



**INSTRUCTIONS:** Please submit four (4) copies of this review to the UCR Office of Research, University Office Building Room 200 and (1) copy to the College Dean as appropriate. For information about the process for preparing an annual report, please contact the Office of the Vice Chancellor for Research at 951.827.5535.

**A1. GENERAL NARRATIVE:** Please provide a short statement highlighting the main activities in which the center has engaged during the review period and how they relate to the mission, goals and objectives of the research center and to the challenges/issues/problems central to the work of the research center. How did the center contribute to UCR's graduate and undergraduate teaching programs? What activities did the center provide to UCR's external communities?

MAIN ACTIVITIES RELATED TO MISSION, GOALS, AND OBJECTIVES:

1. Four CEPCEB members (Xuemei Chen, Jian-Kang Zhu, and Julia Bailey-Serres and Sean Cutler) presented plenary talks at the **20th International Conference on Arabidopsis Research (ICAR)** in Edinburgh (6/30-7/1/09). This conference is one of the most important, highly valued and attended meetings in plant biology and is the largest annual international scientific conference dedicated to the model plant *Arabidopsis thaliana*. CEPCEB is THE ONLY PLACE across the world that had four people presenting featured talks. Detailed information on the Conference and Program: <http://arabidopsis2009.com/>
2. **Weekly CEPCEB Seminar Series [see Attachment]:**  
Invited prominent speakers, as well as CEPCEB faculty and postdocs, present and discuss noteworthy research discoveries in the field of plant biology. The seminar series offers an opportunity for collaborations to be established across disciplines, institutions and levels of experience. The seminars are scheduled weekly and advertised on the CEPCEB website:  
2008: <http://cepceb.ucr.edu/news/seminarsCEPCEB2008.html>  
2009: <http://cepceb.ucr.edu/news/seminarsCEPCEB2009.html>  
They are also advertised on the IIGB website:  
[http://genomics.ucr.edu/calendar/events/index.php?com=searchresult&s="09/09/08"&e=01/01/2020&k=&t=3](http://genomics.ucr.edu/calendar/events/index.php?com=searchresult&s=)  
(CEPCEB)
3. **Active CEPCEB ChemGen IGERT Seminar Series [see Attachment D]:**  
Prominent scientists with expertise in chemical genomics, chemistry, engineering, bioinformatics/computational sciences, and cell biology are featured. CEPCEB ChemGen IGERT graduate students are directly involved in inviting and hosting these speakers, which enhances their exposure to outstanding scientists and provides contacts that may be of value for many years to come. IGERT Seminars are advertised on the:  
CEPCEB IGERT website ([http://cepceb.ucr.edu/IGERT/IGERT\\_Seminars.htm](http://cepceb.ucr.edu/IGERT/IGERT_Seminars.htm))  
IIGB website:  
[http://genomics.ucr.edu/calendar/events/index.php?com=searchresult&s="/"&e=01/01/2020&k=&t=5](http://genomics.ucr.edu/calendar/events/index.php?com=searchresult&s=)
4. **CEPCEB Chem/Gen IGERT Annual Retreat (October 2-5, 2008):**  
To prepare graduate students participating in the ChemGen IGERT (Integrative Graduate Education and Research Trainee) program, currently in its fourth year, for their interdisciplinary future, an intensive two-day retreat is held annually. The retreat agenda is designed to foster effective interaction and communication between students and faculty of different academic backgrounds, and includes: presentations on current and future projects by participating faculty; an invited keynote speaker who presents on a novel research perspective that is apropos or ancillary to chemical genomics; open discussions; team building activities; interactive workshops; and concludes with formal presentations by students.

**2008 CEPCEB ChemGen IGERT Retreat Speakers and Session Chairs:**

The fourth annual CEPCEB ChemGen IGERT Retreat was held at the UCLA Lake Arrowhead Conference Center. The event was successful this year in demonstrating the development a very vibrant chemical genomics program at UCR with not only a true chemical component but also a very visible computational one. The retreat opened with a talk by Dr. Peter McCourt titled "A Role for Strigolactones in Arabidopsis: A New Plant Hormone" on Friday evening, October 3rd, and continued throughout the weekend with 17 graduate students and four faculty members/academic managers discussing projects involving chemical genomic approaches. For further information, please visit: [http://cepceb.ucr.edu/IGERT/IGERT\\_Retreat.htm](http://cepceb.ucr.edu/IGERT/IGERT_Retreat.htm).

**2008 CEPCEB ChemGen IGERT Retreat Speakers and Session Chairs:**

RETREAT SPEAKER	TITLE	DEPT/GRAD PROGRAM
Lei Wang	Junior Specialist	Botany & Plant Sciences
Sean Cutler	Assistant Professor	Botany & Plant Sciences
Glenn Hicks	Associate Research Plant Cell Biologist	Botany & Plant Sciences
Patricia Springer	Associate Professor	Botany & Plant Sciences
Jason Stajich	Assistant Professor (2009)	Plant Pathology & Microbiology
Eugene Bolotin	Graduate Student	Genetics, Genomics & Bioinformatics
Sean Boyle	Graduate Student	Genetics, Genomics & Bioinformatics
Michelle Brown	Graduate Student	Genetics, Genomics & Bioinformatics
Eddie Cao	Graduate Student	Computer Science
Anna Charisi	Graduate Student	Genetics, Genomics & Bioinformatics
Andrew Defries	Graduate Student	Plant Biology
Jolene Diedrich	Graduate Student	Analytical Chemistry
Theresa Dinh	Graduate Student	Plant Biology
Samer Elkashef	Graduate Student	Genetics, Genomics & Bioinformatics
Kayla Hamersky	Graduate Student	Chemistry
Augusta Jamin	Graduate Student	Cell, Molecular & Developmental Biology
Charles Jang	Graduate Student	Genetics, Genomics & Bioinformatics
James Kim	Graduate Student	Cell, Molecular & Developmental Biology
Ni Li	Graduate Student	Chemistry
Melinda Salus	Graduate Student	Plant Biology
Patrick Schacht	Graduate Student	Genetics, Genomics & Bioinformatics
Melissa Smith	Graduate Student	Plant Biology

5. **NSF CEPCEB Research Experience for Undergraduates (REU) Symposium:**

An NSF CEPCEB REU ( <http://cepceb.ucr.edu/about/REUAfter2008.html> ) Poster Symposium was held on Friday, August 22, 2008 In Keen Hall's lobby area where 11 students in the 2008 summer residential program presented talks summarizing their research projects. Now in its seventh year, the CEPCEB REU program has successfully trained 73 students since the program's inception in 2002, and many undergraduates have since pursued graduate studies in the field of plant biology due to this experience. Of the 60 tracked since the program's inception, 29 students are in or planning to enroll in a science/medical-based graduate program and 12 students transferred from community colleges to UC campuses (6 to UCR).

6. **CEPCEB Principal Investigator Luncheons:**

Early in 2006, CEPCEB initiated a program of quarterly luncheons for principal investigators within the Center for the purpose of exchanging scientific ideas and stimulating interactions and collaborations. Turnout has consistently been high for these meetings.

**PI Luncheon Speakers for FY 2008—09:**

Howard Judelson—Professor, Plant Pathology & Microbiology  
Sean Cutler—Asst. Professor, Botany & Plant Sciences

7. **Annual CEPCEB Award Ceremony and Noel Keen Lecture:**

Postdoctoral, graduate student, undergraduate student and high school students achieving research excellence in the fields of plant cell biology, genomics, bioinformatics or engineering were recognized at the Seventh Annual CEPCEB Award Ceremony and Noel Keen Lecture that was rescheduled to October 16, 2009. This event was rescheduled from April 2008 to mark the inauguration of the Genomics Building and become the first event held in the new Auditorium. A leading scientist was invited as the Noel Keen Special Lecturer. CEPCEB faculty, postdocs and students serve on the award committee.

- a. Dr. Joseph R. Ecker, Professor, Professor, Plant Molecular and Cellular Biology Laboratory, The Salk Institute for Biological Studies was the 2009 Noel Keen Special Lecturer
- b. Outstanding postdoctoral, graduate Student and Undergraduate Student Research Award recipients, accordingly:  
VANITHA RAMACHANDRAN (Botany & Plant Sciences/Xuemei Chen's Lab)  
KEVIN HORAN (Botany & Plant Sciences/Thomas Girke Lab)  
NOLAN M. UNG (Botany & Plant Sciences/Harley Smith's Lab)

8. **25th Symposium in Plant Biology: \$1000 CEPCEB Contribution**

The 25th Symposium in Plant Biology titled "The Evolution of Plant Development" was held January 29-31, 2009 at the Riverside Convention Center. UCR organizers of the symposium were from the Botany & Plant Sciences department and included: Patricia Springer, Associate Professor of Genetics, and Harley Smith,

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Assistant Professor. Both are members of the Center for Plant Cell Biology (CEPCEB). Total symposium attendance was 112. Approximately 39% of the attendees were affiliated with the University of California and represented 5 different UC campuses (Berkeley, Davis, Los Angeles, Riverside and San Diego). Due to available funding, registration fees were reduced or waived for approximately 90% of UC attendees.

CEPCEB FACULTY COORDINATORS/SPEAKERS	CEPCEB FACULTY SESSION CHAIRS
Patricia Springer–Botany & Plant Sciences Harley Smith–Botany & Plant Sciences	Xuemei Chen– Botany & Plant Sciences Renyi Liu– Botany & Plant Sciences Elizabeth Lord– Botany & Plant Sciences Venu Reddy– Botany & Plant Sciences Harley Smith–Botany & Plant Sciences Patricia Springer–Botany & Plant Sciences

9. **Betty Lord Retirement Symposium: June 26, 2009 [See Attachment C]**

After 31 years of service to the campus, **Betty Lord**, Professor of botany and developmental biology, retired on June 30, 2009, and a Retirement Symposium was held on June 26 on campus in Dr. Lord’s honor. The daylong symposium was attended by various UCR faculty and staff and also by many of Lord’s former graduate students and postdoctoral researchers, some of whom gave presentations on their research. Throughout her career, Dr. Lord moved her research on plants seamlessly between traditional anatomy/morphology, molecular biology, cell biology, biochemistry, and evolution, and the talks by eight of her former lab members reflected the range of her research interests.

CENTER'S CONTRIBUTIONS TO UCR'S GRADUATE AND UNDERGRADUATE TEACHING PROGRAMS:

**CEPCEB ChemGen IGERT Program:**

The goal of this innovative training program is to provide students with a team-based research environment that intercalates engineers, chemists and bio-informaticians into research teams with cell biologists. Students in this program have at least two major professors from two disciplines, and attend lab meetings from both research groups as well as an annual retreat. IGERT Students also mentor students participating in the CEPCEB REU program (2005-10). In fiscal year 2008-09, six new students entered the program, and several new faculty are participating in the program: Jason Stajich, Plant Pathology & Microbiology; Anandasankar Ray, Entomology; Wenbo Ma, Plant Pathology & Microbiology; and Karine Le Roch, Cell Biology & Neuroscience.

Participating CEPCEB Faculty in the ChemGen IGERT Program: [http://cepceb.ucr.edu/IGERT/IGERT\\_Faculty.htm](http://cepceb.ucr.edu/IGERT/IGERT_Faculty.htm)

