

# SAFETY BY DESIGN

Improving Safety in Research Laboratories

*For Faculty, Researchers, Students and EH&S Professionals*



ORGANIZED BY:  
National Institutes of Health  
Office of Research Services  
Division of Occupational Health and Safety  
University of California Center for Laboratory Safety  
Northwestern University

**APRIL 10-12, 2016**  
Natcher Conference Center | Bethesda, Maryland



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# Objectives

- Survey causes of accidents in research laboratories.
- Explore ways in which lab safety practices can be improved as an integrated part of research practices.
- Examine the importance of safety culture in
  - improving compliance
  - decreasing accidents and injuries
  - expanding the impact of a research program.

8:00 am - 9:00 am

Registration

9:00 am - 9:20 am

Welcoming Remarks

Michael Gottesman, Deputy Director for Intramural Research, NIH

9:20 am - 10:10 am

Keynote Talk

David Michaels, Assistant Secretary of Labor for OSHA

10:15 am - 10:45 am

RISK Perception and Management

George Gray (Dept. Environmental and Occupational Health, George Washington

11:00 am - 12:30 pm

Panel Discussion on Moving Beyond Lab Accidents

Moderated by Taylor  
Tennessee, APLU L

Chemical Safety Board  
Biosecurity & Select Agent Programs, NIH

Michael Blayney (

Joseph Kanabrock

University of Chic

Kristen Kulinowsk

Craig Merlic (Dep

Casey Skvorc (Bio

William Tolman (D

Member)

Alice Young (Dep

University, APLU L

Northwestern University

Texas Tech University

UCLA

University of Chicago

University of Minnesota

University of Tennessee

- 4:30 pm **Laboratory Safety in Industry and National Labs**
- 3:35 pm **Dawn Mason** - Portland State University, APLU Lab Safety Taskforce Member  
**Eastman Chemical Company**
- 4:00 pm **Kimberly Jeskie** - Director of Laboratory Safety, Oak Ridge National Laboratory  
**Oak Ridge National Laboratory**
- 4:25 pm **Lori Seiler** - Associate Director of Laboratory Safety, Eastman Chemical Company  
**Dow Chemical Company**
- 5:20 pm **Cross-Pollination Session: One-on-one exchange of different work-group topic ideas** - Record discussion points
- 5:40 pm **Center-Sponsored Research - Accidents at UCLA, what have we learned?**  
**Imke Schroeder** (UC Center for Laboratory Safety)
- 6:00 pm **Impact of PI Engagement in Laboratory Safety on Injuries of Research Personnel**  
**Nancy Wayne** (Dept. Physiology and Associate Vice Chancellor for Research, UCLA, APLU Lab Safety Taskforce Member)
- 9:00 pm **Dinner with Gene Block** (speaker) – Chancellor of UCLA  
*Location: Bethesda Marriott*



# Themes

## emerging from the work groups

- How should safety be considered in hiring & advancement of faculty and PIs?
- How can faculty, students & staff be empowered to “own” a culture of safety?
- What skill sets are needed – and how are they best acquired & maintained?
- What institutional practices support – or hinder – a strong positive safety culture?



# Themes

## emerging from the work groups

- What role should granting agencies play in hazard & risk assessment?
  - Expectations? Enforcement?
  - Risk assessment of proposed work as part of submission, review, or award?
  - Requirement that institutions certify hazard analysis & mitigation and appropriate training & supervision?
  - Should funding agencies gather and share incidents & near misses?

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July 31 - Everyone involved in the academic chemical research enterprise has an important role to play in establishing and promoting a strong, positive safety culture, says a [new report](#) from the National Research Council.

NEW REPORT

Promoting Safety in Academic Chemical Research

NEW REPORT

Public Financing System for Physician Training Needs Overhaul

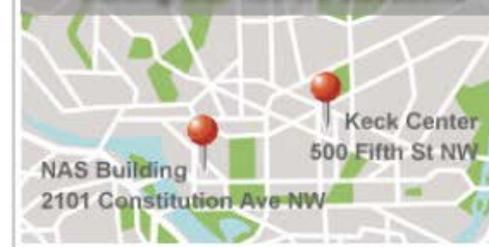
NEW REPORT

Lessons Learned From 2011 Fukushima Nuclear Accident

NEW REPORT

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## Safe Science:

# Promoting a Culture of Safety in Academic Chemical Research (2014)

**Strong, Positive Safety Culture ... Requires Support From All Levels**

# Key actors

## SAFE SCIENCE

### Actions for Principal Investigators and Department Chairs

## Principal Investigators and Department Chairs

## Laboratory Researchers

## University Senior Leaders

## Deans and Vice Presidents for Research

## Environmental Health and Safety Staff

Interest in promoting safety in academic research laboratories has grown in recent years, following high-profile incidents in which researchers were injured or killed. Many colleges and universities want to go beyond complying with regulations to fostering a safety culture: affirming a constant, institution-wide commitment to safety and integrating safety as an essential element in the daily work of researchers.

A report from the National Research Council, *Safe Science: Promoting a Culture of Safety in Academic Chemical Research*, identifies steps that everyone involved in research and other activities using chemicals—from researchers to principal investigators to university leadership—should take to create and promote this approach to safety.

As principal investigators, you have enormous influence over the culture in the laboratories, which you lead. In many ways, you set the tone for the standard of safety that will be implemented. The principal investigator and the entire institution are responsible for promoting safety and providing the resources and training needed to work safely. Day-to-day actions and practices that lead to safe laboratories demand that you, as PIs, encourage participation, commitment, and leadership among your research team (or group), whose safety is at stake.

#### ELEMENTS OF A STRONG LABORATORY SAFETY CULTURE

An ideal laboratory safety culture ensures that anyone who enters a laboratory, from inexperienced students to senior investigators, understands that they are entering an environment that requires special precautions. They are aware of the hazards posed by the materials they and others in the lab are working with, and they are prepared to take immediate and appropriate measures to protect themselves and their co-workers, especially in the case of unexpected events. At a minimum, laboratory safety includes:

- awareness of the physical and chemical properties and health hazards of laboratory reagents and equipment being used, gained by conducting hazard analysis,
- availability and use of proper apparatus and infrastructure needed to carry out the procedure safely,
- knowledge of and ability to execute any additional special practices necessary to reduce risks,
- use of proper personal protective equipment,

- access to a well-organized workspace that facilitates unrestricted movement about the laboratory and appropriate segregation of materials and processes, and
- familiarity with emergency procedures, including the use of safety showers, fire extinguishers, and eye stations.

A strong, positive safety culture encourages all laboratory workers to place the highest priority on these practices. It is not enough to provide safe equipment, systems, and procedures if the culture of the organization does not encourage and support working safely.

One of the barriers to the development of safety culture in academic laboratories is the attitude that safety practices inhibit research productivity. But the occurrence of a serious incident in a laboratory, in addition to being a tragedy in itself, stops research and is certainly a dramatic impact on research progress, as anyone who has experienced or witnessed such an incident can attest.

It is part of the academic culture for researchers to work long hours, late at night, and often alone. These practices may reflect a pressure to produce results, influenced by power dynamics that are antithetical to the advancement of a strong safety culture. No amount of productivity justifies carrying out hazardous procedures alone and with inadequate sleep.

Safety is a core element of responsible research, not an impediment to it. Good science is safe science, fostering a productive and secure work environment. Like publishing papers and acquiring grants, conducting research safely is key to the success of a research group, and it must be held in high academic esteem.

#### ACTIONS FOR PRINCIPAL INVESTIGATORS

Academic research faculty play primary roles in laboratory safety and in developing and maintaining an effective safety culture within their research groups. Principal investigators should take the following steps to promote this kind of culture:

**Encourage open and ongoing dialog about safety.** Graduate students and other research staff are dependent, financially and educationally, upon principal investigators' grants and research projects. This sense of dependence may inhibit them from raising safety concerns because of fear that the principal investigator will feel that they are less focused on

# Basic requirement for safe research:

When I enter a lab or studio, I understand

- ... I'm entering an environment that requires special precautions
- ... the hazards posed by the materials & processes in the space, and
- ... how to take immediate and appropriate measures to protect myself and my co-workers, especially in the case of unexpected events.
- At a minimum, laboratory & studio safety includes:
  - genuine awareness of the properties and hazards of reagents, equipment, and processes being used, gained by conducting hazard analyses as regular component of research work,
  - availability and use of the apparatus, PPE, and infrastructure needed to work safely,
  - knowledge of and ability to execute any additional special practices necessary to reduce risk