Student-led Safety Inspections of Chemistry Teaching and Research Laboratories

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Adelphi

A modern metropolitan university with a personalized approach to higher learning
Department of Chemistry
ACS approved since Fall 2016

B.A. Chemistry
B.S. Chemistry
B.S. Biochemistry

Just got my first PRF grant!
Department of Chemistry

Family of chemists

11 Full-time faculty
- 4 tenured
- 2 tenure-track + 2 openings
- 2 lecturers + 1 opening

60 Students
- 50/50 mix chemistry/biochemistry
- 30% graduate school
- 30% professional school
- 25% industry
- 15% 5th year STEP → M.A.
Department of Chemistry

Family of chemists

Research is required

- 6 labs + 2 openings
- 4 PIs with NIH/NSF/PRF funding

Research seminars in chemistry

- Eight-semester sequence
- Wednesday 2:15 – 3:15
- All full-time faculty & majors
- Student presentations
- Invited speakers
- Group work: writing abstracts & proposals
- Safety
Department of Chemistry

Layers of Safety

Faculty & staff
- Chemical hygiene officer
- Teaching laboratory & day stockroom supervisor
- Chemical waste manager & night stockroom supervisor
- PPEs (anytime in the lab)

Students
- Safety in the Laboratory required course (majors)
- Research and teaching assistant training (majors)
- Laboratory safety requirements (all students)
- PPEs (all students)
- Student safety committee
Student Safety Committee

Get involved!

Committee makeup
- Two students from each year
- Eight total
- Self-nominate

Benefits of membership
- Practical aspects of lab safety
- Leadership skills
- Looks good on a resume
- Hanging out in the Chair’s office
- Free food
Student Safety Committee

Objectives

Culture
• Inspections will become the expected norm
• Constant, visual reminder

Students have a stake in their own safety
Students will be peer role models

Another layer of safety
• Live inspections
• Deficiencies are often found
Student-led Inspections

A borrowed concept, modified for Adelphi academic labs

Not a new idea
- ACS Committee on Chemical Safety (CCS) luncheon at the 2017 San Francisco meeting
- James Kaufman @ The Laboratory Safety Institute

Self-inspections are standard in industrial labs
- Upjohn/Pharmacia 1991 – 2003
- Pfizer 2003 – 2009

Modified inspection form
- Started with an older one from Pfizer
- Modified based on student input
- More succinct
Inspection Form Details

Chemical fume hoods (items in gold are common/corrected deficiencies)

1. First 6” of hood unobstructed-free of chemicals and glassware
   Yes  No  N/A  Comments

2. Hood clean and not cluttered

3. Hood sash closed when not in use

4. Waste containers in the hoods are properly labeled and labels are not degraded by overflow from waste

5. Waste containers are not filled above the 4/5 mark

6. Waste containers are contained in secondary containers
Inspection Form Details

Equipment

7. Electrical panels kept clear for 36 inches

8. Electrical cords & outlet strips in hood, protected from spills & flammables; electrical cords in good repair and secured

9. Refrigerators/Cold Boxes - not over crowded, frost free, labeled "Not for Food Storage", items labeled and in secondary containment where applicable

10. Gas Cylinders - secured to bench or holder, proper regulator in use, capped when not in use

11. Electrical Equipment - cords intact and not posing trip hazard
Inspection Form Details

Fire and safety equipment

12. Chemical storage cabinets labeled & kept fully closed (i.e. latched shut)

13. Biosafety cabinets certified in the last year

14. Fire Extinguishers - know location, sign, proper use, tag up to date (monthly), accessible

15. Eye Wash Stations - know location, sign, proper use, accessible, tag up to date (quarterly)

16. Did you test the sink eyewash station? Was the water clean? Is the benchtop area around the eyewash station marked, and free of obstruction?
Inspection Form Details

Fire and safety equipment (continued)

17. Safety Showers - know location, sign, accessible, tag up to date (quarterly)

18. Sprinkler heads/ceiling unobstructed (>18" ceiling clearance)

19. Spill control kit present
Inspection Form Details

General housekeeping

20. Sinks - uncluttered

21. Minimum aisle width of 32" maintained

22. Shelves - No heavy items, combustible materials, or glass containers above eye level

23. Benches - clean, uncluttered

24. No surplus, stockpiled, or obsolete chemicals

25. No flammable solvents near heat sources

26. Aisleways/hallways/stairs free of tripping hazards/clutter, floors dry and unobstructed
Inspection Form Details

Hazard warning signs and labels

27. Biohazard signs properly displayed

28. No Food in Lab sign

29. Proper PPE required signage

30. Phones display emergency 5 number and have dial tone

31. Exit signs visible from the nearest hallway or main corridor
Inspection Form Details

PPE

32. Site PPE Policy followed by occupants
Samples, reagents, and chemicals

33. MSDSs available or online access

34. All containers closed, properly labeled and stored

35. Peroxide-forming solvents labeled with date of opening and discarded within 6 months of being opened and within 12 months unopened (e.g. THF, ether, dioxane, DME etc.)

