

THE STRATEGIC PLAN OF THE SCHOOL OF BIOLOGICAL SCIENCES UNIVERSITY OF CALIFORNIA, IRVINE April 2007

Mission and Structure

Mission The mission of the School of Biological Sciences (BioSci) is to create new knowledge about biological processes and principles, to disseminate this information by educating students about factual knowledge and the experience of discovery, and to contribute to the public discussion about the nature and role of science in society. Research within the School encompasses all levels of biological organization, from molecular and biochemical to global biological processes. It encompasses both fundamental discovery and application in areas beneficial to society. The latter includes studies on influenza epidemiology, Alzheimer's disease, global biological change, cancer, and stem cell biology, along with many others.

Current Structure & Size BioSci was founded with a (then) non-traditional departmental structure based on levels of biological organization. This structure has since become the disciplinary norm in biology. Our four departments are Developmental & Cell Biology (DC), Ecology & Evolutionary Biology (EE), Molecular Biology & Biochemistry (MBB), and Neurobiology & Behavior (NB). We do not anticipate creating any new departments in the next 10 years. The existing departmental structure, complemented by centers that cross disciplines both within and among schools, can accommodate our anticipated growth and emerging interests. Details concerning the current structure and programs of the School can be found at our website (<http://www.bio.uci.edu/research/index.html>).

The School currently has 109 filled faculty positions (DC: 24; EE: 38; MBB: 26; NB: 21), with an additional 9 positions currently under recruitment and 12 unfilled positions not yet released for recruitment, for a total of 130 positions, as of April, 2007. A number of these positions are or will be shared between departments within the School or with other campus units, principally with the Schools of Physical Science or Medicine. [Most of the unfilled FTE are not available for recruitment, either because they are being used to recall retired faculty for teaching or their funding has been used to upgrade salaries of current faculty to realistic market levels (30-40% above University scale). In addition, since BioSci draws many interdisciplinary researchers, it must retain the flexibility of holding some open FTE to participate in split or career partner's positions with other schools.]

Over the past 4 years, undergraduate majors within the School have increased from 3280 to a current 4263 (+29%). The number of graduate students within the School has increased from 252 to a current 402 (+59%) over the same period. In the past 4 years, student credit hours taught within BioSci increased 33% (33,515 to 44,453), and student-faculty ratios rose by 3-4 students per faculty member. In order to deal administratively with an enterprise encompassing ~5000 individuals, BioSci recently added Vice Chair positions in each of its 4 departments to assist with departmental management and governance. We also added a new Associate Dean for Research position within the School to coordinate and promote its diverse research activities.

Projected Size By 2015, we anticipate the recruitment of approximately 38 new faculty positions in addition to the replacement of approximately 13-14 positions vacated by retirements

(75% of 18 faculty turning 70). The number of new faculty is estimated on the basis of a projected 20% increase in undergraduate campus enrollments, accompanied by the modestly greater fractional increment in student enrollment that BioSci has experienced over the past few years. In addition, we anticipate growth from special opportunities in which the School has historically and recently participated, including distinguished faculty appointments, spousal hires, housing Center faculty, and shared appointments awarded to other campus units [recently including the School of Physical Sciences (PS), the School of Medicine (SOM) and the College of Health Sciences (COHS)]. Based on a projected campus growth of 20%, accompanied by the recent differential growth in BioSci, we project 5000 undergraduate majors by 2012, when campus undergraduate growth is expected to cease. Based on a linear increase of 30 additional graduate students per year over the past 5 years, we estimate a graduate student enrollment of approximately 650 by 2015. Obviously this growth will have major implications for space, facilities, and resource needs of BioSci (detailed elsewhere within this Plan).

