

POSTER PRESENTATION

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# The HHMI National Genomics Research Initiative at Western Kentucky University

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## Background

Western Kentucky University is a member of a select group of colleges and universities chosen to participate in a national science experiment designed to improve undergraduate science education. To introduce freshman students to authentic research, the Howard Hughes Medical Institute's Science Education Alliance (HHMI SEA) has implemented an innovative program to introduce genomics into the classroom. The program draws on themes and techniques from biology, microbiology, molecular biology, genomics and bioinformatics. The WKU course is called "Genome Discovery and Exploration" (GDE); WKU Genome Discovery and Exploration Program [<http://bioweb.wku.edu/asp/wkungri/>]. During the fall semester, students isolate bacterial viruses from the environment and characterize them using a variety of techniques including DNA analysis and electron microscopy. Over the winter break, the complete DNA sequence of one of the viruses isolated by the GDE students is determined. During the spring semester, GDE students learn how use computer programs (e.g. Consed, Glimmer, Genemark, BLAST and Phamerator) to identify all the viral genes and to make genome wide comparisons to identify evolutionary relationships. All course participants and the SEA staff are connected via the internet to share and analyze data, troubleshoot, and discuss results. Near the end of the spring semester, HHMI hosts a research symposium for course faculty and one student from each institution to report on their discoveries and experiences. As unique phages are characterized on campuses nationwide, students will have the opportunity to publish their research for the broader scientific community. This hands-on experience with the tools of Bioinformatics is an outstanding training

opportunity and this unique program has helped the WKU Biology Department create an introductory pipeline to research experiences that complements our existing and planned instructional programs and allows freshman to engage in the thrill of discovery.

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