

Cell and Molecular Biology Graduate Program

Annual Report

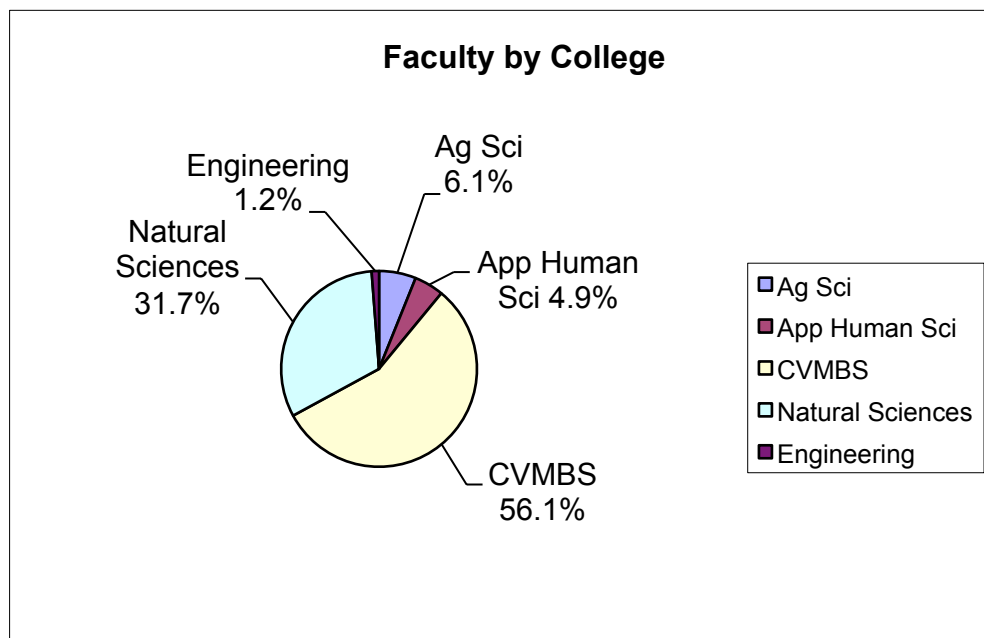
July 1, 2009 to June 30, 2010

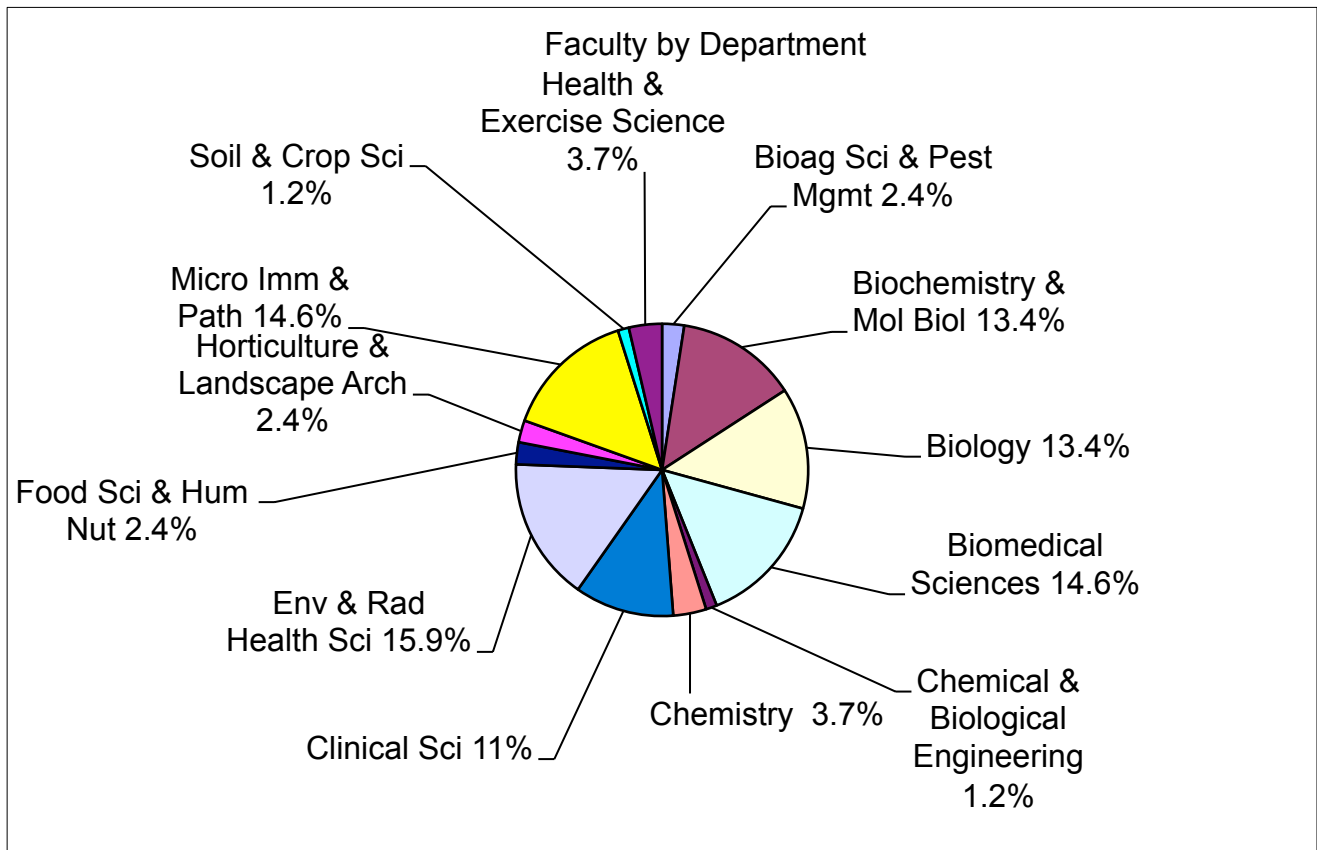
FACULTY

The faculty of the Cell and Molecular Biology Graduate Program continues to expand and broaden into new areas as new faculty join various departments at CSU and then become faculty members in CMB. Last year, one new faculty members joined the CMB program to total 82 members. The faculty of the CMB program as of June 30, 2010, and their departmental affiliations are listed below:

