

2007

Biological Chemistry

Annual Newsletter

Continuing growth and change in the Department of Biological Chemistry

Dear Friends and Colleagues,

The Department of Biological Chemistry has seen many positive developments this past year including the relocation of office and laboratories of about half of the faculty who are in designated Biological Chemistry space. We have also hired two exceptional faculty members, and we have a new departmental administrator. Our former administrator, Merlis Nolan, shepherded the departmental move, which was successfully executed this past fall. This project was a major logistical challenge and took considerable effort and planning. Renovations and large-scale “spring” cleanings were necessary to move nine faculty members from the “old” space in the Medical Science

Building I to the “new” space in Medical Science Research Building III (MSRB III). The new space features open laboratories and shared central core space. It is expected that these arrangements will facilitate interactions among faculty and trainees. The Department’s administrative staff is also now conveniently located in room 5301 MSRB III on the fifth floor.

As I mentioned in a previous newsletter, we have been actively conducting searches both for junior faculty and for senior investigators to fill both the Vincent Massey Endowed Chair and the Anthony Lu Endowed Chair. Dave Ballou was Chair of the Massey Chair search and the Advisory Committee is serving as the search committee for the Lu Chair.



I am happy to announce that Dr. Ruma Banerjee will be the inaugural Vincent Massey Endowed Chair. Dr. Banerjee is currently the George Holmes Distinguished University Professor of Biochemistry at the University of Nebraska. She studies the molecular mechanisms of redox active enzymes. Her current focus is on methionine synthase and methylmalonyl CoA mutase, the two known cobalamin (Vitamin B12)-dependent enzymes present in mammals. She also studies the regulation of B12-dependent metabolism during oxidative stress. These topics are important because of the acknowledged relationship between oxidative damage and disease. Also joining us will be Dr. Stephen W. Ragsdale, Dr. Banerjee's spouse, who is also a world-renowned investigator. He is presently

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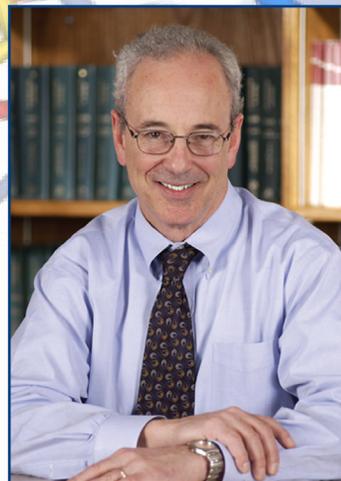
the Charles E. Bessey Professor, in the Department of Biochemistry at the University of Nebraska, and the Director of the Molecular Biosciences and Biotechnology Integrated Graduate Training Program at Nebraska. Dr. Ragsdale is a leader in the field of one-carbon metabolism and of enzymes that use metals as cofactors. His initial claim to fame was the discovery of a novel pathway for acetate formation from methane and CO—the Ljungdahl-Wood pathway. He was also the first to show that there is a nickel intermediate in an enzyme involved in CO fixation. His work on xenobiotic detoxification by anaerobic bacteria will likely prove to be of significant practical importance. It is unusual to be able to attract two such highly regarded and capable faculty at the same time. We have had the good fortune of being able to do this with Drs. Banerjee and Ragsdale. We are also now benefiting from Dr. Yali Dou who holds her primary appointment as an

Assistant Professor in the Department of Pathology and was recently appointed jointly in the Department of Biological Chemistry. Her research is in the area of epigenetics involving the mechanisms of modifications of chromosomal proteins.

As many of you are aware, Merlis Nolan, our former department administrator, has taken a new position with Mechanical Engineering. She did an excellent job, and we were sorry that she decided to move. However, her new position is one of greater responsibility and we wish her continued success. We welcomed Matthew Bazzani as our new administrator, on January 8, 2007. Before joining us, Matt was the Director of Administrative Operations in the Department of Medicine at the University of Illinois College of Medicine in Chicago. Raised in the Champaign-Urbana area, he received his BS in Management at Indiana University-Bloomington in 1995, and an MS in Health Systems Management from Rush University in Chicago in 1999. Matt is married and has two small children.

