UCR Genomics Institute

Proposal To Become An Organized Research Unit

June 2002
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Goals

The goal of genomics is to mine the genomes of all organisms to identify the genes, and hence the proteins, that channel the biological reactions that provide our fuels, our foods, our fibers and other materials, and that underpin our health. We are in an era of very rapid genomics based discovery that is powered by a seemingly unending stream of technical innovations. Today these innovations give us access to the genetic codes necessary to produce better pharmaceuticals for human health, to advance agriculture, to use plants and microbes to produce novel products and to tailor approaches to individual health based on precise genetic characterizations. Along with the promise of genomics comes a number of pressing societal issues including the impacts of genetic engineering on environmental health, the potential for IPR based gains to crowd out “public good” research and the problem of insuring that the benefits of the genomics revolution extend to the world’s poorest peoples.

Two innovations are of paramount importance to the genomics enterprise: (a) rapid methods for DNA sequencing, and (b) computational resources that allow the conversion of this information into knowledge. Access to these fundamental tools will play a large role in determining the future success of research universities. Accordingly, we propose to establish the UCR Genomics Institute (UCRGI), built around a central core instrumentation facility. Arrayed around the core facility would be virtual centers in the areas of insect genomics, plant cell biology/genomics, microbial genomics, mammalian genomics, and bioinformatics. (See Appendix A.) Connected to the Institute will be a policy dimension that considers social, environmental, economic, and ethical impacts of these new technologies. This will take the form of a Biotechnology Impacts Center, which will report jointly to UCRGI and to the UCR Policy Studies Institute.

Mission

The mission of the UCR Genomics Institute is to develop and disseminate new scientific and technical knowledge that will afford economic and social benefits to agriculture, the environment, and human health, thus improving the quality of life. This will be accomplished by making, exploiting, and evaluating the impacts of discoveries in genomics, proteomics, and bioinformatics through focused efforts in: (1) insect genomics, (2) plant cell biology/genomics, (3) microbial genomics, (4) mammalian genomics, and (4) bioinformatics. The Institute will maintain a high level of scientific integrity and social responsibility in its research, educational, and outreach programs.
Research Plan

Insect Genomics

Insects are the most abundant terrestrial animals and have profound effects on human society. Research in insect genomics at UCR is aimed at using the tools of molecular biology and genomics to develop new, non-traditional approaches to the management of pest insects. When combined with the well-established techniques of entomology, these new approaches will help scientists disrupt the interactions between insects and plants, between insects and humans, and between insects and animals in order to prevent damage to economically important crop plants and to avert disease transmission to both livestock and humans.

The UCR Department of Entomology has a long-established reputation for excelling in entomological research and has a breadth and depth of expertise that is perhaps unmatched in the country. A new main entomology building, opened in January 2002, fosters interactions between faculty from the different areas of entomology and, in addition, a new, state-of-the-art Insectary & Quarantine Facility will support UCR’s cutting edge research in insect, plant and microbial genomics. Among the specific projects underway in insect molecular biology and genomics are:

56. Strategies to control pest insect species, such as the Mediterranean fruit fly, Olive fly, pink bollworm and mosquitoes, the latter of which transmit many debilitating human diseases
57. Research projects aimed at controlling the development of the pathogen responsible for malaria by manipulation and activation of the immune system of mosquitoes that vector this disease
58. Understanding the molecular basis of insecticide production by the bacterium Bacillus thuringiensis with the aim of developing new bacterial insecticides and insecticidal-producing transgenic plants
59. Research projects aimed at understanding the basis of blood-feeding behavior in mosquitoes.
60. Projects to identify insect genes that are involved in nutrient uptake in the midgut.

Plant Cell Biology/Genomics

Plants are the basis of all life on Earth, whether as components of natural ecosystems or as domesticated crops used for food and materials. The challenges of the next century will extend from accurately assessing how plants react to stress in the environment to manipulating crop plants safety and efficiently for better and more sustainable production. The understanding of plant function has progressed greatly due to genomic and molecular analysis, but the new frontier will be at the cellular level. The promise of genomics will be realized through new methods for determining the function of gene products in the context of live cells in whole organisms.

The Center for Plant Cell Biology within the Genomics Institute will serve to synergize UCR’s existing strengths in plant cell biology. The center conducts cutting-edge research to answer the significant outstanding questions in plant biology by integrating genomic, bioinformatic, cellular, molecular and biochemical approaches. Research is expected to focused on eight areas: cell walls, large molecules, ion channels and transporters, cell-cell communication and signal transduction,
cytoskeleton, cell cycle control, mechanisms of gene regulation, and mechanisms of plant-pest and plant-pathogen interaction.

Faculty researchers in the plant cell biology/genomics group are investigating such topics as:

61. Mechanisms of protein targeting in plant cells and the genetics of cell wall synthesis
62. Signal transduction mechanisms and translational regulation in response to such abiotic stresses as drought, soil salinity and heat
63. Development of plant transformation technologies
64. Changes in plant gene expression that follows insect feeding, wounding and pathogen invasion

Microbial Genomics

Microbial genomics has provided new approaches to study complex microbial processes. Microorganisms are important for their roles in plant and animal pathogenesis, in global mineral cycling, in the degradation of pollutants, and as the foundation for biological food webs.

The ability to examine these complex roles is now greatly enhanced by the availability of more than 50 complete microbial genome sequences and with new tools to examine whole-genome expression patterns. UCR has unique strengths in research on microbial pathogenesis of plants and insects and on the roles and applications of microorganisms in environmental processes.

UCR researchers are using the tools of genomics to study complex metabolic and signal transduction pathways in microorganisms, as well as interactive genomics to study plant- and insect-microbe relationships. Knowledge gained from this research will benefit the development of sustainable plant disease resistance strategies, improved biological control of pests and diseases, and in applications of microorganisms in bioremediation and restoration of natural systems. Among the specific research topics are:

65. Sequencing and functional analysis of the genome of the plant pathogen *Erwinia chrysanthemi* to understand pathogen virulence
66. Comparative and functional genomic analysis of strains of *Xylella fastidiosa* causing Pierce’s disease of grapes and other plant diseases to understand pathogen virulence and interactions with the insect vector
67. Use of DNA micro-arrays and other genomics tools to study the structure and function of complex microbial populations in soil
**Mammalian Genomics**

Human health and behavior are functions of our genome and the environment. The genome determines how we respond to the environment and the environment affects the human genome in a dynamic way, turning on and off genes in response to extracellular signals.

Research in cellular and molecular biology on mammalian and non-mammalian model organisms is the fastest moving area of research in the biological sciences and is at the forefront of the genomics revolution. With the sequencing of the human, mouse and other genomes, researchers are now able to focus on the function of the gene products and how they interact with each other.

Researchers from several different departments at UCR are using the whole gamut of the latest genomic, proteomic and bioinformatic techniques to address questions in mammalian molecular cell biology and human health. Using these techniques and the facilities at the UCR Genomics Institute, they are addressing such topics as:

68. How genes control the growth of cancer cells, and how can this knowledge be used to kill cancers

69. Changes in gene expression in response to aging and diet that can lengthen life span and delay the onset of age-related diseases.

70. Genes involved in embryonic development

71. The genetic basis of wound healing, strokes and heart attacks

72. Genetic response to environmental insults, such as tobacco smoke and chemicals in food

**Bioinformatics**

Bioinformatics is an interdisciplinary field that draws on the disciplines of biology, mathematics, statistics, physics, chemistry, computer science, and engineering. Its objective is to study informational and computational theories, techniques, and systems that could provide the much needed support for research in modern molecular biology and biochemistry, in particular, genomics and proteomics. Some of the topics that have been studied in the field include biomolecular databases, datamining, sequence comparison, detection of genes and regulary signals, phylogenetic inference, fragment assembly in DNA sequencing, physical mapping, expression array analysis, protein folding, gene networks, and combinatorial drug design.

UCR has active research in bioinformatics with participants from several academic units including Computer Science and Engineering, Statistics, Botany and Plant Sciences, Plant and Pathology, Biology, Chemical Engineering, and Biomedical Sciences. Research has been focused on algorithmic, computational, and statistical issues in comparative genomics, quantitative genetics, functional genomics, environmental biology, and bioengineering. Following are some example projects:
73. Analysis of gene evolution on plant genomes and evolution of nematodes based on gene order analysis

74. Search for transcription factor binding sites on the human genome

75. Classification of microbial organisms using a novel DNA microarray techniques and diagnostic analysis of microbial communities

76. Fertility, smoking and early mammalian development

77. Molecular evolutionary approaches to breast cancer research

78. Pattern discovery in biomolecular sequences

Core Instrumentation Facility

The core instrumentation facility is available to all UC Riverside researchers on a modest recharge basis. The following state-of-the-art equipment is now being put in service:

Genomics
79. Applied Biosystems (ABI) PRISM 3100 Genetic Analyzer: this is a 16-capillary fluorescence-based DNA sequencer.
80. Genetix QPIX for automated and high-throughput picking of bacterial colonies and inoculation of cultures in deep-well microtiter plates. This instrument also has “gridding” capability for making macro- or microarrays on membranes.
81. Beckman Multimek 96 for automated pipetting in filling of 96-well plates with medium for bacterial culture.
82. Genomic Instrumentation Services Hi-Gro incubators for high-throughput culture in 96-well plates.
83. AutoGen 740 for automated extraction of DNA from bacterial cells or animal tissue. This instrument is designed for use with samples in tubes.
84. Liquid-handling robot for automated preparation of plasmid DNA preparatory to cycle sequencing. We will have the capability, with this instrument to automate the preparation of PCR reactions and subsequent cleanup prior to sequencing.

Gene Expression
85. Genetic Microsystems 417 Arrayer and Genetic Microsystems 418 Scanner. These instruments automate the preparation of cDNA microarrays (417) and the scanning of these arrays after hybridization of fluorescent probes (418).
86. ABI PRISM 7700 Sequence Detection System. This instrument is used for quantitation of template mRNA or DNA by PCR amplification and cycle-by-cycle measurement of double-stranded amplicon by fluorescence.
87. Affymetrix workstation containing Data Mining Tool software for analysis of data obtained with use of commercial chips containing oligonucleotides encoding human, mouse, yeast and fly sequences.
Proteomics
88. ABI Procise 492 protein sequencer. This instrument automates N-terminal sequencing of proteins by Edman degradation.
89. Two-dimensional electrophoresis (2DE) equipment for 2DE proteins will allow use of either tube gels or immobilized pH gradient strips in the first dimension and large-format slabs for the second dimension. We will have a high-end scanner for digitization of images and commercial software for analysis and comparison of gels. Preparative applications include fragmentation of proteins in-gel and analysis of fragments by mass spectrometry in our facility in the Chemistry Department or their isolation by microbore HPLC and analysis by automated Edman degradation.

Interdisciplinary Focus
UCR is well positioned to participate in the genomics revolution, by virtue of a research active faculty in the biological, biomedical, and agricultural sciences, in chemistry, in statistics, in computer science and in the social sciences and humanities. In July 2001, genomics was chosen as one of three campus-wide initiatives, endorsed by the Deans and the Executive Vice Chancellor. A primary reason for its selection was the truly multi-disciplinary nature of genomics-related research. The College of Natural and Agricultural Sciences is central to the mission of the proposed UCR Genomics Institute, with expertise in functional and comparative genomics, proteomics, metabolomics, and bioinformatics. The College of Engineering is deeply involved in the bioinformatics aspect of the program, and has linkages to environmental genomics. Because outreach is such an important aspect of the program, faculty in the School of Education are essential in developing the Institute’s K-14 efforts, and University Extension will be heavily involved in public education. Economic and business aspects of biotechnology are addressed by the A. Gary Anderson Graduate School of Management and appropriate units in the College of Humanities, Arts, and Social Sciences. The Division of Biomedical Sciences is involved in the health and medical aspects of genomics. Finally, CHA&SS has a major role to play in terms of the social, economic, ethical, and political impacts of genomics and biotechnology.

