

FROM THE JUNE 2015 ISSUE

# Death in the Lab

A UCLA laboratory fire took Sheri Sangji's life. Her boss and the university closed ranks. Will her family's crusade for justice make researchers any safer?

By Beryl Lieff Benderly | Thursday, April 30, 2015



Jonathan Bartlett

With the campus nearly deserted for winter break, this Monday in late 2008 should have been a quiet one at the University of California, Los Angeles. Around 1 p.m. Dec. 29, Sheharbano “Sheri” Sangji began an experiment in the fourth-floor chemistry lab where the 23-year-old worked as a research assistant to chemistry professor Patrick Harran.

Alone at the bench, wearing a synthetic-fiber sweatshirt, she put on goggles and gloves and began the procedure Harran had outlined to her that morning as part of work to develop a drug to treat obesity. It included transferring a liquid called tert-butyllithium from the bottle it came in to another bottle.

Tert-butyllithium is pyrophoric — it ignites on contact with air — so its manufacturer, Sigma-Aldrich, sent detailed instructions for safe handling with each bottle. Only “fully qualified and experienced laboratory workers” should work with it, the instructions say, according to an investigative report. They should receive training on the specific procedures needed to stay safe: goggles and gloves, but also a fire-resistant lab coat over natural-fiber clothing down to the underwear, and possibly a full-face respirator mask. If a syringe is used, it should be glass, at least twice as large as the quantity to be transferred and fitted with a needle a foot or two long. Sangji had learned to make a transfer from one of Harran’s postdoctoral researchers, who would later admit he hadn’t read those instructions and didn’t follow them.

Sangji hoped to spend the holiday break with her sister and brother, but she couldn't get time off from the job, which she started just nine weeks earlier. She considered the job an interesting way to spend the year between her college graduation the previous May and law school the coming September, using her Pomona College chemistry degree to earn money for law school.

In the lab that December day, Sangji relied on what she had learned from the postdoc researcher, inserting the 2½-inch needle of a large plastic syringe into the bottle's seal. Suddenly, the syringe came apart in her hands, spilling the liquid, which instantly ignited, setting her sweatshirt ablaze. Screaming in pain and panic, she ran for the door — and away from the emergency shower just feet from her that was meant for precisely this type of situation.

Weifeng Chen, a postdoc working elsewhere in the lab, raced over. Tearing off his lab coat, he frantically used it to try to smother the fire engulfing Sangji. When it, too, began to burn, he tried water from a sink. Meanwhile, postdoc Hui Ding dashed in, then ran to call 911 and summon Harran from the floor above. Only when emergency responders arrived did anybody drench Sangji under the shower. No one in the lab was drilled on what to do in case of fire.

The fire would ignite a landmark legal case and the first-ever felony charges for safety violations against an American professor. In legal filings and comments on the case, UCLA officials would consistently call the fire “a tragic accident.” Laboratory safety experts, however, say the fire was no more an accident — in the sense of a mishap that happens by chance — than being thrown from a car while not wearing a seat belt.

No one knows how many chemical safety incidents occur in university laboratories each year. The U.S. Chemical Safety Board, a federal agency that investigates chemical safety events, has “preliminary” information on more than 120 incidents since 2001. Workers in university labs — including 110,000 graduate students and postdoctoral researchers, plus uncounted undergraduates and technicians — are 11 times more likely to get hurt in a university lab than in an industrial lab, according to U.S. Occupational Safety and Health Administration statistics.

## **A Sister in Anguish**

Naveen Sangji, Sheri's 26-year-old sister, arrived in Los Angeles the next morning on the first plane she could get from Boston, where she was in her fourth year at Harvard Medical School. Slender and petite, Naveen appears too slight to contain the passion that burns in her large, dark eyes when she speaks of the “promising, brilliant young woman with her whole life ahead of her” — the idealist, the student, the soccer player, the devoted friend. “Words cannot express her spirit,” she says. In the intensive care unit of the Grossman Burn Center that day, Naveen felt her trained clinical detachment fail her. The sight of her kid sister's face — unblemished by the fire, peeking out among the thick bandages shrouding her ears, neck, chest, arms, hands, back and thighs — engulfed Naveen in anguish. The slightest touch to Sheri's skin caused her to scream in agony.

Sheri had third-degree burns over 40 percent of her body. Naveen, who hoped to be a burn surgeon, knew the best possible outcome was months in the ICU, extreme pain, numerous surgeries and years struggling to recover function.

An uncle also reached the burn center that morning from Toronto, where the extended family had moved from their native Pakistan when Sheri was a teenager and Naveen was in her early 20s. Their parents, who were traveling in Asia, reached Sheri's side three days later.

Amid Naveen's terror, grief and "utter helplessness," however, her scientific mind demanded to know how this happened. According to Naveen, Harran came to the burn center on Dec. 31. She had spoken with him on the phone from Boston. Now she and her uncle met with him. Harran told them Sheri was very conscientious in the lab and he described the transfer, Naveen recalls. The uncle, a structural engineer whose work involved fire safety, was the first to frame the question that would haunt Naveen and form the crux of the legal struggle. "After Harran finished his spiel, my uncle asked him why wasn't she given fire-retardant gear," Naveen says.

