1. What was accomplished in 2008-2009? Several goals were articulated in the previous report.

A. New Graduate Students in MCB Program
We continued to attract and elevate the profile of graduate students in computational and genome biology in the MCB Graduate Program. Six new students were admitted into the MCB PhD graduate program Fall 2008 and one transfer student was admitted for Spring 2009. Two students, Sanjuro Jogdeo and Henry Priest, were provided CGBI-funded GRA positions for 2008-2009. Both students have chosen CGBI faculty to be their major professor. Sanjuro Jogdeo’s major professor is James Carrington, and Henry Priest’s major professor is Todd Mockler.

B. Continue Renovation of MCB Curriculum
Substantial progress on continued MCB Graduate curriculum renovation, formation of new courses, and final instructional plans for the CGBI faculty to teach in the MCB Graduate Program was made.

a. MCB Curriculum Renovation Implementation. The MCB curriculum, including the changes that were implemented, is as follows:

<table>
<thead>
<tr>
<th>Summer 2008</th>
<th>Fall 2008</th>
<th>Winter 2009</th>
<th>Spring 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>*MCB511</td>
<td>*MCB555</td>
<td>*MCB556</td>
<td></td>
</tr>
<tr>
<td>Research Perspectives (3)</td>
<td>Genome Expression (4)</td>
<td>Cell &amp; Developmental Biology (4)</td>
<td></td>
</tr>
<tr>
<td>*MCB525</td>
<td>*MCB668</td>
<td>*MCB557</td>
<td></td>
</tr>
<tr>
<td>Techniques in Molecular &amp; Cellular Biology (3)</td>
<td>Bioinformatics &amp; Programming (2+2)</td>
<td>Scientific Skills &amp; Ethics (3)</td>
<td></td>
</tr>
<tr>
<td>*MCB554</td>
<td>*MCB605</td>
<td>*MCB605</td>
<td></td>
</tr>
<tr>
<td>Genome Structure, Organization &amp; Maintenance (4)</td>
<td>Reading &amp; Conference (1) (Journal Club)</td>
<td>Reading &amp; Conference (1) (Journal Club)</td>
<td></td>
</tr>
<tr>
<td>MCB605</td>
<td>*MCB610</td>
<td>*MCB610</td>
<td></td>
</tr>
<tr>
<td>Reading &amp; Conference (1) (Journal Club)</td>
<td>Internship (3)</td>
<td>Internship (3)</td>
<td></td>
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<tr>
<td>*MCB610</td>
<td>MCB599</td>
<td>MCB564</td>
<td></td>
</tr>
<tr>
<td>Internship (3)</td>
<td>ST: Assoc. Genetics &amp; Breeding (3)</td>
<td>Receptors &amp; Signal Transduction (3)</td>
<td></td>
</tr>
<tr>
<td>MCB620</td>
<td>MCB561</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNA Fingerprinting (1)</td>
<td>Molecular Basis of Plant Pathology (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCB621</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genetic Mapping (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCB 622</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mapping Quantitative Trait Loc. (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
* = MCB Core Curriculum courses

b. Changes to the MCB curriculum in 2008-2009:
   i. The course MCB557 Scientific Skills and Ethics was reactivated in Spring 2009 and will be offered alternate years.

c. CGBI Faculty Teaching in the MCB Graduate Program:
   i. M. Freitag – Co-teaches MCB 554 (Genome Structure, Organization and Maintenance); Instructor for MCB 511 (Research Perspectives), helped organize and presented at the Bioinformatics Symposium and Workshop.
   ii. T. Mockler - Co-teaches MCB555 (Genome Expression); Co-teaches MCB/MB668 (Bioinformatics and Programming), helped organize and presented at the Bioinformatics Symposium and Workshop.
   iii. J. Chang – Co-teaches MCB554 (Genome Structure, Organization and Maintenance), helped organize and presented at the Bioinformatics Symposium and Workshop.
   iv. D. Denver –Co-teaches MCB554 (Genome Structure, Organization and Maintenance), and MCB669 (Genome Evolution), and helped organize and presented at the Bioinformatics Symposium and Workshop. Also co-teaches the externally funded, year-long HHMI undergraduate lab course.
   vi. S. Giovannoni – Teaches MCB/MB668 (Bioinformatics and Programming) and MCB669 (Genome Evolution)

d. The CGBI faculty along with the MCB Director organized a highly successful Bioinformatics Symposium and Workshop held on June 17-18, 2009. Funding for the workshop was obtained through a Graduate School RFP with the goal of enhancing the graduate student experience at OSU, and with support from the CGRB. We had two outside speakers along with approximately 15 OSU faculty and graduate student speakers. The symposium and workshop had 135 participants, including undergraduate and graduate students, post-doctoral fellows and research staff, and faculty members from OSU, UO and industry. The workshop will be held each year in the foreseeable future.

C. Expansion of High-Throughput Sequencing (HTS) Facility and Computational Infrastructure
Several significant expansions to the CGRB HTS facility and computational infrastructure were realized during 2008-09, including a doubling of the space dedicated to the computational infrastructure, and a $100,000 renovation of wet-bench and computational infrastructure associated with the CGRB. This was funded by a BUC grant from the Research Office.

D. New Grant Funding
In addition to the BUC grant, a NIH Shared Instrumentation Grant proposal was submitted by CGBI and CGRB faculty to acquire a new high-throughput sequencing system. Most significantly, however, was the grant total currently held by the new CGBI faculty (Mockler, Freitag, Chang and Denver) rose to $9,000,000 in competitive funding. This is a 15% increase compared to the previous year, and a genuinely impress accomplishment for these assistant professors.

E. Final Comments on the Achievements of CGBI Initiative
The goals stated in the original proposal, and achieved during the life of the CGBI, are as follows:

1. *Dramatically strengthening and reinvigorate interdisciplinary bioscience at OSU through development of a key, enabling area of science in which we are presently underrepresented.* The principal tool was the hiring of five young faculty in four departments, and the development of new core facilities for research in the CGRB. The latter include a successful High-Throughput Sequencing facility, and a heavily utilized Computational Facility. More information on the faculty and core facilities is available at two websites:

   - http://cgbi.cgrb.oregonstate.edu/ (CGBI site)
   - http://corelabs.cgrb.oregonstate.edu/ (CGRB Core Facilities site)

   The current CVs for each of the CGBI faculty are attached.

2. *Significantly increase external grant funding and fundraising potential in computational and genome biology.* Given the priority that major funding agencies now place on computational and genome-enabled science, we projected a goal of $1,800,000/yr in grant funding to new CGBI faculty after year 5. We exceeded this goal, as 2008-2009 external (competitive) total grant value reached ~$9,000,000. This averages to approximately $2,500,000 in annual grant value to the CGBI faculty, a remarkable achievement in the current funding climate. What these numbers do not show, however, is the collateral impact these faculty have had on other faculty programs, resulting in a "rising tide" effect for computational and genome biology across campus.

3. *Increase the quantity of critical courses and quality of education in computational and genome biology.* We proposed to broaden the impact and relevance of the MCB program to non-MCB students, enforce an interdisciplinary view of molecular bioscience, and prepare students with the skills necessary to function as modern bioscientists in both the public and private sectors. The MCB Ph.D. curriculum was dramatically revised to de-emphasize reductionist science and promote system-wide science that employs computation and other integrative approaches. As detailed above and in prior reports, each core course was revamped with new content and name changes, several new courses, including MCB/MB668 (Bioinformatics and Programming) and MCB669 (Genome Evolution), were developed, and core course requirements for MCB Ph.D. students were revised. Ten new Ph.D. students with research interest in computational and genome biology were recruited with CGBI Fellowships. Additionally, funding (Howard Hughes Medical Institute) for a new undergraduate course in molecular and genomic methods was developed and taught in 2008-2009, and a highly successful Bioinformatics Workshop with over 100 registrants was held in summer, 2009.