| <u>Name</u> | <u>Department</u> |
|----------------------------|--|
| Ramesh Akkina | Microbiology, Immunology & Pathology |
| Kenneth Allen | Food Science & Human Nutrition |
| Lorinda Anderson | Biology |
| Susan Bailey | Environmental & Radiological Health Sciences |
| James Bamburg | Biochemistry & Molecular Biology |
| B. George Barias | Chemistry |
| Joel Bedford | Environmental & Radiological Health Sciences |
| Patricia Bedinger | Biology |
| Barbara Biller | Clinical Sciences |
| Gerrit Bouma | Biomedical Sciences |
| Daniel Bush | Biology |
| Chaoping Chen | Biochemistry & Molecular Biology |
| Adam Chicco | Health & Exercise Science |
| Stephen Chisholm | Bioagricultural Sciences & Pest Management |
| Colin Clay | Biomedical Sciences |
| Debbie Crans | Chemistry |
| Norman Curthoys | Biochemistry & Molecular Biology |
| Jennifer DeLuca | Biochemistry & Molecular Biology |
| Steven Dow | Clinical Sciences |
| Dawn Duval | Clinical Sciences |
| Scott Earley | Biomedical Sciences |
| Nicole Ehrhart | Clinical Sciences |
| Gregory Florant | Biology |
| David Frisbie | Clinical Sciences |
| Deborah Garrity | Biology |
| Mercedes Gonzales-Juarrero | Microbiology, Immunology & Pathology |
| Daniel Gustafson | Clinical Sciences |
| Karyn Hamilton | Health & Exercise Sciences |
| William Hanneman | Environmental & Radiological Health Sciences |
| Jeffrey Hansen | Biochemistry & Molecular Biology |
| Charles Henry | Chemistry |
| Matthew Hickey | Health & Exercise Sciences |
| Douglas Ishii | Biomedical Sciences and Biochemistry & Molecular Biology |
| Shane Kanatous | Biology |
| John Kisiday | Clinical Sciences |
| Susan Kraft | Environmental & Radiological Health Sciences |
| Nora Lapitan | Soil & Crop Sciences |
| Susan LaRue | Environmental & Radiological Health Sciences |
| Paul Laybourn | Biochemistry & Molecular Biology |
| Marie Legare | Environmental & Radiological Health Sciences |
| Howard Liber | Environmental & Radiological Health Sciences |
| Karolin Luger | Biochemistry & Molecular Biology |
| June Medford | Biology |
| Donald Mykles | Biology |
| Jac Nickoloff | Environmental & Radiological Health Sciences |
| Jennifer Nyborg | Biochemistry & Molecular Biology |
| Michael Pagliosotti | Food Science & Human Nutrition |

| Name | Department |
|--------------------|--|
| Olve Peersen | Biochemistry & Molecular Biology |
| Marinus Pilon | Biology |
| Sandra Quackenbush | Microbiology, Immunology & Pathology |
| Rajinder Ranu | Bioagricultural Sciences & Pest Management |
| F. Andrew Ray | Environmental & Radiological Health Sciences |
| Kenneth Reardon | Chemical & Biological Engineering |
| Anireddy Reddy | Biology |
| Noreen Reist | Biomedical Sciences |
| Deborah Roess | Microbiology, Immunology & Pathology |
| Eric Ross | Biochemistry & Molecular Biology |
| Elizabeth Ryan | Clinical Sciences |
| Barbara Sanborn | Biomedical Sciences |
| Herbert Schweizer | Microbiology, Immunology & Pathology |
| George Seidel, Jr. | Biomedical Sciences |
| Richard Slayden | Microbiology, Immunology & Pathology |
| Stephen Stack | Biology |
| Laurie Stargell | Biochemistry & Molecular Biology |
| Erica Suchman | Microbiology, Immunology & Pathology |
| Michael Tamkun | Biomedical Sciences |
| Douglas Thamm | Clinical Sciences |
| Henry Thompson | Horticulture & Landscape Architecture |
| Ronald Tjalkens | Environmental & Radiological Health Sciences |
| Stuart Tobet | Biomedical Sciences |
| Susan Tsunoda | Biomedical Sciences |
| Jozsef Vigh | Biomedical Sciences |
| Jorge Vivanco | Horticulture & Landscape Architecture |
| John Volckens | Environmental & Radiological Health Sciences |
| Michael Weil | Environmental & Radiological Health Sciences |
| Carol Wilusz | Microbiology, Immunology & Pathology |
| Jeffrey Wilusz | Microbiology, Immunology & Pathology |
| Stephen Withrow | Clinical Sciences |
| Raymond Yang | Environmental & Radiological Health Sciences |
| Mark Zabel | Microbiology, Immunology & Pathology |





New Faculty: One new faculty member has joined CMB during the past year.

| <u>Name</u> | <u>Department</u> |
|-------------|--------------------------------------|
| EJ Ehrhart | Microbiology, Immunology & Pathology |

Affiliate Faculty: These are faculty who serve on graduate student committees and/or have research collaborations with faculty members in the CMB program.

| <u>Name</u> | <u>Affiliation</u> |
|-------------------|--|
| Michael Cornforth | University of Texas Medical Branch, Galveston, TX |
| Edwin Goodwin | Los Alamos National Laboratory, Los Alamos, NM |
| Michelle Le Beau | University of Chicago Cancer Research Center |
| Pamela Munster | H. Lee Moffitt Cancer Center & Research Institute, Tampa, FL |
| Alice Sigurdson | Dept. of Health & Human Services, Bethesda, MD |

STUDENTS

The CMB Graduate Program currently oversees 51 graduate students (8 MS students and 50 PhD students) conducting research in labs distributed throughout the five colleges represented by our faculty members (see **table 1** for numerical data on the CMB graduate students as of fall 2009). In 2009-2010 academic year, the program awarded two M.S. degrees and six Ph.D. degrees in Cell and Molecular Biology.

There were 51 students in the CMB program as of June 30, 2010. 13 students were accepted into CMB for the fall 2010 semester. Of those nine, one DVM/Ph.D. student was admitted to the Cancer Biology program. The CMB Graduate Program has been expanding each year for the last several years. Approximately 40 domestic and 27 international students applied to the CMB program.

The major limitation to accepting students has been the lack of GTA funding for the first year. In the coming year, the program will continue to implement improved procedures to monitor student progress and to ensure timely completion of qualifying examinations. It will also continue to expand program participation in the annual CMB/MCIN Graduate Student Poster Symposium. A major goal of the CMB program is to seek greater institutional and external support for training graduate students by applying for PRSE status and training grants from NSF (IGERT) and DOE (GAANN). Finally, the CMB graduate program will continue to recruit outstanding students who will become valued participants and contributors to an interdisciplinary effort to promote research in Cell and Molecular Biology on campus.

