

“Revealing how life works”

December 2009

To: Worldwide members of the OSU Biochemistry and Biophysics Community
From: P. Andrew Karplus, Chair

Dear Friends and Colleagues:

At the time of year when we think of wishes for peace and goodwill among all people, I send warm greetings from Corvallis! With all he accomplished, Albert Einstein had clarity about what he considered to be the greatest of all causes. He said: *“Nothing that I can do will change the structure of the universe. But maybe, by raising my voice I can help the greatest of all causes - goodwill among men and peace on earth.”* Wouldn't it be nice if global warming were referring to trends in the quality of relationships worldwide as opposed to changes in the climate?

In the midst of the economic turmoil of the last year, one encouraging development on the national stage is President Obama's positive view of basic science and science education. In an April speech to the National Academy of Sciences, the President spoke to the importance of the work we do:

Science is more essential for our prosperity, our security, our health, our environment, and our quality of life than it has ever been before. ... This work begins with a historic commitment to basic science and applied research, from the labs of renowned universities to the proving grounds of innovative companies. ... the public sector must invest in this kind of research -- because while the risks may be large, so are the rewards for our economy and our society.... And so today I want to challenge you to use your love and knowledge of science to spark the same sense of wonder and excitement in a new generation.

Research to reveal the basic mechanisms of life and interacting with students to spark in the next generation a sense of wonder and excitement about how life works are exactly what we are about. We have great students who are catching that sense of wonder and excitement and gaining the knowledge to be the leaders of tomorrow. Our undergraduate BB-club this year created a delightful T-shirt (shown to the right) that captures how important we see our discipline. I first wore the shirt at a conference in Portland, and got offers from three people wanting to buy it off of my back!



Spring 09 BB club T-shirt

OSU and Department News

In terms of accomplishments, this has been a remarkable year for OSU. Enrollment (at 22,000) and grants and contracts (at \$252 million) are at record levels and the OSU capital campaign has entered its wrap-up phase with \$550 million of the \$625 million goal raised and funds in place already making a difference (see <http://campaignforosu.org/>). For instance, construction that shook the ALS building began this summer on the Linus Pauling Science Center (LPSC) as they pounded in huge beams to frame



Pat Reser, Ed Ray, and Balz Frei at the September LPSC dedication.

the foundation. On September 25th, at the dedication of the building, Pat Reser, donor and co-chair of the capital campaign, shared the compelling metaphor of a relay team passing the baton: first visionaries like LPI director/BB faculty member Balz Frei conceived of the building, then OSU President Ed Ray and the campaign leadership made it the campaign centerpiece and passed the baton to generous donors and the state of Oregon who together put up \$62 million. The dedication ceremony marked the hand-off to construction crews who are running their leg, and soon the final anchor leg will be run by us and our colleagues, the science faculty who will use the facility to create knowledge for humanity's future and to educate generations of students to come.

In major sports, basketball went from a dismal 0-18 Pac-10 season in 2008 to 7-11 in 2009 under Coach Craig Robinson, and in a Cinderella story, ended up winning the College Basketball Invitational

tournament. Baseball made it to the NCAA regional playoffs and football had a strong season leading to the first ever "Civil War for the Roses." On campus this fall, OSU Advancement rolled out the "Powered by Orange" campaign. "Powered by Orange" is meant to convey the energy of "the students, alumni, faculty and friends of Oregon State University making a positive difference in Oregon and beyond." Posters around campus highlight alumni and current OSU faculty, staff and students - like you and me - who are all "Powered by Orange."

In the midst of these strong accomplishments, Oregon and OSU have not been immune to the economic challenges facing our country, and a major theme has been reorganization. President Ed Ray is convinced that consolidation of units along with increased out-of-state, and graduate enrollment are needed to position OSU for success in the face of decreasing support from the state. The consolidation of business activities into centralized business centers continues and the leadership has grouped the colleges into four divisions and called for restructuring within each college to reduce the number of departments/programs to near five. The four divisions include a core Arts and Sciences division and one division for each of the three signature areas in OSU's strategic plan that have been nicknamed the three healthies: Healthy Planet (advancing the science of sustainable earth ecosystems), Healthy People (improving human health and wellness) and Healthy Economy (promoting economic growth and social progress). The coalescing of the College of Science from 14 to about five departments/programs is a major challenge we are still working on; I expect Biochemistry & Biophysics will no longer be its own department, but this will not change our faculty's commitment to our students and our research. Because our BB majors have been so successful in their pursuits, we are working to ensure that the Biochemistry & Biophysics major is not a casualty of the restructuring. In the short term, the changes are taking a lot of time and energy and causing disruption. Hopefully in the long run, they will strengthen us.

