

Cell and Molecular Biology Graduate Program

Annual Report

July 1, 2012 to June 30, 2014

The Colorado State University Cell and Molecular Biology Graduate Program (CMB) is a graduate recruitment, admissions and degree conferring program. CMB consists of faculty members from five colleges and 12 departments whose research programs focus on the molecular and cellular aspects of cancer biology, infectious disease, metabolism (includes biofuels), neuroscience, plant biology, molecular physiology, gene expression, reproductive biology, developmental biology, computational biology and genomics, and structural biology. Due to the broad range of well-funded research laboratories to work in, CMB attracts a large number of highly qualified applications each year. The current CMB student body consists of 10 MS and 61 PhD students conducting their research in laboratories of the CMB Faculty Members.

FACULTY

The excellence of the scholarly activities of the CMB Faculty has been acknowledged through many prestigious honors, awards, appointments and speaking invitations (CSU, national and international), journal editorial positions, leadership roles in scientific workshops, conferences and grant review panels and patent awards.

The faculty members in the CMB Graduate Program have garnered a wide array of prestigious CSU, national and international awards and honors through their careers as professors and scientists. Examples particularly worth noting are several Pew Scholars, an HHMI Investigator, CSU Monfort Professors, Pennock Service Awardees, Cermack Advising Awardees and College of Natural Sciences Professor Laureates. CMB faculty members are often invited to speak at other institutions in the U.S. and abroad, as well as at national and international scientific conferences. Most CMB faculty members serve as manuscript and grant application reviewers, often as editors and committee chairs. A large proportion of the CMB faculty members have leadership roles in scientific societies and as organizers of national and international scientific symposia. On average, CMB faculty members have published 17 journal articles and have been cited 232 times (9.4 times per article) since 2006. The CMB faculty members are well funded with an average of \$1,677,042 in funding per faculty member from 2006 to 2011, or \$335,409 per faculty per year (more recent data not available). Finally, a large number of CMB faculty members collaborate with researchers from across the U.S. and the world. Similarly, they are able to attract postdoctoral fellows nationally and internationally.

The faculty membership 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. In the last two years, 10 faculty joined the CMB program, 7 left, and the total has increased to 102 members. The faculty of the CMB program as of June 30, 2014, and their departmental affiliations are listed below:

<u>Name</u>	<u>Department</u>
Ramesh Akkina	Microbiology, Immunology & Pathology
Gregory Amberg	Biomedical Sciences
Lorinda Anderson	Biology
Lucas Argueso	Environmental & Radiological Health Sciences
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
Brad Borlee	Microbiology, Immunology & Pathology
Gerrit Bouma	Biomedical Sciences
Mark Brown	Clinical Sciences
Daniel Bush	Biology

Chaoping Chen	Biochemistry & Molecular Biology
Adam Chicco	Health & Exercise Science
Colin Clay	Biomedical Sciences
Robert Cohen	Biochemistry & Molecular Biology
Debbie Crans	Chemistry
Dean Crick	Microbiology, Immunology & Pathology
Norman Curthoys	Biochemistry & Molecular Biology
Jennifer DeLuca	Biochemistry & Molecular Biology
Santiago Di Pietro	Biochemistry & Molecular Biology
Steven Dow	Clinical Sciences
Dawn Duval	Clinical Sciences
EJ Ehrhart	Microbiology, Immunology & Pathology
Nicole Ehrhart	Clinical Sciences
Gregory Florant	Biology
Yumei Feng	Biomedical Sciences
Michelle Foster	Food Science & Human Nutrition
David Frisbie	Clinical Sciences
Deborah Garrity	Biology
Brian Geiss	Microbiology, Immunology & Pathology
Chris Gentile	Food Science & Human Nutrition
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
Kim Hoke	Biology
Shane Kanatous	Biology
Takamitsu Kato	Environmental & Radiological Health Sciences
John Kisiday	Clinical Sciences
Susan Kraft	Environmental & Radiological Health Sciences
Susan LaRue	Environmental & Radiological Health Sciences
Paul Laybourn	Biochemistry & Molecular Biology
Jan Leach	Bioagricultural Sciences & Pest Management
Howard Liber	Environmental & Radiological Health Sciences
Karolin Luger	Biochemistry & Molecular Biology
June Medford	Biology
Benjamin Miller	Health & Exercise Sciences
Taiowa Montgomery	Biology
Paul Morley	Clinical Sciences
Rachel Mueller	Biology
Donald Mykles	Biology
Jac Nickoloff	Environmental & Radiological Health Sciences
Jennifer Nyborg	Biochemistry & Molecular Biology
Rodney Page	Clinical Sciences
Michael Pagliosotti	Food Science & Human Nutrition
Christie Peebles	Chemical & Biological Engineering
Graham Peers	Biology
Olve Peersen	Biochemistry & Molecular Biology
Marinus Pilon	Biology
Ashok Prasad	Chemical & Biological Engineering
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	Environmental & Radiological Health Sciences
Tom Santangelo	Biochemistry & Molecular Biology
Herbert Schweizer	Microbiology, Immunology & Pathology
George Seidel, Jr.	Biomedical Sciences
Richard Slayden	Microbiology, Immunology & Pathology
Dan Sloan	Biology
Stephen Stack	Biology
Laurie Stargell	Biochemistry & Molecular Biology
Erica Suchman	Microbiology, Immunology & Pathology
Michael Tamkun	Biomedical Sciences
Glenn Telling	Microbiology, Immunology & Pathology
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
Tiffany Weir	Food Science & Human Nutrition
Philip Westra	Bioagricultural Sciences & Pest Management
Claudia Wiese	Environmental & Radiological Health Sciences
Carol Wilusz	Microbiology, Immunology & Pathology
Jeffrey Wilusz	Microbiology, Immunology & Pathology
Stephen Withrow	Clinical Sciences
Raymond Yang	Environmental & Radiological Health Sciences
Tingting Yao	Biochemistry & Molecular Biology
Mark Zabel	Microbiology, Immunology & Pathology

Affiliate Faculty: from outside CSU.

