

Adopted: May 21, 1996

**ACADEMIC SENATE  
OF  
CALIFORNIA POLYTECHNIC STATE UNIVERSITY  
San Luis Obispo, California**

**AS-462-96/CSM  
RESOLUTION ON  
PROPOSAL TO ESTABLISH AN  
ENVIRONMENTAL BIOTECHNOLOGY INSTITUTE**

RESOLVED: That an Environmental Biotechnology Institute be established at Cal Poly as proposed in the attached bylaws of the *Proposal: Environmental Biotechnology Institute*.

Proposed by the College of Science and Mathematics  
April 16, 1996

**PROPOSAL**  
**ENVIRONMENTAL BIOTECHNOLOGY INSTITUTE**

*California Polytechnic State University*

Aristotle said it more than two millennia ago: "What we have to learn to do, we learn by doing." California Polytechnic State University (Cal Poly) is an institution known for its undergraduate education in the applied sciences. The educational philosophy of "learn by doing" has been the underlying reason for this institution's success in training and educating undergraduate students. Largely because of our commitment to undergraduate education and academic excellence, Cal Poly has been cited as one of America's best universities in undergraduate science education by U.S. News and World Report. It is in the spirit of the Cal Poly's philosophy of providing "hands on" experience to students and faculty alike that the Environmental Biotechnology Institute is based.

Biotechnology can be used to assess the well-being of ecosystems, transform pollutants into benign substances, generate biodegradable materials from renewable sources, and develop environmentally safe manufacturing and disposal processes. Researchers are just beginning to explore biotechnological approaches to problem-solving in many areas of environmental biotechnology, such as:

- Diagnostics, epidemiology, and dispersal-monitoring related to human disease agents;
- Disease, pest, and weed control in agriculture;
- Contaminant detection, monitoring, and remediation;
- Toxicity screening; and
- Conversion of waste to energy.

Environmental biotechnology is not a new field; composting and wastewater treatment technologies are familiar examples of "old" environmental biotechnologies. However, recent developments in molecular biology, microbial ecology, and environmental engineering now offer opportunities to modify organisms so that their basic biological processes are more efficient and can degrade more complex chemicals and higher volumes of waste materials. Notable accomplishments of the "new" environmental biotechnology include the cleanup of water and land areas polluted with petroleum products.

While some success has been achieved, the potential benefits of the new environmental biotechnology are far from fully realized. Advances in this area are delayed not only by legal and social barriers but also by the scarcity of basic scientific knowledge about organisms that may be used in biotechnologies and the ecological systems in

which these technologies are to be employed. Only new knowledge acquired through basic research can provide the foundation for new environmental applications of biotechnology, facilitate the development of these technologies by the commercial sector, and ensure adequate evaluation and safe application of products without blocking innovation with regulatory requirements.

Research in environmental biotechnology has unique international aspects. International cooperation will be needed to help generate new scientific knowledge in this arena, assure U.S. access to the requisite technologies and genetic resources, and establish markets for the resulting U.S. products and processes worldwide. In addition, environmental biotechnology has tremendous potential for use in developing nations seeking low-cost solutions to environmental problems, such as municipal waste disposal, conversion of agricultural wastes to energy sources, and cleanup of polluted areas.

Here, a research-based Institute is proposed for the purpose of exploring biotechnological approaches to problem-solving in the area of environmental biotechnology. through the use of microorganisms and their products. The proposed Institute would involve students and Faculty from Cal Poly and other CSU campuses as well as the international scientific community. The proposed Institute has collaborative research agreements in the area of Environmental Biotechnology with the Dairy Products Technology Center at Cal Poly, the Environmental Biology Department at the University of the Balearic Islands, Palma de Mallorca, Spain, and the Chemistry Department, University of Portugal, Lisboa, Portugal.

The long term goals of the proposed Institute include:

- Develop an understanding of the structure of microbial communities and their dynamics in response to normal environmental variation and novel anthropogenic stresses through the uses of modern and ancient microbial communities as experimental models.
- Develop and evaluate methods for the detection of human and other pathogens in dairy products resulting from environmental contamination;
- Assess the impact of chemicals and radiation on the evolution of microbial communities utilizing modern and ancient microbial communities;

Determine the biochemical mechanisms, including enzymatic pathways, involved in aerobic and anaerobic degradation of pollutants and disease-causing processes;

Expand understanding of microbial genetics as a basis for enhancing the capabilities of microorganisms to degrade pollutants or to cause disease;

Develop and evaluate "gene-delivery systems" for the dissemination of genetic traits among microbial communities in situ.