Table 1. Numerical Data on CMB Graduate Students

| Student Category | Number | Percent |
|-------------------------|---------------|----------------|
| Program | | |
| MS | 8 | 14 |
| PhD | 50 | 86 |
| Total | 58 | |
| Gender | | |
| Male | 30 | 52 |
| Female | 28 | 48 |
| Ethnicity | | |
| Asian American | 5 | 9 |
| African American | 2 | 3 |
| Native American | 3 | 5 |
| Hispanic | 3 | 5 |
| Caucasian | 29 | 50 |
| International | 16 | 28 |
| College of Advisor | | |
| CVMBS | 37 | 64 |
| CNS | 11 | 19 |
| Engineering | 2 | 3 |
| Appl. Human Sciences | 4 | 7 |
| Ag Sciences | 1 | 2 |
| Undeclared (rotating) | 3 | 5 |

Current Students:

| <u>Name</u> | <u>Degree</u> | <u>Advisor</u> | <u>Date Admitted</u> |
|--------------------|---------------|------------------|----------------------|
| Jennifer Arab | Ph.D. | | Fall 2009 |
| Nadia Ashwish | Ph.D. | Deborah Roess | Spring 2009 |
| Zobaida Ben Musa | Ph.D. | Nicole Ehrhart | Spring 2009 |
| Shawna Campbell | Ph.D. | June Medford | Fall 2008 |
| Erica Chao | Ph.D. | Don Mykles | Fall 2006 |
| Shawna Comer | Ph.D. | | Fall 2009 |
| Kathy Cosenza | Ph.D. | Don Mykles | Fall 2008 |
| Alpana Damle | Ph.D. | Deborah Roess | Fall 2004 |
| Ryan Dregalla | Ph.D. | Susan Bailey | Fall 2007 |
| Abdunaser Eadaim | M.S. | Susan Bailey | Spring 2009 |
| Vanessa Enriquez | Ph.D. | Gerritt Bouma | Fall 2008 |
| Laura Epple | Ph.D. | | Fall 2009 |
| John Fitts | Ph.D. | Deborah Garrity | Fall 2009 |
| Jared Fowles | Ph.D. | Dan Gustafson | Fall 2007 |
| Phillip Fox | Ph.D. | Mike Tamkun | Fall 2009 |
| Krystle Frahm | Ph.D. | Stu Tobet | Fall 2009 |
| Scott Fullbright | Ph.D. | Stephen Chisholm | Fall 2009 |
| Jessica Goldstrohm | Ph.D. | Robert Ullrich | Fall 2006 |
| Lakshmi Gummadi | Ph.D. | Norman Curthoys | Fall 2006 |
| Scott Hafeman | Ph.D. | Steve Dow | Fall 2007 |
| Xin Huang | Ph.D. | Deborah Roess | Fall 2005 |
| Hui Hung | Ph.D. | James Bamberg | Fall 2001 |
| Toru Ishii | Ph.D. | | Fall 2009 |
| Nasir Jalal | Ph.D. | Howard Liber | Fall 2007 |
| Luke Kingry | Ph.D. | Richard Slayden | Fall 2006 |
| Tobi Krause | Ph.D. | Karin Hamilton | Fall 2007 |
| Catherine Le | Ph.D. | Matt Hickey | Fall 2008 |
| Phuong Le | Ph.D. | Susan Bailey | Fall 2005 |
| Jerome Lee | Ph.D. | Jeff Wilusz | Fall 2006 |
| Ashley Neff | Ph.D. | Carol Wilusz | Fall 2008 |
| Preston Neff | Ph.D. | Ramesh Akkina | Fall 2007 |
| Jingyi Nie | Ph.D. | Jac Nickoloff | Fall 2008 |
| Donasian Ochola | Ph.D. | Mike Weil | Fall 2009 |
| Liz Perrault | Ph.D. | Ken Reardon | Fall 2007 |
| Chelsea Roan | M.S. | Deborah Roess | Fall 2008 |
| Samantha Roth | Ph.D. | Don Mykles | Fall 2009 |
| Audrey Ruple | Ph.D. | Paul Morley | Spring 2010 |
| Fumi Sagawa | Ph.D. | Carol Wilusz | Fall 2007 |
| Tara Schumacher | Ph.D. | Ken Reardon | Fall 2006 |
| Hoda Shnaishah | M.S. | Deborah Roess | Spring 2009 |
| Jenette Shoeneman | M.S. | Doug Thamm | Fall 2008 |
| Jordan Steel | Ph.D. | Brian Geiss | Fall 2009 |
| Matt Stratton | Ph.D. | Stu Tobet | Summer 2008 |
| Eric Tauchman | Ph.D. | Jennifer DeLuca | Fall 2009 |
| Al Trujillo | Ph.D. | Debbie Crans | Fall 2008 |
| Aida Ulloa | Ph.D. | Barbara Sanborn | Fall 2003 |
| Dezaray Varland | Ph.D. | Jozsef Vigh | Fall 2008 |
| Scott Walmsley | Ph.D. | Norman Curthoys | Fall 2006 |
| Peter Winter | Ph.D. | George Barisas | Fall 2006 |
| Luke Wittenburg | Ph.D. | Doug Thamm | Fall 2005 |
| Hiroto Yoshikawa | Ph.D. | Sue LaRue | Fall 2008 |

Department Level Breakdown of Primary Majors by Ethnicity and Gender

| Student Level & Ethnicity/Race/Gender | Fall 2003 | Fall 2004 | Fall 2005 | Fall 2006 | Fall 2007 | Fall 2008 | Fall 2009 |
|---------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Native American Male | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Native American Female | 0 | 0 | 0 | 0 | 0 | 3 | 2 |
| Black Male | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Black Female | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Asian American Male | 1 | 2 | 2 | 3 | 3 | 3 | 2 |
| Asian American Female | 1 | 1 | 2 | 2 | 2 | 3 | 3 |
| Hispanic Male | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| Hispanic Female | 1 | 1 | 0 | 0 | 0 | 1 | 2 |
| White Male | 14 | 15 | 18 | 17 | 18 | 14 | 17 |
| White Female | 18 | 20 | 20 | 24 | 18 | 13 | 12 |
| International Male | 5 | 6 | 5 | 6 | 7 | 9 | 8 |
| International Female | 9 | 9 | 8 | 7 | 5 | 5 | 8 |
| Other Male | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Female | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Persistence: Percent of Entering Doctoral Students Who Withdrew Before Completing Two Years of Study Averaged Over the Past Three Academic Years

| | 2001-2002 | 2002-2003 | 2003-2004 | 2004-2005 | 2005-2006 | 2006-2007 | 2007-2008 | 2008 - 2009 |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|
| Percent of Students Who Withdrew Averaged Over the Past 3 Years | 28 | 12 | 19 | 25 | 29 | 25 | 24 | 20 |
| Total Entering Students Averaged Over the Past 3 Years | 6 | 6 | 9 | 9 | 9 | 8 | 8 | 9 |

Funded research –estimate by # graduate students * estimated costs per graduate student (\$21,750 stipend, tuition, benefits + \$10,000 supplies, etc. = ~\$32,000. Note that means for tracking this needs to be developed.

