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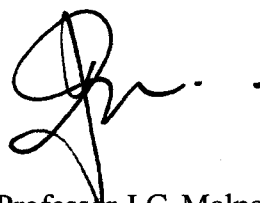
Lessons from a Fatal Accident in a Laboratory of UCLA

On 29 December 2008, a research assistant of UCLA suffered fatal burns from a chemical fire when she was handling a spontaneously ignitable chemical t-butyl lithium in an organic chemistry laboratory in UCLA's Molecular Sciences Building. With 43% of her body sustaining second- and third-degree burns, she died in a hospital's burn unit 18 days after the accident. An account of how the accident happened and the investigations conducted by UCLA's own safety officials as well as state and national governments was reported by the Los Angeles Times. An extract of this newspaper report is attached.

Investigations indicated that many factors contributed to the tragic consequence: inappropriate technique, lack of safety training and supervision, improper protective clothing, inadequate emergency preparedness. Had any of those elements been corrected, the accident or at least its tragic consequence could have been prevented.

While it is true that most of the departments in HKU do not have or use this type of hazardous chemical, there are still lessons to be learned by all of us from the accident when we start examining the root causes of the accident and reflecting on those safety issues behind the scene. Among other things, it was the failure of those involved to perceive the risks of their operations that resulted in the chain of events leading up to the accident. The risks of the activities in your department may be different from those in the UCLA accident, but have you taken the time to examine the risks in your department? Have you identified the potentially hazardous operations in your department that can lead to serious consequences? Have you taken steps to reduce the risks? Are those involved in hazardous operations prepared for emergency? If you have not done so, it is time to start reviewing the situation and to put safety measures in place to address those issues.

Let us all learn from the lessons of the UCLA accident, and start asking your colleagues at all levels to assess and control the risks in their operations. Our Director of Safety Dr Edmund Hau and his colleagues would be glad to offer their advice and assistance to you whenever necessary.



Professor J.G. Malpas
Pro-Vice-Chancellor

May 14, 2009

Deadly UCLA lab fire leaves haunting questions



Sheri Sangji celebrates her graduation from Pomona College in May with brother Hussain, mother Maimoona, father Shaukat and sister Naveen. Two months before Sangji was burned in a chemical fire, UCLA safety inspectors found more than a dozen deficiencies where she was working.

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Federal and state safety agencies investigate after university officials failed to address lapses before a Dec. 29 chemical accident left a research assistant with fatal burns.

By Kim Christensen
March 1, 2009

UCLA's Molecular Sciences Building was mostly closed for the holidays on Dec. 29 as research assistant Sheri Sangji worked on an organic chemistry experiment.

Only three months into her job in the lab, the 23-year-old Pomona College graduate was using a plastic syringe to extract from a sealed container a small quantity of t-butyl lithium -- a chemical compound that ignites instantly when exposed to air.

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Sheri Sangji

As she withdrew the liquid, the syringe came apart in her hands, spewing flaming chemicals, according to a UCLA accident report. A flash fire set her clothing ablaze and spread second- and third-degree burns over 43% of her body.

Eighteen excruciating days later, Sangji died in a hospital burn unit.

"It is horrifying," said her sister Naveen, 26, a Harvard medical student. "Sheri wasn't out doing something stupid. She was working in a lab at one of the largest universities in the world. She gets these horrific injuries and loses

her life to these injuries and we still don't know how it happened or why it wasn't prevented."

Sangji's death was more than a tragic workplace accident. It also raised serious questions about the university's attention to laboratory safety.

"It was totally preventable," said Neal Langerman, a San Diego consultant and former head of the American Chemical Society's Division of Chemical Health and Safety, whose members were given a detailed account of the incident by a

University of California safety official.

"Poor training, poor technique, lack of supervision and improper method. This was just not the right way to transfer these things," Langerman said. "She died, didn't she? It speaks for itself."

Two months earlier, UCLA safety inspectors found more than a dozen deficiencies in the same lab, Molecular Sciences Room 4221, according to internal investigative and inspection reports reviewed by The Times. Among the findings: Employees were not wearing requisite protective lab coats, and flammable liquids and volatile chemicals were stored improperly.

Chemical Safety Officer Michael Wheatley sent the inspection report to the researcher who oversees the lab, professor Patrick Harran, as well as to the head of the Chemistry and Biochemistry Department and a top UCLA safety official. The report directed that problems be fixed by Dec. 5.

But the required corrective action was not taken, records show, and on Dec. 29 all that stood between Sangji's torso and the fire that engulfed her was a highly flammable, synthetic sweater that fueled the flames.