**Participating CEPCEB Labs Mentoring ChemGen IGERT Students:**

First Year	IGERT Student	Graduate Program	Email	CEPCEB Lab Rotations	REU STUDENT MENTORED BY IGERT STUDENT
2005-06	<a href="#">SAMER ELKASHEF</a>	Genetics, Genomics and Bioinformatics	<a href="mailto:selka001@ucr.edu">selka001@ucr.edu</a>	Shou-wei Ding, Plant Pathology Yinsheng Wang, Chemistry	<a href="#">Lauren Quesada</a> (CEPCEB REU 2007)
2005-06	<a href="#">CHARLES JANG</a>	Genetics, Genomics and Bioinformatics	<a href="mailto:cjang001@student.ucr.edu">cjang001@student.ucr.edu</a>	Julia Bailey-Serres, Botany & Plant Sciences Thomas Girke, CEPCEB Bioinformatics	<a href="#">Daniel Swank</a> (CEPCEB REU 2007)
2005-06	<a href="#">JAMES KIM</a>	Cell, Molecular and Developmental Biology	<a href="mailto:jkim082@ucr.edu">jkim082@ucr.edu</a>	Kathy Borkovich, Plant Pathology Cynthia Larive, Chemistry	<a href="#">Zhen (Michael) Qin</a> (CEPCEB REU 2007)
2005-06	<a href="#">COLLEEN KNOTH</a>	Plant Biology	<a href="mailto:colleen.knoth@email.ucr.edu">colleen.knoth@email.ucr.edu</a>	Thomas Eulgem, Botany & Plant Sciences Thomas Girke, CEPCEB Bioinformatics	<a href="#">Jon Ringler</a> (CEPCEB REU 2004)
2005-06	<a href="#">CHRISTIANA MERRYWELL</a>	Chemistry	<a href="mailto:cmerr001@ucr.edu">cmerr001@ucr.edu</a>	Cynthia Larive, Chemistry Natasha Raikhel, Botany & Plant Sciences	<a href="#">Thao Nguyen</a> (Bioanalytical Science REU 2006)
2006-07	<a href="#">EDDIE CAO</a>	Computer Science	<a href="mailto:ycao@bioinfo.ucr.edu">ycao@bioinfo.ucr.edu</a>	Thomas Girke, CEPCEB Bioinformatics	
2006-07	<a href="#">JOLENE DIEDRICH</a>	Analytical Chemistry	<a href="mailto:jdied001@student.ucr.edu">jdied001@student.ucr.edu</a>	Wenwan Zhong, Chemistry Ryan Julian, Chemistry	<a href="#">Christine Reder</a> (Bioanalytical Science REU 2007)
2006-07	<a href="#">THERESA DINH</a>	Plant Biology	<a href="mailto:tdinh007@ucr.edu">tdinh007@ucr.edu</a>	Xuemei Chen, Botany & Plant Sciences	<a href="#">Rhonda Egidy</a> (CEPCEB REU 2007)
2006-07	<a href="#">AUGUSTA JAMIN</a>	Genetics, Genomics and Bioinformatics	<a href="mailto:aujamin@gmail.com">aujamin@gmail.com</a>	Zhenbiao Yang, Botany & Plant Sciences	<a href="#">Alex Paya</a> (CEPCEB REU 2007)
2006-07	<a href="#">KAYLA KAISER</a>	Analytical Chemistry	<a href="mailto:khame001@student.ucr.edu">khame001@student.ucr.edu</a>	Cynthia Larive, Chemistry Julia Bailey-Serres, Botany & Plant Sciences	<a href="#">Archie Taylor</a> (Bioanalytical Science REU 2007)
2007-08	<a href="#">SEAN BOYLE</a>	Genetics, Genomics and Bioinformatics	<a href="mailto:sboyl001@student.ucr.edu">sboyl001@student.ucr.edu</a>	Stefano Lonardi, Computer Science & Eng. Michael Pirrung, Chemistry	
2007-08	<a href="#">MICHELLE BROWN</a>	Genetics, Genomics and Bioinformatics	<a href="mailto:michelle.brown@email.ucr.edu">michelle.brown@email.ucr.edu</a>	Natasha Raikhel, Botany & Plant Sciences	
2007-08	<a href="#">ANNA CHARISI</a>	Genetics, Genomics and Bioinformatics	<a href="mailto:acharisi@cs.ucr.edu">acharisi@cs.ucr.edu</a>	Thomas Girke, CEPCEB Bioinformatics	
2007-08	<a href="#">ANDREW DEFRIES</a>	Plant Biology	<a href="mailto:andrewd@ucr.edu">andrewd@ucr.edu</a>	Sean Cutler, Botany & Plant Sciences	

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2007-08	<a href="#">MELINDA SALUS</a>	Plant Biology	<a href="mailto:msalu001@ucr.edu">msalu001@ucr.edu</a>	Thomas Eulgem, Botany & Plant Sciences
2007-08	<a href="#">MELISSA SMITH</a>	Plant Biology	<a href="mailto:msmit024@student.ucr.edu">msmit024@student.ucr.edu</a>	Linda Walling, Botany & Plant Sciences
2008-09	<a href="#">AYESHA BAIG</a>	Plant Biology	<a href="mailto:ayesha.baig@student.ucr.edu">ayesha.baig@student.ucr.edu</a>	Thomas Eulgem, Botany & Plant Sciences
2008-09	<a href="#">GREGORY BARDING</a>	Chemistry	<a href="mailto:gbard001@ucr.edu">gbard001@ucr.edu</a>	Cynthia Larive, Chemistry
2008-09	<a href="#">PATRICK SCHACHT</a>	Genetics, Genomics and Bioinformatics	<a href="mailto:pscha001@student.ucr.edu">pscha001@student.ucr.edu</a>	Katherine Borkovich, Plant Pathology & Microbiology
2008-09	<a href="#">MOSES TATAW</a>	Computer Science	<a href="mailto:tatawm@cs.ucr.edu">tatawm@cs.ucr.edu</a>	Venugopala G. Reddy, Botany & Plant Sciences Eamonn Keogh, Computer Science
2008-09	<a href="#">SHANG WU</a>	Plant Biology	<a href="mailto:swu014@ucr.edu">swu014@ucr.edu</a>	Harley Smith, Botany & Plant Sciences
2008-09	<a href="#">RAE EDEN YUMUL</a>	Plant Biology	<a href="mailto:rae.yumul@email.ucr.edu">rae.yumul@email.ucr.edu</a>	Xuemei Chen, Botany & Plant Sciences Zhenbiao Yang, Botany & Plant Sciences Patricia Springer, Botany & Plant Sciences

**CEPCEB Research Experiences for Undergraduates (REU) Program (2005-10)**

The NSF Research Experience for Undergraduates (REU) program was first awarded to CEPCEB researchers in 2002 for a period of three years, and renewed in 2005 for five years. As an NSF REU Site, CEPCEB brings research experiences to students of two- and four-year colleges who have limited opportunity to learn about the excitement and career options that research in plant cell biology offers. Eight to twelve students are accepted into the ten-week residential program. The program begins with a one-week workshop, in which students are introduced to techniques and approaches used for analysis of plant and plant fungal pathogen cell function, including basic molecular biology, genomic and bioinformatic analyses, and confocal microscopy methods used to study live cells. Students then spend nine weeks working with a faculty mentor and a graduate or postgraduate mentor on a research project of their choice. Students also participate in workshops to enhance learning skills and professional development, and to discuss ethics in science. Thus far (incl. Summer 2008), 73 undergraduate students have been trained in CEPCEB labs since the program's inception.

Participating Faculty in the CEPCEB REU Program: <http://cepceb.ucr.edu/about/REUafter2008.html#UnderGradTrain>.

The following 11 students participated in the 2008 REU Program in CEPCEB Labs and presented a poster session at the REU Symposium on Friday, August 22, 2008.

REU Student	College/University	CEPCEB Faculty	Mentor
<a href="#">Byron Doyle</a>	Fort Valley State University, Augusta, GA	Cutler Lab	Simon Alfred
<a href="#">Maritza Duarte</a>	Seattle University, Seattle, WA	Reddy Lab	Ram Yadav
<a href="#">Benjamin Fulton</a>	Skidmore College, Saratoga Springs, NY	Jin Lab	Chellappan Padmanabhan
<a href="#">Aimee Johnson</a>	Western Washington University, Bellingham, WA	Ma Lab	Huanbin Zhou
<a href="#">Joseph Manson</a>	Riverside Community College, Riverside, CA	Judelson Lab	Howard Judelson
<a href="#">Colin Murphree</a>	Transylvania University, Lexington, KY	Rao Lab	Soon Choi
<a href="#">Michael O'Leary</a>	University of California, Riverside, CA	Chen Lab	Theresa Dinh
<a href="#">Rebekah Silva</a>	Riverside Community College, Riverside, CA	Walling Lab	Melissa Smith

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<a href="#">Robert Washington</a>	Cal State Polytechnic University, Pomona, CA	Raikhel Lab	Michelle Brown
<a href="#">Andrea Wheat</a>	University of North Texas, Houston, TX	Borkovich Lab	Gyungsoon Park
<a href="#">Ali Zania</a>	California State University, Bakersfield, CA	Bailey-Serres Lab	Piyada Juntawong

### Business/Science Joint Graduate Pilot Program

Last summer, IIGB Director Natasha Raikhel approached Anderson Graduate School of Management (AGSM) Dean David Stewart to explore the collaborative development of a business component to graduate programs in the biological sciences. The purpose was to better prepare students for entrepreneurial and commercial career options related to their scientific education and training, and to improve recruitment possibilities for both programs and for UCR. They decided to initially enroll interested students from the Plant Biology and Genetics, Genomics and Bioinformatics (GGB) programs into two introductory MBA courses: Marketing Management (MGT 209) in fall 2008 and Financial Management (MGT 202) in spring 2009. If successful, the next step involves a tailored business class for science students and a certificate program.

GGB and Plant Biology students were surveyed in the summer of 2008 for their interest in the Business track. Both Isgouhi Kaloshian (Director, GGB) and Patricia Springer (Vice Chair, Botany & Plant Sciences) received overwhelming support for the proposed program. A student application form to participate in the program was developed and distributed, summarizing the criteria for the selection of students from each program for Fall/Winter 09. The form asked students to submit a personal statement describing their career goals and a justification of how this experience would enhance those goals, as well as a letter of support from their major professor.

The following three students were selected and took two AGSM business classes in fall 2008 and spring 2009:

**Michelle Brown** (Genetics, Genomics and Bioinformatics Graduate Program/CEPCEB ChemGen IGERT Program)

**Thanh Thu Dinh** (Plant Biology Graduate Program/CEPCEB ChemGen IGERT Program)

**Nadia Naem Qureshi** (Genetics, Genomics and Bioinformatics Graduate Program)

*Impact of Above:* A meeting was scheduled 9/29/09 with the AGSM Dean, the CNAS Dean, the IIGB Director, and the students above to discuss the possibility of issuing certificates for completion of these courses, and to pursue the possibility of implementing business/science programs in other disciplines on campus (i.e., engineering/business).

### OUTREACH ACTIVITIES:

#### High School Recipients of CEPCEB Plant Cell Biology Awards at Science Fairs (judged by CEPCEB faculty)

- a. The Center for Plant Cell Biology awarded **Ronit B. Abramson**, a high school student from Canyon Crest Academy in San Diego, California, the CEPCEB First Place Plant Cell Biology Award (\$1000) at the California State Science Fair held May 19, 2009. In 2002, CEPCEB initiated the CEPCEB Award Fund to recognize research excellence in plant cell biology, genomics and bioinformatics by pre-college students, graduate students, and postdoctoral researchers. CEPCEB Academic Coordinator **David Carter** attended and evaluated presentations and presented Ms. Abramson a cash prize (\$1000) for her poster titled "Cell Wall Formation from Marine Diatom Protoplasts: Implications for Novel Transformation and Nanotechnology Techniques." The study developed a procedure for growing the diatom species *Nitzschia alba* without its cell wall and proved that the resulting protoplasts are viable and regenerate their cell walls in the wild type morphology. As Ms. Abramson stated, "I worked very hard on this project and plan to continue further research on this topic in the future. I believe diatoms have tremendous potential in many applications from biofuels to nanotechnology and I am very excited about the opportunities. Your interest in my project was very encouraging. Thank you for your support of the California State Science Fair."

An Honorable Mention at the California State Science Fair was presented to **Nitish Lakhnarpal** from University High School in Irvine, California for his poster titled "Computational Prediction of Beta Structure from Amino Acid Sequence in a Class of Pathologically Relevant Proteins." Nitish developed an algorithm to predict beta structure in proteins from amino acid sequences based on properties of known

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beta structures, effectively merging single-amino-acid level analysis with the possibility of long-distance interactions.

- b. The Center for Plant Cell Biology also awarded **Sanjana Marpadga** from Upland High School the 2009 CEPCEB Plant Cell Biology First Place Award (\$2,000) on April 15, 2009 at the Inland Science and Engineering Fair in San Bernardino, California. The Fair is an annual competition of science projects designed, developed, and displayed by elementary and secondary students from schools in Riverside, Inyo, Mono and San Bernardino (RIMS) counties. CEPCEB annually acknowledges scientific achievement at this fair in the fields of cell and molecular biology, genomics, bioinformatics, or technology development by a student in grades 9-12. The title of Sanjana's work was "Beclin I: A Novel Marker to Evaluate Human Iset Quality." CEPCEB member **Harley Smith** participated as a judge in this event.
- c. All award recipients are acknowledged on the CEPCEB and IIGB websites:

CEPCEB website: (<http://cepceb.ucr.edu/news/news.htm#09HighSchool> )

IIGB website: (<http://genomics.ucr.edu/news/news-details.php?id=49> )

**A2. RESEARCH NARRATIVE:** Please summarize any significant trends (new research directions, significant increases or decreases in sponsored funding, changes in outreach efforts, etc.) during the review period.

#### **Chemical Genomics**

A powerful new research approach embraced at CEPCEB stimulating interdisciplinary research efforts is chemical genomics, which is also the foundation of the CEPCEB Chemical Genomics IGERT Program for graduate student training. This is an emerging field at the intersection of chemistry and biology that focuses on the screening of thousands of drug-like chemicals on living organisms using robotic instrumentation for highly automated handling of chemicals and biological samples. Currently, chemical libraries (>60,000 compounds) are housed on the first floor of Keen Hall in dedicated freezers as well as fluid robotics (Microscopy and Genomics Cores), chemical database tools (Bioinformatics Core) and expertise in biological screening of chemicals (Glenn Hicks; David Carter) along with PIs, postdocs and students spread across departments. At the Keen Hall Core Instrumentation Facilities, training and use of fluidics robots are provided, as well as microscopy-based screens training through the Microscopy Core. The Institute for Integrative Genome Biology has organized a rate structure for access to chemical libraries in order to maintain and expand collections.

High throughput screening for chemical genomics is an increasingly important area of research. Much of this is funded by the IGERT Chemical Genomics program. A 46,000 chemical pollen germination inhibitor screen was completed using the methodology of Robert et. al. 2008. A secondary screen was carried out on the Leica SP2, looking for mislocalization of five GFP labeled endomembrane markers. These chemicals may be useful in teasing apart the pathways for trafficking of proteins within a cell. In addition, these libraries will be made available publically in the near future. The libraries include compounds that block pollen germination and compounds known to have effects on endomembrane trafficking. This has been part of an ongoing fruitful collaboration between the University of Ghent, Belgium, and Natasha Raikhel's lab. The Cutler lab has been heavily involved in getting new chemical libraries online and developing robotic handling capability and yeast assays which can screen thousands of compounds a day. In addition, new discoveries are being made by CEPCEB members. For example, Cutler et al, reported in the journal *Science* the use of chemical genomics to identify a new receptor for the plant hormone Abscisic acid (<http://genomics.ucr.edu/news/news-details.php?id=47>).