| | 2002-03 | 2003-04 | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 |
|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| MS | 13 | 10 | 10 | 14 | 11 | 5 | 7 | 8 |
| | 416,000 | 320,000 | 320,000 | 448,000 | 352,000 | 160,000 | 224,000 | 256,000 |
| PhD | 28 | 39 | 41 | 41 | 46 | 40 | 50 | 50 |
| | 896,000 | 1,248,000 | 1,312,000 | 1,312,000 | 1,472,000 | 1,280,000 | 1,600,000 | 1,600,000 |
| total | 41 | 49 | 51 | 55 | 55 | 45 | 57 | 58 |
| | 1,312,000 | 1,568,000 | 1,632,000 | 1,760,000 | 1,760,000 | 1,444,000 | 1,824,000 | 1,856,000 |

Doctoral Student Time-To-Degree and Persistence

| Entering Student Academic Year Cohort | 1995-96 | 1996-97 | 1997-98 | 1998-99 | 1999-00 | 2000-01 | 2001-02 | 2002-03 | 2003-04 | 2004-05 | 2005-06 |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Number of entering doctoral students | 0 | 02 | 02 | 03 | 06 | 07 | 07 | 07 | 14 | 09 | 06 |
| Number students admitted to candidacy by the end of the 4th year of enrollment | 0 | 01 | 02 | 03 | 03 | 06 | 06 | 04 | 09 | 05 | 0 |
| Of those admitted to candidacy, number who complete within 4 years | 0 | 01 | 02 | 03 | 03 | 05 | 06 | 04 | 05 | 02 | 0 |
| Of those admitted to candidacy, number who complete within 6 years | 0 | 0 | 0 | 0 | 0 | 01 | 0 | 01 | 0 | 0 | 0 |
| Of those admitted to candidacy, number who complete within 8 years | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Of those admitted to candidacy, how many are still enrolled after 8 years? | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Withdrew or received MS (Semester/Year) | 0 | 1/2 | 0/3 | 0/2 | 3/0 | 1/3 | 3/1 | 1/1 | 4/1 | 4/2 | 1/1 |

Scholarship activity – listing of publications with CMB graduate students as authors (2001 through 2008). Note that CMB faculty members need to list CMB program along with their department on publications.

| CMB Graduate Student Publications with CMB Faculty, by year enrolled | | | | | | | | |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | 2000-2001 | 2001-2002 | 2002-2003 | 2003-2004 | 2004-2005 | 2005-2006 | 2006-2007 | 2007-2008 |
| Number of student in class | 11 | 10 | 12 | 16 | 10 | 12 | 9 | 10 |
| Number of publications per class | 9 | 35 | 14 | 38 | 5 | 1 | 4 | 1 |

Graduated Students

Fifteen students received their degrees during the past year, five M.S. and ten Ph.D. students. A complete list of students who have graduated from CMB is given below.

| <u>Name</u> | <u>Degree</u> | <u>Advisor</u> | <u>Graduated</u> |
|----------------------|---------------|----------------------------|------------------|
| Luke Wittenburg | Ph.D. | Doug Thamm | Summer 2010 |
| Lisa Kellihan | M.S. | Steven Dow | Spring 2010 |
| Xiangfei Liu | Ph.D. | Robert Ullrich | Spring 2010 |
| Joseph Sottnik | Ph.D. | Steve Dow | Spring 2010 |
| Erica Chao | M.S. | June Medford | Fall 2009 |
| Jes Kuruvilla | Ph.D. | Ramesh Akkina | Fall 2009 |
| Pak, Chi | Ph.D. | Jim Bamburg | Fall 2009 |
| Paul Kim | Ph.D. | Ken Allen | Fall 2009 |
| Stephen Keysar | Ph.D. | Michael Fox | Summer 2009 |
| Rebekah Klingler | Ph.D. | F. Andrew Ray | Summer 2009 |
| Casey Boczon | M.S. | Paul Kugrens | Spring 2009 |
| Lisa Chamberlain | Ph.D. | David Grainger | Spring 2009 |
| Eric Lee | M.S. | Mercedes Gonzalez-Juarrero | Spring 2009 |
| Julie Moreno | Ph.D. | Ron Tjalkens | Spring 2009 |
| Jun Zhou | M.S. | Deborah Roess | Spring 2009 |
| Kristin Askin | Ph.D. | Robert Ullrich | Fall 2008 |
| Amy Boczon | M.S. | Rajinder Ranu | Fall 2008 |
| Corey Broeckling | Ph.D. | Jorge Vivanco | Fall 2008 |
| Ron Carsten | Ph.D. | Robert Ullrich | Fall 2008 |
| Jennifer Chiniquy | M.S. | Jon Carlson | Fall 2008 |
| Tracy Nichols | Ph.D. | Mark Zabel | Fall 2008 |
| Sung-Bong Shin | Ph.D. | Anireddy Reddy | Fall 2008 |
| Abby Williams | Ph.D. | Robert Ullrich | Fall 2008 |
| Kevin Flynn | Ph.D. | James Bamburg | Summer 2008 |
| Kristy McClellan | Ph.D. | Stuart Tobet | Summer 2008 |
| Camilla Kristensen | M.S. | Mike Tamkun | Summer 2008 |
| Amanda Ashley | Ph.D. | William Hanneman | Spring 2008 |
| James Bogenberger | Ph.D. | Paul Laybourn | Spring 2008 |
| Kitty Brown | M.S. | Karolin Luger | Spring 2008 |
| Jennifer Devitt | Ph.D. | Sue LaRue | Spring 2008 |
| R. Tanner Hagelstrom | Ph.D. | Robert Ullrich | Spring 2008 |
| Susan Hudachek | Ph.D. | William Dernel | Spring 2008 |
| Scott McCorvey | M.S. | Steven Dow | Spring 2008 |
| Tiffany Weir | Ph.D. | Jorge Vivanco | Spring 2008 |
| Guanxiong Xiao | Ph.D. | Michael Weil | Spring 2008 |
| Angela Morrison | M.S. | Jeff Wilusz | Fall 2007 |
| Alison White | M.S. | Karolin Luger | Fall 2007 |
| Eli Williams | Ph.D. | Robert Ullrich | Fall 2007 |
| Debra Davison | M.S. | Marie Legare | Summer 2007 |
| Alfred Flint | Ph.D. | William Hanneman | Summer 2007 |
| Jingjing Liu | Ph.D. | Deborah Roess | Summer 2007 |
| Susan McGrath | M.S. | Herbert Schweizer | Summer 2007 |
| Junqing Zhou | Ph.D. | Howard Liber | Summer 2007 |
| Mike Abernathy | M.S. | Michael Fox | Spring 2007 |
| Daniel Konet | Ph.D. | Jonathan Carlson | Spring 2007 |
| Kyoung Hee Choi | Ph.D. | Herbert Schweizer | Fall 2006 |
| Mark Clark | M.S. | Pat Bedinger | Summer 2006 |
| Marisha Godek | Ph.D. | David Grainger | Summer 2006 |
| Sung-Gu Lee | Ph.D. | Don Mykles | Summer 2006 |