<u>Name</u>	<u>Institution</u>
Andrew Thorburn	University of Colorado, School of Medicine
Haley Tucker	University of Texas Austin
Laura Hungerford	University of Maryland, School of Medicine
Sandra Bonetti	Colorado State University, Pueblo

Faculty Composition – College and Department

College of Agricultural Sciences (4%)

Bioagricultural and Pest Management: 2 faculty

Horticulture and Landscape Architecture: 2 faculty

College of Engineering (3%)

Chemical and Biological Engineering: 3 faculty

College of Health and Human Sciences (8%)

Food Science and Human Nutrition: 4 faculty

Health & Exercise Science: 4 faculty

College of Natural Sciences (34%)

Biochemistry & Molecular Biology: 15 faculty

Biology: 16 faculty

Chemistry: 3 faculty

College of Veterinary Medicine and Biomedical Sciences (53%)

Biomedical Sciences: 10 faculty

Clinical Sciences: 12 faculty

Environmental & Radiological Health Sciences: 16 faculty

Microbiology, Immunology & Pathology: 15 faculty

STUDENTS

The CMB Graduate Program currently oversees 71 graduate students (8 MS students and 63 PhD students) conducting research in labs distributed throughout the five colleges represented by our faculty members.

Current Students (as of Sep 1, 2014):

<u>Name</u>	<u>Degree</u>	<u>Advisor</u>	<u>Date Admitted</u>
Amira Hameed Abdel	Ph.D.	Anireddy Reddy	Fall 2013
Mario Aguiar	Ph.D.	Ken Reardon (MAS)	Fall 2011
Guadalupe Aguirre	Ph.D.	Marinus Pilon (MAS)	Fall 2011
Elizabeth Akin	Ph.D.	Mike Tamkun	Fall 2010
Mohammed Albaqami	Ph.D.	Anireddy Reddy	Fall 2013
Stevan Albers	Ph.D.	Ken Reardon	Fall 2010
Rasha Alnefaie	Ph.D.	Deborah Garrity	Fall 2012
Duaa Althumairy	M.S.	Deborah Roess	Fall 2013
Taghreed Alturki	Ph.D.	Susan Bailey	Spring 2013
Nouf Alyami	Ph.D.	Dawn Duval	Fall 2013
Zeyad Arhouma	Ph.D.	Debbie Crans	Spring 2014
Hanan Ashanta	M.S.	Deborah Roess	Spring 2011
Nadia Ashwish	Ph.D.	Deborah Roess	Spring 2009
Rebecca Barnard	Ph.D.	Dan Gustafson	Fall 2010
Thomas Bickett	Ph.D.	Howard Liber*	Fall 2014
Srinivasa Boddeda	Ph.D.	Ramesh Akkina	Spring 2011
Kristen Brown	Ph.D.	Taiowa Montgomery	Fall 2013
Michael Caballero	Ph.D.	Graham Peers	Fall 2011
James Carsella	Ph.D.	Debbie Crans	Fall 2011
Paige Charlins	Ph.D.	Ramesh Akkina	Fall 2013
Lyndah Chow	Ph.D.	Steve Dow	Fall 2014
Stephen Cohen	Ph.D.	Jan Leach	Fall 2013
Hailey Conover	Ph.D.	Lucas Argueso	Fall 2014
Kathy Cosenza	Ph.D.	Don Mykles	Fall 2008
Deanna Dailey	Ph.D.	Dawn Duval	Fall 2011
Abdunaser Eadaim	Ph.D.	Howard Liber *	Fall 2014
Melissa Edwards	Ph.D.	Mark Brown	Fall 2011
Mustafa Elrlmy	Ph.D.	Deborah Roess	Spring 2011
Laura Epple	Ph.D.	Barbara Biller	Fall 2009

Kristen Farrell	Ph.D.	Santiago Di Pietro	Fall 2010
John Fitts	M.S.	Deborah Garrity	Fall 2009
Fabio Fontes	Ph.D.	Debbie Crans	Spring 2012
Jared Fowles	Ph.D.	Dan Gustafson	Fall 2007
Phillip Fox	Ph.D.	Mike Tamkun	Fall 2009
Scott Fulbright	Ph.D.	Stephen Chisholm	Fall 2009
Genevieve Go	M.S.	Stephen Dow	Spring 2014
Guima Hadhoud	M.S.	Deborah Roess	Fall 2010
Sean Hammond	Ph.D.	Ron Tjalkens	Fall 2012
Victoria Harcy	Ph.D.	Lucas Argueso	Fall 2010
Adam Heck	Ph.D.	Taiowa Montgomery*	Fall 2014
Shuang Hu	Ph.D.	Ramesh Akkina	Spring 2012
Toru Ishii	Ph.D.	Glenn Telling	Fall 2009
Aimee Jalkanen	Ph.D.	Carol Wilusz	Fall 2011
Sarah Kane	Ph.D.	Mark Zabel	Fall 2013
Laird Klippenstein	Ph.D.	Daniel Gustafson	Fall 2014
Jillian Lang	Ph.D.	Jan Leach	Fall 2012
Nesrein Layas	M.S.	Deborah Roess	Spring 2014
Junko Maeda	Ph.D.	Takamitsu Kato	Fall 2011
Shawna Matthews	Ph.D.	Henry Thompson	Fall 2009
Miles McKenna	Ph.D.	Susan Bailey	Fall 2012
Stephanie Morphet	Ph.D.	John Belisle	Fall 2013
Christopher Nelson	Ph.D.	Susan Bailey	Fall 2011
Jingyi Nie	Ph.D.	Jac Nickoloff	Fall 2008
Donasian Ochola	Ph.D.	Mike Weil	Fall 2009
Natalie Pitts	Ph.D.	Don Mykles	Fall 2010
Katriana Popichak	Ph.D.	Ron Tjalkens	Fall 2012
Laylaa Ramos	M.S.	M. Gonzalez-Juarrero	Fall 2014
Kate Rockenbach	Ph.D.	Howard Liber*	Fall 2014
Audrey Ruple	Ph.D.	Paul Morley	Spring 2010
Nadia Sampaio	Ph.D.	Lucas Argueso	Fall 2013
Tara Schumacher	M.S.	Ken Reardon	Fall 2006
Vanessa Selwyn	Ph.D.	Glenn Telling	Spring 2013
Karima Shebani	M.S.	Deborah Roess	Spring 2014
Cory Sicard	Ph.D.	Jac Nickoloff	Fall 2012
Joshua Svendsen	Ph.D.	Howard Liber*	Fall 2014
Eric Tauchman	Ph.D.	Jennifer DeLuca	Fall 2009
Christopher Van Horn	Ph.D.	Philip Westra	Fall 2011
Melina Veselinovik	Ph.D.	Ramesh Akkina	Spring 2012
Keifer Walsh	M.S.	Jim Bamburg	
Molly Zeller	M.S.	Deborah Garrity	Fall 2011
Annie Zhang	Ph.D.	Carol Wilusz	Fall 2012
Allison Zimont	Ph.D.	Christie Peebles/ Graham Peers	Fall 2014

