

ABSTRACT

The Jackson Laboratory requests NIH R25 support for an innovative three part educational program, Big Genomic Data Skills Training for Professors. The program will, 1) train undergraduate college and regional university faculty across biology, mathematics and computer science departments; 2) develop a flexible and modular curriculum that faculty can implement at their institutions and 3) engage a diverse student group through dynamic annual data challenges. The biomedical research enterprise requires a workforce that can access, manipulate, integrate and analyze big data; it is essential to train the next generation of scientists to fill this need. The proposed education program will stimulate big data skills training across dozens of institutions and hundreds if not thousands of students and provide a template for genomic big data training at colleges needing improved expertise. An intensive one week workshop will provide skills training to professors from small colleges and regional universities. Jackson Laboratory scientists and participants will use a collaborative, multi-disciplinary approach to develop, deliver and publish online a big data curriculum for implementation in undergraduate courses. Annual data challenges will foster team-based science where undergraduates compete across and between institutions and simultaneously gain research experience. Our needs assessment clearly demonstrates demand for this program across diverse institutions including Historically Black Colleges and Universities, Institutional Development Award (INBRE) institutions and small colleges. The Big Genomic Data Skills Training for Professors program will shift the focus of undergraduate training towards big data skills and raise the competencies of the biomedical workforce. To provide large- scale dissemination, all educational program content will be made available on a public, online resource.