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## Bay Area science teachers put on lab coats and go to work at Stanford

Two dozen teachers from local middle, junior high and high schools are spending eight weeks working alongside Stanford scientists this summer.

BY KATHLEEN J. SULLIVAN

Ask Karen Truesdell why she would give up her precious summer vacation to spend two months working in a basement laboratory on campus, and, teacher that she is, she will answer the question with a question.

"Where else can you go to be *paid* to listen to Stanford professors give lectures and to work on a *real research study*?" Truesdell, a biology teacher at Milpitas High School, said during a recent interview in a basement lab in the [Beckman Center for Molecular and Genetic Medicine](#).

She paused a moment, a look of wonder lingering on her face, and added: "*Wow.*"

Truesdell is one of two dozen teachers – one from a middle school in San Jose, two from junior high schools in Silicon Valley, and 21 from high schools all over the Bay Area – who are taking part in Stanford's [Summer Research Program for Teachers](#).

While most of the teachers work at public and charter schools, two of them teach at private schools – one in San Francisco and another in San Mateo. Within the group, the teachers are about evenly divided among biology, chemistry and physics teachers, with a smattering who also teach general science or math.

Truesdell began the program on June 21 and will complete it at the end of this week.

The eight-week program is a joint project of Stanford's [Office of Science Outreach](#) and the consortium, [Industry Initiatives for Science and Math Education](#), or IISME.

"It's a really wonderful collaboration, because each organization has strengths," said Kaye Storm, director of the Office of Science Outreach. "IISME has a huge network of teachers and can provide coaching and a process for them to develop and share new lessons and teaching materials. Stanford has opportunities and a stimulating environment for them."

The teachers work in a Stanford lab four days a week. They meet once a week – on Mondays – for science and engineering lectures, lab tours and seminars on teaching, and for lunch at a different campus café each week.

The purpose of the program is to re-energize teachers, to expose them to a broad array of scientific fields and to give them in-depth, hands-on research experiences. The goal is to send the teachers back to their classrooms filled with more confidence and enthusiasm – and more knowledge – about the world of science and engineering research and its applications.

"The possibility of working in a research lab at Stanford was a big draw for me," said Truesdell, who will begin her 11th year of teaching this fall. "I'll be able to bring some of that experience back to my students."

Participants receive a stipend of \$7,200 for the program, paid with money from gifts and government grants, most notably from the National Science Foundation, the Howard Hughes Medical Institute and the National

L.A. Cicero



Karen Truesdell, left, a Milpitas High School teacher and her research mentor, Peggy Ho, in the Steinman Lab. Truesdell is one of 24 middle school, high school and community college teachers taking part in Stanford's Summer Outreach Program for Teachers.

Institutes of Health. Teachers also are eligible to receive five units of Stanford Continuing Studies credits, as well as an additional \$1,000 in grants.

Teachers participating in the intensive program are required to be on campus 40 hours a week.

### **Each teacher has a faculty host and a mentor**

This summer, professors in a dozen departments are sponsoring teachers, including bioengineering, chemistry, and civil and environmental engineering. One of the teachers is working at the [Stanford Solar Center](#). Another is working at the [Center to Support Excellence in Teaching](#). Still another is working with researchers in the Medical School's Division of [Infectious Diseases and Geographic Medicine](#).

Truesdell's host is Dr. Lawrence Steinman, the George A. Zimmerman Professor of Neurology and Neurological Sciences, Pediatrics, and Genetics at Stanford's School of Medicine. The [Steinman Lab](#) is dedicated to understanding the pathogenesis – the origin and development – of autoimmune diseases, particularly multiple sclerosis.

Truesdell's mentor is Peggy Ho, a research associate in the lab. Ho, who has served for many years as a mentor to high school students doing research in the [Stanford Institutes of Medicine Summer Research Program](#), said it has been refreshing to also work with a high school teacher this summer. Ho joined the Steinman Lab as a postdoctoral fellow in 2000, after receiving a master's degree and a doctorate in immunology and microbiology from Wayne State University in Michigan.

"Karen is very upbeat and enthusiastic about science, so that makes it easy to teach her all of our basic techniques in the lab," Ho said. "She's a fast learner and isn't afraid to ask questions, so her project has been going pretty smoothly."

Ho said one of the lab's research projects is to investigate the dual role of naturally occurring brain lipids as inflammatory targets and as protective guardians in multiple sclerosis.

Truesdell said the summer program has been inspiring as well as educational.

"I'm working with an amazing group of people who have an in-depth knowledge of neurology and immunology, and the application of that knowledge to multiple sclerosis and other autoimmune diseases like it," she said. "I'm working with people who really care about finding a cure and treatments for multiple sclerosis."

### **Projects span the scientific spectrum**

This summer, teachers are working on a wide variety of projects:

- Jason Lopez, who teaches at Wilcox High School in Santa Clara, is developing science lessons and labs for middle and high school students who are being treated for childhood cancers at Lucile Packard Children's Hospital.
- Lynette Jackson, who teaches at Leigh High School in San Jose, is collecting samples from the field and conducting analyses to test for antibiotic resistant bacteria in water samples.
- Meghan Shuff, who teaches at Los Altos High School, is conducting experiments on the control of heat loss or gain by the human body, and its effects on cognition.
- Len Esparza, who teaches at Cupertino Junior High School, is investigating different thin film solar cells that will achieve good performance at low cost.
- Miguel Baldoni, who teaches at Latino College Preparatory Academy in San Jose, is helping develop equipment that allows students in middle or high school science classes to watch single DNA and protein molecules move, using recently available, off-the-shelf technology to build devices that will cost only about \$100.

The group also includes teachers from Mission High School in San Francisco, Sequoia High School in Redwood City and Castro Valley High School in the East Bay.