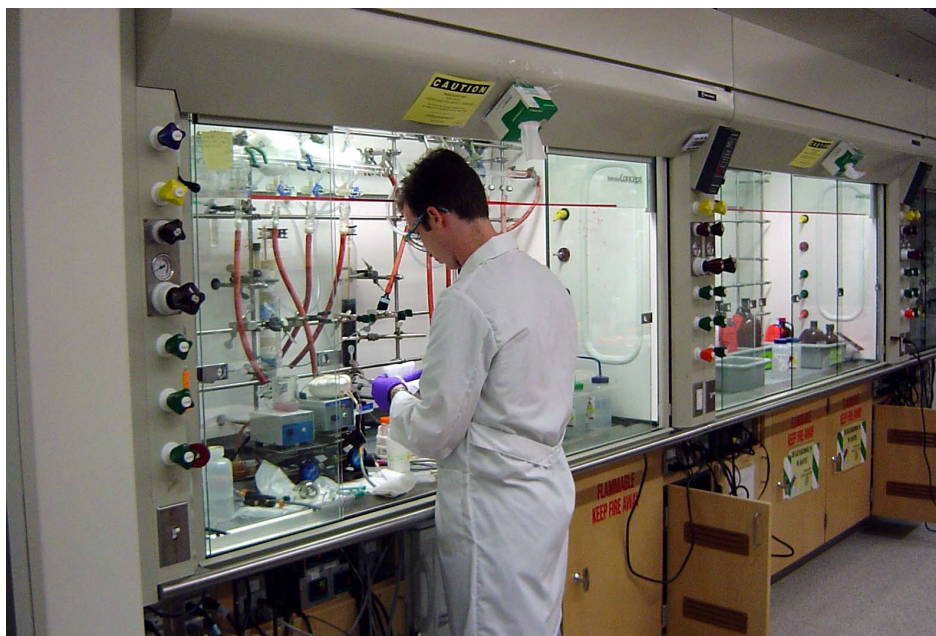


Why is Regulatory Compliance So Difficult? Professional Discretion and Technical Expertise



Susan S. Silbey
Massachusetts Institute of Technology
American Chemical Society, August 2022

**Why Do Biologists and Chemists Do Safety Differently:
The Reproduction of Cultural Variation Through Pragmatic Regulation**

The Pragmatic Turn in Sociology (eds. Gross, Reed and Winship, July 2022)

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**Co-opting Regulation: Professional Control Through Discretionary Mobilization of
Legal Prescriptions and Expert Knowledge**

Organizational Science, (J. Evans and S.S.Silbey, November 2021)

Previous research

How ordinary people think and talk about law.

Narratives of legality that circulate in popular culture.

Increasingly too narrow focus on individual's thoughts.

Too little attention to institutional and structural influences and supports.

Current project:

Look inside organizations to find how competing normative orders shape interpretations and responses to law.

Is the law experienced differently in world of elite scientists than in daily lives of ordinary Americans?

In many ways, scientific spaces no different than most others: saturated with legal regulations.

BL1 Laboratory Practices²

1. Keep laboratory doors closed when experiments are in progress.
 2. Use procedures for entering animal facilities.
 3. Do not eat, drink, or smoke in BL1 areas.
 4. Use laboratory gloves, coats, or suits for other experiments.
 5. Do not handle plastic. Use mechanical opening devices.
 6. Avoid using hypodermic needles.
 7. Wash hands after completing experiments, procedures and before leaving the lab.
 8. Decontaminate work surfaces fully and immediately after a spill.
 9. Decontaminate all biological waste before disposal. Decontaminate other contaminated material before sending, reuse, or disposal.
 10. Use all fire extinguishers with enough compressed gas to smother a small fire, but not a person.
 11. Contact local and other authorities.
 12. Keep BL1 areas clean and clear.
- ² These practices are required for any experiment that requires use of BL1 physical containment level.