On a sadder note, as you will read on the next pages, Professor Martha L. Ludwig, J. Lawrence Oncley Distinguished University Professor of Biological Chemistry, UMMS, and Senior Research Professor in the Biophysics Research Division, passed away last winter. Martha was recognized worldwide as a top-flight x-ray crystallographer whose specialty was the structure and function of enzymes that employ the vitamins riboflavin and B12 as cofactors. Professor Ludwig was one of the most accomplished faculty members in the history of the department—she was a member of the National Academy of Sciences and had recently been elected to the Institute of Medicine. She was a scientist's scientist—thoughtful, thorough and innovative. She was also a warm, caring individual who was an exemplary member to both faculty and students. Her presence is sorely missed. Efforts are underway to establish a lectureship in Martha's name, and we would certainly welcome contributions toward the lectureship. I am also expecting that an Endowed Professorship will be established in her name.

Letter from the Chair, William L. Smith



The Department of Biological Chemistry, the Life Sciences Institute and the Biophysics Research Division are co-sponsoring a symposium in Structural Enzymology to honor the career of Rowena Matthews, G. Robert Greenberg Distinguished University Professor. Rowena will move to emeritus status at the end of this year. As most of you are aware, Dr. Matthews' group studies the mechanisms of folate- and cobalamin-dependent enzymes, the regulation of folate metabolism and transcriptional regulation in prokaryotes. The symposium will be held at the University of Michigan on Friday and Saturday, May 18th and 19th, 2007. The event opens at Palmer Commons on Friday, May 18th at 5:00 p.m. with a reception following a plenary lecture by Professor Christopher Walsh, a Howard Hughes Medical Institute Investigator at Harvard University. The event will culminate with a dinner (reservations needed) at the Michigan League on Saturday, May 19, at 6:45 pm. If you need further information regarding the symposium or the dinner, please visit our website at (<http://www.biochem.med.umich.edu>), or please email Kimberly Crawford at kimjord@umich.edu.

The 2nd annual William E.M. Lands Lectureship was held on November 28, 2006. Professor James C. Fleet in the Department of Foods and Nutrition and Co-Director of the Interdepartmental Nutrition Program at Purdue University was the invited speaker. Dr. Fleet discussed his research on Vitamin D and calcium metabolism.

Other notable events and accomplishments of this past year include: Dr. Jairam K.M. Menon's receiving the State of Michigan Scientist of the Year Award. The award is given as a part of Impression 5's Tribute to Science and Technology Award Program. In May 2006, Dr. Keith D. Wilkinson, a 1977 graduate of the department and Professor of Biochemistry at Emory University School of Medicine, delivered our Distinguished Alumni Lecture. His research concentrates on the regulation of protein turnover and protein ubiquitination. Last October, Professor David P. Ballou was the recipient of the Distinguished Faculty Achievement Award for 2005-2006. This award recognized the exceptional teaching, service, and mentoring

contributions that Dr. Ballou has made to our Department and to the University community at large. As a reminder, our Department is hosting a social hour at the upcoming annual ASBMB meeting in April 2007. The Department's friends and all present and past members are invited. It will be held on Sunday, April 29, 2007 from 5:30-7:30 p.m. in the Washington Grand Hyatt Hotel, Washington DC. The social hour reception will consist of a hosted bar service and hors d'oeuvres. I hope to see you there!

As I mention every year, I hope that you will take the time to keep us apprised of your activities—if you send me a note (smithww@umich.edu), I will make sure the relevant information makes it into the newsletter next year. I find one of the most enjoyable parts of our newsletter to be reading news from former students and fellows reporting about events in their lives. Remember that we are on the web (<http://www.biochem.med.umich.edu>); please visit our site.