#### **Bioinformatics:**

The number of researchers utilizing the Bioinformatics Core's new Linux cluster has increased by almost 20% compared to last year. This trend is related to the much faster hardware (supercomputer) that was acquired in FY 2007-08. In addition, the cluster has become a central resource on campus in analyzing the massive amounts of deep sequencing data from the Illumina genomics core facility. Currently, the Linux cluster is used by over 100 researchers on campus from all bioscience, statistics, chemistry and engineering departments.

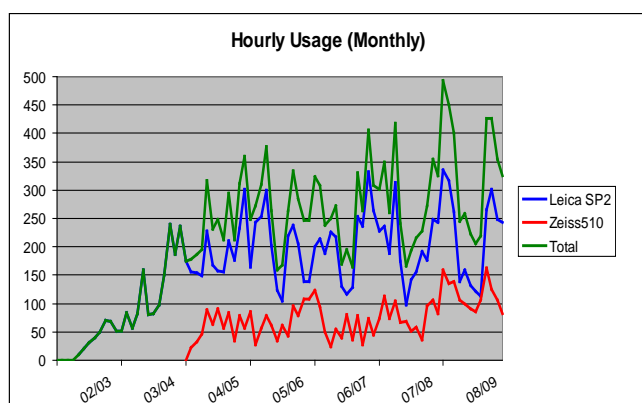


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The number of deep-sequencing projects has continued to increase almost exponentially in the past 12 months. The Illumina sequencing technology has become now the most important enabling resource for grants and research projects in the field of biosciences on campus.

### Microscopy:

The two most popular microscopes in the Microscopy and Imaging Core have required several major repairs due to very heavy use. An NSF Major Research Instrumentation Recovery and Reinvestment (MRI-R2) application was submitted in 2009 for a next generation Olympus Spectral Confocal and Multiphoton Scanner, which will relieve this usage pressure and offer both multiphoton imaging and fluorescence lifetime imaging capabilities on a high throughput inverted microscope. This system will support a large group of mainly biomedical science faculty, who currently have to commute to UC-Irvine. It will be a high throughput inverted system, capable of handling multiwell plates for chemical genomics and mutant screening applications. The Yokogawa confocal microscope has a new Hamamatsu C9100-14 1kx1k EMCCD camera and upgraded optics for collecting video rate confocal images of live cells. A gravitropism imaging periscope and near IR lighting system was developed for the Pathway HT microscope for kinetic analysis of root growth.



*Usage graph for Leica SP2 and Zeiss 510 point scanners, fiscal year 02/03 to 08/09. Usage levels peak above 300 hours per month (10h per day!) on the Leica and about 150 hours on the Zeiss. A new inverted scanner would improve access and add new functionality for over 500 users from 125 labs in 15 different departments.*

### Proteomics:

The proteomics core houses three major instruments including Q-TOF LC/MS/MS, Q-STAR MALDI/MS/MS, and BIACOR X100, but the Q-TOF LC/MS/MS is the highly popular and most-used system. For this review period, the focus on instrumentation improvement was to further strengthen the advantages and capabilities of the Q-TOF LC/MS/MS system because of high user demand. With funds generated from core service revenue, the proteomics core upgraded the nano-UPLC (ultra performance liquid chromatography) system to be able to carry out two-dimensional separation so that MudPIT experiments are possible for projects. This upgrade maintains the flexibility of switching between one- and two-dimensional separations based on sample complexity. This method should have a significant impact in the near future on large-scale proteomics projects.

In the Proteomics Core, there have been more research demands in quantitative proteomics, targeted analyses, and post-translational modification mapping than general profiling. Individual projects are usually long-term projects requiring extensive efforts from both PI labs and the core facility. Most proteomics projects were related to mapping the post-translational modifications of cellular proteins and the discovery of novel cellular protein complexes that are important to biological processes. Another significant growth was in the area of chemical genomics where users often required LC/MS analysis to verify the identity and purity of small chemicals that produced interesting phenotypes after global screening. There has also been more rapid growth in mammalian related research projects than other areas.

To ensure growing demands in these areas, the proteomics core submitted in 2009 an NIH instrumentation proposal for the purchase of a new generation LC/MS system such as the LTQ-Orbitrap, which is currently under review. The proposed new system may provide unprecedented ultra-high mass resolution, accuracy, and sensitivity as well as the new ETD fragmentation technology. It can specifically enhance the facility's ability, on a global scale, in the studies of post-translational modification (PTM) by providing a much higher degree of precision.

### **New Online Instrumentation Facilities Reservation and Billing System**

In July 2009, IIGB instituted an automated reservation and billing system for users of Keen Hall's four instrumentation cores (Microscopy, Genomics, Proteomics, Bioinformatics). Prior to this, Academic Coordinators managing each facility were spending an inordinate amount of time collecting and computing billing data manually from paper records, resulting in a time-consuming system prone to error that detracted significantly from research services and goals. The new IIGB Instrumentation Facilities Services and Billing Site was developed as an online system for users to reserve equipment and request services online and have charges for both internal and external customers automatically calculated. Due to the site's integrated functionality, recharges and monthly statements are automatically generated based on reservation times, submitted forms, and current approved rates. The new system permits efficient generation of usage data and revenue across the facilities and functions of IIGB and facilitates benchmarking to monitor the overall operation and its success.

### **Highlights of Research Trends/Directions within CEPCEB:**

#### **Genomics: Aging/Cancer**

Dr. Nugent's research has been focused on dissecting the underlying mechanism that allows the ends of the chromosomes to be protected from inappropriate degradation. In the course of these experiments, her lab discovered that misregulation of a key telomere protection protein disturbs the ability of the cell to properly regulate DNA replication processes, particularly when the DNA is damaged. Thus, these data have now moved us into the area of researching DNA replication checkpoints - ie, how cells control the integrity of the DNA replication processes in cells that are under stress. Both telomeres and DNA replication checkpoints are areas that are critical in genome stability and hence aging and cancer.

#### **Biofuels:**

The focus of Eugene Nothnagel's research in the Botany & Plant Sciences department continues to be on methylated sugars in plant cell wall polymers. His lab is attempting to identify the methyltransferase that synthesizes 3-O-methyl-L-rhamnose in the moss *Physcomitrella*. Engineering plants with higher or lower levels of polysaccharide O-methyltransferases could have applications in biofuels.

#### **Computational Biology:**

Bioinformaticians are continuing to collaborate with biologists on grants involving such topics as the epigenetics of malaria (Stefano Lonardi, Karine Le Roch) and crop science (Stefano Lonardi, Tim Close). Tao Jiang in the Computer Science & Engineering Department continues to work on a genome-wide ortholog assignment which is a fundamental problem in comparative genomics, i.e., haplotype inference on pedigrees, classification of microbial communities, etc. He received two new NIH grants: "Multi-Point and Multi-Locus Analysis of Genomic Data", \$180K, 8/1/2009 - 7/31/2011, a subcontract from CWRU via an NIH/NLM R01 grant with the same title, and "Nuclear Receptor Networks in Human Disease" (PI: F. Sladek) \$750K, 7/13/2009 - 4/30/2011, NIH/NIMH Exploratory/Developmental (R21) Grant. This grant was made possible by a \$50K seed grant provided by IIGB which permitted her laboratory to generate essential preliminary data and results.

#### **RNA and Disease Prevention:**

IIGB Associate Professor Xuemei Chen and Assistant Specialist Vanitharani Ramachandran published findings in the September 12, 2008 issue of *Science* that filled a gap in current knowledge of small RNA metabolism. Small RNAs are short strands of ribonucleic acids used by plants and animals to regulate diverse biological processes, such as development, maintenance of genome stability, and responses to environmental stresses and pathogen attacks. Understanding how small RNAs are synthesized and degraded is crucial for harnessing the power of small RNAs to develop effective means to treat human diseases and improve agriculture. While it is well known how small RNAs are made, how small RNAs are degraded in vivo is unknown. Researchers Chen and Ramachandran contributed to this mystery in their article titled "Degradation of microRNAs by a Family of Exoribonucleases in *Arabidopsis*" by uncovering a family of enzymes that degrades small RNAs in *Arabidopsis* (homologs of this family of enzymes are present in humans), thereby revealing the mechanism of microRNA turnover.

**Morris Maduro** in the Department of Biology has been collaborating with **Shou-Wei Ding's** laboratory in Plant Pathology & Microbiology on RNAi-mediated antiviral immunity in the nematode, *C. elegans*. During this period they submitted a grant application to the NIH with Ding as lead PI and Maduro as Co-PI that was recently awarded.

**Agricultural Genomics:**

Research from the laboratory of CEPCEB member **Sean Cutler**, an assistant professor of plant cell biology in the Department of Botany and Plant, discovered that spraying a stable synthetic chemical on plants enhances stress tolerance during times of drought and improves yield. Of the various stress hormones, abscisic acid (ABA), produced naturally by plants, has emerged over the last 30 years as the key hormone that helps plants cope with drought conditions. Under such stress, plants increase their ABA levels, which help them survive the drought through a process not fully understood. Using a chemical genomics method and screening thousands of chemicals for one that imitated ABA, Cutler identified pyrabactin, a new synthetic chemical that activates some of the ABA receptors in *Arabidopsis*, a small flowering plant used widely in plant biology laboratories as a model organism. It therefore proved to be a highly effective chemical strategy for improving plants' ability to survive under low-water conditions, potentially benefiting farmers in drought-prone areas worldwide. The results of his discovery appeared in the May 22, 2009 issue of *Science* magazine.

CEPCEB member **Julia Bailey-Serres** was the lead recipient of the 2008 USDA National Research Initiative (NRI) Discovery Award for her landmark work on submergence tolerance in rice. In collaboration with researchers at the International Rice Research Institute (IRRI) in the Philippines and at the Riverside and Davis University of California campuses, Dr. Bailey-Serres, Professor of Genetics in the Botany & Plant Sciences department, was the principal investigator on three USDA-funded projects identifying flood-resistant genes. Their research primarily focused on one such gene, called the Sub1A gene, that when overexpressed allows rice crops to escape ruination from prolonged submergence during floods. The projects, which are leading to the development of rice varieties with greater submergence tolerance, have significant meaning for struggling rice farmers throughout the world whose crop yields are often subject to destruction by seasonal rains.

A team of researchers headed by CEPCEB member **Venugopala Reddy Gonehal** in the Botany and Plant Sciences department identified the stem cell genes responsible for forming plant organs and determining plant architecture in the model plant *Arabidopsis*. Utilizing a multi-disciplinary approach involving genomics, live-imaging and bioinformatics, Dr. Gonehal was able to further scientists' understanding of why some stem cells remain undifferentiated while others differentiate into specialized cells, thus paving a way for the possibility of altering important crop varieties to maximize yield, nutrition and other features. Working with Dr. Gonehal were UCR researchers **Ram Kishor Yadav, Thomas Girke, Sumana Pasala and Mingtang Xie**.

**A3. ORGANIZATIONAL AND MANAGEMENT STRUCTURE:** Have any changes been made to the organizational or management structure of the center during the review period? If so, please describe.

**NEW MEMBERS:**

In FY 2008-09, the following faculty accepted invitations to join the Center for Plant Cell Biology. Currently, 52 faculty (+2 Academic Coordinators) from 13 departments are CEPCEB members.

Stajich, Jason – Plant Pathology & Microbiology (eff. 9/09)

Kaloshian, Isgouhi – Nematology (eff. 8/09)

**LEADERSHIP:**

The following faculty assumed notable roles in FY 2008-09:

**CEPCEB Seminar Committee:**

Faculty Members:

Venu Reddy (Chair) –Botany and Plant Sciences

Xuemei Chen – Botany and Plant Sciences

Tao Jiang – Dept. of Computer Science and Engineering

**CEPCEB Noel T. Keen Lecture and Award Committee:**

Award Committee Members:

Faculty Members:

Harley Smith (Award Committee Chair) –Botany and Plant Sciences

Xinping Cui –Statistics

Yinsheng Wang –Chemistry

Other Academics:

David Carter – CEPCEB Microscopy Core

Marci Surpin –Botany & Plant Sciences

Graduate Student:

James Kim – Cell, Molecular and Developmental Biology Graduate Student/CEPCEB Chem/Gen IGERT Program