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CAUTION

**EYE PROTECTION
REQUIRED
IN THIS AREA**





**Danger
Lift machinery**



**Unauthorised
access prohibited**



**Keep door
locked**

BIOHAZARD

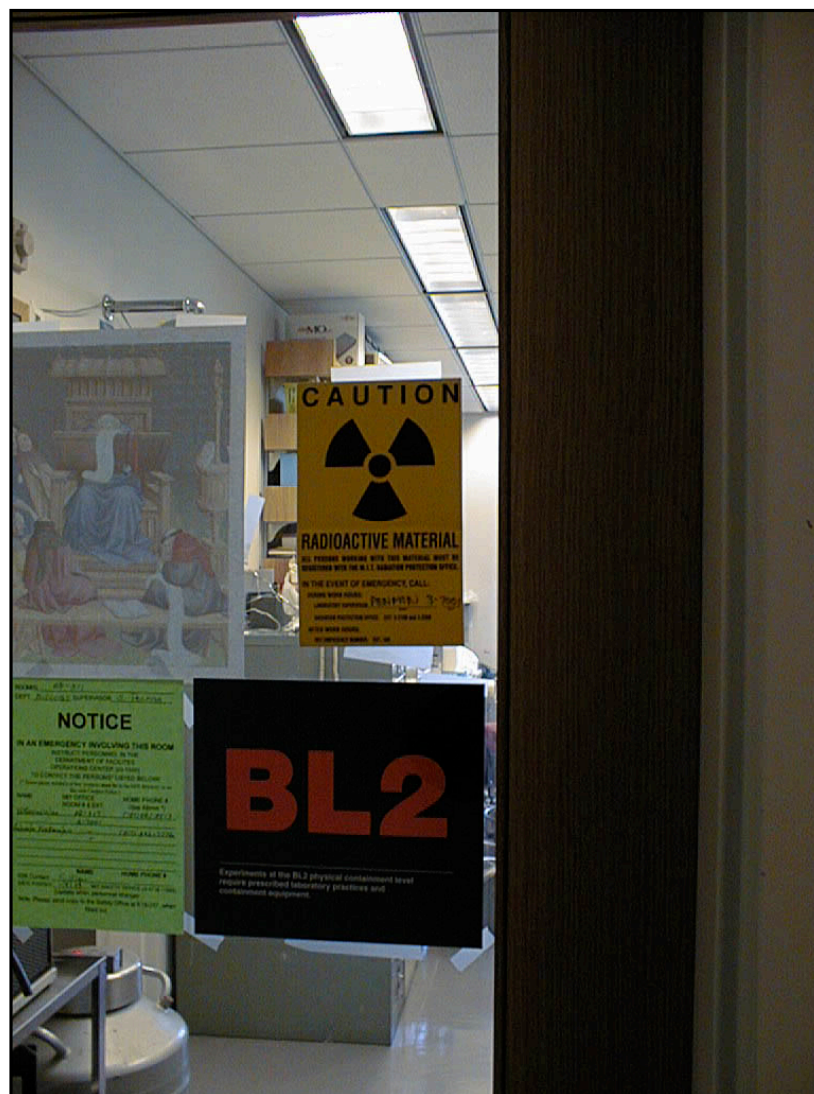


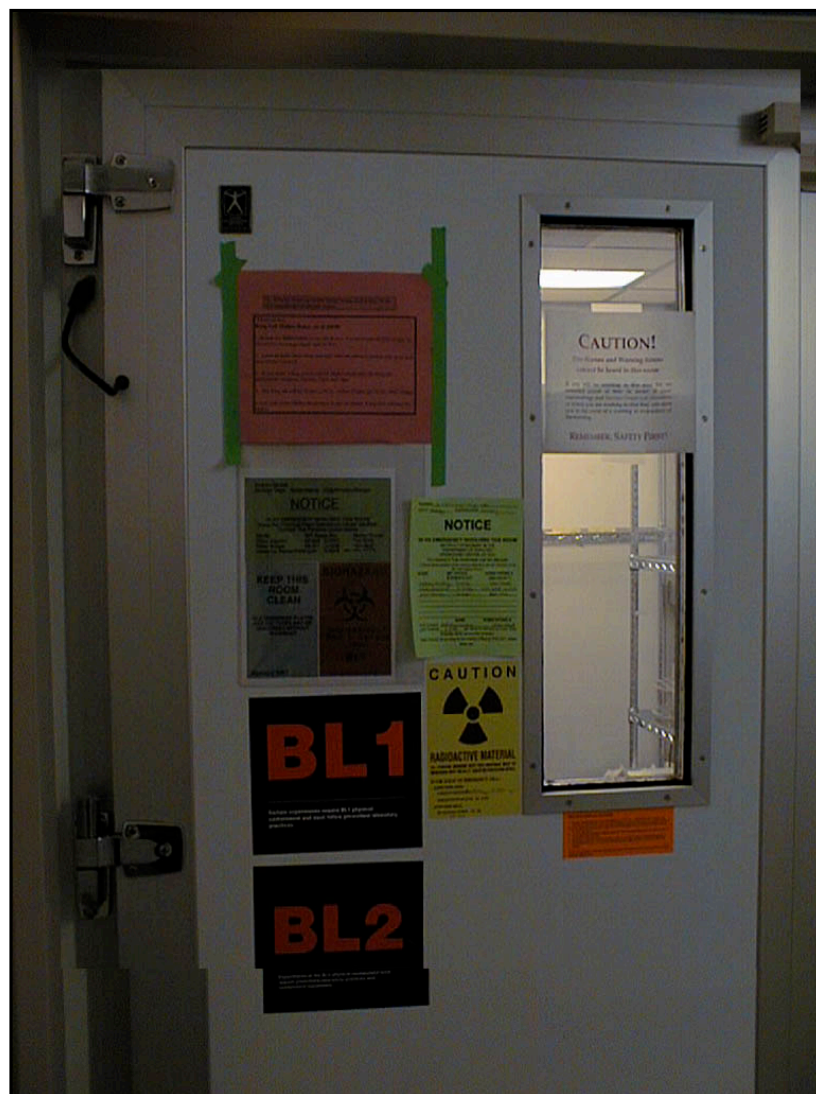