Allocation of Growth and Interdisciplinary Cooperation Living organisms are integrated beings, and to understand their biology, it is necessary to understand them at all levels of biological organization, from molecules to ecosystems. The structure of our School and of the field of biology in general is built on this principle. We therefore are committed to balanced growth among our 4 departments. Within each department and among departments, we have designated the targeted areas of focal growth (specified in the next section) that we believe will be most fruitful for capitalizing on existing strengths and resources and moving aggressively forward over the next decade. In addition, we understand that biology is no longer a stand-alone field. Biological systems can now best be studied using cross- and multi-disciplinary approaches with other scientific fields. The School is committed to such initiatives and already participates in many of these, including those with PS (global change, theoretical and computational biology), SOM (mitochondrial medicine, stem cell biology, immunology, neurosciences), and COHS (pharmaceutical sciences, public health, cancer). BioSci will continue to expand existing interactions with these units, as well as develop new initiatives with the Schools of Engineering (Eng) (energy and the environment, biomedical engineering), Information and Computer Sciences (ICS) (computational biology, genomics), Social Sciences (SS) (neurosciences, hearing), and Education (Ed) (K-12 STEM education).

Research Agenda

Research Strengths within Departments and Focal Areas for Future Development The primary units for the development of the research agenda are the 4 departments of the School. Current strengths and future directions will be presented sequentially for these. Then, the themes that transcend departmental and school boundaries will be discussed.

Developmental and Cell Biology explores the genetic control of cell growth and differentiation that gives rise to tissues and organs of animals. It has traditional strengths in the areas of developmental biology and intercellular communication. Building on these areas and developing new ways to conduct research, future research initiatives will be directed at the study of systems biology, the physical biology of the cell, stem cell biology and regenerative medicine, and developmental biology and disorders.

Ecology and Evolutionary Biology studies the form and function of individual organisms, their interactions with each other and their environment, and how they adapt to changing environments. Its principal research areas are ecology, experimental evolution, evolutionary molecular genetics, and comparative physiology. While maintaining these traditional strengths,

it seeks to increase its emphasis on global change biology and develop new strengths in metagenomics and computational evolutionary biology.

Molecular Biology and Biochemistry investigates the chemical nature of living systems and the interactions among biochemical molecules that are the basis of all genetics and cellular activity. The department has three major research areas of emphasis: genome organization and control, molecular structural biology, and molecular genetics and pathogenesis. In the future, the department wants to expand these themes in the areas of transcriptional and post-transcriptional control of gene expression, molecular and membrane biophysics, and microbial pathogenesis and oncology.

Neurobiology and Behavior specializes in the study of nerve cells and brain function and their implications for the generation of adaptive behavior. This department has four principal areas of study: learning and memory, sensory processing and plasticity, cell signaling, and degenerative brain disorders. It seeks to expand into the areas involving neurocomputation, neurodevelopment, and the study of addiction, while maintaining the excellent strength of its current programs.

Interdepartmental and Multidisciplinary Areas of Research and Their Further Development

Administrative units, such as the departments and schools, permit focused planning, education, and interactions, but sometimes present challenging barriers to cooperation, particularly for areas of biological research that cross departmental and school boundaries. Interest and expertise in some areas of biology, such as genetics, genomics and development, for instance, span all our departments. Multidisciplinary research, which brings diverse areas to address a common theme or problem, also may not be accommodated well within a departmental structure.

One of the School's strategies to foster interdepartmental research is to hire faculty into appointments split between two units, either between two departments within BioSci or with another campus unit. We currently have 12 such interdepartmental appointments within BioSci or with other schools (currently with PS, SOM, and COHS). These split appointments participate actively in the intellectual and educational missions of both of their units, and form an important bridge to foster interdisciplinarity. BioSci currently participates in 23 joint (without salary) appointments, which afford clear pathways for inter-unit interaction. We anticipate an even greater percentage of split and joint appointments in the future, as we aggressively seek to hire individuals with research expertise in expanding multidisciplinary areas, such as systems biology, global environmental change, large scale genomics, molecular biophysics, and neurodevelopment. Additionally we will seek to enhance the development of interdepartmental research initiatives through coordinated recruitments within thematic areas. Currently, increasing strength in computational biology is a priority for all departments in BioSci and figures prominently in recent and prospective hires. The School is also requesting a cluster of positions across departments directed towards understanding the biological basis of diversity, principally in the study of gender and ethnic differences in biological systems. Coordinated hiring in thematic areas can help build new research foci and increase interdepartmental strengths and linkages. When these areas are sufficiently large and diverse, they may become established as School centers to facilitate and expand research interactions. BioSci currently has centers in Chemical & Structural Biology and Evolutionary Genetics, and anticipates the creation of additional centers in the near future, including a Center for Excellence in Education and Research Training.

