

SUPPLEMENTAL MATERIALS

REPRESENTATIVE RECENT AWARDS IN THE CCLI PROGRAM AT BOTH THE PILOT PROJECT (PHASE 1)¹ AND THE FULLY IMPLEMENTED (PHASE 2)² LEVELS.

Note that a wide variety of subdisciplines is served under the CCLI program, (General biology, anatomy & physiology, biochemistry, cell biology, developmental biology, ecology, evolution, genetics, microbiology, plants, systematics), and a wide variety of teaching approaches used and biology techniques employed (Case studies, faculty development, faculty working groups, materials development, mathematics and computer science in biology, microscopy and visualization, research on learning, service learning & community outreach, student research introduced as an integral part of traditional Courses, introduction of technologies new to biology).

Phase 1

0736631. *Design and Evaluation of a Human Anatomy and Physiology Curriculum with Understanding by Design.* Developing a network of local, regional, and national human anatomy and physiology educators working in a continuous improvement cycle to ascertain if Understanding by Design is effective in improving learning of human anatomy and physiology. (Lehning, Jamestown Community College)

0736671 / 0736853. *Collaborative Research: Genomics as the Foundation of a New Undergraduate Curriculum.* Teaching critical concepts and skills by integrating all courses into a large, highly collaborative genomics research project that involves multiple schools and educational levels. (Slater, Arizona State University; Kikkert, Maricopa County Community College)

0736727. *Pathways for New Laboratory Modules in Undergraduate Genetics and Cell Physiology Education: Characterization of Puerto Rican Cassava.* Introduction of community-relevant, research-based, plant specific, laboratory activities into upper division genetics and cell physiology courses. (Sirtunga, University of Puerto Rico Mayaguez)

0736786. *Integrated Pedagogy to Promote Understanding of the Nature of Science and Scientific Inquiry in a College Biology Laboratory.* Creating learning materials and teaching strategies to help students understand the nature of science and how scientists do their work. A research component is examining the effectiveness of varied approaches to developing student understanding. (Schussler, Miami University Oxford Campus)

0736872. *Teaching Science with Minnows and Liverworts: Integration of Faculty Research and Science Education.* Infusing faculty research into a core curriculum in a way that integrates molecular biology with ecology and evolutionary biology concepts, with the overall goal of increasing science literacy. (Fuselier, Minnesota State University Moorhead)

0736927, 0737050. *Collaborative Research: Training Faculty in Scientific Teaching: STAR Mini-Institute*. Focusing on the critical need for professional development of biology faculty at post-secondary institutions throughout the state of Louisiana. (Wischusen, Louisiana State University & Agricultural and Mechanical College; Ales, Baton Rouge Community College)

0736928. *Reforming Introductory Biology at MSU - Does it Make a Difference?* Reforming a foundational biology course that is providing a venue for conducting research on student learning and curriculum reform. (Long, Michigan State University)

0736943. *Diagnostic Question Clusters to Improve Student Reasoning and Understanding in General Biology Courses*. Developing a set of concept inventory questions to enable biology faculty to question and learn about their students' understanding of core biological concepts and ways of thinking about biology. (D'Avanzo, Hampshire College)

0736975. *MathBench Modules: Mathematics for all biology undergraduates*. Integrating mathematics and quantitative approaches more deeply into the undergraduate biological sciences curriculum through a series of interactive, web-based instructional modules that reinforce key biological concepts – the MathBench Biology Modules. (Fagan, University of Maryland College Park)

0736976. *Dilemmas and Decisions: Using Guided Writing to Increase Ecological Literacy in Undergraduate Biology Students*. Testing the effectiveness of using guided writing assignments both as a way of helping students learn ecological principals and to discover what students' conceptualizations are. (Balgopal, Minnesota State University Moorhead)

0736995. *Project Laboratory in Genetics and Genomics*. Providing real research laboratory experience in a course that leads to the understanding of core concepts in genetics. Integrating genomic analysis with readily accessible experiments with bacteria. (Lovett, Brandeis University)

