

NEWS 2005

BIOCHEMISTRY

FROM THE CHAIRMAN: H.F. DeLuca

Colleagues, alumni members, and friends of Biochemistry:

I am very pleased to be able to write this final chapter as Chairman of the Department of Biochemistry. This is my final year as Chair, and I want everybody to know it has been a fantastic trip. I can't say I have enjoyed every minute, but I can say I have enjoyed every year. I have thoroughly enjoyed helping build the department and helping young people develop into great scientists, whether they are students or whether they are faculty members. It has been great to be a part of the University of Wisconsin-Madison which continues to be a significant force in the academic world, especially in the field of biochemistry. I am 75 years of age, and I believe that it is time to sit back and let somebody else have a chance to do what they can to help develop this department. It took a fair amount of time by the department to consider who should be my successor, and after thorough consideration of excellent candidates, the faculty voted that Betty Craig should become the new Chair of Biochemistry effective July 1, 2005. I am extremely pleased with this selection since I have known Betty a long time. We have served on many committees together and I have been fortunate to have her as a faculty member in this department for the last couple of years. Betty is fair, even-handed, an outstanding scientist, and a wonderful person; I have no doubts that she will be an outstanding Chair for this department. I know all of you will be pleased with this selection.

This has been a very eventful year in so many ways for the department; thus, it is difficult to restrict the size of this newsletter. We have had no faculty additions during the past year and our last faculty addition was Julie Mitchell, our first hire who truly is a computational biologist. She is a joint appointment between mathematics and biochemistry, a first in the history of both departments. Her primary research operation will be in the Department of Biochemistry, and her staff will actually occupy a significant

amount of space on the 6th floor of the 1985 wing, including the former faculty lounge, that has now been converted into a space to accommodate the computational biologists who work with Julie. We are currently searching for a plant biochemist, and so far, that search remains open. We are interested in finding an outstanding plant biochemist that will fit into the aims and goals of this department. Please encourage candidates to apply that you think would be good addition for this department. We do have space available for this new faculty addition, but after that position is filled, we will no longer have open laboratory space for further recruitment. However, we have just begun planning Phase II Biochemistry, and this year we will be able to draw the plans for the new building which will replace the 1956, 1939 and a large measure of the 1913 Biochemistry wings. You will recall that on Henry Mall things must remain much as they are for historical reasons, and so new construction must try to match the facade of our old building and the



Graduate student Steve Fuchs, Raines lab

nearby old genetics/dairy science/ag journalism building. That will all become part of the new Biochemistry Phase II building. We will retain the 1985 research tower and the full building which sits at 433 Babcock Drive, the site of the old greenhouses. In the new addition, we will house the Department of Biomolecular Chemistry, the Enzyme Institute staff, some structural biology staff, and a lot of space for biochemistry. We are just now planning that building so I cannot say much more than that at this stage. Of course, one of the very important bits of information is that both Biomolecular Chemistry and Biochemistry have voted to merge as a single department once an acceptable plan has been put in place and has been approved by both faculties. Biochemistry will then be a department that will serve the College of Agricultural and Life Sciences as well as the Medical School. We are very pleased with this development and I believe it will increase the stature and performance of biochemistry on the Madison campus.

There has been a fair amount of flux in the office staff for the department. However, Cheryl Adams remains as the chief person on whom

I rely. She serves as departmental secretary as well as personnel officer for the department. Cathy Michael is also of great importance to the department; she is our chief financial officer and handles all of the finances for the entire department which now amounts to an annual budget in the neighborhood of \$22 million per year. She is assisted in this activity by Jim Shurts who also serves as facilities manager for the department. As you may recall from last year, we sadly reported the retirement of Carol Marth from the department. Carol, by the way, is extremely happy in her retirement. She periodically takes a few minutes to remember her association with Biochemistry but she is doing very well and enjoying life tremendously. She has not yet moved to Las Vegas but I do believe she still plans to do so. After much struggling with the university administration, we were allowed to fill Carol Marth's position. This was no small challenge because Carol made her position a very important part of the department. We now have been very fortunate to hire Flavia Arana who has been tremendous in dealing with all aspects of teaching and education, at both the undergraduate and graduate levels. Already Flavia is instituting important changes and anticipating problems, solving them way in advance of when they might happen. It is these people that make running the department easy. They also have a tremendous support staff and it is difficult to single out any one person, but there have been some exceptional additions. For example, Danielle Tolzmann, who is our new purchasing agent, has done a truly outstanding job in handling the large volume of purchasing and money exchange in the departmental accounts. Bethann Lesnick has contributed in modernizing some of our chargeback accounts and other ways we handle the fiscal responsibilities. We continue to benefit from the hard work of Steve Seiler and Alan Rudrud in reconciling grant accounts with university records. Steve Nofle has also been promoted into a financial specialist position and has been a great asset for this group. Another outstanding staff member is Colleen Clary who handles recruitment of graduate students to the department. This year she received a university recognition award for her efforts in this area.

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Graduate student Jeremiah Frye, Rayment lab

FACULTY PROFILE:

Betty Craig

As you learned from the Chairman's letter, I am the Chair-elect, taking over the reins of the Department from Hector DeLuca on July 1. What an act to follow! I am honored (and excited) to be selected by the faculty to lead the Department in the coming years. I am quite new to the Biochemistry Department, joining in 2002 after having spent almost 23 years in the Department of Biomolecular Chemistry in the Medical School here at the UW. Below, is my attempt to provide a little insight into "where the new Chair is coming from".

First of all, it's "my parents fault". My father spent as much time, teaching me the fine points of baseball (yes, baseball, not softball) as my brother, and my mother argued endlessly that a way should be found for me to go to University, rather than "teachers' college". All this left me with the idea that I could do anything I set my mind to, even though I grew up in an era in which being a women and being a scientist was something of an oxymoron. My interest in science was sparked by two remarkable high school science teachers, both of whom went on to get PhDs and teach at the college level. The turning point for me was the day in 1962 when a professor from the University came and gave a talk on DNA replication (not bad for a rural New Hampshire high school with 200 kids from 7 towns). I thought this was the coolest thing I had ever heard. So I was off to university – majoring in microbiology, minoring in chemistry.

When nearing graduation, I faced the inevitable question: "What do I do with my life?" or more urgently "How will I pay the rent?" Then I learned the most amazing thing – "THEY WOULD PAY ME TO GO TO GRADUATE SCHOOL" !!!!!. I could hardly believe that I could continue my education and make a living at the same time (well, survive, at \$1800/year). I was off to Washington University in St. Louis. (OK, I thought I was going to the West. Of course I was going west. I just hadn't looked at the map very closely.) Here I entered the world of "molecular biology". I developed an interest in RNA, before its heyday, first studying mRNA degradation in *E. coli* as a grad student, and then, as a postdoc, mapping the early and late



RNAs of adenovirus, using those magical new tools that we now take so much for granted, restriction enzymes.

I did eventually make it all the way to the Pacific Ocean, starting a postdoc in the Biochemistry and Biophysics Department at the University of California – San Francisco in 1976. I must say that being able to see the Golden Gate Bridge when sitting at my lab bench was awesome. But what really had attracted me to UCSF was recombinant DNA, having the inkling that this fledgling technology would open the way to ask biological questions that had simply been unapproachable up to that time.

Ahhh..., but what question? I finally settled on a "weird" response of fruit flies - a brief upshift in temperature and all the normal mRNAs are no longer associated with ribosomes and the new "heat shock" mRNAs are churning out large amounts of a handful of proteins. Not only did this fit well with my interest in regulation of mRNA synthesis, it was a wonderfully tractable system. Merely move some bottles of flies from your bench to the 37°C incubator for 15 minutes – voilà! – a source of "pure" mRNA.

So the 70 kDa and small heat shock cDNAs were cloned and sequenced (easy to say, and

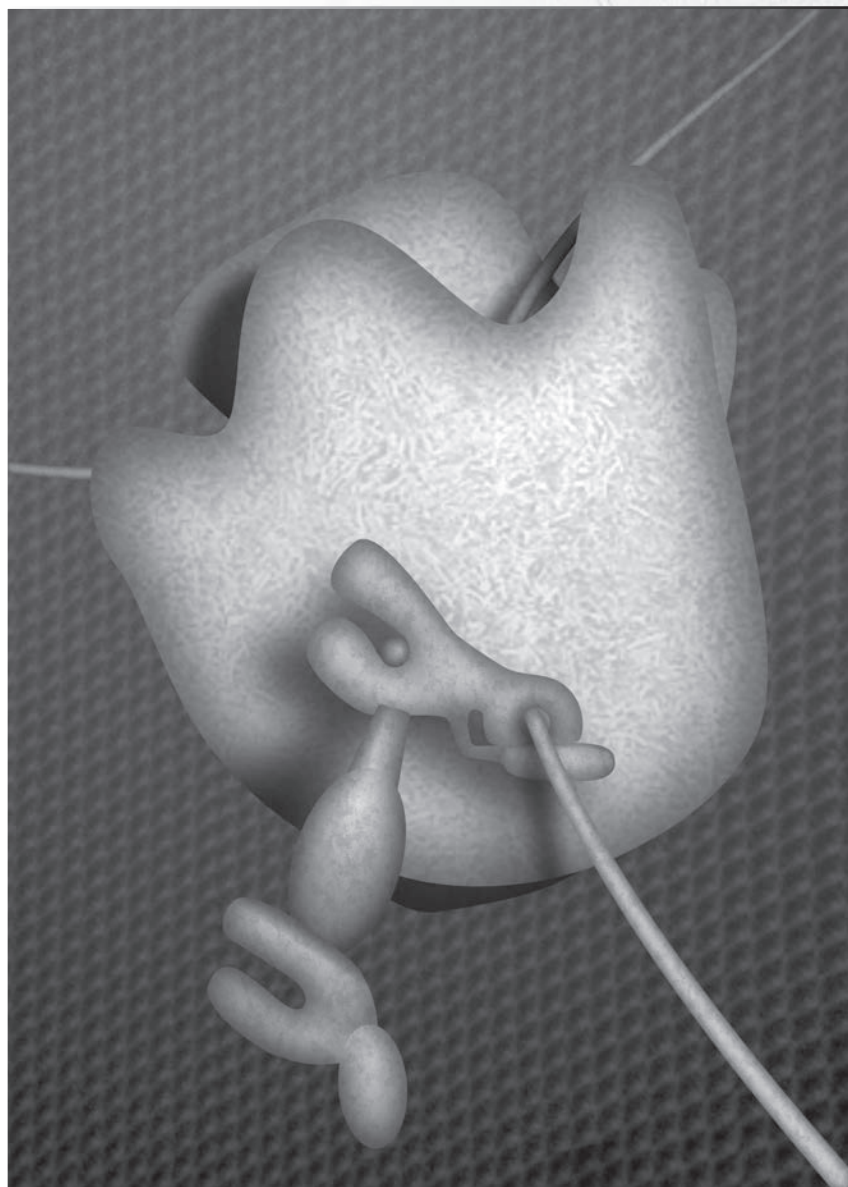
do, now, but remarkably time consuming and painful back then), opening the way for studying regulation of the response, as I had intended. But a report in *Cell* caught my eye – bacteria also had a response to temperature upshift, and one of the major proteins was 70 kDa. I found this tremendously interesting. Not only did organisms as divergent as bacteria and fruit flies have similar responses to an environmental stimulus, maybe, just maybe, those proteins induced were conserved in evolution. If so, they must be doing something(s) incredibly fundamentally important, but nobody had a clue what that might be!

Simply put, I have been chasing this question ever since: What do heat shock proteins do in the cell and how do they do it? I came to Madison in 1979, joining the faculty in the Biomolecular Chemistry (alias Physiological Chemistry), which for my students and myself was an incredibly supportive and productive department in which to do our research. Over the years we came to know that the proteins expressed after heat and other stresses are, in fact, some of the most conserved proteins that exist. But heat shock proteins are encoded by a large multigene family and do important things not only in times of stress, but also in the best of times. They are essential for life: performing roles from facilitating folding of newly synthesized proteins (hence the now commonly used name, molecular chaperone) to driving translocation of proteins across membranes. Long ago we switched from fruit flies to yeast as a model system – “the awesome power” of yeast genetics and new molecular tools allowing us to ask mechanistic questions we could have only dreamed about before.

In 2002 I joined the Biochemistry Department and we settled into the 4th floor of the Biochemistry Addition, close to the skylight that provides a wonderful environment for my favorite plants, just like the department as a whole provides a wonderful environment for our science. We are now much more involved in biochemical studies, trying to combine biochemistry and genetics to critically test the models we develop concerning how chaperones

carry out their marvelous feats within the cell. This blend of science also brings an interesting mix to lab meetings, with the resident biophysicists exposed to suppressor and tetrad analyses and the geneticists to fluorescence anisotropy and dissociation constants. Check out our lab website at: <http://www.biochem.wisc.edu/craig/lab/>

I look forward to the next year(s), leading the department and chasing chaperone function. I will also get my exercise traversing between the 1st floor department office and my 4th floor lab. I can already hear the mantra in my head ... stairs or elevator...stairs or elevator.....