The core faculty for UCRGI are listed in Appendix B. Each of these individuals has agreed in writing to participate in the Institute’s activities. Their expertise reflects the wide range of disciplinary interests described above. A faculty meeting held on May 30, 2001, attracted 65 participants from across campus. An additional 18 faculty expressed an interest but were unable to attend. A survey handed out at that meeting provided the following summary of faculty interests:
Indication of Interest in UCR Genomics Institute

Total respondents: 35

Areas of Interest – indicates number of faculty responding to each area:

- Agricultural Genomics: 18
- Bioinformatics: 15
- Comparative Genomics: 11
- Consumer/Public Outreach: 6
- Economic Impacts of Biotechnology: 6
- Environmental Impacts of Biotechnology: 7
- Ethics: 14
- Graduate Education: 14
- Health and Environmental Genomics: 7
- Insect Genomics: 6
- K-12 Outreach: 5
- Mammalian Genomics: 6
- Metabolomics: 3
- Microbial Genomics: 10
- Non-Mammalian/Animal Genomics: 6
- Plant Genomics: 12
- Proteomics: 13
- Public Policy: 6
- Social Impacts of Biotechnology: 11
- Undergraduate Education: 7
- Other:
  - International dimension (partnership with Mexico): 1
  - Microbial community analysis: 1
  - Intellectual property transfer: 1
  - Plant cell biology: 1
  - Research policy and administration: 1
  - Genomics in tissue engineering: 1
  - Structural genomics: 2
    - Structure and function of proteins: 1

Leadership and Oversight

The Director of UCR Genomics Institute (UCRGI) will be Dr. Michael Clegg, distinguished professor of genetics in the Department of Botany and Plant Sciences and former dean of the College of Natural and Agricultural Sciences. Dr. Clegg is a member of the National Academy of Sciences and is widely respected in his field. It was his vision and leadership that led to the foundation of the UCR Genomics Institute. Dr. Clegg will be responsible for providing the overall research direction of UCRGI and for generating additional resources. (See curriculum vitae, Appendix C.)
Serving as Associate Director will be Dr. Peter Atkinson, Associate Professor of Entomology. He provides leadership in Dr. Clegg’s absence and heads the UCRGI steering committee. The steering committee is advisory to the Director, and meets on a regular basis to review and evaluate programs, identify opportunities and needs, to establish goals for UCRGI, and to make recommendations to the Director. Serving on the steering committee are: Michael Adams, Cell Biology and Neuroscience; Donald Cooksey, Associate Dean, Agricultural Experiment Station; Donald Dye, Dean, AGSM; Norman Ellstrand, Botany and Plant Sciences; Sarjeet Gill, Cell Biology and Neuroscience; Cynthia Giorgio, CNAS; Robert Haddon, Chemistry/Engineering; Bradley Hyman, Biology; Tao Jiang, Computer Science; Howard Judelson, Plant Pathology; Werner Kuhr, Chemistry; Keh-shin Lii, Statistics; June O’Connor, Religious Studies; Natasha Raikhel, Botany and Plant Sciences; Philip Roberts, Nematology; Mikeal Roose, Botany and Plant Sciences; Frances Sladek, Cell Biology and Neuroscience; Richard Sutch, Economics; and Linda Walling, Botany and Plant Sciences. (See curriculum vitae, Appendix D.)

A program leader will be identified for each of the major research areas within the Institute. These individuals are responsible for identifying the primary research direction, for coordinating among relevant faculty, and for helping to seek external funding in their respective areas. In addition, Dr. Michael Adams is acting as faculty director of the core instrumentation facility, Dr. Norman Ellstrand is serving as director of the Biotechnology Impacts Center, and Dr. Natasha Raikhel is serving as director of the Center for Plant Cell Biology.

**Biotechnology Impacts Center**

In biotechnology, as in many fields of science, knowledge is being created at an astounding rate. With this rapid pace of discovery comes the need to: (1) disseminate sound, science-based information to the public and policy makers so they can make informed decisions, and (2) explore all potential consequences, both positive and negative, of these scientific advances. The pervading need, however, is for an informed, open dialogue among all facets of society about the risks and benefits of biotechnology.

Biotechnology, like all emerging scientific innovations, has the potential for both benefits and risks to human society and the environment. It holds the promise for transforming agriculture, stimulating the economy, and improving public health, but also the risk of unintended environmental and social consequences. We are at a crossroads where we could fail to capture the full power and value of biotechnology unless the public and policy makers are well informed and science and industry act responsibly.

The Biotechnology Impacts Center (BIC) is proposed center at UCR, under the auspices of both the UCRGI and the UCR Policy Studies Institute. Its mission is to promote research and education on all aspects of the social, economic, political, environmental, and ethical consequences of the biotechnology revolution. BIC serves as an “honest broker” forum to identify the relevant policy issues, to act as a clearinghouse for credible information, and to initiate research that addresses the impacts of biotechnology. The resulting knowledge will inform public policy discussions among public interest groups, the biotechnology industry, academics, elected
officials, and policy makers. BIC additionally seeks to imbue UCR’s research and educational activities with a spirit of social responsibility and scientific integrity.

BIC also has an important educational mission to disseminate knowledge and address concerns about new and emerging developments in biotechnology. At both the graduate and undergraduate levels, courses will be available in public policy related to such issues as bioethics, scientific responsibility, and the controversy surrounding genetically modified organisms. The Center hopes to provide modest financial and academic support to graduate students in the humanities, the social sciences, and the life sciences and seeks to encourage and enrich faculty mentoring of graduate students. BIC also encourages the creation of hands-on research opportunities for undergraduate students. Finally, the Center will offer a wide variety of additional support services to faculty, students, and the general public. Ultimately, these will include a visiting speakers’ forum, a seminar program, a web-based working paper series to disseminate pre-publication findings of ongoing research projects, and conference support.

Already BIC is engaged in several activities, including actively seeking grants for a study on policy issues related to biotech crops in California. A graduate-level course titled “The Benefits and Risks of Agricultural Biotechnology” has already been offered. As of Spring 2002, BIC has also co-hosted two prominent speakers on the impacts of biotechnology – Lawrence Michael Busch, director of the Institute for Food and Agricultural Standards at Michigan State University and Jane Rissler, deputy director and senior staff scientist with the Union of Concerned Scientists.

The Biotechnology Impacts Center will convene a major international conference in fall 2003 on the scientific aspects and social, economic and environmental impacts of agricultural biotechnology. The meeting will bring to UCR life scientists, social scientists, bioethicists, and policy makers, as well as representatives from the biotechnology industry, the public, the media and non-governmental organizations to address major topics related to genetically modified organisms. Findings emerging from conference discussions will be widely disseminated through briefings for legislators and staff in Washington, D.C., Sacramento and other California cities, published policy briefs on specific issues, and a book examining policy alternatives.

Approximately 40 faculty representing every academic unit on campus attended a planning meeting on October 8, 2001. At that time, they endorsed the proposed mission of BIC as well as the proposed dual reporting relationship to both the UCR Genomics Institute and the Policy Studies Institute. This arrangement serves to keep the Center at an objective distance from the scientific research conducted by the Genomics Institute and to recognize the meaningful contribution that social scientists, humanists, business experts, educators, and others can make to inform the responsible use of biotechnology in society. Leadership for BIC is provided by Dr. Norman Ellstrand, professor of genetics, who will serve as Director, and Dr. Richard Sutch, distinguished professor of economics, who will serve as Associate Director.

**Center for Plant Cell Biology**

As the world leader in plant cell biology, the Center for Plant Cell Biology (CEPCEB) at the University of California, Riverside, will carry out cutting-edge research to answer significant
outstanding questions in plant biology by integrating genomic, bioinformatic, cellular, molecular, biochemical, and genetic approaches. CEPCEB will be one of several centers associated with the UCR Genomics Institute. The Center will make an impact by:

90. Creating a series of research teams, whose members will conduct research to answer important biological questions using multidisciplinary approaches applied to model plant systems and important crop plants. The comprehensive research program carried out by this group of principal investigators will take advantage of, and foster, interdisciplinary research that brings together cell and molecular biology, genomics, bioinformatics, proteomics, and genetics.

91. Building an interdisciplinary infrastructure that is required for frontier research in the field of plant cell biology and for training students and scientists who are most capable of post-genomic biological research and education.

Hence, the strength of CEPCEB will not reside only in its first-class scientists in plant cell biology, but also in the interactions of the research teams in genomics, bioinformatics, and structural biology, and in the integration of the Center with the ongoing genomics initiatives. An additional resource is the animal cell biology faculty in UCR’s new Department of Cell Biology and Neurosciences.

Plants are the basis of all life on earth, whether as components of natural ecosystems or as domesticated crops used for food and materials. The challenges of the next century will extend from assessing accurately how plants react to stress in the environment, to manipulating crop plants safely and efficiently for better and more sustainable production. Our understanding of plant function has progressed greatly due to genomic and molecular analysis, but the next frontier now extends to the cellular level. Indeed, the promise of genomics will be empty without new methods for determining the function of gene products in the context of live cells in whole organisms.

CEPCEB will become a prominent modern center through an outstanding group of interactive and open-minded cell biologists and an infrastructure that promotes interdisciplinary research and maximum interaction. The research group must be built on the existing strength at UCR and new hires that will complement and strengthen existing research programs in the forefront areas of Plant Cell Biology. Leadership for CEPCEB will be provided by Dr. Natasha Raikhel, Distinguished Professor of Plant Cell Biology and holder of the Ernst and Helen Leibacher Endowed Chair.
Projections of Faculty, Students, and Other Personnel

Even before genomics was identified as a cross-campus initiative, the Chancellor committed an additional 9.00 faculty FTE to related areas. New faculty positions directly associated with UCRGI are:

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<td>1.50</td>
<td>Bioinformatics</td>
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<td>Quantitative Genetics</td>
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<td>Genomics - <em>C. elegans</em></td>
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<tr>
<td>.50</td>
<td>Comparative Genomics</td>
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<td>1.00</td>
<td>Microbial Genomics</td>
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<td>.50</td>
<td>Insect Genomics</td>
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<td>.50</td>
<td>Plant Genomics</td>
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These positions have been included in the CNAS Academic Plan for 2002-05 (see Appendix E). Additional FTE were committed in conjunction with CEPCEB. They are:

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In addition to faculty lines, the Chancellor committed funding for staff positions to support UCRGI and the Center for Plant Cell Biology. Effective July 1, 2001, Dr. Timothy Kingan was appointed as academic coordinator for the core instrumentation facility. His responsibilities include the supervision, maintenance, and operation of the core instrumentation facility; establishment of workflow and procedures; selection and supervision of facility staff; and coordination of research activities. In addition, he will work with faculty to identify instrumentation needs and seek funding for new equipment. A search is currently underway to hire a staff research associate to assist the academic coordinator. Ultimately, additional technicians will be supported on grant funds and through recharge activity. Searches are currently underway for two additional academic coordinators to handle the bioinformatics and microscopy functions of the core instrumentation facility.