Multidisciplinary research is usually accommodated within thematically directed Organized Research Units (ORU), which have membership spanning several schools and report to the Office of Research. Many of these involve biologically relevant research and have extensive participation by BioSci faculty, including the Cancer Research Institute, the Center for Complex Biological Systems, the Center for Hearing Research, the Center for Immunology, the Center for Molecular and Mitochondrial Medicine and Genetics, the Center for the Neurobiology of Learning and Memory, the Center for Virus Research, the Developmental Biology Center, the Institute for Brain Aging and Dementia, and the Institute for Genomics and Bioinformatics, the Sue & Bill Gross Stem Cell Research Center, and the multicampus UC Network for Experimental Research on Evolution. Additional ORUs that are currently in early stages of development or planning include the areas of Evolutionary Genetics, Global Biological Change, Innovative Teaching, Macromolecular Structure, Diabetes, and Biomembrane Studies. New ORUs will remain our primary mechanism for developing new faculty groupings in response to emerging research priorities.

Faculty

Distinction BioSci has an illustrious faculty that includes 3 National Medal and Presidential Award winners, 8 members of the National Academy of Sciences, 9 members of the American Academy of Arts and Sciences, and over 50 fellows of the American Association for the Advancement of Science. The School also has 5 Donald Bren Professors and 2 Distinguished Professors. National Research Council departmental rankings in 1995 were DC, 39th; EE, 22rd, and NB, 21st; the 2007 US News & World Report ranked BioSci 34th nationally. NB is ranked 5th in the nation in behavioral neuroscience. Extramural research funding increased 13% from 2005 to 2006 to \$39.7 million, despite a downturn in federal funding for biological research. BioSci (including the basic science departments in SOM) ranks 21st nationally and 1st in the UC system in federal research expenditures (latest available, FY2004).

Diversity While planning for faculty growth, it is important to have in place processes and practices that not only promote excellence, but also foster equity and diversity. Former Dean Susan Bryant was successful in obtaining one of the first-round NSF ADVANCE gender equity awards. BioSci successfully used that award to increase greatly the number and percentage of women on our faculty (from 16.5% at the beginning of this award in 2001 to 27% and 27 full FTE female faculty currently). Between 2002 and 2006, 46% of newly hired faculty were women, up from 11% between 1997 and 2002 period. This percentage equals the national average % availability pool of PhD women from top universities in the biological sciences, which in most subdivisions is 41-50%. The percent of minority faculty in the School is 25% (including Asian Americans), up from 16% in 1999, with a new hire rate of 33%. The non-Asian American minority is 11% (12% newly hired), again the national average availability in the biological sciences. The programs pioneered within BioSci, including the position of School Equity Advisor, have now been institutionalized throughout the UCI campus. BioSci is committed to continuing to build on its strong base developed by the ADVANCE program to realize its goal of developing a diverse and excellent faculty.

Near Term Plans for New Faculty Recruitment Over the next two year period, BioSci seeks to hire new faculty positions in three broad organizational themes: education, computational biology, and genetics and developmental processes. The education area is principally driven by specific curricular needs. We seek to hire two Lecturer SOE series positions with a primary

emphasis on teaching and development of new programs. One will assume primary responsibility for directing new programs and courses in our new undergraduate major in Science Teaching and in our prospective Master of Science in Biology Education program. These programs require extensive interactions with the Department of Education, which supports this request, as well as with K-12 schools and requires someone with an education background and experience. The second lecturer, previously staffed by a Senior Lecturer SOE transferred to a primary administrative appointment, will direct our largest undergraduate laboratory class, BioSci 100LW, Experimental Biology Laboratory. This is a required course for majors and our primary means of fulfilling the upper-division writing requirement. It demands extensive training of TAs to evaluate scientific writing, as well as overseeing multiple sections of diverse experimental laboratory exercises. We also seek to hire faculty to teach and do research in the area of physiological sciences. This area has been a traditionally strong area of BioSci and experiences intense student interest and demand, but the senior faculty members in this area have assumed administrative positions that greatly restrict their ability to teach and supervise students. We anticipate even greater student interest in courses in this area as programs in Nursing, Pharmaceutical Sciences, and Public Health expand. New faculty in this area would interact extensively with the SOM and COHS.