At the department level, I'd like to highlight a few events. In February, **Jill Wait** again spearheaded our participation in the OSU annual food drive. Many faculty and students prepared treats for regular bake sales and a "sundae party" including an entertaining "who's that baby" contest with faculty and staff photos. We doubled last year's total raising over \$2400! With restructuring, Jill Wait and Lisa Shepard are sadly no longer in the office (Jill still does our accounting at one of the business centers and Lisa is with the EHSC). Before they left we had a party for them and for Barbara Hanson (who fortunately is still here) to say "THANK YOU!" Until our new departmental structure gets sorted out, I am grateful that the Dean has assigned Mary Fulton (Office Manager) and Dina Stoneman from Microbiology to join Barbara the BB office and provide support to both departments.



The party for Barbara, Lisa and Jill included a song in their honor written by Kevin Ahern! ☺



Dale and Larry just before cutting the ribbon and enjoying cake in the *Frances Cripps Conference and Reading Room*



The BB-excursion in August to Opal Creek

In July, we had a celebration to dedicate our departmental conference room as the **Frances Cripps Conference and Reading Room**. Frances was a friend of the department who gave generously to support BB scholarships and research activities and who passed away in 2008. We were very pleased that her two sons Dale Cripps and Larry Griffeth were able to be present as honored guests and share with us remarks to help us and the students in attendance know Frances better. As another summer activity, in August a few of us spent a Saturday enjoying a hike through the old growth forest along Opal Creek including a swim at Opal Pool and a visit to the 1,000-year-old trio of trees at Cedar Flats.

Faculty news

I am pleased to report that this year we added **Weijian Zhang** to the faculty as a Research Assistant Professor. Since 1998, Weijian has been working collaboratively with **Balz Frei** in the Linus Pauling Institute. He uses mouse models to investigate the mechanisms of action of intracellular antioxidants and metal chelators in atherosclerotic development, with an ultimate goal of developing new diet-based strategies for preventing and treating heart disease. Weijian is already engaging actively in the program as two of our first year students have chosen to do research rotations in his lab.



Welcome to Weijian Zhang

As with last year, to keep down the length of this newsletter and give you better insight into the BB faculty's activities, I have asked each faculty member to prepare his or her own mini-newsletter for posting on the web. So to learn more about individual faculty activities please visit our website at <http://biochem.science.oregonstate.edu/2009-newsletter>. Also available on the web will be the annual publications report, and links (using the "BB in the news" button) to BB research picked up by the press. For 2009, these involve basic discoveries about the importance of vitamin D in our immune defenses, how teeth get their protective enamel coating, and what makes crab claws strong.

I also want to highlight the major new grants that have contributed to building up BB investigator-initiated grant support from about \$2.5 million annually a couple years ago to nearly \$4 million! This is remarkable given the current funding climate. Contributing to this increase are major grants won this year by **Elisar Barbar**, **Michael Freitag**, **Chris Mathews**, and me. **Elisar Barbar** garnered her first NIH R01 (5 yr!) and it focuses on her expanding work on LC8, a protein that she has hypothesized works as a dimerization hub in many systems. **Michael Freitag's** new funding is part of an NIH Program Project on the systems biology of filamentous fungi. The aim is to uncover basic regulatory networks that are activated in response to light. **Chris Mathews** is continuing his work on nucleotide metabolism, and my new grant is on structural studies of the enzymology of cysteine catabolism. In addition, **Dave Williams** (BB affiliate faculty) led the successful application for a Superfund grant that includes support for **Bill Baird's** work on chemical carcinogenesis. Also, although funding is not yet certain, **Joe Beckman** has led the Environmental Health Sciences Center (involving many BB faculty) to develop a strong focus on translating basic research into clinical studies. This was a crucial strength in the renewal proposal that ranked 4th best of 12. Congratulations are in order to Joe and the center investigators for the creative talent that has brought what appears to be five more years of funding.