Joining the UCRGI in February 2002 were David Carter, academic coordinator for imaging, and Thomas Girke, academic coordinator in bioinformatics. Dr. Carter will manage the imaging facilities of the Center for Plant Cell Biology, overseeing the operation of three Leica scanners (including the spectral imaging system, multiphoton system and high-speed scanner), a Meridian InSight Point system for real-time confocal ocular viewing and CCD data collection, a laser ablation system, and a microinjection microscope. Dr. Girke will maintain a functional bioinformatics infrastructure by administering several networked terminals and server(s) dedicated to provide the Institute with state-of-the-art tools for high-throughput sequence analysis, project-specific data mining approaches, construction of relational databases, and other tasks. A search is underway for another academic coordinator in the area of proteomics.
As of September 2001, Kathryn Barton began working as a grant writer for UCRGI. An experienced writer at UCR, her responsibilities include working with faculty to develop large, multi-investigator contracts and grants, including training, center, and equipment grants. In addition, she is responsible for development activities for the Institute, including corporations, foundations, and individuals. UCRGI also shares an administrative assistant III with the Director of the Center for Plant Cell Biology, Kimm Streit. In addition to providing administrative support to the Director, she is responsible for all fiscal operation functions for the Institute, including budget preparation, reporting, and financial planning. She sets up meetings and prepares agendas and minutes, and is working with a faculty committee to establish a website for the Institute.

On average, the faculty affiliated with UCRGI support two postdoctoral researchers and three graduate students. Thus, we anticipate that there will be approximately 75-80 postdocs and 150 grad students affiliated with the Institute. Graduate programs that are directly related include:

Biochemistry and Molecular Biology
Biology
Biomedical Sciences
Cell, Molecular, and Developmental Biology
Chemical and Environmental Engineering
Computer Science
Entomology
Evolution and Ecology GRU
Genetics
Genetics/Bioinformatics
Microbiology
Plant Genetics
Plant Pathology
Statistics

Space Needs

Construction is currently underway to renovate approximately 10,000 asf in the former Bio-Agricultural Library to house the core instrumentation facility. A faculty committee has designed a facility that will support the Institute’s programmatic goals by offering distinct spaces for proteomics, microarray, robotics, bacterial culture, microscopy, DNA sequencing, molecular biology, PCR, and bioinformatics. The proposed physical structure has sufficient flexibility to accommodate future changes in programmatic direction. In addition, the facility will bring together the Institute’s key leadership and staff, including the Director, Associate Director, grants writer/development officer, administrative assistant, technicians, and academic coordinators in the areas of instrumentation, bioinformatics, and microscopy, thus creating an identity and administrative and research hub for the Institute.

Already, UCR has made a significant investment in equipment and staffing for the core instrumentation facility. The Chancellor made available $2 million for equipment purchases; of this, approximately half has been spent to date. An additional $1.3 million in equipment funds has
been committed to the Center for Plant Cell Biology over the next three years; this instrumentation will also be housed within the core instrumentation facility. Monsanto Company donated equipment valued in excess of $3 million, including DNA sequencers, robots, colony pickers, autogen automatic ion systems, and other ancillary pieces. Until renovations of the Bio-Ag Library are completed in fall 2002, the core instrumentation facility is housed in room 2466 Boyce Hall.

A plant transformation facility is currently under construction, consisting of approximately 2,117 asf in laboratory space, tissue culture rooms, an Arabidopsis growth room, an imaging room, and a “dirty” lab preparation area. The laboratory will be equipped for standard molecular biology laboratory techniques, and will include a state-of-the-art imaging facility for detecting transgene expression. This includes a specialized camera system for detection of luciferase gene expression, and a specialized microscope for detection of green fluorescent protein (GFP) expression. Luciferase is the most sensitive reporter gene available for studying regulation of plant gene expression. No similar system is currently available on campus. Approximately 1,396 square feet in new greenhouse space is also being constructed in conjunction with the plant transformation facility, as well as 2,128 square feet asf in renovations to Greenhouse 2A.

In the long run, UCRGI hopes to house associated faculty and programs in a new laboratory and office building constructed by funding raised through the CNAS capital campaign as well as proceeds from the sale of property in Moreno Valley (~$15 million). The goal is to construct a facility that will hold 16-20 faculty. Without such a facility, UCRGI will face a major challenge in finding adequate space to house the projected faculty hires. The only new space identified in the Biological Sciences is a 30,000 asf building that was planned to accommodate growth in Biology and Cell Biology and Neuroscience. In the near term, one floor of the Biological Sciences Building will be used to house Dr. Raikel and 7 other faculty in Plant Cell Biology. A second floor will accommodate Cell Biology and Neuroscience 7 faculty (formerly Environmental Toxicology) who are currently in Boyce Hall; their vacated space will be used to meet additional needs in the biological sciences.

**Additional Resource Needs**

Renovation of the Bio-Ag Library to create the core instrumentation facility is being made possible by a $3 million loan from Office of the President. It is necessary for the College of Natural and Agricultural Sciences to repay this loan. To date, CNAS has been successful in generating $100,000 each from the Parsons and J.G. Boswell Foundations. A $2 million proposal to the Keck Foundation is pending. While this proposal is for instrumentation rather than facilities, it will offset expenditures that otherwise would be borne by UCRGI. A priority for UCRGI and CNAS development offices will be repayment of this loan.

Equipment resources have been identified above. As UCRGI grows and technology advances, additional instrumentation will be needed. To meet these needs, the grant writer will work with faculty to seek equipment grants from the National Science Foundation and other sources. Recently, for example, proposals were submitted to NSF and NIH to acquire a fluorescence-activated cell sorter (FACS).
Beginning with FY 00-01, the Chancellor also provided temporary funds of $300,000 per year for five years for research support for UCRGI. The funds will be utilized to support genomics-related activities and, to the extent possible, to leverage additional resources for UCRGI. At least a portion of these funds will be used to provide small grants to faculty to offset the use of the core instrumentation facility, thus stimulating interest in and use of the facility. A criterion for approval of these grants will be to leverage extramural support. As of Spring 2002, 27 mini grants have been awarded.

General operating costs for UCRGI are presently covered by a permanent allocation of $25,000 annually. The core instrumentation facility is expected to be self-supporting. A six-year budget projection for UCRGI is shown in Appendix F. Also shown are budgets for the core instrumentation facility, CEPCEB, and BIC.

**Benefits to Teaching Programs**

*Undergraduate Teaching* – By bringing together faculty across a variety of disciplines, UCRGI will help facilitate curricular changes at the undergraduate level. For example, engineering courses are absent from typical undergraduate curricula in genetics, molecular biology, genomics, or other biotechnology related sciences. Training in quantitative sciences such as mathematics, computer science, and statistics should be well integrated into a comprehensive program. Undergraduate curricula must be restructured to reflect the kinds of problems most likely to be encountered in contemporary science. Undergraduates must be taught practical as well as conceptual skills, and should be given the opportunity to obtain hands-on research experience. Undergraduate students should be provided access to state-of-the-art equipment, opportunities to mentor students in local high schools and campus laboratories, and courses in public policy related to such issues as bioethics, scientific responsibility, and the controversy surrounding genetically modified organisms. Already, a special genetics/bioinformatics track has been developed within the biological sciences major. Fall 2003 should bring about the first cohort of undergraduate students in this program.

*Graduate Training* – Again, UCRGI’s multidisciplinary focus will enhance training at the graduate level. Priority will be given to achieving the following goals related to graduate education in genomics-related fields: (a) Emphasizing the problem solving skills as the highest value in graduate education. (b) Enhancing the level of quantitative training, especially in the computational sciences, to manage the large streams of data inherent in our information era. (c) Establishing industry and government internships that allow our graduate students to experience first-hand the challenges and satisfactions of team based research. (d) Incorporating engineering approaches to automation and system design into graduate training. In addition, curricula that include a public policy focus emphasizing issues such as bioethics, scientific responsibility, and the controversy surrounding genetically modified organisms are essential to the future success of the biotechnology enterprise.

The Genetics Ph.D. Program has been identified as the graduate training "home" for the UCR Genomics Institute. The Genetics faculty, partnering with faculty in the Computer Science and
Statistics Departments, have developed a contemporary curriculum in the broad area of Genomics, Proteomics and Bioinformatics. Unique to this curriculum is the melding of microbial, animal and plant genomics/bioinformatics within a single program. The program welcomed its first cohort of students for this new degree "track" in the 2001-2002 academic year. The Chancellor's Distinguished Lecture Series in Genomics serves as a forum for discussion of timely and intellectually stimulating issues in biotechnology with leading scientists and scholars. Each quarter, the Genomics Institute will host a high-profile speaker who will present one general talk and one lecture on his or her area of expertise. On April 24, 2002, Ronald M. Green, director of the Ethics Institute at Dartmouth College and former director of the Office of Genome Ethics at the National Human Genome Research Institute of the National Institutes of Health, became the first scholar featured in the lecture series.

**Relationship to Other Units**

UCRGI will have close ties to a number of related centers and initiatives at UCR. As mentioned above, the Policy Studies Institute will provide joint oversight of the Biotechnology Impact Center. Many of the activities of UCRGI will have policy implications, so this connection to the Policy Studies Institute will be extremely beneficial. Other programs or facilities related to UCRGI include:

**ACIF – The Analytical Chemistry Instrumentation Facility (ACIF) is a valuable resource to genetic and proteomics-oriented research.** This campus-wide, centrally located facility consists of four components: mass spectrometry, with five high-resolution mass spectrometers; X-ray crystallography, equipped with the Bruker Smart 1000 CCD system; nuclear magnetic resonance (NMR) spectroscopy, with four different spectroscopic instruments; and optical spectroscopy with three spectrophotometers, two polarimeters, and three imaging microscopes. A faculty director and a staff of six spectroscopists manage the facility.

**Structural Biology** - Structural biology has been an important approach for UCR researchers in investigating plant-microbe interactions, and with the development of UCRGI and CEPCEB, there will be many applications for structural biology in the fundamental plant sciences. A college-wide committee recently recommended establishing an Institute of Structural Biology at UCR. Their report focused on a primary role of addressing biomedical research problems associated with mammalian biology, but structural biology will clearly play a key role in genomics as well. That report underlines the role of several key technologies for resolving macromolecular structure and molecular-level interactions. These are X-ray crystallography, advanced NMR (particularly solution NMR), ESR (electron spin resonance) imaging, high-resolution electron microscopy, and computational modeling.

**Nanotechnology/Materials Science** – Dr. Robert Haddon, Director of the proposed Center for Nanoscale Science and Engineering, serves on the steering committee for UCRGI because of the potential close linkages between the two. The mission of the proposed nanotechnology center is to become a world leader in nanoscale research, technology and education, and to stimulate the creation of new industries based on nanotechnology. A likely emphasis will be on biomaterials. UCR has strengths in the theory of nanoelectronic devices, molecular devices, machines and
wires, scanning microscopies, complex adaptive materials, spin electronic materials, carbon
fullerenes and nanotubes, biosensors, cellular motors, synthetic DNA, and neuroscience. Our
developing strengths in agricultural genomics will provide the tools and capabilities to "program"
plants to produce novel materials.