- Conduct microcosm/mesocosm studies of new bioremediation techniques to determine in a cost-effective manner whether they are likely to work in the field, and establish dedicated sites where long-term field research on bioremediation technologies can be conducted.
- Develop, test, and evaluate innovative biotechnologies, such as biosensors and genetic profiling, for monitoring bioremediation in situ and assessing the level of contamination in dairy and environmental samples;
- Involve graduate and undergraduate students from Cal Poly and other CSU campuses in the research activities of the Institute.

Bioremediation is addressed as one example of an environmental biotechnology. Because the knowledge required for bioremediation is similar to that needed for the development of many other environmental biotechnologies, the research approach described here is likely to have wide application.

Bioremediation is a term for a number of microbiologically-based processes that degrade waste materials into harmless by-products such as water, carbon dioxide and various forms of salt. It is, in effect, using the same processes that take place when lawn or garden waste is composted to be later used as a soil nutrient for future planting. By identifying and isolating naturally-occurring bacteria or fungi that degrade specific substances, scientists are able to clone them, manufacture the organisms in large quantities and introduce combinations of microorganisms (bacteria, fungi, etc.) that will eliminate the specific waste materials at a given hazardous waste site. Genetic engineering techniques could also be implemented to potentiate the biodegrading activities of autochthonous microorganisms in contaminated sites.

The United States has a large number of identified polluted areas, including land, fresh water, and marine sites that, by law, must be cleaned up. Estimates for the cleanup of Federal lands alone may be \$450 billion. The extent of contaminated non-Federal agricultural acreage, mining areas, industrial sites, and aquifers and other water bodies is unknown, but the magnitude of the

problem is undoubtedly large and clean-up expenses could be astronomical. It has been estimated that cleanup of both Federal and non-Federal lands could cost \$1.7 trillion using conventional approaches, which would produce noxious waste by-products and thereby impose additional clean-up or environmental costs.

Due to its comparatively low cost and generally benign environmental impact, bioremediation offers an attractive alternative and/or supplement to more conventional clean-up technologies. Bioremediation has been successful at many sites contaminated with petroleum products. However, it is not always the technology of choice because efficacy and the rate of degradation at any particular site cannot be predicted reliably. Improved predictive and process validation capabilities would help stimulate wider use of this technology. Research also could lead to development of biotechnologies to remediate areas contaminated by metals, pesticides, radioactive elements, other toxic materials, and mixed wastes.

These types of studies could be especially productive at this time. Recent developments in biology have provided new tools and approaches for monitoring the environment and engineering organisms with the capacity to degrade environmental pollutants. These developments have created unprecedented opportunities for significant advances. Indeed, bioremediation is expected to become an industry with annual sales of more than \$500 million by the year 2000.

The United States is among several nations developing bioremediation technologies. Maintaining and enhancing the U.S. position in this arena will require continued investment in the generation of new knowledge needed for the development of new technologies. Investment in bioremediation research has the dual benefits of solving important environmental problems while stimulating the growth of the U.S. bioremediation industry.

The Environmental Biotechnology Institute at Cal Poly will accrue many benefits to both the University and to the citizens of the Central Coast of California. The environmental impact of oil and solvent spills that have plagued the Central Coast will be felt for hundreds of years. As a result environmental remediation efforts of the affected habitats will be required on a long-term basis. Cal Poly, with its "learn-by-doing" philosophy, can take advantage of this "natural laboratory" opportunity by engaging students and scientist mentors in this real life situation. It will provide an infrastructure for scientists at Cal Poly, sharing common interests, for interdisciplinary research activities and soliciting extramural research funds. Our students will certainly benefit from their participation in the activities of the Institute in Senior Projects and other independent research activities by acquiring new techniques and experience, thereby

increasing their value to companies and communities facing similar situations in many places around the world. Additionally, this Institute will allow the affected communities on the Central Coast to experience the positive impact that joint efforts between business and academia can have on both the economy and the environment.

A major focus of the Institute will be to study microbial communities in terrestrial and aquatic ecosystems, both from present-day and ancient environments (such as those preserved in amber and other fossilized biopreserving materials) as well as those autochthonous of dairy products. The goal of these studies will be to assess the essential community composition of diverse environments and monitor the evolution of important microorganisms in those environments in response to environmental stimuli.