The second theme, computational biology, is an area in which all departments in BioSci want to add strength. It involves the management of very large amounts of complex data to allow for the search for internal patterns. We seek to hire faculty with mathematical and computational expertise in the areas of systems biology (the study of an organism or cell viewed as an integrated and interacting network of genes, proteins and biochemical reactions), the physical biology of the cell (an integration of traditional cell biology with the disciplines of biophysics, analytical proteomics, and computation), and neurocomputation (the study of the computational rules used by the nervous system in information processing). We are particularly interested in people who can communicate and teach both “wet bench” biology and computational approaches to biological problems. Faculty in this area will complement previous appointments within the School and help build a School focus in computational biology that transcends departmental boundaries. We expect that these new faculty will have close interactions with other campus units, including the Schools of PS, ICS, Eng, and SS as well as the Center for Complex Biological Systems, the Institute for Genomics and Bioinformatics, the Beckman Laser Institute, and the Developmental Biology Center.

The third theme for new faculty recruitment is genetics and developmental processes. Biological systems must replicate themselves, and most start from single cells and undergo an orderly progression to maturity. The study of the processes and rules underlying gene activation and developmental progression, including the consequences of defective development or development subverted by infection, is a central part of biology. A primary element of this study is the investigation of gene structure and regulation (how genes are organized and transcribed into proteins). We seek additional faculty in this area and in regenerative medicine/developmental diseases to help unravel the causes and perhaps remediate developmental mistakes. Because of the School’s particular strength in neuroscience, we also seek faculty in the areas of neurodevelopment and the biological basis of addiction, which can be viewed as neurodevelopment subverted by external agents. We also want to add to our growing strength in the study of the mechanisms underlying infectious disease, particularly in regard to microbial pathogenesis and the consequent development of cancers. Many of these topics cross departmental boundaries and are of obvious interest and will add strength to programs in the

SOM, COHS, and SS, as well as interacting with numerous centers, including the Cancer Research Institute, the Center for Immunology, the Center for Molecular and Mitochondrial Medicine and Genetics, the Center for the Neurobiology of Learning and Memory, the Center for Virus Research, the Developmental Biology Center, the Institute for Brain Aging and Dementia, and the Sue & Bill Gross Stem Cell Research Center.

Longer Term Plans for Faculty Recruitment Looking to the next 5 to 10 years, BioSci has two goals: to build on the focal areas of growth outlined in the near-term plan and to maintain our traditional areas of strength within each of our departments. With regard to the former, we will continue to emphasize new hires to strengthen growing foci in computational and systems biology, global biological change, molecular and cellular biophysics, neurodevelopment and addiction, stem cell and regenerative medicine, and transcriptional and post-transcriptional control of gene expression. We will seek to maintain and amplify our traditional strengths in cell-cell interactions, developmental biology and regeneration, evolutionary genetics, experimental evolution, gene structure and regulation, learning and memory, molecular biophysics and structural biology, molecular genetics and pathogenesis, neurodegenerative diseases, physiology, and systems biology. Many of these new faculty members will have interdepartmental appointments within BioSci or interschool appointments, particularly with COHS, PS, or SOM. Many of them will be hired in conjunction with campus centers.

Educational Programs

Current and Prospective Graduate Programs (PhD or MS) The School of Biological Sciences currently admits doctoral students through three gateway programs [the Interdepartmental Neuroscience Program (with SOM & SS); Molecular Biology, Genetics & Biochemistry (with SOM); and Mathematical and Computational Biology (with Eng, ICS, SOM, and PS)] and two departmental programs [Ecology & Evolutionary Biology and Neurobiology & Behavior]. Students receive the doctoral degree in Biological Sciences through departmental graduate programs in nine departments in BioSci and SOM. The School also admits students into Masters programs in Biotechnology and Stem Cell Biology. In addition, a few MS degrees are granted by other Departments in the School. Descriptions of these programs may be found at http://www.bio.uci.edu/grad_students/index.html. Virtually all of the graduates from these programs obtain research and/or teaching positions in universities or corporate labs, or continue in graduate or professional programs elsewhere.

