American Chemical Society issues guidelines for safer research laboratories

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The world's largest scientific society today issued guidelines to better ensure the safety of the tens of thousands of personnel who work in research laboratories around the country. The American Chemical Society (ACS) issued the report, requested by a federal safety board, during its 246th National Meeting & Exposition. The meeting, which includes almost 7,000 reports on new advances in science and other topics, continues here through Thursday.

"Guidelines and standard operating procedures are common in industrial settings where chemicals and pharmaceuticals are manufactured in large amounts, but they are much less common in research laboratories, particularly in academia," said Kimberly Jeskie. She chaired the 12-member task force that developed the guidelines and is a hazards analysis expert at the Oak Ridge National Laboratory. "Often, students and staff working in research labs do not identify and evaluate all potential hazards, especially physical hazards, when devising experiments. That is crucial to keep everyone safe and reduce the potential for harm."

The U.S. Chemical Safety and Hazard Investigation Board (CSB), an independent federal agency that investigates industrial chemical accidents, requested the report in the aftermath of a 2010 laboratory accident at Texas Tech University in Lubbock, Texas. A graduate student was injured in the accident, and CSB found several safety lapses. CSB's investigation concluded that safety guidelines already in effect at research institutions typically are lacking when it comes to the safe

handling of potentially explosive materials. And guidelines from the U.S. Occupational Safety and Health Administration also do not specifically address this type of hazard.

CSB asked ACS to "develop good practice guidance that identifies and describes methodologies to assess and control hazards that can be used successfully in a research laboratory."

ACS' Committee on Chemical Safety, working with the Society's Division of Chemical Health and Safety, responded by assembling a task force, which wrote the report *Identifying and Evaluating Hazards in Research Laboratories*. The report states that key elements of hazard identification and evaluation include defining the scope of work, recognizing the potential hazards involved in every step of an experiment and evaluating the chances that a hazard will happen. It also discusses the selection and use of proper safety equipment and procedures. Continual learning is also an integral part of the process, the report states, citing the importance of reviewing the experiment and reflecting on the safety lessons learned.

The report will be introduced at the Indianapolis meeting through a symposium featuring Rafael Moure-Eraso, Ph.D., CSB Chair, with members of the task force describing the methodologies that can be used for hazards analysis by laboratory researchers.

"Safety in the research laboratory setting is the responsibility of all stakeholders involved in research activities throughout the institution, including administrators, as well as researchers," the report emphasizes. "For a hazards identification and evaluation process to be successful, everyone must know and be committed to their respective roles and obligations." The report is not intended to be a comprehensive guide on the development of a culture of chemical safety, but is rather geared specifically toward the identification, evaluation and mitigation of

hazards as they exist in the research laboratory. "Additional information concerning the advancement of a safety culture may be found in the ACS report, titled *Creating Safety Cultures in Academic Institutions: A Report of the Safety Culture Task Force of the ACS Committee on Chemical Safety*," the report states.

The report includes five methods that scientists and students can put into practice immediately. They are Chemical Safety Levels, Job Hazards Analysis, What-If Analysis, Hazards Analysis Checklists and Structured Development of Standard Operating Procedures. It also includes discussions on how to use each technique, the situations in which a researcher should use a particular method, and the limitations and challenges associated with the methods.

Provided by American Chemical Society