Additionally, genes of interest will be isolated and cloned and their nucleic acid sequences determined. These organisms, their genes, and genetic sequences will be stored and managed by the Institute in order to serve an important source of biological information to scientists throughout the world, and in particular investigators and students from laboratories in the CSU system. The purpose of these efforts would not only be to study the evolution of microbial communities and describe the microbial diversity, but also to develop new molecular methods for detecting pathogens, measuring microbial diversity, and to develop culture methods to recover and grow yet undiscovered microbes. These microorganisms, from ancient and contemporary ecosystems, will be evaluated for their potential in industrial applications such as bioremediation, production of novel and useful pharmaceuticals, and secretion of enzymes with various industrial applications. New assays, databases, and software to assess and describe such microbial diversity, as well as educational materials will be developed at the Institute. whenever possible, the Institute will strive to patent and license its intellectual property.

Another major area of concern for the Institute will involve the characterization of contaminated sites to determine the feasibility of in situ as opposed to off-site remediation. Because in situ bioremediation involves the action of the indigenous microbial population, site characterization must include an evaluation of microbial diversity for the site in question. The molecular methods developed by the Institute for characterizing microbial communities and the microbial and genetic libraries created, can be used effectively in these studies.

Once the microorganisms involved are identified and the degradative pathways resolved, a consortium of microorganisms, both genetically altered and/or indigenous, can be assembled to more effectively remediate the site. The genetic enhancement of microorganisms, both

ancient and isolated from contaminated sites for the purpose of producing a more efficient clean-up process will be another Institute focus requiring the expertise of faculty in the Cal Poly Biology and Chemistry Departments. These microorganisms will also be added to the microbial library of the Institute.

As with any remediation effort, an in situ bioremediation treatment must be followed by an evaluation of the "biological health" of the soil after treatment. Again the molecular methods developed at the Institute will help characterize the soil microbial communities before and after treatment. The Institute will also have the expertise of scientists in the Soil Sciences and Environmental and Civil Engineering Departments at Cal Poly to help develop post remediation therapies for decontaminated soils to restore their productivity.

Finally, the Institute will develop and analyze multiple approaches to the application of both in situ and off-site bioremediation processes. The application of bioremediation to a contaminated site is often an extremely site-specific process. Using the expertise of faculty members in the Cal Poly Colleges of Agriculture and Engineering, the Institute will study bioremediation applications and determine the unifying factors that may allow for a more standardized and easily utilized approach to remediating contaminated sites.

An overall training program for the Institute will tie these diverse disciplines together to form a coherent program. All of the skills and processes for site evaluation and remediation developed at the Institute will be made available for educational purposes and can be used to attract collaborations with businesses interested in acquiring skilled employees. In addition to training Cal Poly students, the Institute will serve as a training site for students and scientists from across California, the West, as well as internationally. Additionally, seminars and workshops will be regularly scheduled and a site on the world-wide web established to inform and educate the Central California community of the Institute's efforts and advances and as well as progress in environmental biotechnology.

If such a project is developed, Cal Poly could become the "Environmental Biotechnology Center of the West Coast". Undoubtedly, a large-scale program such as this would allow the parties involved access to many microorganisms and genetic systems from outside sources, making the Institute even more influential and productive. Moreover, a joint programs in various aspects of environmental biotechnology could be coordinated with programs elsewhere in the U.S., such as the University of Tennessee's Institute for Environmental Biotechnology or Michigan State University's Center for Microbial Ecology.

The Institute will be directed by Dr. Raul Cano, Biological Sciences Department and assisted by Dr.

Christopher Kitts, Biological Sciences Department. The Institute will enlist the collaboration of scientists and engineers in the Colleges of Science and Mathematics, Agriculture, and Engineering. These scientists will bring essential expertise in the areas of microbial ecology, analytical chemistry, bio-instrumentation, agronomy, bio-processing, and systems design. Interdisciplinary undergraduate, graduate and post-doctoral research will be conducted at the Institute.

The Institute will also strive to bring in outstanding scientists and interested students from other institutions, both from the United States and abroad, for consultation or to conduct independent research at the Institute.

#### FUNDING STRATEGIES:

There has been considerable activity related to the types of projects that will be sponsored by the Environmental Biotechnology Institute (EBI). Table 1 and Table 2 below summarizes funded and pending grants and contracts since 1991. It is projected that the Environmental Biotechnology Institute would be self-supporting starting on year 3. Table 3 summarized the projected budget for the first five years of operation. Funds for the activities of the EBI will result from extramural funds in the form of grants, contracts, consultation fees, training workshops, and gifts.

