

NON -TECHNICAL ABSTRACT: (State in layman's terms the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project for California.)

Cal Poly is developing an integrated, multidisciplinary, undergraduate curriculum in molecular forensics to promote an undergraduate research community and prepare students for careers and graduate study in biotechnology and bioinformatics. The CSUPERB funds will be used to support students from four departments (Biological Sciences, Chemistry and Biochemistry, Computer Sciences, Statistics) as they help develop laboratory activities where students will collect *E. coli* bacteria from human and environmental sources, obtain molecular fingerprints of these bacteria, build a unique database of these fingerprints, and statistically assess the accuracy of the data using cutting edge techniques and equipment. The W.M. Keck Foundation provided funding in 2010 to purchase modern DNA sequencers capable of easy use by students in the classroom to fingerprint the isolated bacteria. The full program's curriculum will be delivered to over 1,000 students each year in courses that bridge two colleges (Sciences and Mathematics, Engineering) to combine analytical procedures from microbiology, molecular biology, bioinformatics, computing sciences, and statistics. This project fosters an experimental mindset and provides a platform that will transform the way students experience the application of technology in scientific discovery. The product of these collaborative laboratory classes will be a bacterial fingerprint database that will be used to the develop applied student research projects in food and water safety across the Cal Poly San Luis Obispo campus and in the surrounding community.