Under scrutiny

The California Division of Occupational Safety and Health is investigating, as are the Office of the State Fire Marshal, the National Institute for Occupational Safety and Health and the U.S. Chemical Safety and Hazard Investigation Board. A spokeswoman for Cal/OSHA, the lead agency, said she could not comment on the investigation.

UCLA officials say they are cooperating with all of the agencies.

"We consider this a profoundly tragic accident, and the campus community is still reeling from the loss of Sheri as a member of the Bruin family," said Kevin Reed, vice chancellor for legal affairs.

Harran, the organic chemistry professor for whom Sangji worked, said he could not comment on the accident because of the pending investigations. But he said he's heartbroken.

"Words cannot convey my grief or that of those who work in my lab, and our pain cannot possibly compare with the immeasurable anguish felt by Sheri's family," he wrote in an e-mail. "Sheri's death is a tragedy that has left her friends, colleagues and co-workers here in our department devastated."

UCLA has launched a comprehensive review of lab safety protocols and has stepped up inspections and shortened the time allowed to correct serious violations. Chancellor Gene Block also established a campuswide lab safety committee and ordered enhanced accountability measures.

Such efforts are of little comfort to Sangji's family. Her parents, Shaukat Sangji, a small-business owner who lives in Toronto, Canada, with his wife, Maimoona, a Montessori schoolteacher, were too distraught to be interviewed, said Naveen, who relayed an e-mail message to The Times from her father.

"They say time will heal, but I know for sure nothing can heal this," he said. "This has completely destroyed our lives forever."

Born and raised in Pakistan, Sheharbano "Sheri" Sangji followed her older sister to Pomona College, a small, top-tier liberal arts school in Claremont, in 2003. Their parents and younger brother moved to Canada.

"Sheri always loved science and fell in love with chemistry," Naveen said, but she also was interested in the rights of women and immigrants, environmental policy and law. She decided to become an attorney, with an eye toward a career that would blend her interests.

"She was brilliant, just so impressive," her sister said.

Daniel O'Leary, Sheri's chemistry professor for nearly three years at Pomona, recalled her as being upbeat, with a good sense of humor, and an independent problem-solver who published two papers as an undergraduate in professionally vetted chemistry journals.

"She was a talented researcher and a very involved student in the chemistry department," said O'Leary, who earned his doctorate at UCLA and now teaches at Bowdoin College in Maine.

Sangji graduated in May and had applied to some of the nation's top law schools.

In October, she took a job in a lab run by Harran, a rising star who joined the UCLA faculty in July as the first Donald J. Cram Chair in Organic Chemistry. In 2007, Harran and colleagues at the University of Texas Southwestern Medical Center gained notice for their work on a synthetic toxin that shrinks cancerous tumors in mice.

"Sheri was excited about this job . . . and was so happy when she got it," said her friend Jahan Bruce, 24, a special-education teacher. "She wanted to be in the

research area and wanted to be in a university setting. All of her friends thought this was perfect for her."

On Dec. 29, Sangji was performing an experiment related to Harran's work on a potential anti-obesity drug, UCLA's Reed said.

She was trying to transfer up to 2 ounces of t-butyl lithium, which was dissolved in pentane, another highly flammable chemical, from one sealed container to another. It was the second time she had performed that procedure in Harran's lab, UCLA officials said.

"The barrel of the syringe was either ejected or pulled out of the syringe, causing liquid to be released," the UCLA accident report stated.

Sangji's rubber gloves caught fire, searing her hands. Her sweater, made of a synthetic material, was so flammable that Langerman, the chemical safety expert, compared it to "solid gasoline." It, too, was quickly engulfed.

The panicked young woman ran away from a nearby emergency shower instead of toward it, records state, costing her precious time.

"She might have been fine" had she quickly made it to the shower, said Russ Phifer, head of the American Chemical Society's safety division, who also reviewed the UC official's account of the accident.

A postdoctoral researcher, who UCLA officials say was just a few feet away, rushed to Sangji's aid and tried to smother the flames with a lab coat. Another ran in from an adjoining room, helped douse the fire, then called 911 and summoned Harran, Reed said.

"He said when he got there Sheri was sitting with her arms outstretched in front of her and someone was throwing water at her from a sink," said Naveen, who spoke with Harran later at the hospital. That account squares with the UCLA accident report.

From the Ronald Reagan UCLA Medical Center, Sangji was transferred to the Grossman Burn Center in Sherman Oaks.