TABLE 1: Funded Grants and Contracts

YEARS	TITLE	AMOUNT
1996	Microbial diversity indexing with HPLC technology	\$68,000
1996-1998	Development and Standardization of a PCR-Based Rapid Assay for Spore Count Determination in Powder Milk	\$120,238
1995-1997	Field testing of a PCR assay for <i>Listeria monocytogenes</i> in dairy products	\$179,000
1995-1997	Detection of <i>Salmonella</i> in a fluorescence PCR-based assay for monitoring dairy herd health	\$72,772.
1995	Species Diversity in bacteria of using the <i>16S</i> rRNA gene.	\$85,000
1993-1996	Rapid detection of <i>Listeria monocytogenes</i> by FD-PCR.	\$74,000
1993	Molecular phylogeny of stingless bees using amber-entombed specimens	\$59,950
1993	Molecular phylogeny of stingless bees using amber-entombed specimens. Analytical tools.	\$25,000
1991	Development of a Biotechnology Laboratory	\$129,000

TABLE 2: Pending Grants and Contracts

YEARS	TITLE	AMOUNT
1997-2000	Minority Biomedical Research Support Program.	\$1,183,068
1997-1998	Model to study host/parasite relationship evolution.	\$85,000
1997-1999	Calibration of molecular clocks.	\$201,406
1997-1999	Monitoring microbial communities with molecular methods.	\$75,000
1997-2000	Effect of micronutrients on bioavailability and microbial diversity.	\$470,996
1996-2000	Authentication of ancient bacteria from amber inclusions using coalescent distributions of <i>16S</i> rRNA and <i>Adh</i> haplotypes.	\$201,146

TABLE 3. Projected yearly expenses

ITEM	-- YEAR 1 --		-- YEAR 2 --		YEAR 3	YEAR 4	YEARS
	CPSU	EBI	CPSU	EBI	EBI	EBI	EBI
Director							
Academic year (release time)	\$	\$ 4,572	\$ 4,572	\$ 9,144	\$ 9,144	\$ 10,058	\$ 10,516
Summer	\$ 3,530	\$ 3,530	\$ 3,530	\$ 3,530	\$ 10,590	\$ 11,649	\$ 12,179
Associate Director							
Academic year (release time)	\$		\$ 4,572	\$ 4,572	\$ 9,144	\$ 10,058	\$ 10,516
Summer	\$ 3,949	\$ 3,949	\$ 2,073	\$ 1,088	\$ 9,250	\$ 10,175	\$ 10,638
Visiting Scientist/Post Doctoral	\$	\$	\$	\$	\$ 41,990	\$ 46,189	\$ 48,289
Student Assistantst	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 8,000	\$ 12,000	\$ 12,000
Clerical	\$ 6,853	\$ 6,853	\$ 7,195	\$ 7,195	\$ 27,410	\$ 30,151	\$ 31,522
Release time	\$	\$ 3,530	\$ 3,530	\$ 3,530	\$ 27,432	\$ 30,175	\$ 31,547
Equipment	\$	\$ 73,000	\$	\$ 58,000	\$ 29,000	\$ 25,000	\$ 15,000
Supplies	\$ 2,700	\$ 2,100	\$ 2,835	\$ 2,205	\$ 18,600	\$ 20,460	\$ 21,390
Travel	\$ 2,510	\$ 2,510	\$ 2,636	\$ 2,636	\$ 16,550	\$ 18,205	\$ 19,033
Lecture series	\$	\$	\$	\$	\$ 7,500	\$ 8,250	\$ 8,625
Initial start-up	\$ 8,500	\$	\$	\$	\$	\$	\$
<b>TOTALS</b>	<b>\$ 30,041</b>	<b>\$ 102,043</b>	<b>\$ 32,943</b>	<b>\$ 93,900</b>	<b>\$ 214,611</b>	<b>\$ 232,372</b>	<b>\$ 231,252</b>

\* CPSU: Cal Poly funds requested

\*\* Funds will be provided by Environmental Biotechnology Institute

† Scholarship funds to be made available by a corporate donor in behalf of EBI

# BYLAWS

These Bylaws are applicable within the authorization established by the Board of Trustees of the California State University (CSU) and the California Polytechnic State University (Cal Poly)

## NAME:

The name of this organization shall be Environmental Biotechnology Institute, referred to in this Bylaws as the EBI.