**CEPCEB Principal Investigator Luncheons:**

Coordinator: Katherine Borkovich –Plant Pathology & Microbiology

**NSF CEPCEB REU Program:**

Director: Patricia Springer –Botany & Plant Sciences

Asst. Director: Thomas Eulgem –Botany & Plant Sciences

**NSF ChemGen IGERT Program:**

Director: Julia Bailey-Serres –Botany & Plant Sciences

Assoc. Director: Sean Cutler –Botany & Plant Sciences

**CEPCEB Award Nomination Committee:**

Shou-wei Ding, Plant Pathology & Microbiology

Xuemei Chen, Botany & Plant Sciences

**NSF CEPCEB IGERT Proposal Renewal (2010)**

PI: Katherine Borkovich –Plant Pathology & Microbiology

**NSF CEPCEB Research Experiences for Undergraduates (REU) Proposal Renewal (2010):**

PI: Howard Judelson –Plant Pathology & Microbiology

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B.1: PARTICIPATING PERSONNEL UCR FACULTY (Senate Members)		Type of Participation (check all that apply)							(Description of Other)
Name	Payroll Title	Affiliation	PI/Co-PI on Center Sponsored Award	Center Advisory Committee Member	Speaker at Center Event	Author on Center Publication	Other		
Bachant, Jeffrey	Asst. Professor	Cell Biology & Neuroscience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Bailey-Serres, Julia	Professor	Botany & Plant Sciences	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ChemGen IGERT Dir; PI Luncheons and Meeting; REU Mentor	
Bazhenov, Maksim	Assoc. Professor	Cell Biology & Neuroscience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Borkovich, Katherine	Professor	Plant Pathology & Microbiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	IGERT Proposal Renewal PI (2010); REU Speaker/Mentor; PI Luncheons; ChemGen IGERT Mentor	
Chang, Chia-en	Asst. Professor	Chemistry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chen, Xuemei	Assoc. Professor	Botany & Plant Sciences	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Co-PI of Center Grant; CEPCEB Seminar Cmte Chair; PI Luncheons; REU and IGERT Mentor' 25 <sup>th</sup> Plant Symp Session Chair	
Cheng, Quan	Asst. Professor	Chemistry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	PI Luncheons; CEPCEB Seminars	
Cui, Xinping	Asst. Professor	Statistics	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PI Luncheons; CEPCEB Seminars	
Cutler, Sean	Asst. Professor	Botany & Plant Sciences	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ChemGen ChemGen IGERT Assoc Dir/Mentor/Speaker; REU Mentor	
Ding, Shouwei	Professor	Plant Pathology & Microbiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	REU Mentor; ChemGen IGERT Mentor; GGB Dir.	
Eulgem, Thomas	Asst. Professor	Botany & Plant Sciences	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	REU Asst. Dir; ChemGen IGERT Mentor; CEPCEB Seminars; PI Luncheons	
Girke, Thomas	Asst. Professor	Botany & Plant Sciences	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	PI Luncheons; REU Mentor; ChemGen IGERT Mentor	
Jiang, Tao	Professor	Computer Science & Eng	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	IGERT ChemGen Co-PI	
Jin, Hailing	Asst. Professor	Plant Pathology & Microbiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CEPCEB Seminar Coord.	
Judelson, Howard S.	Professor	Plant Pathology and Microbiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	REU Speaker; CEPCEB REU Renewal PI (proposal - pending); REU Mentor	
Kaloshian, Isgouhi	Prfessor	Nematology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pilot Bus/Science Grad Program Coord; GGB Dir.	
Larive, Cynthia	Professor	Chemistry	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ChemGen IGERT Mentor	
Le Roch, Karine	Asst. Professor	Cell Biology & Neuroscience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Li, Bai-lian (Larry)	Professor	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CEPCEB Seminars; PI Luncheons	
Liao, Jiayu	Asst. Professor	Bioengineering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Lonardi, Stefano	Asst. Professor	Computer Science & Eng	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CEPCEB Seminars; PI	

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								Luncheons
Lord, Elizabeth	Professor	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25 <sup>th</sup> Plant Symp Session Chair; CEPCEB Seminars; PI Luncheons
Lyubovitsky, Julia	Asst. Professor	Bioengineering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CEPCEB Seminars; PI Luncheons
Ma, Wenbo	Asst. Professor	Plant Pathology & Microbiology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CEPCEB REU Mentor; CEPCEB PI Luncheons
Maduro, Morris	Asst. Professor	Biology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CEPCEB Seminars; PI Luncheons
Morikis, Dimitrios	Assoc. Professor	Bioengineering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CEPCEB Seminars; PI Luncheons
Morton, Thomas	Professor	Chemistry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PI Luncheons
Nothnagel, Eugene	Professor	Botany & Plant Sciences	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	CEPCEB Seminars; PI Luncheons
Nugent, Connie	Assoc. Professor	Cell Biology & Neuroscience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Ozkan, Cengiz	Assoc. Professor	Electrical Engineering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ozkan, Mihri	Assoc. Professor	Electrical Engineering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Pirrung, Michael	Professor, UC Presidential Chair	Chemistry	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	IGERT ChemGen Co-PI
Raikhel, Natasha	Distinguished Professor	Botany & Plant Sciences	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CEPCEB Dir; IGERT ChemGen Mentor and Co-PI; REU Mentor; CEPCEB Seminars; CEPCEB Meeting Facilitator
Rao, A.L.N.	Assoc. Professor	Plant Pathology & Microbiology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Reddy, Venugopala G.	Asst. Professor	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	25 <sup>th</sup> Plant Symp Session Chair; CEPCEB Seminar Chair; REU Mentor
Rodgers, Victor	Victor	Bioengineering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Roy-Chowdhury, Amit	Asst. Professor	Electrical Engineering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Schultz, Jerome	Distinguished Professor	Bioengineering	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CEPCEB Seminars; PI Luncheons; IGERT ChemGen Co-PI
Smith, Harley	Asst. Professor	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	25 <sup>th</sup> Plant Symp Organizer; CEPCEB Awards Cmte Chair; REU Mentor
Springer, Patricia S.	Assoc. Professor	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	25 <sup>th</sup> Plant Symp Organizer; REU Program Dir; ChemGen IGERT Retreat Speaker
Stajich, Jason	Asst. Professor	Plant Pathology & Microbiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ChemGen IGERT Retreat Speaker
Walker, Sharon	Asst. Professor	Chemical & Env Engineering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Walling, Linda	Professor	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	REU Mentor; ChemGen IGERT Mentor; CEPCEB Seminars; PI Luncheons
Wang, Yinsheng	Assoc. Professor	Chemistry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ChemGen IGERT Mentor

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Xu, Guanshui	Assoc. Professor	Chemistry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CEPCEB Seminars; PI Luncheons
Xu, Shizhong	Professor	Botany & Plant Sciences	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CEPCEB Seminars; PI Luncheons
Yang, Zhenbiao	Professor	Botany & Plant Sciences	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	CEPCEB PI Luncheons Coordinator; REU Mentor; ChemGen IGERT Mentor
Zhong, Wenwan	Asst. Professor	Chemistry	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PI-NIH Instrumentation Proposal (Mass Spec); CEPCEB Seminars; PI Luncheons
Zhu, Jian-Kang	Professor	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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For Other Academics: Please list professional researchers, post-docs, visiting scholars, adjunct professors, academic specialists, research associates, academic coordinators, and academic CE appointees who actively participated in Center activities, e.g., PI on a sponsored project administered by the Center, member of a Research Team, speaker at a Center Conference/Event, author on a Center publication, etc. [Note: this is not a complete list; dependent upon PI response]

Name	Payroll Title/Faculty Mentor	Affiliation	PI/Co PI on Center Sponsored Award	Center Advisory Committee Member	Speaker at Center Event	Author on Center Publication	(Description of Other)
Agarwal, Pooja	Postdoc/Reddy	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Alfred, Simon	Postdoc/Cutler	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	REU Mentor
Alonzo, Virginia	Postdoc/Springer	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Regular attendee IIGB/CEPCEB seminars, training sessions
Brown, Michelle	Grad Student/Raikhel	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	REU Mentor; Bus/Science Grad Student Participant
Cao, Eddie	Grad Student/Girke	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Carter, David	Academic Coordinator	Center for Plant Cell Biology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Science Fair Award Committee Judge; PI, NSF Instrumentation Proposal (multiphoton scanner)
Chae, Keun	Postdoc/Lord	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Betty Lord Retirement Symposium Speaker
Chellappan, Padmanabhan	Asst. Specialist/Jin	Plant Pathology & Microbiology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	REU Mentor
Choi, Soon	Postdoc/Rao Lab	Plant Pathology & Microbiology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	REU Mentor
Dinh, Theresa	Grad Student/Chen	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	REU Mentor; Bus/Science Grad Student Participant
He, Xinjian	Postdoc/Zhu	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Hicks, Glenn	Associate Research Plant Cell Biologist	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ChemGen IGERT Retreat Speaker
Holzer, Fran	SRA/Walling	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Participated in research; CEPCEB listed on Plant Cell paper; Fran co-mentored REU (Rebekah Silva summer 09)
Juntawong, Piyada	Grad Student/Bailey-Serres	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	REU Mentor
Kanrar, Siddhartha	Asst. Specialist/Smith	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Li, Shengben	Postdoc/Chen Lab	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	REU StudentMentor
Lida, Kei	Postdoc/Zhu	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Morgan, Robyn	SRA/Ma	Plant Pathology & Microbiology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Narvaez-Vasquez, Javier	Prof. Researcher/ Walling	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CEPCEB listed on Plant Cell paper
Pan, Songqin	Academic Coordinator	Center for Plant Cell Biology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Co-PI, NIH Instrumentation Proposal (Mass Spec);
Park, Gyungsoon	Asst. Specialist/Borkovich	Plant Pathology & Microbiology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	REU Mentor
Park, Sang-youll	Asst. Specialist/Cutler	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	



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Pierce, Marcela	Postdoc/Raikhel	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Ramachandran, Vanitha	Asst. Specialist/Chen	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rosado-Rey, Abel	Postdoc/Raikhel	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	REU Student Mentor
Shuilin, He	Visiting Professor/Eulgem	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sabbatical visit
Smith, Melissa	Grad Student/Walling	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	REU Mentor
Sohn, Eun-Ju	Postdoc/Raikhel	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Stevenson, R.	SRA	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surpin, Marci	Professional Researcher	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CEPCEB Noel Keen Lecture & Award Committee
Tsuchiya, Tokuji	Postdoc/Eulgem	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Yadav, Ram	Postdoc/Reddy	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	REU Mentor
Zhou, Huanbin	Postdoc/Ma	Plant Pathology & Microbiology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	REU Mentor
Zhu, Jianhua	Postdoc/Zhu Lab	Botany & Plant Sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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**PROFESSIONAL/TECHNICAL/RESEARCH STAFF [Note: this is not a complete list; dependent upon PI response]**

Name	Payroll Title	Faculty Mentor	Dept	Source of Funding
Agarwal, Pooja	Postdoc	Reddy, V G	Botany & Plant Sciences	SA
Ah Fong, Audrey	Specialist	Judelson, H	Plant Path & Micro	SA
Alfred, Simon	Jr. Specialist	Cutler, S	Botany & Plant Sciences	Campus Allocation
Andreeva, Kalina	Postdoc	Judelson, H.	Plant Path & Micro	SA
Assisi, Collins	Postdoc	Bazhenov, M.	Cell Biol & Neuroscience	SA
Barrera, Blanca	Postdoc	Zhu, JK	Botany & Plant Sciences	Gift/Endowment
Batelli, Giorgia	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift
Biswajit, Roy	Postdoc	Pirrung, M	Chemistry	SP
Broitman-Maduro, Gina	Assoc. Specialist	Maduro, M.	Biology	SA
Castro, Julian Pena	Postdoc	Bailey-Serres	Botany & Plant Sciences	SA
Chan, Zhulong	Postdoc	Zhu, JK	Botany & Plant Sciences	SA
Chellappan, Padmanabhan	Asst. Specialist	Jin, H	Plant Path & Micro	SA
Chen, Angel	Postdoc	Walling, L	Botany & Plant Sciences	Campus Allocation/SP
Chen, Jen-Yung	Postdoc	Bazhenov, M.	Cell Biol & Neuroscience	SA
Chen, Wei	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift/Endowment
Chia, Tyler	Lab Assistant (.5)	Springer, P.	Botany & Plant Sciences	SA
Chinnusamy, Viswanathan	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift/Endowment
Deng, XiangYang	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift/Endowment
Drakakaki, Georgia	Visiting Asst. Researcher	Raikhel, N	Botany & Plant Sciences	SP
Du, Dongliang	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift/Endowment
Fan, Zhaocheng	Jr Specialist	Jiang, T	Computer Sci & Eng	Campus Allocation/Gift
Fatmi, M. Qaiser	Postdoc	Chang, C-E.	Chemistry	SA
Filatov, Gregory	Project Scientist	Bazhenov, M	Cell Biology & Neuroscience	SA
Fujii, Hiroaki	Postdoc	Zhu, JK	Botany & Plant Sciences	SA
Fukao, Takeshi	Asst. Specialist	Bailey-Serres	Botany & Plant Sciences	SA
Gamboa-Melendez, Heber	Postdoc	Judelson, H.	Plant Path & Micro	SA
Gao, Zhihuan	Asst. Specialist	Ding, SW	Plant Path & Micro	SA
Gong, Yuehua	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	SA
He, Xinjian	Postdoc	Zhu, JK	Botany & Plant Sciences	SA
Hicks, Glenn	Associate Research Plant Cell Biologist	Raikhel, N	Botany & Plant Sciences	Campus Allocation/Sales & Service
Holzer, Frances	SRA	Walling, L	Botany & Plant Sciences	Campus Allocation
Hu, Yuanlei	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	SA
Huang, Xi	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift/Endowment
Idris, Ali	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift/Endowment
Illerita, Rodrigo	Jr. Specialist	Smith, H.	Botany & Plant Sciences	SA
Jablonska, Barbara	SRA	Springer, P	Botany & Plant Sciences	College RSAP and SA
Kang, Myungshim	Postdoc	Chang, C-E.	Chemistry	SA
Kanrar, Siddhartha	Asst. Specialist	Smith, H	Botany & Plant Sciences	SA
Klingler, John	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift/Endowment
Levchuk, Aleksandr	Programmer/Anlst	Girke, T	CEPCEP Bioinformatics	Campus Allocation/Sales & Service
Li, Liande	Postdoc	Borkovich, K	Plant Path & Micro	SP
Li, Shengben	Postdoc	Chen, X.	Botany & Plant Sciences	SA
Li, Wan-Xiang	SRA	Ding, SW	Plant Path & Micro	SP
Lida, Kei	Postdoc	Zhu, JK	Botany & Plant Sciences	SA
Madishetty, Kavitha	Postdoc	Judelson, H	Plant Path & Micro	SA
Mama, Yo	Asst. Specialist	Smith, H.	Botany & Plant Sciences	SA
Mandal, Jayati	Jr. Specialist	Cutler, S	Botany & Plant Sciences	SP/Campus Allocation
Mercedes Schroeder	Junior Specialist	Eulgem, T.	Botany & Plant Sciences	SA
Miki, Daisuke	Postdoc	Zhu, JK	Botany & Plant Sciences	Gift/Endowment
Morgan, Robyn	SRA	Ma, W	Plant Path & Micro	Campus Allocation
Morita, Chizuko	Postdoc	Yang, Z	Botany & Plant Sciences	SA
Mustroph, Angelika	Postdoc	Bailey-Serres	Botany & Plant Sciences	SP
Nagawa, Shingo	Postdoc	Yang, Z	Botany & Plant Sciences	SA
Nath, Suvadeep	Postdoc	Pirrung, M	Chemistry	SP
Oh, Jee Eun	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift/Endowment
Panda, Sanjib	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift/Endowment