36. Flammable chemicals stored in flammable cabinets when not in use

37. Incompatible chemicals segregated (e.g., acid, base)

38. Wash bottles appropriately labeled (no abbreviations), stored in hood/cabinet when not in use
Inspection Form Details

Waste handling

39. Waste containers correctly identified (i.e. label is applicable to the type of waste being collected)

40. Labels properly filled out (i.e. contents, legible & visible for inspection)

41. Waste containers compatible with waste and in good condition, with no structural defects or leaks

42. Waste containers closed when not actively in use
Student-led Inspections

Opportunities

Research
- 6 wet labs

Teaching
- Physiological chemistry (16 fall, 6 spring)
- General chemistry (11 fall, 8 spring)
- Organic chemistry (6 fall, 4 spring)
- Analytical chemistry & Biochemistry (2+2 fall)
- Inorganic chemistry & Physical chemistry (1+1 spring)

69 Inspection Opportunities
Each done TWICE
Student-led Inspections

Logistics

Pre-inspection meeting
  • Calendar coordination
  • Ideally two students for each inspection
  • Always miss a couple labs each semester
Student-led Inspections

Logistics

Inspections
• Aim for weeks 4 and 10 of the semester
• One hour after start of 2.5 hour lab
• Two hours after start of 5 hour lab
• Research labs on Wednesdays after seminar

Post-inspection meeting
• Consolidate deficiencies
• Discuss any issues or problems
• More free food
Student-led Inspections

Logistics

Teaching labs
  • Faculty notified one week in advance

Lab inspections by the Student Lab Safety Committee week of February 25

Thu, Feb 21, 2019 at 3:41 PM
To: Brian Stockman <bstockman@adelphi.edu>, Daniel Silverio <dsilverio@adelphi.edu>, David Parkin <parkin@adelphi.edu>, Dempsey Hyatt <dhyatt@adelphi.edu>, Justyna Widera <widera@adelphi.edu>, Melissa Van Alstine <mvanalstine@adelphi.edu>, Samantha Kovener <skovener@adelphi.edu>, Timothy Sorbuchner <tsorbuchner@adelphi.edu>, Andrew Lichtman <alichtman@adelphi.edu>, Buddhadeb Mallik <bmallik@adelphi.edu>, Edward Shenal <eshenal@adelphi.edu>, James Adamski <adamski@adelphi.edu>, Nicholas Sisti <nsisti@adelphi.edu>, Sonna Allun <sallun@adelphi.edu>, Vasiliki Kanellis <vkanelis@adelphi.edu>, Wesley Miller <wmiller@adelphi.edu>
Cc: Eva Liza Songcuan <elsongcuan@adelphi.edu>

Greetings,

The Student Lab Safety Committee will be walking through and inspecting the teaching labs during the week of February 25 (if no lab is being held, they will come back the following week). The schedule and inspection form are attached.

Thank you for helping support this initiative.

Brian
Student-led Inspections

Logistics

Teaching labs
- Faculty notified one week in advance

Research labs
- Faculty notified day before

Inspection sheets are posted in teaching labs
- Work in progress – need bulletin boards
Student-led Inspections

Inspections

Live – labs are in progress
Teams of two students
- One inspection form
- Takes about 20 minutes per lab
Inspectors operate under my ‘umbrella’
- Check-in with instructor
- Minimize disruptions
- Don’t bother the other students
- No direct feedback to instructor
- Unless imminent danger
Unexpected outcomes

Wear the yellow badge

During inspections
  • 15 inspections x 20 minutes = 5 hours

mysafetysign.com
$5.07 each for >20
Unexpected outcomes

Wear the yellow badge **ALL THE TIME!**

During inspections
- 15 inspections x 20 minutes = 5 hours

During research time
- 14 weeks x 4 hours = 56 hours

During lab period
- 14 weeks x 2.5 hours = 35 hours
- 14 weeks x 5 hours = 70 hours

While working as a teaching assistant
- 14 weeks x 2.5 hours = 35 hours
- 14 weeks x 5 hours = 70 hours

While working in the stockroom
Constant, visual reminder!!
Student Presentations in MEDI

Wednesday 7:00 – 9:00 PM, West Hall E2

MEDI 321: Julia Persaud
Structure-activity relationships of fragment-based inhibitors of *Trichomonas vaginalis* uridine nucleoside ribohydrolase

MEDI 328: Samantha Thuilot
NMR-based counter screens of fragment inhibitors of *Trichomonas vaginalis* uridine nucleoside ribohydrolase confirm reversible, target-specific inhibition

MEDI 329: Abinash Kaur
Molecular modeling and NMR-based counter screens of fragment inhibitors of *Trichomonas vaginalis* adenosine/guanosine nucleoside ribohydrolase

MEDI 342: Madison Canestrari
Translation of $^1$H and $^{19}$F NMR-based activity assays to in vitro characterization of nucleoside hydrolase activity in cell extracts and whole cells
Thank you!