| | | | |
|----------------------|---------------|---------------------|------------------|
| Colleen McWilliams | M.S. | David Grainger | Summer 2006 |
| Name | Degree | Advisor | Graduated |
| Carley Ross | Ph.D. | Michael Fox | Summer 2006 |
| Ginny Schmit | M.S. | Jennifer Nyborg | Summer 2006 |
| Traci Nichols | M.S. | William Hanneman | Spring 2006 |
| Aaron Thompson | Ph.D. | Olve Peersen | Spring 2006 |
| Christine Lee | M.S. | Ramesh Akkina | Spring 2006 |
| Brian Barth | M.S. | Michael Fox | Fall 2005 |
| Adam Holmes | M.S. | Charles Waldren | Fall 2005 |
| Ying Lei | Ph.D. | Deborah Roess | Fall 2005 |
| Junqing Zhou | M.S. | Howard Liber | Fall 2005 |
| James Bogenberger | M.S. | Paul Laybourn | Summer 2005 |
| Jingjing Liu | Ph.D. | Deb Roess | Summer 2005 |
| Sung-Bong Shin | M.S. | Anireddy Reddy | Spring 2005 |
| Kristin Askin | M.S. | Robert Ullrich | Fall 2004 |
| Purabi Dhakras | M.S. | Norm Curthoys | Fall 2004 |
| Jennifer Malone | Ph.D. | Robert Ullrich | Fall 2004 |
| Dhanashree Joshi | M.S. | Michael Fox | Summer 2004 |
| Chang-Uk Lim | Ph.D. | Michael Fox | Spring 2004 |
| Jill Livengood | Ph.D. | Jennifer Nyborg | Spring 2004 |
| Hyun-Woo Kim | Ph.D. | Don Mykles | Spring 2004 |
| Joseph Gogain | Ph.D. | Marv Paule | Fall 2003 |
| Susan Hudachek | M.S. | Greg Florant | Fall 2003 |
| Sean Lupien | Ph.D. | Douglas Ishii | Fall 2003 |
| Venu Muni | M.S. | Steve Stack | Fall 2003 |
| Qing Zhao | M.S. | Douglas Ishii | Summer 2003 |
| Carrie Tyszko | M.S. | Russell Anthony | Spring 2003 |
| Buffy Ellsworth | Ph.D. | Colin Clay | Fall 2002 |
| Richard Griffeth | M.S. | Gordon Niswender | Fall 2002 |
| Rachelle Lynn | M.S. | William Hanneman | Fall 2002 |
| Bridget Robinson | M.S. | Joseph Smith | Spring 2002 |
| Xiaoli Yu | Ph.D. | Don Mykles | Spring 2002 |
| Sandra Gunselman | Ph.D. | Charles Waldren | Fall 2001 |
| Amy Farris | M.S. | Colin Clay | Summer 2001 |
| Anna Maria Al-Khoury | Ph.D. | Marv Paule | Spring 2001 |
| Diane Hohorst | M.S. | Pat Bedinger | Summer 2000 |
| Regina Horvat | Ph.D. | Deborah Roess | Spring 2000 |
| Ryan Orbus | M.S. | Russell Anthony | Summer 1999 |
| Meredith Holtzen | M.S. | Debbie Crans | Spring 1999 |
| Fei Pan | M.S. | Herbert Schweizer | Spring 1999 |
| Jonathan Bowser | M.S. | Anireddy S.N. Reddy | Spring 1998 |
| Qing Li | M.S. | Kathy Partin | Spring 1998 |
| Tara Nolan | M.S. | Colin Clay | Spring 1998 |
| Suzanne Stratford | M.S. | Patricia Bedinger | Spring 1998 |

Department Total of Masters and Doctoral Degrees Conferred by Gender and Academic Year

| | 2002-03 | 2003-04 | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 |
|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| MS Total Male | 2 | 0 | 1 | 3 | 1 | 1 | 3 | 0 |
| MS Total Female | 2 | 3 | 1 | 3 | 2 | 4 | 2 | 2 |
| MS Total % Minority | 0 | 0 | 0 | 17% | 0 | 0 | 20% | 0 |
| PhD Total Male | 0 | 4 | 1 | 3 | 2 | 5 | 4 | 5 |

| | | | | | | | | | |
|---------------------|---|---|-----|---|-----|---|---|---|--|
| PhD Total Female | 0 | 2 | 2 | 4 | 4 | 5 | 6 | 0 | |
| PhD Total %Minority | 0 | 0 | 33% | 0 | 17% | 0 | 0 | 0 | |

Department Total of Masters and Doctoral Degrees Conferred by Gender, Race/Ethnicity and Academic Year

| Unit Level & Gender | 2000-2001 | 2001-2002 | 2002-2003 | 2003-2004 | 2004-2005 | 2005-2006 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 |
|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Master's Level | | | | | | | | | | |
| Native American Male | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Native American Female | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Black Male | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Black Female | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Asian American Male | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| Asian American Female | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hispanic Male | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Hispanic Female | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Non-Minority Male | 0 | 0 | 2 | 0 | 1 | 2 | 1 | 0 | 1 | 0 |
| Non-Minority Female | 0 | 0 | 2 | 3 | 1 | 3 | 2 | 0 | 2 | 2 |
| Doctoral Level | | | | | | | | | | |
| Native American Male | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Native American Female | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Black Male | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Black Female | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Asian American Male | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Asian American Female | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Hispanic Male | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hispanic Female | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Non-Minority Male | 0 | 0 | 0 | 4 | 1 | 3 | 2 | 0 | 3 | 4 |
| Non-Minority | 0 | 3 | 0 | 2 | 1 | 4 | 3 | 0 | 6 | 0 |

ADMINISTRATION & COMMITTEE MEMBERS

The CMB program is jointly administered by the Deans of the College of Veterinary Medicine, Agricultural Sciences, Applied Human Sciences and Natural Sciences. The Director is Dr. Paul Laybourn. The Steering Committee is the major policy-making committee. There are four standing committees with responsibilities for different areas of the program. Terms for the Academic Committee and Research Committee are for two years, with two members being elected each spring. The members of the standing committees are listed below.