In terms of our teaching awards, **Indira Rajagopal** and **Kevin Ahern** continue to accrue well-deserved honors. Last year I missed congratulating **Indira** on the College of Science Loyd Carter Award for Outstanding & Inspirational Undergraduate Teaching. And I am pleased to add that **Kevin** was honored last year and again this year with a Mortar Board Top Prof Award. And though no award was given, the Howard Hughes Medical Institute Undergraduate Summer Research Program overseen by Kevin brought 63 undergraduates into research labs to enrich their undergraduate training.

Emeritus faculty **Bob Becker** and **Wil Gamble** continue to bring good humor and perspective to the daily hustle and bustle of the department and pass on their wisdom to current graduate students. One sad event was the passing last spring of Caron Reed, wife of Emeritus BB Professor **Don Reed**. At Caron's memorial I learned that she touched many of Don's students and colleagues through her hospitality and warmth. Such losses always serve to remind me of the importance of making the most of every day and being engaged investing in people and doing things that are worthwhile. On this note, Gary Merrill's son Nate was a local hero who risked his life to help rescue a couple from their burning vehicle after a crash. He got them away from the car about 20 seconds before the vehicle exploded!

Recognition of current Graduate Students

This year we welcomed six doctoral students in the incoming class: **Yan Campbell** (Jinan U. & Illinois Inst. Tech.), **Jun Ding** (Anhui Medical U), **Jessica Morgan** (U Oregon), **Atrayee Basu** (Presidency College & Kasturba Medical College), **Chuan Li** (Shanghai Jiao Tong U) and **Jared Williams** (Colgate U). Also, four grad students finished up this year. Congratulations to new PhD's **Donnie**

Berkholz (Karplus lab) and **Hyo Sang Jang** (Greenwood lab). Donnie has begun a post-doc at the Mayo Clinic working on enzyme mechanism and drug design and Hyo Sang is doing a post-doc with Arup Indra here in the College of Pharmacy. **Megan Hirko** (Beckman lab), whose husband got a job offer that was too good to pass up, completed an MS degree and has moved to Texas. **Cameron Long** (Merrill lab) completed his MS degree working on the thioredoxin reductase liver specific knockout mouse and is now an anesthesiology assistant at OHSU with plans to attend medical school.



First-year students Yan Campbell, Jun Ding, Jessica Morgan, Atrayee Basu, Chuan Li and Jared Williams (from left to right).



Justin and Andrea Hall (center) with their mentors Elisar Barbar and Andy Karplus.

Some recognized accomplishments of current graduate students include a remarkable garnering of the two top scholarships the Graduate School gives by husband and wife **Justin Hall**, who won the Yerex Fellowship, and **Andrea Hall**, who won the Bayley Fellowship. **Justin** also successfully competed for an American Heart Association Graduate Fellowship. For presentations at meetings, **Pallavi Phatale** (Freitag lab) won both a poster award and a young investigator award at the Fungal

Genomics Conference and **Donnie Berkholz** (Karplus lab) won the best student talk award at the West Coast Protein Crystallography Workshop. Also, I note that fourth year grad students **Rick Cooley**, **Eric Smith**, and **Megan Hirko** did a great job hosting 2006 National Medal of Science winner Dr. Stephen Lippard from MIT as the 2009 Tsou King lecturer.

Recognition of Current and Recent Undergraduates - see undergrad news section

Alumni News

This year we have again heard from a variety of alumni and former staff and post-docs. Updates from recent undergrad alumni are in the "Undergrad News" section.

Congratulations to **Brandt Eichman** (PhD, Ho 2001), Asst. Professor at Vanderbilt University who was honored with the Sigma Xi Young Investigator Award for his work on how proteins recognize and manipulate DNA structure during replication and repair. **Louisa Hooven** (PhD, Baird 2003) is working as a postdoc at OSU studying circadian rhythms with Jaga Gieboltowicz. **Tom Ellen** (PhD, van Holde 2004) is now working at the Institute of Environmental Medicine, New York U and just published in *Biochemistry* on the mechanism of nickel-induced carcinogenesis. **Ganapathy Sarma** (PhD, Karplus 2005), a postdoc with Susan Taylor in San Diego, just had a major paper accepted into the journal *Structure*. **Chris Stoner** (PhD, Merrill 2007) continues toward a career in patent law at Lewis & Clark Law School, and **Daniel Calles** (French postbacc 2007) is in a Master's program at the University of Lyon, France and applying to pursue further graduate study next year in the states.