Chaperone protein model

FROM THE FRONT OFFICE:

Cheryl Adams

As always, there have been some big changes in the front office during the past year. We were all sad to hear the news that our dedicated leader of 35+ years decided to retire effective July 1, 2005. As you know by now, Hector has decided to retire as Chair in order to spend more time on his research activities and other outside interests. Although it was hard to accept this news, we are all very happy that he is taking time to slow down and relax a little. We are also looking forward to working with Betty Craig who was elected by the faculty as the next Chair for the department. I'm sure it will be different seeing someone else in the Chair's office after all these years, but Betty seems like a great choice and we are all looking forward to working with her and helping make this transition as easy as possible.

Another major change was the addition of Flavia Arana to the student services group. Flavia replaced Carol Marth and manages all the course and student related issues in the department. She has done a great job so far and has made some changes to help move us forward in this area. She continues to receive valuable service from Carolyn Kunen who does various grant and administrative work and Colleen Clary who handles the graduate recruitment activities for the department. This year we are very happy to note that Colleen received a university award and recognition for her achievements in this area – congratulations Colleen! Other changes in this group include the addition of Theresa Pillar, who replaced Angela Trentadue, and the departure of Mary Murray. We are currently searching for a replacement for that position and have been thinking about other duties that job could encompass during the slower non-recruitment times of the year. We have come to realize that the staff must be flexible and adaptable to changes taking place in the office. In this regard, we are looking at more cross-training for various staff so that they can help out other groups when necessary. Overall, the support staff has been truly outstanding and we could not succeed without their help.

The accounting group also had some big changes during the past year. Jule Pauls left the

department in June 2004 after providing over 12 years of valuable service to the department and purchasing group. Somehow we were lucky enough to find Danielle Tolzmann who has done a superb job of keeping our purchasing group moving forward. She has made some great changes for this group, saved the department a large amount of money by her creative thinking and hard work, and she does this with a most positive and upbeat demeanor. It has been a pleasure working with her. Another noteworthy accomplishment is the approval of delegated purchasing for our department which will expedite the purchasing process. Danielle's assistant, Emilie Keen, also left for another job and we are currently trying to fill that position. It is a difficult position to fill because it can be a repetitive and tedious job, but nevertheless, it is a very important one that keeps the group going. Cathy Michael continues to manage this group with a lot of energy and foresight. She works daily with Jim Shurts to manage the department's financial and grant matters which have become incredibly complicated over the years. The department now has an annual budget of approximately \$22 million and the accounting group does a wonderful job of keeping our budget on track. Other members of the accounting group include: Steve Nofle, Alan Rudrud, Steve Seiler, and Terry Tarrow.

We are also starting plans for Biochemistry Phase II and Jim Shurts is working with the building committee on this issue. We will need to estimate space needs for the current staff along with projections for growth well into the future. It will be an interesting project that will take considerable time and effort but it will be worth it once the building is complete. We now have experience in this area and have learned much from our move into the 1998 addition building.

The payroll and front office group has remained steady during the past year. I have been fortunate to have such a great group of people working with me. Janice Carberry does a terrific job of organizing and managing the various seminar and reception events for the department. Another

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CHAIRMAN...

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Carol Peterson assists Cheryl Adams in handling personnel and payroll matters and just about anything else that comes her way. Others – such as Carolyn, Theresa, Janice, Kay, Marcia and Terry, keep everything running on a day to day basis that permits us to move forward. Dan Barnish is our undergraduate advisor and has received really significant recognition for his work in advising undergraduates. I can go on and on with the many outstanding support personnel we have. The departmental animal room is fortunate to be staffed and run by Wayne and Dave Nehls, while our computing staff is managed by Matt Unger and now also incorporates the media lab. Many of you may recall the truly outstanding staff in this group which includes John Richards, Adam Steinberg, Robin Davies and Laura Vanderploeg. Ken Kalbfleisch is the building manager and electronics repair person, although most of his work is managing the three buildings. This is no small task because the old building has medical school components, and also houses the Department of Bacteriology, which makes his job really rather demanding. The departmental storeroom is managed by Paul Willadsen and it is an efficient and effective storeroom. Having said this, the department

really runs on the basis of the excellent support staff and faculty committees, all of them helping make the Chair's job an easy one. Decisions are made by the Chair, but the rest is done by this outstanding support staff and/or faculty committees.

Many of you will be interested in the fact that Bob Burris does come into the department, although not as frequently as he used to, i.e. every day, but often enough to keep in touch with us. Henry Lardy continues to function as a faculty member as if nothing ever changed; he is an amazing person showing a tremendous level of activity despite his age.

In this final message, I would like to thank all of you -- former students, staff, and faculty --for all the support you have given me while I have been Chair of Biochemistry. As I have said, it has been a wonderful trip. Biochemistry is a great department and let's work to keep it that way!



Graduate student Dipati Sashital, Butcher lab

FRONT OFFICE...

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successful Steenbock Symposium has passed with Janice at the administrative helm. Kay Fitzgerald continues to capably manage the student and classified payroll issues which I truly appreciate. Carol Peterson does a wonderful job assisting me with various payroll, visa, and personnel issues which makes my workload much more manageable. Marcia Bubrick and Dean Hanson round out the group at the front desk, providing valuable service to faculty, staff, and students coming into the office with a multitude of questions and requests. They are able to handle almost anything that comes their way!

We also want to recognize our "satellite" offices and staff. Janet Dewane handles all administrative tasks for the Enzyme Institute faculty and staff in a most thorough and efficient manner. We are very appreciative of her efforts in this area. We also want to applaud Matt Unger who manages

the Information Technology and Media Center (ITMC). This group is a merger of our former computing and media lab staff. As you may recall, we have several outstanding staff who contribute to this group – Robin Davies, John Richards, Adam Steinberg, and Laura Vanderploeg. Matt has done a great job of integrating this group to make us a leader on the technology front! One of the highlights for this group was a presentation for Showcase 2005, a university forum to showcase campus project initiatives. The work involved a database the ITMC created to track university Procard transactions, and thus made the process much more efficient and user friendly. There were many campus users who were interested in this creative project.

I'm sure we will have lots of news to share when we meet again. But please stop by during the year to see how we are doing.

The BACTER Program:

Bob Mau

New to the Biochemistry family is the BACTER program, taking up residence on the sixth floor of the Biochemistry annex. BACTER is one of three new Department of Energy Institutes for the Advancement of Computational Biology Research and Education; the others are at Johns Hopkins University in Baltimore and the University of California at Merced. The goal of all three institutes is to translate computational power into improved biological understanding to further the goals of the DOE Genomics: GTL program.

Led by Professor Julie Mitchell (Departments of Biochemistry and Mathematics), BACTER: Bringing Advanced Computational Resources to Environmental Research brings a new paradigm of computational biology research and education to bear on the DOE goals of bioremediation and energy production. The research of the BACTER program focuses on two model microbial organisms, *Rhodobacter sphaeroides* and *Shewanella oneidensis*. Understanding the remarkable ability of these microbes to thrive under extreme environmental conditions will lead directly to new avenues for addressing the DOE missions of clean energy production and bioremediation. Starting with the fully sequenced and annotated genomes of the two model organisms, the goal of research in the BACTER Institute is to find predict the folds, perform pairwise docking of the model structures, deduce pathways, and ultimately construct whole cell models.

BACTER will engage students in project oriented computational biology research through three interdependent research tracks: Comparative Genomics, Biological Pathway Analysis; Protein Dynamics, Folding, and Docking. BACTER trains students to uncover biological mechanisms and pathways within these microbial organisms through the use

of computational biology and synergistic collaborations with experimental groups. Beginning with existing software tools, the BACTER research team will actively explore the relationship between genome sequence, protein structure, and macromolecular function. In future years, BACTER researchers will develop their own computational tools for the analysis of microbial genomes, molecular interactions, and signaling pathways.

To achieve these ambitious goals, the BACTER Institute has assembled an interdisciplinary team of faculty, postdocs, and graduate students. BACTER-affiliated faculty include Tim Donohue (Bacteriology), Qiang Cui (Chemistry), Nicole Perna (AHABS), Mark Craven (Biostatistics), George Phillips (Biochemistry), Steven Wright (Computer Sciences), Paul Milewski (Mathematics) and David Schwartz (Chemistry). BACTER trainees were drawn from a pool of interested students attending BACTER sponsored workshops and lectures presented in Fall 2004. The students and their departmental affiliations are: Ryan Bannen from Biochemistry, Sarah Cunningham and Omar Demeresh from Biophysics, Yann Dufour from Bacteriology, Michael Gilson from AHABS, Yue Pan and Vanitha Suresh from Computer Sciences, and Julie Simons from Mathematics. Also joining the BACTER family as of February are postdoc Raman Lall and Associate Director Bob Mau. Raman leads the Pathway Analysis group, while Bob is project leader for Comparative Genomics and the BACTER Journal Club. Kudos to Raman Lall and Sarah Cunningham for presenting the first BACTER poster, entitled "Integration of kinetic information in *Rhodobacter Sphaeroides* in Calvin cycle pathway and development of the S-system representation", this May at Biocomplexity 7.

BACTER will offer a Journal Club beginning in Fall 2005, and we have positions available for two graduate students and one postdoc. Interested students are encouraged to enroll in the Journal Club, which is offered as a 1-credit seminar course through the Biochemistry Department. For more information, please visit our webpage <http://www.bacter.wisc.edu>.

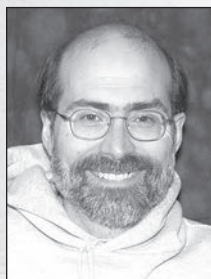
BACTER

BRINGING ADVANCED COMPUTATIONAL RESOURCES TO ENVIRONMENTAL RESEARCH



LABS 2005

FROM THE



**Rick
Amasino
Lab**

As you have heard for the past several newsletters, we continue to try to understand how plants, or more specifically how one particular innocuous weed called *Arabidopsis*, know when it is the correct time of year to begin flowering.

There have been many changes in the lab. Colleen Bizzell completed her Ph.D. and as a postdoc in a new lab she is now hoping, if she could just get those zebrafish to mate, to use her considerable skills in genetics to probe vertebrate development. *Arabidopsis* may need help if cross pollination is to occur, but at least it is always reliable. Mark Doyle completed his Ph.D. and is now in the Peace Corps in Africa. With Mark gone (and he is in a location without electricity so email is out of the question), the lab needs someone who can calm me down after I read a newspaper, but perhaps, in this second term of the Bush administration, even Mark would not be able to accomplish that task. In any case, we all miss Mark and will keep our promise to get his next paper published – the one that needs “just one more experiment.”

As always, we are incredibly fortunate to have many fantastic undergraduates doing research projects with us (11 this year). Tifani Home, Brett Deiter and Weibin and Huibin Zhang will graduate by the time this newsletter is read. Regarding Weibin and Huibin who are identical twins, I had finally acquired the ability to be able to tell them apart, and now they are leaving. I wonder if anyone in the Genetics Program at Stanford, where they will both go to graduate school, will acquire this ability. I also am proud to note that Lewis Hong was received a Hilddale award for his proposal on his research with Bob Schmitz.

Additional news of recent alumni: Scott Michaels is off to a great start as a faculty member at my graduate school alma mater, Indiana University. Ed Himelblau is moving from Southampton College in New York to Cal Poly at San Luis Obispo. He is pleased to be moving back to California. Yoo-Sun Noh recently moved from the Kumho Institute to Kyunghee University in Seoul. Michael Weaver continues his position as Senior Project Manager at the International Science and Technology Center in Moscow, deciding how non-proliferation money is to be spent by scientists.

This year Rachel Rodman, who is a Biochemistry graduate student, joined us. In the few months that she has been in the lab, she is already juggling several projects. Scott Woody joined us as a postdoc to solve several mysteries of the vernalization process. Chris Schwarz continues to try to get the value of QTL, RIL and NIL analyses through my thick, reductionist skull. I admire his patience. Bob Schmitz is well on his way to a first-author paper in his second year of graduate school – a record for my lab. Jae-Young Yun and Sibum Sung are sorting through family of plant-specific genes that are involved in determining if a cold exposure of sufficient duration to trigger flowering has occurred. Among Yuehui He's many accomplishments this year was one paper I particularly enjoyed helping him write. In this work, he showed that the insertion of a transposable element into a key gene regulating flowering time created a novel allele with an island of heterochromatin in and around

the transposable element. This novel allele resulted in a major alteration of flowering behavior that was likely to have adaptive value. This gave me an excuse to spend a day reading the work of Barbara McClintock. I found that in a 1950 paper in the Proceedings of the National

Academy of Sciences she predicted that the insertion of “controlling elements” could result in the “transposition of heterochromatin,” and it was wonderful to be able to contribute to the confirmation of, as well as to cite in Yuehui’s paper, her prescient ideas.



**Margaret
Clagett-Dame
Lab**

The Clagett-Dame lab continues to work on understanding the role of vitamin A in embryonic and nervous system development. In addition, more emphasis in the last year has been placed on developing therapies based on vitamin A in the areas of dermatology and cancer, and more recently, vitamin D analogs for the prevention/treatment of obesity.