Park, Gyungsoon	Specialist	Borkovich, K	Plant Path & Micro	SA
Park, Sang	Specialist	Cutler, S	Botany & Plant Sciences	SA/Campus Allocation
Park, Sang-Youl	Asst. Specialist	Cutler, S.	Botany & Plant Sciences	SA
Perales, Mariano	Postdoc	Reddy, V G	Botany & Plant Sciences	SA
Pickles, Neal	Postdoc	Nothnagel, E	Botany & Plant Sciences	Campus Allocation
Pierce, Marcela	Postdoc	Raikhel, N	Botany & Plant Sciences	SA
Ponts, Nadia	Postdoc	Le Roch, K.	Cell Biol & Neuroscience	SA
Prashanth, Giri	Postdoc	Bazhenov, M.	Cell Biol & Neuroscience	SA
Prudhomme, Jacques	SRA	Le Roch, K	Cell Biol & Neuroscience	SA
Qian, Weiqiang	Postdoc	Zhu, JK	Botany & Plant Sciences	SA
Ramachandram, Vanitharani	Asst. Specialist	Chen, X.	Botany & Plant Sciences	SA
Ren, Zhonghai	Postdoc	Zhu, JK	Botany & Plant Sciences	SP
Rosado-Rey, Abel	Postdoc	Raikhel, N	Botany & Plant Sciences	SA
Roy, Sourav	Postdoc	Judelson, H.	Plant Path & Micro	SA
Sohn, Eun-Ju	Visiting Asst. Researcher	Raikhel, N	Botany & Plant Sciences	SP
Song, Dandan	Jr Specialist	Jiang, T	Computer Sci & Eng	Campus Allocation/Gift
Stevenson, Rebecca	SRA	Zhu, JK	Botany & Plant Sciences	Campus Allocation
Surendra, Gadamsetty	Postdoc	Pirrung, M	Chemistry	SP
Surpin, Marci	Asst. Research Plant Cell Biologist	Raikhel, N	Botany & Plant Sciences	SA
Tsuchiya, Tokuji	Postdoc	Eulgem, T.	Botany & Plant Sciences	SA
Van de Ven, Wilhemina	SRA	Raikhel, N	Botany & Plant Sciences	Campus Allocation
Wang, Lei	Programmer	Girke, T	Engineering	Campus Allocation
Wang, Lei	Jr. Specialist	Cutler, S.	Botany & Plant Sciences	SA
Wang, Zhenyu	Postdoc	Zhu, JK	Botany & Plant Sciences	SA
Wei, Linda	Lab Assistant	Eulgem, T.	Botany & Plant Sciences	SA
Wu, Qingfa	Jr. Specialist	Ding, SW	Plant Path & Micro	SP
Xiang, Qijun	Postdoc	Judelson, H	Plant Path & Micro	SP
Xing, Yu	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift/Endowment
Xu, Xiamong	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift/Endowment
Yadav, Ram	Postdoc	Reddy, V B	Botany & Plant Sciences	SA
Yang, Yang	Jr Specialist	Jiang, T	Computer Sci & Eng	Campus Allocation/Gift
You, Na	Postdoc	Cui, X	Statistics	SA
Yu, Bin	Postdoc	Chen, X.	Botany & Plant Sciences	SP
Yue, Xiule	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift
Zarate, Sonia	Postdoc	Walling, L	Botany & Plant Sciences	Campus Allocation/SP
Zeng, Youling	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift
Zhan, Xiangqiang	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift
Zhang, Huijuan	Postdoc	Nothnagel, E	Botany & Plant Sciences	SP/Campus Allocation
Zhang, Na	Postdoc	Pan, S	Botany & Plant Sciences	Gift
Zhang, Shoudong	Visiting Postdoc	Zhu, JK	Botany & Plant Sciences	Gift
Zhang, Xiaoming	Postdoc	Jin, H	Plant Path & Micro	SP
Zhao, Haibing	Postdoc	Cui, X	Statistics	SP
Zhao, Hongwei	Postdoc	Jin, H	Plant Path & Micro	SP
Zhao, Jiayuan	Jr Specialist	Jiang, T	Computer Sci & Eng	Campus Allocation/Gift
Zhao, Yang	Visiting Postdoc	Yang, Z.	Botany & Plant Sciences	Gift
Zheng, Binglian	Postdoc	Chen, X.	Botany & Plant Sciences	SP
Zhou, H	SRA	Ma, W	Plant Path & Micro	SP

### OTHER ADMINISTRATIVE AND SUPPORT STAFF

For other administrative and support staff, please include Director along with other Center administrative support staff.

Name	Payroll Title	FTE	Source(s) of Funding
Natasha Raikhel	Director	0.00	Campus Allocation (Botany-100%)
Jocelyn Brimo	Analyst III	.96	Campus Allocation
Alex Levchuk	Programmer Analyst	1.00	Campus Allocation (42%); CEPCEB Bioinformatics Sales & Service Fund (58%)
Nick Rainsberry	Analyst II	0.34	Campus Allocation
Ronly Schlenk	Analyst I	.50	Sponsored Project (NSF ChemGen IGERT)

**GRADUATE STUDENTS [Note: this is not a complete list; dependent upon PI response]**

For Graduate Students, please indicate degree being pursued, program/department/institutional affiliation, and faculty mentor.

Name	Degree	Faculty Mentor	Dept/Program
Ai, Rizi	PhD	Chang, Chia-en	GGB
Alawode, Christopher	PhD	Bazhenov, M	Computer Science
Baig, Ayesha	PhD	Eulgem, T.	Plant Biology/IGERT
Barding, Greg	PhD	Larive, ./Bailey-Serres, J	Chemistry/IGERT
Bolden, Jenifer	PhD	Pirrung, M	Chemistry
Boucher, Craig	PhD	Jiang, T	Computer Science
Boyle, Sean	PhD	Lonardi, S/Pirrung, M	GGB/IGERT
Bozdog, Serdar	PhD	Lonardi, S	Computer Science
Brown, Michelle	PhD	Raikhel, N	GGB/IGERT
Cao, Yiqun	PhD	Girke, T/Jiang, T	Computer Science
Cervantes, Serena	PhD	Le Roch, K	Cell Biol & Neuroscience
Chen, Xin	PhD	Cui, X	Statistics
Chung, Doug	PhD	Le Roch, K	Cell Biol & Neuroscience
Defries, Andrew	PhD	Cutler, S	Plant Biology/IGERT
Diaz, Jessica	PhD	Smith, H	Plant Biology/IGERT
Diedrich, Jolene	PhD	Zhong, W	Analytical Chem/IGERT
Dinh, Theresa	PhD	Chen, X.	Plant Biology/IGERT
El-Assaad, Atfal	PhD	Jiang, T/Chang, C	Computer Science
Elkashef, Samer	PhD	Ding, SW	GGB/IGERT
Fan, Zhaocheng	PhD	Jiang, T	Computer Science / Tsinghua U
Feng, Jianxing	PhD	Jiang, T	Computer Science / Tsinghua U
Ferreira, Amanda	PhD	Springer, P	Plant Biology
Gao, Shang	PhD	Jin, H	Plant Pathology
Gasparyan, Hovik	PhD	Nugent, C.	CMDB
Harris, Elena	PhD	Lonardi, S	Computer Science
Horan, Kevin	PhD	Girke, T	Computer Science
Jamin, Augusta	PhD	Yang, Z	GGB
Jang, Charles	PhD	Bailey-Serres	GGB
Ji, Lijuan	PhD	Chen, X.	Plant Biology
Jiang, Shushu	PhD	Ma, W.	Plant Path & Micro
Junqueira, Ricardo	PhD	Smith, H	Plant Biology
Juntawong, Piyada	PhD	Bailey-Serres	GGB
Kaiser, Kayla	PhD	Bailey-Serres/Larive, C	Chemistry
Kim, Panya	PhD	Springer, P	Plant Biology
Kim, James	PhD	Larive, C/Borkovich, K	CMDB/IGERT
Kim, YunJu	PhD	Chen, X	Plant Biology
Knoth, Colleen	PhD	Eulgem, T	Plant Biology/IGERT
Koble, Robert	PhD	Springer/Yang/Raikhel/Eulgem	Plant Biology
Lal, Shruti	PhD	Smith, H	GGB
Lee, Seung Cho	PhD	Bailey-Serres	Plant Biology
Lehto, Elizabeth	PhD	Ma, W	Plant Pathology
Li, Wei	PhD	Jiang, T	Computer Science
Lii, Yifan	PhD	Ma, W/Jin, H	GGB
Lotfi, Sima	PhD	Jiang, T/Bazhenov, M	Computer Science
Luo, Yingjun	PhD	Ding, SW	Plant Pathology
Martinez, Sara	PhD	Borkovich, K	Plant Pathology
Massoud, Theresa	PhD	Pirrung, M	Chemistry
Michkov, Alexander	PhD	Borkovich, K	GGB
Niu, Xiaofan	PhD	Judelson, H	Plant Pathology
Ornusa Khamsuk	PhD	Yang, Z	Plant Biology
Owraghi, Melissa	PhD	Maduro, M	CMDB
Peng, Meng-Chih	PhD	Jiang, T	Computer Science
Pokhriyal, Neeti	PhD	Lonardi, S	Computer Science
Roy, Sourav	PhD	Judelson, H	Plant Pathology
Sain, Divya	PhD	Stajich, J	Computer Science
Salus, Melinda	PhD	Eulgem, T	Plant Biology/IGERT

Schacht, Patrick	PhD	Borkovich, K	GGB/IGERT
Shi, Guanqun	PhD	Jiang, T	Computer Science
Shi, Nigie	PhD	Cui, X	Statistics
Skorheim, Steven	PhD	Bazhenov, M	Computer Science
Small, Vanessa	PhD	Nugent, C.	CMDB
Smith, Melissa	PhD	Walling, L	Plant Biology
Song, Dandan	PhD	Jiang, T./Chen, X.	Computer Science/Tsinghua U
Sorensen, Reed	PhD	Bailey-Serres	Botany & Plant Sciences
Tataw, Moses	PhD	Reddy, V	Computer Science/IGERT
Wang, Bushi	PhD	Cui, X	Computer Science
Wang, Juan	PhD	Raikhel, N.	Chinese Univ of Hong Kong
Won, Susan	PhD	Borkovich, K	Plant Pathology
Wong, James	PhD	Ma, W.	Plant Pathology
Wright, Sara	PhD	Borkovich, K	Plant Pathology
Wu, Shang	PhD	Smith, Harley	Plant Biology
Xie, Mintang	PhD	Reddy, V	Plant Biology
Xu, Tongda	PhD	Yang, Z	Plant Biology
Yan, An	PhD	Yang, Z	Plant Biology
Yang, Yang	PhD	Jiang, T./Ma, W.	Computer Sci & Eng/ Shanghai Jiaotong U
Yiqun (Eddie) Cao	PhD	Jiang, T	Computer Science/IGERT
Yu, Lifeng	PhD	Springer, P	Plant Biology
Yumul, Rae	PhD	Chen, X.	Plant Biology/IGERT
Zhang, Zhanpan	PhD		
Zhao, Jiayuan	PhD	Jiang, T./Liu, J.	Genetics and Ecology, Fudan U
Zhao, Yuanyuan	PhD	Chen, X.	Plant Biology
Zhong, Jing	PhD	Ding, SW	CMDB
Zhou, Jaclyn	PhD	Walling, L./Walker, G.	CMDB
Zhou, Yi	PhD	Ding, SW	Plant Pathology
Zhu, Lei	PhD	Nothnagel, E.	Plant Biology
Zhuang, Xiaohong	PhD	Raikhel, N.	Chinese Univ. of Hong Kong

## UNDERGRADUATE STUDENTS

For Undergraduate Students, please indicate class level, major/department/institutional affiliation, and faculty mentor.