STOP!!!
LABORATORY
PERSONNEL ONLY

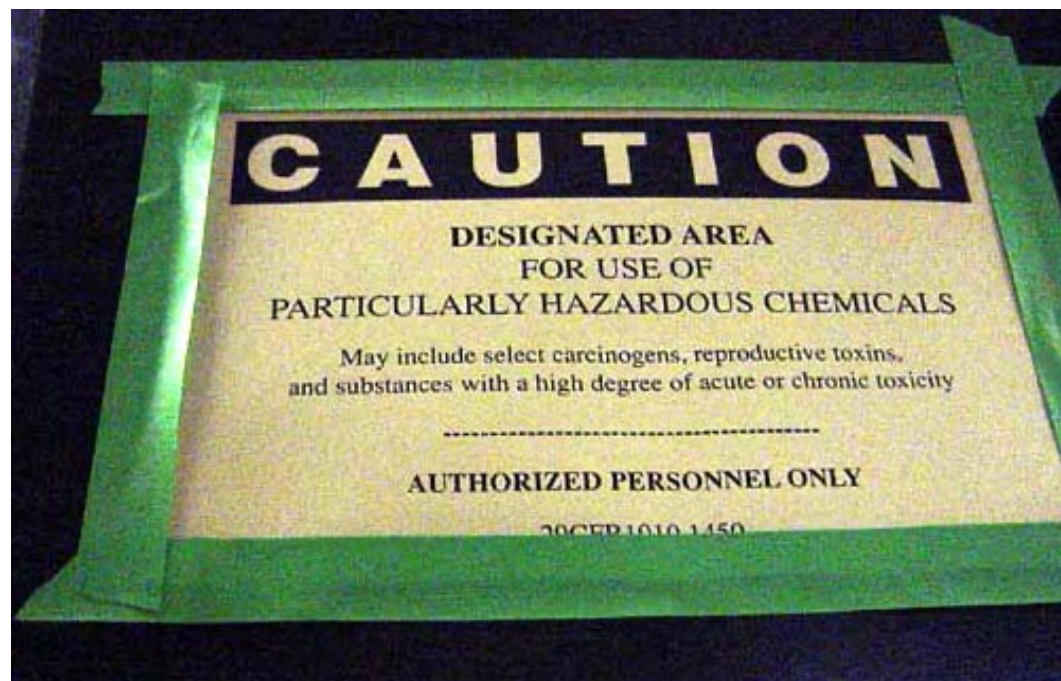
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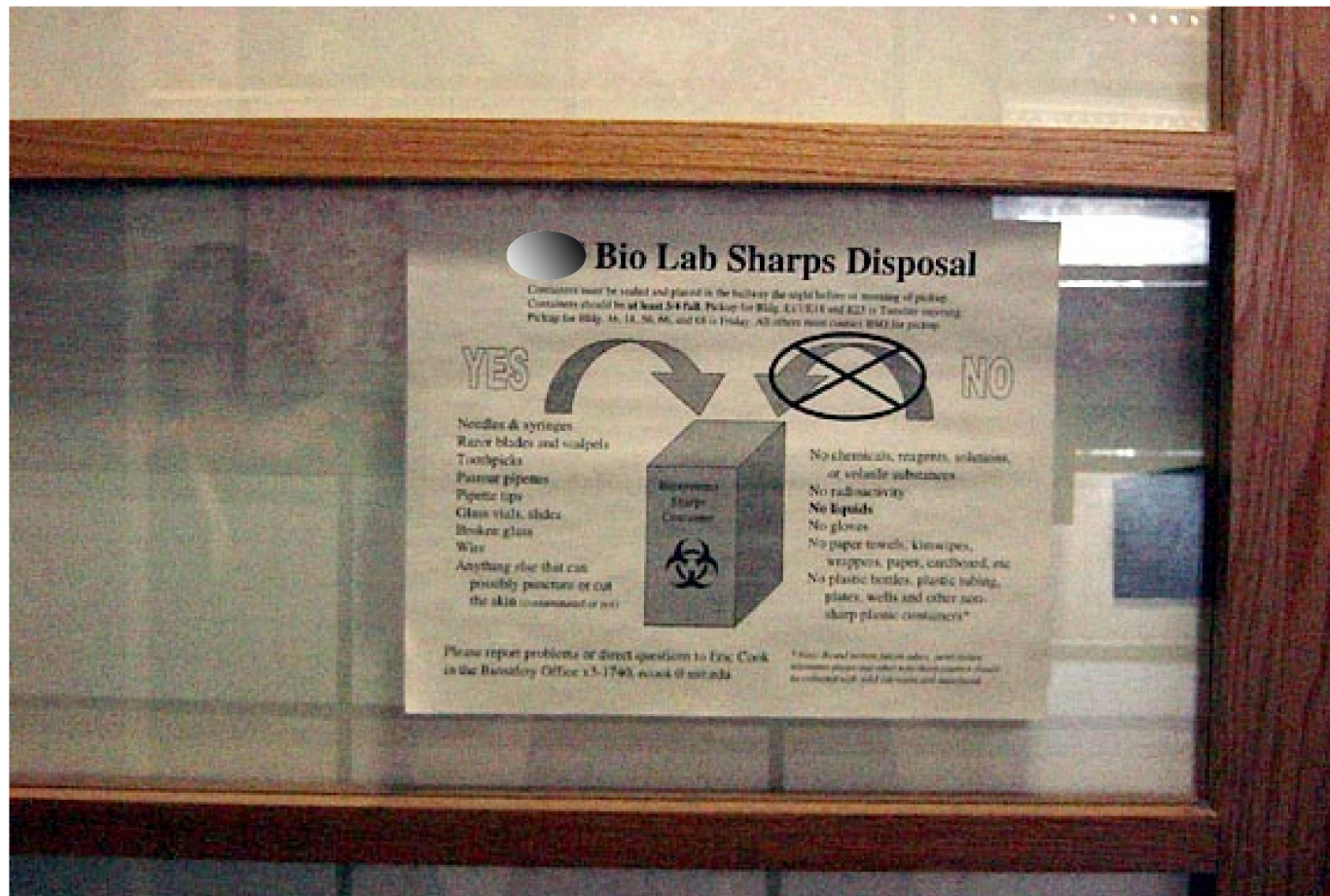














RESEARCH FINDINGS:

Ethnographic observations showed

- Reproduce previous findings about regulatory compliance: Science looks like most cases of regulatory governance and compliance: varied and inconsistent
- Two contributions to what we already know:
 - Scientists recognize and respond to a different set of hazards and threats
 - Interpreted regulations and compliance on basis of local expertise

