Colorado State University  
Spring 2010

Welcome from the Chair

Greetings from faculty, staff, and students in the Department of Biochemistry and Molecular Biology at Colorado State University. This past year, members of the department were recognized for their research, teaching and outreach at all levels. Two members of the faculty were recognized, one for his prior accomplishments and the other for her future potential in biomedicine.

Dr. Tu had applied his knowledge of toxicology to help the Japanese government track the source of sarin nerve agents used in two attacks, including the much publicized attack on the Tokyo subway in 1995. For this, he was honored with the Order of the Rising Sun medal with Gold Rays and neck ribbon, one of the highest given to foreign nationals in Japan.

Dr. Jennifer (“Jake”) DeLuca was named one of 17 PEW Scholars in Biomedical Sciences for 2009, which recognizes the most promising scientists in biomedicine across the country.

Research in the Department benefited from the federal economic stimulus funds that supported the studies of Drs. Chen, Cohen, Curthoys, and Peersen. In the next five years, studies on chromatin structure and function in the labs of Drs. Nyborg, Luger, Stargell, and Hansen will be significantly bolstered by a recently awarded Program of Projects grant from the NIH.

The BMB faculty and students have also been working outside the campus to get K-12 students excited about science. Professor Stargell and Dr. Ross, with the help of several graduate students, brought yeast genetics to a group of elementary school students in Windsor, CO. Betsy Buechler, with help from Dr. DeLuca, established WISDOM (Women in Science Devote to Outreach and Mentoring), a volunteer organization to tutor middle school students in math and science.

The department congratulates its graduating class of 34 undergraduate and 9 graduate students for their academic achievements, and welcomes them as the newest members of BMB Alumni.

Dr. Jennifer DeLuca, 2009 Pew Scholar in Biomedical Sciences.
Faculty News

Members of the BMB faculty in the past year have been highly productive in research, instruction and advising. It is always satisfying to see their accomplishments and efforts recognized.

James Bamburg: Dr. Bamburg went on transitional appointment this year, but you would never know it from his schedule. His group continues to be very active, with a joint publication in Nature Neuroscience and editing a special issue of The Open Neuroscience Journal devoted to the “Exciting Dendritic Spine”. Dr. Bamburg also gave the keynote lecture at the Department’s annual retreat in Pingree Park.

Barbara Bernstein (Joint faculty): Dr. Bernstein celebrated her 30 year anniversary in working in the Bamburg lab this past year. She continues to run the spinning disk confocal microscope facility and has a review coming out in Trend in Cell Biology this year.

Chaoping Chen: Dr. Chen received an R21 grant from the NIH to develop RNA aptamers as therapeutics targeted against the HIV-1 virus.

Robert Cohen (Joint faculty): Dr. Cohen received a grant from the NIH through its highly competitive Challenge Grant program to determine the cellular targets for ubiquitin conjugation and deconjugation.

Norm Curthoys: Dr. Curthoys was recognized with the Outstanding Undergraduate Teaching Award by the College of Natural Sciences and celebrates his 20th year at CSU. He was also successful in renewing his NIH grant to study the control of renal glutaminase expression during acidosis.

Jennifer (Jake) DeLuca: In addition to being named one of 17 PEW Scholars in Biomedical Science in 2009, Dr. DeLuca served as a session Chair a session on Mitosis and Mieosis at the American Society for Cell Biology Annual Meeting, San Diego, CA.

Santiago DiPietro: Dr. Di Pietro was awarded a American Heart Association National Scientist Development Grant to support his work on molecular mechanisms of platelet dense granule formation, and has two PhD students in his lab.

Jeff Hansen: Dr. Hansen successfully renewed his NIH grant on chromatin structure and stability. He was also nominated for the Provost’s N. Preston Davis Award for Instructional Innovation for his work to integrate CHIME tutorials (developed by Dr. Fahnrey) as the major instructional tool to teach structural biochemistry in BC401.

P. Shing Ho: Dr. Ho’s talk on biological halogen bonds at the Annual Meeting of the American Chemical Society was highlighted in an article in Chemical & Engineering News. He also published an article in the inaugural issue of Nature Chemistry.

