Dear Friends of Iowa Biochemistry,

This summer is a hot one and an eventful one for the Department. Four new assistant professors and one tenured faculty member are setting up their laboratories and two colleagues have been promoted. Drs. Eric Taylor and Brandon Davies are new faculty from Utah and UCLA, respectively, hired as part of the University of Iowa Obesity Initiative and the Fraternal Order of Eagles Diabetes Research Center. Dr. M. Ashley Spies was recruited from Illinois on a joint basis with the College of Pharmacy. Dr. Michael Schnieders was recruited from Texas on a joint basis with the College of Engineering and with support of the University of Iowa Genetics Initiative. Dr. Maria Spies is a new tenured faculty member from Illinois. Drs. Kris DeMali and Adrian Elcock were promoted to associate professor and professor, respectively. I invite you to read all about our new colleagues and to celebrate the achievements of home-grown colleagues in the pages that follow.

The Carver College of Medicine conducted a five year review of Biochemistry this summer and issued us a wonderful bill of health. Reviewers were struck by the Department’s significant contributions in each of our missions—research, education and service—and by our relative lack of specialization. For example, a Department could meet its missions by having superstar researchers who don’t teach and a cadre of faculty who specialize in teaching and service. Though the Department is pleased to engage Dr. Elisabeth Swain as a full time superstar lecturer, all of the research-active faculty members teach and perform service.

While reviewers were pleased to see recruitment of eight new faculty groups since July, 2009 and the consequent growth in research activity, reviewers were also struck by the growing undergraduate teaching mission of the Department. Undergraduate enrollment sets a new high water mark essentially every year. We now have over 180 Biochemistry majors, and at least that many nonmajors who take our survey course in the fall and in the spring. Twelve faculty members teach in four Biochemistry majors courses and six of us will be teaching nonmajors in the coming year.

As an educator who previously taught only at the graduate level, I have found undergraduate teaching to be good for my chops. In the past, I only lectured in areas of expertise (the Patterson function, yeast genetics and NAD metabolism). Now, I have to think about central carbon metabolism for the majors and go all the way back to acids and bases for the nonmajors. It’s time consuming but rewarding to plant seeds in young people. I’ve also gotten some fresh research ideas, particularly in thinking about the effect of overnutrition on mitochondrial function.

Megatrends in education are mandating that premeds take biochemistry as undergraduates, while the preclinical basic science curriculum is being accelerated, and the practice of medicine increasingly requires an understanding of genomics and metabolism. Here at Iowa, we’ll try to reach students earlier and hook them on biochemistry deeper. We’ll continue to impart as much as we can to medical students in the time allotted, some of which is likely to be in the M3 or M4 years. Our hope is that a better-prepared medical student will incorporate more biochemistry into her medical education and practice.

Please keep those letters and emails coming and register your interest in the Department’s 65th birthday celebration on August 23-25, 2013 at: biochem.uiowa.edu/65.

Best,

Roy J. Carver Chair and Head of Biochemistry
**Faculty Honors**

**Promotions**

Adrian Elcock was promoted to full professor. He also received a new NIGMS/NIH R01 entitled “Molecular Simulations of Cotranslational Folding.”

Kris DeMali was promoted to associate professor with tenure in the Departments of Biochemistry and Dermatology.

Miles Pufall garnered two awards this year. He was named a V Foundation Scholar to study B precursor acute lymphoblastic leukemia. He also joined Lori Wallrath, Adrian Elcock, Todd Washington and Ernesto Fuentes as an early career recipient of a Carver Young Investigator Award from the Roy J. Carver Charitable Trust.

Rex Montgomery received the 2012 Faculty/Staff Distinguished Alumni Award from the University of Iowa. Rex began at Iowa in 1955, and is admired for his impact as a researcher, teacher and mentor. Rex’s tenure included serving as Associate Dean for Academic Affairs in the College of Medicine and the Vice President of Research for the University. In addition to being an internationally noted carbohydrate biochemist and textbook author, he was the founding director of the University of Iowa Physician Assistant Program.

**Editorial Positions**

Nancy Stellwagen was promoted to Senior Deputy Editor of *Electrophoresis*.

Todd Washington accepted a position on the Editorial Board of the *Journal of Biological Chemistry*.