* Temporary advisor

CMB Graduate Student Composition – Association with College and Department

College of Agricultural Science (5.6%)

Bioagricultural Science and Pest Management: 3 students

Horticulture and Landscape Architecture: 1 student

College of Engineering (7%)

Chemical and Biological Engineering: 5 students

College of Health & Human Sciences (0%)

College of Natural Sciences (21%)

Biochemistry and Molecular Biology: 2 students

Biology: 10 students
 Chemistry: 3 students
 College of Veterinary Medicine and Biomedical Sciences (58%)
 Biomedical Sciences: 9 students
 Clinical Sciences: 9 students
 Environmental and Radiological Health Sciences: 12 students
 Microbiology, Immunology and Pathology: 12 students

Five students are rotating through laboratories and are not yet affiliated with a College/Department.

Distributions of CMB Graduate Students

Student Category	Number	Percent
Degree Program		
MS	8	11
PhD	63	89
Gender		
Male	29	41
Female	42	59
Ethnicity		
Asian American	2	3
African American	2	3
Native American	1	1
Hispanic	6	9
Caucasian	35	49
International	25	35

The above table shows a breakdown of CMB students by degree program, gender and ethnicity as of fall 2014. Among US citizens and residents, 9/46 (20%) students are URMs.

Recruitment of URM applicants is key to increasing the proportion of URM students in our program. Direct, active recruitment of URM students is the most effective approach. Carol Wilusz, Chair of the Academic Committee, was funded through the Graduate School and the AGEP program to travel to the University of Puerto Rico – Rio Piedras in October 2013 specifically for graduate recruiting. She met with and encouraged several groups of students at various stages of their undergraduate degree to apply to CSU and particularly the CMB program. We hope to see some applications for fall 2015. We applied for a GAANN Fellowship Grant from the Department of Education in 2012, and this was awarded in August 2014. In fact, the goal of this program is to improve retention and recruitment of under-represented minorities (URM) including women.

While there has been a steady improvement in minority graduate student recruitment, a sustained effort and commitment over decades will be required to achieve parity with the proportion of URMs in the U.S. and Colorado population.

Composition of CMB Student Body by Ethnicity and Gender, Over Time

Ethnicity/Race/Gender	Fall 2006	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
Native American Male	0	0	0	0	0	0	0	0

Native American Female	0	0	3	2	1	0	0	1
Black Male	0	0	0	1	1	1	1	1
Black Female	0	0	1	1	0	1	1	1
Asian American Male	3	3	3	2	0	0	0	0
Asian American Female	2	2	3	3	3	2	2	1
Hispanic Male	0	1	1	1	2	4	3	2
Hispanic Female	0	0	1	2	3	3	3	6
White Male	17	18	14	17	17	12	16	18
White Female	24	18	13	12	16	16	19	19
International Male	6	7	9	8	9	9	13	10
International Female	7	5	5	8	8	12	12	17
Other Male	0	0	0	0	0	0	0	0
Other Female	0	0	0	0	0	0	0	0

Graduate Student Success

The table below shows that the great majority of students earn a degree from the CMB Program. For the most part, this success should be attributed to the committed CMB Faculty advisors and the quality and commitment of our students to science. Students that do leave generally do so for personal reasons or upon finding that biomedical research in graduate school is not for them.

Retention of Graduate Students in the CMB Program

Entering Year*	Number Enrolled	Still in Program	Earned PhD	Earned MS	Left No Degree	Reason for leaving
2007	9	1	4	3	1	graduate school not good fit
2008	12	2	6	2	2	1 moved for fiancé 1 academic dismissal
2009	18	9	3	4	2	1 graduate school not good fit 1 family emergency
2010	15	8	2	4	1	to become a nun
2011	17	14	0	3	0	
2012	13	10	0	2	1	graduate school not good fit
2013	13	12	0	0	1	Transfer/CSU not a good fit

* These data are for calendar year of entry in the program

One measure of graduate student success is scientific publications. Among 21 students who earned their M.S. degree between 2009 and 2014, there have been 13 papers published. In that same time period, 32 students earned their Ph.D. Among these graduates, 28 have produced 109 scientific papers; thus the average is 3.4 per person. And more should be coming, especially from students who graduated in the last year or so.

Upon graduation CMB students go on to successful careers in science. Of the 40 CMB Ph.D. Program graduates since 2006, four have a faculty position; 14 have research scientist or professional scientist (DVM, forensics, biotechnology) positions, one is in scientific equipment sales, and 18 are now postdoctoral fellows.

Graduated Students

A total of 17 students received degrees between July 1, 2012 and June 30, 2014; 7 were M.S. and 10 were Ph.D. A complete list of students who have graduated from CMB is shown below.

