Macalester receives $1.3M grant from the Howard Hughes Medical Institute

St. Paul, Minn. – Macalester has received a $1.3M, four-year grant from the Howard Hughes Medical Institute (HHMI) in support of undergraduate science education. Macalester, one of 47 small colleges and universities in the United States to receive a HHMI award, will use the funding to promote curricular innovation and to provide local and global research experiences for students. Macalester's application was considered along with 181 other submissions in this national competition.

HHMI
HOWARD HUGHES MEDICAL INSTITUTE

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Macalester's proposal, titled "Transforming Data into Knowledge: Curricular Innovations in the Era of Big Data," emphasizes the important computational skills scientists must develop to access, analyze and draw dependable conclusions from large, complex data sets. The award will pursue several inventive ways to build those skills in undergraduates.

"The proposal is the product of deep and extensive collaborative work among Macalester's science faculty," said Macalester President Brian Rosenberg. "The process that led to the formation of this proposal is an example of the 'integrative science' envisioned in our program and bodes well for the future success of our work."

Students who begin scientific careers in the coming decades will confront data in multiple formats from multiple sources. They must be able to judge the quality (precision, completeness, and accuracy) of data, comply with evolving practices of use (property, privacy and security, access), and select and execute appropriate computational strategies to analyze the data and convey to others the knowledge derived from it. While advanced analytic software and data experts will supply tools for these endeavors, ultimately scientists must make critical judgments that depend on their grasp of the data and their familiarity with the phenomenon under study.

To prepare students for such future challenges, Macalester faculty will infuse computational principles and data fundamentals into the science curriculum, encouraging students to take on the challenges of Big Data. Because data and computation cross disciplinary boundaries, this undertaking is multi-disciplinary, involving 24 faculty members and 17 courses/labs. Faculty in Biology, Chemistry, Environmental Studies, Geography, Geology, Mathematics/Statistics/Computer Science, Physics, Psychology, and Neuroscience Studies will take part.

Faculty development and curricular innovations will develop through the Computation and Visualization Consortium (CVC), led initially by science faculty at Macalester and made up of faculty at other liberal arts colleges. Faculty will attend workshops and collaborate on curricula and instructional strategies. Building on the CVC workshops, Macalester faculty will devise a Data Fundamentals course where students in multiple disciplines first encounter core principles of data structure, computation, and visualization.

In order to reinforce and extend these core principles, students will collect, analyze, and represent data in various research settings, including academic labs at Macalester and at the University of Minnesota. Furthermore, in collaboration with partners at universities in Uganda, student participants in the Global

Health Scholars program will have the opportunity to complete a research project in a course in the fall and then travel to Uganda to present their findings during the following January.

“Collectively, these activities will anchor Macalester’s efforts to prepare students to be leaders in science and medicine in an era of increasingly complex and large data sets,” said Biology Prof. Paul J. Overvoorde, who developed the proposal and will direct the grant activities. “Students will refine and enhance their computation and visualization skills from the beginning of their studies, across multiple disciplines, and into intensive research experiences, learning how to transform data into knowledge.”

Since 1988, the Howard Hughes Medical Institute (HHMI) has awarded more than $870 million to 274 colleges and universities to support science education. HHMI support has enabled nearly 85,000 students nationwide to work in research labs and developed programs that have helped 100,000 K-12 teachers learn how to teach science more effectively.

HHMI’s approach differs from that of many other organizations, including the federal government, because its science education awards are made at an institutional level and not to individuals. As a result, HHMI encourages science faculty and administrators at colleges and universities to work together to develop common educational goals.

Macalester College, founded in 1874, is a national liberal arts college with a full-time enrollment of 1,958 students. Macalester is nationally recognized for its long-standing commitment to academic excellence, internationalism, multiculturalism and civic engagement. Learn more at macalester.edu (http://www.macalester.edu/).

May 24 2012

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