This past year has seen the graduation of two Biochemistry PhD students, Ron Merrill and Jason Chapman. Ron left our lab a great legacy with the discovery and characterization of numerous genes induced by retinoic acid (RA) in neuroblastoma cells. This information is fueling several new PhD projects. Ron accepted a post-doc position in the Department of Pharmacology at the University of Iowa with Dr. Strack; Ron is studying the role of a mitochondrial protein phosphatase in neurological disease. Jason Chapman completed his thesis on the mechanism of action of 4-HPR and a non-hydrolyzable analog, 4-HBR, in inhibiting the growth of mammary tumor cells. He is currently using his scientific background in the military.

The vacancy of Ron and Jason as senior graduate students, leaves our fourth year students, Angela See and Danielle Knutson (both from the Interdepartmental Graduate Program in Nutritional Sciences or IGPNS) to climb to the top of the ladder. Angela See, our new bride and home-owner, is advancing our lab in the development arena, where she is studying the role of vitamin A in eye development. Despite all the recent changes in her life, she is still in a good mood, as long as Francis continues to give her a ride to work. Danielle Knutson, CHIP princess of the second floor, is advancing our understanding of how a number of the recently discovered RA-responsive genes are regulated. Between CHIP assays, transfections, and hopefully a transgenic mouse, she still

manages to find time to go to the gym with her newly returned (from Iraq) husband Chad. Even though Chad was an Army Ranger, Danielle still whips him into shape in sculpt class.

Our three third year graduate students, Elizabeth McNeil (IGPNS), Nirca Nieves (Pharmaceutical Sciences) and Brian Thomson (Biochemistry) are deeply embedded in their projects. Elizabeth is continuing a project started by Ron Merrill using *C. elegans* to study the functional domains of the human RAINB1 (NAV2) discovered in our lab. She has also ventured into the realm of four legged critters using a hypomorphic mouse to study how NAV2 functions in nervous system development. Elizabeth, however, is no stranger to four legged critters; she and her husband Andrew are reptile lovers who love to baby their turtle Bessey. Nirca is looking at the effectiveness of several new RA derivatives in acne treatment, and is also studying the mechanism of retinoid effectiveness in this disorder. Nirca is a native of Puerto Rico whose love of seasoned food (not spicy!) and Spanish soap operas ties with her love of wrinkled Rhino mice. Brian is working to discover how 1,25(OH)2D3 and its analogs inhibit the differentiation of pre-adipocytes into mature fat cells. He successfully completed his preliminary exam, and is now working on his first manuscript. One step closer to graduation!

Our lab has continued to expand this year with the addition of two new Biochemistry graduate students, Mark Marzinke and Allyson Anding. Mark will follow up on functional studies of RA-responsive genes. Mark is a huge fan of American Idol and is vying to be a contestant on Survivor. Allyson Anding, our Southern Belle, has taken over the task of studying the mechanism of action of 4-HPR and novel derivatives in chemoprevention/chemotherapeutic applications. Originally from

Baton Rouge, she is adjusting to the cooler climate of Wisconsin and mourning for Mardi Gras. When not working in the lab, she tries to convince her cat Murphy to exercise; he is not responsive (maybe we should try vitamin D?).

Parag Muley, originally of the Animal Science Department, is our post-doc who works harder than any person should. Parag has several irons in the fire including functional studies of the RAISN-1 (retinoic acid induced in sympathetic neurons) and RAINB-1 genes. His wife Sheetal took a job in New Jersey late 2004, and he hopes to join her there soon.

Three talented undergraduate students, Katy Federhart, Vivian Poon and Julie He, completed their senior projects in the lab. Katy and Vivian went off the graduate school, and Julie hopes to go further her education next fall.

And finally, where would the lab be without the faithful technicians? Dan Harrigan is the newest addition to our crazy team. Dan works with Nirca on the dermatology project, helping to dose, maintain a Rhino mouse colony, and analyze mounds of data. Dan and his wife Michelle are expecting a baby girl any day now, and it's safe to say that little lady will have her daddy wrapped around her finger in no time!

A keystone keeping this place running is Mary Kaiser; she is not only a jack-of-all-trades but is also the master of most! Mary is our "animal guru" who nearly single-handedly keeps the vitamin A-deficiency and toxicity studies up-and-running; she is spearheading work to describe embryonic skeletal malformations due to both early and late vitamin A deficiency, and plays a key role in all in situ hybridization studies in the lab. Mary's free time activities include transporting her kids, Lizzy and Matt, from one after school activity to the next and spending time with her scientist husband Mike. Jamie Ahrens is another absolutely essential member of the team who strives to keep all fronts moving forward and to keep us all organized. Jamie was the pioneer on the vitamin-D analog adipocyte inhibition project and continues to test new analogs in this system. She is the "master" of real-time PCR and tissue culture, and these occupy much her time (along with any "pilot" experiments that interest Margaret). She and her husband Mark live in Mt. Horeb and are convinced that rats make the best pets; they currently have two rats, Pumpkin and Seven, who are terribly spoiled.

We wish all the past members of the lab the very best, and ask you to please keep in touch when you have a chance to write or email.



**Mo
Cleland
Lab**

The Cleland lab currently consists of Associate Scientist Laurie Reinhardt, who just had a second child and is on maternity leave, Asst. Scientist Mark Anderson, and grad students Jeremy Van Vleet and Yong Liu. John Marlier from Cal Poly and Jill Rawlings from Univ. Alabama work in the lab in the summers. Our major NIH grant was renewed for 4 years starting 1-1-05, and we just received a second grant to work on pyruvate carboxylase. This is a joint effort with Paul Attwood at the Univ. of Western Australia and John Wallace at the Univ. of Adelaide, so the Australian connection is continuing. We also have joint projects with Matt Templeton in Auckland, New Zealand, and a publication just resulted from this collaboration (Kinetic Analysis of the L-Ornithine Transcarbamoylase from

Pseudomonas savastanoi pv. *phaseolicola* that is Resistant to the Transition State Analogue (R)-N^δ-(N'-sulfodiaminophosphinyl)-L-ornithine. M. D. Templeton, L. A. Reinhardt, C. A. Collyer, R. E. Mitchell & W. W. Cleland. *Biochemistry* 44, 4408 (2005)). A paper also resulted from John Marlier's work.

(Multiple Isotope Effect Study of the Acid-Catalyzed Hydrolysis of Methyl Formate. J. F. Marlier, T. G. Frey, J. A. Mallory & W. W. Cleland. *J. Org. Chem.* 70, 1737 (2005)).

Mo attended the meeting of the Australian Society for Biochemistry and Molecular Biology in late September in Perth, and the whole lab went to the Enzyme Mechanisms Conference in Asilomar in January. Stop by and see us if your travels bring you to Madison.



**Mike
Cox
Lab**

Current Lab News:

Rachel Britt has joined the lab as a graduate student. Rachel got her B.S. at Washington State University. Welcome to the lab, Rachel!

Julia Cox interned for three months during the spring of 2004 as part of the Biotechnology Training Program. She was an intern at the Becton Dickinson Technologies in Research Triangle Park, North Carolina (near Durham). She worked with the protein engineers of the BioSense Group, developing and testing fluorescent fusion proteins to detect and monitor glucose. Julia said it was an invaluable learning experience, she met some really wonderful people, and it was great to learn about industry and product-driven research. She said that she's extremely grateful for the opportunity.

The Cox lab was on TV (Channel 15) in December 2004. Julie Eggington, Michael Hobbs, and Julia Drees volunteered their time on the 2nd Harvest Food Drive and were immortalized doing so on television.

The Cox lab went on a one-day canoe retreat on the Kickapoo River in summer 2004.



Past Lab News:

Kevin Rice accepted a position in the Pharmacology Department at Yale as an Associate Research Scientist in the lab of Alan Sartorelli.

Natalie Lenz (Baker) is now working at Michigan State University doing research in math and science education as a research assistant. She's involved with a project called PROM/SE (Promoting Rigorous Outcomes in Math and Science Education).

Wendy Bedale accepted a position in the DeLuca Lab here at the Department of Biochemistry as an Assistant Scientist. We all enjoy having Wendy back at Biochemistry.

Li-chun Huang is now a manager at Corautes Genetics, a small gene therapy company in San Jose, California, producing plasmid DNA for heart ischemia application.

Julie Senecoff has completed her Master's in genetic counseling at Arcadia University.

Cynthia Gates is now Associate Director, Department of Chemical Enzymology at Bristol-Myers Squibb.

Awards:

Erika Shor received her Ph.D. in January 2005. She was a member of the Rodney Rothstein lab at Columbia University but spent time working on a project here in the Cox lab since February 2002.

Shelley Lusetti received the Boyer Postdoctoral Excellence Award for 2004-2005.

Julia Cox received the Wharton Predoctoral Fellowship for 2004-2005.

Julie Eggington received the Steenbock Predoctoral Fellowship for 2004-2005.

Julia Drees received the Wasson Research Assistant Award for 2004-2005.

Michael Hobbs, Julia Cox and Dennis Harris received a Vilas Travel Award to attend the Keystone meeting in Keystone, Colorado, in January 2005.

Julia Drees received a Keystone Travel Award for the same meeting.

Julie Schultz (Bork) received an NRC Senior Research Associate Fellowship. She's still at the NIDCD/NIH.

Visits:

Elizabeth Stohl, graduate student in the Hank Seifert lab at Northwestern University spent two weeks working in the lab summer 2004.

Goings:

Sergei Saveliyev accepted a position as Senior Scientist, Research and Development, Promega Corporation. Along with the new job, he and his son George purchased their first home near Promega. Congratulations Sergei and George! Sergei also obtained his US citizenship in August 2004.

In 2004, Nami Haruta accepted a position in the lab of Dr. Hiroshi Iwasaki at the Yokohama City University in Japan. We miss Nami a lot and wish her well.

Weddings:

Stephen Abbott is engaged to Leah, a librarian and computer teacher at Yorkville Elementary School in Racine. They plan to marry in 2005.

Nami Haruta is engaged to Satoshi Takahashi, a biophysist. Nami says they carried on their romance even while she was here in the U.S. with the Pacific Ocean separating them. They plan to marry in the spring of 2005.

Leslie Waite and Ari-Asha Castalia renewed their wedding vows in September 2004 before family and friends. Congratulations Leslie and Ari.

Babies:

Erika Shor and Lev Borisov are now the proud parents of their first child, Maya Esther, born 4/11/04, 7 lbs, 20 inches.

Mara and Vali Robu have an addition to their family. Codrin Emanuel was born 1/25/05 (a full moon), 8 lbs, 7 oz, 21 inches. Mara says that big brother Andrei is very excited with his new brother.



**Betty
Craig
Lab**

Greetings from the Craig lab. It is hard to believe that it has been almost three years since the lab moved to the Biochemistry Department, and almost two years since we wrote a lab update (sorry!). So here is the news:

So-Young Kim returned home to South Korea and now has a position in the research development division of CJ Corporation. She reports that she is working very, very, very hard. Bob Seiser is now an assistant Professor at Roosevelt University in Chicago – enjoying the teaching, but reports that it takes A LOT of time. The lame duck (a member of the lab since ~1985, who becomes the responsibility of the “eldest” graduate student, is doing well – and doesn’t appear to have aged a bit) has been passed down through the caring hands of three graduate students since the last update: Helene Eisenman, Peggy Huang and Heather Hundley. Helene, who graduated in the summer of 2003 and is now a postdoc at the Albert Einstein College of Medicine in New York, is deep into the world of pathogenic fungi. She visited the lab last summer – clearly being back in New York agrees with her. Heather, the most recent graduate of the lab, is off to Utah to enter the world of RNA and worms.

So-Young, Helene and Heather were all immersed in the complexities of ribosome

associated chaperones. The project is still in good hands. Although Peggy graduated last summer she is staying on for a year before she goes off for her postdoc. Three new students, Alison Meyer, Liz Alexander and Samantha Herbst, have taken on the project. Willy Walter has spent more and more time in the ribosome world, helping Peggy and Heather with their papers and getting the new students on track.

Kerman Aloria returned to the University of the Basque Country last summer to set up a protein facility in the Biotechnology Center there. The initial tales we heard of a lab with no electricity, to say nothing of no equipment, have, fortunately, not been so dismal lately. Those working at 3 in the morning find the Craig lab a more lonely place, and all of us miss the treats his mother used to send him. Tao Wang joined us from Penn State and has taken over the frataxin work from Kerman. Amy Andrew and Brenda Schilke continue work at the interface between iron and chaperones, having a burst of energy (and caffeine) for 3 months each year when Jarek Marszalek visits from the U. Gadansk. They are all looking forward to the Steenbock Symposium that Betty is organizing this year – “Fe-S Proteins: Biogenesis, Structure and Function”, <http://www.biochem.wisc.edu/steenbock/symposium31>.