Heather Bartlett was awarded support from the March of Dimes foundation for a project entitled “Molecular Mechanisms of Actin-Mediated Vascular Diseases.”

Ashley Spies received a new NIGMS/NIH R01 entitled “Exploiting Enzyme Plasticity in Drug Discovery: Application to Glutamate Racemase.”

Dan Weeks was the recipient of both the J.P. Long Award for Teaching in the Basic Sciences and the CCOM Collegiate Teaching Award. Both awards recognized Dan’s sustained commitment to excellence in teaching, as well as his contributions to research and service. In addition to being an internationally known nucleic acid biochemist and developmental biologist, Dan has made wide-ranging contributions to the teaching missions of CCOM and demonstrates a long-term dedication to graduate students, having served as Director of Graduate Studies in the Department for the last decade.

Dan Weeks receives his awards from Paul Rothman, former CCOM Dean, at the CCOM Awards Banquet

Madeline Shea was awarded a Grant-in-Aid from the American Heart Association (AHA) for her work to understand the calcium-mediated effects of calcineurin on the events that commit a cell to cardiac differentiation.

Madeline also successfully renewed her R01, “Molecular Dissection of Calmodulin Domain Functions,” with NIGMS/NIH.

Peter Rubenstein was appointed the Dr. Harold A. Myers Professor in the Basic Sciences. This three year professorship was established to support a PhD faculty member who exhibits exemplary skill and passion for teaching. He is a beloved teacher of medical students, and has been a finalist for the Outstanding First Year Medical Student Teacher award 12 times.

Peter was also elected Vice President of the FASEB Scientific Policy Committee.
**Publication Highlights**

David Price and his research group were featured on the January cover of *Molecular Cell* for a study examining the role of Gdown1 in controlling transcription by RNA polymerase II. The results provide significant evidence for transcription being regulated through coordinating initiation and elongation mechanisms.

A paper by Lori Wallrath’s group was featured on the April cover of *Human Molecular Genetics*. It describes research done in collaboration with Steven Moore (Pathology) and Katherine Mathews (Pediatrics) on the development of a Drosophila model for LMNA-associated muscular dystrophy.


**Postdoctoral Achievements**

Rebecca Fagan (Brenner lab) was elected to the Executive Board of the University of Iowa Postdoc Association as Secretary/Treasurer. Dr. Fagan was also featured by the Office of Postdoctoral Scholars in the online series *Postdocs@Iowa*. The profile describes her work characterizing and identifying inhibitors of DNA methyltransferase 1.

Jiannan Guo (Price lab) was awarded an AHA postdoctoral fellowship to support his work on the transcription elongation by RNA Polymerase II.

Jens Bohnekamp, a postdoctoral fellow in Dr. Thomas Magin’s laboratory at the University of Leipzig in Germany, performed research in the Wallrath lab this summer. He received a travel fellowship that brought him to Iowa to study the generation of a genetic model for skin blistering diseases due to mutations in keratins.

The department was pleased to welcome several new postdoctoral fellows this year: Vasily Kerov (Baker lab), Karry Jannie (DeMali lab), Ritika Gurung (Geyer lab), Hongxing Yang (Pufall lab), Masayoshi Honda (M. Spies lab), and Colin Wu (M. Spies lab).

**Graduate Student News**

**Recent Graduates**

Lawrence Gray (Khademi lab)—postdoctoral fellow with Eric Taylor, University of Iowa
Cathy Hass (Wold lab)—research scientist at BioAmber, a biotech start-up in Minneapolis, MN
Amber Hohl (Geyer lab)
Yingyue (Annie) Li (MS, Weigel lab)—research assistant with Ronald Weigel, University of Iowa
Om Shrestha (MS, Wallrath lab)—research assistant with Elizabeth Craig, University of Wisconsin–Madison
Nicole Vanderpool (MS, Bartlett lab)—Illinois State Police forensics lab
Shun Zhu (Elcock lab)—postdoctoral fellow with David Mobley, University of California–Irvine