In summary, the CGBI leveraged a $1.5 million investment from the Provost's Initiative fund to significantly affect the molecular biosciences research and education community at OSU. It has been an honor to guide this initiative, and as always, support from the Provost, Deans, Chairs and VP Research has been greatly appreciated.
F. CGBI Budget Year 5

Cumulative revenues & resources

<table>
<thead>
<tr>
<th></th>
<th>Provost fund (RDR313)</th>
<th>CGRB Wakeham (RDR302)</th>
<th>CGRB (RDR072)</th>
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<tbody>
<tr>
<td>FY08-09 initiative</td>
<td>300,000</td>
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<tr>
<td>Carryover from Prior</td>
<td>165,218</td>
<td>109,464</td>
<td>108,674</td>
</tr>
<tr>
<td>year</td>
<td></td>
<td></td>
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<tr>
<td>Revenues &amp; resources</td>
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<tr>
<td>total:</td>
<td>465,218</td>
<td>109,464</td>
<td>108,674</td>
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Expenditures

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<td>Salary + OPE</td>
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<td>0</td>
<td>28,226</td>
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<td>Equipment upgrade</td>
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<td></td>
<td></td>
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<td>261,725</td>
<td>117,068</td>
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<td>144,657</td>
<td>109,464</td>
<td>546</td>
<td>0</td>
<td>108,918</td>
<td></td>
<td></td>
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<tr>
<td>Equipment upgrade (startup obligation)</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Other service &amp; supplies</td>
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<td></td>
<td></td>
<td></td>
<td>50</td>
<td>222</td>
<td></td>
<td></td>
<td>0</td>
<td>(96,816)</td>
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<td></td>
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<tr>
<td>Sub total:</td>
<td>465,218</td>
<td>389,323</td>
<td>0</td>
<td>75,895</td>
<td>109,464</td>
<td>546</td>
<td>0</td>
<td>108,918</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>GRA stipends</td>
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<td>36,798</td>
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<td>71,876</td>
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<tr>
<td>Total:</td>
<td>465,218</td>
<td>389,323</td>
<td>0</td>
<td>75,895</td>
<td>109,464</td>
<td>546</td>
<td>0</td>
<td>108,918</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Final Progress Report prepared by:

James C. Carrington
Director, Center for Genome Research and Biocomputing
CURRICULUM VITAE

JEFFREY H. CHANG

Department of Botany and Plant Pathology
Oregon State University
2082 Cordley Hall
Corvallis, OR 97331-2902
Phone: 541-737-5278
Fax: 541-737-3573
Email: jeff.chang@cgrb.oregonstate.edu

EDUCATION AND EMPLOYMENT

Education:

<table>
<thead>
<tr>
<th>Institution and location</th>
<th>Degree</th>
<th>Years</th>
<th>Field of Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of California, Davis</td>
<td>PhD</td>
<td>1999</td>
<td>Genetics</td>
</tr>
<tr>
<td>University of Minnesota, Minneapolis/St. Paul</td>
<td>B.S.</td>
<td>1993</td>
<td>Genetics and Cell Biology</td>
</tr>
</tbody>
</table>

Employment:

3/06- Assistant Professor, Department of Botany and Plant Pathology, Computational and Genome Biology Initiative, Oregon State University, Corvallis, OR

9/99-2/06 Postdoctoral Fellow, Department of Biology, University of North Carolina, Chapel Hill, NC (Research Director: Jeffery L. Dangl)

9/93-9/99 Graduate Research Assistant, Center for Engineering Plants for Resistance Against Pathogens (CEPRAP), University of California, Davis, CA (Research Director: Richard Michelmore)

1/91-8/93 Undergraduate Research Assistant and Laboratory Assistant, Department of Agronomy, University of Minnesota, St. Paul, MN (Research Director: David Somers)

TEACHING, ADVISING AND OTHER ASSIGNMENTS

1. Instructional Summary

<table>
<thead>
<tr>
<th>CRN</th>
<th>Term</th>
<th>Years</th>
<th># enrolled students</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI212</td>
<td>Winter 07-09</td>
<td>950~1000</td>
<td></td>
</tr>
<tr>
<td>MCB554</td>
<td>Fall 06-08</td>
<td>25~35</td>
<td></td>
</tr>
<tr>
<td>MCB637x</td>
<td>Spring 07</td>
<td>12</td>
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</tr>
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</table>

Guest lectures Credit courses

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<thead>
<tr>
<th>CRN</th>
<th>Term</th>
<th>Years</th>
<th># enrolled students</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI213</td>
<td>Spring 08 (4 lectures) -09 (2 lectures)</td>
<td>950~1000</td>
<td></td>
</tr>
<tr>
<td>BOT550</td>
<td>Fall 06-08</td>
<td>4~13</td>
<td></td>
</tr>
<tr>
<td>BOT651</td>
<td>Spring 06-07</td>
<td>~12</td>
<td></td>
</tr>
<tr>
<td>MCB511</td>
<td>Fall 06-07</td>
<td>~10</td>
<td></td>
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</table>

Non-credit courses

- Genomics, Bioinformatics, and Systems Biology Symposium and Workshop (June 17th – 18th, 2009): Program organizer and participant
- LifeScience Club – prepare for, apply to, and succeed in graduate school (Oct, 2008): Program participant
- Curriculum Development
  - Courses Developed: MCB637x (Spring 2007)
  - Curriculum committee service: BPP curriculum committee (April, 2008 – present)
  - OSU Professional Science Master’s Workshop – Bioinformatics PSM program (Dec, 2008)
  - MCB Graduate Program Workshop (Dec, 2006)
Graduate and Undergraduate Students and Postdoctoral Trainees:

<table>
<thead>
<tr>
<th>Advisee</th>
<th>Start Date</th>
<th>End Date</th>
<th>Degree conferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stout, Jamye</td>
<td>06/09</td>
<td>08/09</td>
<td>n/a</td>
</tr>
<tr>
<td>Smith, Alison</td>
<td>03/09</td>
<td>present</td>
<td></td>
</tr>
<tr>
<td>Lilley, Ryan</td>
<td>08/08</td>
<td>present</td>
<td></td>
</tr>
<tr>
<td>Pankow, Rebecca</td>
<td>03/08</td>
<td>present</td>
<td></td>
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<tr>
<td>Nielsen, Mike</td>
<td>05/07</td>
<td>05/08</td>
<td></td>
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<tr>
<td>Thireault, Caitlin</td>
<td>04/07</td>
<td>present</td>
<td></td>
</tr>
<tr>
<td>Chu, Ashley</td>
<td>04/06</td>
<td>09/06</td>
<td></td>
</tr>
<tr>
<td>*Sandberg, Eva</td>
<td>10/06</td>
<td>06/07</td>
<td></td>
</tr>
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</table>

Undergraduate students

Graduate Students (program; degree pursued)

<table>
<thead>
<tr>
<th>Thesis advisor to:</th>
<th>Program</th>
<th>Degree</th>
<th>Start Date</th>
<th>Present</th>
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<tbody>
<tr>
<td>Cumbie, Jason</td>
<td>MCB; PhD</td>
<td></td>
<td>Fall, 07</td>
<td>present</td>
</tr>
<tr>
<td>Thomas, William</td>
<td>MCB; PhD</td>
<td></td>
<td>Fall, 06</td>
<td>present</td>
</tr>
<tr>
<td>Kimbrel, Jeffrey</td>
<td>MCB; PhD</td>
<td></td>
<td>Fall, 06</td>
<td>present</td>
</tr>
</tbody>
</table>

Rotation Students (program)

| Cumbie, Jason      | MCB | Fall, 07 |
| Cuperus, Josh      | MCB | Spring, 07 |
| Hartney, Sierra    | BPP | Fall, 06 |
| Thomas, William    | MCB | Fall, 06 |

Graduate committee member (program)

| Whalen, Joe        | PSM | Fall, 08 | present |
| Carini, Paul       | Micro | Fall, 07 | present |
| Cuperus, Josh      | MCB | Fall, 07 | present |
| Gupta, Rashmi      | Micro | Fall, 07 | present |
| Smith, Daniel      | MCB | Fall, 06 | present |
| Sandoz, Kelsi      | MCB | Fall, 06 | present |
| Hartney, Sierra    | BPP | Fall, 06 | present |
| Wilder, Cara       | Micro | Fall, 06 | present |
| Montgomery, Taiowa | MCB | Aug, 08  |
| Sweat, Teresa      | MCB | March, 07 |