Work continues on the yeast “prions” and chaperones. Rebecca Aron has been joined by two postdocs, Takashi Higurashi and Chandan Sahi. Takashi joined us via Tottori and Osaka Universities in Japan, while Chandan came from the University of Dehli. We are waiting for the time when he will let us call him Dr. Sahi – some of the students in the lab are amazed to learn that in India it can take a year for a submitted thesis to be accepted. We miss Jenn Novak (now Nau, after marrying John Nau from the Ansari Lab), who has moved back to her beloved Iowa. She and John are both working at Pioneer Seed.

The combination of Patrick D’Silva’s biochemistry and Brenda’s genetics continue to be a winning combination for the lab’s mitochondrial import studies. They have been joined

by Masaya Hayashi, a new graduate student, and Dirk Schiller, a postdoc from the University of Köln, Germany. Dirk has picked up the work of Maverick Cheng on Tim44. Maverick and Sara Cheng have moved south to Illinois, joining the growing number of UW alums at Abbott Labs.

Betty’s primary obsession (besides the projects in the lab) over the past couple of years has been keeping the 4th floor kitchen stocked with dishes. She keeps asking and asking: How is it possible for 4 dozen spoons and forks to disappear within 3 months? Why do the missing dishes reappear on top of the soda machine??? However, this preoccupation may soon be overtaken by other concerns when she becomes Chair (remember, Chair, not Chairman) of Biochemistry in July.



**Hector
DeLuca
Lab**

It is 2005 and time to write another chapter to the vitamin D story emanating from the Biochemistry Department at the University of Wisconsin-Madison! A lot has happened during this year; most of it good, some of it, just part of life.

As many of you probably realize, this is my 75th year of life, and I can tell you that I am happy to celebrate it! Many folks here have helped me celebrate this three-quarters of a century event. Notably, Carl Gulbrandsen and Kristi Sullivan from WARF and Pat Mings threw a birthday party for me on the 14th floor of WARF this past April 5. It was a wonderful event, M.C.ed by Carl and it brought some of my former associates as well as present friends together for a wonderful celebration. For those who could not attend, I received cards and other recognitions from you. Most notable in attendance was Helen Frank who hasn’t changed since the time she was running the lab in the 70’s up to the present time. She came to the party with Kato Perlman who also has been able to manage age without showing it. Similarly, Heinrich Schnoes was his usual jovial self but I could not induce him to sing. Among the WARF personnel, Howard Bremer, who wrote my very first patent we provided for WARF in 1968 and was key in the early patent work done on the vitamin D story. Howard also is amazing in his activities and energy level. Our

party girl, Pat, was instrumental in arranging the party and was the smiling and laughing catalyst for a good time. Unfortunately, I missed Connie Smith’s visit to my office to relay her wishes.

Another major event, which I am sure you already gathered from the Chairman’s letter, is that I am retiring from being Chairman of Biochemistry, effective of July 1, 2005. This has been a long time coming and I must say that I have thoroughly enjoyed directing the Department for all of these years. However, I am looking forward to not being responsible for all of the departmental aspects that trouble a Chair. It will provide a lot more time for me to do the things I really like to do and among them, of course, is to continue working on vitamin D, especially originating new derivatives that might provide special activities.

Because of this, I have been fortunate to assemble a wonderful chemistry staff who turn out interesting and important new compounds almost every month. The chief person helping us is Rafal Sicinski who is a Professor at the University of Warsaw. He has brought students, Agnieszka and Katarzyna, every summer for the last 3-4 years to work on the vitamin D system. Professor Wicha sent to me Pawel Grzywacz who has been just outstanding as has been Rafal Barycki and his wife, Katarzyna. I also have my superb Indian connection with Padmaja

Tadi and finally I have an Italian connection with Grazia Chiellini who did excellent work on the thyroid analogs and is now turning out interesting vitamin D compounds.

It is my plan to continue working at a reasonable level at least in the foreseeable future, assuming that all goes well in all other ways. Coupled with the chemistry of the vitamin D compounds is the development of Deltanoid Pharmaceuticals, Inc., a start-up company of mine and Margaret's that is devoted to the development of university inventions to a point where pharmaceutical industries license them. A lot of the Deltanoid work is contracted back to our laboratories by a sponsored research agreement with the University of Wisconsin. Thus, the preclinical testing all goes on in Biochemistry under a contract from Deltanoid, and all work beyond this goes on in outside contracted laboratories. This foray into the business world has been a wonderful experience for me. I've enjoyed every aspect of it. We recently added Paul Radspinner, who was Licensing Director of the vitamin D portfolio at WARF, to Deltanoid as Vice President for Business Development. We anticipate that Deltanoid will continue to grow. Currently, there are two of our products that are in phase 2 clinical trials and several others that are in preclinical development. The Director of Research and Development is Lori Plum, who received her Ph.D. a few years ago from Margaret's laboratory (Congratulations to Lori, who just had a baby boy, Zachary.) Lori has done an outstanding job of directing technicians and senior postdoctorates who are employed by Deltanoid. They include Julia Zella, Moises Rivera, a Ph.D. from Bill Mellon's laboratory in Pharmacy, and we've been fortunate to attract Wendy Bedale, a Ph.D. from Mike Cox's lab who has had 10 years experience in the biotech industry. This is rounded out with several excellent technicians, especially Xiaohong from China and Ellen Lake, who came from Dr. Adler's laboratory, have truly been outstanding additions. This whole area of development of drugs has been a stimulus for the whole lab.

On the down side is that two of my very best students received their Ph.D.s and have left. Terry Meehan who came to us from Eric Pierce's lab did an outstanding job as a graduate student in the autoimmune disease area and has

decided to continue to work in the immunology area but on a biochemical aspect. He is now a postdoctorate in the Immunology Department at Scripps Research Institute in La Jolla, CA. Kevin Healy, who came to Graduate School at the same time as Terry, received his Ph.D. and is currently doing a postdoctorate in the Department of Pharmacology at the University of North Carolina in Chapel Hill. Kevin also did an outstanding job as a graduate student, and I am very proud of both of them. Terry insisted that we have a pig roast and I guess I never realized how much students enjoy and remember the annual pig roasts that currently takes place on our home farm near Cottage Grove. This year's event was a lot of fun as usual, although I must say Terry did not live up to his claim that they were going to drain the half barrel of beer! They did do a reasonable job however! They also did a great job in preparing and cooking the pig and everyone else brought wonderful foods and fun to the party. We also added to this our annual holiday party at Christmas time which usually takes place in the 6th floor lounge of the 1985 wing of Biochemistry; but this will no longer happen because that lounge has been turned into a research laboratory for our Assistant Professor in the area of computational biochemistry. However, we will have another holiday party but exactly where, we do not know at this time.

I know that I have been telling everyone that I am NOT TAKING ANY MORE GRADUATE STUDENTS, but every year I seem to end up with one or two more. This year, I've been fortunate to add James Kim from Deerfield, Illinois, who is very interested in the area of drug development, and is currently working in the area of autoimmune diseases. I am very happy to have him and he fits in very well. He joins my other students working to complete their Ph.D.s. Marie Schwinn (formerly Wiater) is nearing completion of her degree as she identifies coactivators that might explain how some new analogs act selectively. Jeni Scancella works on the biogenesis of an endogenous ligand for the Ah receptor. Katie Williams studies the regulation of phosphate absorption. Bryan Becklund took over the multiple sclerosis project from Terry Meehan, and Gina Gialamas is working on a cancer project. Some

great contributions are coming from Ehren Rudolph in the area of type 1 diabetes and its prevention by vitamin D. Claudia Zierold continues to provide important contributions on mechanisms of regulation of the vitamin D endocrine system. Janeen Vanhooke has been studying the crystal structures of the vitamin D receptor and when it is bound to selective analogs. Using microarray technology, Galina Kutuzova is finding which genes are regulated in intestine and osteoblasts by 1,25-dihydroxyvitamin D and/or its analogs. Shirin Akhter has been studying a calbindin D9k mutant mouse to determine if this protein is required for intestinal calcium absorption. Last but not least is Jason Song, who discovered, isolated and identified an endogenous ligand for the Ah receptor, has been putting together the study of its synthesis and inactivation. The work of these gifted postdoctorates and scientists is supported by technical work by Eric Danielson and Aaron Hirsch as well as a gifted group of undergraduates. Another point of interest is that during the last couple of years, Jamie Mings and Jean Prahll have been students in the new two-year U.W. Master's Program in Biotechnology and will graduate this May. I don't know if these two anointed people will be able to talk down to our level but we will have to deal with them as best we can. In the case of Jean, though, it's not difficult ... since she really can't talk down to any one as there is no one shorter. The only other interesting area is Wendy Hellwig's chickens! As you probably know, Wendy and her husband live near Oregon, Wisconsin. They raise chickens and she has an egg concession going on from her office and everyone "flocks" to get her fresh eggs and believe me, they are excellent! I imagine she will be making so much money pretty soon that she will quit her job as lab manager.

Many of you might be interested in what has happened to my children. Starting with Camille, who lives in California south of San Francisco. She is a clinical director in the biotech company, Excelexis. As many of you may recall, she got her Ph.D. in Biochemistry with Rick Hallick at the University of Colorado. My oldest son, Jim, and daughter, Debra, are both in environmental cleanup work. Deb is a mother and has a consulting business in this area and her husband, Eric Dott, is a geologist, who is also in the

environmental cleanup area in Minneapolis/St. Paul area. My son, Tom, is a Professor of soils at the University of Montana in Missoula. My two youngest children, Martin and Adriana, are in first grade and preschool, respectively. These kids are my pride and joy and all of them have turned out to be wonderful additions.

And now for a little bit of news that is not so good. During the 2004 Christmas season, I was diagnosed as having a large B-cell lymphoma which fortunately remained as stage I localized in my neck. I have been undergoing chemotherapy treatment and I soon start radiation therapy; hopefully it will be entirely successful. We are very encouraged by the prognosis and by the statistics in regard to this treatment. I am sorry to report to you the passing of Jack Omdahl who you will remember was in the laboratory at the time of the great discovery of the vitamin D hormone, 1,25-dihydroxyvitamin D₃, and played a significant role in that development. Jack was an outstanding person in every way, and it was extremely sad to lose him to a long fight with melanoma. On the other side is the story of Anita Roberts, one of my finest students, who has been battling an inoperable stomach carcinoma. Her story and the way she is handling this problem is a truly outstanding one and everyone who knows her say they are not surprised. She has a strongly positive attitude, and it has helped me tremendously in dealing with my diagnosed lymphoma. It is my hope that Anita will be the Lance Armstrong of Biochemistry, i.e. she will beat this cancer.

My final message is to tell you that it is important to do the things you really like to do, and I must say that I have been blessed in my life because I am doing exactly what I most enjoy, namely research, working with young people, developing them as well as ideas, hopefully to some advantage to everybody. Feeling that you have contributed is probably one of the greatest gifts and an even greater gift is the feeling that you have helped understand something for the first time. I am fortunate to be in this kind of work and to actually be paid for it.

I send my greetings to all of you and I am so grateful to have had your association.

Hector



**Brian
Fox
Lab**

Hello from 141B Biochemistry Addition.

In the past year, our lab included Lucas Bailey, Paul Blommel, Brendan Burns, Yong Chang, Dave Dyer, Nate Elsen, Zach Eggers, Jason Ellefson, Ronnie Frederick, Holalkere Geetha, John Kunert, Won Bae Jeon, Thomas Malone, Peter Martin, Janet McCombs, Lea McMartin, Luke Moe, Brad Pierce, Megan Ritters, Kory Seder, Pablo Sobrado, Hassan Sreenath, Eric Steffan, Teresa Tiradani, Frank Vojtik and Russell Wrobel. Our undergraduates include Steven Bagguely, Erich Brauer, Petar Duvnak, Miriam Halsted, Steve Kaul, and Abby Wochinski. Our projects are still the desaturases and toluene monooxygenase, TIM barrel flavoproteins from bacteria and plants, and the cloning, expression, growth, and purification subgroups in the UW Center for Eukaryotic Structural Genomics (CESG). In the lines below, I will summarize what we were up to in the last year.

Karen and I made the trip to Duluth to Joe Studt's wedding last summer. It was a great time. He and John Broadwater both work at Boehringer Ingelheim. They have a great set of coworkers and friends, but this would be exactly as expected. Kevin and Tracey were also at the wedding, and we enjoyed spending some time with them as well. Kevin and Tracey are moving away from California, and will reportedly come through Madison for a visit en route to Beantown. Enrique is working at the UW Medical School now, having returned to his immunological roots, but hopefully he is much the wiser for knowing that enzymes are important too. Jeff is still in Davis, CA and was the co-author of the first patent actually granted to our lab for his superhuman effort to make fluorescently labeled acyl carrier proteins. Sadly, sales have plummeted ever since. Karen and Brandon are in Europe, hopefully not having to always explain the intricacies of US foreign policy to their EU friends. Karen and Dave's structure of Rv1094, solved with Ivan's help, came out just recently, with a Lys sticking its imposing side chain right into the theory of primary sequence annotation. And, late breaking news, the score is Rogge-Fox, 3; Rogge-pre Fox, 0.