**Graduate Student Spotlight**

Xu Liu (Fuentes lab) and Jessica Maiers (DeMali lab) were awarded pre-doctoral fellowships from the AHA to support their PhD research • Lawrence Gray (Khademi lab, 2012 PhD), was awarded a Student Research Award from the poster competition at the Biophysical Society annual meeting in March • Xiao Peng (DeMali lab, 2011 PhD), won the 2011 Subramanian Thesis Award. She also received a Jane Coffin Childs Fund fellowship for her postdoctoral work with Keith Mostov at UCSF • Xiaowen Sun and Jessica Maiers (DeMali lab) received travel awards for their presentations at the 2011 Molecular and Cellular Biology Retreat • Xu Liu (Fuentes lab) was awarded the best student/postdoc oral presentation at the Great Plains Annual Symposium on Protein and Biomolecular NMR
Following the summers of 2009, 2010 and 2011 in which the Brenner, Baker and Pufall groups got going at Iowa, this year has been a bountiful one in faculty recruiting. This year, we are pleased to welcome Maria Spies, M. Ashley Spies, Eric Taylor, Brandon Davies and Michael Schnieders to the Department.

Maria Spies, nee Koudrova, a native of St. Petersburg, Russia, is a 1994 BS and a 1996 MS from St. Petersburg State Polytechnic University, and a 2000 PhD from Osaka University. As a post-doctoral fellow with Stephen Kowalczykowski at University of California, Davis, she obtained a series of high profile results on the RecBCD helicases of E. coli, which were published in Nature, Cell and Molecular Cell. As an assistant professor at Illinois, she expanded her work to characterize Rad52, Brca1 and several helicases using novel single molecule methods that allow her to dissect individual steps in complex DNA transactions, which are sensitive to small molecule ligands and post-translational modifications. Since launching her group, Maria has produced a body of 11 publications as last or penultimate author, including papers in PNAS, Molecular Cell and EMBO Journal. Her research program has been funded by the American Cancer Society and by an Early Career Award from the Howard Hughes Medical Institute. She joins the Department as a tenured associate professor. Her laboratory brought two postdoctoral fellows, three graduate students and a research assistant.

M. Ashley Spies, a native of Kansas, is a 1991 BA, a 1994 MA, and a 1997 PhD from the University of Kansas, where he calculated the intrinsic base-flipping rate constants for DNA and RNA with Richard Schowen. From 1997 to 2000, as a post-doctoral fellow with Katsuyuki Tanizawa at Osaka, he worked on quinone biosynthesis. He then joined Michael Toney's laboratory at the University of California, Davis, where he developed novel methods to characterize individual steps in the alanine racemase catalytic cycle. At Illinois, he developed an independent, NIH-funded research program using computational and experimental approaches to inhibit glutamate racemase. Ashley holds a joint appointment in the College of Pharmacy. He was awarded a new R01 on his second day as a University of Iowa faculty member.

Eric Taylor is a 2005 PhD from Brigham Young in Physiology and Developmental Biology, who published seven papers as a graduate student (four first author) on the regulation of Lkb1 and AMP-activated protein kinase signaling by small molecules and exercise. As a post-doctoral fellow with Laurie Goodyear at the Joslin Diabetes Center and Harvard Medical School, Eric was funded by an individual NIH post-doctoral fellowship to identify molecular mechanisms by which the Rab GAPs AS160 and TBC1D1 regulate glucose uptake in skeletal muscle. This work was recognized by an award in the post-doctoral section of the American Physiology Society. In 2007, Eric moved to Jared Rutter’s lab at the University of Utah, where he helped identify a system for mitochondrial protein quality control, which has produced three units of funding for him including an NIH K99-R00 Pathway to Independence Award. Using systems from yeast to human patient samples, he also discovered the identity of the mitochondrial pyruvate carrier, a finding published as a co-first author paper in Science, which has implications for multiple human diseases.
including cancer, neurodegeneration, and diabetes. Eric is the first faculty hire from the diabetes and obesity search initiated jointly by the Department of Biochemistry, the Fraternal Order of the Eagles Diabetes Research Center (FOEDRC) and the Obesity Initiative (OI). Research in his laboratory will focus on mitochondrial protein quality control and the pyruvate transporter as they relate to obesity and diabetes.

Brandon Davies is a 2000 BA from University of Utah and a 2005 PhD from University of California, Berkeley. At Berkeley, in Jasper Rine’s lab, he uncovered a role for sterol levels in oxygen sensing and adaptation to hypoxia in yeast. His work was published in first author papers in Genetics and Molecular & Cellular Biology.

