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Mercy College

Mercy Initiative for Undergraduate Research and Education in Genomics

Project Summary/Abstract (Publicly Releasable)

Founded in 1950, Mercy College is an accredited, private, nonsectarian, coeducational liberal arts college with both urban and suburban campuses in Dobbs Ferry, the Bronx, Manhattan, and Yorktown Heights in New York. Embracing technology, Mercy has over 200 classes as well as 30 undergraduate, graduate, and certificate programs entirely online, including an innovative on-line Nursing program. Mercy is a federally-designated Hispanic Serving Institution, where many students are the first in their families to attend college and/or are low-income. Mercy has been designated as a “Bright Spot” in Hispanic Education by the White House and is noted as being a “military-friendly” college by the Department of Veteran Affairs, receiving a “Yellow-Ribbon” designation. For six years running, *G.I. Jobs* magazine has named Mercy College as among the top 20% of the nation’s “Military Friendly Schools.” Also, in November, 2015 Mercy was designated a 2016 STEM JobsSM Approved College by Victory Media, the leader in connecting young professionals with education and career opportunities.

Mercy College requests funds of \$142,771.75 to purchase the components of a genomics system—an Ion S5—and associated equipment and training. This system will be a significant addition to the existing biotechnology suites available at the College’s Bronx campus, the developing research infrastructure at the main Dobbs Ferry campus, and complete the research and education pipeline from gene to organism, thereby facilitating high-impact research in areas such as genomics, metagenomics, and transcriptomics. The genomics system will serve as the core equipment of a new Initiative for Undergraduate Research and Education in Genomics (IUREG). Under the direction of the Principal Investigator, Dr. Davida Smyth, the initiative will expose Mercy students, staff and faculty as well as high school students, teachers, and the local public (through workshops and seminars) to advances in bioinformatics and genomics. The focus of the proposed initiative will be to enhance the quality and range of science education and research at Mercy. Improving the education experience by means of high-impact, student-driven, mentored research has demonstrated efficacy in improving student retention in STEM fields, particularly among underrepresented minority-students. The activities of the initiative will include: 1) design and integration of inquiry-based genomics modules throughout the undergraduate STEM curriculum, including biology, mathematics, and computer science; 2) development of research-focused undergraduate courses within the natural sciences such as bioinformatics and applied and environmental microbiology; 3) providing the means for faculty to establish novel and advanced research activities in genomics to foster an environment that engages and invigorates students and faculty; and 4) development of educational genomics-based outreach activities, including seminars and workshops for regional high school students, teachers, and the public.

Sequencing technology is at the forefront of the natural sciences and is used in almost every aspect of biology, from the level of the gene (genomics) to the level of the protein (proteomics), to bioinformatics, metabolomics, and systems biology (using computers). These technologies are used in such diverse fields as medicine, forensics, microbiology, plant and animal sciences, and synthetic biology. Bringing genomics to the undergraduate arena will enable Mercy College to give our underrepresented minority students—also underrepresented in the scientific community—the capability to gain skills needed to succeed in these fast-growing, technology-dependent fields and enter the workforce as skilled 21st century graduates.