

EXECUTIVE SUMMARY [NON-CONFIDENTIAL, NON-TECHNICAL ABSTRACT FOR PUBLIC INFORMATION OR PROGRAM PROMOTION]: State the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project relevant to California. Do not include proprietary or confidential information. This may be distributed before the funding decision has been finalized.

Basic microbiology and molecular biology related skills are needed in many aspects of biotechnology. Although research suggests that investigative laboratories are more effective in teaching science process skills and in achieving higher order learning than are traditional cookbook laboratories, many laboratory manuals follow traditional cookbook formulas. This may be because laboratory skill acquisition is central to the molecular biology and microbiology laboratories. We intend to produce a multimedia electronic laboratory guide that will give students first exposure to new laboratory techniques outside of class time. The guide will not be a laboratory manual, but an integrated, hyperlinked presentation of essential methods and equipment used in microbiology laboratories. We expect that there will be broad application of this product to teach common biotechnology skills in related introductory courses and for students doing research projects that need a review of basic techniques. California State University, Fresno is a Hispanic Serving Institution, with a majority of students of color and a large proportion of first generation college students. We hope that this application of instructional technology will increase students' confidence in their laboratory skills and their willingness to work independently.