**Other UC Efforts in Genomics**

At least three additional UC campuses, likewise capitalizing on the genomics revolution, have
recently launched efforts to build on their existing strengths with facilities supporting genomics-
related research. The Institute for Genomics and Bioinformatics at UCI focuses on functional
genomics, structural genomics, human genomics and evolutionary genomics. Exploiting genomics
to solve biomedical problems and developing new computational approaches to analyze genome-
scale information are the areas of concentration in the Berkeley Program in Genomics at UC
Berkeley and the Lawrence Berkeley National Laboratory. At UC Davis, a new genomics
initiative aims to better understand the actions of genes in growth, health, disease, and behavior.
The UC Davis Genome Center will be located in a Genome and Biomedical Sciences Building
currently under construction. The UCR Genomics Institute is distinctive from these efforts in its
concentrations on the traditional campus strengths of the agricultural sciences, as well as faculty
strengths in basic cellular and molecular mechanisms underlying human health. While UCD also
has strengths in agriculture, UCR is specifically targeting the areas of insect genomics, plant cell
biology, and microbial genomics for future investment.

**Synergies/Opportunities**

As seen above, the designation of the UCR Genomics Institute as a cross-campus initiative is
well-deserved. UCRGI brings together faculty from all major academic units at UCR. Without
the formal structure of an organized research unit, it is not possible to capture the expertise that
exists throughout the campus and to adequately showcase what UCR is doing. Recognition as a
formal academic research unit will also position the campus well in pursuing major equipment,
training, and center grants—an important goal of UCRGI. Finally, ORU status seems warranted
in order to fully encompass the “virtual centers” that will fall under the overall umbrella of the
Genomics Institute. As indicated above, BIC and CEPCEB are already well underway. The
other centers are expected to develop over time, although all will not have the same scale of
structure and resources. Rather, they are meant to be intellectual foci that will help maximize the
opportunities available in genomics research and to integrate these activities within the overall
Institute, without requiring significant additional resources.

When a Blue Ribbon Committee visited UCR in 1995 to review the reorganization of the life and
agricultural sciences, they coined the phrase, “The Riverside Advantage.” This was meant to
connote the programmatic synergies and opportunities made possible by the unique structure of
CNAS—encompassing the agricultural, biological, and physical sciences under a single
administrative umbrella. In planning and organizing UCRGI, it has become clear that there is an
even broader “Riverside Advantage,” meaning the highly collaborative and receptive culture that
exists among UCR faculty—a culture that has facilitated the development of UCRGI, and upon
which the Institute will continue to capitalize as it evolves. This unique characteristic, combined with major investments already committed by the campus and an enthusiastic faculty who are actively pursuing novel research directions and extramural support, has gotten the UCR Genomics Institute off to an excellent start and ensures a promising future.
UCR GENOMICS INSTITUTE

- MAMMALIAN GENOMICS
- INSECT GENOMICS
- BIOINFORMATICS
- MAMMALIAN GENOMICS
- PLANT CELL BIOLOGY CENTER
- MICROBIAL GENOMICS
- INSECT GENOMICS
- BIOTECH IMPACTS CENTER
- POLICY STUDIES INSTITUTE

APPENDIX A
UCR GENOMICS INSTITUTE
PARTICIPATING FACULTY

Participating Units

Department of Anthropology
Department of Biochemistry
Department of Biology
Department of Botany and Plant Sciences
Department of Cell Biology and Neuroscience
Department of Chemical and Environmental Engineering
Department of Chemistry
Department of Computer Science
Department of Economics
Department of Entomology
Department of Environmental Sciences
A. Gary Anderson Graduate School of Management
Department of Mathematics
Department of Nematology
Department of Philosophy
Department of Plant Pathology
Department of Psychology
Department of Religious Studies
Department of Sociology
Department of Statistics
UC MEXUS

Department of Anthropology
Sang-Hee Lee

Department of Biochemistry
Daniel R. Gallie
Helen L. Henry
Ernest Martinez
Anthony W. Norman
Justin K.M. Roberts
Stephen R. Spindler
Jolinda A. Traugh
UCR Genomics Institute Proposal to Become an Organized Research Unit

Department of Biology
Mark Chappell  
Cheryl Y. Hayashi  
Bradley Hyman  
Manuela Martins-Green  
Dmitri Maslov  
Leonard Nunney

Department of Botany and Plant Sciences
Julia Bailey-Serres  
Elizabeth A. Bray  
David Carter  
C. Thomas Chao  
Michael T. Clegg  
Timothy J. Close  
Norman C. Ellstrand  
Arturo Gomez-Pompa  
Thomas Girke  
Anthony H.C. Huang  
Timothy Kingan  
Elizabeth M. Lord  
Adam J. Lukaszewski  
Eugene A. Nothnagel  
Natasha V. Raikhel  
Mikeal L. Roose  
Patricia S. Springer  
Linda Walling  
Shizhong Xu  
Zhenbiao Yang

Department of Cell Biology and Neuroscience
David A. Eastmond  
Sarjeet Gill  
Manuela Martins-Green  
Connie Nugent  
Frances M. Sladek  
Prudence Talbot

Department of Chemical and Environmental Engineering
Wilfred Chen  
Dimitrios Morikis  
Ashok Mulchandani
UCR Genomics Institute Proposal to Become an Organized Research Unit

Department of Chemistry
Steven R. Angle
Robert C. Haddon
Werner G. Kuhr

Department of Computer Science
Tao Jiang
Lonardi, Stefano
Satish K. Tripathi

Department of Economics
Gary Dymski
Steven M. Helfand
Richard Sutch

Department of Entomology
Michael E. Adams
Peter W. Atkinson
Brian A. Federici
Robert F. Luck
Thomas A. Miller
John J. Peloquin
Alex Raikhel
Richard Stouthamer

Department of Environmental Sciences
William Frankenberger
Brian Lanoil

A. Gary Anderson Graduate School of Management
Don Dye

Department of Nematology
Isgouhi Kaloshian
Philip A. Roberts

Department of Philosophy
Carl Cranor

Department of Plant Pathology
Michael Allen
Salomon Bartnicki-Garcia
Katherine Borkovich
James Borneman
Donald A. Cooksey
Shou-Wei Ding
Dennis Focht
Howard S. Judelson
Noel T. Keen
A.L.N. Rao

Department of Political Sciences
Juliann Allison

Department of Psychology
Chandra A. Reynolds
Department of Religious Studies
June O'Connor

Department of Sociology
Christopher Chase-Dunn
Robert Parker

Department of Statistics
Keh-Shin Lii
S. James Press

UC MEXUS
Marlene de la Cruz
MICHAEL T. CLEGG
CURRICULUM VITAE

DATE & PLACE OF BIRTH: August 1, 1941; Pasadena, California

EDUCATION:  
Year  Degree  Institution
1969  B.S.  University of California, Davis
1972  Ph.D.  University of California, Davis

ACADEMIC POSITIONS HELD:

July 1984 - present, Distinguished Professor of Genetics, Department of Botany & Plant Sciences, University of California, Riverside. Presidential Chair July 1, 2000 – June 30 2002.

July 1, 1994 – June 30, 2000, Dean, College of Natural and Agricultural Sciences, University of California, Riverside.

September 1982 - July 1984, Professor of Botany and Professor of Genetics, University of Georgia, Athens, GA.


September 1976 - September 1982 - Associate Professor of Botany and Genetics, University of Georgia, Athens, GA.

July 1973 - August 1976, Assistant Professor of Biology, Brown University, Providence, RI.

July 1972 - July 1973, Instructor of Biology, Brown University, Providence, RI.

September 1969 - June 1972, NDEA Fellow, University of California, Davis, CA.

HONORS:
NDEA Fellowship 1969 -72
Guggenheim Fellow 1981 -82
President American Genetic Association, 1987
Member, US National Academy of Sciences, Elected 1990
Fellow, American Academy of Arts and Sciences, Elected 1992
Key Lecturer, American Genetic Association 1994
Dawin Prize, Edinburgh University 1995
Award of Distinction, UC Davis College of Agriculture and Environmental Sciences, 1999
President, Society for Molecular Biology & Evolution, 2002.
2006

MAJOR NATIONAL SERVICE ACTIVITIES:
NIH Genetics Study Section, 1982 - 86
NSF Advisory Committee on Biological Sciences Directorate, 1992 - 1995
Commission on the Life Sciences, National Research Council, 1990 - 96
Chairman, National Research Council Committee on Scientific Issues in the
Ex Officio member, Governing Board, National Research Council (1998 -2000).
Chairman, National Research Council Committee on the Status of Atlantic Salmon in

Associate Editor, GENETICS, 1982 -88
Theoretical Population Biology, 1984 - 87
The American Naturalist, 1980 - 84
Molecular Phylogenetics and Evolution, 1992 -

2000
Co-Editor, Evolutionary Biology 1992-present
Editorial Board, Proceedings National Academy of Sciences USA 1995-97, 2001- present..
Molecular Ecology 1993-2000

PUBLICATIONS


2472-2478.


The esterase E1, E2, E4, E5, E6, and anodal peroxidase APX4 loci in A. fatua. J.
Hered. 64: 3-7.


mutation within and among full-sib lines. Theoretical Appl. Genet. 54: 133-139.


33. Clegg, M. T. and M. A. Asmussen. 1983. Use of restriction fragment polymorphism as


59. Ritland, K. and M. T. Clegg. 1987. Evolutionary analysis of plant DNA sequences. Amer. Natur. 130: S74-S100. (This paper was awarded a prize for being the best paper published in the Amer. Natur. in 1987)


74. Wilson, M. A., B. Gaut and M. T. Clegg. 1990. Chloroplast DNA evolves slowly in the palm


REPORTS


BOOKS


APPENDIX D
BIOGRAPHICAL SKETCH

NAME
Michael E. Adams

POSITION TITLE
Professor of Entomology and Neuroscience and Entomologist

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(S)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of California, Riverside</td>
<td>Ph.D.</td>
<td>1978</td>
<td>Entomology</td>
</tr>
<tr>
<td>Max Planck Institute for Behavioral Physiology, Germany</td>
<td>Postdoctoral</td>
<td>1978-81</td>
<td>Neurobiology</td>
</tr>
<tr>
<td>University of Chicago</td>
<td>Postdoctoral</td>
<td>1982</td>
<td>Neurobiology</td>
</tr>
</tbody>
</table>

Relevant Research Interests

The biological chemistry and molecular physiology of signaling in the nervous system studied by examining mechanisms by which paralytic venoms disrupt synaptic transmission. Current research efforts include the isolation and identification of novel toxins and analysis of their structure-activity and examination of neuropeptides that regulate developmental and behavioral processes.

Grants Awarded (within the last three years)

<table>
<thead>
<tr>
<th>PIs</th>
<th>Agency</th>
<th>Amount</th>
<th>Dates</th>
<th>Research Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.S. Gill, M. Adams</td>
<td>National Institutes of Health</td>
<td>$966,263</td>
<td>3/1/02-2/28/07</td>
<td>Molecular physiology of the epitracheal endocrine system</td>
</tr>
<tr>
<td>F. Libersat, M. Adams</td>
<td>Binational Science Foundation</td>
<td>$73,500</td>
<td>11/1/97-10/31/02</td>
<td>Biochemistry and physiological actions of Ampullex compressa venom on identified neurons</td>
</tr>
<tr>
<td>M. Gurevitz, M. Adams</td>
<td>Binational Agricultural Research and Development</td>
<td>$102,312</td>
<td>10/1/98-9/30/02</td>
<td>Interacting domains of anti-insect scorpion toxins and their sodium channel binding sites: structure, allostery, synergism with agrochemicals, and application</td>
</tr>
<tr>
<td>M. Adams</td>
<td>National Science Foundation</td>
<td>$143,056</td>
<td>7/1/96-6/30/00</td>
<td>Chemistry and biology of ecdysis-triggering hormones</td>
</tr>
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</table>

Relevant Publications (from the last three years)


UCR Genomics Institute Proposal to Become an Organized Research Unit

BIOGRAPHICAL SKETCH

NAME
Peter W. Atkinson

POSITION TITLE
Associate Professor of Entomology & Associate Entomologist

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Melbourne, Australia</td>
<td>B.S. (Honors)</td>
<td>1979</td>
<td>Genetics</td>
</tr>
<tr>
<td>University of Melbourne, Australia</td>
<td>Ph.D.</td>
<td>1986</td>
<td>Molecular Genetics</td>
</tr>
<tr>
<td>Syracuse University, New York</td>
<td>Postdoctoral</td>
<td>1989</td>
<td>Molecular Genetics &amp; Evolution</td>
</tr>
</tbody>
</table>

Current Professional Activities
- Subject Editor, Journal of Economic Entomology, 2002-Present
- Editorial Board Member, Insect Molecular Biology, 1999-Present
- Editorial Board Member, Insect Biochemistry and Molecular Biology, 1999-Present

Relevant Research Interests
Development of genetic strategies for the control of pest insect species, including isolation and development of transposable elements and the identification and characterization of genes that prevent pathogen transmission.