<u>Name</u>	<u>Degree</u>	<u>Advisor</u>	<u>Graduated</u>
Brie Hawley	Ph.D.	John Volckens	Summer 2014
Chuck Halsey	Ph.D.	Dan Gustafson	Summer 2014

Vanessa Enriquez	Ph.D.	Gerritt Bouma	Summer 2014
Elwiah Alhashim	M.S.	Deborah Roess	Summer 2014
Jordan Steel	Ph.D.	Brian Geiss	Spring 2014
Theo Gurol	M.S.	J. Lucas Argueso	Spring 2014
Krystle Frahm	Ph.D.	Stu Tobet	Spring 2014
Fatima Alheji	M.S.	Deborah Roess	Spring 2014
Zeyad El Rafadi	M.S.	Howard Liber	Fall 2013
Ahmed Elbakush	M.S.	Debbie Crans	Fall 2013
Alejandro Trujillo	Ph.D.	Debbie Crans	Fall 2013
Rema Saad	M.S.	Howard Liber	Fall 2013
Ashley Neff	Ph.D.	Carol Wilusz	Fall 2013
Zobaida Ben Musa	Ph.D.	Eric Ross	Fall 2013
Hiroto Yoshikawa	Ph.D.	Sue LaRue	Summer 2013
Catherine Le	Ph.D.	Matt Hickey	Summer 2013
Michael Barnhart	M.S.	Jeff Wilusz	Spring 2013
Matt Stratton	Ph.D.	Stu Tobet	Fall 2012
Jennifer Arab	M.S.	Ramesh Akkina	Fall 2012
Lakshmi Gummadi	Ph.D.	Norman Curthoys	Summer 2012
Nasir Jalal	Ph.D.	Howard Liber	Summer 2012
Phuong Le	Ph.D.	Susan Bailey	Spring 2012
Abdunaser Eadaim	M.S.	Susan Bailey	Spring 2012
Mia (Melissa) Routh	M.S.	Adam Chicco	Spring 2012
Hoda Shnaishah	M.S.	Deborah Roess	Fall 2011
Luke Kingry	Ph.D.	Richard Slayden	Fall 2011
Preston Neff	Ph.D.	Ramesh Akkina	Fall 2011
Hoda Shnaishah	M.S.	Deborah Roess	Fall 2011
Samantha Roth	M.S.	Don Mykles	Fall 2011
Peter Winter	Ph.D.	George Barisas	Fall 2011
Scott Hafeman	Ph.D.	Steven Dow	Summer 2011
Jerome Lee	Ph.D.	Carol Wilusz	Summer 2011
Chelsea Roan	M.S.	Deborah Roess	Summer 2011
Dezaray Varland	M.S.	Jozsef Vigh	Summer 2011
Shawna Campbell	M.S.	June Medford	Spring 2011
Ryan Dregalla	Ph.D.	Susan Bailey	Spring 2011
Fumi Sagawa	M.S.	Jeff Wilusz	Spring 2011
Scott Walmsley	Ph.D.	Norm Curthoys	Spring 2011
Aida Ulloa	Ph.D.	Barbara Sandborn	Fall 2010
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.	M. 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 Dernell	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
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 Griffith	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-Khour	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

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
MS Total Male	3	1	1	3	0	1	0	1	2
MS Total Female	3	2	4	2	2	1	3	1	3
MS Total % Minority	17%	0	0	20%	0	50%	33%	0	20%
PhD Total Male	3	2	5	4	5	4	4	2	3
PhD Total Female	4	4	5	6	0	1	1	1	5
PhD Total %Minority	0	17%	0	0	0	20%	0%	0	50%

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

Unit Level & Gender	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	
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	1	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	2	0	0	0	0	0
Asian American Female	0	0	0	0	0	0	0	1	0	0
Hispanic Male	0	1	0	0	0	0	0	0	0	1
Hispanic Female	0	0	0	0	0	0	0	1	0	0
Non-Minority Male	1	2	1	0	1	0	0	0	1	1
Non-Minority Female	1	3	2	0	2	2	2	1	1	3
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	1	0	0
Black Female	0	0	0	0	0	0	0	0	0	0
Asian American Male	0	0	0	0	1	1	0	0	1	0
Asian American Fem.	0	0	1	0	0	0	1	0	1	1
Hispanic Male	0	0	0	0	0	0	0	0	0	1
Hispanic Female	0	0	1	0	0	0	0	0	0	2
Non-Minority Male	0	4	1	3	2	0	3	0	1	3
Non-Minority Female	0	2	1	4	3	0	6	1	0	2

ADMINISTRATION & COMMITTEE MEMBERS

The CMB program is jointly administered by the Dean of the Graduate School and the Deans of the College of Veterinary Medicine and Biomedical Sciences and the College of Natural Sciences. The Director is Dr. Howard Liber. There are four standing committees with responsibilities for different areas of the program. The members of the standing committees are listed below. The Steering Committee is the major policy-making committee and consists of the chairs of each of the four standing committees.