## MISSION:

*To explore biotechnological approaches to problem-solving in various areas of environmental biotechnology through the use of microorganisms and their products.*

To achieve this the Institute shall:

- Develop an understanding of the structure of microbial communities and their dynamics in response to normal environmental variation and novel anthropogenic stresses through the *uses* of modern and ancient microbial communities as experimental models.
- Develop and evaluate methods for the detection of human and other pathogens in food/dairy products resulting from environmental contamination.
- Assess the impact of chemicals and radiation on the evolution of microbial communities utilizing modern and ancient microbial communities.  
Determine the biochemical mechanisms, including enzymatic pathways, involved in aerobic and anaerobic degradation of pollutants and disease-causing processes.  
Expand understanding of microbial genetics as a basis for enhancing the capabilities of microorganisms to degrade pollutants or to cause disease.
- Develop and evaluate "gene-delivery systems" for the dissemination of genetic traits among microbial communities in situ.  
As a standard practice, conduct *microcosm/mesocosm* studies of new bioremediation techniques to determine in a cost-effective manner whether they are likely to work in the field, and establish dedicated sites where long-term field research on bioremediation technologies can be conducted.  
Develop, test, and evaluate innovative biotechnologies, such as biosensors and genetic profiles, for monitoring

bioremediation in situ and assessing the level of contamination in dairy and environmental samples.

- Involve graduate and undergraduate students from Cal Poly and other CSU campuses in the research activities of the Institute.
- Foster an active research program among its membership on problems best addressed through an integrated approach that applies the disciplines of chemistry, agriculture, engineering, physics, computational sciences and biology.
- Seek ways of improving the individual teaching performance of its members through interdisciplinary communication at all levels of instruction
- Provide the infrastructure for the training of, and communication of ideas to the scientific and lay communities through publications, seminars, lectures, and workshops.

## PURPOSE:

### 1. Direction

The President of California Polytechnic State University, San Luis Obispo, authorizes the establishment of the Environmental Biotechnology Institute, California Polytechnic State University (CPSU), for the purpose of promoting an atmosphere conducive to research, creative activity, education, and training in the areas molecular paleobiology, microbial ecology, molecular biology, and biotechnology.

### 2. Policies

The policies of the EBI shall be in accordance with the policies of the CSU and Cal Poly.

### 2. Dissolution

**In** the event that the EBI is dissolved, its assets remaining after payment of, or provision for payment of, all debts and liabilities shall be distributed equitably among the departments represented by the membership of the EBI.

## MEMBERSHIP:

Appointments to the Institute shall be recommended to the President or his designee by the existing members. Candidates will be considered according to their individual abilities to contribute to the Institute within the guidelines of its particular purposes and functions.

1. The initial membership of the Institute shall be comprised of the Charter Members of the Institute. The Charter Members are:

Raul J. Cano, Ph.D., Professor, Biological Sciences.  
(Director)

Christopher Kitts, Ph.D., Assistant Professor,  
Biological Sciences. (Associate Director)

Nirupam Pal, Ph.D., Assistant Professor, Civil &  
Environmental Engineering.

Thomas A. Ruehr, Ph.D., Professor, Soil Sciences.

Jeffrey G. Sczechowski, Ph.D., Assistant  
Professor, Civil & Environmental Engineering.

Douglas Williams, Ph.D., Professor,  
Agricultural Engineering.

Max Wills, Ph.D., Professor, Chemistry and  
Biochemistry.

2. Thereafter, individuals who hold full-time faculty positions at Cal Poly may be nominated for membership by the existing members. In general, the guidelines for such nomination shall be as follows:

- a. The nominee shall have a demonstrated and continuing interest in scientific research.
- b. The nominee, shall show evidence of a background and research interest strongly oriented toward the biological, biotechnological sciences, chemical, physical sciences, or agriculture.
- c. The nominee's previous research shall focus in areas of investigation that fall within the mission of the Institute.

3. A nominee shall be recommended for membership in the Institute by a two-thirds (2/3) vote of the voting membership, the election to be conducted by closed ballot.

4. Since it is recognized that a great variety of disciplines may be able to contribute to the Institute in a valuable manner, Associate Members may be nominated if their discipline is construed as a useful adjunct to molecular biology or biotechnology, even though their background does not fit the guidelines for full membership. Such nominees shall become Associate Members of the Institute by the same balloting procedure as is done for election of Members. An Associate Member will be a non-voting member, but will otherwise be a full participating member of the Institute.