*co-advisor with Dr. Melodie Putnam and Dr. Jennifer Kraus

2. Student and Participant/Client Evaluation

BI212: Winter quarter*

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2008</th>
<th>2007</th>
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<tbody>
<tr>
<td># respondents^</td>
<td>775(83%)</td>
<td>693 (74%)</td>
<td>680 (75%)</td>
</tr>
<tr>
<td>Category* 1</td>
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<td>3.9</td>
</tr>
<tr>
<td>Category* 2</td>
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<td>Category* 5</td>
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<td>Category* 6</td>
<td>4.2</td>
<td>4.1</td>
<td>4.1</td>
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<td>Category* 7</td>
<td>3.9</td>
<td>3.8</td>
<td>3.8</td>
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<td>Category* 8</td>
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<td>Category* 11</td>
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<td>Category* 12</td>
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MCB554: Fall quarter

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<th>2007</th>
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<td>20 (83%)</td>
<td>11 (40%)</td>
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<td>5.3</td>
</tr>
<tr>
<td>Category* 2</td>
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<td>5.6</td>
</tr>
<tr>
<td>Category* 12</td>
<td>4.9</td>
<td>4.1</td>
<td>5.3</td>
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</tbody>
</table>

^Number of responding students (% enrolled students responding).
*Scores ranking is from Very Poor (1) to Excellent (6). Median score is presented.
*1 The course as a whole was; 2 The instructor’s contribution to the course was; 3 Clarity of course objectives or outcomes was; 4 Clarity of student responsibilities and requirements was; 5 Course organization was; 6 Availability of extra help when needed was; 7 Instructor’s use of various instructional techniques...was; 8 Instructor’s interest in my learning was; 9 Instructor’s ability to stimulate my thinking...was; 10 Instructor’s timely feedback to tests...was; 11 Instructor’s ability to develop a welcoming classroom environment...was; 12 Instructor’s evaluation of student performance...was.

SCHOLARSHIP AND CREATIVE ACTIVITY

1. Publications:
   Referred Journal Articles (16):
Manuscripts submitted:


*J. A. Kimbrel and J. H. Chang as co-authors

Manuscripts in preparation:


2. Invited presentations:

University of California, Davis; Department of Plant Pathology (Oct, 2007). Type III Effectors of Mutualistic Bacteria


Plant and Animal Genome Conference VIII; San Diego, CA (Jan, 2005). Identification and Comparison of Type III Effector Genes from *Pseudomonas syringae* pathovars.
Swiss Society of Microbiology, Lugano, Switzerland (March, 2004). Micro-organisms and integrated plant defenses.


Massachusetts General Hospital, Department of Molecular Biology Lecture Series, Harvard University; Harvard Massachusetts (Aug, 2002). A high-throughput, near saturating screen for identifying type III effector genes of \textit{Pseudomonas syringae} pathovars.

3. Research Grants

Current:

07/10/09-07/10/11
PI: Jeffrey H. Chang
Agency: ARF; Competitive Grants Program
Title: “Determining the transcriptome changes of pathogenic bacteria grown in plant-mimicking conditions”
Amount awarded: $12,500

02/15/08-02/15/12
PI: Jeffrey H. Chang
Agency: “Functional Genomics of Type III Effectors from Rhizobia and their Effects on Soybean Compatibility”
Amount awarded: $790,000

01/01/07-12/31/09
PI: Todd Mockler
Co-PIs: Todd Michael, Samuel Hazen, and Jeffrey H. Chang
Agency: JGI
Title: “Deep EST sequencing the transcriptome of the experimental model grass \textit{Brachypodium distachyon}”
Amount requested: NONE; Competitive grant proposal and JGI provides service in kind.

Expired:

09/01/07-08/31/08
PI: Jeffrey H. Chang
Agency: ARF; Competitive Grants Program
Title: “Sequencing the Genomes of 16 Plant-Beneficial Bacteria”
Amount awarded: $12,500

COMMUNITY CONTRIBUTION AND SERVICE

Community contribution
Assisted Johnson, Mills, and Arp research groups with microbial genome sequencing and analysis
Development of \textit{Brachypodium distachyon} as a model grass – empirical validation of gene models and annotation of defense genes.

Obtained RERF funding to upgrade flow cytometer in the Department of Microbiology.
Flow Cytometry facility: Helped cover cost of on-site training for the facility’s new MoFlo operator.
Contributed $40,000 towards the purchase of a Solexa 1G Genetic Analyzer.
Purchased three 2X Intel Xeon X5355 (Quad Core) RHEL 5 machines for the CGRB computing cluster.

1. University Service
Teaching and Learning Initiative Contributor – (June, 2009; College of Agricultural Sciences).
Search Committee – Assistant Professor of Environmental Microbiology (Spring, 2009; Dept. of Microbiology).
Search Committee – Plant Systems Biologists: Metabolic Engineering (Spring, 2008).
OSU Biobased Economy Symposium (April, 2007).
Bio-PUG (2007 – present); student-led programming club.
Co-developed the Host-Microbe Interactions and Molecular Pathogenesis (HMIP; 2006) and Genome Biology (2007) MCB tracks.
Developed CONNEX: services include advising and connecting undergraduate students to research opportunities (Jan, 2006-present; over 50 participants).

2. Service to the Profession:

Grant review panel:
- NSF; Prokaryotic Molecular and Cellular Biology

Grant reviews (Ad hoc reviewer):
- Pierce’s Disease Grant Management
- NSF
- BARD (Israel Binational Agricultural Research and Development Fund)
- USDA

Journal reviews (Ad hoc reviewer):
- BMC Genomics
- BMC Microbiology
- Cellular Microbiology
- Current Biology
- Environmental Microbiology
- Molecular Plant Pathology
- MPMI
- PLoS Biology
- PLoS ONE
- PLoS Pathogens
- PNAS
- The Plant Journal
- The Plant Cell

AWARDS

National and International Awards
- NRSA Postdoctoral Fellowship, 2001

University and Community Awards:
- Finalist for College of Science’s Lloyd Carter Award for Outstanding & Inspirational Teaching (Graduate teaching), 2008
- Jastro-Shields Research Scholarship, 1998
- Jastro-Shields Research Scholarship, 1997
- Graduated cum laude with B.S., 1993
CURRICULUM VITAE

DEE DENVER

Department of Zoology
Center for Genome Research and Biocomputing
Oregon State University
3029 Cordley Hall
Corvallis, OR 97331-7303 USA
Phone: 541-737-3698
Fax: 541-737-0501
Email: denver@cgrb.oregonstate.edu
Denver Lab website: http://denverlab.cgrb.oregonstate.edu/

ACADEMIC APPOINTMENTS
2006-present  Assistant Professor, Department of Zoology and Center for Genome Research and Biocomputing, Oregon State University, Corvallis, OR USA
2005-2006  Visiting Lecturer, Institute of Molecular Biosciences, Massey University, Auckland, New Zealand

EDUCATION AND PROFESSIONAL PREPARATION
2005  Allan Wilson Centre Postdoctoral fellow, Massey University, Auckland, New Zealand. Advisor: David M. Lambert
2002-2005 NIH NRSA Postdoctoral Fellow, Indiana University, Bloomington, IN, USA. Advisor: Michael Lynch
2002  Ph.D., Molecular Biology and Biochemistry, University of Missouri-Kansas City, Kansas City, MO USA. Advisor: W. Kelley Thomas
1996  B.S., Biological Sciences, University of Missouri-Columbia, Columbia, MO USA

RESEARCH GRANT SUPPORT
Active
2009-2010 OHSU Medical Research Foundation. PI. Genome-wide analysis of the oxidative stress-induced mutation spectrum. Total and Denver portion = $30,000.

Pending
2009-2014 NIH R01 GM087678-01A2. PI. Mutational and evolutionary consequences of mitochondrial dysfunction. Total = $1,805,361. [Note: JIT requested, Council Sep 11-12, 2009]
AWARDS AND HONORS

2009 University of Missouri-Kansas City Alumni Achievement Award.
2007-present C. elegans mutation rates featured in widely used undergraduate textbooks, e.g.:

2007 Featured as a “Scientist to Watch” by The Scientist magazine.

2006-present Associate Investigator, Allan Wilson Centre for Molecular Ecology and Evolution, Massey University, Auckland, New Zealand.

