

The practical challenges of the BSO : interacting with the user



11 december 2008

University of Liège

Complete university

- 17000 students
- 2500 researchers-teachers

- Teaching and research in all domains except agronomy
(activity of Gembloux agricultural University)

Biosafety at U.Lg : who is concerned ? (1)

○ Faculty of Sciences



- Research on transgenic plants
- Research on phytopathogens
- Molecular biology (GM bacteria & yeasts)
- Production of bacteria in fermentors or bioreactors
- Use of bacteria & yeasts to produce recombinant proteins
- Research on animal, plant or human cells (usually GM)



Biosafety at U.Lg : who is concerned ? (2)

○ Faculty of Medicine



- Use of GM bacteria & yeasts
- Use of GM zebrafish
- Use of GM animal and human cell lines or primary cells
- Production & use of defective viral vectors (lentiviral, adenoviral)
- Handling of pathogens (HPV, Plasmodium, VZV, prions...)



The Interdisciplinary Group of Applied Genoproteomics comprising a center of excellence in academic research (20 research units – 280 employees)

Biosafety at U.Lg : who is concerned ? (3)

○ Faculty of Veterinary Medicine

- Use of GM bacteria and yeasts
- Housing, breeding and use of transgenic mice
- Use of GM cell lines and animal primary cells
- Food microbiology
- Identification of viruses or bacteria in animal clinical specimens (*Salmonella*, *Pasteurella*, Poxvirus, ...)
- Handling of animal pathogens (*Mycoplasma*, parasites, Herpesvirus, Pestivirus,..)



Biosafety at U.Lg : who is concerned ? (4)

Faculty of Medicine Central Animalery

5 floors
5000 mice
1000 rats
50 rabbits



- Housing, breeding and use of transgenic mice
- Experiments with biohazard agents
(viral vectors, bacteria, VZV,...)

Faculty of Psychology Animalery decentralized

Housing, breeding and use of
transgenic mice



Biosafety - who is concerned ? (5)

Outside of Liege city

○ Environmental department – Arlon

- Research and identification of pathogens in waters
- R & D on mould



No BSO on this site

One part-time prevention officer

U.Lg Containment facilities

- Numerous **L2** located in different buildings
- Some **L2+** dedicated to a pathogen
- Three **L3** :
 - one dedicated to prions
 - one reserved to the veterinary department of infectious and parasitic diseases
 - one common for all researchers - composed of 3 separated culture rooms
- Some **A2** available in Faculty of Medicine and Veterinary Medicine
- One **A3** room in each L3 (for rodents but also for cats in veterinary department)

Biosafety officers at U.Lg



Christine GRIGNET
BSO
since July 2004



Stana GRUBISIC
BSO assistant
since June 2007 (half-time)
and January 2008 (full time)

HSE service called
Service **U**niversitaire de **P**rotection et
d'**H**giène du **T**ravail

Biosafety committees at U.Lg

- One by Faculty
(Sciences, Medicine, Veterinary Medicine)
Composed of Faculty investigators + BSO and chaired by a Professor

Issues :

- ✓ Members not officially designated
- ✓ Members sometimes not aware of the duties and responsibilities of the committee
- ✓ Rare meetings

Biosafety supervision at U.Lg

Usually

the **biosafety officer**

=

the **unique** interlocutor
for researchers, lab directors,
architects, ...