BioSci is also actively developing an *MS in Biology Education with Teaching Credential* in cooperation with the UCI Department of Education. The program will involve completion of a Master of Science in Biology Education and a California Single Subject Teaching Credential in Biology. The first year of the program will be devoted principally to coursework leading to an MS in Biology Education. In the second year participants complete any remaining work needed to complete the MS and pursue the credential requirements, including the required coursework and student teaching. The degree requirements may be completed by either a thesis (plan I) or comprehensive exam (plan II) option. In addition, a summer program will be developed to accommodate teachers that already have a teaching credential, but would like to return to the university to complete the MS degree.

Over the next 5 years, we intend to implement two new PhD programs, an Interdisciplinary Gateway Program in Global Biological Change (with PS) and an Interdisciplinary Doctoral Program in Mathematical, Computational and Systems Biology (with Eng, ICS, SOM, and PS). The former will provide multidisciplinary training to incoming

graduate students in the biological and physical sciences to fundamental principles of atmospheric science, ecophysiology, evolution, ecosystem science, geochemistry, global biology, hydrology, and meteorology. The latter program will provide quantitative training for biologists and biological training for mathematicians and computer scientists, and provide a quantitative understanding of large-scale and complex biological systems.

Current and Prospective Undergraduate Programs The School currently offers BS degrees in the following areas: Biochemistry & Molecular Biology, Biological Sciences, Developmental & Cell Biology, Ecology & Evolutionary Biology, Genetics, Microbiology & Immunology, Neurobiology, Plant Biology, Pharmaceutical Sciences (with COHS), and a Specialization in Science Teaching. See http://www.bio.uci.edu/Students/prospective/content_majors.html for additional information about these majors. We are currently developing a cross-school major with SS in Cognitive Neuroscience (estimated total of ~800 majors). We collaborate with Biomedical Engineering, Public Health, and Nursing by offering critical courses for their majors. We rely on the School of Physical Sciences to offer chemistry, math and physics courses for our majors.

We have a historically very strong independent research program for undergraduates, including faculty from BioSci, COHS, and SOM. In addition, a large number of students from other schools also are involved in independent research within BioSci. We also have a strong outreach program that is described in detail at http://www.bio.uci.edu/outreach/content_outreach.html. The School also has extensive programs to encourage minority participation in our undergraduate majors (<http://port.bio.uci.edu>). BioSci attracts large numbers of highly qualified undergraduates. The average SAT scores of incoming undergraduates in 2006 were 576 Verbal and 626 Math. During the past 5 years, USA Today has twice designated a BioSci undergraduate as one of the top 40 students in America, and our students have won 5 Fulbright, 6 Goldwater, 1 Hughes, 1 NSF, 1 NDEA, 1 Strauss, and 1 Truman Fellowships. Each year, about 150 BioSci graduates enter medical school, 150 enter dental school, and 150 enter pharmacy school. As an independent outcome measure of our students' learning, BioSci majors who take the MCAT exam in Biology do substantially better than the national average.

Student evaluations of faculty teaching are extraordinarily high. The average rating for overall teaching quality in the four departments is 3.62/4.00. Two of our faculty members have been designated as Howard Hughes Teaching Fellows, one has been awarded a Hughes grant to foster creative approaches to biology education, and another has been given a career award from NSF for that purpose. Over the past 3 years, one BioSci faculty member received the UCI Academic Senate award for the most distinguished teacher on campus, and three have won other campuswide awards for the use of technology in the classroom. One of our lecturers won the campus award for TA development, and one of our graduate students won the award for most promising future faculty member on campus.

