - > clarify, whether Federal Office for the Environment needs to be informed.
- During your work, **proper documentation** of biological material and plasmids is mandatory.

# Lab rules (BSL 1 & 2): General points

- **Everybody new in the lab and any external guest/visiting scientist**
  - > **has to read and sign the Laboratory Safety Guidelines, which include these biosafety instructions**
- new lab members are encouraged to attend the “How to play it safe in a biosafety lab” course offered by the ETH Safety Department
- behave professionally in the lab, **work safely** (for you, others and environment)
- work in **organized** manner, keep benches **clean and tidy**
- limit the amount of personal items (e.g. bags, cell phone, etc.) in working areas
- **no visitors** (children) allowed in the labs
- keep **doors and windows** closed during work
- **eating and drinking** and food storage in the lab is prohibited
- use sharps (**syringe needles, scalpels, razor blades**) only if absolutely necessary, discard in special containers and dispose of as special waste, **do not re-cap syringe needles!**
- prevent the formation of **aerosols** (e.g. during centrifugation)
- clean and **decontaminate work surfaces** at regular intervals
- all biological material is **properly labeled and kept in appropriate containers**, containers are always kept closed, except for the immediate use of the biological material
- check **identity of microorganisms** if there is a certain probability of contamination by pathogenic organisms or if required for risk assessment

# Lab rules (BSL1 & 2): Personal protective equipment & hygiene

- **Personal protective equipment: (closed) lab coat, gloves, safety glasses, closed shoes**
  - > **avoid spreading** of microorganisms from the lab area
  - > clean or change contaminated gloves/lab coats immediately
  - > wear **nitrile gloves** if you have injuries at your hands or work with hazardous chemicals or radiochemicals
  - > do not wear gloves and lab coats outside the lab (in offices, coffee room, etc.)
  - > **Safety glasses:** - side protectors are required
    - persons who wear glasses should use corrected safety glasses or safety goggles that fit over their own glasses
    - if work contract > 1 year and safety glasses are needed regularly:
      - > obtain **corrected safety glasses via SGU**
    - No glasses for operations in a safety cabinet required
    - **Contact lenses are not recommended** (forbidden for work with hazardous chemicals)
- **Personal hygiene:**
  - > Do not touch mouth and eyes while working
  - > **wash hands** before leaving BSL 1 labs
  - > **decontaminate hands** before leaving BSL 2 labs

# Additional rules apply to BSL2 work

- **Working area** (entrance door of lab, incubators, strain storage area, BSL2 safety cabinet) has to be labelled with “**BIOHAZARD**” sign



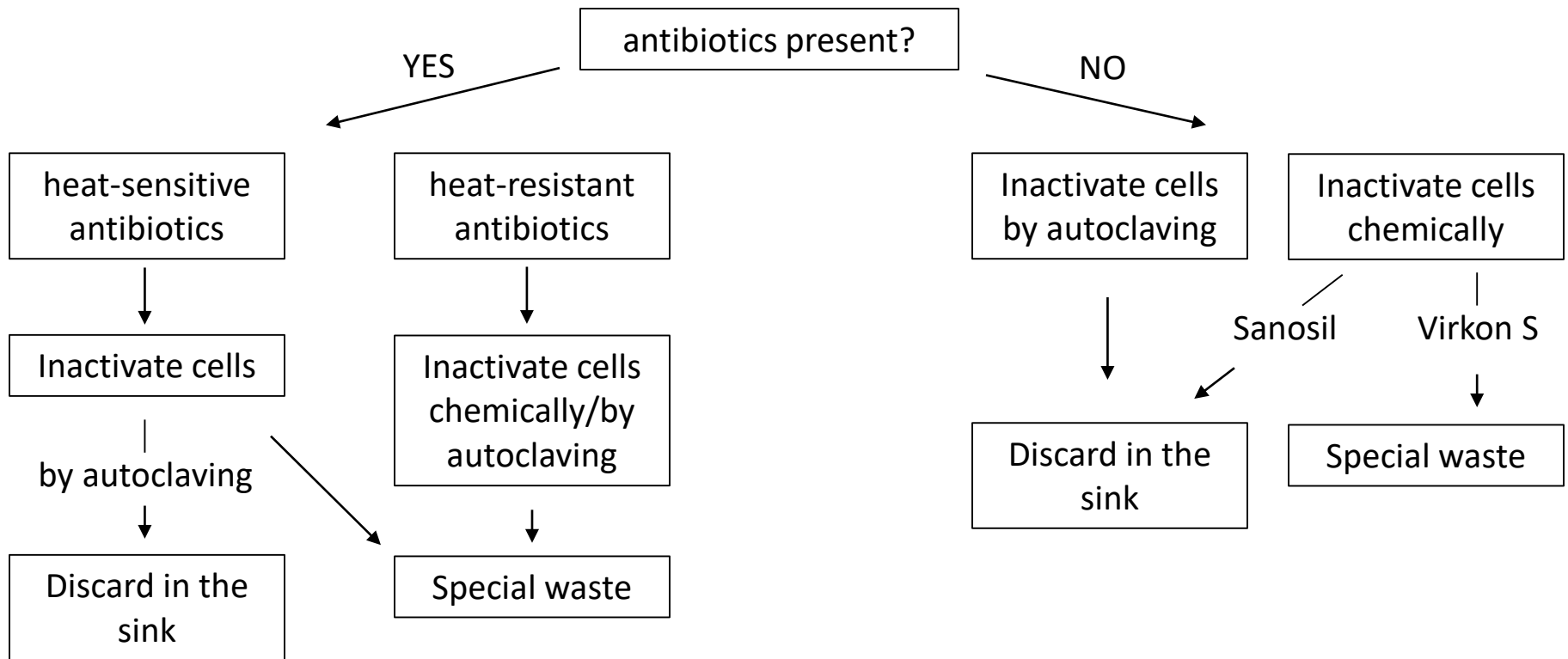
European biohazard warning sign

- Lab access requires **permission** of group leader
- **Doors** need to be permanently **closed**
- dedicated set of lab coats required (have to remain in BSL 2 lab)
- wear **nitrile gloves** instead of rubber gloves, wear **two pairs of gloves** when working with dangerous microorganisms
  