"Harran said they used lab coats 90 percent of the time," she says. "I remember that because I wrote it down." The investigative report would find that, "with few exceptions, personnel did not routinely wear lab coats while working in the lab."

Over the following weeks, Naveen and her parents watched Sheri endure multiple surgeries. Between operations, encased in bandages and tubes, she spent her waning strength with those she loved, who read her the many messages arriving from friends and family around the world.

Meanwhile, Naveen began seeking the answer to her uncle's question. "Sheri suffered agonizing injuries," she says; she expected that some official body would conduct a full and impartial investigation. But meetings with UCLA officials — including the university fire marshal, the chemistry department chair and Chancellor Gene Block — produced no new information. As Naveen's search widened, Sheri's burns deepened, and her organs began to fail. On Jan. 16, 2009, Sheri died.

Sheri's death, and the way she died, left her parents — a Montessori teacher and a small-business man — "mere shadows of the people they used to be," Naveen says. She knew she would have to lead the drive for answers. Justice for Sheri, the family agreed, meant not revenge or material damages, but rather a public trial that laid out the truth and held accountable those who should have protected Sheri. The only thing her parents want, Naveen says, is that "someone else's child shouldn't have to suffer, other parents shouldn't have to suffer."

As Sheri lay dying and Naveen pursued answers, both Harran and UCLA — the fifth-largest employer in Los Angeles and one of the world's top-rated universities — began taking refuge in the same argument, one they would carry into the upcoming legal fight. Sheri, they maintained, was "an experienced and skilled chemist," though the chemical company where she worked for several months before UCLA considered her a novice researcher who needed supervision. "The campus continues to believe that she was using an appropriate method," Vice Chancellor for Legal Affairs Kevin Reed said in a statement in June 2009. The university, Block would repeatedly say, stood with Harran.



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## A Stellar Rise

Harran and close associates refused or did not respond to interview requests for this story, but his remarkable research life is a matter of public record.

Harran's career as a scientific star began early, with honors at Skidmore College, Ph.D. studies at Yale and two postdoctoral years at Stanford. In 1997, at the strikingly young age of 28, he landed his first faculty job in a competitive labor market as an assistant professor at the University of Texas Southwestern Medical Center in Dallas. He advanced with exceptional speed.

He beat out a dozen other labs in a race to synthesize a toxin that attacks cancer cells. Nearly alone among anti-cancer agents, diazonamide A did not harm normal cells, suggesting the possibility of a drug with few side effects. In 2001, Harran's tour de force research also uncovered and corrected an error in the initially published chemical structure. He also showed that diazonamide A could kill cancer cells by a method previously unknown, making him not only a master of chemical synthesis but a contributor to cancer research.

He gained tenure in five years and full professorship in just seven — a time when most academics are first up for tenure. Less than a year later, he had an endowed chair in biochemistry.

Beyond technical mastery, Harran reportedly finds aesthetic and humanitarian value in crafting molecules. “Synthetic chemistry is like painting or architecture,” he told the Glens Falls Post-Star, published near his childhood home of Corinth, N.Y. “We have almost infinite possibilities in the ways we can create new materials. . . . Discovering a new type of reaction or finding something out about a molecule that, for example, could be very useful, or could change people’s lives? That’s remarkable.”

In July 2008, Harran moved to UCLA, and the university provided \$3.2 million to get his new research operation underway. Naveen said Sheri told her that Harran pushed his staff to help him win “the Nobel Prize in six years.”

## **Safety Standards on Trial**

State investigators soon began seeking answers. As a university employee, Sheri came under the jurisdiction of the California Division of Occupational Safety and Health, known as Cal/OSHA. Had she been a student, the agency would have lacked jurisdiction because occupational safety laws cover only paid workers. No government agency had the power to exact penalties, for example, when a lab explosion in 2010 critically injured Texas Tech University graduate student Preston Brown or when a lathe strangled Yale University senior Michele Dufault in 2011 in a university science building.

Sheri’s case would be different. In May 2009, Cal/OSHA fined the University of California \$31,875 on four violations of the occupational safety law: lack of required safety training, lack of needed protective equipment, failure to maintain an “effective Injury and Illness Prevention Program” and lack of required training records. It classified the first three violations as “serious,” indicating a likelihood of serious injury or death.

These findings and fines were hardly the inquiry that Naveen had expected. The family wanted “a full investigation and want to see a more comprehensive questioning into how my 23-year-old sister lost her life from injuries sustained while working at UCLA,” she says. In the *Journal of Chemical Safety*, lab safety expert Neil Langerman wrote, “The death of Ms. Sangji was the direct result of management failure throughout the UCLA administration, from Chancellor Gene Block through Professor Harran and the [Environmental Health and Safety] department.” Later developments would confirm this view.