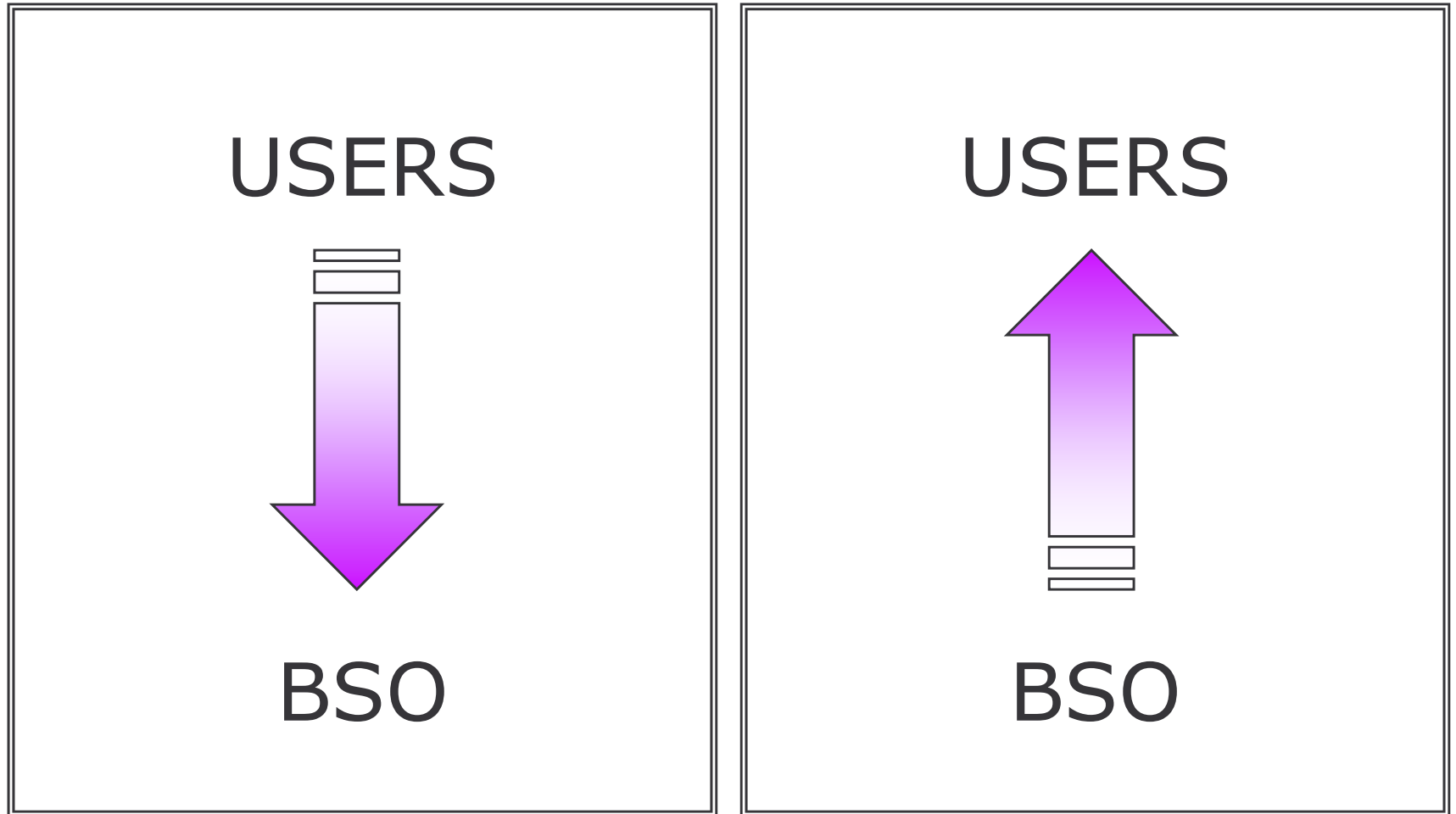
BSO : summary of our duties

Overall control that all activities within the University involving biohazard agents are conducted in a **safe manner** and in **conformity** with the federal and regional regulations

Issues :

- ✓ the large range of **pathogens**
- ✓ the diversity of lab directors **mentalities** and **perceptions** of health and safety

Interaction with users



Users queries and expectations

- Advice for modifications of existing labs or construction of new facilities concerned or not by contained used

Issues :

- ✓ Lack of informations necessary to make the risk assessment
- ✓ Frequent changes in the research programs - short-term view
- ✓ Confusion between chemical, physical and biological risks
- ✓ Difficulty to convince people when transformations are expensive

Users queries and expectations

- Conditions of pathogens or viral vectors handling (*in vitro* & *in vivo*)

Issues :

- ✓ Low knowledge of some researchers about the biohazard agents being handled
- ✓ Contained facilities sometimes not available in the researcher's department

- Questions about all the hazardous substances used in a lab

Issue :

Confusion between chemical, physical and biological risk

Users queries and expectations

- Procedures to decontaminate a biosafety cabinets, a laboratory or animalery space

Issues :

- ✓ Requirements depend on the nature of infectious agent
- ✓ Specialized equipment to generate gaseous disinfectants usually not available (e.g. : vaporized hydrogen peroxide or peracetic acid)

Users queries and expectations

- Administrative problems

(orders to ATCC, contacts with AFSCA, informations for application of research funding)