Staff

There are three critical staffing areas for all science schools: 1) *administrative staff* to support faculty, graduate and undergraduate students, researchers, postdoctoral researchers, and other staff.; 2) *PhD-level technical research support staff* for core facilities; and 3) *technology and computing/web-support staff*. At present, we have 84 administrative support staff, 0.5 research support staff (split with PS), and 7 technology/computing staff; only 60 of these positions are permanently (Sub 1) funded. As a consequence, individual staff workloads are unworkable:

workload is the only factor strongly and consistently designated as a primary source of dissatisfaction among our current employees. In addition, low salaries and lack of advancement potential cause many staff members to change jobs or leave UCI, taking with them much valuable historical and procedural information. It is essential for the campus to re-adjust the staff/faculty ratio in science schools to reduce the enormous workload placed on the staff.

In regard to undergraduate education, our counseling and lab staff has not grown in years, despite the enormous increase in majors' enrollment. We need to restore reasonable levels of service and to parallel any further growth in number of undergraduate majors with a concomitant growth in the number of support staff.

Support Services and Facilities

Common core facilities are necessary for competitive modern research in the life sciences. The need for and utility of common facilities spans many schools on campus, including BioSci, Eng, PS, SOM and COHS, and SS, and thus need to be centrally planned and managed. Specifically, these needs include BSL3 containment space, greenhouses, transgenic mouse facilities, and vivaria. In addition, a number of critical research support services need to be developed within BioSci to attract new faculty and to permit faculty and students to produce first-class research. In recognition of the critical importance of this area, we have recently created the position of Associate Dean for Research in Biological Sciences. One of the key responsibilities of this person is to initiate and oversee the development of a centrally coordinated Life Sciences Research Support Core. Facilities within the core would optimally be protected by service agreements and operated by skilled PhD-level research professionals. To support such activities as the stem cell initiative, pathogen and environment health initiatives, and the newly created pharmaceutical sciences emphasis area, Core Facilities should at a minimum include cell sorting and analysis; computation, modeling, and informatics; genomic and proteomic facilities (including microarrays), high-throughput screening capacities; imaging and optical biology; and molecular structure determination (mass spectrometry, NMR, and X-ray crystallography). Some of the pieces of a successful Core are already in place, but the basis of their operation is piecemeal and idiosyncratic. For example, the Optical Biology Facility is a heavily used and relatively well developed facility on campus benefiting a large number of labs (>60 labs, in 3 schools and >20 departments). One new staff FTE would provide efficient and effective use of these facilities and greater productivity for the faculty. For other facilities, the instrumentation is outdated, costly to maintain, and inefficiently used due to a lack support personnel. Our greenhouses, essential for research in many areas, including structural biology, genomics, and global change, have space that is outdated and too small for current demand, curtailing the scope of research. Many parts of the Core would be coordinated with SOM facilities to provide complementary breadth (for example, the genomics and proteomics core). While coordinated plans for the administration and use of these facilities are currently ongoing, an investment of resources/funds will be urgently needed for the successful implementation of these plans.

Campus Life

To enhance the identity and experience of our enormous number of undergraduate majors, we propose to turn the entire first floor of our new building, Biological Sciences 3, into a Biological Sciences Student Center. This Center will include facilities for both academic and career counseling, space for biologically-related student activities, space for student-faculty interaction, and classrooms for discussion sections, tutoring, mentored study groups, and dry laboratory

exercises associated with large lecture classes. This central facility will adjoin a new biology lecture hall, which will be adjacent to the Center. We are currently in the process of completing a large lounge facility for BioSci graduate students in Natural Sciences 1, to provide an area for them to congregate and relax between classes and experiments.

In the life sciences, postdoctoral fellows play an essential role in research and graduate student mentoring. However, since there is no formal degree associated with postdoctoral training, these important scholars are frequently overlooked in university planning and resource allocation. Our success in attracting and retaining excellent postdocs is critical for the maintenance of a high-profile research program in biology. At UCI, life scientists face four barriers in attracting postdocs: the lack of prestigious (named) fellowships, the lack of on-campus housing, the high cost of off-campus housing, and the lack of adequate public transportation. Only the first two of these issues are under UCI's control, but they need to be made a high priority across all fields of science. There is a strong need for an International Center on campus that is able to provide one-stop assistance with the many complexities that foreign students, postdocs and faculty face on arriving at UCI. We recommend an expansion of the current mission of the UCI International Center to include providing complete guidance on visa issues and assistance of foreign nationals in other aspects of coping with life in a new country.