33 Safety events identified in fieldwork

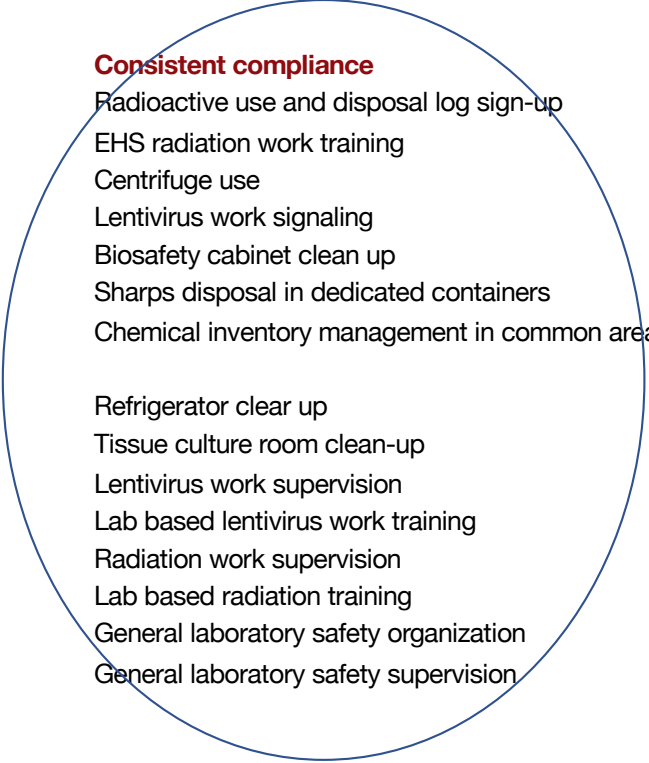
Lab coat wearing during lab work	Storing and labelling misplaced chemicals
Lab coat wearing during lentivirus work (co-workers)	Chemical inventory management in common areas
Lab coat wearing during tissue culture	Phenol vapor minimizing
Drawing blood from animals with mechanical pipette	Liquid waste minimizing
Radioactive use and disposal log sign-up	Isopropanol vapor minimizing
EHS radiation work training	Clearing storage 18 inches or more below ceiling
Radiation work supervision	Clearing obstructed corridors
Lab based radiation training	General laboratory safety organization
Using radiation room when pregnant	General laboratory safety supervision
Tissue culture room clean-up	Chemical spill management by hazardous materials team
Biosafety cabinet clean up	Lentivirus work supervision
Refrigerator clear up	Lentivirus work signalling
Glove wearing when transporting human cells	Lab based lentivirus work training
Centrifuge use	Tissue culture supplies planning
Contact avoidance – surfaces/ co-workers	Tissue culture signaling
Signaling of hazardous dispersion and contact limiting	Ethidium Bromide dispersion and contact limiting
	Sharps disposal in dedicated containers

Excluded events that were not about science but not laboratory practices, e.g. seminars, publications. 20

Lab observations reproduced common findings about regulatory compliance: *variation and inconsistency*

(4) 33 Safety events identified in fieldwork: compliance varied

Consistent compliance



- Radioactive use and disposal log sign-up
- EHS radiation work training
- Centrifuge use
- Lentivirus work signaling
- Biosafety cabinet clean up
- Sharps disposal in dedicated containers
- Chemical inventory management in common areas

- Refrigerator clear up
- Tissue culture room clean-up
- Lentivirus work supervision
- Lab based lentivirus work training
- Radiation work supervision
- Lab based radiation training
- General laboratory safety organization
- General laboratory safety supervision

Case by case, discretionary compliance

- Glove wearing when transporting human cells
- Lab coat wearing during lab work
- Chemical spill management by hazardous materials team
- Lab coat wearing during lentivirus work (co-workers)
- Lab coat wearing during tissue culture
- Drawing blood from animals with mechanical pipette

Symbolic compliance

- Storing and labelling misplaced chemicals
- Clearing storage 18 inches or more below ceiling
- Clearing obstructed corridors

Local practices, norms

- Using radiation room when pregnant
- Contact avoidance – surfaces/ co-workers
- Tissue culture signaling
- Signaling of hazardous dispersion and contact limiting
- Ethidium Bromide dispersion and contact limiting
- Phenol vapor minimizing
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What distinguished these safety practices? Why some consistently followed and others not? Why new ones?

Scientists enact /use their expertise to identify and manage laboratory risks.

Assess:

- what hazards exist

- what is being threatened

- what are the probabilities of limiting risk by following one or another regulation or combination of rules/regs

Example: Radioactivity Logbook

Record keeping for use and stores of radioactive isotopes: *“I have used radioactivity, I have checked myself and my equipment.”*

“I'd like the person who last used the hybridization oven without signing up and left a radioactive spill in it to come and talk to me and Ally about how to use radioactivity. I don't see any logged record of radioactive use, which is a more significant violation beyond this lack of regard for your colleagues. If I don't hear from anyone we'll talk about this in lab meeting tomorrow.”

