

Learning in the Lab

Undergraduates in NSM and ECS have abundant opportunities to participate in research studies

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Here's a little known fact: research opportunities are plentiful for undergraduates in the colleges of Natural Sciences and Mathematics and Engineering and Computer Science.

For example, Carlos Garcia, a senior civil and environmental engineering major, and Ishwar Dhungana, a graduate student in the same major, are working with Binod Tiwari, assistant professor of civil and environmental engineering, on a research project titled "Reduction of the Stability of Pre-existing Landslides During Earthquakes."



Amybeth Cohen



Binod Tiwari

"We are studying the Prithwi Highway in Nepal, which has a history of landslides," Tiwari said. "We are using a geographical information system for capturing, storing, analyzing and managing data and associated attributes."

The road, which is important to the region, has been blocked many times because of landslides, so there is a great deal of existing data to work with, Tiwari said, "and it is always cheaper to work with existing data than it is to generate all your data from the beginning."

The information gathered, he said, will have applications worldwide.

Myriad other research projects that NSM and ECS students are working on include studies dealing with Alzheimer's disease, increasing life expectancy, pharmaceuticals, bridge construction, robotics, atmospheric chemistry, lasers, the role of metals in the human body, preserving rocky coastlines, monitoring endangered species, tracking climate changes since the last ice age, quickly detecting toxins in water, and removing contaminants and harmful microbes from water.

Many NSM and ECS students also can take part in the Minority Access to Research Careers program.

MARC offers research opportunities for underrepresented students seeking careers in biomedical research and is funded by grants from the National Institute of General Medical Sciences, one of the National Institutes of Health.

This year's MARC scholars are: junior chemistry majors Anna Trinidad and Gary Gallego, junior psychology majors Lilia Rodriguez and Vanessa Harris, senior biological sciences major Jose Corleto, and Jacob Gonzalez, a senior biochemistry major.

"We take scholars into the program when they are finishing their last two years of classes at the university," said Amybeth Cohen, associate professor of biological science and Cal State Fullerton's MARC director. "We also have our first pre-MARC scholar, Rolando Ruiz, a sophomore biological science student. We hope to expand the pre-MARC program. It allows the students to prepare for MARC, which is research-intensive and includes a

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number of assignments."

Cohen said Ruiz sits in on the MARC seminars, completes all assignments, has a research mentor and conducts research. However, he is not receiving the stipend or travel money that full MARC scholars receive.

The MARC program provides high-quality research training to undergraduates through a curriculum that includes an enhanced seminar series and experience conducting research with Cal State Fullerton faculty members. MARC Scholars also receive personalized career and academic advisement and experience in presenting

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research data on campus and at national conferences.

Program applicants must be from an ethnic background underrepresented in biology, chemistry, biochemistry, psychology, bioengineering and other biomedical-related fields. Also considered are applicants who represent the first generation in his or her family — regardless of ethnicity — to attend a four-year university, or who come from a high school that does not send a high percentage of its students to a four-year college. Students from any ethnicity who can provide proof of financially disadvantaged status also can apply.

And, Cohen emphasized, "applicants must intend to pursue a Ph.D. or M.D./Ph.D. program in biology, biochemistry, chemistry, psychology, bioengineering or other biomedical-related field."

Other programs offering research experiences are the Minority Health and Health Disparities International Research Training Program (usually shortened to MHIRT), funded by the National Institutes of Health's National Center on Minority Health and Health Disparities, which sends students to foreign universities to work with researchers there over the summer; and the National Science Foundation-funded Research Experiences for Undergraduates, which brings students to the campus to work with faculty.

In addition, there are opportunities for undergraduate and graduate students to work with faculty on research that is funded directly from outside sources, that is, not through university channels. *inside*



Jacob Gonzalez works in the lab.