Grants Awarded (within the last three years)

<table>
<thead>
<tr>
<th>PIs</th>
<th>Agency</th>
<th>Amount</th>
<th>Dates</th>
<th>Research Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>D. O’Brochta, P. Atkinson</td>
<td>National Institutes of Health</td>
<td>$1,016,698</td>
<td>7/1/00-6/30/05</td>
<td>Hobo-like elements in insects</td>
</tr>
<tr>
<td>P. Atkinson</td>
<td>National Institutes of Health</td>
<td>$</td>
<td>10/1/99-9/30/03</td>
<td>Hermes element transposition in mosquitoes</td>
</tr>
<tr>
<td>R. Leopold, P. Atkinson</td>
<td>California Department of Food &amp; Agriculture</td>
<td>$</td>
<td>7/1/00-6/30/03</td>
<td>Cryopreservation of fruit fly (Tephritidae) embryos and sperm</td>
</tr>
<tr>
<td>P. Atkinson</td>
<td>California Department of Food &amp; Agriculture</td>
<td>$</td>
<td>6/10/00-6/30/02</td>
<td>Development of a RIDL system for control of Medfly</td>
</tr>
</tbody>
</table>

Relevant Publications (from the last three years)


BIOGRAPHICAL SKETCH

NAME
Donald A. Cooksey

POSITION TITLE
Professor and Bacteriologist, Plant Pathology
Associate Dean, Agricultural Experiment Station and Cooperative Extension

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albion College, Albion, Michigan</td>
<td>B.A.</td>
<td>1977</td>
<td>Biology</td>
</tr>
<tr>
<td>Oregon State University, Corvallis, OR</td>
<td>Ph.D.</td>
<td>1982</td>
<td>Botany and Plant Pathology</td>
</tr>
</tbody>
</table>

Current Professional Activities

1995-present Editorial Advisory Board, European Journal of Plant Pathology
1999-present Director, American Phytopathological Society Foundation Board

Grants Awarded (within the last three years)

CDFA, Biological Control of Pierce's Disease with Non-pathogenic Strains of Xylella fastidiosa. $154,629, PI.
CDFA, Epidemiology of Pierce's Disease in Southern California: Identifying Inoculum Sources and Transmission Pathways, $255,000, PI.
USDA-APHIS, Control of Pierce's Disease Through Degradation of Xanthan Gum. $318,998, PI.
USDA-APHIS, Impact of Multiple Strain Infection of Xylella fastidiosa on Acquisition and Transmission by the GWSS, $55,754, co-PI with H. Costa.
USDA-APHIS, Insect-Symbiotic Bacteria Inhibitory to Xylella fastidiosa in Sharpshooters, $650,472, co-PI with Miller et al.
American Vineyard Foundation, Developing an Integrated Pest Management Solution for Pierce's Disease Spread by the GWSS in Temecula, $218,172, co-PI with R. Redak et al.

Relevant Publications (from the last three years)

UCR Genomics Institute Proposal to Become an Organized Research Unit

BIOGRAPHICAL SKETCH

NAME
Donald Dye

POSITION TITLE
Dean, Anderson Graduate School of Management

EDUCATION/TRAINING

<table>
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<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
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</thead>
<tbody>
<tr>
<td>University of California, Berkeley</td>
<td>B.A.</td>
<td>1964</td>
<td>Political Science</td>
</tr>
<tr>
<td>University of California, Los Angeles</td>
<td>J.D.</td>
<td>1967</td>
<td>Law</td>
</tr>
</tbody>
</table>

Professional Positions

Dean, AGSM, University of California, Riverside, 1999-present
President and Chief Executive Officer, Callaway Golf Company, 1996-1998
President and Chief Operating Officer, Callaway Golf Company, 1994-1996
Vice Chairman and Chief Operating Officer, Callaway Golf Company, 1991-1994
General Counselor, Callaway Golf Company, 1982-1993
Director, Callaway Golf Company, 1982-1998
Founding and Senior Partner, Dye, Thomas, Luebs & Mort, 1982-1991
Partner, Reid, Babbage, & Coil, 1975-1982
Associate Attorney, Reid Babbage, & Coil, 1973-1975
Military Judge, United States Airforce, 1971-1973
Staff Judge Advocate, United States Airforce, 1972-1973
Assistant Staff Judge Advocate, United States Airforce, 1968-1972

Professional Activities

1995-2000 In excess of 100 presentations to public and private groups as CEO of Callaway Golf Company. Presentation topics included Callaway Golf products, investment opportunities, and overall business of Callaway Golf. Presented nationally and internationally (Europe and Asia).

1973-present Member, American Bar Association

1967-present Member, California Bar Association

Admittance to the following Courts of Law:

1984-present Southern District, California
1983-present Eastern District, California
1975-present Northern District, California
1967-present California Supreme Court
1967-present Central District, California

Grants Awarded (within the last three years)

1996, United States Small Business Administration National Entrepreneurial Success Award

Relevant Publications (from the last three years)

None


UCR Genomics Institute Proposal to Become an Organized Research Unit

BIOGRAPHICAL SKETCH

NAME
Norman C. Ellstrand

POSITION TITLE
Professor of Genetics

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
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<tbody>
<tr>
<td>University of Texas –Austin</td>
<td>Ph.D.</td>
<td>1978</td>
<td>Biology</td>
</tr>
<tr>
<td>University of Illinois – Urbana</td>
<td>B.S.</td>
<td>1974</td>
<td>Biology</td>
</tr>
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</table>

Professional Positions
Professor of Genetics, UCR, 1991-present

Professional Activities
1992 National Science Foundation Mid-Career Fellow
1993 J. William Fulbright Fellow to Sweden
1997 Graduate, ESCOP/ACOP Leadership Development Program
1998 Distinguished Speaker, 42nd Ecological Genetics Group Meeting, St. Andrews, UK
2000 AAAS Fellow
2000-02 National Research Council Committee on Environmental Impacts Associated with Commercialization of Transgenic Plants

Grants Awarded (within the last three years)
1999-00 Collaborating Investigator, MWD, “Scientific review and research on the MWD Eastside landscaping project,” $363,316 (w/ A. Montalvo).
2000-01 Principal Investigator, UC MEXUS, “Biodiversity in maize and teosinte populations: screening for molecular markers to measure genetic variation and gene flow,” $14,986.
2000-03 Principal Investigator, USDA, “Factors Affecting Gene Flow and Introgression into Natural Populations,” $215,000.

Relevant Publications (from the last three years)


BIOGRAPHICAL SKETCH

NAME
Sarjeet S. Gill

POSITION TITLE
Professor

EDUCATION/TRAINING

<table>
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<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(S)</th>
<th>FIELD OF STUDY</th>
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<tbody>
<tr>
<td>McGill University, Montreal, Canada</td>
<td>B.S.</td>
<td>1969</td>
<td>Entomology</td>
</tr>
<tr>
<td>University of California, Berkeley</td>
<td>Ph.D.</td>
<td>1973</td>
<td>Entomology</td>
</tr>
<tr>
<td>University of California, Berkeley (Prof. John Casida)</td>
<td>Postdoc</td>
<td>1973</td>
<td>Toxicology</td>
</tr>
</tbody>
</table>

Current Professional Activities

1983 - 1999 Assistant, Associate and Professor, and Assistant, Associate and Toxicologist, Department of Entomology, University of California, Riverside, CA 92521.
1999 - Present Professor and Entomologist, Department of Cell Biology and Neuroscience, University of California Riverside, CA 92521.
Editorial Board – Insect Biochemistry and Molecular Biology; Chemical Toxicology
Co-Editor – Comprehensive Biochemistry, Pharmacology and Physiology, 6 Volume series
Executive Committee, UC Toxic Substance Research and Training Program

Grants Awarded (within the last three years)

ONGOING RESEARCH SUPPORT ONLY
NIH/NIAID 5RO1AI32572 (PI S. Gill) 4/00 - 3/05 "Ion regulation in mosquitoes:
The goal of this project is to characterize ion transport and V-type ATPase regulation in mosquitoes.
NIH/NIAID 5RO1AI48049 (PI S. Gill) 9/00 - 8/05 "Membrane transporters in mosquitoes"
The goal of this project is to identify cell membrane transport processes in insects.
NIH/NCCR 1S10RR15929 (PI S. Gill) 4/02-3/03 "Acquisition of DNA sequencing capability”
Syngenta Inc.Gill/Novartis/00 (PI S. Gill) 7/99 - 12/03 “Identification of potential targets for insecticide development in insects
NIH/NIAID (PI. M. Adams, Co-PI S. Gill) 3/97-2/02 “Molecular physiology of the epitracheal endocrine system”.

Relevant Publications (from the last three years)


UCR Genomics Institute Proposal to Become an Organized Research Unit

BIOGRAPHICAL SKETCH

NAME  
Robert C. Haddon

POSITION TITLE:  
Distinguished Professor of Chemistry & Chemical & Environmental Engineering

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melbourne University, Australia</td>
<td>B. Sc (Hon)</td>
<td>1966</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Pennsylvania State University, U.S.A.</td>
<td>Ph.D.</td>
<td>1971</td>
<td>Organic Chemistry</td>
</tr>
</tbody>
</table>

Current Professional Activities

- Theory, design and synthesis of organic metals and superconductors.
- Neutral Radical molecular conductors
- Carbon nanotubes and fullerenes
- Devices based on organic electronic materials

Grants Awarded (within the last three years)

- “Advanced Carbon Materials Center.” National Science Foundation MRSEC Program, Grant No. DMR-9809686, $3,500,000 (total award, including University and CAER contribution: $6,677,081, Multiple PIs), 9/1/98 – 8/31/02.
- “Spectroscopy, Electronic Structure and Reactivity of the Fullerenes.” National Science Foundation, CHE-9816339, $484,000 (M. S. Meier, R. C. Haddon, H. P. Spielmann), 4/1/99 – 3/31/02.

Pending Grants

- “Cataloguing and Purification of the Library of Single-Walled Carbon Nanotubes.” Office of Naval Research, $482,829, 1/1/01-12/31/03.

