

Diara Spain, Ph.D., Associate Professor of Biology, HONORS Program Director, Sibdas Ghosh, Ph.D., Professor of Biology, Associate Dean, Meghan Peck, MESA Program Director, Kenneth Frost, Ph.D., Chemistry Lecturer, Dominican University of California, San Rafael, CA 94901



Program Overview

Undergraduate Research has been established as an important part of the Dominican biology curriculum. There are several key elements to sustaining undergraduate research at a small university. Phase 1 is institutionalizing research as part of the campus culture. Phase 2 is recruiting and attracting faculty capable of mentoring undergraduate students. Phase 3 is cultivating partnerships with industry and other institutions.



PHASE 1 – INSTITUTIONALIZING RESEARCH

We institutionalized research by adding a series of four classes. While enrolled in these classes the students transition from a beginner learner to intermediate then into an advanced learner.

- Bio 2990 (1 unit) – beginner – 1st year student, 2nd semester
- Bio 4990 (2 units) – intermediate – 2nd year student, 1st semester
- Bio 4991 (2 units) – intermediate – 2nd year student, 2nd semester
- Bio 4993 (1 unit) – advanced – 3rd year student, 1st semester

Other factors to consider are:

- **Student Collaboration** – research classes start with a small team of 6-10 students. They learn teamwork techniques in addition to working with a mentor.
- **Project Topic Diversity** – topics include field biology, organismal biology, biochemistry, environmental sciences, molecular biology
- **Sustainability** – creating topics that evolve and allow students to gain ownership as their research makes an impact
- **Civic Engagement and Impact** – These projects are relevant and students can see the impact of their work. The “weed free feed” is an example; this has changed how non-native species of plants are controlled in National Parks and other open spaces.



PHASE 2 – RECRUITING AND UTILIZING FACULTY EXPERTISE

Our full-time and part-time faculty have enthusiastically supported the undergraduate research program. In many cases, we learned that a successful project relies on different fields of science. For example, biology projects often require knowledge of chemistry and physics. Therefore, recruiting faculty with interdisciplinary specialties will develop an extensive reservoir of skills and experiences.

Faculty research topics include:

- Breast Cancer: Dr. Maggie Louie
- Stem Cells: Dr. Mohammed El Majdoubi
- Health and Recreation: Dr. Diara Spain
- Sudden Oak Death: Dr. Sibdas Ghosh
- Coral Reefs: Dr. Vania Coelho
- Alcohol Addiction: Dr. Asma Asyyed
- Drug Development: Dr. Graciela Carranza
- BioFuels: Dr. Kenneth Frost
- Fish Parasites: Dr. Jim Cunningham



PHASE 3 – CULTIVATING PARTNERSHIPS – LOCAL, NATIONAL, AND INTERNATIONAL

We look for a broad array of partnerships – a) local biotechnology companies, b) community organizations, c) the National Park Service (NPS), and d) other colleges and universities. In particular, health projects maintain a high interest within our community. We recently concluded a health and recreation study at a Point Reyes National Park and initiated an outreach program to senior citizens with the Marin Department of Health and Human Services. In conclusion, maintaining an active effort to publicize the work we do within the community helps stimulate interest and support for undergraduate research at our university.



Local and Federal Governments

Projects include Fish Parasitology, Non-Native Invasive Plant Research, Sudden Oak Death, Health and Recreation Research, Biodiversity of Bees, and Forensic Science.

Corporations

Our partnerships include The Buck Center for Age Research and BioMarin Pharmaceuticals, both encompassing molecular biology and age-associated diseases.



International Research Projects

These include a student driven project of developing Bio-Soap for Tanzania, working with Poland on a Bison exhibit, and the University of Skovde is working with us on a variety of projects including cancer and stem cell research.