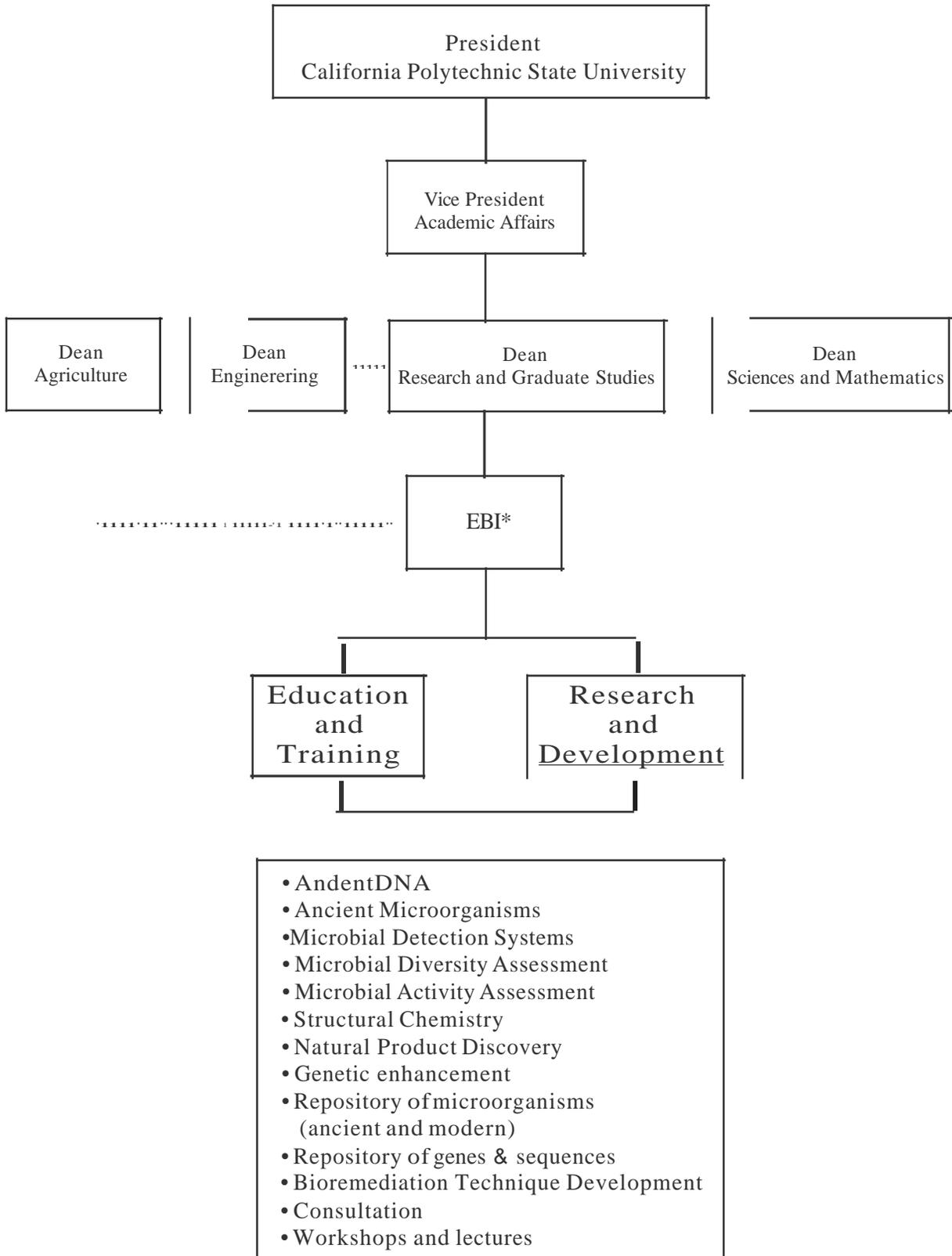
#### STRUCTURE:

The organizational chart below summarizes the administrative hierarchy governing the Institute. It is the intent of the Charter Membership that the internal governance of the Institute be largely free of

administrative hierarchy. However, it is recognized that some administrative structure is necessary, and for that reason the following shall be implemented.