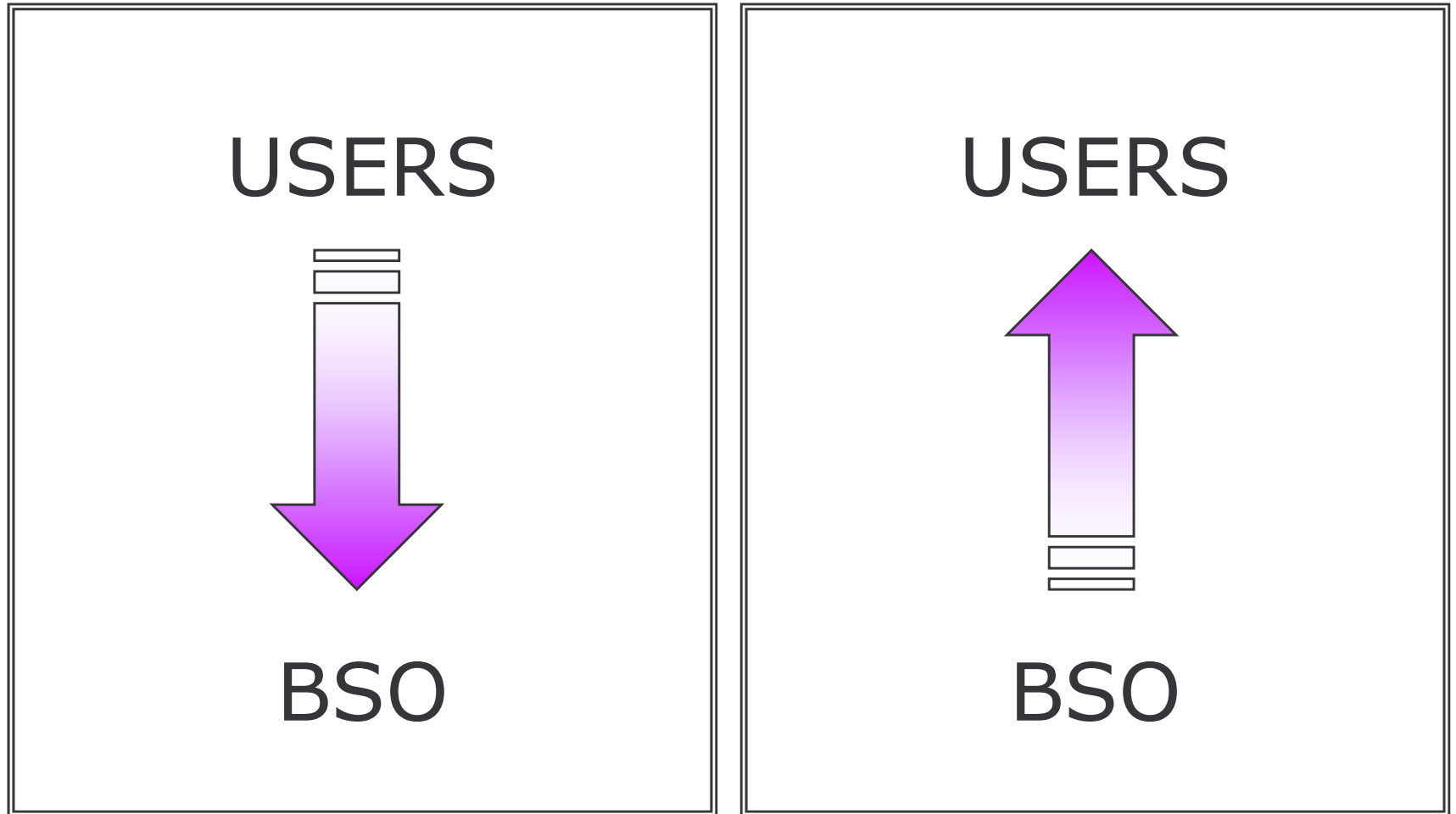
- Transport of pathogens

(e.g : shipment of biological samples in Taiwan for a patent deposit)

Issue :

- ✓ People not aware of the requirements - What about local transportation ?