Name	Degree	Faculty Mentor	Dept/Program/Institute
Bhogal, Neil	BS	Nugent, C.	Biochemistry
Cheung, Jeffrey	BS	Springer, P	Biochemistry
Esfeld, Lizz		Chen, X.	Truman College
Garrett, Anna	BS	Nugent, C.	Biology/French
Hernandez, Wynter	BS	Nothnagel, E.	Biology
Hope, Bianca	BS	Raikhel, N.	Biological Sciences
Huerta, Apolonio	BS	Nothnagel, E.	Biochemistry
Johnson, Latasha	Undergrad	Raikhel, N	Botany & Plant Sciences
Kang, Da Young	BS	Raikhel, N.	Biological Sciences
Khong, Jerry	BS	Nothnagel, E.	Biological Sciences
Le, Nguyen	Undergrad	Raikhel, N	Botany & Plant Sciences
Liu, Tammy	BS	Chen, X.	CNAS
Mariscal, Cynthia	Undergrad	Raikhel, N	Botany & Plant Sciences
Mosavi, Arif	BS	Chen, X.	CNAS
Nguyen, Jacqueline	Undergrad	Raikhel, N	Botany & Plant Sciences
Nguyen, Kelsey	BS	Chen, X.	CNAS
Nguyen, Viet	BS	Nothnagel, E.	Biology
O'Leary, Michael	BS	Chen, X.	Botany & Plant Sciences
Park, Alex	BS	Eulgem, T.	Biological Sciences
Patel, Ankit	BS	Nugent, C	Biochemistry
Rogerson, Heather	BS	Maduro, M.	Biology
Shaibi, Derek	BS	Eulgem, T.	Biological Sciences
Stempke, Jenessa	BS	Walling, L	Botany & Plant Sciences
Thai, Lisa	BS	Nothnagel, E.	Biology
Vien, Kenneth	MS	Springer, P	Pre-business
Vuong, Tuyen	BS	Walling, L	Biochemistry
Witz, Jonathan	BS	Eulgem, T.	Biological Sciences

**ADVISORY COMMITTEE MEMBERS**

For Advisory Committee members, please indicate name, title, and affiliation. Below the table, list dates of meetings held for the period under review and attach a copy of the agenda for each meeting listed.

<i>Name</i>	<i>Title</i>	<i>Affiliation</i>	<i>Period of Service on Advisory Committee</i>

Advisory Committee Meetings

Date of Meeting 1: \_\_\_\_\_ (agenda attached)  
Date of Meeting 2: \_\_\_\_\_ (agenda attached)  
Date of Meeting 3: \_\_\_\_\_ (agenda attached)



## B.2: CENTER PUBLICATIONS

### AGRICULTURAL GENOMICS

- Dong CH, Zolman BK, Bartel B, Lee BH, **Stevenson B, Agarwal M, Zhu JK**. 2009. Disruption of Arabidopsis CHY1 reveals an important role of metabolic status in plant cold stress signaling. *Mol. Plant.* 2:59-72.
- Fukao, T and Bailey-Serres J** (2008) Submergence Tolerance Conferred by Sub1A is Mediated by SLR1 and SLRL1 Restriction of Gibberellin Responses in Rice. *Proc Natl Acad Sci* 105(43): 16814-6819.
- Fukao T, Harris T and Bailey-Serres J** (2008) Evolutionary Analysis of the *Sub1* Gene Cluster that Confers Submergence Tolerance to Domesticated Rice. *Annals of Botany* doi:10.1093/aob/mcn172.
- Bressan R, Bohnert H, Zhu JK**. 2009. Abiotic stress tolerance: from gene discovery in model organisms to crop improvement. *Mol. Plant.* 2:1-2.
- Ding X, Richter T, Chen M, Fujii H, Seo YS, Xie M, Zheng X, Kanrar S, **Stevenson RA**, Dardick C, Li Y, Jiang H, Zhang Y, Yu F, Bartley LE, Chern M, Bart R, **Chen X, Zhu L**, Farmerie WG, Gribskov M, **Zhu JK**, Fromm ME, Ronald PC, Song WY. 2009. A rice kinase-protein interaction map. *Plant Physiol.* 149:1478-1492.
- S.Bozdag, **T.Close, S.Lonardi**, "A Compartmentalized Approach to the Assembly of Physical Maps", *BMC Bioinformatics*, 10:217, 2009.
- S.Bozdag, **T.Close, S.Lonardi**, "Computing the Minimal Tiling Path from a Physical Map by Integer Linear Programming", *Proceedings of the Workshop on Algorithms in Bioinformatics (WABI'08)*, LNBI 5251, pp.148-161, Universitat Karlsruhe, Germany, 2008.
- Y.Wu, **T.J.Close, S.Lonardi**, "On the accurate construction of consensus genetic maps", *Proceedings of LSS Computational Systems Bioinformatics Conference (CSB'08)*, pp.285--296, Stanford, CA, 2008.
- Y.Wu, P.Bhat, **T.J.Close, S. Lonardi**, "Efficient and accurate construction of genetic linkage maps from the minimum spanning tree of a graph", *PLOS Genetics*, 4(10):e1000212, 2008.

### CHEMICAL GENOMICS

- Zou Y, **Rojas-Pierce M, Raikhel NV and Pirrung M** (2008). Preparation of Methyl Ester Precursors of Biologically Active Agents. *Bio Techniques* 44(3): 377-384.
- Norambuena L, Zouhar J, Hicks GR and Raikhel NV** (2008) Identification of cellular pathways affected by Sortin2, a synthetic compound that affects protein targeting to the vacuole in *Saccharomyces cerevisiae*. *BMC Chemical Biology* 8:1, doi:10.1186/1472-6769-8-1, ISSN: 1472-6769, <http://www.biomedcentral.com/1472-6769/8/1>.
- Robert S, Chary SN, Drakakaki G, Yang Z, Raikhel NV & Hicks GR** (2008) The Brassinosteroid Receptor BRI1 and the Auxin Transporters PIN2 and AUX1 are Sorted Via Specific Endosomes Essential for BRI1 Signaling. *Proc Natl Acad Sci USA* 105:8464-8469.
- Sang-Youl Park**, Pauline Fung, Noriyuki Nishimura, Davin R. Jensen, Hiroaki Fujii, Yang Zhao, Shelley Lumba, Julia Santiago, Americo Rodrigues, Tsz-fung F. Chow, Simon E. Alfred, Dario Bonetta, Ruth Finkelstein, Nicholas J. Provart, Darrell Desveaux, Pedro L. Rodriguez, Peter McCourt, **Jian-Kang Zhu**, Julian I. Schroeder, Brian F. Volkman, and **Sean R. Cutler** (2009) Abscisic Acid Inhibits Type 2C Protein Phosphatases via the PYR/PYL Family of START Proteins. *Science*. 324(5930):1068-71.  
UCR's press release dated April 30, 2009

### COMPUTATIONAL BIOLOGY

- V.Vacic, **H.Jin, J.-K.Zhu, S.Lonardi**, "A probabilistic method small RNA flowgram matching", *Proceedings of Pacific Symposium on Biocomputing (PSB'08)*, pp.75-86, Hawaii, 2008.
- Y.Wu, L.Liu, **T.Close, S.Lonardi**, "Deconvoluting BAC-gene relationships using a physical map", *Journal of Bioinformatics and Computational Biology*, vol.6, no.3, pp.603-622, 2008.
- E. Bolotin, H. Liao, T. Ta, C. Yang, W. Hwang-Verslues, J. Evans, **T. Jiang, and F. Sladek**. Integrated approach for identification of Human HNF4 target genes using protein binding microarrays. *Journal of Hepatology*, in press.
- Y. Yang, J. Zhao, R. Morgan, **W. Ma, and T. Jiang**. Computational prediction of type III secreted proteins from gram-negative bacteria. To appear in *BMC Bioinformatics*.
- D. Song, Y. Yang, B. Yu, B. Zheng, Z. Deng, B. Lu, **X. Chen, and T. Jiang**. Computational prediction of novel non-coding RNAs in *Arabidopsis thaliana*. *BMC Bioinformatics* 10 (Suppl 1):S36, 2009 (special issue for selected papers presented at the Seventh Asia-Pacific Bioinformatics Conference (APBC), Jan. 2009, Beijing).
- Y. Cao, **T. Jiang and T. Girke**. A maximum common substructure-based algorithm for searching and predicting drug-like compounds. *Bioinformatics*. 28(13): i366-i374, 2008; also presented at the 16th Annual International Conference on Intelligent Systems for Molecular Biology (ISMB), 2008, Toronto, Canada.

Y. Cao, A. Charasi, L.C. Cheng, **T. Jiang**, and **T. Girke**. ChemmineR: A compound mining framework for R. *Bioinformatics* 24(15):1733-1734, 2008.

## GENOME BIOLOGY

**Ponts, N.**, Harris, E.Y., Prudhomme, J., Wick, I., Eckhardt, C., **Hicks, G.R.**, Hardiman, G., **Lonardi, S.**, **Le Roch, K.** (2009) Binary Alterations of Chromatin Structure Control a Rigid Transcriptional Device in the Human Malaria Parasitem, (submitted) [Note: Results based on Illumina services]

V.Y. Small\*, C. Chuang\*, and **C.I. Nugent** (2008) Rad24 truncation, coupled with altered telomere structure, promotes cdc13-1 suppression in *S. cerevisiae*. *Cell Cycle* 7(21):3428-3439. \*These authors are listed as co-first authors.

H.J. Gasparyan, L. Xu, R.C. Petreaca, A.E. Rex, V.Y. Small, N.S. Bhogal, J.A. Julius, T.H. Warsi, **J. Bachant**, O.M. Aparicio, and **C.I. Nugent** (2009). The yeast telomere capping protein Stn1 overrides DNA replication control through the S phase checkpoint. *Proc Natl Acad Sci U S A*. 106(7):2206-11. Epub 2009 Jan 26. Accepted 12/18/08.

**Xianwu Zheng**, Olga Pontes, Jianhua Zhu, **Daisuke Miki**, **Fei Zhang**, **Wen-Xue Li**, **Kei lida**, **Avnish Kapoor**, Craig S. Pikaard, **Jian-Kang Zhu** (2008) ROS3 is an RNA-binding protein required for DNA demethylation in Arabidopsis. *Nature* 455: 1259-1262 .

## PLANT DISEASE RESISTANCE

**Knoth, C. & Eulgem, T.** (2008) The oomycete response gene LURP1 is required for defense against *Hyaloperonospora parasitica* in *Arabidopsis thaliana*. *The Plant Journal*, 55: 53-64

**Knoth, C., Salus, M.S., Girke, T., Eulgem, T.** 2009. The Synthetic Elicitor 3,5-Dichloroanthranilic Acid Induces NPR1-Dependent and NPR1-Independent Mechanisms of Disease Resistance in Arabidopsis. *Plant Physiology*. Vol. 150: p.333-347

## PLANT/INSECT ORGANISM INTERACTION

Fowler, J.H., Aromdee, D.N., Pautot, V., **Holzer, F.M.**, and Walling, **L.L.** (2009). Leucine aminopeptidase regulates defense and wound signaling downstream of jasmonic acid. *Plant Cell* 21, 1239-1251.

Walling, L.L. (2008). Avoiding effective defenses: Strategies employed by phloem-feeding insects. *Plant Physiol.* 146, 859-866.

Walling, L.L. (2009). Adaptive defense responses to pathogens and pests. *Adv. Bot. Res.* 51, 551-612.

## SIGNAL TRANSDUCTION

Polge, C., Jaquinod, M., **Holzer, F.M.**, Bourguignon, J., **Walling Linda, L.**, and Brouquisse, R. (2009). Evidence for the existence in *Arabidopsis thaliana* of the proteasome proteolytic pathway: activation in response to cadmium. *Journal of Biological Chemistry* , In press.

Evrard, A., Ndatimana, T., **Eulgem, T.** 2009. FORCA, a promoter element that responds to crosstalk between defense and light-signaling. *BMC Plant Biology*. Vol. 9: doi:10.1186/1471-2229-9-2

## SMALL RNAs

Lida K, **Jin H, Zhu JK.** 2009. Bioinformatics analysis suggests base modifications of tRNAs and miRNAs in *Arabidopsis thaliana*. *BMC Genomics* 10:155.

He XJ, Hsu YF, Pontes O, Zhu J, Lu J, Bressan RA, Pikaard C, Wang CS, **Zhu JK.** 2009. NRPD4, a protein related to the RPB4 subunit of RNA polymerase II, is a component of RNA polymerase IV and V and is required for RNA-directed DNA methylation. *Genes Dev.* 23:318-330.

He XJ, Hsu YF, Zhu S, Wierzbicki AT, Pontes O, Pikaard CS, Liu HL, Wang CS, **Jin H, Zhu JK.** 2009. An effector of RNA-directed DNA methylation in Arabidopsis is an ARGONAUTE 4-and RNA-binding protein. *Cell* 137:498-508.

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**B.3: DISTINGUISHED AWARDS RECEIVED OR HELD BY CENTER PARTICIPANTS**

Fiscal Year Period: 2007-08

Center Name: Center for Plant Cell Biology

Please list prestigious awards received or held by Center participants from professional organizations, industry, etc.