Relevant Publications (from the last three years)


BIOGRAPHICAL SKETCH

NAME
Bradley C. Hyman

POSITION TITLE
Professor of Biology and Geneticist

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(S)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cornell University</td>
<td>Sabbatical leave</td>
<td>1991</td>
<td>Evolutionary Genetics</td>
</tr>
</tbody>
</table>

Current Professional Activities

- Director Interdisciplinary Ph.D. Program in Genetics, UC-Riverside
- Editor-in-Chief Journal of Nematology
- Executive Board Society of Nematologists
- member USDA W-186 regional project “Genetic variability of nematodes”

Grants Awarded (within the last three years)

- UC DANR “Accessible microsatellite analysis” $65,000
- UC DANR “Expansion of Microsatellite Facility” $8,000

Relevant Publications (from the last three years)

UCR Genomics Institute Proposal to Become an Organized Research Unit

**BIOGRAPHICAL SKETCH**

**NAME**
Tao Jiang

**POSITION TITLE**
Professor

**EDUCATION/TRAINING**

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(S)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Science and Technology of China, Hefei, P.R. China.</td>
<td>B.S.</td>
<td>1984</td>
<td>Computer Science</td>
</tr>
<tr>
<td>University of Minnesota, Twin Cities.</td>
<td>Ph.D.</td>
<td>1988</td>
<td>Computer Science</td>
</tr>
</tbody>
</table>

Professional Positions
1999 to present  Professor, Computer Science, University of California, Riverside.
1998-present  Professor, Computing and Software, McMaster University, (on leave of absence since Sept. 1, 1999).
1995-1996  Visiting Associate Professor, Computer Science and Engineering, University of Washington.
1993-1998  Associate Professor, Computer Science and Syst., McMaster University.
Assistant Professor, Computer Science and Syst., McMaster University.

Professional Activities

- **Prog. Comm.** For many international conferences, including: FOCS’97, ISAAC’98, RECOMB’99, APPROX’2000, COCOON’01, ISAAC’01, IEEE BIBE’01, CPM’02, etc.
- 1997 Program Committee Chair, COCOON’97.
- 1999 NSF Computational Biology Activity (CBA) Review Panelist
- Task Force Member UC Life Science Informatics.

Grants Awarded (within the last three years)
- PI, (co-PIs M. Clegg and M. Li), NSF ITR, ”Computational Techniques for Applied Bioinformatics,” 2000-2003, $800k (approx.).

**Relevant Publications (from the last three years)**


UCR Genomics Institute Proposal to Become an Organized Research Unit

BIOGRAPHICAL SKETCH

NAME
Howard S. Judelson

POSITION TITLE
Associate Professor

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
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<tbody>
<tr>
<td>University of Wisconsin-Madison</td>
<td>Ph.D.</td>
<td>1985</td>
<td>Molecular Biology</td>
</tr>
</tbody>
</table>

Current Professional Activities

Editor, Plant Cell Reports
Instructor, Biology 107A, Genetics 240A, Plant Pathology 215

Grants Awarded (within the last three years)

- NSF, Determinants of mating type in Phytophthora, 2/1/98 - 1/31/01, $315,000 (PI)
- USDA-NRI, Genetics of development in Phytophthora infestans, 12/15/98 - 12/31/02, $170,000 (PI)
- IRM/Novartis, Sporulation and stress responses in Phytophthora infestans, 7/1/99-6/30/02, $300,000 (PI)
- UC-Biostar, Sporulation and stress responses in Phytophthora infestans, 7/1/99 - 6/30/01, $153,554 (PI)
- Novartis, Basis of metalaxyl resistance, 7/1/99 - 6/30/01, $150,000 (PI)
- NSF, Mating in Phytophthora, 1/1/02-12/31/04, $360,000 (PI)
- USDA-ARS, Multifungicide resistance in Phytophthora infestans, 1/1/00 - 12/31/00, $44,633 (PI)
- UC-Biostar, Sporulation and stress responses in Phytophthora infestans, 7/1/01-6/30/02 $139,000 (PI)
- USDA-IFAFS, Plant and pathogen gene sets in Phytophthora infection of dicots, 9/1/00 - 8/31/03, $1,000,000 (Co-PI)
- USDA-NRI, Regulators of spore pathways in . infestans, 9/15/02-9/14/05, $271,000 (PI)

Relevant Publications (from the last three years)


BIOGRAPHICAL SKETCH

NAME
Keh-Shin Lii

POSITION TITLE
Professor of Statistics and Statistician

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(S)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Taiwan Normal University, Taiwan</td>
<td>B.S.</td>
<td>1969</td>
<td>Mathematics</td>
</tr>
<tr>
<td>University of California, San Diego</td>
<td>M.S.</td>
<td>1975</td>
<td>Mathematics</td>
</tr>
<tr>
<td></td>
<td>Ph.D.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Current Professional Activities
Member, NIH Clinical Trial Site Review, Staten Island, NY (May 1998)
Associate Editor, Journal of Time Series Analysis (1998 – Present)
Chairman, Department of Statistics, University of California, Riverside (1999 – Present)
Participant, Workshop on Statistical Consulting & Collaborating, McKenna College, Claremont, CA (1999 & 2000)
Participant - Workshop on Genomics/Bioinformatics, UC Davis (August 14 – 16, 2000)
Member, Experiment Station Committee on Organization and Policy and Academic Programs Committee on Organization and Policy (ESCOP/ACOP), Indianapolis, Indiana (September 8 – 13, 2001)

Grants Awarded (within the last three years)

<table>
<thead>
<tr>
<th>Office of Naval Research (ONR)</th>
<th>&quot;Random sampling and higher order statistics for multivariate random signals and fields&quot;</th>
<th>10/01/91-09/30/98</th>
<th>$375,671</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Senate</td>
<td>&quot;Research Travel Grant&quot;</td>
<td>07/1998 – 06/1999</td>
<td>$700</td>
<td>PI</td>
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<tr>
<td>Office of Instructional Development</td>
<td>&quot;Major Instructional Improvement Grant&quot;</td>
<td>05/2000 – 06/2001</td>
<td>$4,300</td>
<td>PI</td>
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<tr>
<td>Academic Senate</td>
<td>&quot; Research Travel Grant&quot;</td>
<td>07/2001 – 06/2002</td>
<td>$700</td>
<td>PI</td>
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</table>

Relevant Publications (from the last three years)


Li, T. H. and Lii, K. S. “A joint estimation approach for two-tone image deblurring.” IEEE Transactions on Image Processing (Accepted 01/2002; 32 manuscript pages)

## BIOGRAPHICAL SKETCH

<table>
<thead>
<tr>
<th>NAME</th>
<th>POSITION TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>June E. O’Connor</td>
<td>Professor of Religious Studies</td>
</tr>
</tbody>
</table>

### EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mundelein College, Chicago</td>
<td>B.A. (Honors)</td>
<td>1964</td>
<td>English Literature</td>
</tr>
<tr>
<td>Marquette University, Milwaukee</td>
<td>M.A.</td>
<td>1966</td>
<td>Theology</td>
</tr>
<tr>
<td>Temple University, Philadelphia</td>
<td>M.A.</td>
<td>1972</td>
<td>Religion</td>
</tr>
<tr>
<td>Temple University</td>
<td>Ph.D.</td>
<td>1973</td>
<td>Comparative Religious Ethics</td>
</tr>
</tbody>
</table>

### Current Professional Activities

- Editorial Board Member, Religion, 1989-Present

### Relevant Research Interests

Comparative religious ethics and Western religious thought.

### Grants Awarded

<table>
<thead>
<tr>
<th>Name</th>
<th>Agency</th>
<th>Amount</th>
<th>Dates</th>
<th>Research Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>J. O’Connor, M. Orans</td>
<td>UC Institute on Global Conflict and Cooperation</td>
<td>$30,000</td>
<td>1995</td>
<td>Development of programs on non-violence and social scientific theories of conflict resolution Conference on Religion and Ethnic Conflict</td>
</tr>
<tr>
<td>J. O’Connor (principal organizer)</td>
<td>UC Humanities Research Institute, UCR Center for Ideas and Society, UCR Institute for Economic Conflict and Cooperation and private donations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team of Scholars</td>
<td>American Academy of Religion Collaborative Research Grant</td>
<td></td>
<td>1989</td>
<td>Gender and Methodology</td>
</tr>
<tr>
<td>J. O’Connor</td>
<td>UC Humanities Research Grant</td>
<td></td>
<td>1978</td>
<td></td>
</tr>
<tr>
<td>J. O’Connor</td>
<td>UCR Center for Ideas and Society</td>
<td></td>
<td>Fall 1993; Spring 1998; Winter 2001</td>
<td>Research Fellowship</td>
</tr>
<tr>
<td>J. O’Connor</td>
<td>UC Institute on Global Conflict and Cooperation</td>
<td></td>
<td>1984</td>
<td>Teaching Grant</td>
</tr>
</tbody>
</table>

### Select Publications

#### Books

#### Articles (from total of 37)


BIOGRAPHICAL SKETCH

NAME
Natasha Raikhel

POSITION TITLE
Director, Center for Plant Cell Biology
Ernst and Helen Leibacher Endowed Chair
Distinguished Professor of Plant Cell Biology

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leningrad State University, USSR, 1975</td>
<td>Ph.D.</td>
<td>1975</td>
<td>Biology</td>
</tr>
<tr>
<td>Institute of Cytology, Academy of Sciences, Leningrad, USSR, Cell Biology</td>
<td>M.S.</td>
<td>1970</td>
<td>Cell Biology</td>
</tr>
<tr>
<td>Institute of Cytology, Academy of Sciences, Leningrad, USSR</td>
<td>Ph.D.</td>
<td>1979-84</td>
<td>Cell Biology</td>
</tr>
<tr>
<td>University of Georgia, Athens, GA</td>
<td>Postdoctoral work</td>
<td>1997-2000</td>
<td>Cell Biology</td>
</tr>
</tbody>
</table>

Current Professional Activities
1997- Editorial-in-Chief, Plant Physiology
1998- Editorial Board, Current Opinion in Plant Cell Biology
2001 Board Member, International Society for Plant Molecular Biology
2002 Committee Member of National Academy of Sciences workshop, “Community Standards for Sharing Publication-Related Data and Materials”
2002 Member, Search Committee for Faculty Position at the University of California, Riverside
2002 Chair, Search Committee for Academic Coordinator in Proteomics at the University of California, Riverside
2002 Director, Center for Plant Cell Biology at the University of California, Riverside
2003 Co-organizer of 22nd Symposium in Plant Biology, “Frontiers of Plant Cell Biology: Signals and Pathways, Systems-Based Approaches” with Zhenbiao Yang
2003 Organizer and speaker of Symposium “Intra and Intercellular Trafficking” for the 7th International Conference of Plant Molecular Biology
Member American Society for Cell Biology
Member American Society for Plant Biologists
Member International Society for Plant Molecular Biology

Grants Awarded (within the last three years)
NSF Functional Genomic Grant (1999-2002) “Functional Genomics of Hemicellulose Biosynthesis”; PI, Natasha Raikhel; Co-PIs, Ken Keegstra, Jonathan Walton, Curtis Wilkerson; $360,000
DOE Grant (2002-2005) “Biogenesis of Plant Vacuole(s) in Arabidopsis”; PI, Natasha Raikhel; $360,000
NSF Grant (2000-2005) “Vesicle trafficking form the tans-Golgi network to prevacuolar compartment in Arabidopsis”; $690,000
US-Israel Binational Science Foundation Grant (2000-2002) “Regulation of protein trafficking to plant vacuoles”; $50,000 per year

Relevant Publications (from the last three years)

Refereed Papers:


Bassham D, Raikhel NV (1999) The prevacuolar t-SNARE AtPEP12p forms a 20S complex that dissociated in the presence of ATP. Plant J 19:2251-2264


UCR Genomics Institute Proposal to Become an Organized Research Unit

BIOGRAPHICAL SKETCH

NAME
Philip A. Roberts

POSITION TITLE
Professor of Nematology and Nematologist in the AES

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(S)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leeds University, United Kingdom</td>
<td>University of Birmingham and Rothamsted Experimental Station, United Kingdom</td>
<td>B.Sc.(Honors) Ph.D.</td>
<td>1975 1978</td>
</tr>
</tbody>
</table>

Current Professional Activities

- Research - A major emphasis is placed on genetic resistance in crop plants to root-knot nematodes organized in the areas of: 1) identifying new sources of resistance genes; 2) genetic and molecular characterization of resistance genes; 3) introgressing resistance for breeding line and crop improvement for warm/arid environments using classical and novel techniques, including genome mapping and marker assisted selection development; 4) assessing and implementing resistant and tolerant lines and cultivars in the field in appropriate cropping systems; and 5) studying variability of parasitic specificity within and between nematode species.