In the last year, the CESG grant was up for renewal. John Markley, George Phillip, I, and a

host of other helpers put together two proposals to fund our continued participation in the second phase of the Protein Structure Initiative. It was a very, very busy September. We are now waiting for the final decision from NIH council, which should come sometime in late May. Along with Project Manager John Primm, the team leaders Russell, Ronnie, Sreenath and Frank and each of their wonderful staff (named above) have really kept this adventure going. So far we have solved 52 structures, 98% of them from eukaryotes, 75% in PFAM_A clusters, and 22% in eukaryote only clusters. Upon considering the structural genomics groups funded by NIH, we had the highest percentage of novel folds among our solved structures, so at least we did that part right. As we get favorable information on funding, CESG is poised to move into the Old Genetics building to have a contiguous research space for all the subgroups from bioinformatics to protein production. This should be a great opportunity for the organization. CESG said goodbye to Todd (Architecture grad school in Oregon) and Sandy (Bacteriology grad school at UW) this year, but welcomed Teresa and Zach into the CESG group.

My lab has a number of other new faces this year. Brad Pierce joined as a postdoctoral from Mike Hendrich's lab at Carnegie Mellon. Brad knows a thing or two about EPR, so in trade for his obtaining and interpreting our occasional spectra, we agreed to expose him to the occult intricacies of cloning and expression. Just recently, Brad's cauldron has begun to bubble, and we expect mutated stuff to shortly emerge in a nearly publishable form.

Lea McMartin joined the lab in April as a research technician based on an insider tip from my former undergraduate research mentor Jerry Mohrig at Carleton College. Lea has experience in organic synthesis, and by merely reading the chemical literature in this age of kit-dominated molecular biology she was able to execute a synthesis that saved us a huge amount of money relative to purchase in the not-so-free market. Lea has also shown interest in mutagenesis, except for when Tyr codons are involved. This is hard to understand, but there must be a reason, and she will have to address this as a graduate student starting this fall.

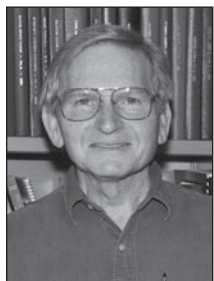
Pablo Sobrado joined the lab as a postdoctoral from Paul Fitzpatrick's lab at Texas A&M University after a short working visit to Chile. Pablo has interests in enzyme kinetics so naturally he picked the slowest and most difficult enzyme in the lab to work on, membrane desaturase. Fortunately, Pablo does not take no for an answer and he has already worked some marvels on this fat-embedded pork chop. Consequently, I suspect that the mate' he sips during group meetings may be fortified with something like unbridled optimism.

Peter Martin joined the lab in November after a recent graduation from Biochemistry 651 and a few vacations here and there. He is working on a test of a new cloning strategy that was developed by Promega for high-throughput cloning. We are fortunate to be one of the lead beta test sites for this technology, which you will hear more about in the coming months. This job has allowed Peter to develop skills in pipetting, electrophoresing, transforming, and gel reading, which ain't a bad start for anybody.

Lucas Bailey and Nate Elsen joined the lab in December. Apparently, both of them liked my cryptic style and art gallery approach to teaching in Biochemistry A to B, and so came to join the lab. One important task for next year will be to recover our rightful ownership of the department Best Christmas Ornament Award.

Luke, Paul, and Thomas are in the later stages of their degree work. For Luke, the light has begun to emerge at the end of the tunnel. His norcarane paper in Biochemistry is going to be a standard in the field of radical clock enzymology. Along with the structures of T4moC solved by X-ray (Craig Bingman and George Phillips) and NMR (Brian Volkman, John Markley and NMRFAM) and a promising start on fluorescence polarization studies of complex formation, Luke's dissertation seems to be shaping up well. Paul has many pans in the fire, and an uncanny knack to add a new pan while keeping all of the old pans evenly cooking. Thomas has made some new linkages on problems of structure and function in the Xen/OPR family, and will take his BTP internship later this year in Greece. Yong is putting together a Mycobacterium enzyme complex assembled from parts predicted from bioinformatics. It should be an interesting story to tell in a year or so, especially as assay has become our operational key word now that parts cloning is working well.

So, that's enough for now. Eckard is in town for the Steenbock symposium, and his plan with collaborators Andreja and Oleg from Ames National Lab is to use our rapid mixer to mix ozone and iron in 1 M perchloric acid to generate a mononuclear ferryl species. Brad thought ahead and bought a new mixer. So far, no smoke. My best wishes for your continued success and happiness in the coming year. We're still here, waiting to hear from you whenever you have the opportunity.



**Perry
Frey
Lab**

The Frey lab continues its strong tradition of biochemical research and education. Much remains the same in the lab this year. Dawei Chen, Ab Arabashahi, and Frank Ruzicka remain active in the lab, contributing much of the backbone of the Frey lab research. Kaisheng Huang, Susan Wang, and Elham Behshad continue their post doctoral work. Glen Hinckley and Phillip Schwartz remain as the last two graduate students in Dr. Frey's group.

Dr. Frey was honored by his alma mater this year. The Ohio State University Chemistry Department honored him with its distinguished alumni award for 2005.

It is the year of the infant in the Frey lab, with many new additions to the families of our lab members, past and present. Glen and Michelle Hinckley are the proud parents of Everett Ariosto Hinckley. Adrian Hegeman and his wife Ericka welcome their new daughter, Sylvia Sanders Hegeman, into the fold. Oli and Selma Magnussen welcome their second child, Idunn Margret. We wish health and happiness to all our new, budding young scientists.

The Frey lab stirs with change as well. Alejandro Yévenes joins the lab for postdoctoral experience. Alejandro received his doctorate in biochemistry from the Universidad de Chile, where he studied phosphoenolpyruvate carboxykinase from

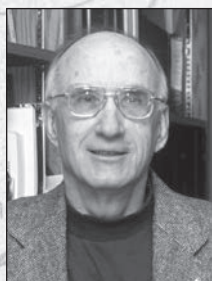
Saccaromyces cerevisiae. This work was done under the guidance Emilio Cardemil, some of which was done in collaboration with the Frey lab right here in Madison. The lab welcomes Alejandro and his wife, as they make their new home in Wisconsin.

Encouragement and congratulations are in order, as Glen Hinckley enters the final stage of his graduate career. Glen is hard at work finishing his doctoral thesis, and plans to defend sometime in June. Glen has accomplished great things in the way of enzymological electrochemistry, and has accomplished very important work in determining the reduction potentials of iron sulfur clusters in enzymes such as lysine 2,3 aminomutase. We wish Glen well, as he enters a new phase in his young scientific career.

Frank Ruzicka will say farewell to the lab this year, as he plans to retire in the fall. Frank has had a long and rich career in biochemistry, starting his work at Purdue in the mid 1960's with Dr. Frederick Crane on mitochondrial

respiratory-chain linked NADH dehydrogenase. After a brief experience with the military, Frank joined the Enzyme Institute with Dr. Helmut Beinert, where he contributed to the remarkable work being done at the time, involving low temperature EPR of metallo-proteins. He worked for the UW Department of Human Oncology for seven years, before returning to basic research in Dr. Frey's lab. Frank spent seventeen years working with Dr. Frey, where he worked on a variety of fruitful projects. He was a key figure in leading the lab to the success it enjoys today. Frank looks forward to retirement with his long time companion and wife, Eva. He fervently awaits the time he will spend with Eva, horseback riding and gardening. He would like to extend his gratitude to Dr. Frey and their former colleagues for a wonderful and rewarding career.

All our continuing lab members look forward to another productive year of research and collaboration within the lab, and wish joy and prosperity to all who are continuing or leaving.



**Jack
Gorski**

A highlight for me this past year was attending the Nuclear Receptor Symposium in Urbana, IL organized by the Katzenellenbogens and other IL faculty. It was nice to see the progress of the field although it is getting so complicated that some questions are raised in my skeptic's mind.

This was a good year for many former associates. Mike Kladde got tenure at Texas A&M, as did Doug Wendell at Oakland U and David Furlow at U CAL-Davis. Kotaro Kaneko and his wife had a baby and Kotaro was promoted at the NIH. Iain Anderson is moving to DOE Joint Genome Institute in Walnut Creek, CA. Scott Lundeen was promoted to Research Fellow at Johnson and Johnson.

Karen Gould is now an Assistant Professor at U Nebraska Medical School in Omaha. Mary Ozers and Jyoti Watters each had their second child this past summer.

We had a very nice visit from Frank Gannon last spring that gave us a chance to catch up on his family and some of his research. Jeff Hansen came through and gave a great seminar. This past December, Roy Welch was invited by Bacteriology to present a seminar on his studies using informatics to understand development in bacteria. The talk was very impressive and required three laptops to show time lapse movies, dynamic models, etc. Tammy Greco completed her sabbatical year with the Fritsch/Murdoch lab. We didn't see her as much as we would have liked but she did have a good year.

Harriet and I have had a good year. A new grandson makes six grandkids and they are a delight for us. We travel a lot and enjoy our activities and consider ourselves to be very lucky. US politics were very disappointing to us and, I know, for many of you. We do worry where the country is going but these times are not so different than other times that we have experienced. It has been a long winter but we know that spring will soon follow.



**laura
Kiessling
Lab**

Having finally returned from an extensive 2-year search for WMDs in Antarctica, the Kiessling group will strive to describe the changes over the last few years. Much has changed since the last update. We will try to describe the professional and personal developments as best we can.

There are a number of recent graduates. One of these is Michelle Soltero, who continued the tradition of close collaborations with the Raines lab by marrying one of its members, Josh Higgin, in 2003. Both Higgins graduated in 2004 and are doing post-docs in Raleigh-Durham North Carolina. Byron Griffith graduated in December 2003 and is working in Jon Thorson's group in the School of Pharmacy at UW-Madison. Byron has the distinction of being the first in the lab to realize "pants-less Thursday". We hope that the reactions he is running in the Thorson laboratory are less exciting. Chemist Bill Thomas graduated in April 2003 and is working on in California (from Gilead to Chemocentryx). He and his wife welcomed their fourth child shortly after their departure. Post-doc Andy Spencer left the lab in March 2003 for a job at Mirus in Madison, WI and then he too traveled west to California. Andy will be happy to know that his buffers are still in the cold room. Undergraduate Steve Brown graduated in 2003 and is pursuing graduate studies in chemistry at Scripps.

There is a trend that might disturb some diehard Badger fans: Many of our former group members become Wolverines after graduation. Robert Owen graduated from chemistry in June 2003 and left to work as a post-doc in Bill Roush's laboratory at the University of Michigan. Robert is holding down the fort since Bill Roush has moved to Scripps Florida. Soon after arriving in Michigan, Robert and his wife Jessica bought a farm. This farm includes a horse (of course). Allison Lamanna also migrated to Michigan. After graduation in 2004, she is pursuing her post-doctoral studies at the University of Michigan in Rowena Matthews's group. Moreover, Jason Gestwicki (PhD 2002) will be an assistant professor in the Department of Pharmacology in the new Life Sciences

Institute at the University of Michigan, and Tonia Buchholz (MS 2000) is starting graduate studies in the Chemical Biology Program there. In addition, one of our fabulous chemistry undergraduates, Matt Leathen, will also be heading out to the Chemistry Department at University of Michigan. He will join Katie Johnson (a former undergraduate in Chemistry) who is pursuing her MD-PhD and working in Gary Glick's group and Kary Oetjen (a former Chem/Biochem undergraduate), who is pursuing her MD. Jesse Wilkins (Chemistry undergrad), a rugged individualist, is heading off for graduate school at UC-Irvine.

Matt Allen joined in December 2003 as a new post-doc from Tom Meade's group at Caltech via Northwestern. He likes mustaches. John Phillips, Yi He, Jesse Wilkins, and Matt started and participated in Mustaches 4 Kids Madison, raising \$3169.01 for sick kids. In an unprecedented trade of immense magnitude and even bigger coincidence, the Kiessling group traded two individuals to the University of Utah in exchange for a post-doc and a graduate student to be named later. In August 2003 Patricia Mowery received her Ph.D. and left for Sandy Parkinson's group at Utah, and after graduating, (former) undergraduate Beth Stadtmueller went to Utah to join the Biology graduate program in 2003. In return the Kiessling lab gained from Utah Coby "Biochemist" Carlson in May 2003, a recent graduate of Pete Beal's lab. The student to be named later turned out to be biochemistry student Todd Gruber, a recent graduate of Utah's Chemistry Department, who joined in December 2003 after being cut as Harry Potter's stunt double. The biochemistry lab also gained John May, a "Cameron Crazie" who may be talking to you or just as likely to himself. Chemistry gained graduate students Lingyin Li and Katie Alfare. In addition, a number of new postdoctoral fellows have arrived including Jiyoung Chang, Christine Brotschi, and Yimin Zhu. In December 2004, Adam "My last name is a first name" Courtney joined the lab, all the way from Canada, eh. He likes his apartment here, but misses his igloo back home. Another first year from CMB, Joe Klim, joined the

lab after skiing around the world for a year. Fortunately most of it was downhill.