Recipient Name	Name of Award	Year Award Received
BAILEY-SERRES, JULIA Botany & Plant Sciences	USDA CSREES National Research Initiative (NRI) Discovery Award	2008
BAILEY-SERRES, JULIA <b>Botany &amp; Plant Sciences</b>	2009 World Technology Award (Nominee)	2009
LARIVE, CYNTHIA Chemistry	Recipient, 2008 Fellow, American Association for the Advancement of Science (AAAS)	2008
LYUBOVITSKY, JULIA Bioengineering Department	NSF CAREER Award	2009
NOTHNAGEL, EUGENE Botany & Plant Sciences	Recipient, 2008 Fellow, American Association for the Advancement of Science (AAAS)	2008
NOTHNAGEL, EUGENE Botany & Plant Sciences	UCR Academic Personnel Innovative Teaching Award UCR Academy of Distinguished Teachers	2008 2005-10
MIHRI OZKAN, Electrical Engineering	Article highlighted on cover of <i>The Bridge</i> , quarterly journal magazine published by the National Academy of Engineering (NAE) as the frontier engineering research in emerging nanoelectronic devices. Title: "Role of DNA in Nanoarchitectonics and Future Prospects"	2008
MIHRI OZKAN, Electrical Engineering	Recipient of the Young Investigator Medal of the Society of Engineering Science (SES)	2009
CENGIZ OZKAN, Mechanical Engineering	"	2008
SHARON WALKER Chemical & Environmental Engineering	Fulbright Fellowship to Ben Gurion University in Israel: Establishes an interdisciplinary research and educational collaboration leading to innovative approaches for management of water quality in Israel and US	2009
BAILEY-SERRES, Julia CHEN, Xuemei CUTLER, Sean ZHU, Jian-Kang	Four CEPCEB members presented plenary talks at the 20th International Conference on Arabidopsis Research (ICAR) in Edinburgh (6/30-7/1/09). This conference is one of the most important, highly valued and attended meetings in plant biology. CEPCEB is THE ONLY PLACE across the world that had four people presenting featured talks.	2009

Several CEPCEB members have received promotions and major advancements:

**Xinping Cui** was promoted to an Associate Professor with tenure,**Hailing Jin** was promoted to an Associate Professor with tenure,**Xuemei Chen** was promoted to a Full Professor,**Cynthia Larive** was promoted to Full Professor, Step 6**Shizhong Xu** was promoted to Professor, Step 5

Center for Plant Cell Biology  
FY 2008-09

**B.4: EVENTS SPONSORED BY CENTER**

Fiscal Year Period: 2008-09

Center Name: Center for Plant Cell Biology

Please list events sponsored by Center during the period under review.

<b>Title of Event</b>	<b>Type of Event</b>	<b>Date of Event</b>	<b>Number of Attendees</b>	<b>Names of Featured Speakers</b>	<b>Title and Affiliation of Featured Speakers</b>
NSF CEPCEB ChemGen IGERT Fourth Annual Retreat	Faculty and Student Retreat	October 3-5, 2008	22	PETER MCCOURT	Professor, Dept. of Cell & Systems Biology, University of Toronto. Title: "A Role for Strigolactones in Arabidopsis: A New Plant Hormone"
NSF REU Summer Symposium	Student Symposium	August 22, 2008	~50	2008 REU Students (12)	Listed on p. 5
CEPCEB Noel T. Keen Annual Lecture and Award Ceremony	Award Ceremony	October 16, 2009	~70	JOSEPH ECKER	Professor, Plant Molecular and Cellular Biology Laboratory The Salk Institute for Biological Studies Title: "Sequencing Across the Genome/Phenome Divide"
CEPCEB Quarterly PI Luncheons	Seminar Luncheons	November 12, 2008  April 8, 2009  May 6, 2009 [CANCELLED]	~15	HOWARD JUDELSON  SEAN CUTLER  LINDA WALLING	Professor, Plant Pathology & Microbiology. Title: "Molecular Genetic and Bioinformatic Insights into the Developmental Regulation of Oomycete Spores and the Evolution of Plants, Animals, and Microbes"  Asst. Professor, Botany & Plant Sciences Title: "Sidestepping Functional Redundancy with Small Molecules"  Professor, Botany & Plant Sciences Title: "Know Your Enemy: Plant Perception of Insect Feeding"
CEPCEB General Meeting	General Meeting: Direction/Goals	April 8, 2009	26	Facilitator: N. Raikhel	Agenda: Attachment A
25 <sup>th</sup> Plant Biology Symposium	Scientific Symposium	January 29-31, 2008	112	See Attachment B	See Attachment B
Betty Lord Retirement Symposium	Scientific Symposium	June 26, 2009	50	Former Postdocs/Students (See Attachment C)	See Attachment C
CEPCEB Seminar Series	Seminars	Weekly	~25	See Attachment D	See Attachment D
IGERT Seminar Series	Seminars	8/yr	~25	See Attachment D	See Attachment D
GGB Seminar Series	Seminars	8/yr	~25	See Attachment D	See Attachment D

**B.5: SPACE UTILIZED BY CENTER**

Please provide explanations or descriptions as required. Changes to number of square feet, space configuration, or space use should be described.

Space Description	Square Feet
Meeting Space	298 (2018 Keen Hall)
Office Support	884*
Research	6518**
Special Use	
Miscellaneous	148
Total Assigned Space	7,848

\* Offices assigned to IIGB/CEPCEB

\*\* Core Instrumentation Facilities: Lab/Offices belonging to Genomics.

**B.6: SPONSORED FUNDING PROPOSALS AND AWARDS**

On the first table below, please list all current (new and continuing) awards for the fiscal year under review. This list should include only those projects where the intellectual content was a result of Center collaborations, not awards that were made possible simply because of the availability of Center facilities and/or equipment.

**Current Awards**

Proposal Title	PI	Co-PIs	Funding Agency	Period of Funding	Total Award	1 <sup>st</sup> year Award
REU Site: Research Experiences for Undergraduate Students in Plant Cell Biology	Patricia Springer	Julia Bailey-Serres	NSF	3/1/2005-2/28/2010	\$432,901	\$80,100
IGERT in Chemical Genomics: Forging Complementation at the Interface	Julia Bailey-Serres	Michael Pirrung; Tao Jiang; Natasha Raikhel; Jerome Schultz	NSF	9/1/2005-8/31/2010	\$2,900,553	\$222,786
NSF 2010: Chemical Genomics of Vesicular Trafficking	Zhenbiao Yang	David Carter, Thomas Girke, Natasha Raikhel	NSF	9/1/2005-8/31/2008	\$999,999	\$999,999
Dissection of regulatory networks controlling plant defense gene expression by chemical genomics	Thomas Eulgem	Isgouhi Kaloshian	USDA	7/1/2008-6/30/2011	\$349,128	\$87,258

On the second table below, please list all pending and planned proposals in fiscal year under review and indicate the total amount of the request.

**Proposals Pending**

Proposal Title	PI	Co-PIs	Funding Agency	Period of Funding	Total Award Requested	Status
Interactome of ApoLs in Schizophrenia	Songqin Pan		NIH/Univ. Of New Mexico	10/1/2009-9/30/2011	\$210,000	Withdrawn
Chemical Genomics Discovery and Learning Center for Plant Cellular Networks	Natasha Raikhel	Linda Scott Hendrick; Glenn Hicks;	NSF	6/1/2010-5/31/2015	\$25,000,000	Denied
Arabidopsis 2010: Integrative Dissection of Cell Biological Mechanisms underlying Plant Morphogenesis	Glenn Hicks	Sean Cutler; Bir Bhanu; Natasha Raikhel	NSF	12/1/2009-11/30/2013	\$4,152,221	Pending



**B.7: NON-SPONSORED RESOURCES**

Fiscal Year Period: 206-07

Center Name: Center for Plant Cell Biology

<b>Sources of Funding</b>		<b>Amount</b>
	CNAS Staff funding	\$275,953
Funding Provided by UCR Institutional Sources		
	CNAS Operating Budget	\$9,136
Funding Provided by UC System Sources		
	CEPCEB Award Fund	\$19,960
Funding from Endowments or Gifts		
		\$305,049

## CEPCEB GENERAL MEETING

Batchelor Hall  
Wednesday, April 8, 2009  
1:00 – 2:00pm

### Agenda

- INTRODUCTION OF MEMBERS AND RESEARCH INTERESTS  
[Distribution of 2009 CEPCEB Member List]
  - Currently 54 members (incl. one honorary)
- GENOMICS BUILDING – L. Walling  
[Status, Estimated Move, Concept]
  - Estimated move: end of August/beginning of Sept 09; dependent upon anticipated bond funding in April 09
  - full budget to be restored to building project when funds released;
  - Coordination Committee proceeding with remaining items to ensure all orders ready to go when funds released
- BUDGET CUTS and IMPACT – L. Walling
  - No definite news; furloughs possible as UCR researches areas to cut without terminating employees
  - CNAS Dean dedicated to preserving research infrastructure
- CEPCEB PARTICIPATION/ROLES –N.Raikhel  
[Distribution of 2007-2009 IIGB/CEPCEB Participation Summary]
  - Following changes were made to participant roles:
    - **Hailing Jin:** replacing Xuemei Chen as chair of CEPCEB Seminar Committee (remaining members – Venu Reddy and Tao Jiang)
    - **Katherine Borkovich:** replacing Harley Smith as chair of CEPCEB Award Ceremony/Lecture and Science Fairs
- CEPCEB GRANTS/RENEWALS/OPPORTUNITIES – N. Raikhel  
REU Renewal (2010): PI – Howard Judelson  
IGERT Renewal (2010) PI – Katherine Borkovich  
NIH Equipment Grants (Illumina, Mass Spectrometer)  
Illumina PI: Glenn Hicks; Mass Spectrometer PI: Yinsheng Wang; co-PI Songqin Pan  
CEPCEB Designation on Proposals – encouraged for interdisciplinary proposals  
Remaining CEPCEB Stipend for International IGERT Student (\$15K) –possibility of funding additional new students in 2009-10
- KEEPING CEPCEB ON THE MAP  
[Groups, Luncheons, Ideas, Synergies, Collaborations, etc.]
  - Ideas encouraged; forward to N. Raikhel
- AWARDS – N. Raikhel  
[Active Nomination Process]
  - **Shou-wei Ding and Xuemei Chen:** replacing Anthony Huang as CEPCEB Award Nominators
- IMPORTANT DATES  
Elizabeth Lord Retirement Symposium/Lunch: June 26, 2009  
CEPCEB ChemGen IGERT Retreat: October 2-4, 2009, UCLA Lake Arrowhead Conference Center  
CEPCEB Award Ceremony/Lecture: October 16, 2009  
Genomics Building Estimated Move-in: Fall 2009  
Genomics Building Grand Opening: Spring 2010

## PROGRAM

### 25<sup>th</sup> Symposium in Plant Biology “The Evolution of Plant Development”

Organizers: Patricia Springer, Harley Smith, and Elena Kramer  
Riverside Convention Center, 3443 Orange Street, Riverside, CA 92501

January 29 – 31, 2009

#### Thursday, January 29, 2009

11:00 am – 5:00 pm      Registration

1:00 – 1:10 pm      Welcoming remarks  
**Patricia Springer and Natasha Raikhel, Director of Center for Plant Cell Biology and Institute for Integrative Genome Biology, University of California, Riverside**

#### Session I Comparative Genomics and Speciation

**CHAIR: Renyi Liu, Dept. of Botany and Plant Sciences, University of California, Riverside**

- 1:15 – 1:45 pm      **Claude dePamphilis**, Penn State University  
*Transcriptome- and genome-based inferences about the ancestral genetic toolkit in angiosperms*
- 1:45 – 2:15 pm      **Loren Rieseberg**, University of British Columbia  
*The role of hybridization in plant evolution*
- 2:15 – 2:45 pm      **Richard Clark**, University of Utah  
*Towards understanding the impact of natural variation on plant development*
- 2:45 – 3:00 pm      **Michael Zanis**, Purdue University (Poster #40)  
*Short Talk: Evolutionary processes shaping molecular diversity of morphogenesis genes in Zizania species (North American Wild rice)*
- 3:00 – 3:15 pm      **Hongzhi Kong**, State Key Laboratory of Systematic and Evolutionary Botany (Poster #18)  
*Short Talk: Genome-wide analysis of duplicated MADS-box and F-box genes: evidence for multiple mechanisms of duplication and diversification*
- 3:15 – 3:45 pm      BREAK
- 3:45 – 4:15 pm      **John Willis**, Duke University  
*Genetic basis of adaptation and speciation in Mimulus*
- 4:15 – 4:45 pm      **Cris Kuhlemeier**, University of Bern  
*Genetic dissection of pollination syndromes in Petunia*
- 4:45 – 5:15 pm      **Kirsten Bomblies**, Max Planck Institute for Developmental Biology  
*Autoimmunity as a recurrent by-product of genetic divergence of the plant immune system*
- 5:15 – 5:30 pm      **Tie Liu**, Stanford University (Poster #21)  
*Short Talk: Orthologues of Arabidopsis thaliana stomatal bHLH genes and regulation of stomatal development in grasses*
- 6:00 – 7:30 pm      RECEPTION
- 7:30 – 9:30 pm      Poster Session

**Friday, January 30, 2009**

9:00 – 10:00 am **Keynote Address**, Sponsored by the UCR Center for Plant Cell Biology  
**Antonia Monteiro**, Yale University  
*The evolutionary origin of novel, complex, and serially homologous structures: butterfly eyespots*

10:00 – 10:20 am BREAK

**Session II Leaves and Vascular Patterning**

**CHAIR: Darleen Demason, Dept. of Botany and Plant Sciences, University of California, Riverside**

10:20 – 10:50 am **Neelima Sinha**, University of California, Davis  
*The evolution of leaf complexity*

10:50 – 11:20 am **John Bowman**, Monash University  
*Tracing the evolution of patterning genes inland plants*

11:20 – 11:50 am **Jane Langdale**, Oxford University  
*Developmental transitions in the evolution of vegetative shoot form*

11:50am – 12:05pm **Ian Sussex**, Yale University (Poster #31)  
*Short talk: Architectural innovation and developmental controls in some mesozoic gymnosperms, or why do the leaf crowns in mesozoic forests look tufted?*