Much of the academic scientific community, however, agreed with UCLA and, amid expressions of shock and sorrow, argued that Harran had done nothing that lab chiefs across the country do not do every day.

Scientists in industry took a different view. Officials at three major chemical companies published an open letter citing lax university safety standards that require companies to provide new hires arriving from campuses “weeks of remedial safety training before [they] are allowed to work in their labs.” William Banholzer, then technology chief at Dow Chemical, says in industry, “If you can’t do the work safely, you can’t do it in our company. . . . If somebody violates our safety protocols, we’ll dismiss them. I’ll go into a lab and shut them down.”

Determined to force the authorities to seek deeper causes, the family appealed the Cal/OSHA citations and pressed for the opportunity to express their concerns to the agency, as did Sheri’s labor union, the University Professional & Technical Employees Local 9119 of the Communications Workers of America. UCLA, which initially paid the fines, also filed an appeal of the findings.

Cal/OSHA authorized a new investigation. Senior Special Investigator Brian Baudendistel interviewed Harran, as well as the postdoc who was said to have demonstrated the transfer to Sheri, the two postdocs who tried to help her and her boss at Norac Pharma, where she worked before UCLA. Baudendistel's 95-page report, released in December 2009, detailed how, more than two months before the fire, a university safety inspection noted inadequate use of lab coats and other protective equipment in Harran's lab and ordered improvement within 30 days, a requirement Harran failed to fulfill.

"Dr. Harran," Baudendistel wrote in his report's conclusion, "simply disregarded the open and obvious dangers presented in this case and permitted victim Sangji to work in a manner that knowingly caused her to be exposed to a serious and foreseeable risk of serious injury or death." He sent the report to the district attorney, recommending a charge of involuntary manslaughter.

By now a surgical resident in Boston, Naveen feared that the DA would not prosecute so powerful an institution and its prominent faculty member. In all the time she could spare, she worked to bring pressure on the DA and keep the case alive in the media. She made calls, wrote letters and collected thousands of signatures urging prosecution. "There is no doubt in our minds," Naveen wrote to the DA just days before the statute of limitations expired in late 2011, "that criminal prosecution, against the university and the professor, will be the single most effective deterrent to unsafe laboratory conditions in the future at UCLA, and at other universities."

In December 2011, the Los Angeles DA charged Harran and the regents of the University of California with three felony counts, later raised to four, of willful violations of California's labor code with a resultant death. Conviction on all counts carried up to four-and-a-half years in prison.

Chancellor Block denounced the charges as "unwarranted" and again pledged UCLA's "full support," including legal defense. Some scientists objected to Harran being "railroaded" for conduct most considered ordinary. Others, especially lab safety experts, saw conviction as the well-deserved — and cautionary — consequence of neglect.

In July 2012, the university regents settled with the DA. They agreed to "accept responsibility for the conditions under which the laboratory was operated," to create a law school scholarship in Sheri's name and to establish, in all the chemistry labs on all of the system's 10 campuses, an extensive program of required safety training and compliance for all lab workers. In exchange, the DA dropped the felony charges.

Never before had an academic institution come under a legal standard equivalent to that found in industry, where management enforces safety from the top down.

Harran, however, did not settle and continued to maintain his innocence. Given the high risk of conviction should a jury hear Baudendistel's conclusions, his defense team used every possible means to prevent a trial. They made repeated motions to dismiss the charges, knowing that the statute of limitations precluded the prosecution ever bringing them a second time. Delays postponed arraignment dates. On Sept. 5, 2012, over the defense's objections, a Los Angeles judge entered four not-guilty pleas for Harran. That November, a judge ordered him to stand trial.

Harran's lawyers eventually petitioned the California appeals court to dismiss the charges because the university, not Harran, was Sheri's employer. The appeals court asked for briefs, raising the possibility of a

dismissal, but it never heard arguments. In May 2014, the district attorney settled with Harran.

Harran would accept “responsibility for the conditions under which the laboratory was operated” but would not plead guilty. The district attorney will dismiss the charges if, during five years of probation, Harran teaches summer courses in chemistry to disadvantaged high school graduates, lectures incoming UCLA chemistry students about lab safety, performs 800 hours of service in the UCLA hospital and donates \$10,000 to the burn center where Sheri died. Because the settlement allowed Harran to avoid criminal penalties, the landmark case that many had hoped would set a new standard for accountability in labs across the country ended without settling the legal question of whether the lab chief has personal responsibility for the safety of students and workers.

In the courtroom on the last day of proceedings, after nearly six years of anguish and effort, Naveen rose to tell the judge of Sheri’s dauntless spirit and ruined future, of her sister’s agony and her family’s desolation. With many of her listeners in tears, Naveen called the settlement “barely a slap on the wrist for the responsible individual. . . . We do not understand how this man is allowed to continue running a laboratory, and supervising students and researchers. We can only hope that other young individuals are better protected in the future.”

The agreement, one of Harran’s lawyers told reporters outside the court, will “allow professor Harran to continue with his life-saving work.”

Harran said nothing as he left the court.

UCLA spent nearly \$4.5 million on his defense.