Please accept my best wishes for the coming year.

Regards,

A handwritten signature in black ink that reads "Bill".

Department On the Move!

BioChem Department Moves to its New Location

Special thanks and congratulations to everyone that helped the department move to its new location in Medical Science Research Building III. The move and everything it achieved is a testament to the hard work and dedication of the department's faculty and staff. After the dust settled from the uprooting and relocation of laboratories, offices, and staff we have been left with a much improved department.

Faculty Report

News from Faculty and their Labs

Mary Sue Coleman

President of the University, Professor of Biological Chemistry in the Medical School, and Professor of Chemistry in the LS&A College since 2001, was reappointed as President for an additional five years by the Board of Regents. She has joined Governor Jennifer Granholm, Ann Arbor Mayor John Hieftje, SPARK President and CEO Michael Finney, and others in response to the recent decision of Pfizer Inc. to close its facilities here. This is a major effort to retain Pfizer's skilled scientists and other workers in this area. Governor Granholm has announced a \$1 million commitment from the Michigan Department of Labor and Economic Growth to aid in assisting displaced workers.



David Ballou

was elected a Fellow of the American Association for the Advancement of Science (AAAS) for developing and applying stopped-flow techniques for rapid kinetic studies on flavin and metal-containing enzymes, revealing intermediates crucial to understanding biological oxidation reaction mechanisms.



Carol Fierke

Chair of the Chemistry Department, was elected a Fellow of the AAAS for distinguished contributions to bio-inorganic chemistry, particularly the mechanisms of zinc metalloenzymes and the ribozyme ribonuclease P, and the development and use of biosensors. She was elected as the Chair of the Biological Chemistry Division of the American Chemical Society for 2007.



The move allowed for improvements and additional facilities to become available for research purposes. Most notably: a centralized molecular modeling suite in which structural and molecular modeling computation can reside in an appropriate environment, improved faculty offices, a centralized administration office, an efficiently designed data center to account for the increasing technology requirements of research faculty and staff, improved data network access,

and perhaps most importantly contiguous laboratory space allowing for increased collaboration and sharing of resources.

After months of hard work and planning the department of Biological Chemistry can more effectively work together in this new location; continuing to move forward to meet new challenges in the coming year.

Jud Coon's

research was the subject of a Journal of Biological Chemistry Classic Article. Authored by Nicole Kresge, Robert Hill, and Robert Simoni, the Coon Classic referred to Jud's early work with Anthony Lu on phenobarbital-inducible microsomal cytochrome P450 and subsequent papers in the JBC on ethanol-inducible and numerous other P450 isozymes.



Mike Marletta

former professor in the Department, now Professor and Chair of Chemistry at the University of California in Berkeley, was elected to membership in the National Academy of Sciences last year and he received the 2007 Repligen Award for his demonstration that nitric oxide is an intermediate in the formation of nitrite and nitrate in microphages and elucidation of the mechanism for the regulation of guanylate cyclase by NO.



Jack Dixon

former chair and professor in the Department and then Dean of Scientific Affairs and Professor of Chemistry and Biochemistry at the University of California School of Medicine in San Diego, has been appointed Vice President and Chief Scientific Officer of the Howard Hughes Medical Institute headquartered in Chevy Chase, Maryland.



Richard Kowalczyk

former faculty member in our Department, has retired. He received his Ph.D. degree with Hal Christensen as his mentor. His many professional activities upon leaving the University of Michigan included the following: he headed the special chemistry lab at Northern Michigan Hospital in Petoskey, taught biochemistry and other courses for the University of Michigan's BSN program in Traverse City and at North Central Michigan College in Petoskey, and worked for Boston Biomedica Inc., a small biotech company. His scientific interests have been endocrinology, pharmacology, and pathophysiology, and he was national President of the Clinical Ligand Assay Society.