Interaction with users



BSO assignments (1)

○ Biosafety Trainings

L2 training (1h30)*

General safety training (2h)

Issues :

- ✓ Turnover of the staff
- ✓ Senior scientists or Directors often not presents
- ✓ Not always mandatory
(depending on the hierarchy decision)
- ✓ Large number of persons to train
- ✓ Low knowledge of some researchers about viral vectors

* L3 training : assignment of the facility manager

BSO assignments (2)

- Environmental licences and biosafety dossiers
 - For old building regularisation
 - For new building or transformation of existing laboratories

Issues :

- ✓ Difficulties to collect all the information necessary to complete forms
- ✓ Update of the licences : take note of modifications - registers

BSO assignments (3)

○ Biological waste management

Issues :

- ✓ Segregation requirements between class B1 and B2 wastes :
 - Sometimes unknown
 - Misunderstood
 - Not respected

- ✓ No financial intervention of waste producer in the cost

- ✓ Experimental animal waste management

BSO assignments (4)

- Supervision of biosafety in labs and animaleries



Sources of informations :

- ✓ animal ethical commission



- ✓ inspection of working areas



Animal ethical commission (1)

Before performing any animal experiment, operators should complete an ethical form including a § on **worker and environmental safety**

(risk class of biohazard agent ? place of animal housing ? Biosafety dossier ref ?)



Forms are examined monthly
(200 protocols/year)



Animal ethical commission (2)



Commission decision including biosafety measures transmitted to operators



Issues :

- Management of the risk e.g. with animals like pigs or calves
- Control of the respect of prescribed conditions

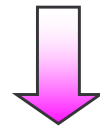
Advantage :

- Better knowledge of the *in vivo* experiments involving biohazard agent (→ setting of data base)



Inspection of working areas (1)

Annual visits with an occupational physician and a prevention officer (mandatory by the health and safety at work legislation)



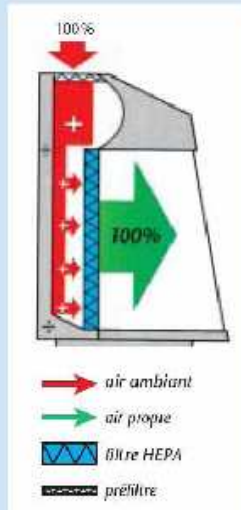
Visit report containing :

- remarks about deviations in :
 - ✓ waste management
 - ✓ personal protective equipment
 - ✓ safety equipment
 - ✓ facility design

- recommendations to lab directors in order to improve the (bio)safety

SUPHT 13 - Hotte à flux laminaire horizontal

HOTTE A FLUX LAMINAIRE HORIZONTAL
 QUI NE PERMET QU'UNE MANIPULATION
 SOUS ATMOSPHERE STERILE
SANS AUCUNE PROTECTION DU
MANIPULATEUR ET DE L'AIR AMBIANT



manipulations à risque
 biologique ou chimique
INTERDITES



SUPHT 12 - Elimination des aiguilles



COMMENT SE DEBARRASSER DES
 AIGUILLES ET LAMES DE SCALPEL ?

Savez-vous que les piqûres d'aiguilles font partie des
5 accidents de laboratoire les plus fréquents ?
 30% des piqûres d'aiguilles sont liées au
recapuchonnage.

Comment ?

- l'aiguille passe à côté du capuchon
- l'aiguille perce le capuchon
- le capuchon, mal ajusté, tombe de l'aiguille



Obligation de placer les aiguilles
 directement après usage dans des
 petits conteneurs spéciaux* plus
résistants à la perforation que les
conteneurs jaunes de 50 litres.

Les lames de scalpel doivent aussi être
 évacuées par cette voie.

* Les conteneurs à aiguilles sont distribués GRATUITEMENT lors des permanences de collecte des déchets chimiques (Renseignements: SUPHT 04/366.22.47). Dès qu'un conteneur est rempli, il faut le fermer hermétiquement dans le laboratoire et l'éliminer selon les mêmes modalités que les conteneurs jaunes de 50 litres pour déchets à risques.



Inspection of working areas (2)

- Our actions to correct deviations :
 - ✓ Improve information about waste management (segregation requirements,...)
 - ✓ Increase the involvement of laboratory supervisors and directors in the health and safety at work by informing them of their **legal responsibilities**

- Problem to correct deviations :
 - ✓ Financial resources to modify safety equipment or arrange facility
Who is going to pay ??

Conclusion

Many tasks for only 2 BSOs !

Our challenges :

- Increase the **personnel** awareness of potential hazards
- Improve the formation of **persons** who work with biohazardous materials about safe practices
- Convince **lab directors** that biosafety is not a brake on their research activity
- Concern **committee members** with biosafety problems to be assisted in our duties

Conclusion

Continuous efforts should be made **TOGETHER** to provide a safe and healthy work environment in our University in compliance with the federal and regional biosafety regulations

Thank you for your attention !

