UC SANTA BARBARA
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UCSB To Receive $1 Million for Undergraduate Biology Research from the Howard Hughes Medical Institute

At UC Santa Barbara, hundreds of sophomores take the introductory biology course each year. Soon, each one will have the opportunity to perform original research on the roundworm *Caenorhabditis elegans*, a widely used genetic model for biomedical research, thanks to a $1 million grant from the Howard Hughes Medical Institute (HHMI).

The grant is part of HHMI's commitment to helping universities strengthen undergraduate and precollege science education nationwide. HHMI announced today a total of $70 million in grants to research universities across the nation to advance these efforts.

The inspiration for much of the new curriculum at UCSB came from the experience of Joel Rothman, a biology professor and chair of the Department of Molecular, Cellular, and Developmental Biology, when he directed the summer embryology course at the Marine Biological Laboratory (MBL) in Woods Hole, Mass. During the MBL course, graduate students and postdoctoral fellows spent three days conducting original experiments on *C. elegans*. Despite the time limitations, these advanced students were able to make original scientific discoveries, and came away with an

appreciation for this area of research.

Back at UCSB, Rothman and his colleagues Kathy Foltz and Rolf Christoffersen, also biology professors, began thinking about whether such an approach could be adapted to undergraduate laboratory activities that might kick-start college students' interest in original research. "If advanced students could make original discoveries in only three days," Rothman notes, "we wondered if it might be possible for biology students who are just starting their training to do the same over several quarters in a laboratory course." Some 600 to 800 UCSB students take the introductory biology course each year.

As part of the new effort, called the Large-scale Undergraduate Research Experience (LURE), each introductory biology student will use RNA interference to knock down one of the worm's 20,000 genes in an effort to identify which genes are important for specific aspects of development or physiology. "*C. elegans* is easy to grow, and the techniques are standard, making it ideal for such a large-scale undergraduate project," Rothman said. "It will be true research, as the outcome of each experiment will not be known beforehand. In fact, some students may not find anything. That will be an important lesson, too. Failure is a perennial part of the research experience."

The university plans to share the students' results with the worldwide *C. elegans* research community by publishing their data on the web. Those results could stimulate new directions for researchers around the world. "There are elements in science in which 600 pairs of eyes and hands are very valuable," said Rothman.

Foltz and Christoffersen also designed continuing research experiences into the more specialized upper-division courses that will be supported by the HHMI.

In addition, a summer "boot camp" course that they and other faculty crafted will provide the most research-motivated students from UCSB and other institutions an opportunity for in-depth research experiences, under the direction of accomplished scientists from several UCSB departments.

"The overall package, made possible by generous support from the HHMI, will allow undergraduate biology students at all stages of their training to experience the thrill of making scientific discoveries that no one else on the planet has heretofore known," said Rothman.

The grant is part of HHMI's Precollege and Undergraduate Science Education Program. Fifty research universities in 30 states and the District of Columbia will be awarded grants through the undergraduate program.

"HHMI is committed to funding education programs that excite students' interest in science," said HHMI President Robert Tjian. "We hope that these programs will shape the way students look at the world –– whether those students ultimately choose to pursue a career in science or not."

HHMI, the nation's largest private funder of science education, has spent $1.6 billion since 1985 to reform life sciences education, from elementary through graduate school.

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