Paul Laybourn: Dr. Laybourn was appointed this year as the Interim Associate Dean for Undergraduate Studies in the College of Natural Sciences. This is in addition to his other roles, including his service as the Director of the Cellular and Molecular Biology Program. Dr. Laybourn will be receiving the Oliver Pennock award in recognition of his outstanding service to the University over the past five years.

Karolin Luger: Dr. Luger published several papers including one in Molecular Cell with Laurie Stargell, which was highlighted in a previews article. She has accepted an invitation to serve on the National Advisory Council for General Medicine with the NIH, and was a keynote speaker at several scientific meetings and symposia.

Brian McNaughton (Joint faculty): The Department welcomes Dr. McNaughton, a recently appointed Assistant Professor in Chemistry, as a joint member of the BMB faculty.

Jennifer Nyborg: Dr. Nyborg successfully renewed her grant from the NIH to study transcriptional regulation by the tax protein in human T-cell leukemia virus.

Marv Paule: Dr. Paule published a set of protocols to detect and characterize strand separations and distortions in DNA.

Olve Peersen: Dr. Peersen completed a major study to map the structural mechanism of RNA replication in picornaviral viruses. He also successfully renewed his grant from the NIH to continue these studies.

Eric Ross: Dr. Ross published an interesting paper that re-evaluated the way data for the aggregation of prion proteins had been analyzed. The study has significant implications for understanding the mechanisms of prion-related diseases.

Laurie Stargell: Dr. Stargell spearheaded the outreach program to use yeast genetics as a way to introduce concepts of molecular biology to fifth graders. She was also elected by the Department to serve as the Associate Chair of Undergraduate Studies to help coordinate and improve the undergraduate program.

Tingting Yao: Dr. Yao continues to establish her research program, and attracted four PhD students to rotate in her laboratory, and is training two undergraduates in research.

Emeritus Faculty

Parviz Azari: The CSU and Fort Collins communities were saddened by the passing of Anne Azari.

Anthony Tu: Dr. Tu was recognized with the Order of the Rising Sun with Gold Rays and neck ribbon by the Japanese government for his help with solving cases of sarin attacks.
Program of Projects (P01) Grant Supports Studies on Histone Chaperones and Acetyltransferases in Chromatin Transitions

A major grant with Professors Jennifer Nyborg, Karolin Luger and Laurie Stargell serving as Principle Investigators (PIs) and Professor Jeff Hansen as a Co-PI was approved for funding by the National Institutes of General Medical Sciences (NIGMS) at the NIH. This five-year grant will provide over $8 million to support research on how genes in eukaryotes (from yeast to humans) become accessible, even though they are typically tightly wound around histone proteins that compact the DNAs into nucleosomes, which are themselves, compacted into chromatin and finally chromosomes in the cell.

The studies funded by the NIH will focus on a class of proteins known as histone transferacetylases (HATs), which serve as molecular chaperones. As with chaperones at the high school prom, the function of HATs are to insure that the dance that must occur between proteins of the nucleosome, those for gene expression, and the DNA are all “appropriate” when a gene must be turned on or turned off.

Local Fifth Graders Infected with Biochemistry

“The scientists are coming”, whispered a fifth grader at Skyview Elementary School in Windsor, CO. Those scientists were Professor Laurie Stargell and Dr. Eric Ross, along with Cathy Radebaugh and graduate students Kris Hite, Sarah Lee, Keely Sudhoff, and Troy Sorenson, all from the Department of Biochemistry & Molecular Biology at CSU.

The scientists were at the school to teach the students in Teri Romshek’s class some real science, including how to study proteins and the phenotypes of mutant yeasts.

The activities were part of a pilot outreach program called “Biochemistry is elementary” that was supported in part by a grant from the National Science Foundation and by funds donated to the College of Natural Sciences from Dean Tsao, who received his PhD in BMB in 1973 with Professor Parviz Azari.