Public Role

The public comes to know about us through what we show them about ourselves. We do this through public lectures and press releases. BioSci and its affiliated centers sponsor lecture series that collectively draw thousands of interested participants each year from the local community. We intend to expand these lecture series, particularly into the areas of stem cell biology/regenerative medicine and global biological change. We have had dramatic successes with our press releases over the past several years, with research news from BioSci being widely reported at the national and international levels. Part of the role of our new position of the Associate Dean for Research is to facilitate and enhance communication of our research.

Especially in the sciences, it is important that we take a role in inspiring K-12 students to pursue scientific study. BioSci takes this mission extremely seriously, and is in the process of creating both undergraduate and graduate programs in science education to increase the number of K-12 science teachers. Historically, we have had excellent outreach programs to interest and support minority student training in science.

The ties between UCI and the surrounding community need to be strengthened. We particularly need to maintain and increase ties to our undergraduate, graduate and postdoctoral alumni, an area in which the School has previously been deficient. Many alumni recognize the difference their UCI education made in their lives and are eager to support BioSci and UCI, but need to be told how they can help. One of our most successful programs in this area is our Mentoring Program, in which community members are linked to current undergraduates for career information and advice. Most of our mentors are former UCI students, and they are especially effective in helping direct students.

We are particularly fortunate in being located in an area of great biotech, medical device, and venture capital activity. BioSci has an active Dean's Advisory Council of community members who are generous in sharing their expertise and experience with us, and we are in the process of solidifying and expanding those ties. Technology transfer is also an important way in which we can extend our reach into the community. We need to put more emphasis on bringing

our research findings into the public realm and on partnering with businesses in the community to capitalize on scientific discoveries made by our faculty.

Resources

In order to reach our potential and to grow to maximum size with increased excellence and quality, we need a variety of resources:

Capital Construction and Space As enrollments rise within BioSci, there will be increasing demand for an additional research building (BioSci 4) to contain the laboratories and offices for the estimated 25 to 30 new faculty recruits beyond those that can be accommodated in BioSci 3. We will need more classrooms, both large and small, and instructional laboratories to accommodate our increased undergraduate enrollment. One means of efficiently adding classrooms and instructional science labs would be to convert Steinhaus Hall entirely into an undergraduate science lab and lecture building, possibly to be shared with other science programs from PS and COHS. Steinhaus has an ideal central location of these labs, permitting undergraduate access within the campus core. However that conversion could only be accomplished if new research space were provided for the existing 23 faculty laboratories currently housed in Steinhaus. If this option were accepted, BioSci 4 would have to grow from 25-30 laboratories to 50-55, or an additional building (BioSci 5) would have to be planned and built as well.

Extramural and foundation funding We need to develop more extensive ties with the Office of Research and expand internal school staff to assist faculty in preparing successful large, multi-investigator research and training proposals.

Compensation Plan for the Life Sciences and a revision of the pay scale for science faculty In order to develop and retain a successful faculty, the inequities between the compensation for life sciences faculty and basic sciences faculty in the SOM need to be removed. A compensation plan for equitable pay for equivalent faculty must be developed. In addition, a competitive pay scale for faculty in the life sciences needs to be instituted to reflect the current competitive salaries in academia (as has previously been done for Engineering, example): each of the BioSci's recruitments currently requires substantial upgrade funds to bring the salaries up to competitive market rates.

Philanthropic funding Since the State of California funds less than 20% of the campus operations, philanthropic giving must play an increasingly important role in making the difference between marginal and excellent programs at public institutions such as UC Irvine. Our priorities for philanthropic donations include

- Undergraduate, graduate & postdoctoral fellowships to attract the best candidates to participate in education and research in BioSci.
- Endowed Chairs to retain and attract excellent senior faculty in highly competitive areas.
- Research buildings to house centers, including funding for the completion of the Stem Cell Center Building, as well as funding for new buildings for the Institute for Brain Aging and Dementia, along with funding for a building to house research in Developmental Disorders.

**The School of Biological Sciences is committed to providing excellent educational opportunities, creating new knowledge, and serving the people and the State of California.
We ask for support and resources to permit us to achieve those goals.**