12:05 – 1:30 LUNCH

**Session III Evolution of Floral Form**

**CHAIR: Xuemei Chen, Dept. of Botany and Plant Sciences, University of California, Riverside**

1:30 – 2:00 pm **Vivian Irish**, Yale University  
*Petal development: variations on a theme*

2:00 – 2:30 pm **Elena Kramer**, Harvard University  
*Evolution of floral novelty in *Aquilegia**

2:30 – 3:00 pm **Günter Theissen**, Friedrich Schiller. University  
*Integrative evo-devo: from floral quartets to orchid lips*

3:00 – 3:15 pm **Madelaine Bartlett**, University of California, Berkeley (Poster #5)  
*Short talk: PISTILLATA and the evolution of floral morphology in the Zingiberales*

3:15 – 3:45 pm BREAK

3:45 – 4:15 pm **Sabine Zachgo**, University of Osnabrück  
*Shaping the beauty: the making of petals*

4:15 – 4:45 pm **Tom Gerats**, Radboud University Nijmegen  
*Conservation and diversification in floral developmental networks: what *Petunia hybrida* can teach us*

- 4:45 – 5:00 pm **Florian Jabbour**, University of Paris-Sud (Poster #17)  
*Short talk: Juggling with organ identities on an ontogenic spiral: developmental features and evolution of zygomorphy in the tribe Delphinieae (Ranunculaceae)*
- 5:00 – 5:15 pm **Paula Elomaa**, University of Helsinki (Poster #14)  
*Short talk: Characterization of Gerbera hybrida CYCLOIDEA-like gene family*
- 5:30 – 7:30 Dinner – on your own
- 7:30 – 9:30 pm Poster Session and Reception

## Saturday, January 31, 2009

### Session IV Inflorescence Architecture

**CHAIR: Harley Smith, Dept. of Botany and Plant Sciences, University of California, Riverside**

- 9:00 – 9:30 am **David Baum**, University of Wisconsin, Madison  
*Meristem identity genes and architectural evolution in Brassicaceae*
- 9:30 – 10:00 am **Elizabeth Kellogg**, University of Missouri, St. Louis  
*Streptochaeta and other grasses: building something new*
- 10:00 – 10:30 am **Ronald Koes**, Vrije University, Amsterdam  
*Same genes, different network, different inflorescences*
- 10:30 – 10:45 am **Teemu Teeri**, University of Helsinki (Poster #32)  
*Short talk: Functional analysis of SQUA-like genes in Gerbera hybrida shows involvement in floral induction but not in the floral homeotic A function*
- 10:45 – 11:15 am BREAK
- 11:15 – 11:45 am **Clint Whipple**, Cold Spring Harbor Laboratory  
*A conserved mechanism regulating bract suppression in the grasses*
- 11:45 am–12:15pm **Simon Malcomber**, California State University, Long Beach  
*Conservation and divergence of inflorescence branching genes in grasses and immediate relatives*
- 12:15 – 12:30 pm **Zachary Lippman**, Cold Spring Harbor Laboratory (Poster #19)  
*Short talk: The making of a compound inflorescence in tomato and related nightshades*
- 12:30 – 1:30 pm LUNCH

### Session V Ovules, Carpels, and Fruit Evolution

**CHAIR: Venu Reddy, Dept. of Botany and Plant Sciences, University of California, Riverside**

- 1:30 – 2:00 pm **Chuck Gasser**, University of California, Davis  
*Angiosperm ovule diversification*
- 2:00 – 2:30 pm **William Friedman**, University of Colorado  
*Modularity and the evo-devo basis of angiosperm reproduction*
- 2:30 – 3:00 pm **Esther van der Knapp**, Ohio State University, Wooster  
*Underlying mechanisms of tomato fruit morphology*
- 3:00 – 3:15 pm **Mily Ron**, University of California, Berkeley (Poster #27)  
*Short talk: Mis-regulation of a nat-siRNA pair in sperm cells results in single fertilizations*
- 3:15 – 3:45 pm BREAK

**Session VI      Early Land Plants****CHAIR: Elizabeth Lord, Dept. of Botany and Plant Sciences, University of California, Riverside**

- 3:45 – 4:15 pm      **Jody Banks**, Purdue University  
*The evolution of the sporophyte meristem*
- 4:15 – 4:45 pm      **Ralph Quatrano**, Washington University  
*Regulation of polar tip growth in the moss *Physcomitrella patens*: the role of the Arp2/3 & SCAR complexes*
- 4:45 – 5:15 pm      **Mitsuyasu Hasebe**, National Institute for Basic Biology, Okazaki, Japan  
*Polycomb genes regulate alteration of gametophyte to sporophyte pluripotent stem cells without fertilization*
- 5:15 – 5:30 pm      **Michael Prigge**, University of California, San Diego (Poster #25)  
*Short talk: The auxin-perception mechanism is conserved in diverse land plants*
- 5:30 – 5:45          **Hongchang Cui**, Duke University (Poster #10)  
*Short talk: Getting to the root of *SHORTROOT* and *SCARECROW* function*
- 7:00 pm              SYMPOSIUM BANQUET

**Elizabeth Lord's Retirement Symposium**  
**Friday, June 26<sup>th</sup>, 2009**

**Continental Breakfast – Science Library Room 240**

- 09:00 am            Opening Remarks by:  
                         Dallas Rabenstein - Executive Vice Chancellor and Provost  
                         Jodie Holt- Chair, Botany & Plant Sciences Department  
                         Natasha Raikhel- Director, IIGB and CEPCEB
- 09:30 am            Jean-Claude Mollet, Professor , Laboratory of Glycobiology , University of Rouen, France  
                         “Plant Cell Wall Polymers: from Basic to Applied Research”
- 10:00 am            Guang-Yuh Jauh, Associate Research Fellow, Institute of Plant and Microbial Biology, Academia Sinica, Taiwan  
                         “Dynamic Cellular Compartmentation and Actin Organization in the Elongating Lily Pollen tube”
- 10:30 am            Keun Chae, Postgraduate Researcher, Department of Botany and Plant Sciences, University of California, Riverside, CA  
                         “Roles of Lily Stigma/stylar Cysteine Rich Adhesin (SCA) and Arabidopsis Lipid Transfer Protein (LTP) in Plant Pollination/Fertilization”
- 11:00 am            Juan Dong, Postgraduate Researcher, Department of Biological Science, Stanford University, CA.  
                         “Control of Asymmetric Cell Divisions in the Arabidopsis Stomatal Lineage”

**Lunch Break- Botanic Gardens 12:30 -2:00 pm**

- 02:30 pm            Shundai-Li, Postgraduate Researcher, Department of Plant and Microbial Biology, University of California, Berkeley, CA.  
                         “Arabidopsis Transcription Factors Critical for Defense Against Powdery Mildew”
- 03:00 pm            Jeffrey Hill, Associate Professor, Department of Biological Sciences, Idaho State University, ID  
                         “Sugar, Sex and Ceratopteris”
- 03:30 pm            Cynthia Jones, Associate Professor, Department of Ecology and Evolutionary Biology, University of Connecticut, CT  
                         “Stem-Splitting and Beyond: Wood Density, Anatomy and Water Flow in Shrubs”
- 04:00 pm            Rebecca Sherry, Research Scientist, Department of Botany and Microbiology, University of Oklahoma, OK  
                         “Plant Community Dynamics with Warming Temperatures”

**Reception- Noel T. Keen Hall 5:00 pm**

**CEPCEB/IGERT/IIGB (2008-09)**

**Location:** Science Library, Room 240; \*1104 Batchelor Hall

**Time:** 12:10 pm Every Friday

**CDVR (2008-09)**

**Location:** Science Library, Room 240

**Time:** 12:10pm Every Thursday

**GGB (2008-09)**

**Location:** Science Library, Room 240, \*1104 Batchelor Hall

**Time:** 12:10 pm Fridays

DATE	SPEAKER	TITLE	HOST
<b>July '08</b>			
(Friday)	4	Holiday	
(Friday) <b>**Internal Speakers</b>	11	<b>Kei Iida</b> Botany & Plant Sciences	<i>"Computational Analysis of Alternative mRNA splicing and small RNAs in Arabidopsis"</i> Jian-Kang Zhu
(Friday) <b>**Internal Speaker</b>	18	Rescheduled to August 08, 2008	
(Friday) <b>**Internal Speaker</b>	25	<b>Prasanna Bhat</b> Botany & Plant Sciences	<i>"A High Throughput Method to Assign Genes to Barley Chromosomes, Arms and BAC Clones"</i> Tim Close
<b>August '08</b>			
(Friday) <b>**Internal Speaker</b>	1	<b>Amanda Ferreira</b> - Thesis Botany and Plant Sciences	<i>"Functional Characterization of LOB-Domain Genes in Plant Development"</i> Patricia Springer
(Friday) <b>** Internal Speaker</b>	8	<b>Tongda Xu</b> Botany & Plant Sciences	<i>"Auxin Activates Cellular Interdigitation via a Novel Rho Gtpase-Dependent Cell Surface-based Signaling Pathway"</i> Zhenbiao Yang
(Friday) <b>**Internal Speaker</b>	15	<b>Julian Pena Castro</b> Botany & Plant Science	<i>"Functional characterization in Arabidopsis of rice transcription factors (SUB1) mediating submergence tolerance"</i> Julia Bailey-Serres
(Friday) <b>**Internal Speaker</b>	22	<b>REU Patty Springer</b>	TBA
(Friday) <b>**Internal Speakers</b>	29	<b>Takeshi Fukao</b> Botany & Plant Sciences	<i>"Waterproof Rice: Sub1A-dependent hormonal regulation confers submergence tolerance to rice"</i> Julia Bailey Serres
<b>Sept '08</b>			
(Friday)	5		
(Friday) <b>** Internal Speaker</b>	12	<b>Victor Rodgers</b> Department of Bioengineering	<i>'Crowded Proteins + Proton Pumping = Rapid Membrane Flux: A Theoretical Case for Venus Flytrap Behavior'</i> Victor Rodgers
(Friday) <b>**Internal Speaker</b>	19	<b>Vanitharani Ramachandran</b> Botany & Plant Sciences Department	<i>"Degradation of microRNAs by a family of exoribonucleases in Arabidopsis."</i> Xuemei Chen
(Friday)	26		
<b>Oct '08</b>			
<b>IGERT (Friday)</b>	3-5	<b>IGERT RETREAT</b>	
(Friday) <b>**Internal Speaker</b>	10	<b>Karine LeRoch</b> Assistant Professor Department of Cell Biology & Neuroscience University of California, Riverside	<i>"Mapping chromatin structure and nucleosome fluctuation by massive parallel sequencing: A genomic-based approach to understand the malaria parasite infection cycle"</i> Karine LeRoch



DATE	SPEAKER	TITLE	HOST
CEPCEB (Friday) <b>CANCELLED</b>	17 <b>Guri Giaever</b> Assistant Professor Dept of Pharmaceutical Sciences and Dept of Molecular Genetics University of Toronto	CANCELLED	Sean Cutler
(Friday)	24 <b>NO SEMINAR</b>		
Friday) <b>**Internal Speaker</b>	31 <b>Sean Cutler</b> Assistant Professor Dept of Botany and Plant Sciences University of California, Riverside	<i>"Abscisic acid inhibits type 2C protein phosphatases via PYR1, a START-family ABA receptor"</i>	Sean Cutler
<b>Nov '08</b>			
(Friday)	7		
IGERT (Friday)	14 <b>Nicholas Provart</b> University of Toronto	<i>Raising the BAR for Arabidopsis Research: Using Large-scale Data Sets for Hypothesis Generation</i>	Sean Cutler
(Friday)	21 <b>Antje Heese</b> Research Assistant Professor University of Missouri-Columbia Department of Biochemistry	<i>Vesicular trafficking in plant innate immunity</i>	Natasha Raikhel
	28		
<b>Dec '08</b>			
(Friday)	5 <b>Magnus Nordborg</b> Molecular & Computational Biology University of Southern California	Cancelled	Natasha Raikhel
IGERT (Friday)	12 <b>Jacqueline Shanks</b> Professor Iowa State University	<i>Phytochemical Engineering Combining Chemical Reaction Engineering with Plant Science</i>	<b>Cindy Larive Kayla Kaiser</b>
GGB <b>**Internal Speaker</b>	22 <b>Maxim Bazhenov</b> University of California, Riverside	<i>Role of extracellular potassium dynamics in cortical epileptogenesis</i>	Anand Ray
GGB (Tuesday) <b>** Internal Speaker</b>	26 <b>Francis Sladek</b> University of California, Riverside	<i>HNF-4 New Ways to look at an old nuclear receptor</i>	Joint with Biochemistry
<b>June '09</b>			
CEPCEB (Friday)	5 <b>Adrienne Roeder</b> California Institute of Technology, Pasadena	<i>Timing of cell division determines the relative cell size pattern in Arabidopsis</i>	Venu Reddy
IGERT	12 <b>Alan Saghatelian</b> Harvard University Chemistry Department	<i>"A Peptidomics Approach to Identify Peptidase Substrates"</i>	Sean Cutler
CEPCEB (Friday)	19 <b>Pankaj Dhonukshe</b> Biology Department Utrecht University	<i>Cell polarity in plants: linking single cell mechanics to multicellular patterning".</i>	Zhenbiao Yang
CEPCEB (Friday) <b>**Internal</b>	26 <b>Betty Lord Symposium -</b>	No Seminar	Natasha Raikhel

**LEGEND:**

**CEPCEB (BPSC 252) Seminars: Special Topics on Botany**

**IGERT Seminars**

**CDVR Seminars**

**IIGB Seminars**

**GGB Seminars**