1. The membership of the Institute, by closed ballot, shall elect a Director, whose general function shall be to exert leadership and such organization as shall be necessary to implement the purposes of the Institute. Election of the Director shall require a two-thirds (2/3) majority of the voting membership, and will be held in the last month of the academic year. His/Her term of office will be four (4) years, and he/she may be reelected.
2. The duties of the Director shall be general and in keeping with the intent of the office expressed above.
  - a. The Director shall call meetings, appoint committees when needed and coordinate the activities of the Institute as deemed necessary.
  - b. The Director shall maintain the files of the Institute and act as the liaison between the membership and the administration and any other outside agencies with which the Institute does business.
  - c. The Director will be the official signatory of the Institute on all official documents, such as research grant applications and letters pertaining to the entire membership.
  - d. In keeping with the philosophy of the Institute, the Director will strive at all times to keep administrative duties (both his own and those of the membership) at a minimum, on the assumption that time spent in administration is time lost for teaching and research. Within this context, all Members and Associate Members of the Institute agree to perform such administrative tasks as may be asked of them by the Director.
3. An Advisory Board shall be established and will consist of no more than ten individuals in Industry, Government, and Academia with the appropriate expertise and perspective. Nominations and final election to the Advisory Board shall be made by the members of the EBL. Nominations for the Advisory Board will be sought at the first meeting of the EBL.
4. Consultants and Collaborators will be sought to provide guidance in the various aspects associated with the mission and goals of the EBL. Consultants and collaborators are

Figure 1. Structure and Activities of the Environmental Biotechnology Institute



\* Faculty reporting lines will be within their respective Colleges

TABLE 4: Consultants and Collaborators.

NAME AND INSTITUTION	AREA of EXPERTISE
Javier Benedi, Ph.D. University of Balearic Islands (UBI) , Spain	Gene expression systems
Dolores Berber-Jimenez, Ph.D. California Polytechnic State University	Structural chemistry
Keith A. Bostian, Ph.D. COO, Microcide Pharmaceuticals	Microbial diversity Natural product discovery
Ricardo Franco, Ph.D. University of Portugal	Protein structure and function
Jorge Galazzo, Ph.D. Research Fellow, Microcide Pharmaceuticals	Natural product fermentations Recovery of microorganisms from soils
Edward E. Golenberg, Ph.D. Wayne State University	Molecular evolution
Roger I. Gambs, Ph.D. California Polytechnic State University	Animal biology Biosafety
Jose Gil Sanchez, MD. University of Balearic Islands, Spain	Food Microbiology Food manufacturing practices
V.I. Holland, Ph.D. California Polytechnic State University	Chairman, Biological Sciences
Rafael Jimenez Flores, Ph.D. California Polytechnic State University	Dairy Microbiology
David J. Keil, Ph.D. California Polytechnic State University	Plant taxonomy
Charles Kurland, Ph.D. Biomedical Center, University ofUppsala	Genome evolution Genetic analysis
Jorge Lalucat, Ph.D. University of Balearic Islands, Spain	Microbial degradation of hydrocarbons Chairman, Environmental Biology, UBI
Darryl A. Leon, Ph.D. California Polytechnic State University	Protein structure
Anjos I. Macedo, Ph.D. University of Portugal	Protein structural analysis Nuclear Magnetic Resonance
Jose Carlos Palomares, MD., Ph.D. University of Sevilla, Spain	Molecular diagnostics
Norman Pieniazek, Ph.D. Centers for Diseases Control	Molecular Evolution Nucleic acid analyses
Thomas I. Richards, Ph.D. California Polytechnic State University	Biohazardous material handling Scholarships
Franco Rollo, Ph.D. University of Camerino, Italy	Ancient DNA analysis

eligible for membership in the EBI and shall be subject to the guidelines in parts 2 and 3 of this section. The EBI has, at the present time, a list of Consultants and Collaborators (Table 5) whose expertise has been sought or will be sought in anticipated future projects.

#### FISCAL POLICIES

1. Fiscal Year

The fiscal year shall be in accordance with the University.

2. Accounts and Audits

The books and accounts of the EBI shall be kept by the Cal Poly Foundation in accordance with sound accounting practices, and shall be audited annually in accordance with University Policies.

3. Peer Review

The EBI shall be subject to peer review every five years in accordance with Administrative Bulletin 87-3 of Cal Poly.

#### ACTIVITIES:

Since one of the prime purposes of the Institute is to foster interdisciplinary cooperation among its Members and Associates, it is therefore assumed that joint projects involving two or more of the membership will be highly encouraged. In order to facilitate this kind of cooperation, it shall be a standing function of the Institute to carry out the following projects and functions:

1. Seminar Series

The Institute shall sponsor a continuing seminar series which shall involve the membership, their graduate students and outside research persons as speakers. It is also the goal of the Institute to establish a Distinguished Lectureship in Microbial Ecology, patterned after the Robbins Lectureship at Claremont College, to attract Nobel status scientists to CPSU.