BMB Graduate student Kris Hite work with Skyview fifth graders to learn the Biochemistry is Elementary
Undergraduate Students

Graduating Seniors: The Department conferred Bachelors of Science degrees in Biochemistry and Molecular Biology to 34 students in 2009. Spring 2009 degree recipients were Felicia Balzano, Nichelle Barbari (cum laude), Matthew Briel, Cecelia Calbert, Josiah Cox, Alyssa Dyke (cum laude), Ashley Fenn (cum laude), Christopher Freehling, Michael Getzy, Jaclyn Gonzales, Elizabeth Hadden, Eldon Harrelson, Erik Hartwick, Theodore Johnson (summa cum laude), Kyle Knapp, Eli Kolodny, Yoon Lee, Jessica Martin, Sarah Norskog, Darcy Orahood, Julie Spond, Alexander Staller (cum laude), Ford Strimenos, Prashant Tank, Justin Warman, Joseph Westrich.

Fall 2009 degree recipients were: Bradley Bray, Betsy Buechler (summa cum laude), Ashley Holly, Jennica Kolean, Alex Lulack, Kaitlyn Mulhern, James T. Palmer, Patrick Saul.

Congratulations to the newest class of BMB alumni.

BMB Majors: The department is currently training 150 undergraduate majors. Some of our majors that received special recognition this year include:

Goldwater Scholar: Katy Benson was named a Goldwater Scholar for 2010. The Goldwater Scholarship and Excellence in Education Program was established in 1989 to honor former US Senator Barry M. Goldwater. These highly prestigious scholarships are awarded nationally to college students pursuing careers in science, mathematics and engineering. We congratulate Katy for this great honor (go to www.today.colostate.edu/story.aspx?id=3559 for the full story).

Professor Parviz Azari Fellowship: This fellowship was established by Dr. Dean and Mrs. Ping-Ping Tsao in honor of Dr. Azari to enhance student research opportunities in biochemistry and molecular biology research labs. This year’s recipient is Adam Almeida.

David Fahney Scholarship: This scholarship was established by Dr. Fahney to recognize outstanding juniors or seniors who have excelled in higher level biochemistry classes. This year’s recipient is Lily Parkinson.

Frank X. Gassner Scholarship: This award is presented to an undergraduate student who excels in research in biochemistry and molecular biology. This year’s recipient was Alexander Zevin.

Alok Mehta 9-11 Scholarship: This was created by Dr. Gopal and Mrs. Sneh Mehta in honor of the victims of the 9-11-2001 terrorist attacks on the World Trade Center. Their son, Alok, was working in the First Tower at the World Trade Center and has been missing since that date. This scholarship is especially for undergraduate students in biochemistry and molecular biology. This year’s recipient is Matthew Kortus.

Grant N. and Betsy P. Smith Memorial Scholarship: This scholarship is in memory of Grant and Betsy who both held doctorates in biochemistry and shared a dedication to scientific research and education. It is awarded to excelling undergraduates in biochemistry and molecular biology. This year’s recipients are Betsy Buechler and Matthew Kortus.

Natural Sciences Undergraduate Scholarships: This fund provides financial assistance to committed and talented students who enroll in an undergraduate program in College of Natural Sciences. She Hang Chen and Natalie Lesko were this year’s recipients.

Undergraduate Research Institute Fellowship: This fellowship was funded through a grant to encourage undergraduate research to prepare students for research careers in physical and mathematical sciences. This year’s recipient was Alexander Kumar Verma.

Colorado State University Research Symposium: The following students received recognition for their poster presentations: Matthew Kortus (Dr. Olve Peersen) received the Highest Honor. Nichelle Barbari (Dr. Karyn Hamilton) and Betsy Buechler (Dr. Jennifer DeLuca) received Honors.

Outstanding Biochemistry Senior: Betsy Buechler and Nichelle Barbari were recognized with this honor this year.

Graduate Students

Ph.D. Program: The BMB faculty is currently training 26 graduate students in the BMB Ph.D. program and 2 students in the Cellular & Molecular Biology Program headed by Dr. Paul Laybourn. Among the current students who deserve recognition are:

Troy Sorensen & Lynsie Sundin: Troy and Lynsie received the Mauricio X. Zuber Award for most outstanding first-year graduate students.

Sarah Lee & Keely Sudhoff: Sarah and Keely received the Preecha Kownin Memorial Award which honors exceptional senior BMB graduate students.

Geoff Guimaraes & Troy Sorensen: Geoff and Troy received the Professor Parviz Azari Graduate Fellowship for excellence in research.