0737006. *Biomechanics of Human Movement Laboratory Curriculum*. Creating new learning materials and software based tools for use in undergraduate programs in kinesiology, exercise science, pre-physical therapy and related areas. (Schleihauf, San Francisco State University)

0737027. *Integrating Genomics Throughout the Undergraduate Microbiology Curriculum*. Introducing genomics to a broad base of undergraduate students through coordinated activities and the creation of an introductory genomics course. (Triplet, University of Florida)

0737131. *Implementation and Evaluation of an Undergraduate Inquiry-Based Research Laboratory Curriculum in Microbial Ecology*. Developing and evaluating an inquiry-

based undergraduate laboratory curriculum in microbial ecology that is geared toward majors in the life sciences in a large university setting. (Sanders-Lorenz, University of California-Los Angeles)

0737149. *Implementation of an Integrative Cell Culture and Stem Cell Laboratory Course*. Developing and implementing an upper division laboratory course (and related materials for integration into additional biology courses) that features stem cell protocols and cell culture techniques. Conducting faculty development workshops, and disseminating effective teaching materials and strategies. (Patel, California State University, Fullerton)

0737203. *Incorporating Mass Spectrometry-Based Protein Identification into Biochemistry Laboratory*. Developing laboratory procedures and online materials that aim to foster student learning of the use of protein purification and characterization techniques and bioinformatics tools, and to reinforce their understanding of protein structure-function and evolutionary relationships. The focus of study is the Bowman-Birk trypsin inhibitor gene family, a set of stable serine protease inhibitors found in seeds. (Wilson, SUNY at Binghamton)

0737386. *Stoichiometry of the Soil-Plant-Atmosphere Continuum: A Long-Term Ecological Field-Based Curriculum for Biology Undergraduates*. Enriching the ecology curriculum at a small private college by establishing a long-term field study in ecological stoichiometry in which undergraduates can engage in authentic research at all levels of instruction, from freshman to senior year. (Machado, Swarthmore College)

0737407. *CCLI: Integrating Bioinformatics into the Life Sciences*. Developing, pilot testing and disseminating a set of modules in bioinformatics that can be integrated into curricula in the biological sciences, computer science and other disciplines. (Pauley, University of Nebraska at Omaha)

0737466. *BOT 2.0: Botany through Web 2.0, the Memex and Social Learning*. Taking an innovative technological approach to recruiting students and retaining their interest in the biological and botanical sciences to address the lack of diversity in the student population pursuing the botanical sciences. (Greenberg, University of N Carolina at Chapel Hill)

0737474. *Science Collaboratory: Open Participatory Learning Infrastructure for Education (SCOPE)*. Implementing and assessing a novel approach to faculty professional development by using online Problem Spaces to integrate existing e-science resources with collaborative web-based productivity tools. (Donovan, Beloit College)

0737487. *Active Learning and Inclusion of Mathematics and Modeling for Biology Undergraduates at Everett Community College*. Improving the quality of science education provided to transfer students (from a 2-yr to 4-yr undergraduate program) enrolled in a majors' biology series. Enrichments include infusion of strategies for significant exposures to case-based learning and guided inquiry, mathematical problems

with biology applications, molecular biology techniques, and computer-based simulations and modeling exercises. (Pape-Lindstrom, Everett Community College)

Phase 2

0817276, 0817337. *Collaborative Proposal: Expanding Evolutionary Studies in American Higher Education* Implementation, dissemination and evaluation of a model for incorporating an interdisciplinary, evolutionary perspective throughout the education curriculum. (Wilson, SUNY at Binghamton; Geher, SUNY College at New Paltz)

0816515. *Community College Undergraduate Research: A Model of Integration* Design, implementation and evaluation of a model for integrating undergraduate research into a community college curriculum. (Hewlett, Finger Lakes Community College)

¹Phase 1 and Phase 2 were terms used to characterize different types of CCLI proposals under the previous CCLI program solicitation, NSF 08-546, which was in effect when these awards were made. Analogous terms in the new solicitation (NSF 09-529) are Type 1 and Type 2.