2005 Postdoctoral Panelist for NIH Open Access Meeting (one of two outstanding NIH NRSA postdoctoral fellows selected).


2000 Outstanding Presentation in Biological Sciences Award. Midwest Regional AAAS Meeting, Omaha, Nebraska.

DENVER LAB SCIENTISTS AND STUDENTS

Postdoctoral Fellows
Peter C. Dolan, 2007-2009
Leslie A. Dyal, 2006-2007

Research Associates
Dana K. Howe, Laboratory Manager & Scientist, 2006-present
Larry J. Wilhelm, Bioinformaticist, 2007-present

Graduate Students
Michael Raboin, 3rd Year MCB PhD student, 2008-present
Bobby Babra, 2007-2009

1st Year MCB rotation students supervised
Sanjuro Jogdeo, Fall 2008
Jason Cumbie, Winter 2008
Michael Raboin, Fall 2007
Bobby Babra, Spring 2007

Undergraduate Students
Caroline Hilburn, 4th Year Biochem./Biophys. major, 2006-present
Danika Kusuma, 2nd Year Biology major, 2008-present
Robin Leung, 3rd Year Mathematics major, 2008-present
Edward Piper, 4th Year Engineering and Japanese double major, 2007-2008
Stephanie Weitz, 4th Year Biology major, 2006-2008
Ashley Timko, B.S. Biology 2008, 2007-2008, now a technician with American Red Cross
Samantha C. Lewis, B.S. Zoology 2008, now a 2nd Year Ph.D. student at UC-Riverside

CURRICULUM ADVANCEMENT AND TEACHING

Curriculum Advancement

2008-2009 Developed a new Genomics Research lab section for the BI211-213 series where students will participate in the HHMI National Genome Research Initiative – a phage genome will be sequenced and analyzed by a lab section of 12-15 undergraduates.

2006-2007 Wrote and administered OSU Category II proposal for new MCB program graduate course (MCB669: Genome Evolution). Received approval in June, 2007 – instructed for the first time in Spring 2008.
Teaching

Oregon State University

Fall-Spring 2008/9  Course Coordinator and Instructor: BI211-213 Genomics Research Laboratory (HHMI National Genome Research Initiative program)

Spring 2007  Course Coordinator and Instructor: MCB 669 Genome Evolution (graduate).

Fall 2007-2008  Instructor: MCB 554 Genome Structure and Maintenance (graduate).

Fall 2007-2008  Single lectures for MCB525 Techniques in Molecular and Cellular Biology (graduate).

Fall 2006-2008  Single lectures for MCB511 Research Perspectives in Molecular and Cellular Biology (graduate).

Fall 2006  Course Coordinator and Instructor: BI 445/545 Evolution (undergraduate/graduate).

Prior to OSU

2005  Course Coordinator and Instructor (Massey U.): Genomes, Genetic Analysis & Bioinformatics (undergraduate)

2003-2004  Assistant Lecturer (IU): Evolution (undergraduate), Evolution of Genes and Genomes (graduate)

1997-2000  Laboratory Teaching Assistant (UMKC): General Biology I, General Biology II, Introductory Microbiology (all undergraduate)

Scientific Service

Oregon State University

2009-present  CGRB Seminar Committee

2008-present  CGRB Scientific Advisory Board

2007-present  College of Science advisor for Pre-Veterinary Medicine majors

2007-present  Dept. Zoology Curriculum Subcommittee

2006-present  PhD student committees: Kaitlin Bonner (Zoology); Matthew Parks (Bot. Plant Pathology); Christine Schnitzler (Zoology); Daniel Smith (MCB); Josef Uyeda (Zoology); Larry Wilhelm (Microbiology)

2009  Co-Organizer for MCB Genomics, Bioinformatics and Systems Biology Symposium and Workshop

2009  faculty reviewer for OSU Oregon Sports Lottery scholarship candidates

2007  Dept. Zoology Graduate Review Subcommittee

2007  Dept. Zoology Graduate Admission Subcommittee

External

2007  Undergraduate mentor for the Undergraduate Diversity Mentoring Program at the 2007 Society for Molecular Biology and Evolution Meeting in Halifax, Canada.

2006-present  External research grant reviewer for NSF, USDA, BARD (Israel) and Horizon (Netherlands).

2002-present  Manuscript referee for BMC Evolutionary Biology, Genetics, Genome Biology and Evolution, Genome Research, Journal of Invertebrate Pathology, Molecular Biology and Evolution, Molecular Phylogenetics and Evolution, Nature Methods, PLoS Genetics, Science, Trends in Genetics, Wormbook.

1999-present  Member: Society of Nematologists, Society for the Study of Evolution, American Association for the Advancement of Science, Genetics Society of America, Society for Molecular Biology and Evolution.


1999-2002  Guest Speaker, Antioch Middle School, North Kansas City, MO and Olathe High School South, Olathe, KS.
INVITED SEMINARS

2009  University of Missouri-Kansas City, School of Biological Sciences seminar series.
2009  University of Florida, Department of Zoology seminar series.
2009  University of Oregon, Center for Ecology and Evolutionary Biology seminar series.
2008  Windsor University (Canada), GLIER seminar series.
2007  Portland State University, Department of Biology seminar series.
2005  Massey University, College of Sciences seminar series.
2004  Georgia Institute of Technology, School of Biology seminar series.
2002  Missouri Western State College, Department of Biology seminar series.

SCIENTIFIC MEETING PRESENTATIONS

2003  14th International C. elegans Meeting, Los Angeles, California. Poster.
2003  Society for Molecular Biology and Evolution Meeting, Newport Beach, California. Oral presentation.
2000  Midwest Regional AAAS Meeting, Omaha, Nebraska. Oral presentation.

PEER-REVIEWED PUBLICATIONS

In Review or Revision

Published or In Press

Published as a result of OSU research


*Published as a result of work prior to OSU*


**PUBLICATIONS NOT PEER-REVIEWED**

CURRICULUM VITAE

MICHEAL FREITAG

Department of Biochemistry and Biophysics
Center for Genome Research and Biocomputing
Oregon State University
2011 ALS Building
Corvallis, OR 97331-7305
Phone: 541-737-4845
Fax: 541-737-0481
http://www.cgrb.oregonstate.edu/faculty/freitag
http://oregonstate.edu/dept/biochem/faculty/freitag.html

RESEARCH OBJECTIVE
To understand how gene silencing mechanisms shape the genomes and epigenomes of eukaryotes.
Current research topics include: (1) Assembly, maintenance and evolution of centromeres in filamentous fungi; (2) connections between heterochromatin, cell division and circadian clocks; and (3) control and function repeat-induced point mutation (RIP).

EDUCATION AND AWARDS
Ph. D. Biochemistry and Molecular Biology 1996
Oregon Graduate Institute of Science & Technology, Portland, OR
2nd Annual Quantum Society Student Achievement Award, OGI Science & Technology (1995)
Best Oral Presentation, Mycological Society of America Annual Meeting and
Travel Award to MSA Annual Meeting, San Diego (1995)

M. S. Forest Products 1990
Oregon State University, Corvallis, OR
South Santiam Fellowship (1989)

Dipl. Forstwirt (B. S. Forestry) 1987
Georg-August-Universität, Göttingen, Germany
Competitive IAESTE travel grant to Turkey (Tree Genetics, 1984)
Competitive IAESTE travel grant to Australia (Silviculture, 1986)

PROFESSIONAL EXPERIENCE
Assistant Professor of Biochemistry and Biophysics 2006 - present
Department of Biochemistry and Biophysics
Center for Genome Research and Biocomputing
Oregon State University

Adjunct Investigator 2006 - present
Departamento de Microbiologia
Centro de Investigación Científica y Educación Superior de Ensenada (CICESE)
Ensenada, B.C. Norte, Mexico

CNRS Centre de Biologie et d’Ecologie Tropicale et Méditerranéenne
Université de Perpignan Via Domitia
Perpignan, France
**Postdoctoral Research Associate**
University of Oregon (Institute of Molecular Biology)
Mentor: Eric U. Selker
Research: DNA methylation, repeat-induced point mutation and heterochromatin formation
1996 - 2006

**Graduate Research Assistant (Ph.D.)**
Department of Biochemistry and Molecular Biology
Oregon Graduate Institute of Science & Technology
Advisor: Matthew S. Sachs
Research: Transcriptional and translational control of gene regulation
1990 - 1996

**Graduate Research Assistant (M.S.)**
Oregon State University (Dept. Forest Products)
Advisor: Jeffrey J. Morrell; Research: Biological control of wood-destroying fungi
Forest engineer
1987 - 1990

**Research Assistant**
Universität Göttingen (College of Forestry – Quantitative Silviculture)
Advisor: Horst Kramer
Research: Silviculture field trials, data management.
1984 - 1986