Chenghua Yang & Keely Sudhoff: Chenghua received Highest Honors and Keely received High Honors in the BMB/CMB/MCIN Graduate Student Poster Competition.

Recent Ph.D. Graduates: In 2009, the BMB faculty graduated 4 Ph.D.s. They are:

Chi Pak: Chi completed his degree in the Cell and Molecular Biology program under Dr. Bamburg in Fall 2009. His thesis was on “Actin dynamics in silico, in waves, and in rods”. He is currently a Postdoctoral Fellow at University of Texas Southwestern, Dallas.

Predrag (Pete) Serbedzija: Pete completed his degree with Dr. Ishii, Professor in Biomedical Sciences in Fall 2009 with a thesis on “Insulin and its combination with IGF-1 prevent brain degeneration in diabetic rats despite hyperglycemia.” He is currently a Postdoctoral Fellow at University of Colorado, Anschutz Medical Center.

James (Trey) Toombs: Trey completed his degree with Dr. Ross in Summer 2009 with a thesis on “Molecular Determinants of Yeast Prion Formation.”

Chenghua Yang: Chenghua completed her thesis on “Biochemical, biophysical and structural study of the nucleosome-MeCP2 complex” with Dr. Luger in Summer 2009. She is currently a Postdoctoral Fellow at Weil Cornell Medical School in New York.

Recent M.S. Graduates: In 2009, the BMB faculty graduated 5 M.S. degree students. Among them are:

Judy Mufti: Judy completed her degree with Dr. Curthoys in Spring 2009 with a thesis on the “Characterization of HUR binding sites in phosphoenolpyruvate carboxykinase mRNA.” She currently attends graduate school at Regis University in Denver.

Shay Perea-Boettcher: Shay completed her degree with Dr. Bamberg in Summer 2009.

Robert Smith: Robert completed his degree in Summer 2009 with a thesis on “Characterization of the DNA Binding Region of the Transcription Repression Domain in MeCP2” and is now attending University of North Texas, Health Science Center, Texas College of Osteopathic Medicine.

Maximiliano Vallejos: Maximiliano completed his degree with Dr. Ho in Fall 2009.

Eric Anderson: Eric completed his degree with Drs. Bamberg and DeLuca in Fall 2009.

Poster Awards: Several BMB Graduate students were recognized at the annual Graduate Research Symposium at CSU, including

Highest Honors: Keely Sudhoff (Luger lab)  
High Honors: Nicholas Clark (Luger lab) and Lynsie Sundin (DeLuca lab)  
Honors: Jarred Bultema (Di Pietro lab) and Megan Carter (Ho lab)  
Honorable Mention: Geoff Guimaraes (DeLuca lab).

Of Biochemistry and Zombies: Nicholas Clark (PhD student in Luger lab) and Kris Hite (PhD student in Hansen lab) enlightened and horrified a packed audience with tales of vampires, zombies, and witches. Are they all just scary stories, or is there science behind the mysteries? Our own BMB versions of the Myth busters reviewed the possible biochemical causes of various diseases that could account for why individuals had a thirst for blood, or even appear to come back from the dead to serve as soul-less slaves.
Staff & Postdoc News

BMB continues to very well served by and highly dependent on its office staff. We greatly appreciate Yvonne Bridgeman, Justine Barela, Sharon Gale, Nancy Reeves and Marti Stokes for their work in keeping the Department, and the Graduate and Undergraduate Programs running. Some specific news includes:

Justine Barela is celebrating 15 years of service to CSU.
Sharon Gale is celebrating her 10th year at CSU, the past two with the Department.

We are also fortunate to have a very talented group of staff and postdocs that keep the research enterprise running smoothly by maintaining instrumentation and training students, among other things.

Brian Geiss: Dr. Geiss was promoted to an Assistant Professor in the Department of Microbiology, Immunology, and Pathology. Brian has a primary appointment in MIPS, and works with Dr. Peersen on development of viral inhibitors.

Laurie Minamide: Ms Minamide has completed 20 years in the Bamburg lab. Her work on rod isolation and characterization paper, the culmination of 4 years of her life in the lab, has appeared in J. Biol. Chem. in December, 2009.