We also heard this year from **Duncan Taylor** (PhD, Newburgh 1978) who recently became the Senior Director of Business Development for SK Life Science in New Jersey, where he manages the development of new technologies and new drug candidates. **Laura Moen** (postdoc, Mathews, mid-1980's), a career NIH employee, was recently appointed as Director of Extramural Research at the

National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). **Karen Miller** (Research Prof, van Holde 1973-2003) continues to build her reputation in the Katazome business (traditional Japanese stencil dyeing of fabrics). She had a show of her work this spring at the Benton County Historical Society. Being able to return to Corvallis doesn't work out for everyone, but **Janet Leeds** (PhD Mathews, 1986) was able to move back taking a position as Senior Director for Toxicology at Siga Pharmaceuticals.

We also heard from a couple Biochemistry alumni from earlier years. I was pleased to connect with **Karen Nickel** (BS, 1961 and worked 2 yrs with Drs. Cheldelin and King) who wrote that after getting her Biochemistry PhD in Kansas, she had a career as a clinical chemist/lab director, working the last 17 years with the Department of Public Health in California. **Tom Tibbitts** (BS, 1983) went on to get his PhD from Brandeis and is now a Scientist working on optimizing anticancer drugs for Infinity Pharmaceuticals in Cambridge, MA. **Timothy Miller** (BS, 1994; research with Merrill) worked a variety of research-based positions, and this spring graduated from the West Virginia School of Osteopathic Medicine; with his wife Sarah and 1-year old daughter Caitlin, he will be doing his residency in Anchorage, Alaska. **Clint Spiegel** (B.S. 1999) got his PhD from the University of Washington in 2004 and is now an Asst. Professor of Chemistry at Western Washington University.

Those stopping by the department to say hi included **Eric Hanson** (PhD Mathews, 1995) who was in town with wife Patty (a former Microbiology graduate student) and their two children. Eric is now an Assistant Professor at the University of Southern Nevada, which specializes in training pharmacists. **Patrick Varga-Weisz**, (PhD, Barnes 1993; postdoc, van Holde) is now a principal investigator at the Babraham Institute, which is affiliated with Cambridge University in England. The Mathews laboratory contributed toward a project in Patrick's lab, and a paper describing the research is in press in *Molecular and Cellular Biology*. **Joe Mendoza** (MS, Beckman 2007) is serving in the Corvallis Fire Department and was just outside our building one day teaching students about fire safety.

Closing Thoughts

Despite the challenges of the times, it has been a strong year for Biochemistry & Biophysics, as we have kept our focus in on our core dual mission of research and teaching - revealing new principles of how life works and passing them on to the next generation. I feel honored to have been entrusted with serving as Chair of this fine department; I have been stretched and stressed, but also greatly blessed. Instead of just getting to know the students in my laboratory and my classroom and focusing on my research, I have been exposed more broadly to all the students in the program and to the workings and activities of the University at a broader level. This exposure has made me all the more convinced of the great value of what we do at Oregon State and the great privilege we have to be able to do it. Whether one likes the catch phrase "powered by orange" or not, *we are making a difference*.

I think again about Pat Reser's relay race analogy and how it recognizes the value of contributions at all stages: the visionaries, the fundraisers, the philanthropists, the builders, and the long term workers who together create value where it was not. I am grateful to each of you for how you make this world a better place and also for your interest in our program and for the investments you entrust to us. Thank you. THANK YOU.

Finally, once again on behalf of the faculty, staff, and students in the Department, I extend to you and yours best wishes for the year ahead. I wish you fresh energy and vision for the adventure that is your life. We would love to hear from you and would welcome your visit — on a Wednesday afternoon for popcorn, or really at any time!

Yours warmly, Andy Karplus

P.S. I thank my colleagues and especially Kevin Ahern, Chris Mathews and Barbara Hanson for their help assembling information for and editing this letter.