2. Research Grants

The Institute shall actively seek outside research grant support for its activities. These efforts may be initiated by one or more members, either alone or with non-members as collaborators, on behalf of the Institute as a whole. It is hoped, but it is by no means necessary, that proposals be initiated in the name of the Institute and that internal review take place prior to submission.

3. Solicitation of Additional External Support

A major goal of the Institute is to obtain outside funding to promote microbial ecology, bioremediation, and biotechnology

at CPSU. This shall include developing proposals for a graduate training program in Molecular Biology and Biotechnology, equipment grants, and specialized seminar series.

4. Publications

The membership will be actively encouraged to publish the results of their researches, individually or collectively. It is suggested that when this is done that the following format be employed:

Name(s);

Environmental Biotechnology Institute,  
Department of

–

The Director of the Institute shall maintain a file of copies of all publications of the Institute, and shall be responsible for assigning each with a number. In addition, the Director will submit an Annual Report of the Institute to the Vice President, Academic Affairs through the Dean of Research and Graduate Studies.

5. Consultation

The Institute shall serve as an entity to advise and be consulted by the administration and the community on affairs relative to the molecular sciences and biotechnology. The Institute will be concerned with future hiring patterns, and it shall feel free to make recommendations to the administration relative to research and teaching in the molecular biological sciences and biotechnology.

6. Repository of Microorganisms and Genes

The Institute shall represent a repository of ancient microorganisms, genes, and nucleic acid sequences. The Institute will also serve as a repository of microorganisms obtained from modern habitats rich in biodiversity with bioactive properties. These will be available at no cost to the scientific community at large, in particular collaborating laboratories in the CSU system for the purpose of studying biological processes, or other basic research activities. The Institute shall retain all rights to microorganisms, genes, nucleic acid sequences and their products for commercialization purposes. Licenses and rights will be granted to interested parties on an individual basis and only after negotiations with the Institute, California Polytechnic State University, and the California Polytechnic State University Foundation, as appropriate.

7. Teaching

The membership of the Institute shall be encouraged to make use of state-of-the-art technology and pedagogical devices in the various classes taught by them, utilizing the resources of the Institute to enrich these courses.

8. Institute for Applied Biotechnology Brochure

The Institute will communicate its existence annually and distribute a formal brochure to appropriate undergraduate departments at various institutes of higher learning to attract students to CPSU for graduate research in the molecular biological sciences and biotechnology.

9. Master's Degree in Special Major

The Institute will collaborate with the appropriate Department(s) to establish a multidisciplinary Masters Degree Program in a Special Major entitled "Molecular Biology and Biotechnology."

10. Ph.D. Program in Special Major

The Institute will attempt to establish and co-administer a Ph.D. Degree in a Special Major in collaboration with the University of California and other Ph.D.-Granting Institutions in the US and Abroad.

LOCATION:

The Institute will initially be housed in Fisher Science Hall, on the Cal Poly campus. The basic infrastructure for the isolation, cultivation, characterization, and genetic manipulation of the organisms from fossilized materials (e.g., amber) deep ocean cores, and contaminated sites, is already in place, requiring only additional equipment, supplies and personnel to meet the expected research and training needs. Classroom and laboratory space for training courses are available and will be reserved for use in workshops and scientific meetings. It is also anticipated that the Institute will sponsor scientific meetings and symposia on the Cal Poly campus.

AMENDMENTS

1. Amendments

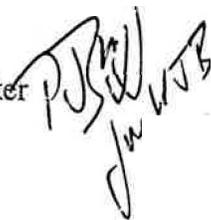
The Bylaws may be amended by a 2/3 vote of the membership voting at any meeting of the EBI. Each member shall have at least one week advanced written notification of the proposed amendment(s).

## Memorandum

**To:** Professor Raul Cano  
Biological Sciences Department

**Date:** August 15, 1996

**From:** Warren J. Baker  
President



**Copies:** Paul J. Zingg  
Philip S. Bailey  
V.L. Holland  
Susan Opava  
Harvey Greenwald

**Subject: Establishment of the Environmental Biotechnology  
Institute**

---

I am pleased to formally approve the establishment of the Environmental Biotechnology Institute. This approval is based upon the recommendation of the Academic Senate and the approval of the Academic Deans' Council.

Congratulations on your successful efforts in this regard, and best wishes in gaining outside sponsorship for your Institute's programs.