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HHMI Seeks Schools to Join Science Education Revolution

The Howard Hughes Medical Institute will hold its third nationwide competition to find 12 colleges and universities to join the Science Education Alliance (SEA), a bold effort to engage students through authentic research experiences at the start of their academic careers.

The schools selected in this competition will join 24 other institutions in a network working to enhance science teaching and inspire new generations of scientists. Schools may submit applications from May 25 to October 1, 2009. Any four-year academic institution in the United States is eligible to apply, but they must be committed to providing research opportunities for beginning science students.

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— **Tuajuanda Jordan**

The SEA, which is headquartered at HHMI's Janelia Farm Research Campus in Northern Virginia, was created by HHMI in 2007 to help scientists and educators work together to create and distribute new materials and methods to the education community. HHMI has committed \$4 million over four years to the Alliance.

The SEA's first project is the National Genomics Research Initiative, an innovative research course for beginning students that unites students and faculty across the country to work on a common research problem. HHMI chose genomics because it is a new, important branch of science that can encompass a wide range of biology topics, ranging from microbiology to molecular biology to bioinformatics. The class itself, which was first offered during the 2008-2009 academic year, has been greeted enthusiastically.

"These students are fully engaged in their research; it is obvious that they are really learning and really thinking," says SEA director Tuajuanda Jordan. "It is good to see that if you challenge students to do more than memorize facts they are able to go beyond that."

In the first year, more than 250 students took the two-term course at 12 schools across the nation. The students began by going to nature: they isolated a virus from locally collected soil samples. They then spent the remainder of the term purifying and characterizing the DNA of their purified virus. Almost every student identified an entirely new virus, which they got to name.

The purified DNA from one virus was sent by each school to the Joint Genome Institute-Los Alamos National Laboratory in New Mexico for sequencing. That resulting data allowed students to spend the second term using bioinformatics tools to analyze and annotate the DNA sequence and identify genes. Students compared their DNA sequence to that characterized by other SEA schools and researchers worldwide.

Faculty participating in the National Genomics Research Initiative—which includes training workshops for faculty and technicians—say they prize the opportunity to be part of a community of scholars who are sharing ideas, discussing challenges, and suggesting solutions. That supportive environment also benefits the students. “Not only do these new scholars experience true discovery, they become part of a national education network that shares findings and solutions to common problems,” says Peter J. Bruns, vice president for grants and special programs.

HHMI will select 12 schools in the 2009 competition, and the applicants will be notified of the decision by January 2010. Each participating institution will be given teaching and laboratory resources, and the participating faculty and teaching assistants will receive hands-on training on the laboratory and bioinformatics portions of the courses. In addition, they attend several meetings to discuss challenges and solutions with their fellow faculty members. A limited number of schools will also be selected as associate members, which will allow them access to the program’s course materials and the site’s online wiki.

Jordan says many schools could benefit from being part of the SEA. “The course is adaptable in a variety of different institutions and has targeted a variety of different types of students,” she says.

More information about the Science Education Alliance and background about this initiative can be found at www.hhmi.org/grants/sea/. The application and other details can be found at www.hhmi.org/grants/sea/apply.html.