

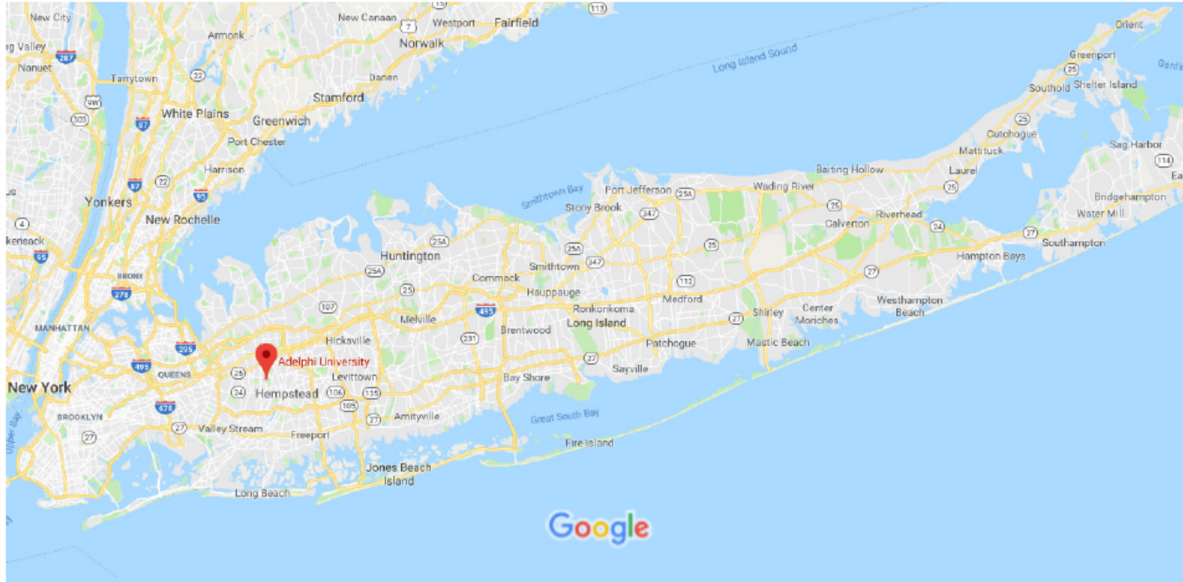
# Student-led Safety Inspections of Chemistry Teaching and Research Laboratories

Brian J. Stockman

2 April 2019

# Adelphi

A modern metropolitan university with a personalized approach to higher learning



Map data ©2019 Google 5 mi

# 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% 5<sup>th</sup> 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

The Upjohn logo is displayed within a light gray rectangular box. It consists of the word "Upjohn" in a bold, black, sans-serif font.The Pharmacia logo is shown in a blue, italicized, sans-serif font.

# 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



# Inspection Form Details

## 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)

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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

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

1 message

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**Brian Stockman** <bstockman@adelphi.edu>

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 <ihyatt@adelphi.edu>, Justyna Widera <widera@adelphi.edu>, Melissa Van Alstine <mvanalstine@adelphi.edu>, Samantha Kovener <skovener@adelphi.edu>, Timothy Sonbuchner <tsonbuchner@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 Allen <sallen@adelphi.edu>, Vasiliki Kanellis <vkanellis@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

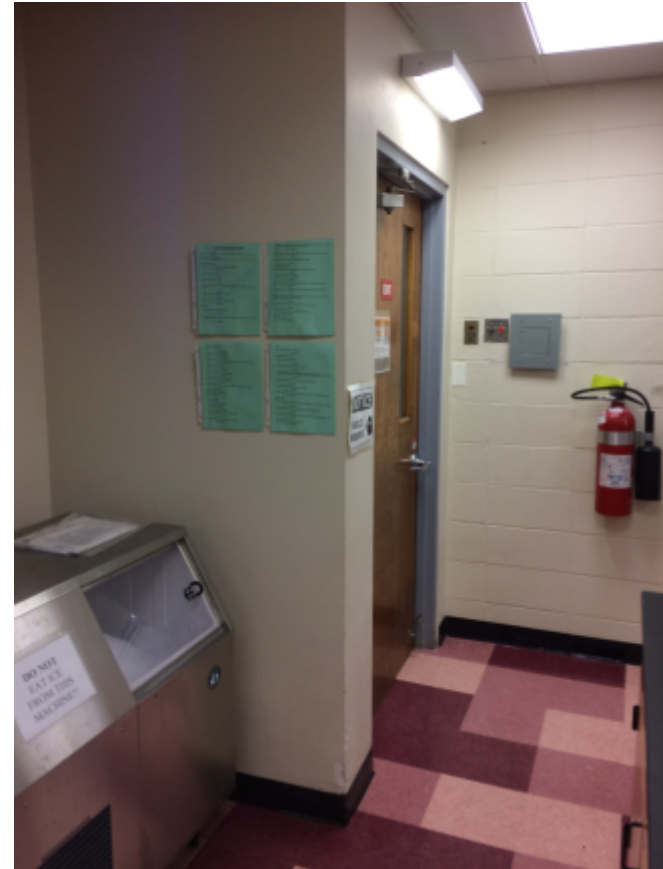
- Faculty notified one week in advance

### 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](http://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  $^1\text{H}$  and  $^{19}\text{F}$  NMR-based activity assays to in vitro characterization of nucleoside hydrolase activity in cell extracts and whole cells

Thank you!