- **biological safety cabinet** mandatory for work potentially causing aerosols
- BSL2 safety **cabinet service** (filter exchange, repair) only by **authorized service personnel**, yearly control necessary
- for **transporting BSL2 material** outside of the BSL2 area, a **double containment** and a biohazard label are mandatory
- contaminated materials (glassware, equipment) need to be decontaminated before transporting it outside of the BSL2 area

# Biological waste disposal

- solid and liquid biological waste have to be **collected separately**
- **temporary storage**: collect waste in designated places labeled “Solid biological waste” or “Liquid biological waste”
- > **solid waste**: agar or any solid material that was in contact with cells (petri dishes, pipette tips, toothpicks, cuvettes, soaked paper towels...)
  - Collect in autoclave bag and autoclave
  - Before disposal, biohazard sign of the bag must be hidden -> transfer autoclave bags into a second, neutral waste bag
- > **liquid waste**: cultures and supernatants
  - autoclave or disinfect chemically, dispose of as special waste depending on whether antibiotics, sodium hypochlorite (bleach), Virkon S are present
- **instruct new lab members** about the procedures
- **efficiency of inactivation needs to be checked** on a regular basis

# Disposal of cell culture and culture supernatants



## Disposal sites for special waste:

### HCI D276

Tue, Thu & Fri 1-4 pm (during semester)

Tue & Thu 2-4 pm (semester break)

### HPL D15.2

1<sup>st</sup> Tue each month 9-11 am

#### on-demand appointments:

- > E-mail [sgu-sonderabfall@ethz.ch](mailto:sgu-sonderabfall@ethz.ch)
- > a few days in advance
- > with approx. amounts of waste



# First aid and biological incidents

- **Generally:**

- > know the location and how to use emergency equipment (safety showers, eyewash stations, safety datasheets)
- > Be alert to unsafe conditions/actions in the lab, report them to your supervisor immediately

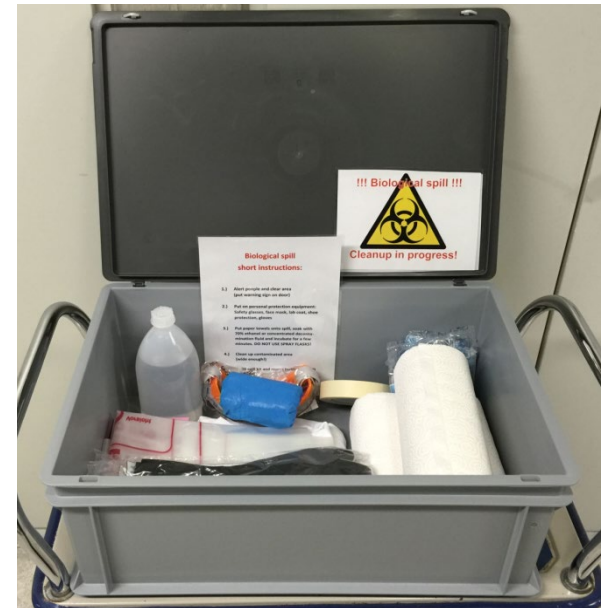
- **Examples for biological incidents:**

- > bacterial/cell culture splatters in the face
- > injury with contaminated sharps (broken glassware, syringe needle...)
- > spillage of large volumes (>1L) of cell culture

- **Any biological incident must be reported** to the IMBB biosafety officer Dr. Christoph Giese ([giesec@mol.biol.ethz.ch](mailto:giesec@mol.biol.ethz.ch), 33292) or deputy biosafety officer Dr. Marc Leibundgut ([leibundgut@mol.biol.ethz.ch](mailto:leibundgut@mol.biol.ethz.ch), 33148) and the project leader.

# What to do in case of a biological incident?

- **call 888**, report what happened
- **Skin/face contact:**
  - > Wash face extensively with water, at each sink an eye wash station is installed labeled “Kaltwasser” (flush tubing for a short moment before use)
- **Injury/Wound:**
  - > Wash with water, disinfect, consult medical doctor
- **Culture spill:**
  - > decontaminate with 70% ethanol or equivalent
  - > clear the affected working area
  - > avoid further spreading by contaminated clothing/ lab coat/shoes/gloves
  - > Do not use spray flasks! Clean up with paper towels (to be autoclaved prior to disposal)
  - > **Spill kit** is available in each lab



# Working with biological material during pregnancy

- **pregnant and nursing mothers** may not handle infectious or pathogenic microorganisms or materials which contain such
- **Special safety considerations** apply during pregnancy, set up on individual basis.
- **Contact [mutterschutz\\_cabs@ethz.ch](mailto:mutterschutz_cabs@ethz.ch) as early as possible,**  
Your concern will be treated confidentially!
- **factsheet** with detailed information  
on **maternity protection** is provided by SGU

**ETH** zürich

**Information Sheet  
Maternity Protection –  
Pregnancy and Breastfeeding**