**Research Assistant (Diplomarbeit)**
Universität Göttingen (College of Forestry - Technical Mycology)
Advisor: Aloys Hüttermann
Research: Extracellular enzymes of ligninolytic basidiomycete fungi
1984 - 1986

**EXTRAMURAL FUNDING**

<table>
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<tr>
<th>Fund Source</th>
<th>Title</th>
<th>Dates</th>
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<tbody>
<tr>
<td>NIH subcontract from 1P01 GM068087 to Jay Dunlap ($44,000)</td>
<td>“Functional Analysis and Systems Biology of Filamentous Fungi”, ChIP-Seq of transcription factors</td>
<td>1 Sep 2009 – 31 Aug 2010</td>
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<td>Université de Perpignan Via Domitia, (€ 4,500/$6,800)</td>
<td>Teaching epigenetics classes and summer research on epigenomics of <em>Schistosoma mansoni</em> (at the CNRS Centre de Biologie et d’Ecologie Tropicale et Méditerranéenne, Perpignan, France)</td>
<td>Aug-Sep 2009</td>
</tr>
<tr>
<td>DOE/USDA ($1,200,000) DE-FG02-08ER6466</td>
<td>“Epigenomics of Development in <em>Populus</em>” (with Stephen Strauss, OSU Forest Science, and Todd Mockler, OSU Botany and Plant Pathology)</td>
<td>1 Sep 2008 to 31 Aug 2010</td>
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<tr>
<td>American Cancer Society ($719,000) RSG-08-030-01-CCG</td>
<td>PI</td>
<td>1 Jan 2008 to 31 Dec 2011</td>
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<td>Medical Research Foundation of Oregon, Seed Grant ($30,000)</td>
<td>PI</td>
<td>1 Dec 2006 – 30 Nov 2007</td>
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**INTRAMURAL FUNDING**

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<tr>
<td>Post-doctoral fellowship: Individual National Research Service Award (National Institutes of Health)</td>
<td>&quot;Identification of signals for <em>de novo</em> methylation of DNA&quot;</td>
<td>1996 - 2000</td>
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</table>

**INTRAMURAL FUNDING**

OSU RERF equipment proposal, co-written with Drs. Michael Gross and Adrian Gombart ($15,000) 2009
(Purchase of a high-throughput Bioruptor cell disruption device for the Department of Biochemistry and Biophysics, housed in previous Freitag lab space, ALS2034)
OSU Graduate School Bioinformatics Workshop ($15,000) 2009
(with Barbara Taylor, Jeff Cheng, Dee Denver, Scott Givan, Todd Mockler)

FUNDING PENDING
USDA Co-PI (with Frances Trail, Michigan State University),
“Dissection of the Life Cycle Gene Network of a Plant Pathogenic Fungus” $1,000,000
NIH Co-PI (with Deborah Bell-Pedersen, Texas A&M University),
(competitive supplement to DBP 3R01 GM058529-10; score: 30) $389,000
“Molecular Genetic Analysis of Fungal Circadian Rhythms”
NIH Co-PI (with Jay Dunlap, Dartmouth Medical School),
(administrative supplement to JCD 2P01 GM068087; score: 20) $418,000
Functional Analysis and Systems Biology of Filamentous Fungi

FUNDING SOUGHT (BUT NOT AWARDED)
NIH (2008; Co-PI with Roderick Dashwood, OSU; “Epigenomics of metabolic syndrome”) $1,000,000
Australian Research Council (2008; Co-PI; “Recombination in Neurospora”)
NSF (2007; American Cancer Society grant for same topic “Assembly and Maintenance of Centromeres”) $389,000
HHMI Young Investigator competition (2008) $418,000
NSF IGERT (2007, 2008)

SERVICE
Service to scientific community
Neurospora Policy Committee (2008-2012)
Program Co-chair of international “Neurospora 2010” meeting in Asilomar, CA.
Symposium organizer for X. Fungal Biology Conference (6-10 Dec. 2009, Ensenada, Mexico)

Editorial:
Editorial Board of “Fungal Genetics Reports” (2006 - present)

<table>
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<td>2006</td>
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<td>2008</td>
<td>3 (PLoS), 3 (FGR)</td>
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<tr>
<td>2009</td>
<td>4 (PLoS), 2 (FGR) [July]</td>
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Ad-hoc reviews:
Applied and Environmental Microbiology
BMC Genomics
Eukaryotic Cell
Fungal Genetics and Biology
Genetics
Genome Biology
Journal of Genetics
Molecular Microbiology
Molecular Biology and Evolution
Mycologia
Nucleic Acids Research
Proceedings of the National Academy of Sciences
<table>
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<th>Year</th>
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<td>2006</td>
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<td>2007</td>
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<td>2008</td>
<td>14</td>
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<td>2009</td>
<td>6 (July)</td>
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</table>

Grant proposal review:
Ad hoc: Health Research Council of New Zealand (2009)

Consulting service:
Consultant (*pro bono*), LUX Biotechnology, Edinburgh, Scotland

External teaching:
Invited lectures: “Epigenetics and Epigenomics” (taped for online and classroom use)
Université de Perpignan Via Domitia

External Student Committees [year of defense]:
Diego Delgado (Microbiologia, CICESE, Dra. R. R. Mouriño-Pérez) [2009]
Rosa Ramirez Cota (Microbiologia, CICESE, Dra. R. R. Mouriño-Pérez) [2008]
Cheng Wu, PhD (EBS, OHSU OGI School of Science and Engineering, Dr. Matthew S. Sachs) [2006]
Silvia. L. Ramos-Garcia (Microbiologia, CICESE, Dra. R. R. Mouriño-Pérez) [2006]

**Service at OSU**
OSU Radiation Safety Committee
OSU Genomics, Bioinformatics and Systems Biology Symposium and Workshop 17-18 June 2009
Department of Biochemistry and Biophysics, Space Committee
Department of Biochemistry and Biophysics, Grad. Stud. Admissions Committee 2008 - present
OSU Professional Science Masters Annual Workshop, Bioinformatics Group 4-5 Dec. 2008
Department of Biochemistry and Biophysics, Curriculum Committee 2006 - present
Molecular and Cellular Biology Graduate Program, Curriculum Workshop 12-13 Dec. 2006

Graduate Student Committees [year of first meeting, preliminary exam]:
Ruoqing (Julia) Zhu (Forest Science, M.S. – Dr. Steven Strauss)
Angela Poole (MCB, Ph.D. – Dr. Virginia Weiss)
John Clarke (MCB, Ph.D. – Dr. Emily Ho) [2007, 2008]
Lindsey Shorey (EMT, Ph.D. – Dr. David Williams) [2007, 2008]
Megan Stewart (BB, Ph.D. – Dr. Joseph Beckman) [2007, 2008]
Xu Jun (BB, Ph. D. – Dr. Michael Gross) [2008]
Hillary Bevers (Microbiology, Ph. D. – Dr. Morrie Craig) [2007]
David Ly (Genetics, M.S. – Dr. Ling Jin [2007; graduated 2009])
Sangeet Lal (BB, Ph.D. – Dr. Jeffrey Greenwood) [2006, 2008]
Justin Hall (BB, Ph.D. – Dr. Elizar Barbar) [2006, 2008]
Hui Nian (BB, Ph.D. – Dr. Rod Dashwood) [2006, 2008]
Patricia Khuu (BB, Ph.D. – Dr. Pui-Shing Ho) [2007; graduated 2008]
Yao Yin (MCB, non-thesis M.S. – Dr. Steve Giovannoni) [graduated 2007]
Ann Ketter (MCB, non-thesis M.S. – Dr. John Fowler) [2006; graduated 2008]

Undergraduate Thesis Committees [year of exam]:
Georgi Mitev (Biochemistry, Honor College – PI Bruce Geller) [2009]

Committee work during Graduate Student training:
Oregon Graduate Institute of Science & Technology
Radiation Safety Committee (Student Member) 1992 - 1995
Student Council (President 1994) 1992 - 1995
Mentoring
Graduate students:
Joseph Whalen (MCB, M.S.), 2007-2009
(Joseph received a Supplemental Laurels Fellowship in Winter 2009)
Erin Bredeweg (MCB; Ph.D.) 2008-
Kyle Pomraning (MCB; Ph.D.) 2008-
Pallavi Phatale (BPP; Ph.D.) 2008-
Pallavi received a 2009 Anita Summers Graduate Student Travel Award (BPP, OSU), and poster awards from the Genetics Society of America and from the American Society of Microbiologists (25th Fungal Genetics Conference, Asilomar, CA)