In 2006, he moved to Stephen Young’s laboratory in the Cellular and Molecular Cardiology Unit of the Department of Medicine at University of California, Los Angeles. Brandon produced a body of 23 original research papers, and eight reviews. His work has made a high impact in two areas. First, he has used engineered forms of Lamin A to dissect the significance of the post-translational farnesylation and proteolysis of prelamin A and how defects in these processing steps contribute to laminopathies. Second, he performed groundbreaking work on a molecule termed GPIHBP1, which he discovered is essential to transport lipoprotein lipase from muscle and fat cells into the bloodstream. These discoveries have been published in first author articles in Cell Metabolism, Journal of Lipid Research and Molecular Endocrinology.

Brandon’s post-doctoral fellowship produced multiple awards, including an AHA Scientist Development Grant, which he brought to Iowa. The goal of his research is to exploit the role of GPIHBP1 to dissect regulation of lipid transport and utilization in health and in diseases of energy imbalance such as type 2 diabetes and the metabolic syndrome.

Brandon is the second hire from the joint search by the Department of Biochemistry, FOEDRC and the OI.

Michael Schnieders is a 1999 BSE from the University of Iowa, where he received numerous scholarships including a Goldwater and a Dunlap. He completed his PhD in 2007 at Washington University in St. Louis with Jay Ponder, where he advanced the development of a polarizable force field that has allowed precise computation of solute-solvent interactions.

Michael was a postdoctoral fellow at Stanford University with Vijay Pande and Axel Brunger. There, he and collaborators showed that accurately calculated multi-pole and environmentally sensitive electrostatics allow the refinement of crystal structures beyond the resolution to which data are collected.

In 2011, Michael moved to the University of Texas, Austin as a postdoctoral fellow with Pengyu Ren, where he has moved into two additional areas at the forefront of computational chemistry and biophysics. First, he is working on calculations of free energy of binding, solvation and crystal stability. Second, he is aiming to improve predictive technologies for structure-based drug development and to predict which human protein variants are best targeted by existing drugs.

Michael is a joint recruit with the College of Engineering and the University of Iowa Genetics Initiative.
Seven Biochemistry Honors students presented research at the 8th Annual Gene F. Lata Undergraduate Research Symposium.

**Chelsea Khaw** (DeMali lab) and **James Min** (Zabner lab, Internal Medicine, plan to attend medical school. **Emma Nash** (Monick lab, Internal Medicine) and **Luke Prest** (Weeks lab) will attend medical school at the University of Illinois at Chicago and CCOM, respectively. **Austin Stark** (Elcock lab) will be finishing a BA in French and Chemistry this year and applying to MSTP programs.

**Ashley Angell** (DeMali lab) will enroll in the Neurobiology and Behavior PhD program at the University of Washington. **Hyun Soo Ryu** (Khademi lab), will be applying to dental schools this fall.

Two students also presented honors research in the fall semester: **Min Jung Choi** (McNamara lab, Internal Medicine) plans to pursue a PhD in Biophysics or Structural Biology; **Steve Linden** (Khademi lab) will attend dental school at the University of Illinois this fall.

**Undergraduate Student Spotlight**

**Allyson Mayer**, a rising senior biochemistry major in the Brenner lab, was named a 2012 Goldwater Scholar. The Goldwater program fosters and encourages outstanding students to pursue careers in the fields of mathematics, the natural sciences and engineering, and is the premier undergraduate award of its type. Allyson conducts research on new steps in NAD metabolism and plans to go to graduate school to pursue a PhD in biochemistry or an allied discipline, with the goal of advancing the influence of nutritional biochemistry in preventative health care.

**Dylan Thiemann**, a biochemistry major performing research with **Lori Wallrath**, received a Student Employee Award certificate of appreciation for his long-term commitment to the Wallrath lab at an early stage in his education, and for his altruistic efforts helping the department. As part of this recognition, Dylan had lunch at the home of UI president Sally Mason with other award recipients.