Academic Committee

Chairman: *Dr. Stu Tobet*, Department of Biomedical Sciences
Dr. Marinus Pilon, Department of Clinical Sciences
Dr. Susan Bailey, Department of Environmental & Radiological Health Sciences
Dr. Erica Suchman, Department of Microbiology, Immunology & Pathology

Research Committee

Chairman: *Dr. Carol Wilusz*, Department of Microbiology, Immunology & Pathology
Dr. Jennifer DeLuca, Department of Biochemistry & Molecular Biology
Dr. Mark Zabel, Department of Microbiology, Immunology & Pathology
Dr. Matt Hickey, Department of Health & Exercise Sciences

Admissions Committee

Chairman: *Dr. Norm Curthoys*, Department of Biochemistry & Molecular Biology
Dr. Ron Tjalkens, Department of Environmental & Radiological Health Sciences
Dr. Dawn Duval, Department of Clinical Sciences
Dr. Deborah Garrity, Department of Biology

Seminar Committee

Chairman: *Dr. Howard Liber*, Department of Environmental & Radiological Health Sciences
Dr. Chaoping Chen, Department of Biochemistry & Molecular Biology
Dr. Lorrie Anderson, Department of Biology
Dr. George Seidel, Jr., Department of Biomedical Sciences

Steering Committee

Chairman: *Dr. Paul Laybourn*, Department of Biochemistry & Molecular Biology
Dr. Carol Wilusz, Department of Microbiology, Immunology & Pathology
Dr. Stu Tobet, Department of Biomedical Sciences
Dr. Howard Liber, Department of Environmental & Radiological Health Sciences
Dr. Norm Curthoys, Department of Biochemistry & Molecular Biology

Research Committee Activities

The research committee planned several activities designed to bring together the faculty and students to interact and learn about each other's research interests and expertise. The events included a series of seminars in which one faculty member from each focus area presented their current research, the annual Poster Competition, and co-sponsorship of the Frontiers of Science Seminar Series. Prospective new students were invited to visit campus at the same time as the Poster Competition so they could meet many faculty and students, which helped our recruitment activities.

Faculty Seminar Series

Fall 2009

| Date | Speaker |
|-------------|----------------|
| Nov 5 | Jozsef Vigh |
| Nov 19 | George Seidel |

Spring 2010

| Date | Speaker |
|-------------|----------------|
| Mar 4 | John Volckens |

Poster Competition

The Annual Cell and Molecular Biology Poster Symposium was held on Friday, February 26, 2010 from 2:00 - 5:00 p.m. in the North Ballroom at the Lory Student Center. The event was co-sponsored by the Molecular, Cellular and Integrated Neuroscience Program, the Department of Biochemistry & Molecular Biology and the Department of Microbiology, Immunology & Pathology. Approximately 40 applicants to the CMB, MCIN, Biochemistry and Microbiology graduate programs attended the symposium. Seventy-seven posters were presented. Of those posters, 75 were judged. Three judges reviewed each poster. Two awards were presented for the highest honor, two awards were presented with High honors, five with honors and twelve honorable mentions. One postdoc award was given. The judges were Drs. Ken Allen, Chuck Anderson, Jennifer Barfield, Andrea Bohn, Jerry Bouma, Charles Calisher, Chaoping Chen, Robert Cohen, Debbie Crans, Norm Curthoys, Sheena D'Arcy, Santiago Di Pietro, Alexa Dickson, Steven Dow, Dawn Duval, Scott Earley, Melanie Furgason, Deborah Garrity, Brian Geiss, Alan Godwin, Amanda Guth, Jeff Hansen, Matt Hickey, Shing Ho, Paul Laybourn, Caroline Lopez, Steve McBryant, Brian McNaughton, Patrick Monnier, Dilyara Murtazina, Don Mykles, Jenny Nyborg, Mike Pagliassottie, Kathy Partin, Christie Peebles, Olve Peersen, Jessica Prenni, Bruce Pulford, Sandra Quackenbush, Andy Ray, Mary Robinson, Deborah Roess, Eric Ross, Joel Rovnak, Alan Schenkel, Carol Seger, Laurie Stargell, Erica Suchman, Stu Tobet, Mark van der Woerd, Sue VandWoude, Jozsef Vigh, O'Neil Wiggan, Carol Wilusz, Jeff Wilusz, Robert Woody Ting Ting Yao and Mark Zabel.

The Post-doctoral Award was:

Uma Muthurajan Biochemistry & Molecular Biology

The Graduate Student Awards were:

Highest Honors

Kevin Sokoloski Microbiology, Immunology & Pathology
Keely Sudhoff Biochemistry & Molecular Biology

High Honors

Nicholas Clark Biochemistry & Molecular Biology
Lynsie Sundin Biochemistry & Molecular Biology

Honors

Candace Mathiason Microbiology, Immunology & Pathology
Jarred Bultema Biochemistry & Molecular Biology
Megan Carter Biochemistry & Molecular Biology
Scott Walmsley Cell & Molecular Biology
Karin Streifel Molecular, Cellular & Integrative Neurosciences

Honorable Mention

| | |
|--------------------|--------------------------------------|
| Ryan Dregalla | Cell & Molecular Biology |
| Scott Hafeman | Cell & Molecular Biology |
| Davis Seelig | Microbiology, Immunology & Pathology |
| Liza O'Donoghue | Clinical Sciences |
| Peter Winter | Cell & Molecular Biology |
| Michel Brady | Microbiology, Immunology & Pathology |
| Geoff Guimaraes | Biochemistry & Molecular Biology |
| Luke Wittenburg | Cell & Molecular Biology |
| Crystal Meyerett | Microbiology, Immunology & Pathology |
| Jenette Shoeneman | Cell & molecular Biology |
| Emily Chaskey | Microbiology, Immunology & Pathology |
| Michael De Miranda | Biology |

The Research Committee members, Drs. DeLuca, Dow, Wilusz and Zabel, wish to thank all of the contributors, the judges, and those who visited the CMB Student Poster Competition for contributing to its success.

Academic Committee Activities

The Academic Committee advised new students on lab rotations and class registration issues.

CMB Classes Taught

FALL 2009:

| | | |
|--------|--|-----------------------------|
| CM 502 | Techniques in Molecular & Cellular Biology | Carol Wilusz (coordinator) |
| CM 510 | Introduction to Cell & Molecular Biology | Paul Laybourn (coordinator) |
| CM 792 | Cell & Molecular Biology Seminar | Howard Liber (coordinator) |
| CM 793 | Seminar | Paul Laybourn (coordinator) |

SPRING 2010:

| | | |
|--------|-------------------------------------|---|
| BC 601 | Responsible Conduct in Biochemistry | Paul Laybourn (co-instructed with Jenny Nyborg) |
| CM 792 | Cell & Molecular Biology Seminar | Howard Liber (coordinator) |
| CM 793 | Seminar | Paul Laybourn (coordinator) |

Admissions Committee Activities

The admissions committee reviews applications received by the CMB program and recommends whether to accept or deny the applicants and then prioritizes the top student.

