

EXECUTIVE SUMMARY [NON-TECHNICAL ABSTRACT FOR PUBLIC INFORMATION OR PROGRAM PROMOTION]:

Excellent laboratory skills are essential to the success of our students, not only in the classroom laboratory, but in the workplace laboratory, hospital or clinic in which they will someday be employed. Certain experimental theories and techniques are introduced early in the Organic Chemistry Laboratory curriculum. These techniques are continuously recalled throughout the more advanced courses, and in both undergraduate and graduate research. It is critical to lay a strong foundation in the very beginning, but doing so is a challenge since the students are inexperienced, laboratory time is limited, and lackluster laboratory manuals fail to adequately prepare students for the experiment ahead.

The goal of this proposal is to develop online tutorials to supplement the existing lab manuals. Such tutorials would offer many advantages, and positive effects on student learning have been observed with a pilot program at Cal Poly Pomona. Computer-based tutorials can bring to life the behavior of molecules with vivid animations, which otherwise could only be described with mathematical equations and simple, static graphics. The tutorials will include a variety of video demonstrations to fully introduce new glassware, equipment and instrumentation, and to model proper techniques with a strong emphasis on safety considerations. By having the tutorials delivered via the Internet, they become highly accessible; students will be required to view the tutorial before lab in order to prepare for the experiment, but they can also revisit the tutorial at a later time to refresh on the topic during subsequent labs or for research projects. Once developed, the tutorials will have a large return on investment and will have a significant impact on a wide audience.