Teen stars learn hands-on science in internships

Kshama Agrawal, a senior from Silver Creek High School in San Jose, carries a tray of cells while working at a Stanford lab.

Michelle Chen, a graduate of Lynbrook High School in San Jose, looks at cells while researching diabetes during an internship program at Stanford University.

PRESTIGIOUS POSTS EXPOSE STUDENTS TO CUTTING-EDGE LAB WORK

By Anne Rochell Konigsmark
Mercury News

While her friends from Silver Creek High School spent the summer sleeping late or studying for the SATs, Kshama Agrawal made mice glow green.

Kshama, 17, is one of 20 Bay Area teens chosen for a prestigious eight-week summer internship at Stanford University. She studied pediatric leukemia with a post-doctoral researcher in a Stanford laboratory, learning to handle serum samples and high-tech lab instruments. They attached a leukemia gene to a green fluorescent protein, which glows under an ultraviolet-light microscope, then injected it into mice and tracked the disease’s progress.

The highlight of her summer was “seeing the cells glow and seeing what we actually theorized happen in real life,” said Kshama, who lives in San Jose.

In its second year, the internship, organized by the multi-disciplinary Center for Clinical Immunology at Stanford (CCIS), aims to expose high-achieving high school juniors and seniors to real-life research and the world of scientific exploration.

Besides lab work, the students attend formal lectures and lunch lectures and go

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"By the end of the summer, they are designing and carrying out relatively complex experiments in a semi-independent fashion."

— DR. P.J. UTZ, AN ORGANIZER OF THE INTERNSHIP PROGRAM

Kshama Agrawal, 17, of San Jose, changes the environment of cells to make a virus during an internship at Stanford University in which she assists with lab work.

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on field trips to labs where researchers are involved in cutting-edge work.

"For me, it's exciting to see how they start off knowing absolutely nothing," said Dr. P.J. Utz, an assistant professor of medicine and an organizer of the internship program. "They can't even hold a pipette to draw up fluids, and by the end of the summer, they are designing and carrying out relatively complex experiments in a semi-independent fashion."

Derek Fong, a recent graduate of Mountain View High School, got so involved in his internship last year that he continued working in the lab throughout his senior year and returned full time this summer. He is the co-author of a paper that will be published in a major scientific magazine, said Utz, who worked with Fong. It is very unusual for a high school student to co-author a scientific paper, Utz said.

"We constructed protein arrays using a robot," Utz said. These arrays, or groupings of more than 1000 proteins, can be used to screen human serum samples for autoimmune diseases such as lupus. "This could be used to design customized therapy for patients. Because if you have 10 patients with lupus, each one is different."

The internships ended this week; Thursday night, the students showed off their summer's work in a poster session for parents, faculty and medical school deans. Other science and medicine departments at Stanford have expressed interest in creating similar internship programs, said Dr. C. Garrison Patman, director of CCIS.

The interns, who are paid $1,500 for eight weeks and also receive free parking and an immunology textbook, are funded by private donations through the Northern California chapter of the Arthritis Foundation and CCIS.

Utz has been surprised that both this year and last year, almost all of the interns have been female.

Kshama thinks she knows the reason.

"At this age, boys are not mature," she said. "Or the mature ones are too shy to go after programs like this."

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