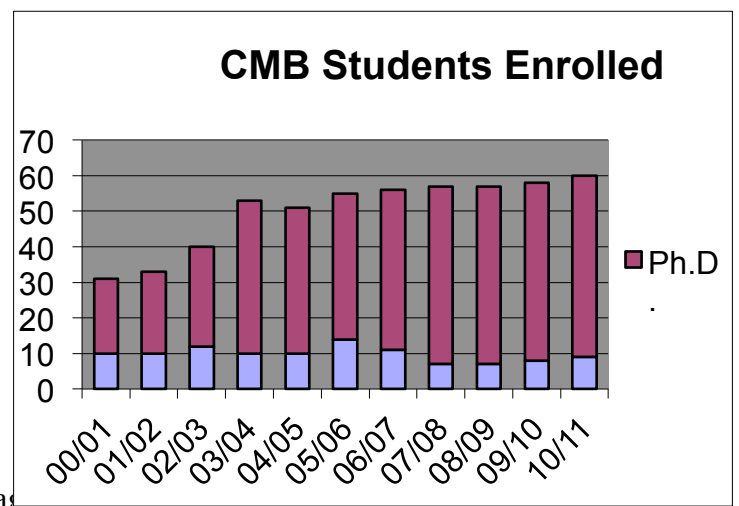
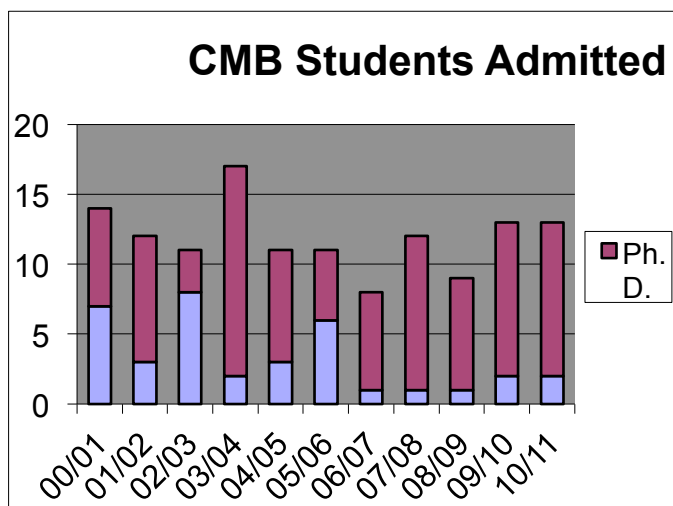
In the 2010 applicant pool there are 40 domestic applicants (11 MS, 29 PhD) and 27 international applicants. Within the domestic applicant pool the average GPA is 3.43, and the average combined GRE score is 1117. Of this pool, 11 students were invited to attend our recruiting weekend and to participate in the fourth annual combined CMB/MCIN Graduate Student Poster Symposium on February 26, 2010. Eight of these applicants accepted the invitation (average GPA 3.71, average combined GRE 1163).

The tables and graphs below summarize the number of applications received, accepted, denied, and enrolled over the past six years for comparison.

| Admits/Enroll. Status | 2001-2002 | 2002-2003 | 2003-2004 | 2004-2005 | 2005-2006 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 |
|--------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Number Applications | 103 | 87 | 81 | 58 | 50 | 31 | 110 | 72 | 92 |
| Number Admits | 31 | 27 | 17 | 25 | 26 | 17 | 16 | 13 | 12 |
| Number Enrolled | 10 | 12 | 16 | 10 | 12 | 9 | 10 | 9 | 9 |
| Percent Accepted that Enrolled | 32 | 44 | 94 | 40 | 46 | 53 | 63 | 69 | 75 |

History of Average Verbal, Quantitative, and Analytical GRE Scores for Entering Graduate Students

| Test Area and Unit Level | Fall 2001 | Fall 2002 | Fall 2003 | Fall 2004 | Fall 2005 | Fall 2006 | Fall 2007 | Fall 2008 | Fall 2009 | Fall 2010 |
|---------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Average Verbal Scores | 532 | 509 | 493 | 509 | 529 | 516 | 484 | 444 | 537 | 562 |
| Aver. Quantitative Scores | 698 | 666 | 639 | 669 | 682 | 666 | 565 | 644 | 671 | 612 |
| Aver. Analytical Scores | 693 | 710 | 609 | 637 | 707 | 630 | 670 | 4 | 4 | 4.5 |
| Aver. GPA | 3.40 | 3.37 | 3.42 | 3.40 | 3.42 | 3.76 | 3.53 | 3.64 | 3.58 | 3.68 |



Seminar Committee Activities:

The seminar committee solicits national and international speakers to present their latest research to the CMB students and faculty. Students who register for the seminar class also get experience writing reports that are graded by members of the seminar committee or their mentors. Thus, it serves a dual purpose of informing the students about different areas of research and practicing their writing skills. The seminars given during the past year are listed below.

FALL 2009 SEMINAR SPEAKERS

| DATE | | SPEAKER AND HOST | SPEAKER AFFILIATION | SEMINAR TITLE |
|---------------------|------------|--|--|--|
| Mon Aug 24 | | NO SEMINAR | | |
| Thurs Aug 27 | | NO SEMINAR | | |
| Thurs Sep 3 | CMB | Dr. Ted Able Host: Dr. Greg Florant | CANCELLED | |
| Mon Sep 07 | BMB | NO SEMINAR | | |
| Fri Sept 11 | CMB | Dr. Bert Selmer Host: Erica Suchman | University of California - Irvine School of Medicine | Viral Subversion of Host Functions During Picornavirus Replication |
| Thurs Sep 17 | CMB | Dr. Dave Kovar Host: Dr. Jim Bamburg | University of Chicago | Formin-Mediated Actin Assembly for Cell Division in Yeast and Worms |
| Thurs Sep 24 | CMB | Dr. Amit Mitra Host: Dr. Rajinder Ranu | University of Nebraska - Lincoln | Direct Repeat Induced Gene Silencing in Plants |
| Mon Sep 28 | BMB | Dr. Michael Shogren-Knaak Host: Jeff Hansen | Iowa State University | The Role of Cooperative Nucleosome acetylation in Regulating Inducible Gene Expression |
| Wed Oct 7 | CMB | Frontiers Dr. Paul J. Anderson | | Polysomes, P-bodies and Stress Granules: Spatial Control of mRNA Translation/Decay |
| Mon Oct 12 | BMB | NO SEMINAR | | |
| Thur Oct 22 | CMB | Dr. Chris Allen Host: Dr. Jac Nickoloff | University of New Mexico School of Medicine | High Throughput Flow Cytometric Screening for Chemical Probe Discovery - Developing a Collaborative Pipeline in the NIH Roadmap Initiative |
| Fri Oct 23 | CMB/MIP | Dr. Erik Sontheimer Host: Jeff Wilusz | Northwestern University | Roles and Mechanisms of CRISPR Interference in Staphylococci |
| Mon Oct 26 | BMB | Dr. Martin Bisaillon Host: Dr. Brian Geiss | University of Montreal | Molecular Modeling Studies & Nucleotide Analogs to Understand Enzymes Involved in RNA Cap Synthesis |
| Thur Nov 5 | CMB | Dr. Jozsef Vigh | CSU - Biomedical Sciences | Visual Information Processing by Retinal Bipolar Cells |
| Mon Nov 9 | BMB | Dr. Joaquin Maximilliano Espinosa Host: Sarah Lee | Howard Huges Medical Institute, CU Boulder | Mechanisms of Transcriptional Regulation in the Serum Response and p53 Networks |
| Thurs Nov 19 | CMB | Dr. George Seidel | CSU - Biomedical Sciences | The National Academy of Sciences - How it functions; what it does. |