“Contact can cause at most a burn. But the situation in which it was used ... while I was concerned about the radioactivity, I was more concerned by the lack of attention to hygiene. If that person ends up being sloppy... I am very intolerant of people making messes for others to clean.”

Laboratory hazards

Federal and state law recognizes and seeks to control:

threats to *bodies*

threats to the *environment* (e.g. OSHA, EPA, Clean Water Act)

Laboratory hazards

Federal and state law recognizes and seeks to control:

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threats to the *environment* (e.g. OSHA, EPA, Clean Water Act)

Scientists recognize and seek to limit threats not relevant to law

threats to the *experiment* (contamination)

threats to scientific *sociality* (untrustworthy colleagues)

Compliance varied by number and types of risks experts attended to:

Consistent compliance

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***Body, environment, experiment, sociality
4 hazards, legal regulations and local rule***

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Glove wearing when transporting human cells
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Drawing blood from animals with mechanical pipette

***All threaten body, varied effect on environment and
experiment, range 1-3 hazards, legal regulations***

Symbolic compliance

Storing and labelling misplaced chemicals
Clearing storage 18 inches or more below ceiling
Clearing obstructed corridors

Environmental hazards, legal rules

Local practices, norms

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Threats primarily bodies and sociality, no law

Practice	(a) Direct hazard managed				(b) # Hazard managed	(c) Legal regulation	(d) Lab rule
	Body	Material	Experiment	Sociality			
Consistent compliance							
1 Radioactive use and disposal log sign-up	X	X	X	X	4	Y	
2 EHS Radiation work training	X	X	X	X	4	Y	
3 Centrifuge use	X	X	X	X	4	Y	
4 Lentivirus work signaling	X	X	X	X	4	Y	
5 Biosafety Cabinet clean-up	X	X	X	X	4	Y	
6 Sharps disposal in dedicated containers	X	X	X	X	4	Y	
7 Chemical inventory management in common areas	X	X	X	X	4	Y	
8 Refrigerator clean-up	X	X	X	X	4		Y
9 Tissue culture room clean-up	X	X	X	X	4		Y
10 Lentivirus work supervision	X	X	X	X	4		Y
11 Lab-based Lentivirus work training	X	X	X	X	4		Y
12 Radiation work supervision	X	X	X	X	4		Y
13 Lab-based radiation work training	X	X	X	X	4		Y
14 General laboratory safety organization	X	X	X	X	4		Y
15 General laboratory safety supervision	X	X	X	X	4		Y
Discretionary compliance							
16 Gloves wearing when manipulating human cells	X	X	X		3	Y	
17 Lab coat wearing during laboratory work	X				2	Y	
18 Chemical spill management by hazardous materials team	X	X			2	Y	
19 Lab coat wearing during lentivirus work (co-workers)	X				1	Y	
20 Lab coat wearing during tissue culture	X				1	Y	
21 Drawing animal blood through mechanical pipetting	X				1	Y	
Expert practice, Local Norms							
22 Using the radiation room when pregnant	X		X	X	3		
23 Contact avoidance - surfaces / co-workers	X		X	X	3		
24 Tissue culture signaling	X		X	X	3		
25 Signaling of hazardous materials handling	X			X	2		
26 Ethidium Bromide dispersion and contact limiting	X			X	3		
27 Phenol vapor minimizing	X			X	2		
28 Liquid waste minimizing		X	X	X	2		
29 Tissue Culture supplies planning	X			X	2		
30 Isopropanol vapor minimizing	X	X		X	2		
Symbolic compliance							
31 Storing and labelling misplaced chemicals		X			1	Y	
32 Clearing storage 18 inches or more below the ceiling		X			1	Y	
33 Clearing obstructed corridors		X			1	Y	

Conclusions - takeaways

- Selective and variable regulatory compliance enacts *professional expertise*:
 - *interpretations of risk* – what hazards exist, what is threatened,
 - *probabilities for control* by following regulation, expert procedure or combination
- Discretionary compliance is part of the technical, practical and tacit assemblage of local (and expert) culture.