Uma Muthurajan: Dr. Muthurajan, as postdoctoral associate with Karolin Luger was recognized with the best postdoctoral poster award at the annual Graduate Research Symposium at CSU

Aaron Sholders: Dr. Sholders will be recognized with the University’s Cermak Award for his outstanding contributions to advising undergraduates in the department.

O’Neil Wiggan: Dr. Wiggan was the recipient of a K01 grant from the NIH.

Catherine Radebaugh, Narasimha Sreerama, and Lynn E. Taylor are celebrating 20 years of service to CSU and to the Department, while Jeanne E. Mick is celebrating 15 years.

Alumni News

Undergraduate Alumni

Nichelle Barbari (BS 2009) moved to North Carolina after graduation, and has been admitted to East Carolina Medical School.

Graduate Alumni

Kevin Flynn (PhD 2007) received a prestigious Marie Curie Postdoctoral Fellowship to support his research at the Max Planck Institute for Neurobiology, Martinsreid, Munich, Germany, where he has been a postdoc with Frank Bradke since 2007.

Lubna Tahtamouni (Ph.D. 2005), an assistant professor at Hashmite University in Zarqa, Jordan was married this past year and will return for collaborative research with Dr. Bamburg in summer 2010.

Mike Maloney (Ph.D 2006), continues to postdoc at Stanford University where he works on transport of NGF in neurons. His wife Janice Gonzalez, MS in Bamburg lab in 2003, works for Genentech.

Hui Chen (Ph.D. 2001), had a very productive postdoc at Johns Hopkins University, but decided to return to her roots in medicine. She studied and passed the board exams qualifying her for a residency and she is currently at Dartmouth University Medical School Hospital, Dartmouth NH, where she is a pathology resident.

Mike Brown (Ph.D. 1999) has been promoted to associate professor (teaching track) at BYU.

Brian Agnew (Ph.D 1995) continues his productive work with the Molecular Probes division of Invitrogen. He has developed new kits for N-acetylglucosamine and other protein modifications, which have been featured at recent ASCB meetings.

Former Postdoctoral Associates

Thomas Kuhn (1995-98) was promoted to associate professor in the chemistry department at the University of Alaska, Fairbanks.

Arshak Alexanian (1997-99) was promoted to associate professor in neurosurgery at the Wisconsin Medical College in Milwaukee.

Sharon Ashworth (1998) started an assistant professor position at the University of Maine, Orono. She has switched on kidneys from rat to zebrafish, now focusing on cofilin’s role in kidney development.

Kyoko Okada (1998-20000 has completed a postdoc at Brandeis University and is now looking for a permanent faculty position.

If you have news that you would like to share with the Department or your former classmates, please feel free to send them along to use at bmbalumni@colostate.edu.
Development News

Merck Pharmaceuticals has committed to donating an R-AXIS IV++ X-ray detector to help upgrade one side of the Department’s X-ray diffraction facility, an important research component for the determination of structures of DNA, RNA and their protein complexes.

Despite the economic problems of the past year, the Department has continued to provide financial support of our outstanding undergraduate and graduate students through the various scholarship and fellowships established by the alumni, former faculty members and friends of the department. This year, the Department was also able to use funds to help support our outreach programs to local elementary schools (see story on page 3).

You can do your part in helping to insure that all qualified students have opportunities to pursue their careers in biochemistry and molecular biology with gifts and endowments to the Department. Giving has become even easier through on-line donations at http://www.campaign.colostate.edu/

What’s Happening on the CSU Campus

After the major changes in the leadership at CSU last year, the campus was relatively quiet in this respect. We saw the inaugurations of Dr. Tony Frank as the President of Colorado State University and Joe Blake as the Chancellor of the CSU system. Both are working hard to maintain the mission and the positive strides made in the past years at CSU, despite the constant budgetary challenges that we, and all of higher education face with the lingering economic recession.

Some of the positive things that continue to happen at CSU include the construction of the new Behavioral Health Sciences building, which will house most of the Psychology Department, and will include a special stereographic classroom developed with the help of BMB, where students can visualize biomolecular structures in 3-D!

The CSU volleyball team won the MWC title, and advanced to the Sweet 16 in the NCAA tournament. The men’s basketball team went on to post-season play at the College Basketball Invitational tournament. Go Rams!