SPRING 2010 SEMINAR SPEAKERS

| DATE | | SPEAKER AND HOST | SPEAKER AFFILIATION | SEMINAR TITLE |
|-------------------------|-----|---|--|--|
| Thurs Jan 21 | | CMB faculty meeting | | |
| Thurs Jan 28 | CMB | Dr. Julian Schroeder Host: Dr. Dan Bush | University of California - San Diego | Early Atmospheric CO ₂ Sensing and Abscisic Acid Signaling Mechanisms in Plants |
| Thurs Feb 4 | CMB | NO SEMINAR | | |
| Mon Feb 08 | BMB | Dr. Brian McNaughton Host: Dr. P. Shing Ho | CSU - Chemistry | Advances in RNA - Targeting: From Small Molecule Discovery to siRNA Delivery |
| Wed Feb 17 | | Frontiers in Biomedical Sciences: Dr. Tom Cech | Colorado University - Boulder | Crawling Out of the RNA World: Telomerase and Telomeres |
| Mon Feb 22 | BMB | Dr. Aaron Hieb Host: Dr. Karolin Luger | CSU - Guest Faculty | Transcription Factor Accessibility; One Molecule at a Time |
| Thurs Mar 4 | CMB | Dr. John Volckens | CSU - Environmental & Radiological Health Sciences | An In Vitro Lung Model for Aerosol Research: Potential Applications in Toxicology, Global Health, and Infectious Disease |
| Mon Mar 08 | BMB | Dr. P Andrew Karplus Host: Shing Ho | Oregon State University | From Peroxide Signaling to Pi-helices: The Power of an Evolutionary Perspective on Protein Structure |
| Mon Mar 22 | | NO SEMINAR | | |
| Thurs Mar 25 | CMB | Dr. Paula Cohen Host: Lorrie Anderson | Cornell University | In Search of an Integrated View of Meiotic Recombination in the Mouse |
| Mon Mar 29 | BMB | Dr. Jeffrey Kieft Host: Dr. Olve Peersen | University of Colorado Medical School | |
| Thurs Apr 8 | CMB | Dr. Jackie Shanks Host: Ken Reardon | Iowa State University | CANCELLED |
| Mon Apr 12 | | NO SEMINAR | | |
| Thurs April 22 | CMB | Dr. James Quigley Host: Luke Wittenburg | The Scripps Research Institute | Tumor Cell Intravasation. The Understudied Step in the Metastatic Cascade |
| Mon Apr 26 | BMB | Dr. Eric O. Freed Host: Dr. Chaoping Chen | Chief, Virus-Cell Interaction Section, NIH | HIV Assembly, Release, and Maturation |
| Mon May 3 | BMB | Dr. Rui Zhao Host: Dr. Karolin Luger | University of Colorado - Denver | Structure, Mechanism, and Regulation of Spliceosomal Proteins Prp8 and Brr2 |
| Mon May 10 | | Dr. Marcy Osgood Host: Nicholas Clark | University of New Mexico Health Science Center | An Alternate Paradigm? Scientific Teaching, and education research, as component of an Academic Career |

Major Accomplishments:

The CMB Webpage (<http://www.cmb.colostate.edu/>) attracts a large number of hits. More to the point, when one runs a Google search for “Cell and Molecular Biology graduate programs” the CSU CMB program comes up fifth from the top (not including gradschoools.com). In addition, recent questionnaires, administered to our graduate students and program applicants, indicated that most of them identified potential programs through the Internet. Therefore, the CMB Website has probably contributed to the increased number of outstanding applicants to the program.

In 2008, the CMB Program developed a concentration in Cancer Biology. This program has attracted foundation and university AEP funding that supports fellowships for recruiting additional PhD and DVM/PhD students. Students in the Cancer Biology concentration complete additional courses (see **table 2 Additional Cancer Biology Courses** and <http://www.colostate.edu/Depts/CMB/Cancerbiology1.html>).

Table 2. Additional requirements for Cancer Cell Biology (min. 5 credits from this list)

| Course | Title | Credits |
|---------------|-----------------------------------|----------------|
| ERHS 510 | Cancer Biology | 3 |
| ERHS 611 | Cancer Genetics | 2 |
| VS 780 | Cancer Biology Clinical Practicum | 2 |
| ERHS 733 | Environmental Carcinogenesis | 3 |

CMB Budget 2009-2010

ALLOCATED TO CMB BUDGET

| | |
|--------------------------|-----------------|
| base budget | \$103,752 |
| rollover/adjustments | \$10,000 |
| GTA from Graduate School | <u>\$16,440</u> |

TOTAL \$130,192

EXPENDITURES

| | Budgeted | Expended |
|---|-----------|-----------|
| ADMINISTRATION | | |
| Director (2 months) | \$23,900 | \$28,975 |
| Administrative Asst III (10 months) | \$29,389 | \$29,168 |
| | | |
| SEMINAR PROGRAM | \$11,000 | \$11,953 |
| | | |
| TEACHING | | |
| NB502/CM502 | \$2,275 | \$2,399 |
| | | |
| OFFICE OPERATIONS | \$10,000 | \$11,574 |
| copying, phone, postage, etc | | |
| | | |
| STUDENT STIPENDS/TUITION | | |
| GTA (CVMBS) | \$22,000 | \$24,849 |
| | | |
| STUDENT RECRUITMENT | \$8,400 | \$7,186 |
| | | |
| EDUCATIONAL OUTREACH & INTERACTION | \$9,105 | \$3,448 |
| poster contest, research meetings, etc. | | |
| | | |
| TUITION | - | - |
| | | |
| TOTAL | \$121,145 | \$119,552 |
| | | |
| Roll Forward | | \$10,640 |

Annual CMB Budget for 2000 through 2008

| | 2002-03 | 2003-04 | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 |
|---------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Personnel | 75,758 | 77,538 | 84,479 | 72,353 | 92,985 | 92,985 | 79,206 | 86,690 |
| Operating Expenses | 45,500 | 44,850 | 40,500 | 54,586 | 41,629 | 41,629 | 49,976 | 32,862 |
| Total | 121,258 | 122,388 | 124,979 | 126,939 | 134,614 | 134,614 | 129,182 | 119,552 |