Daniel Klionsky

was one of 21 scientists named an Education Mentor in the Life Sciences by The National Academies. He also is the Abram Sager Collegiate Professor of Life Sciences, Professor of Molecular, Cellular and Developmental Biology, and Professor of Biological Chemistry in the Medical School, and a National Science Foundation Distinguished Teaching Scholar.



Kun-Liang Guan

Professor of Biological Chemistry, Halvor N. Christensen Collegiate Professor in the Life Sciences, and research professor in the Life Sciences Institute and Institute of Gerontology, received a Distinguished Agricultural Alumni Award from Purdue University. The award honors mid-career Purdue College of Agriculture graduates who have made significant contributions to their profession or society in general and have a record of outstanding accomplishments.



RITC
Research Information Technology Co-operative

What is RITC?

RITC stands for the Research Information Technology Co-operative and it is your technology support group. This past year the administrators and tech support groups in several basic science departments worked together towards finding a cost effective, high service technology support solution. Research department technology needs continue to grow. Technology support groups therefore must evolve to meet these growing needs by becoming elite technology support providers.

Faculty Report

News from Faculty and their Labs

Gary Glick

is a member of the Editorial Board and new Editor-in-Chief of Biopolymers, which is being expanded to include additional topics of interest to the biophysical and biochemical research community.



Randal Kaufman

was elected a Fellow of the AAAS for distinguished contributions to the biological and medical sciences, particularly the understanding of protein folding in the endoplasmic reticulum and the production of recombinant protein therapeutics. He was recently named the Warner-Lambert/Parke-Davis Professor of Internal Medicine.



News to Share?

We'd Love to Hear from you!

Use the enclosed contact card or email us at:
umbiochem@umich.edu

By combining knowledge bases, supplies, and personnel, RITC shifts our collective resources to suit current technology trends. RITC is developing robust new services focused on excellent desktop support, data center services - primarily focused on data storage and disaster recovery- and multimedia services. From computer repair to storage of terabytes of data, to web page and poster printing, RITC is working hard to give the participating departments the best technology service on campus.

More information about the Research Information Technology Co-operative can be found at our web site- <http://www.ritc.med.umich.edu>.

In Memorium - Martha Ludwig

Remembering the outstanding contributions by an individual to the department



Martha Ludwig,

the J. Lawrence Oncley Distinguished University Professor of Biological Chemistry at the Medical School and Senior Research Professor in the Biophysics Research Division, died November 27th. Martha was one of the most distinguished scientists on campus. She joined the faculty in

1967 as an assistant professor and maintained an active research program until her death. She is survived by her husband of 45 years, Frederic Hoch, Professor Emeritus of Internal Medicine and of Biological Chemistry.

She was recognized nationally and abroad as an X-ray crystallographer whose specialty was the structure and function of enzymes that employ the vitamins riboflavin and B-12 as co-factors. As an assistant professor, she solved the structure of the first flavin-containing protein to be structurally characterized. Subsequently her laboratory determined the structure of several other flavoproteins, often in collaboration with other faculty members. Her interest in B-12 stemmed from another collaborative project, spearheaded by a young graduate student, Catherine Drennan, who is now a tenured associate professor at the Massachusetts Institute of Technology. The structure of B-12 bound to a fragment of the enzyme methionine synthase was the first structure of that vitamin bound to a protein. Exciting outcomes of her work were movies of molecules in motion, dancing through their catalytic roles.

Her scientific contributions were recognized by the Garvan Medal of the American Chemical Society in 1984, by the Distinguished Faculty Achievement Award from the University of Michigan in 1986, by election as a fellow of the American Association for the Advancement of Science in 2001, and by election to the National Academy of Sciences in 2003 and to the Institute of Medicine in 2006.