Undergraduate students:
Kayly Lemke (Biochemistry, Scripps College, CA) – summer 2009 (transposons in Neurospora)
Greg Ekberg (Microbiology, OSU), 2008 – present (centromere proteins)
Miguel Williams, volunteer researcher (B.S.), 2008 (PCR on Fusarium spp., phylogenetics)
Eva Schoepf (Univ. Hohenheim, Germany), internship fall ’07 (Gibberella cytology, Neurospora RIP)
Hannah Wilson (Univ. Oregon, Eugene), summer research ’07 (Gibberella cytology, transformation)
Paul Donegan (Bioeng., OSU), HHMI/URISC, spring/summer ’07 (RIP, PCR / bisulfite sequencing)
Tilmann Schauwecker (Furtwangen Univ.) internship, fall-spring ’06/07 (mapping of RIP mutants)
Grant Farr (Chem., OSU) HHMI ’06, volunteer ’06/7 (Neurospora and Gibberella cytology)
Thomas Lew (Biol., Stanford Univ.) HHMI ’06 (Neurospora microtubule-binding proteins)
Colin Sexton (Chem. Engineering, OSU), summer workstudy and genetics projects, 2006-2007
Serita Holte (Psychology, OSU) workstudy student, media prep., genetics, DNA isolations, ’06-present

Graduate student rotations:
Henry Priest (MCB, OSU), winter ‘08/09 (Poplar epigenomics)
Samantha Waters (BB, OSU), winter ‘07/08 (Autonomous replicating plasmids in fungi)
Joseph Mendoza (BB, OSU), winter ‘06/07 (CenH3 from filamentous fungi)
Eric Smith (BB, OSU), fall ‘06 (Neurospora centromere assembly)

Postdoctoral Associates:
Kristina M. Smith, Ph.D. June 2007 to June 2009 Centromeric chromatin and light regulation
Kristina received the prestigious 2009 Perkins Award from the Neurospora community for her work on telomeric silencing, centromeric chromatin and light-inducible transcription factors

Sabbatical visitors and visiting scientists:
Meritxell Riquelme, CICESE, Ensenada, Mexico July - Aug. ’09 (Neurospora exocyst)
Jason Stajich, UC Riverside June ’09 (Sordaria genome)
Meritxell Riquelme, CICESE, Ensenada, Mexico March ’08 (Neurospora exocyst)
Céline Cousseau, Université de Perpignan, France Summer ’08 (Schistosoma epigenomics)
E. Blythe Nilson UBC Okanagan, Canada Sept. ’07 to June ’08 (Neurospora centromeres)
Gabriela Roca, University of Edinburgh, UK Sept. ’07 to Jan. ’08 (Neurospora mitosis)

Faculty Research Assistant:
Lanelle Connolly Dec. ’06 to present

Teaching
(scores: course as a whole/contribution of instructor; scale: 1 = very poor, 6 = excellent)

2009/10 (assignments)
Department of Biochemistry and Biophysics, BB492, Biochemistry Core Spring 2010
Department of Biochemistry and Biophysics, BB592, Biochemistry Core Spring 2010
Mol. Cell. Biology, MCB554, nine lectures on DNA, chromatin, epigenetics Fall 2009
Mol. Cell. Biology, MCB511, class coordinator Fall 2009
2008/09
Department of Biochemistry and Biophysics, BB492, Biochemistry Core
(team-taught with Dr. Victor Hsu) scores: / Spring 2009
Department of Biochemistry and Biophysics, BB592, Biochemistry Core
(team-taught with Dr. Victor Hsu) scores: / Spring 2009
Department of Biochemistry and Biophysics, BB651, Epigenetics
scores: / Winter 2009
Mol. Cell. Biology, MCB555, four lectures on translation Winter 2009
Mol. Cell. Biology, MCB554, seven lectures on DNA, chromatin, epigenetics Fall 2008
Mol. Cell. Biology, MCB511, class coordinator Fall 2008
Department of Biochemistry and Biophysics, BB507/607, Graduate Seminar Fall, Spring 2008/09
High-throughput sequencing interest group, twice monthly meetings Fall – Spring 2008/09
Epigenetics Journal Club, twice monthly meetings Spring – Fall 2009

2007/08
Department of Biochemistry and Biophysics, BB492, Biochemistry Core Spring 2008
(team-taught with Dr. Victor Hsu) scores: 3.9/4.3
Department of Biochemistry and Biophysics, BB592, Biochemistry Core Spring 2008
(team-taught with Dr. Victor Hsu) scores: 5.8/5.9
Department of Biochemistry and Biophysics, BB507/607, Graduate Seminar academic year 2007/8
CICESE, Ensenada, Baja California Norte, Mexico, Neurospora Genetics Workshop Nov., 2007
Mol. Cell. Biology, MCB555, four lectures on translation Winter 2007
Mol. Cell. Biology, MCB554, seven lectures on DNA, chromatin, epigenetics Fall 2007
Mol. Cell. Biology, MCB511, class coordinator Fall 2007

2006/07
Department of Biochemistry and Biophysics, BB492, Majors Biochemistry Spring 2007
(team-taught with Dr. Victor Hsu) scores: 3.6/3.9
Department of Biochemistry and Biophysics, BB592, Graduate Students Biochemistry Spring 2007
(team-taught with Dr. Victor Hsu) scores: 4.0/4.3
Department of Biochemistry and Biophysics, BB507/607, Graduate Seminar academic year 2006/7
CICESE, Ensenada, Baja California Norte, Mexico, Neurospora Genetics Workshop Dec. 6-8, 2006
Mol. Cell. Biology, MCB555, Guest lecture Fall 2006

Before 2006:
Lectures on chromatin remodeling and gene silencing 2002 - 2005
University of Oregon (Dept. of Biology, Dr. Eric U. Selker)
Lectures on genetics and molecular biology of fungi 1994
Oregon State University (Dept. of Botany and Plant Pathology, Dr. Nancy Weber)
Seminar classes 1990 – 1995
Oregon Graduate Institute of Science & Technology
Teaching Assistant 1986 – 1987
Universität Göttingen (College of Forestry – Quantitative Silviculture)

INVITED PRESENTATIONS (SINCE 2003)
Université de Perpignan Via Domitia (September 2009)
“Chromatin of filamentous fungi: RIP, Centromeres and Circadian Rhythms”
Universität Bochum, Germany (August 2009)
“Chromatin of filamentous fungi: RIP, Centromeres and Circadian Rhythms”
University of Calgary Health Sciences Center, Calgary, Alberta, CDN (May 2009)
“ChIP-sequencing: Centromeres and Circadian Rhythms”
Oregon State University, Corvallis, OR - Department of Botany and Plant Pathology (April 2009)
“Chromatin of filamentous fungi: RIP, Centromeres and Circadian Rhythms”
Oregon Health & Sciences University, Portland, OR - CROET (April 2009)
“Chromatin of filamentous fungi: Centromeres and Circadian Rhythms”
25th Fungal Genetics Conference (March 2009), Asilomar, CA
   “Centromere assembly and maintenance of Neurospora crassa”
   “Repeat-induced point mutation in Fusarium graminearum”
Mycological Society of America Annual Meeting (August 2008), State College, PA
   “Centromere and kinetochore proteins of filamentous fungi”
PBoFF Symposium (April 2008) Texas A&M University, College Station, TX
   “Low-cost, massively parallel sequencing approaches to study the biology of filamentous fungi”
Neurospora 2008 (March 2008), Asilomar, CA
   “Centromeres of filamentous fungi”
CICESE (14 November 2007), Ensenada, Baja California Norte, Mexico.
   “Centromeres of filamentous fungi”
24th Fungal Genetics Conference (March 2007), Asilomar, CA
   “Genome defense by repeat-induced point mutation: an evolutionary dead end?”
Asilomar Chromatin and Chromosome Conference (December 2006), Asilomar, CA
   “Centromeres of filamentous fungi”
CICESE (December 2006), Ensenada, Baja California Norte, Mexico.
   “Centromeres of filamentous fungi: RIP and epigenetics”
   “Control and function of RIP (repeat-induced point mutation)”
SUNY Buffalo (September 2005), Buffalo, NY.
   “Control of DNA methylation and heterochromatin formation”
Oregon State University (August 2005), Corvallis, OR.
   “Epigenetic Control of Heterochromatin Formation”
Ludwig-Maximilian-Universität, (January 2005), Munich, Germany.
   “Control of DNA methylation and heterochromatin formation in Neurospora”
Biozentrum Basel (January 2005), Basel, Switzerland.
   “RIP, DNA methylation and heterochromatin formation in Neurospora”
Texas A&M University (September 2004), College Station, TX.
   “Control of DNA methylation and heterochromatin formation in Neurospora”
CICESE (August 2004), Ensenada, Baja California Norte, Mexico.
   “Gene silencing, DNA methylation and heterochromatin formation in Neurospora”
Gordon Conference on Cellular and Molecular Fungal Biology (June 2004), Holderness, NH.
   “Control of DNA methylation and heterochromatin formation in Neurospora”
Neurospora 2004 (March 2004), Asilomar, CA
   “HP1 is essential for DNA methylation in Neurospora”
FASEB conference on Chromatin and Transcription (July 2003), Snowmass Village, CO
   “Connections between DNA methylation and RIP”
22nd Fungal Genetics Conference (March 2003), Asilomar, CA
   Workshop organizer and co-chair (invited), “Transposable Elements and Epigenetics”.
   “Genome defense by mutation and the methylated component of the Neurospora genome”
22nd Fungal Genetics Conference (March 2003), Asilomar, CA
   Workshop on “Regulation of Primary Metabolism” (chaired by Dr. M. Hynes)
   “Putative chromosome remodeling factors in Neurospora crassa”

