SUPPLEMENTARY DOCUMENTS:
Impact Statement and Eligibility Certification

Appendix 1: RUI IMPACT STATEMENT

Over the last two years, the impact of this research specifically on students via summer field research, independent study, or course-based research, has been profound (Figure One). This has been possible a result of Western Oregon University's strong commitment to supporting field trips and course-based research, and the combined support of Western and the National Science Foundation (specifically the ILI), which allowed us the acquisition of an automated DNA sequencer. Eleven different students have benefited from direct experience performing field research and collections; three different students have worked with me via independent study performing molecular studies; and eight different students have participated in a course-long research project based on this work in Molecular Biology (Biology 475). Of these, half are pursuing or intend to pursue advanced degrees (M.D., M.S., or Ph.D.), a quarter work or intend to pursue work as technicians in biotechnology-oriented labs, and a quarter are considering teaching or non-M.D. health professions.

Figure One: Yellowstone Research Team, 1999

Over the next years, we foresee that there will be an increase not only in biology majors, particularly those who want to teach secondary level biology, but also in research demands on my lab and in my department. Western Oregon University recently began

offering a fifth year secondary education-based Masters in Teaching that can be applied to an existing Bachelor's Degree. In one year, we have seen a 20% rise in incoming majors, approximately one third of whom want to teach at the secondary level. Additionally, the university is significantly recruiting for and expanding its Honors Program, a curriculum which requires that students perform original research and complete a senior thesis. Last year, Dr. Robert Turner, with whom I team-teach Molecular Biology (Biology 475), assumed the Chair of the Honors Department. Freshmen enrollment in this program saw a 10% rise; with Dr. Turner, the first biologist to head the program, a substantial number of students in Honors are now being directly recruited from the natural sciences. Where, in the past, I have only worked with independent study mentees for one to two quarters, Honors thesis requirements will allow me to work with students for an entire year. As stated previously, I hope to provide both Honors students, as well as general biology majors, with a summer stipend and travel/meeting money so that they can truly put the kind of research effort original thesis work requires.

The impact that the MAT and Honors Program will have on research-based courses I teach will be substantial. Presently, I utilize the Yellowstone research project as the backbone of the teaching curriculum in Molecular Biology (475); students work with original mat samples to analyze 16S rRNA genes via sequence analysis and computer-based phylogenetic methods. During the past two years, enrollment in this class has not exceeded four students and, over the course of each term, each student has had the opportunity to experience every aspect of the research project (e.g. pouring and running an entire sequencing gel start to finish); this year enrollment will double. In order to maintain the high standards of experience provided to other classes, I have requested funding for technician; a subset of his/her roles, particularly during the spring term when molecular biology is offered, will include training/technical leadership in the teaching lab, generation of some reagents for the teaching labs, and management of data, isolates, and reagents as students generate more data and contribute to the overall project via course-based research.

Finally, Dr. Bryan Dutton and I have recently developed a new course in computational biology which will be a majors course option (students may choose to take two terms of Calculus or a series that includes Computational Biology and Statistics). My contribution to the course will emphasize reading, editing, and aligning DNA Sequences, database building and searching, and phylogenetics. My aim in the class is to use

original unknown 16S rRNA sequences derived by my technician as the raw data students analyze, thereby allowing even more majors to participate in the research project.

In conclusion, the impact of expanding this research project as proposed in this grant will be felt in the form of (1) supporting undergraduates with an uninterrupted summer research experience that combines field collection, contemporary molecular methodology, and communication skills in the form of a formal lab notebook maintenance, a written thesis, and a public presentation; (2) increasing opportunities for independent study and research-based laboratories during the academic year, particularly for a growing population of secondary education majors in biology; (3) providing career experience and training for graduates who are bound for careers or post-graduate education in molecular or microbiology; and (4) enhancing student perceptions about research as it relates to science education on a campus that lacks traditional research tracks or local significant connections to science industry.

Appendix 2: CERTIFICATION OF RUI ELIGIBILITY

[Mailed as a hard copy following electronic submission]

By submission of this proposal, the institution hereby certifies, as evidenced by the signature below, that the proposal is from a department that offers courses leading to a bachelor's or master's degree, but does not offer a doctorate, or doctoral courses and the supervision of doctoral research, and is located on a campus where the total number of doctorates awarded in fields supported by NSF did not exceed 20 in the two academic years preceding the proposal submission.

AUTHORIZED INSTITUTIONAL REPRESENTATIVE

_____ _____

Name/Title (Typed) Signature

_____

Date