Academic Committee 2012-2013

Chair *Dr. Carol Wilusz*, Department of Microbiology, Immunology & Pathology
Dr. Doug Thamm, Department of Clinical Sciences
Dr. Deb Roess, Department of Biomedical Sciences
Dr. Karyn Hamilton, Department of Health & Exercise Sciences
Krystle Frahm (student)
Shawna Matthews (student)

Research Committee 2012-2013

Chair: *Dr. Mark Zabel*, Department of Microbiology, Immunology & Pathology
Dr. Debbie Garrity, Department of Biology
Dr. Chris Gentile, Department of Food Science & Human Nutrition
Dr. Joseph Vigh, Department of Biomedical Sciences
Ashley Neff (student)
Donasian Ochola (student)

Admissions Committee 2012-2013

Chair: *Dr. Paul Laybourn*, Department of Biochemistry and Molecular Biology
Dr. Ben Miller, Department of Health & Exercise Sciences
Dr. Mark Brown, Department of Clinical Sciences
Dr. Lucas Argueso, Department of Environmental & Radiological Health Sciences

Seminar Committee 2012-2013

Chair: *Dr. Debbie Crans*, Department of Chemistry
Dr. Tiffany Weir, Department of Food Science & Human Nutrition
Dr. Noreen Reist, Department of Biomedical Sciences
Dr. Ashok Prasad, Department of Chemical & Biological Engineering
Eric Tauchman (student)
Jillian Lang (student)

Steering Committee (2012-13)

Chair *Dr. Paul Laybourn*, Department of Biochemistry & Molecular Biology
Dr. Carol Wilusz, Department of Microbiology, Immunology & Pathology
Dr. Mark Zabel, Department of Microbiology, Immunology & Pathology
Dr. Debbie Crans, Department of Chemistry

Academic Committee 2013-2014

Chair: *Dr. Carol Wilusz*, Department of Microbiology, Immunology & Pathology
Dr. Doug Thamm, Department of Clinical Sciences

Dr. Deb Roess, Department of Biomedical Sciences
Dr. Karyn Hamilton, Department of Health & Exercise Sciences
Vacant (student)
Shawna Matthews (student)

Research Committee 2013-2014

Chair: *Dr. Mark Zabel*, Department of Microbiology, Immunology & Pathology
Dr. Debbie Garrity, Department of Biology
Dr. Chris Gentile, Department of Food Science & Human Nutrition
Dr. Joseph Vigh, Department of Biomedical Sciences
Vacant (student)
Donasian Ochola (student)

Admissions Committee 2013-2014

Chair: *Dr. Lucas Argueso*, Department of Environmental & Radiological Health Sciences
Dr. Ben Miller, Department of Health & Exercise Sciences
Dr. Mark Brown, Department of Clinical Sciences
Dr. Dawn Duval, Department of Clinical Sciences

Seminar Committee 2013-2014

Chair: *Dr. Debbie Crans*, Department of Chemistry
Dr. Tiffany Weir, Department of Food Science & Human Nutrition
Dr. Noreen Reist, Department of Biomedical Sciences
Dr. Ashok Prasad, Department of Chemical & Biological Engineering
Eric Tauchman (student)
Jillian Lang (student)

Steering Committee (2013-2014)

Chair: *Dr. Howard Liber*, Department of Environmental & Radiological Health Sciences
Dr. Carol Wilusz, Department of Microbiology, Immunology & Pathology
Dr. Mark Zabel, Department of Microbiology, Immunology & Pathology
Dr. Debbie Crans, Department of Chemistry

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 the annual CMB Research Symposium and co-sponsorship of the Frontiers of Science Seminar Series. Prospective new students were invited to visit campus at the same time as the symposium so they could meet many of the faculty members and students and constituted a key component of our recruitment activities.

Poster Competition 2013

The Annual Cell and Molecular Biology Symposium was held on Friday, February 22, 2013 from 3:00 - 6:00 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. 90 posters were presented. Of those posters, all but three were judged. Two judges reviewed each poster. Two Highest Honors award, three High Honors awards, six Honors awards and eight Honorable Mention awards were given to graduate student poster presenters. In addition, one postdoc Highest honors and two post-doc honorable mention awards were given out.

The Post-doctoral Awards were:

Highest Honors

Albert Gonzales Biomedical Sciences

Honorable Mention

Uma Muthurajan Biochemistry & Molecular Biology
Kelly Resmer Microbiology, Immunology & Pathology

The Graduate Student Awards were:

Highest Honors

Francesco Scanvone Biochemistry & Molecular Biology
Matthew Scholfield Biochemistry & Molecular Biology

High Honors

Jared Fowles Cell & Molecular Biology
Elizabeth Akin Cell & Molecular Biology
Charles Hoxmeier Microbiology, Immunology & Pathology

Honors

Milena Veselinovic Cell & Molecular Biology
Michelle Sullivan Molecular, Cellular & Integrative Neurosciences
Briana Trout Molecular, Cellular & Integrative Neurosciences
Ling Zhang Biochemistry & Molecular Biology
Daniel Feliciano Biochemistry & Molecular Biology
Daniel Krzizike Biochemistry & Molecular Biology

Honorable Mention

Deanna Dailey Cell & Molecular Biology
Shawna Matthews Cell & Molecular Biology
Jordan Steel Cell & Molecular Biology
Lindsey Long Biochemistry & Molecular Biology
Luisa Nietro Microbiology, Immunology & Pathology
Scott Fulbright Cell & Molecular Biology
Ashley Neff Cell & Molecular Biology
Claire Birkenheuer Microbiology, Immunology & Pathology

The Annual Cell and Molecular Biology Symposium was held on Friday, February 28, 2014 from 3:00 - 6:00 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 55 applicants to the CMB, MCIN, Biochemistry and Microbiology graduate programs attended the symposium. 94 posters were presented. Of those posters, all but two were judged. Two judges reviewed each poster. One Highest Honors award awards and fifteen Honors awards were given to graduate student poster presenters. In addition, two postdoc Highest

honors awards were given out. The Research Committee members, Drs. Zabel, Garrity, Gentile and Vigh wish to thank all of the contributors, the judges, and those who visited the CMB Student Poster Competition for contributing to its success.