Congratulations are in order for Brandon Beyer (recently married) and Jason Pontrello (recently married). We have also some engagements to report: Jack Borrok, Todd Gruber, and Katie Alfare all recently became engaged (not to each other). In addition, we have some new arrivals to report: Jessica is now the mother of a little boy (James) and Yi He (Chemistry) is the father of a boy (Calvin). In addition to all this good news we have some that is tragic; the much beloved triops 'Chirpee' passed away at the old age of 56 days. Jack is still mourning the sudden loss; perhaps there will be another triops but right now it's just too soon.

A number of lab members have received awards. Brendan Orner received the Boyer Postdoctoral Excellence Award, Michelle Soltero Higgin received the Sigrid Leirimo Award, Erik Puffer received the Steenbock Predoctoral Fellowship, and Jack Borrok also received a Biochemistry Department Graduate Fellowship. John May and Katie Alfare (Chemistry) were awarded NSF graduate fellowships. Emily Dykhuizen (Chemistry) was awarded an Abbott Pre-doctoral Fellowship and Erin Carlson (Chemistry) was selected for the first Ralph Hirschmann-Daniel Rich Award in Bioorganic Chemistry. Both of our new-generation outstanding undergraduates (Elissa

Hobert and Ashley Reinke) were selected for Hilldale Fellowships. We congratulate all of them on their achievements!

There are a number of group members that will soon be moving on (some even to locations other than Michigan). Dave Peal (CMB) is defending his thesis (in weeks) and he will be moving out to Utah (Alejandro Sanchez group) to work on planaria and regeneration. Jason Pontrello (Chemistry) is also about to defend his thesis, and then he will head out to the East Coast. John Phillips (Chemistry) is also on the verge of defending his thesis. John will head out to California (where else?) to work in Brian Stoltz's research group at Caltech. Yi He (Chemistry), Erik Puffer (Biochemistry) and Erin Carlson (Chemistry) will also be gone by the time you get another newsletter. More on those developments in our next newsletter...

Who is working at our westside location? Those you can find in the Biochemistry lab include: Jack Borrok, Todd Gruber, Adam Courtney, Joe Klim, John May, David Peal, Erik Puffer and Eric Underbakke, post-docs Coby Carlson, Jessica Hollenbeck and Brendan Orner and undergraduates Elissa Hobert and Ashley Reinke. The eastside location houses: Katie Alfare, Erin Carlson, Ratmir Derda, Christine Brotschi, Matt Allen, Emily Dykhuizen, Jiyoung Chang, Grace Jiarpininum, Erin McElroy, Lingyin Li, Yi He, Yimin Zhu, and Brandon Beyer. Come visit us anytime.





**Judith
Kimble
Lab**

Since our last newsletter, a lot has happened on both the science front and the personal one. This may be because it has been a while since the last newsletter, but it is also because the lab has been a very active place.

Let me first talk about where people have gone from the lab, where people are going and who our new members are. Kellee Siegfried finished her Ph.D in 2003, and moved to Germany to work on zebrafish gonadogenesis in the laboratory of Janni Nusslein-Volhard. Intermittent emails suggest she is thriving there, and I will be going in September to check on her. Laura Mathies finished her postdoc in 2003 and started as an Assistant Professor at North Carolina State University in Raleigh, and Christian Eckmann finished his postdoc in the same year, and started as a Group Leader at the Max-Planck-Institut for Cell Biology and Genetics in Dresden. I have visited both Laura and Christian in their new sites, and they both seem to be doing well. Kit Tilmann will be finishing his postdoc in a couple of months and has accepted a job as an Assistant Professor at Loyola University in Baltimore. So Kit will be close to Eric Haag, another former postdoc who is now an Assistant Professor at the University of Maryland. Jen Bachorik has a defense date and will be getting her degree this summer as well. Her plans are not yet finalized so I will have to leave that for next year's newsletter.

Who remains in the lab? Within the last two years one graduate student has joined the lab, Kyung Won Kim, and five postdocs have arrived. Myon Hee Lee came directly from Korea, Dana Byrd from Santa Cruz, Keith Nykamp from Florida, Ngan Lam from McCardle Labs here in Madison, and Bryan Phillips from Texas. Their projects are wide-ranging, but all focus on some aspect of germline or somatic gonadal development. And we still have a core of graduate students who are in varying stages of their thesis research, including Trey Kidd, Liana Lamont, Beth Thompson, Mike Chesney, Dan Hesselson, and Nayoung Suh. Trey is currently interviewing for postdocs, and should defend before the end of the year. Liana and Beth are starting to think about postdocs, but not quite ready to go on the interview circuit. And Mike, Dan and Nayoung, all dissertators

are busily working on their projects with the idea that a postdoc is not too far in the future.

Here are the email addresses of the people who have left the lab in the past couple of years.
kellee.siegfried@mailhost.tuebingen.mpg/de
idmathies@ncsu.edu
eckmann@mpi-cbg.de

But what about science. Well we continue to make progress and have a good time doing it! The SYS-1 project, started by Jen Miskowski nearly 10 years ago now, and continued by Trey Kidd has turned into a wonderful story. SYS-1 turns out to be a novel protein that acts functionally as a β -catenin. It also appears to be rate-limiting for POP-1 activity, so we have a new model for the function of POP-1 asymmetry. This is all spelled out in a paper to appear in June (Cell), so you should look there for the details. More is in the pipeline of course, and I am struggling to keep up with the papers that need to be written. FBF continues to be a mainstay in the lab, as does GLD-2. And we continue to collaborate with the Wickens lab on RNA regulation, which has been wonderfully productive and fun for both labs.

And what else? I cannot update every one's personal lives, but will provide a few details of mine. Zach is now 17 years old, taller than either parent, and doing well generally. He is thinking about colleges, and we will be spending the next six months visiting various places to give him some idea of the range of possibilities. In the mean time, Zach is still willing to travel with his parents. Last summer, we had a terrific trip to Ecuador, visiting the Andes Highlands, the Galapagos, and the Amazon basin. Stunning images throughout. And we had a week veg-out time in the Apostle Islands, which gave a much needed rest!! This next summer, we will be taking Zach and two of his friends to London and the Cotswolds – should be an interesting time with three 17 year olds all bigger than us. Luckily they are all great kids and we are really looking forward to it.

Well that's it for this year. I am still in contact with many of you – either at meetings or at your own home sites. Jen Miskowski, who is now

a tenured professor at UW-La Crosse came to Madison for our celebration of the publication of the SYS-1 story. It was great to see Jen,

and I hope more former lab members will be coming through soon!! In any event, my very best wishes to you all!!



**James
Ntambi
Lab**

Greetings from the Ntambi lab!! This year has been another busy time for everyone, and we would like to share a little bit with you all.

Dr. Ntambi continues to be involved in the CALS study abroad program as one of his outreach activities. This year he took another group of UW students on a three week field study to Makerere University at Kampala, Uganda where they had an opportunity to study international health issues in a developing country. He was involved in a very interesting academic experience when he acted as an opponent for a student's Ph.D thesis defense in Stockholm University in Sweden. He also attended many conferences and visited universities to give talks on SCD.

Associate scientist, Makoto Miyazaki, continues to work on the mechanism whereby SCD1 inhibition protects mice against obesity. With his wife, Shinobu, who has recently joined the Deluca lab, he tries to find time to exercise everyday to shape up his body.

Agnieszka Dobrzyn, a postdoc in our lab, continues to work on the role of SCD1 in lipid-induced apoptosis in the heart. Her project is almost done and in December 2005 she will be leaving Madison for good. She is going back to Poland, where she will continue her work in the Department of Physiology, Medical University of Bialystok. We are very happy to have her working with us for the last three years, and we wish her the best of luck in her near future.

Weng Chi Man, the most senior graduate student in the lab, is trying to find a good balance between keeping herself physically fit and finding out how SCD is located in the ER and what contribution this can have on understanding the role of SCD in the lipid metabolism. Apart from work, she is enjoying the interactions with other lab members inside and outside the lab.

Harini Sampath, a graduate student in Nutritional Sciences, has had a very busy year as she has had to go through her preliminary exams this past year. She passed both her exams and now looks forward to continuing her research on cardiac substrate metabolism as well as hepatic steatosis. This year, Harini received a predoctoral fellowship from the American Heart Association as well as a travel grant from the American Society for Nutritional Sciences to travel to the International Congress of Nutrition in Durban, South Africa in September 2005. Harini also recently received a scholarship from the American Oil Chemists' Society. On a more personal note, Harini will be heading home to India this summer for her wedding in June.

Kiki Chu, another graduate student in the lab, continues her research to study the role SCD in lipid metabolism and its effect on hypertriglyceridemia and liver steatosis. Aside from work, she also took a break this winter to visit her parents in Okinawa, Japan. She enjoyed her short break and is now fully recharged to get back to work.

Aside from the three graduate students, we also have one graduate student, Fiona Fernandes, from the medical school, who is currently working in collaboration with us. In addition, we had five motivated senior undergraduates this year working with us to gain some research experience and techniques. We hope that their experience gained in our lab would be valuable in their next step of life as they graduate in May. Shayan Ahmed, Sean Bruggink, Eric Monroe, Chris Lui, and Willy Soesanto—Congratulations!!

We hope you all were able to catch a glimpse of our lives this year, and we hope to see you again next year! Best of luck!!



**Ron
Raines
Lab**



**Bill
Reznikoff
Lab**

2004 was a year full of big events for me and, I think, for the whole Rez Lab. The major decision that really led to many of the important happenings was one that Cathy and I made a few years ago. I decided that I wanted to retire from the University of Wisconsin sometime during the first half of 2007. I definitely have mixed feelings about this eventuality. There is no doubt that we want the freedom to travel when ever and where ever we want – to visit Sarah, Charlie and Joe where ever they may be. I also want the freedom to explore new avenues of science without concerning myself with teaching and other university duties. On the other hand this has been and will continue to be a truly great department within a great university. I don't really mean that in terms of its scientific stature, although that is certainly true. I mean it in terms of it being a great place to work, learn and have friends. When 2007 does come, I will dearly miss the closeness of our many friends, but as you will see below, I will be gaining some new ones.

This decision to retire led us to decide to establish a new home in Falmouth, Massachusetts. Lots of family and personal reasons for this choice. We now have a new, lovely home there that Cathy designed. It is a five minute walk from a great swim for any of you that visit. One reason that we chose Falmouth is because we know that I would go

crazy if I did not continue considerable science, and Woods Hole (a village in Falmouth) is the site of the Marine Biological Laboratory – a good place where I can do precisely that. Last year I decided to spend a sabbatical at the MBL in part because I wanted to learn new things and in part because I wanted to make sure that I would fit in and enjoy science at the MBL. I spent from January to April and then from June to September in the molecular evolution group at the MBL. My immediate project was to use the genome database to search out relatives of Tn5 transposases and use comparative sequence analyses to discover what parts of the primary sequence had been conserved – and therefore might be important. In general I had a “blast” (sorry for the pun), discovered whole new areas of interest (from Wolbachia and Trypanosoma to blue fish), made new good friends and was successful with the project.

In part, the idea of retiring in a few years, suggested that it would be a good time to have a meeting including as many former students, postdocs and colleagues that I could manage to contact. Thus, with the help of Tricia Kiley, Paul Lambert and Xain-Ming Yu, a Steenbock Symposium was organized for May 20-23 of last year <http://www.biochem.wisc.edu/steenbock/symposium30>. Unfortunately, some former colleagues could not make it and some we could not find, and we missed them a lot.

However, people came from all over including from Russia, Germany, France, Switzerland, Israel, Canada, West Africa, Australia and Korea. It was a wonderful meeting of science, old memories and fun, including a let's roast Bill session led by Julian Davies (of course).

You would think that with all of the above, there would be little time for science in my lab. Well, with the help of Igor Goryshin, Mindy Steiniger, Chris Adams, Rich Gradman, Rachel Sterling, Agata Czyz (a new postdoc), Jennifer Apodaca, Deb Hug and Carol Pfeffer plus a couple of great undergraduates, science has

gone on. I have always believed that I should focus our work but I have always been unable or unwilling to do so. That is why we are studying the basic molecular biology of Tn5 transposition, using Tn5 as a genomics tool, and trying to find HIV-1 integrase inhibitors using Tn5 transposase as a surrogate. It has gone well and I hope that it will continue to go well for the next year +.

Please stop by and see us. The one thing to keep in mind is that I will be spending most of the next two summers at the MBL – but you can stop by and see me there too.



**Marv
Wickens
Lab**

Here in the clearing, strange sounds from the rainforest. Chatter among the capuchins, high up in the canopy. Pop songs from the shrubs – the call of the bald-headed Daniel. Wild goats bray. An occasional coconut or beaker crashes to the floor. A silverback and the other males challenge the wild Labib. There is chest-beating, songbirds in the trees, frogs in the marsh. In the clearing of my office, above the sound of the tapping of keys, you can hear it all, and wonder. You may not be sure what species you are hearing, but you darn sure the rainforest is alive.