Martha Ludwig was born in Pittsburgh in 1931, received her undergraduate degree in chemistry at Cornell University in 1952 and her master's degree in chemistry from the University of California, Berkeley in 1955, and then held postdoctoral positions at Harvard and MIT. At Berkeley, she developed scientific ties with Howard Schachman, who had a major influence on her

career. While at Harvard she worked with J. Lawrence Oncley and Margaret Hunter, and she continued lifelong collaborations with them at the University of Michigan. She did further post doctoral training with future Nobel laureate William Lipscomb, with whom she solved the structure of carboxypeptidase A. This was the first structure of a protein to be determined in the United States, and colleagues say it signaled this rising star in the field of X-ray crystallography.

In addition to her research contributions, Martha was recognized widely for the rigor of her teaching and training of graduate students and for her many administrative responsibilities. To quote her former students, "Regardless of rank, all students and fellows in the Ludwig laboratory receive superb training. No computer program is ever treated as a black box ... She spends enormous amounts of time with each of her students. I remember many five- to six-hour-long meetings, where we would sit down and write a paper together, or try to figure out why a crystallographic refinement was not working. Graduate students were included in brainstorming sessions about future experiments, as Martha encouraged us to think creatively about her projects. In addition to the training, Martha provided us with many opportunities to speak at national meetings and to network with well established scientists."

Dr. Ludwig served as chair of the Biophysics Research Division from 1986-89 and initiated the Molecular Biophysics Training Program at the University of Michigan, securing funding from the National Institutes of Health for this graduate training resource, and providing leadership of the program for nearly 20 years. She also played a leading role in the development of the Michigan Life Science Corridor-funded synchrotron beam line. This represented a \$22 million dollar effort to construct a new facility for protein crystallography at the Advanced Photon Source at Argonne National Laboratory. The facility, which very recently became operational, provides an opportunity for structural biologists from all the participating institutions in Michigan to have access to the most advanced X-ray source for macromolecular crystallography.

Dr. Hoch is in the process of establishing an endowed chair in Martha's name to be called the "Martha Ludwig Endowed Professorship in Protein Structure and Function."

Carl Belke (Ph.D. with Shafer) has retired from a faculty position in the Department of Chemistry at Brandon University in Brandon, Manitoba, Canada. After leaving Ann Arbor, he took a postdoctoral position at the University of Minnesota with Dr. Finn Wold. At Brandon he was primarily responsible for teaching courses in organic chemistry and biochemistry, and he served as department Chair for 17 years. His research included collaboration with physiologists at the Agri-Food Research Station on uterine estradiol receptors and with the Regional Hospital Laboratory on serum cholesterol and apolipoprotein levels in subjects with coronary heart disease. His sabbatical leaves were in the Department of Horticulture at the University of Minnesota, in the Brewing Research Department at John Labatt Ltd. (London, ON), and in the Biochemistry Department at Merck Pharmaceuticals (West Point, PA) headed by Dr. Jules Shafer. He is now living on the shores of Lake Huron in Grand Bend, Ontario.

Charles (Chuck) Winter (Ph.D. with Christensen), after leaving Ann Arbor, held postdoctoral positions at Johns Hopkins with Albert Lehninger and then with Charles Wadkins before accompanying the latter to the University of Arkansas College of Medicine as a faculty member in the Department of Biochemistry. Other than spending a sabbatical with Guido Guidotti at Harvard, he has devoted his years to dedicated service at Arkansas, where he was Acting Chairman of the Department of Biochemistry for two years and then Associate Dean for Research, a position he has held since 1994, now

part-time although he formally retired in June of 2004.

John Chiang (postdoc with Coon), Professor in the Department of Biochemistry and Molecular Pathology at Northeastern Ohio University's College of Medicine, has been elected Secretary-Treasurer of the Drug Metabolism Division of the American Society for Pharmacology and Experimental Therapeutics.