The Post-doctoral Awards were:

Highest Honors

Lisa Wolfe	Microbiology, Immunology & Pathology
Stephen Coleman	Microbiology, Immunology & Pathology

The Graduate Student Awards were:

Highest Honors

Krystle Frahm	Cell & Molecular Biology
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Honors

Shawna Matthews	Cell & Molecular Biology
Jordan Steel	Cell & Molecular Biology
Keifer Walsh	Cell & Molecular Biology
Jillian Lang	Cell & Molecular Biology
Sean Cascarina	Biochemistry & Molecular Biology
Michelle Sullivan	Biomedical Sciences
Mike Caballero	Cell & Molecular Biology
Vanessa Enriquez	Cell & Molecular Biology
Stephanie Moon	Microbiology, Immunology & Pathology
Lindsey Long	Biochemistry & Molecular Biology
Gina Caldas	Biochemistry & Molecular Biology
Ada Ndoja	Biochemistry & Molecular Biology
Thomas Tolsma	Biochemistry & Molecular Biology
Qian Zhang	Biochemistry & Molecular Biology
Sean Hammond	Cell & Molecular Biology

ACADEMIC COMMITTEE ACTIVITIES

CMB Courses Taught

FALL 2012/Fall 2013:

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

SPRING 2013/Spring 2014:

CM 601	Responsible Conduct in Cell and Molecular Biology	Paul Laybourn
CM 666	Science & Ethics	Bernie Roland
CM 792	Cell & Molecular Biology Seminar	Debbie Crans (coordinator)
CM 793	Seminar	Paul Laybourn/Howard Liber (coordinator)

A new 1-credit course, CM 700, Critical Analysis of Scientific Literature, was developed. This will meet each semester. Several faculty from different focus groups will guide students through the presentation and analyses of current papers.

See tables below for the current curriculum. CM 502 - Techniques in Cell Biology is now required for all students in the CMB Program. In addition, the Graduate Seminar course (CM

793) has been modified to create a venue for the review of each student's progress on his or her dissertation research each year through completion of the program. Briefly, the seminar presentation is coupled with a written progress report and a meeting with their advisory committee. At this same meeting the major advisor, in consultation with the advisory committee completes a progress evaluation form and submits it to the program Director. Finally, the program has instituted a requirement for PhD students to complete their preliminary (advance to candidacy) exam prior to the beginning of their fifth semester in the program. The Committee revised the format of the preliminary exam; the major change was that students now must write and defend an independently-prepared research proposal in an area related to, but not identical to their own. The Chair of the Academic Committee and/or the Director meets with all second year students early in the fall term to ensure that they completely understand the process. Briefly, the recommended process to complete the preliminary exam is now as follows:

1. The student completes the GS6 in the fall term of their second year, and with their advisor and committee, formulates a set of specific aims that will constitute their dissertation.
2. In the spring, they take a grant-writing course and develop their research proposal.
3. At the end of the spring semester, the research committee and Director of the CMB program meet with the student to (i) approve the proposal, (ii) discuss the format of the preliminary exam, and (iii) discuss the content of the independent proposal which will form the basis for the exam.
4. The preliminary exam should be held by the end of the following fall semester.

Courses for M.S. Degree

	Title
BC 563	Molecular Genetics
BC 565	Advanced Cell Biology
GRAD 550	STEM Communication
CM 502	Techniques in Cell & Molecular Biology
CM 510	Introduction to Cell & Molecular Biology
CM 595	Independent Study
CM 699	Thesis
CM 792	Cell and Molecular Biology Seminar
CM 793	Graduate Seminar
Ethics Elective*	At least 1 credit in Ethical Conduct of Science
Electives**	At least 4 credits in regular graduate level courses

Courses for the Ph.D.

	Title
BC 565	Advanced Cell Biology
BC 563	Molecular Genetics
GRAD 550	STEM Communication
CM 502	Techniques in Cell & Molecular Biology
CM 510	Introduction to Cell & Molecular Biology
CM 792	Cell and Molecular Biology Seminar – take 4 times
CM 793	Graduate Seminar - take 3 times
CM 795	Independent Study
CM 799	Dissertation
Ethics Elective*	At least 1 credit in Ethical Conduct of Science
Topics Elective*	At least 2 credits in Topics/Literature Review class
Statistics Elective*	At least 3 credits in graduate level Statistics

Writing Elective*	At least 1 credit in a graduate level Writing Class
Other Electives**	At least 6 credits in regular graduate level courses

Additional requirements for Cancer Biology (minimum 5 credits from this list, as electives)

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

Additional CMB Program Courses Offered

Course	Title	Credits
CM 520	Intracellular Proteolysis	3
CM 595	Independent Study	Variable
CM 699	Thesis	Variable
CM 640	Creative Science Writing	3
CM 700	Critical Analysis of Scientific Literature.	1
CM 701D	Radiation Cytogenetics	1
CM 701I	Planning Research Grant Proposals	2
CM 702B	Mammalian Cell Culture Techniques	1
CM 702C	Immunochemical Techniques	1
CM 702D	Radiation Cytogenetics	1
CM 702E	Flow Cytometry and Cell Sorting	2
CM 710	Techniques in Molecular Biology and Genetics	3
CM 784	Supervised College Teaching	Variable
CM 795	Independent Study (rotations)	Variable

The PhD degree program in Cell in Molecular Biology incorporates additional mechanisms for advising, guidance and tracking of progress. Initially, the program Director acts as the advisor for first year students before they identify a research advisor. The Director and the CMB Coordinator help the new students with their move to Fort Collins and navigating the university bureaucracy. CM 510, Introduction/Orientation to the Cell and Molecular Biology Graduate Program, is designed to provide much of their remaining orientation. In the week prior to the start of classes first year students attend a one hour group orientation to remind them of the program requirements and apprise them of key issues like health insurance, applying for Colorado residency, etc. This is followed by individual advising sessions for discussing class registration, individual issues, and their first laboratory rotation assignment. In the week before classes begin and the first two weeks of the semester there are five two hour sessions consisting of presentations by leading faculty in each of the eight research focus areas. In these sessions the students participate in discussions about potential research directions and projects, long-term career prospects and which laboratories have openings for a new student. In the final class period, the first year PhD program students describe their career path and goals. They also turn in a short paper on what they gained from the orientation course and where they are in formulating their long-term career goals. The program Director provides students feedback on both their talk and paper. A key purpose of the orientation course is to help the students identify the three laboratories for their rotations (approximately 10 week research projects; CM 795). The purpose of these rotations is to gain research experience and also for students to “try on” a lab and an advisor for good fit. They often function as a probationary period for the potential PhD advisor to evaluate the student’s skills, maturity and work ethic. By mid May of their first year,

most first year students identify a PhD advisor and begin working full time in their laboratory. Those few that have not yet found a permanent advisor can do a fourth rotation over the summer.