PUBLICATIONS (including accepted; 14 since 2006; 6 under review [see below])

2009


2008


2007


2006

2005


2004


2003


2002 and earlier (total of 12)


**Manuscripts under review**


B. J. Bowman, M. Draskovic, **M. Freitag**, E. J. Bowman. Structure and distribution of organelles and the cellular location of calcium transporters in *Neurospora crassa* (accepted with minor changes at *Eukaryotic Cell*).


M. G. Roca M., H.-C. Kuo, A. Lichius, **M. Freitag** and N. D. Read. Nuclear dynamics, mitosis and cytoskeleton during the early stages of colony initiation in *Neurospora crassa* (submitted to *Eukaryotic Cell*).

**Manuscripts in preparation**

**M. Freitag**, S. Honda, A. Kobsa (Hagemann) and E. U. Selker. A *Neurospora* mutant defective in Repeat-Induced Point mutation (RIP) and DNA methylation carries a missense mutation in histone H3 (to be submitted to Current Biology).


P. Phatale, K. M. Smith, J. Mendoza and **M. Freitag**. Evolution of the centromeric foundation proteins CenH3 (CenpA) and CKP-1 (CenpC) in filamentous fungi (to be submitted to Genetics).

CURRICULUM VITAE

TODD C. MOCKLER

Oregon State University
Department of Botany and Plant Pathology
2082 Cordley Hall
Corvallis, OR 97331
Phone: (541) 737-5207
Fax: (541) 737-3573
Email: tmockler@cgrb.oregonstate.edu

EDUCATION AND EMPLOYMENT INFORMATION

Education:
2002 Ph.D., Molecular Biology, University of California, Los Angeles
1993 B.A., Molecular Biology, Wesleyan University, Middletown, Connecticut

Position Held:
Assistant Professor, Oregon State University, Corvallis, OR, 2006 - present
Postdoctoral Research Associate, Salk Institute, La Jolla, CA, 2002 - 2006

Appointment: 0.75 FTE

FTE Distribution: 0.75 FTE College of Agricultural Sciences

Principal Duties in Present Position:
Plant Genomics Research
Molecular and Cellular Biology Program Graduate Teaching
Advising Undergraduate and Graduate Students
Botany and Plant Pathology Teaching

Other OSU Program and Department Affiliations:
Molecular and Cellular Biology Program, Graduate Faculty
Center for Genome Research and Biocomputing, Graduate Faculty
Computational and Genome Biology Initiative, Faculty
Genetics Program, Graduate Faculty

TEACHING, ADVISING, AND OTHER ASSIGNMENTS

Instructional Summary
a. Credit Course
I currently teach two lecture courses.
1. MCB 555, Genome Expression and Regulation (4 cr). One of the core required courses for first year MCB graduate students. Within this course I teach a module on transcriptional regulation.
2. MCB 668/699, Bioinformatics and Genomics (4 cr). This course covers key concepts from the bioinformatics and genomics revolution including genome sequencing technologies, database mining methods, sequence alignments, fundamental theories of computational biology, bioinformatics algorithms, and concepts of programming for bioinformatics.

I am currently developing a third course, BOT 332 Laboratory Techniques in Plant Biology (3 cr), which I will teach for the first time in the Spring quarter of 2010.
Credit courses:

<table>
<thead>
<tr>
<th>Course #</th>
<th>Name of Course</th>
<th>Term/Year</th>
<th># of students</th>
<th>% Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCB 555</td>
<td>Genome Expression and Regulation</td>
<td>Winter 2008</td>
<td>23</td>
<td>25</td>
</tr>
<tr>
<td>MCB 668/699</td>
<td>Bioinformatics and Genomics</td>
<td>Winter 2008</td>
<td>24</td>
<td>33</td>
</tr>
<tr>
<td>MCB 555</td>
<td>Genome Expression and Regulation</td>
<td>Winter 2009</td>
<td>26</td>
<td>25</td>
</tr>
<tr>
<td>MCB 668/699</td>
<td>Bioinformatics and Genomics</td>
<td>Winter 2009</td>
<td>24</td>
<td>33</td>
</tr>
</tbody>
</table>

b. Non-Credit Courses and Workshops

Workshops:

- Member of the organizing committee for the "Bioinformatics, Genomics and Systems Biology Workshop" that was held June 17-19th, 2009 at OSU.

Continuing Education:

- Academy for Lifelong Learning, Oregon State University Alumni Association. Plant Genomics and Biofuels. Corvallis, OR. (guest speaker) 2009

Curriculum Development

As one of the five new faculty hires in the CGBI, I was charged with collaborating on efforts to integrate and emphasize training in computationally intensive, genome-centered biology into the MCB curriculum. Beginning with the 2007-2008 academic year, several core courses in the MCB graduate program were substantially updated and reorganized. The revised MCB core curriculum now provides an introduction to the principles and results of high-throughput genomics experiments and their analysis and interpretation via the tools of computational biology and bioinformatics. It introduces students to fundamental concepts in probability and statistics. The recent integration, redesign, and creation of MCB courses were an important first step towards building a modern genome biology training program. One of the key changes involved the course MCB 668/699, for which I am one of the instructors. The course was dramatically changed to address key concepts from the bioinformatics and genomics revolution. Improved or new topics include genome sequencing technologies, database mining methods, sequence alignments, fundamental theories of computational biology, bioinformatics algorithms, and concepts of programming for bioinformatics. Students are introduced to fundamental tools of bioinformatics (Linux, Perl) and bioinformatics algorithms necessary to process and analyze large datasets generated from high-throughput genomics experiments. The name of MCB 668/669 was changed to “Bioinformatics and Genomics” to reflect its improvement.

Curriculum committee service:

- Participant in the Molecular and Cellular Biology Graduate Program Workshop, December 12-13, 2006.
- Member of the "Undergraduate Bioinformatics Curriculum Exploratory Committee" (2008 - ; Dr. Robert Mason, Chair), Biology Program, College of Science.

Students and Postdoctoral Trainees

I currently advise three Ph.D students and three undergraduates in my laboratory. I meet with these students weekly in a formal lab meeting and informally in ad hoc meetings as needed.

Current Graduate Students:

- Samuel Fox, Ph.D. expected 2011, MCB.
- Doug Bryant, Ph.D. expected 2011, Computer Science.
- Henry Priest, Ph.D. expected 2014, MCB.
Postdoctoral Trainees:
• Rongkun Shen (October 2006 - February 2008). Current position: Postdoc, OHSU, Portland, OR.