Kuniyo Inouye (postdoc with Coon), Professor of Enzyme Chemistry in the Graduate School of Agriculture, Kyoto University, took part as an organizer of the symposium entitled "Recent Development of HPLC Techniques in Diagnosis and Therapy" at the 20th IUBMB International Congress in Kyoto, gave an informal talk in our department on the role of a metalloproteinase, thermolysin, in aspartame synthesis, and lectured at the workshop on extra-cellular matrix degradation at the 18th International Congress on Fibrinolysis and Proteolysis in San Diego.

Carlos de Cespedes, M.D., Ph.D., first came to the department in 1971, attracted by the pioneering work of Halvor Christensen and Hal's interest in medical aspects of biochemistry. He had a Fogarty Postdoctoral Fellowship at that time, returned with a Fulbright Fellowship in 1983 to rejoin the Christensen lab and also carry out advanced studies with another faculty member, Jess Thoene, and in addition enjoyed brief training in DNA analysis in 1991 in the lab of his dear friend, the late Dale Oxender. Dr. de Cespedes recently returned to Ann Arbor on a visit and shared

with us some of his memories and his generous view of his experience at Michigan that helped him envision his future work in Costa Rica in hereditary metabolic diseases, an important health problem that badly needed to be addressed in his country. To quote from a letter he wrote after a return visit to Ann Arbor several months ago, "Most of my career has been as Professor of Biochemistry and Medical Genetics at the University of Costa Rica where I left as Dean of the Faculty of Medicine (as noted in the Biological Chemistry Newsletter of 1999). I have held other Chairmanships in my home country: academic, hospital, and governmental. I am formally retired since 2001, but doing voluntary work."

Fred Guengerich (Postdoc with Coon), Professor of Biochemistry and Director of the Center in Toxicology at Vanderbilt University, gave the Distinguished Scientist Keynote Lecture at IRBM/Merck in Rome. He was previously awarded the School of Medicine's Medal of Merit for mentoring postdoctoral fellows and residents in the research setting, which in the future will be named the Frederick Peter Guengerich Award at Vanderbilt in his honor.

Tetsufumi (Ted) Ueda (PhD with Coon), Professor of Pharmacology and Research Professor in the Molecular and Behavioral Neuroscience Institute at the U of M, gave several seminars in Japan and an invited lecture at the 23rd International Conference on Brain Energy Metabolism in Lausanne, Switzerland.

The Halvor N. and Mary M. Christensen Award is presented to a second-year student on the basis of academic record. This award is given in honor of Mary M. and Professor Emeritus Halvor N. Christensen who served as Chair of Biological Chemistry from 1955-1970, and who has generously provided the gift that supports this annual award.

Becky Fagan

Becky studies flavin reduction in dihydroorotate dehydrogenases by determining isotope effects in transient kinetic experiments in order to get at the nitty-gritty of the mechanism. Her work has been instrumental in showing that two carbon-hydrogen bonds are broken simultaneously in one phylogenetic enzyme class while proceeding in steps in another class. This work will enable the origins of transition-state stabilization by these enzymes to be uncovered, and could lead to the design of useful inhibitors.



2006 Annual Student Awards

Recognizing the Excellence and Dedication of our Students

The Anthony and Lillian Lu Award is presented to a student on the basis of academic background, achievement in the graduate program, and potential as a scientist. This award is made possible by the Lu Family who have generously provided the gift that supports this annual award.

The Adam A. and Mary J. Christman Award is presented to a third-year student judged to be the most outstanding in that class. The Christman Award is named in memory of former long-time faculty member Professor Adam Christman.



Junyu Xiao

In selecting Junyu for this award the Student Award Committee noted that Junyu is making excellent progress on his thesis research. Junyu studies the structure and function relationship of protein, an AAA (triple-A)-

Vps4 ATPase involved in the endocytic multivesicular-body pathway. His research uses biochemical and structural biology methods and he has excelled in both fronts. He has recently crystallized the yeast Vps4 protein and successfully solved the structure. He is now designing new mutagenesis and biochemical experiments to test some of the discoveries he learned from the structure.