Here in the clearing of my office, above the tapping ticks of my keyboard, I wonder which metaphor best captures the lab's inner nature? The expedition, the exploration of new territory? True, but too literal: our work is to chart and occupy new lands. A family? Filial affections, arguments over who messed up the table and who would clean up, and long-term commitments. A firm, calculating where our energies and effort should best be placed for good returns. A forum, an engine driven by data, a rainforest full of sentient creatures. Sloths, monkeys, insects, giant trees, orchids. Let us visit this expedition, this family, this firm, this rainforest.

In this last year, Aaron Goldstrohm, a post-doc in the lab, has made much headway understanding how a family of regulators regulated mRNAs in yeast. He has clues of direct connections between them and destructive machines that render the mRNA lifeless. Moving through the landscape, he has made a large turn in the

river, and a new perspective emerges. If you listen carefully, you can always hear the low rumble of a motorcycle as you approach his desk. Its in his head, but you can hear it. Mike Kuchenreuther, an undergrad, is working under Aaron's guidance, has evidence of incestuous liaisons among proteins that regulate mRNAs. Once her returned from a summer at Abbott, we will take this up full time once again.

Daniel Seay has identified mRNAs that these proteins control, and Brad Hook has examined how a group of proteins cluster on a short region of one of these mRNAs, turning the expression of the mRNA down. Daniel and Brad both move in determined fashion toward the endgame of their theses, the data now coming rapidly, and, we hope, coalescing soon into thesis chapters, discussion sections, and cover letters to journals. Daniel, his fuzzy shaved head peering over the bench top, continues to sing pop songs, among the most distinctive sounds in the rainforest. Rarely is the chorus joined by other birds. It is a strange, solo chant he sings, lately muzzled by the face mask. On rare days, when the sun is out, one can hear the call of the Wild Labib too, never the same tune as Daniel's. Some day one will sing back up for the other, and the rest of the creatures will surrender, put down their pipets, and go to town instead.

Brad the Priest Hook preaches purity in all things, cleaves proteins from their mortal tags, and then analyzes how they behave after liberation. How do these proteins cling to their RNAs, only then able to function? Laura Opperman too has concentrated on RNA-

binding regulatory proteins. She now sees how the presence or absence of a single base makes all the difference in which protein binds to which RNA. Lying before her are a new group of experiments aimed at modulating the expression of real mRNAs.

Dave Bernstein is the proud father of a new thesis. A thesis which, in its final bound form, sets a new standard, a new bar to which all of you waiting in the wings should strive. Not only was the beautifully bound thesis presented to Marv without solicitation, but it also included a CD version of the thesis inside the bound copy, and had been placed on the server. Dave will leave for Washington in the late summer, ready to begin rotations anew, this time visiting his talents on members of Congress. He will be an intern, with an aim of providing advice on key issues. Think of Dave in his hockey pads deciding how high your taxes will be, or whether to invade, or build the pipeline. Meanwhile, he continues to search libraries of molecules for new books to read. Just recently, he has found a new and startling volume that turns out to have a scintillating opening. What does this protein do to microRNAs? We wait to read the final chapters. Mia DeFino, an undergrad once under the tutelage of Laura and Dave, has for the summer taken up protein purification for a variety of purposes, most recently to read Dave's new book. Her physics final out of the way, she takes a deep breath, tries to put that class behind her, and looks to GST for purity.

Craig Stumpf too has enjoined the efforts of another, Abi Degner. Craig wants to understand how a family of proteins, all similar, can behave differently. An anthropological examination. How would Craig fare under such scrutiny himself? Look at that curious behavior, the investigator would say. Look at how he spends hours staring at a computer screen. And these curious hieroglyphic charts he creates! What is their meaning?

And speaking of this computorial anthropology, these computers that now adorn every desk in the lab appear to be private waterholes and salt-licks. Each lab member returns from a trip to the bench, out in the land of gainful exploration

and foraging, to a digital screen on which they can not only learn more about the land they occupy – their protein, their RNA, their gene – but, even more, they can look at new shiny motorcycles, or card games, or stock quotes, or who knows what? Intoxicated, they drift into a reverie interrupted only by a buzzer sounding, the incubation finished; or by the chant of a flying Daniel, growling Labib, or questioning undergrad in the underbrush. But I digress.

Jae Eun Kwak and Labib Rouhana have joined forces to tackle an enzyme that adds poly(A) to the ends of mRNAs, thereby turning up their expression. How does it do this and why? The enzyme exists in many creatures, and so we have been drawn into work with mouse and human cells, with worms, and with yeast. Tania Gonzalez, who once focused on the human enzyme, has left to move west. She has returned to her old stomping ground, Genentech. And Natascha Buter, now — incredibly, it seems — with three young kids, has left studies of the brain for nights of sleeplessness, worries, and joys of childhood, having received a Masters.

Liz Barlow, Carol Pfeffer and Tina Olsen try to keep things functioning properly, orders handled, three-hybrid requests responded to, Marv on his toes. Carol recruits Marv to fill our forms, sign pages, review papers, critique grants, and do it on time. We now have a clean system, with In and Out and Pending trays. If that top "In" tray gets too big, you can be sure Marv will hear from Carol and the door will close to seal off the rainforest, and Marv will start reading and writing and signing.

As for me, I think I am much the same, but at the moment struck by just how much a lab is a family. Trite perhaps, but apt. Dave Zarkower and Aaron Barkoff, both alums of the lab, came by this year. And even though their visits were brief, it felt (forgive me, Dave and Aaron) like they came home. Parents can be so nauseatingly proud of their own kids. You shepherd, train, and prepare them, and then let loose on the professional world. It is wonderful to see them succeed — you remember when their first group meeting was total babble, and they hooked the electrodes up backwards, and left the ATP out of the ligase reaction. And it

is particularly gratifying to hear about their successes and “adult” concerns in person... the prodigal son or daughter returns. Rivalries, arguments, discussions around the table. And how do they treat their own students? Do they now understand why Marv went on about positive controls and markers when they joined the lab? Always.

Our own literal son, Zach, is doing well. 17 and thriving, in his own inimitable, computer-permeated way. We — Judith, Zach and I — had a great vacation this past summer, spending time in the Galapagos and the Amazon. Hard to imagine any short period that could be more exhilarating. We visited a Shaman in Ecuador, who examined Marv before treating him. He summarized, “Your head is too large. You think too much. You need balance. Balance.” The treatment was flames blown from the Shaman’s mouth to Marv’s bare chest, rosewater and

masticated roots on his face, smoke wafted over bare skin, eggs of a special bird in a special place in the mountain rubbed to collect the evils. I am much better now.

Refreshed, I wait to hear from you alums, who have gone off to do other things. I listen for the sound of a breaking beaker crashing to the ground, a coconut dropped by a capuchin monkey who howls in complaint; the sight of a sloth asleep in the tree, emptily gazing at a computer screen; the braying of a feral goat, the grunt of a boar. How could you have changed the setting on this PCR machine off, you useless twit! I hear the silverback. A rich, varied and enriching place, this rainforest is. Beneath this complex ecology thrives the search for how mRNAs are controlled, and each person’s progress toward a professional future. For everyone who has joined me, and howled at the stars, I am grateful.



HONORS & AWARDS:

FACULTY 2004

Amasino, Richard - Wisconsin Idea Fellow

DeLuca, Hector - Ernst & Young Wisconsin Entrepreneur of the Year Award

Kimble, Judith. – President, Society for Developmental Biology

James Ntambi - Osborne Mendel Award from the American Society for Nutritional Sciences

POSTDOCS

Paul D. Boyer Postdoctoral Excellence Awards:

Yuehui He

The role of histone Modification
in flowering-Time Control



Shelly Lusetti

Regulation of RecA filament
Dynamics



Brian Miller

Substrate ambiguity and the
evolution of new enzyme activities



FACULTY 2005

Amasino, Rick - Hilldale Award, Biological Sciences Division, UW-Madison, 2004-2005

DeLuca, Hector - Brian D. Howell Award for Excellence in Innovation

Kiessling, Laura – Tetrahedron Young Investigator Award in Bioorganic and Medicinal Chemistry from Tetrahedron Publications, Editor-in-chief of American Chemical Society's Chemical Biology, a new publication scheduled to launch in 2006

Nelson, Dave - Arthur J. Maurer Extra Mile Award, UW-Madison

Raines, Ron - 2005 Emil Thomas Kaiser Award from the Protein Society

GRADUATE STUDENTS

Graduate Teaching Excellence Award David W. Staple

This award is intended to recognize a Biochemistry graduate student who has consistently shown evidence of quality, commitment, and innovation in teaching.



Graduate Mentoring Award Dipali G. Sashital

This award is designated to honor Biochemistry graduate students who consistently provide quality guidance and scientific training in mentoring undergraduate students in their research efforts.



Sigrid Leirmo Memorial Award in Biochemistry

Liana B. Lamont

This award is to be given to a postdoctoral or graduate student who displays clear promise as a research scientist. The award is to be designated in appreciation of the student's consistent willingness to contribute to the intellectual and technical potential of his or her fellow students and colleagues through the selfless help of others.



Staff Profile: Cheryl Adams-Kadera

I guess one of the benefits of helping coordinate the newsletter each year is that I get to help select people to write the staff profiles and I could always make the assignment to someone else. This year my time was up and I was asked to contribute an article. However, I am pleased to be able to complete this task, and to be a part of this wonderful department and environment. I started in the department in July 1994 and followed a long chain of excellent administrative staff. I still hear the names of Anne Terrio, Eloise Marsh, Carol Marth, and others echo in the halls. We have had so many wonderful people in this department! My official title is Academic Department Manager, which is a pretty generic title, but the position encompasses loads of different tasks and responsibilities. My job duties here are to help the Chair with day to day administrative tasks in the departmental office so that he/she can focus on their research duties. That doesn't mean that they don't get the occasional call for help! I also manage the payroll/benefits/human resource aspects of the office which is a never-ending task. With almost 500 employees and students, there is always a position to fill, a promotion waiting to happen, or lots of other personnel issues to deal with.

On a personal note, I was born and raised in Lancaster, Wisconsin which is a small community of about 4,000 people located 70 miles southwest of Madison. I grew up

on a dairy and hog farm with my parents, 14 siblings, lots of family pets and ONE bathroom. I know most kids these days would be appalled to live in such a situation but for us it was just a normal way of life. Luckily, I had 10 brothers who were assigned most of the farm chores, but the girls certainly were given their fair share of chores in the house, garden, lawn work, or any other "fun" activity that my parents could think of. If we were bored or looking for something to do, there were always weeds to be pulled in the garden or rocks to be picked up in the field! Regardless, I have many fond memories of the farm and growing up there. My brother took over the family farm after my parents retired and moved into town in 1987. Oddly enough, there was rarely a day that my dad wasn't out there "supervising" or looking at the fields and crops. After high school, I decided to attend college at UW-Platteville and earned a degree in business marketing and human resources. Both of these have come in handy with my various job duties here. After graduation from college, I moved to Madison and worked in a couple of starter jobs until I arrived at Biochemistry in July 1994. I can't believe that it's already been 11 years! There is always something new to learn or a project waiting to be completed. I can truthfully say that I have never had a boring day here. It's been a pleasure working with all of the faculty and staff too. Hector has been a great boss and he is a wonderful person to work for and we have become good friends. I will miss seeing him down here in the Chair's office but I plan to have his research office number on my speed dial! I'm also looking forward to working with Betty and she seems enthusiastic about starting her duties as departmental chair. We are all looking forward to helping her make the transition as easy as possible.

In my spare time, I enjoy traveling, volleyball, biking, UW sporting events, reading, and spending time with family and friends. I just got married in April so I am looking forward to spending the summer working with my husband (Kevin) on various house projects. There are still lots of family events to attend since I have 6 siblings in the Madison area and the remainder are spread out in other cities, but we all remain Wisconsin residents.



Student Faculty Liaison Committee (SFLC):

Nick Reiter



Greetings from the Student-Faculty Liaison Committee! The work hard, play hard philosophy is taken to heart among graduate students and below is a highlight reel from the year's events.

First off, many congratulations to Biochemistry graduate students Dave Bernstein (recipient of the Sigrid Leirimo Memorial award), Kim Dickson (Graduate Mentoring award), and Michael Hobbs (Graduate Teaching Excellence award). The Sigrid Leirimo award is given to a postdoctoral or graduate student who is widely acknowledged by his/her peers and advisors and displays clear promise as a research scientist. The latter two awards were recently created by the department to acknowledge outstanding graduate students who show evidence of quality, commitment, and innovation in teaching undergraduates in the classroom (graduate teaching excellence award) as well as in the laboratory setting (graduate mentoring award). In the spirit of celebratory awards, many congratulations as well to all Biochemistry students who have recently earned their PhD degrees in 2004 and 2005. May you have much success in your future scientific endeavors.