Undergraduate Student Researchers:

Other Graduate Student Advisees:
• Jeff Kimbrel (Genetics; 2006-), Kyle Pomraning (MCB, 2008-), Pallavi Phatale (BPP; 2008-), Jill Franzosa (EMT; 2009-), Sagar Vidyasa (Horticulture; 2008-), Noah Fahlgren (MCB; 2006-), Josh Cuperus (MCB; 2007-), Shawn Butcher (Zoology; 2008-), Yang Bao (Forestry; 2006-2008).

Student Evaluation Summary (2008-2009 on a scale of 6.0)

<table>
<thead>
<tr>
<th>Course</th>
<th>MCB 555 Genome Expression and Regulation</th>
<th>MCB 668/699 Bioinformatics and Genomics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term</td>
<td>W08</td>
<td>W09</td>
</tr>
<tr>
<td>Number of evaluation responses</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>The course as a whole was:</td>
<td>4.0</td>
<td>4.6</td>
</tr>
<tr>
<td>The instructor's contribution to the course was:</td>
<td>4.3</td>
<td>4.9</td>
</tr>
<tr>
<td>Clarity of course objectives or outcomes was:</td>
<td>4.0</td>
<td>4.3</td>
</tr>
<tr>
<td>Clarity of student responsibilities and requirements was:</td>
<td>3.3</td>
<td>4.3</td>
</tr>
<tr>
<td>Course organization was:</td>
<td>4.0</td>
<td>4.4</td>
</tr>
<tr>
<td>Availability of extra help when needed was:</td>
<td>6.0</td>
<td>5.8</td>
</tr>
<tr>
<td>Instructor's use of various instructional techniques to accommodate differences in learning styles among students was:</td>
<td>3.3</td>
<td>4.5</td>
</tr>
<tr>
<td>Instructor's interest in my learning was:</td>
<td>5.0</td>
<td>5.1</td>
</tr>
<tr>
<td>Instructor's ability to stimulate my thinking more deeply about the subject was:</td>
<td>3.3</td>
<td>4.5</td>
</tr>
<tr>
<td>Instructor's timely feedback to tests and other work was:</td>
<td>4.5</td>
<td>5.0</td>
</tr>
<tr>
<td>Instructor's ability to develop a welcoming classroom environment for all participants was:</td>
<td>4.3</td>
<td>5.3</td>
</tr>
<tr>
<td>Instructor's evaluation of student performance in accordance with course objectives was:</td>
<td>4.5</td>
<td>5.6</td>
</tr>
</tbody>
</table>
SCHOLARSHIP AND CREATIVE ACTIVITY

Major Areas of Current Research:
Research in my laboratory is focused on three areas: 1) comparative analysis of plant diurnal and circadian gene expression regulation and promoter architecture; 2) alternative splicing and its regulation in plants; and 3) development of genomic tools for *Brachypodium distachyon*, a new model system for grass crop research.

PUBLICATIONS

a. **Refereed Journal Articles:**


b. Chapters in Books:

c. Manuscripts in Review or Revision:
The Brachypodium Genome Initiative (I am one of four co-corresponding authors). Genome sequence analysis of the model grass Brachypodium distachyon: insights into grass genome evolution. Submitted to Science.

Filichkin SA, Priest HD, Givan SA, Shen R, Bryant DW, Fox SE, Wong W-K and Mockler TC. Genome-wide mapping of alternative splicing in Arabidopsis thaliana. Submitted to Genome Research - in revision.


d. Manuscripts in Preparation:

PROFESSIONAL MEETINGS AND SEMINARS

a. International Audiences:
Applications of next-generation sequencing to molecular analysis of plant transcriptomes. 8th Canadian Plant Genomics Workshop. August 24-27, 2009. Sheraton Cavalier Hotel, Saskatoon, SK Canada.


b. National and Regional Audiences:


c. Departmental Audiences


Analyzing alternative splicing in plants using high-throughput sequencing (HTS). December 5, 2008. Iowa State University. Ames, IA.


d. Poster Presentations


Splicing Regulation and Transcriptome landscapes in plants. Samuel Fox, Sergei Filichkin, Henry Priest, Rongkun Shen, Scott Givan, Chris Sullivan and Todd Mockler. Center for Genome Research and Biocomputing Fall Conference. Redmond, OR. October 4-5, 2008.


Todd Michael, Todd Mockler, Amanda Byer, Fangxin Hong, Samuel Hazen, Marcelo Yanovsky, Steve Kay, and Joanne Chory, Ambient temperature cycles or photoperiod diurnally regulate more than half of


GRANT AND CONTRACT SUPPORT

a. Current Support

Project Title: Comparative Genomic Analysis of Diurnal and Circadian Gene Expression Regulation
PI: Todd C. Mockler (co-PIs Joanne Chory and Steve Kay)
Source: NSF Plant Genome Project
Period: 09/01/2006 – 08/31/2009
Amount: $1,192,225

Project Title: A Universal Genome Array and Transcriptome Atlas for Brachypodium distachyon
PI: Todd C. Mockler (co-PI Todd P. Michael)
Source: DOE - Plant Feedstock Genomics for Bioenergy Program
Period: 09/01/2008 – 08/31/2011
Amount: $1,200,000
Project Title: Variation in Diurnal Transcriptional Networks in Rice
PI: Todd C. Mockler (co-PI Sergei Filichkin)
Source: USDA – National Research Initiative
Period: 07/01/2008 – 06/30/2012
Amount: $364,330

Project Title: Epigenomics of Development in Populus
PI: Steve Strauss (co-PIs Todd Mockler and Michael Freitag)
Source: DOE - Plant Feedstock Genomics for Bioenergy Program
Period: 09/01/2008 – 08/31/2011
Amount: $191,700 (Mockler subaward)

Project Title: Systems Level Engineering of Plant Cell Wall Biosynthesis to Improve Biofuel Feedstock Quality
PI: Sam Hazen (co-PIs Todd Mockler and Steve Kay)
Source: DOE - Plant Feedstock Genomics for Bioenergy Program
Period: 09/01/2008 – 08/31/2011
Amount: $187,916 (Mockler subaward)

Project Title: Precise mapping of growth hormone effects by cell-specific gene activation response
PI: Sigal Savaldi-Goldstein
Source: BARD - United States - Israel
Period: 09/01/2009 – 06/30/2012
Amount: $150,000 (Mockler subaward)

Project Title: Arabidopsis 2010: Daily adaptation of transcriptional programs.
PI: Todd P. Michael
Source: NSF
Period: 1/01/10 - 12/31/13
Amount: $ 799,586 (Mockler subaward)

Project Title: Development of a Fast and Cost-Effective Method for Gene Discovery in Plants
PI: Todd C. Mockler
Source: Agricultural Research Foundation, Oregon State University
Period: 07/01/2007 – 06/30/2009
Amount: $12,500

b. Pending Support
Project Title: Circadian regulation of protein homeostasis during aging
PI: Jaga Giebultowicz
Source: NIH
Period: 01/01/2010 - 12/31/15
Amount: $1,133,030 (subaward)

Project Title: Characterization of healthy aging in a model organism
PI: Jaga Giebultowicz
Source: NIH
Period: 01/01/2010 - 12/31/12
Amount: $245,012 (subaward)
PATENT AWARDS AND INVENTIONS


SERVICE

1. University Service
Departmental Committees:
• COSIIne Advisory Group Representative for BPP (2009-present).
• Botany and Plant Pathology Faculty Search Committee (2008).
• BPP Infrastructure Committee - Computers (2007-present).

University Committees:
• Member of the Undergraduate Bioinformatics Curriculum Exploratory Committee, Biology Program, College of Science (2008-).
• Member of the Scientific Advisory Board, Center for Genome Research and Biocomputing (2008-present).

2. Service to the Profession
• Panel member for GenomeCanada’s Competition in Applied Genomics in Bioproducts and Crops (2009).
• Member of the Program Committee of the American Society of Plant Biologists (2008-).
• Editorial Board member for the journal Molecular Plant (2007-).

3. Professionally-Related Service to the Public
• Taught an introduction to plant biology to Kindergartners at Mountain View School, Corvallis in 2008.
• Assisted with the Science Fair at Mountain View School, Corvallis in 2008.

AWARDS

1. University
• Phi Kappa Phi Emerging Scholar Award, 2009.
• UCLA Dissertation Year Fellowship, 2001-2002.

2. National
• NIH National Research Service Award Postdoctoral Fellowship, 2003-2006.
• NIH Biotechnology Training Grant, 1997-2000.