Before or early in the first semester of the second year the PhD program students are required to form a Graduate Advisory Committee (GAC) chaired by their research advisor and consisting of CMB faculty chosen for expertise useful for successful completion of their dissertation research. It is this committee that recommends what elective courses the student will be required to take. Most students take a grant proposal-writing course like CM 640, CM 7011 or BC 701. Most of the regular course work including electives suggested by their GAC as important background for their PhD project is completed in the second year. Before beginning their fifth semester, PhD program students must pass their advance to candidacy exam in which they orally defend a written independent research proposal (related to but not identical to their actual research project and demonstrate sufficient background knowledge in their chosen field.

In the remaining two to three years the students in the PhD program conduct their dissertation research, submit manuscripts to peer-review journals based on that research, and complete the program with the writing and defense of their dissertation. PhD candidate progress is tracked through participation in the CM 793 course. Students in the CMB PhD program must take this course at least once per year. In this course the students orally present their research progress. Other students and the program Director provide feedback on the quality of their presentation. Students are also required to notify their PhD advisor and Graduate Advisory Committee members of the date and time of their presentation, to submit a written progress report to their GAC members a week prior to their presentation, and to meet with their GAC within two weeks of their CM 793 presentation date. In this meeting the mentor, in consultation with the GAC members, completes a form evaluating the student's oral and written progress report and research progress. This form is submitted to the program Director and kept in the student's file. The student's progress is officially recorded through their grade in CM 793 and CM 799. Through this process students receive input on their research and feedback on their oral and written communication skills at least once per year. The goal is to avoid students getting "stuck behind a brick wall" in their research project and unexpectedly learning that their PhD advisor and GAC do not agree that they are ready to defend their dissertation. This process also provides a "paper trail" of the student's progress in the unfortunate event that a student is unable to successfully complete the PhD program.

Finally, the CMB program has established a Cell and Molecular Biology Student Association (CMBSA) that has been fully recognized by the CSU Student Association for several years. The CMBSA has been fortunate to have of a series of very active sets of officers. The CMBSA sponsors student organized career seminars and social activities throughout the year. The CMBSA is also an integral participant in our efforts to recruit new students to the CMB Graduate Program.

In 2005, the CMB Program developed a new specialization in Cancer Biology; this will be listed on transcripts and the diploma. 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 Additional Requirements for Cancer Biology in Appendix 2).

Each year several of the PhD students in the CMB Program are in the process of earning their DVM (essentially a DVM/PhD program) or already have their DVM. Most of these students are in the Cancer Biology Program, but a couple of these students are pathology residents. These students are clearly highly qualified and motivated. They also address a significant need for biomedical researchers using animal models to address human health issues, while at the same time addressing animal health issues.

ADMISSIONS COMMITTEE ACTIVITIES

The Admissions Committee reviews applications received by the CMB program and recommends whether to invite them to visit for an interview and whether to offer them admission into the program.

There were 95 applications to the CMB Graduate Program for admission for fall 2012 and 74 for fall 2013. During this two-year period, the program enrolled 21 new Ph.D. students and 4 new M.S. students. There were 114 applications for fall 2014; one M.S. and 9 Ph.D. students were enrolled.

For Academic Year:	2009-10	2010-11	2011-12	2012-13	2013-14
Applications	92	71	95	95	74
Offered Admission	12	22	14	16	14
Enrolled	9	17	12	11	14
% Enrolled	75%	77%	86%	69%	100%

The above table summarizes the number of applications received, offered admission, and enrolled over the past five academic years.

Semester Enrolled	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
Average Verbal	537	562	548	155	155
Average Quantitative	671	612	583	154	155
Average Analytical	4	4.5	3.70	4.08	3.90
Average GPA	3.58	3.68	3.34	3.33	3.45

The above table shows GRE scores and undergraduate GPAs for the students entering the program, over the last five years.

A critical component of our recruitment activities include inviting prospective new students (applicants strong enough to be interviewed) to visit campus the same weekend as the Annual Cell and Molecular Biology Poster Symposium so they can interact with the CMB faculty and students. This Symposium is held on the last Friday in February. The event is 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 PhD programs attended the symposium in 2011. This past spring, 67 posters were presented. During this same weekend, faculty members matching the applicants' research interests interview prospective students. The applicants are afforded opportunities to meet with graduate students in the program at dinners organized by the CMB Student Association. For many of the applicants, the highlight of the visit is a snowshoeing trip in Rocky Mountain National Park.

SEMINAR COMMITTEE ACTIVITIES:

The seminar committee solicits national and international speakers to present their latest research to the CMB students and faculty. In addition, each semester two to three faculty members, particularly new faculty, present their research to keep the students and other faculty members apprised of their latest research interests and results. 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 two years are listed below.