The creativity and expression of graduate students is not only displayed in the scientific medium. The SFLC-sponsored departmental art show was a resounding success again and showcased the many talents of students, post-docs, faculty, media lab, and administrative staff. For the past 2-3 years, Jackie Fretz has organized

the event and has brought new perspective to the spaces within the walls of the Biochemistry Addition. This year was a special treat and included a live musical performance. Graduate students John May (Violin) and Summer Raines (Piano) performed a beautiful classical duet in the east atrium. I believe that their harmoni-

ous sounds were so precise and unified that they were on resonance with the new 900 MHz spectrometer in the basement. In addition to the art show, Jackie continues to bring new and interesting pieces to display in the atriums of the building. Her elaborate decoration for the holiday party was also a touch of class that was enjoyed by many passer-bys.

The EGG DROP event is another recent SFLC-sanctioned phenomenon which abounds with excitement. Graduate student Mark Jacobson had the vision to bring the egg drop to a whole new level four years ago and it has always been a fun-filled departmental activity. Held in the west atrium of the building, each lab designs some sort of a contraption that will secure and cushion a raw egg as it travels in free fall from the 2nd, 3rd, and 4th floors. Needless to say, most eggs don't quite make it to the 4th floor drop. This event is usually held during a recruitment weekend allowing prospective students to witness the spectacle and wonder "Is this really what graduate school is about?" Lab pride is mainly what's at stake but there have also been a few interesting awards given out in the last few years (including: elephant bookends donated by Professor Robert Burris, an egg drop champion title belt, and the MacGyver award, given to the most ridiculous yet structurally sound contraption).

Speaking of prospective students, the recruiting expertise of Mark Meyer, Kara Lake, and Professor Paul Friesen allowed for a fantastic new group of biochemistry students that will arrive this coming fall. From all prospective students that visited and were offered positions, the department achieved a 43% acceptance rate. This is exactly consistent with the departmental needs and growth for the future. Thanks to all students (especially point people) as well as faculty members who volunteered their time to help make for such a successful recruiting year. Highlights of the recruiting weekends include: a UW men's hockey game, a women's basketball game, ice skating, Capitol brewery tours, and visiting the Olbrich botanical gardens.

During the fall semester, the student seminar series remained steady and strong under the



John May and Summer Raines duet at Art Show



leadership of Jared Davis. Although Promega chose not to sponsor the event, several students in the department joined together to hear about the research of fellow colleagues in the Bock Labs Penthouse. Pizza, soda, and snacks were served as students presented research to their peers in a relaxed atmosphere. For most all talks, the student speakers received positive feedback about their research projects, oftentimes generating a slew of new ideas.

Each year, the SFLC also brings a student invited speaker to present a seminar and meet with graduate students. In the past two years, Chris Adams has helped bring high quality, leading researchers to campus. In 2004, Professor Jamie Williamson (Scripps Research Institute) discussed STAR protein -RNA interactions

that occur within 3' untranslated regions of *C. elegans*. This year, Professor Greg Verdine (Harvard University) was chosen by students to talk about his research, which focuses on the structure and mechanism of DNA repair proteins (specifically, the base excision repair pathway). The SFLC has been quite successful in getting high caliber scientists to speak to the department and many speakers have said that it is quite an honor to be invited by graduate students.

Social chair stalwart's David Staple and Jack Borrok worked their fingers to the bone in preparing Friday socials, the fall departmental BBQ, and the mighty holiday party. The holiday party is by far the most festive of occasions as it is the time when 1st years decide what lab they will join and the holiday ornament contest occurs. This year's winner was the Butcher lab, who combined various lab parts to engineer an interactive snow-making ornament that was perhaps too large to fit on a typical tree. Nonetheless, judges opted again for the over-the-top and most impressive design over the refined, handcrafted artistry of a smaller ornament. The fun, food, and merriment at the holiday party were in high abundance this year for which we have Jack and David to thank. Their distinguished careers in social excellence, at times, go unnoticed and they will be sorely missed as they will be stepping down from their social duties.

Other students that have helped plan or are involved in ongoing departmental events include: Dennis Harris and his organization of the Life Science Career Day (which is a mini-symposium that features talks from scientists from universities, private colleges, state colleges, biotech. companies, and federal organizations). This is held every other year and is a great opportunity to learn about many different science career opportunities (www.biochem.wisc.edu/lscd/). And Steve Darnell for his assistance in helping update and design the new SFLC webpage as well as making sure that the computing needs of students are satisfied.

This past year, two important changes also took place for graduate students and the department. First, the graduate student departmental preliminary exam was modified. Over the course



Sundaralingam, Muttaiya:

Perry Frey

Professor Emeritus of Biochemistry Muttaiya Sundaralingam and his wife Indani perished on December 26, 2004 in the tsunami while vacationing in Trincomalee, Sri Lanka.

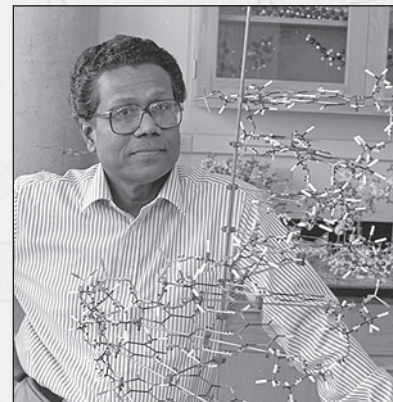
Muttaiya Sundaralingam was born in Taiping, Malaysia, on September 21, 1931, and was educated at the University of Ceylon-Colombo, graduating with a BSc in 1956. He immigrated to the United States in 1958 and received his Ph.D. degree at the University of Pittsburgh in 1961. He did postdoctoral work at the School of Medicine of the University of Washington from 1962 until 1965. He was a postdoctoral research associate at the Children's Cancer Research Foundation and Harvard Medical School in Boston in 1965-66. He was an Associate Professor of Chemistry at Case Western Reserve University from 1966 to 1969. Professor Sundaralingam moved to the University of Wisconsin-Madison in 1969 where he served as Professor of Biochemistry and Steenbock Professor of Biomolecular Structure. After retiring in 1989, he accepted a position as Ohio Regents Eminent Scholar and Professor of Chemistry and Biochemistry at The Ohio State University. He retired from that position in 2002.

Professor Sundaralingam put his colleagues at ease with his friendly disposition and his insistence that they address him as "Sunda". He was educated in chemistry, with x-ray crystallography as his principal experimental method. He retained a deep interest in and appreciation for chemistry as his research led him into x-ray diffraction analysis of biologically important molecules and ultimately biological macromolecules. Sunda made vital contributions to the detailed structures of nucleosides and nucleotides; to the conformational analysis of nucleic acids, including the DNA duplex, 5sRNA, and transfer RNA. He elucidated the stereochemical principles that govern the

structures of nucleic acids and determined three-dimensional structures of nucleic acid-drug complexes, protein-nucleic acid complexes, and RNA-DNA hybrid duplexes. He made contributions to the structures of proteins, including troponin C, phospholipase A2, flavodoxin, calmodulin, α -lactalbumin, and high potential iron protein,

Sunda's main interest was nucleic acid structure. In early work, he characterized the two principal conformers of the ribosyl ring in nucleosides and nucleic acids, the 2'-endo-3'-exo and 3'-endo-2'-exo conformations, in a paper published in the Journal of the American Chemical Society in 1972. This paper became a classic in nucleic acid chemistry and has been cited hundreds of times in scientific articles. The conformational transition between these structures has become part of the core of nucleoside, nucleotide and nucleic acid chemistry, and is invoked in explaining many aspects of the biological functions of these molecules. Sunda solved the structures of numerous nucleotides and nucleotide analogs. He and his associates chemically synthesized the oligonucleotides needed for producing and crystallizing models for his detailed studies of sequence effects on nucleic acid structure. He deposited more than 80 structures of nucleic acids and oligonucleotides, including many duplexes, in the Protein Data Bank.

Sunda brought protein crystallography to the University of Wisconsin-Madison. In collaboration with Professor Marion Greaser, he determined the structure of troponin C. This discovery contributed significantly to muscle research. Sunda subsequently determined the three-dimensional structures of several additional proteins. But his true calling was nucleic acid research, and the vast majority of the more than 350 scientific articles he published dealt with the structures of nucleosides, nucleotides, and nucleic



acids, with special attention to interactions within double helical oligonucleotides.

Sunda was an interactive scholar who collaborated widely with colleagues. His collaborators on this campus included Robert M. Bock, W.W. Beeman, W. Wallace Cleland, John L. Markley, and Marion L. Greaser. He also collaborated with research associates in the Cleland lab on the structures of metal-nucleotides.

Sunda made important contributions to education at this university. He re-instituted the Graduate Program in Biophysics. He trained a number of graduate students here, several of whom became prominent scholars in their own

right as macromolecular crystallographers at leading institutions, including the University of Texas, The Scripps Institute, the University of Michigan, and Harvard University.

Sunda's life and that of his wife ended in tragedy. Sunda overcame a much earlier tragedy, childhood polio, which left him with a disability. He was not by nature simply a survivor: he triumphed over polio and moved forward with vigor. We choose to remember him for his vitality, for his friendliness, for his infectious laugh, and for the ease with which he got around this campus, with his cane, his Cadillac, and his special parking permit. He made a positive statement about living and working by the way he lived his own life.

IN MEMORIAM: 2005

Bunge, Elizabeth

(spec w/DeLuca 1974-1977)
2004

Rumsfeld, Herbert William, Jr.

Jan 4, 2004

Engstrom, George Wesley

(PhD June 1960 DeLuca)
May 13, 2004

Tsao, Maryanne (Yu)

(w/Anderson 1957-60)
August 15, 2004

Sundaralingam, Muttaiya

(Professor 1969-1990)
December 26, 2004

SFLC...

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of the last few years, many students worked with Professor Rick Amasino to help improve the preliminary exam process. Implemented in this year, the new prelim exam will now require students to hand in only one written draft of their proposal prior to their oral defense. In addition, students' progress is evaluated by their committee members at the end of the first year. This 1st year meeting also serves as a forum to discuss the student's primary research objectives. As in years past, Professor Dave Nelson offered sage advice to students preparing to write and defend their preliminary exam. In addition, graduate student Roy Gerona (with librarian Jean De Muzio) helped to make the library more useful in this process by offering a proposal writing workshop (in conjunction with the English department's writing center).

The second change was the timing of the departmental retreat. Liana Lamont, Allison Albee, and Professor Bill Reznikoff spearheaded the move from a fall (on campus) departmental retreat to a late spring (off campus) event. This year, the facilities at the Promega Corporation and the dinner at the Fitchburg Community Center proved to be a welcome and fresh alternative. The fascinating keynote speaker, Dr. Olen Kew, from the Center for Disease Control and Prevention gave an excellent talk about the world wide surveillance of viral diseases and the emerging health problems that we face in the near future. Dr. Kew gets to travel around the world and track down the origins of various viruses and virulent organisms. How cool is that!

All the best to you in research and life,

BIOCHEMISTRY DEGREE LISTING 2003:

Degree	Name (Major Professor)	Thesis Title
PhD	Amanna, Ian, J (Hayes)	Determining the Roles of BAFE-R in the Development of B Lymphocytes Through the Analysis of BAFE-R Mutant Mice
PhD	Bizzell, Colleen, M (Amasino)	The isolation and characterization of several genes involved in the repression of flowering in <i>Arabidopsis thaliana</i>
PhD	Healy, Kevin, D (DeLuca)	Physiological Regulation of the Vitamin D Receptor
PhD	Higgin Soltero, Michelle (Kiessling)	UDP-Galactopyranose Mutase: A New Role for Flavin Cofactors in Catalysis
PhD	Merrill, Ronald, A (Clagett-Dame)	Retinoic acid regulated genes in neuronal development
PhD	Odegard, Amy, L (Nibert)	Structure and Function Studies of the Reovirus Membrane Protein $\mu 1$
PhD	Chapman, Jason, S (Clagett-Dame)	Molecular Mechanism of Action of the Synthetic Retinoid N-(4-hydroxyphenyl) retinamide
PhD	Larsen, Eric, C (Martin)	The role of Ca^{2+} dependent interactions between synaptotagmin and SNARE complexes in regulated exocytosis
PhD	Lamanna, Allison, C (Kiessling)	Receptor oligomerization in bacterial and neutrophil chemotaxis
PhD	Sung, Si-Bum (Amasino)	Molecular Genetic Studies of Vernalization in <i>Arabidopsis thaliana</i>
PhD	Bernstein, David, S (Wickens)	The PUF Chronicles: A study of the interaction between FBF and RNA
PhD	Hong, Jiang (Record)	Solute Probes of changes in Water Accessible Biopolymer Surface: Development and Application to Lac Repressor Lac Operator Binding
PhD	Koropatkin, Nicole, M (Holden)	New twists and turns in deoxysugar biosynthesis: Two enzymes from the tyvelose biosynthetic pathway
MS	Basile, Angela, T (Friesen)	Defining the AcMNPV-induced apoptotic pathway in <i>Drosophila melanogaster</i>
MS	Harding, Sandra, J (Menon)	Characterization and Purification of the Cytoplasmic Domain of hPIG-L, the GPI biosynthetic pathway de-N-acetylase
MS	Janco, Adam (Martin)	Role of Rab3 in regulated exocytosis
MS	Sterling, Rachel, C (Reznikoff)	DNA-Transposase Interactions Leading to Tn5 Synapsis

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