Professor of Nematology and Nematologist, Department of Nematology, University of California, Riverside; 1990-present.

Associate Director, Research, UC Statewide IPM Project, University of California, Riverside; 1993-97.

Chair, Department of Nematology, University of California, Riverside; 1996

Associate Dean for AES and Cooperative Extension, University of California, Riverside; 1996-2001.

Grants Awarded (within the last three years)

<table>
<thead>
<tr>
<th>Name(s)</th>
<th>Funding Agency</th>
<th>Project Title</th>
<th>Amount</th>
<th>Start Date</th>
<th>End Date</th>
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</thead>
<tbody>
<tr>
<td>Kaloshian, I. Roberts, P.A.</td>
<td>USDA/NRICGP</td>
<td>USDA-WSARE</td>
<td>$1,119,242</td>
<td>08/01/02</td>
<td>07/31/07</td>
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<tr>
<td>Roberts, P.A.</td>
<td>USDA-WSARE</td>
<td>USDA-WSARE</td>
<td>$134,158</td>
<td>10/01/02</td>
<td>09/30/05</td>
</tr>
<tr>
<td>Roberts, P.A.</td>
<td>USDA/CRSP</td>
<td>USDA/CRSP</td>
<td>$24,600</td>
<td>04/01/00</td>
<td>03/31/03</td>
</tr>
<tr>
<td>Roberts, P.A.</td>
<td>1CA Dry Bean Advisory Bd.</td>
<td>1CA Dry Bean Advisory Bd.</td>
<td>$29,600</td>
<td>04/01/00</td>
<td>03/31/03</td>
</tr>
<tr>
<td>Roberts, P.A.</td>
<td>2CA Dry Bean Advisory Bd.</td>
<td>2CA Dry Bean Advisory Bd.</td>
<td>$24,600</td>
<td>04/01/00</td>
<td>03/31/03</td>
</tr>
<tr>
<td>Roberts, P.A.</td>
<td>USDA/CRSP</td>
<td>USDA/CRSP</td>
<td>$29,806</td>
<td>08/01/98</td>
<td>07/31/02</td>
</tr>
<tr>
<td>Roberts, P.A.</td>
<td>USDA/CRSP</td>
<td>USDA/CRSP</td>
<td>$29,600</td>
<td>04/01/00</td>
<td>03/31/03</td>
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</tbody>
</table>
Roberts, P.A. | Cotton Incorporated | $30,000 | 5/01/02 to 12/31/02 | “Genetic and molecular characterization of host plant resistance in cotton to root-knot nematodes and fusarium wilt”

Roberts, P.A. | UC IPM | $99,723 | 07/01/02 to 06/30/05 | “Implementation value of root-galling resistance and reproduction resistance for root-knot nematode management in dry beans”

Roberts, P.A. | UC IPM | $98,656 | 07/01/99 to 06/30/02 | “Development of an integrated management strategy for root-knot nematode in carrot”

Roberts, P.A. | CA Fresh Carrot Advisory Bd. | $91,500 | 03/01/00 to 02/28/03 | “Identification of gene sources for resistance to root-knot nematodes attacking carrots in California”

Relevant Publications (from the last three years)


UCR Genomics Institute Proposal to Become an Organized Research Unit

BIOGRAPHICAL SKETCH

NAME
Mikeal L. Roose

POSITION TITLE
Professor of Genetics

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(S)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reed College, Portland OR</td>
<td>B.A.</td>
<td>1973</td>
<td>Biology</td>
</tr>
<tr>
<td>University of California, Davis, CA</td>
<td>Ph.D.</td>
<td>1979</td>
<td>Genetics</td>
</tr>
</tbody>
</table>

Grants Awarded (within the last three years)

- Positional Cloning and Analysis of the Citrus Tristeza Virus Resistance Gene. 9/15/00 - 9/30/02. $101,000. USDA/CSRRES/Special Research Grants Program
- Transformation with Candidate Genes for a Citrus Tristeza Virus Resistance Gene. 9/15/01 - 9/30/02. $39,709. The Texas Agricultural Experiment Station (subcontract to USDA grant).
- High Resolution Mapping and Cloning of a Gene for Citrus Tristeza Virus Resistance. 6/1/99 - 10/1/02. $65,000 California Citrus Research Board.
- Citrus Genome: Comparative Analysis of Genetic Maps. 5/30/00 - 6/30/03. $5,000. USDA/Foreign Agricultural Service.
- Asparagus Breeding and Cultivar Development. 1/1/00 - 12/31/02. $198,128. California Asparagus Commission
- Molecular Characterization of Citrus Germplasm. $93,000. 5/5/98 - 12/31/02. USDA Agricultural Research Service.
- Molecular Genetic Analysis of Nucellar Embryony and Thornlessness in Citrus. 7/1/99 - 6/30/01. $37,224. California Citrus Nursery Advisory Board.

Relevant Publications (from the last three years)


UCR Genomics Institute Proposal to Become an Organized Research Unit

BIOGRAPHICAL SKETCH

NAME
Frances Sladek

POSITION TITLE
Associate Professor of Cell Biology and Associate Toxicologist

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
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<tbody>
<tr>
<td>Princeton University</td>
<td>B.A.</td>
<td>1979</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>Yale University</td>
<td>M.S.</td>
<td>1981</td>
<td>Mol. Physics and Biochemistry</td>
</tr>
<tr>
<td>Yale University</td>
<td>Ph.D.</td>
<td>1988</td>
<td>Mol. Physics and Biochemistry</td>
</tr>
<tr>
<td>Rockefeller University</td>
<td>Postdoctoral</td>
<td>1988-1991</td>
<td>Molecular Cell Biology</td>
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</table>

Relevant Research Interests
Using molecular, cellular, and biochemical techniques to decipher the molecular mechanism by which a certain liver-enriched transcription factor, hepatocyte nuclear factor 4 (HNF4), controls the expression of a variety of genes, including those involved in cholesterol, fatty acid, and glucose metabolism, as well as detoxification processes.

Grants Awarded (within the last three years)

<table>
<thead>
<tr>
<th>PIs/Agency</th>
<th>Amount</th>
<th>Dates</th>
<th>Research Topic</th>
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<tbody>
<tr>
<td>F.M. Sladek / National Institutes of Health</td>
<td>$158,654</td>
<td>6/16/98-5/31/02</td>
<td>Regulation of liver-specific gene expression</td>
</tr>
<tr>
<td>O. Hankinson, F. Sladek / UC Toxic Substances</td>
<td>$900,000</td>
<td>1/00-12/02</td>
<td>UCLA/UCR/Los Alamos consortium in research &amp; training in mechanisms of toxicity</td>
</tr>
<tr>
<td>C. Switzer, F. Sladek / NSF Major Research Instrumentation Program</td>
<td>$187,500</td>
<td>10/99-9/01</td>
<td>Acquisition of mass spectrometers for a university facility</td>
</tr>
<tr>
<td>F. Sladek / Pfizer</td>
<td>$38,779</td>
<td>2/1/00-11/30/00</td>
<td>Investigation of potential ligands for HNF41</td>
</tr>
<tr>
<td>F. Sladek / Supplemental DANR Hatch Funds</td>
<td>$8,500</td>
<td>1/1/01-6/30/01</td>
<td>Transcriptional responses to the environment</td>
</tr>
</tbody>
</table>

Relevant Publications (from the last three years)


UCR Genomics Institute Proposal to Become an Organized Research Unit

BIOGRAPHICAL SKETCH

NAME
Richard C. Sutch

POSITION TITLE
Distinguished Professor of Economics

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
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<tbody>
<tr>
<td>University of Washington</td>
<td>B.A.</td>
<td>1963</td>
<td>Economics</td>
</tr>
<tr>
<td>Massachusetts Institute of Technology</td>
<td>Ph.D.</td>
<td>1968</td>
<td>Economics</td>
</tr>
</tbody>
</table>

Select Current Professional Activities
Director, UCR Center for Social and Economic Policy, 1998-Present
Research Associate, Agricultural History Center, University of California, Davis, 1986-Present
Research Associate, National Bureau of Economic Research, 1988-Present
Chair, International Committee on Reform, International Economic History Association, 1998-2002
Executive Committee Member, International Economic History Association, 1990-2002

Relevant Research Interests
Macroeconomics, U.S. economic history, and quantitative methods in economics.

Grants Awarded (within the last three years)

<table>
<thead>
<tr>
<th>PIs</th>
<th>Agency</th>
<th>Amount</th>
<th>Dates</th>
<th>Research Topic</th>
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</thead>
<tbody>
<tr>
<td>R. Sutch, S. Carter</td>
<td>National Science Foundation</td>
<td>1999-2001</td>
<td>Historical statistics of the United States [years two and three]</td>
<td></td>
</tr>
<tr>
<td>R. Sutch</td>
<td>Social Science Research Council</td>
<td>2001</td>
<td>Immigration and Education Research Initiative</td>
<td></td>
</tr>
</tbody>
</table>

Select Publications

Books

Articles (from more than 45 journal articles and book chapters)

BIOGRAPHICAL SKETCH

NAME
Linda L. Walling

POSITION TITLE
Professor of Genetics

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Rochester Medical School, Rochester, NY</td>
<td>Ph.D.</td>
<td>1980</td>
<td>Microbiology</td>
</tr>
<tr>
<td>Middlebury College, Middlebury, VT</td>
<td>BA</td>
<td>1975</td>
<td>Biology and Chemistry</td>
</tr>
</tbody>
</table>

Professional Activities (last 3 years)


Reviewer, 16 grant proposals For Academic Research Initiation Grant Program, North Carolina Biotechnology Program, BARD, NSF, Swiss NSF, UC Salinity Drainage Program, USDA, DOE,

May 1997 Member, USDA Plant Pathology Panel

April 2001 Member, National Science Foundation Integrative Plant Biology Panel

June 2001 Editor, Journal of Chemical Ecology

Grants Awarded (within the last three years)

PI, National Science Foundation (Integrated Plant Biology), "Leucine Aminopeptidase: Role in Wounding and Defense", 09/01/00-08/31/03, $345,000

PI, USDA (Genetic Mechanisms), "Novel signaling pathways and elicitors in whitefly-plant interactions" 9/15/01 to 9/14/03, $160,000

Co-PI with P. S. Springer (PI), E.A Bray, I. Kaloshian. Southwest Consortium; Activation tagging in Arabidopsis: Dissection of developmental and stress-response pathways using dominant mutants." 07/02-6/04, $100,000

PI, USDA (Genetic Mechanisms) "Plant Responses to Phytophagous Insects: The Silverleaf Whitefly Squash Interaction" 9/15/99-09/14/01, $100,000