It is unknown whether a typical cotton lab coat would have saved her. But even if it caught fire, it could have been removed much more easily than a burning synthetic sweater, safety expert Phifer said.

"I can't imagine why she didn't have protective clothing if she knew she was working with chemicals that dangerous," Sheri's friend Bruce said.

Training questioned

But just how much Sangji knew about the procedure that took her life is an open question.

"The employee may not have been using best work practices while handling the syringe to transfer a pyrophoric liquid," a UCLA accident report concluded. "The employees should be instructed in safer handling techniques."

Harran told a UCLA investigator the day after the fire that a syringe "was the appropriate method" for transferring t-butyl lithium -- and that Sangji had been trained how to do it. But according to the investigator's report, Harran did not know when that training occurred and had no record of it, as required by Cal/OSHA and UCLA lab safety standards.

UCLA's Reed said Sangji "was trained by senior chemists within Dr. Harran's lab to conduct this specific experiment and handle these specific chemicals." But he couldn't say why there was no record of it.

"We're still trying to figure that one out," he said, adding that Cal/OSHA is also looking into it.

At the hospital, Naveen said, her sister told her that she was not given safety training: "She was very clear about the lack of safety training, because I asked her directly."

It was not unheard of for people in Harran's labs to work without protective gear, UCLA records show.

On Oct. 30, two months before the fire, an annual safety inspection uncovered more than two dozen deficiencies in his four labs, including the one where Sangji worked. Among other things, inspectors found excessive amounts of flammable liquids and missing chemical spill cleanup kits.

"Eye protection, nitrile [rubber] gloves and lab coats were not worn by laboratory personnel," the inspection report said.

The Nov. 5 report said lab coats "must be worn while conducting research and handling hazardous materials in the lab" and assigned the Dec. 5 deadline to correct the deficiencies.

After the accident, however, Bill Peck, UCLA manager of occupational safety and

employee health, wrote in his report that "most of the corrections in the laboratory were not accomplished by 12/30/08."

A first-aid kit and spill cleanup materials were still lacking; flammable materials and water- and air-reactive chemicals were still being stored improperly; and employees still weren't using protective equipment, the report said.

Cal/OSHA is investigating why the deficiencies were not corrected sooner, UCLA officials said. One potential factor, they said, is that Harran had planned to move the lab.

Phifer and Langerman saw other potential problems: At the time of the fire, Sangji worked at a cupboard-like "fume hood," which pulls potentially harmful vapors out through an exhaust system. It has a tempered-glass vertical sash that probably was not lowered enough, they said, because if it had been, only her hands and forearms would have been burned.

In addition to the fume hood, Sangji would have been better protected if she had used a "blast shield," a free-standing portable device made of brass that chemists put between themselves and potentially dangerous experiments, the experts said. A blast shield was not required for that experiment, Reed said, and it is unknown if one was available.

Langerman also questioned the safety of transferring t-butyl lithium with a syringe.

"The preferred method is to use pressure to push the liquid out of the source bottle into your receiver through a stainless-steel tube," he said.

Both experts also wondered if Sangji and the postdoctoral researchers who risked their lives to help her had received adequate fire safety training. UCLA officials say they had.

"The response afterward is probably most responsible for her death," Phifer said. "The fact that she immediately turned away from the shower and went in the opposite direction is a problem. It means that she wasn't properly trained in what to do in the event she caught fire."

Final days

At the burn center, Sangji's family found her wrapped in bandages, her arms suspended from the ceiling. Deep burns covered her back, legs, torso and ears.

"It was really hard to see her like that," Naveen said. "They gave her a lot of sedation and oxygen therapy, but she was in a lot of pain. Her big concern was her hands. She really worried that she wouldn't get function back. She kept asking about her hands: 'Will they get better? How long will it take?' "

Naveen said her sister could not bring herself to discuss the accident: "She was having flashbacks and nightmares, and she didn't want to talk about it."

Only family members were permitted visits, so friends dropped off cards and posters with photos and messages of encouragement for Sheri, an avid soccer player. She seemed to make progress for about a week, her sister said, but began to decline at about the time of a second surgery to remove burned tissue.

On Jan. 16, she succumbed to respiratory failure, infection and other complications, according to a coroner's report.

"Sheri was such a fighter that it just never entered our minds that she wouldn't make it through," her sister said.

A day before her funeral in Toronto, her family learned that she had been accepted to UC Berkeley's Boalt Hall School of Law.

"It was her dream school," Naveen said.

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Times staff writer William Heisel contributed to this report.