Several undergraduates conducted research in labs this summer, including seven Biochemistry Summer Undergraduate Fellowship students, three Khorana Scholars from India, five students on an Iowa Center for Research by Undergraduates fellowship, one SROP/McNair scholar and one Iowa Biosciences Advantage student. Many others received course credit for their work. A remarkable 29 students showcased work done in Biochemistry labs at this year’s Summer Undergraduate Research Conference, sponsored by the Graduate College. More information about the presenters and their projects can be found on the Graduate College website: [grad.uiowa.edu/SURC/2012](http://grad.uiowa.edu/SURC/2012). Pictures can be seen at [facebook.com/iowabiochem](http://facebook.com/iowabiochem).

**Staff News**

The Department said goodbye to **Brenda Kunkel** this summer, who retired after 31 years as a secretary in the Department. Biochemistry members and friends packed the EMRB atrium on July 16 to recognize Brenda's dedication to helping students and faculty reach their goals and her excellent record of service at the University.

Brenda served under seven department heads during her career. The overwhelming turn-out for Brenda's reception was proof of the profound impact she has had on Biochemistry at Iowa.

Brenda Kunkel and her son, Brad, at Brenda's retirement reception in July.
Kenneth Mann, a 1967 PhD with former department head Carl Vestling, received the CCOM Distinguished Alumnus Award. After he earned his PhD, Ken trained as a postdoctoral fellow with Charles Tanford (former UI faculty member) at Duke University. He began his independent career at the University of Minnesota in 1970, where he held a joint appointment in the Mayo Clinic. In 1984, he was recruited to the University of Vermont, where he served as Chair of Biochemistry for 21 years. Ken has recently indexed his 418th paper on PubMed, been awarded an RC2 GO grant, and is principle investigator of a multiply-renewed Program Project Grant and a T32 Training Grant from the National Heart, Lung and Blood Institute.

Susan Wente, 1984 BA with Alice Fulton, received the 2011 Women in Cell Biology Senior Award. In conjunction with the award, Susan published an article in *Molecular Biology of the Cell* thanking many of her mentors John York, a 1986 BA with Arthur Arnone, was recently recruited to Vanderbilt as the chair of Biochemistry.

David Stump, a former postdoctoral fellow with Ed Heath, was awarded the Internal Medicine 2011 Distinguished Achievement Award. David is currently the Executive Vice President for Research and Development at Human Genome Sciences.

Billy Hudson, a 1966 PhD with Robert Barker, was featured in the December 2011 issue of *ASBMB Today*. Billy is Elliot V. Newman Professor of Medicine and Biochemistry, and Director of the Center for Matrix Biology at Vanderbilt. He developed the Aspirnaut Initiative to support rural students pursuing careers in math and science. Billy is a previous recipient of the CCOM Distinguished Alumnus Award.

Andrew Buller, a 2007 Mathematics and Biochemistry double major, now in graduate school at Johns Hopkins, won the best poster award at the 2012 Enzymes Gordon Conference.

Billy Hudson and Rex Montgomery at Rex’s annual faculty dinner, where Billy was the guest of honor.
Biochemistry continues to work with Shelly Mott, our representative at the University of Iowa Foundation. Shelly is a Tipton, Iowa native and UI graduate. While husband Joe has transitioned to a professional life post-NFL, Shelly has transitioned from a career in law to the world of philanthropy.

Private support, which has always been important for the Department, is critical in today’s environment. Hundreds of donors have expressed their loyalty to Biochemistry and Iowa through gifts, large and small. These gifts make it possible for our best graduate students and post-docs to attend meetings and receive awards, for the Department to purchase new equipment, for us to pay for a seminar series and named lectureships, and for Biochemistry to attract and retain outstanding faculty members. To facilitate gifts, Shelly has created a donor website at http://www.givetoiowa.org/biochemistry.

A tax-wise adviser, Shelly also encourages conversations with friends of the Department who are thinking about creating an endowment, either with an outright gift or by estate planning. The Department is enormously grateful to friends and family of Eugene F. Lata, and to friends and colleagues of Rex Montgomery, who have established funds for the annual undergraduate symposium and a new undergraduate research award, respectively. Shelly travels extensively—Bowl Games included—and would be happy to talk with friends of the Department by phone (800-648-6973) or by email (shelly-mott@uiowa.edu) about contributions to existing funds or new initiatives.