PI, Dupont, “Plant Responses to Phloem-feeding Insects”, 4/10/00-4/09/01, $ 10,000

PI with G.A. Thompson (co-PI; Univ Arizona). Southwest Consortium, "Phloem-Feeding Pests of Arid/Semi-Arid Environments: Understanding Plant Defense Responses to Aphids and Whiteflies", 05/31/00-06/30/02, $100,000 ($47,500 to LLW)

Co-PI with P. S. Springer (PI), E. A. Bray, J. Bailey-Serres, D. Gallie, N. Keen, I Kaloshian, Southwest Consortium; Identification of Stress-regulated Genes using Enhancer/Gene Traps", 07/20/99-06/30/01, $100,000

Co-PI with R. Porat (PI) and D. Holland (The Volcani Ctr., Bet Dagan, Israel), BARD, "Identification of Citrus Fruit-Specific and Pathogen-Induced Promoters and Their Use in Molecular Engineering", 10/01/99-09/30/00, $ 30,000 (to LLW)

Relevant Publications (from the last three years)


Pautot, V, Holzer, F.M., Chaufaux, J., and LL Walling. 2001. The induction of tomato leucine aminopeptidase (LapA) genes after Pseudomonas syringae pv. tomato infection is primarily a wound-response triggered by coronatine. Molec. Plant-Microbe Interact. 14:214-224


<table>
<thead>
<tr>
<th>COLLEGE OF NATURAL AND AGRICULTURAL SCIENCES</th>
<th>ACADEMIC PLAN</th>
</tr>
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<tbody>
<tr>
<td><strong>APRC</strong></td>
<td>2 AQ Phas/Env Anal Ch (Chem/APRC) 75/25</td>
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<tr>
<td><strong>Biochemistry</strong></td>
<td>Molecular Biology 100/0</td>
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<tr>
<td><strong>Biology</strong></td>
<td>Dev Genetics (Jr) 100/0 Agulnick FTE</td>
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<tr>
<td><strong>Botany &amp; Plant Sciences</strong></td>
<td>CE Biotechnology (Open) 25/75</td>
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<tr>
<td><strong>Cell Biology &amp; Neuro.</strong></td>
<td>CE-TOX (65) Mehr. FTE</td>
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<tr>
<td><strong>Chemistry</strong></td>
<td>Organic (Open) 100/0</td>
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<tr>
<td><strong>Earth Sciences</strong></td>
<td>Biogeochimist (Open) 100/0</td>
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<tr>
<td><strong>Entomology</strong></td>
<td>Molecular Preception (Open) 25/75</td>
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<tr>
<td><strong>Env. Sciences</strong></td>
<td>Water Res. Mgt. Specialist (Jr) 25/75</td>
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<td><strong>GPP</strong></td>
<td>Astrophysics/IGPP 67/33 Barsony FTE</td>
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<tr>
<td><strong>Mathematics</strong></td>
<td>Jones Chair - Topology (Open) 100/0</td>
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<tr>
<td><strong>Nematology</strong></td>
<td>Sensory Physiology (Jr) 25/75</td>
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### UCR Genomics Institute Proposal to Become an Organized Research Unit

<table>
<thead>
<tr>
<th></th>
<th>2001-02: Ongoing Searches</th>
<th>SEARCH IN 2002-03</th>
<th>2003-04</th>
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<tr>
<td><strong>Physics</strong></td>
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<td>Condensed Matter Theory (Open) 100/0</td>
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<td>Cond Matter Exp (Jr) 100/0 HADDON</td>
<td>Condensed Matter Exp (Jr) 100/0 HADDON</td>
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<tr>
<td>TOP Astrophysics - Physics/IGPP 67/33</td>
<td>Condensed Matter Theory 100/0 CastroNeto FTE</td>
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<td>Cond Matter Exp. (Open) HADDON</td>
<td>Cond Matter Exp. (Open)100/0 HADDON</td>
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<tr>
<td></td>
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<td>Cond Matter Exp. (Jr) 100/0 HADDON</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>High Energy Expt (Assoc) 100/0 HANSON</td>
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<td></td>
<td>High Energy Babar Expt (Jr) 100/0</td>
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<tr>
<td><strong>Plant Pathology</strong></td>
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<tr>
<td>Ornamental Plant Pathologist (Jr) 0/0/100</td>
<td>CE Veg. Plant Pathology (TBD) 0/30/70 Paulus FTE</td>
<td>Microbial Genom (Jr) 50/50 CLEGG</td>
<td>Evol. Microbiology (TBD) 50/50 CLEG</td>
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<tr>
<td>Applied Epidemiology (Jr) 25/75 Eckert FTE</td>
<td>insect-Vectored Pathogens (Jr) 25/75/0</td>
<td>Theoretical Epidemiology (Jr) 25/75</td>
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<tr>
<td><strong>Statistics</strong></td>
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<td>Director, Stat Consulting Strauss FTE</td>
<td>Bioinformatics (Open)50/50/0 Gokhale FTE</td>
<td>Statistical/Biological Sci 50/50 CLEG</td>
<td>Statistical/Biological Sci 50/50 CLEG</td>
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<td>Bioinformatics (Jr) 50/50</td>
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<td>CE Specialist 0/25/75</td>
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**Key:**

- **Blue:** New Position
- **Green:** Replacement
- **Red:** Origin of Position
- **Brown:** Programmatic Investment
- **1:** Position shared between two units
- **2:** Failed search in 2000-01; position reallocated
## UCR Genomics Institute Proposal to Become an Organized Research Unit

### GENOMICS INSTITUTE BUDGET 2000 - 2006

<table>
<thead>
<tr>
<th></th>
<th>2000/01</th>
<th>2001/02</th>
<th>2002/03</th>
<th>2003/04</th>
<th>2004/05</th>
<th>2005/06</th>
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</thead>
<tbody>
<tr>
<td>STAFF SUPPORT - Permanent commitment</td>
<td>240,000</td>
<td>244,800</td>
<td>249,696</td>
<td>254,690</td>
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<td>(includes 2% estimated range adjustment)</td>
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<tr>
<td>RESEARCH SUPPORT - 5 year commitment</td>
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<tr>
<td>OPERATING FUNDS - Permanent commitment</td>
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<tr>
<td>STAFF OPERATING SUPPORT - Permanent commitment</td>
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<td>15,750</td>
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<tr>
<td>EQUIPMENT - 2 year commitment</td>
<td>1,000,000</td>
<td>1,000,000</td>
<td>0</td>
<td>0</td>
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<tr>
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<tr>
<td><strong>Total</strong></td>
<td>1,580,750</td>
<td>1,585,550</td>
<td>590,446</td>
<td>595,440</td>
<td>600,534</td>
<td>305,729</td>
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</tbody>
</table>

Funds for permanent staff, research funds, operational expenses and equipment were provided by campus general funds.

### EXTRAMURAL FUNDS

<table>
<thead>
<tr>
<th>Agency/ P.I./ Purpose</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ralph M. Parsons Foundation/ Clegg/ Renovation</td>
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<tr>
<td>Sale of Equipment / Clegg / Renovation</td>
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<tr>
<td>National Institutes of Health / Gill / Equipment</td>
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### GIFTS

<table>
<thead>
<tr>
<th>UCR Foundation - Genomics / Renovation - General Support</th>
<th>Amount</th>
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<tbody>
<tr>
<td></td>
<td>125,887</td>
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</table>
## CORE INSTRUMENTATION FACILITY BUDGET 2000-2006

<table>
<thead>
<tr>
<th></th>
<th>2000/01</th>
<th>2001/02</th>
<th>2002/03</th>
<th>2003/04</th>
<th>2004/05</th>
<th>2005/06</th>
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<tbody>
<tr>
<td>CORE INSTRUMENTATION FACILITY REVENUES (Sales and Service revenues)</td>
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<td>101,400</td>
<td>120,666</td>
<td>143,593</td>
<td>170,875</td>
<td>203,341</td>
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<tr>
<td>CORE INSTRUMENTATION FACILITY EXPENSES (Sales and Service expenses)</td>
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<td>(100,380)</td>
<td>(119,452)</td>
<td>(142,148)</td>
<td>(169,156)</td>
<td>(201,296)</td>
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<tr>
<td>SOFTWARE REVENUES (Sales and Service revenues)</td>
<td>0</td>
<td>20,000</td>
<td>21,000</td>
<td>22,050</td>
<td>23,153</td>
<td>24,310</td>
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<tr>
<td>SOFTWARE EXPENSES (Sales and Service expenses)</td>
<td>0</td>
<td>(20,000)</td>
<td>(21,000)</td>
<td>(22,050)</td>
<td>(23,153)</td>
<td>(24,310)</td>
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<tr>
<td>MIROSCOPY REVENUES (Sales and Service revenues)</td>
<td>0</td>
<td>22,000</td>
<td>88,000</td>
<td>92,400</td>
<td>97,020</td>
<td>101,871</td>
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<tr>
<td>MICROSCOPY EXPENSES (Sales and Service expenses)</td>
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<td>(22,370)</td>
<td>(85,798)</td>
<td>(90,088)</td>
<td>(94,592)</td>
<td>(99,322)</td>
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0 650 3,416 3,757 4,147 4,595
## CENTER FOR PLANT CELL BIOLOGY BUDGET 2000-2006

<table>
<thead>
<tr>
<th></th>
<th>2000/01</th>
<th>2001/02</th>
<th>2002/03</th>
<th>2003/04</th>
<th>2004/05</th>
<th>2005/06</th>
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<td>One time allocation</td>
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<td>STAFF SUPPORT</td>
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<td>181,776</td>
<td>185,412</td>
<td>189,120</td>
<td>192,902</td>
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<tr>
<td>Permanent commitment</td>
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</tr>
<tr>
<td>(includes 2% estimated range adjustment)</td>
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<td>EQUIPMENT</td>
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<td>0</td>
<td>1,365,189</td>
<td>615,110</td>
<td>618,746</td>
<td>189,120</td>
<td>192,902</td>
</tr>
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</table>

Confocal microscope funds from the Chancellor; staff support and equipment provided from campus general funds.

* Funding for FY 2001 - 2002 began in January 2002

## EXTRAMURAL FUNDS

<table>
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<tr>
<th>Agency / P.I. / Purpose</th>
<th>2000/01</th>
<th>2001/02</th>
<th>2002/03</th>
<th>2003/04</th>
<th>2004/05</th>
<th>2005/06</th>
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<tbody>
<tr>
<td>National Science Foundation / Bray / REU - Undergraduate Research</td>
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<td>75,145</td>
<td>77,858</td>
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BIOTECHNOLOGY IMPACTS CENTER BUDGET 2000-2006

<table>
<thead>
<tr>
<th>Existing Commitments</th>
<th>2000/01</th>
<th>2001/02</th>
<th>2002/03</th>
<th>2003/04</th>
<th>2004/05</th>
<th>2005/06</th>
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<tbody>
<tr>
<td>2003 CONFERENCE - UCRGI</td>
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<td>0</td>
<td>5,000</td>
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<td>2003 CONFERENCE - UCR Policy Studies Institute</td>
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<td>10,000</td>
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EXTRAMURAL FUNDS

- UC Biotechnology Research and Education Program (Planned Proposal) 15,000
- UC BioSTAR (Planned Proposal) 15,000
- National Science Foundation (Planned Proposal) 20,000

PROJECTED CONFERENCE EXPENSES
<table>
<thead>
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<th>Category</th>
<th>Amount</th>
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<tbody>
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</tr>
<tr>
<td>Logistics: Travel, lodging, meals, A/V</td>
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