	SPEAKER AND HOST	SPEAKER AFFILIATION	SEMINAR TITLE
2012			
Sep 6	Dr. Gregory Amberg	CSU	Local Calcium and Redox Signaling in Arterial Smooth Muscle Cells
Sep 13	Dr. Jeremy Nelson & Steve Albers PhD Candidate	CSU	Intellectual Property & the Technology Transfer Process at CSU
Sep 25	Dr. Jinghshi Shen	University of Colorado - Boulder	Molecular Mechanisms of Synaptic Neurotransmitter Release
Sep 27	Dr. Chris Gentile	CSU	Obesity Related Vascular Dysfunction
Oct 1	Dr. Nadrian C. Seeman	New York University	DNA: Not Merely the Secret of Life
Oct 11	Dr. Carol Carter	Stony Brook University	HIV Protein Trafficking: Driven by ESCRTs and Signaled by Calcium
Oct 15	Dr. Don Cleveland	University of California, San Diego	Guarding the Genome: centromeres, aneuploidy and tumorigenesis
Oct 25	Dr. Shobha Vasudevan	Harvard Medical School	Regulation of Gene Expression by microRNPs in Quiescence and Germ Cells
Oct 29	Dr. Tom Santangelo	Ohio State University	Central dogma machinery and regulation in the Archaea: insights from the third domain
Nov 6	Dr. C. Edward Dixon	University of Pittsburgh	Traumatic Brain Injury: Models and Mechanisms
Nov 12	Dr. Adam Marcus	Co-Founder, Retraction Watch and Managing Editor, Anesthesiology News	Research Misconduct – A Publishing Perspective
Dec 4	Dr. Todd Maddix	University of Texas	Dual Processing Modes of Learning
Dec 6	Dr. Art Skoultchi Host: Jeff Hansen	Albert Einstein College of Medicine	Controlling the proliferation versus differentiation decision in normal and malignant blood cells
2013			
Feb 8	Dr. Rob Knight Hosts: Jillian Lang & Scott Fulbright	University of Colorado - Boulder	Profiling Microbial Community Composition Dynamics Across Ecosystems, Including the Human Microbiome
Mar 7	Dr. Takamitsu Kato	CSU	Introduction of carbon-ion radiotherapy and its biology
Apr 4	Dr. Ronald Montalero Host: Chaoping Chen	University of Pittsburgh	Development of novel engineered cationic antimicrobial peptides (eCAPS) for the treatment of infectious diseases
Apr 18	Dr. Dean Crick	CSU	Identification and Characterization of a Previously Unknown Enzyme in Mycobacterial Menaquinone Synthesis

May 13	Dr. Paul Rainey Host: Ashok Prasad	New Zealand Institute for Advanced Study Massey University	Transitions in individuality and the evolution of biological complexity
Sep 26	Dr. Dan Needleman Host: Ashok Prasad	Harvard University	The metaphase spindle as an active liquid crystal
Sep 27	Dr. Richard Davis Host: Annie Zhang	University of Colorado - Denver	Silencing of Germline – Expressed Genes by DNA Elimination in Somatic Cells
Oct 25	Dr. Rui Yi	University of Colorado - Boulder	MicroRNAs and their roles in mammalian epithelial tissues
Nov 14	Dr. Thomas Glover Host: Lucas Argueso	University of Michigan	Identifying environmental and genetic risk factors for mammalian CNV mutations
Nov 21	Dr. Kim Hoke	CSU	Evolution of stress physiology, metabolism and behavior in guppies
2014			
Feb 6	Dr. Michelle Foster	CSU	Adipose tissue distribution and its relation to metabolic syndrome
Apr 3	Dr. Brad Day Host: Jillian Lang	Michigan State University	The pathogen-actin connection: perception, signaling and death
Apr 10	Dr. Anna Malkova Host: Lucas Argueso	University of Iowa	Unusual mode of DNA synthesis promotes genomic destabilization
May 1	Dr. Raza Shaikh Host: Adam Chicco	East Carolina University	N-3 polyunsaturated fatty acids boost B cell activity in lean and obese mice

FUTURE GOALS:

Secure additional funding support for graduate students.

Apply for status as a Special Academic Unit at CSU.

CMB Budget 2012-2013

ALLOCATED TO CMB BUDGET

base budget	\$97,752
rollover/adjustments	\$13,355
GTA from Graduate School	<u>\$17,684</u>
TOTAL	\$128791

EXPENDITURES

	Budgeted	Expended
ADMINISTRATION		
Director (2 months)	\$29,016	\$31,480
Administrative Asst III (10 months)	\$32,849	\$32,848
SEMINAR PROGRAM	\$10,300	\$6,468
TEACHING		
NB502/CM502	\$5,400	\$4,198
OFFICE OPERATIONS	\$7,300	\$7,280
copying, phone, postage, etc		
STUDENT STIPENDS/TUITION		
GTA (Graduate School)	\$17,684	\$21,151
WORKSTUDY	\$3,200	\$305
STUDENT RECRUITMENT	\$11,700	\$14,404
EDUCATIONAL OUTREACH & INTERACTION	\$10,822	\$6,476
poster contest, research meetings, etc.		
CMB AWARD	\$7,000	\$6,699
TOTAL	\$128,791	\$128,146
Roll Forward		\$ 645

CMB Budget 2013-2014

ALLOCATED TO CMB BUDGET

base budget		\$ 102,331
rollover/adjustments		\$ 0
GTA from Graduate School		<u>\$18,213</u>
TOTAL		\$120,544

EXPENDITURES

	Budgeted	Expended
ADMINISTRATION		
Director (2 months)	\$25,115	\$28,683
Administrative Asst III (10 months)	\$30,270	\$30,270
SEMINAR PROGRAM	\$10,300	\$8,680
TEACHING		
NB502/CM502	\$5,400	\$4,627
OFFICE OPERATIONS	\$7,766	\$5,100
copying, phone, postage, etc		
STUDENT STIPENDS/TUITION		
GTA (Graduate School)	\$18,213	\$20,802
WORKSTUDY	\$1,500	\$2,290
STUDENT RECRUITMENT	\$11,700	\$10,456
EDUCATIONAL OUTREACH & INTERACTION	\$3,800	\$5,862
poster contest, research meetings, etc.		
TOTAL	\$120,544	\$119,933
Roll Forward		\$ 611

Personnel	72,353	92,985	92,985	79,206	86,690	81,822	70,106	73,069	80,078
Operating Expenses	54,586	41,629	41,629	49,976	32,862	41,846	55,125	55,700	40,466
Total	126,939	134,614	134,614	129,182	119,552	115,959	125,230	128,769	120,544

**Annual CMB
Budget for 2005
through 2014**