Kunyoo Shin

The Student Awards Committee noted that Kunyoo was selected for this award because he has amassed a solid record of academic achievement, demonstrated a noteworthy ability to communicate scientific ideas, and made important experimental contributions towards understanding cell polarity. Specifically Kunyoo studied a protein called Patj, a newly identified protein in the Margolis lab that is crucial for apical membrane formation by epithelial cells. Kunyoo also showed that Patj is important for formation of tight junction seals between cells.



Members of the Student Awards Committee 2006

Irwin Goldstein, Chair
Suzanne Admiraal
Kun-Liang Guan
Amiya Hajra
Randal Kaufman



The Lee Murphy Memorial Prize is awarded annually to the student who embodies the highest ideals

of scientific integrity and who has published a paper or a series of papers judged most significant by the Awards Committee. This award is named in honor of Lee Murphy, an alumnus of this department.

Kuei Lee

For his thesis research Kuei developed techniques to optimize cytosine deaminase gene therapy. Cytosine deaminase is an enzyme that converts the pro-drug 5-fluoro-cytosine to 5-fluoro-uracil. 5-F-uracil, in turn, is useful in cancer chemotherapy because it has the effect of depleting the thymidine nucleotide pool needed for DNA synthesis and cell growth. Kuei designed and tested several different cytosine deaminase fusion proteins to optimize this cytosine deaminase based therapy. One fusion was with uracil phosphoribosyltransferase. The resulting fusion protein enhanced the production of 5F-UMP which inhibits thymidylate synthase. Another fusion was with the herpes simplex virus tegument protein, vp22, which was used to target cytosine deaminase to cells that normally do not express cytosine deaminase.

The Dziewiatkowski Award (dedicated to the memory of the late faculty member, Dominic D. (Jay) Dziewiatkowski), is offered to the student who has submitted the most outstanding Ph.D. dissertation during the last academic year.

Mohamed Abazeed

Initially working with another PhD student, Jen Blanchette, Mohamed first characterized and authenticated a cell-free assay that reconstituted vesicular transport from the trans Golgi network to the late endosome, demonstrating requirements for five proteins thought to be required for formation of clathrin-coated vesicles at the TGN and their targeting and fusion at the endosome. He demonstrated that this transport step requires the Gga1/2 (pronounced “Giga ½”) and not AP-1 clathrin adaptors and identified the mechanism of cargo selection by these adaptors at the TGN.

The Minor J. and Mary Lou Coon Award is awarded annually to the student who exhibits overall excellence in research, teaching, and service to the department. This award honors Professor Coon, former Chair of the department, and Mary Lou Coon who have provided the gifts that supports this award.

Becky Haeusler

Becky has already had great success with her research project, working on three-dimensional organization of genes in nuclei.

She started with a second-author Science paper and a first-author “Perspective” in the journal Cell Cycle. She now has a co-first author paper in JBC and is submitting a first-author review in Nucleic Acids Research and a first author research paper to PNAS, and expects at least one more manuscript to come out of her dissertation.



2006 Distinguished Graduate Lecturer- Dr. Keith Wilkinson “Structure and Function of USP5, a Deubiquitinating Enzyme”



Dr. Keith Wilkinson worked with Charles Williams and received his Ph.D. from our department in 1977. He is a professor of Biochemistry and acting director of the graduate division of Biological and Biomedical Sciences at the Emory University School of Medicine.

Currently his laboratory concentrates on the regulation of protein amount and location in the cell. They are studying the ubiquitin-dependent proteolysis system that is responsible for regulated degradation of intracellular proteins as well as the role of ubiquitin and ubiquitin-like proteins as a targeting signal.

New Faculty

Ruma Banerjee

Currently the George Holmes Distinguished University Professor of Biochemistry at the University of Nebraska. She studies the molecular mechanisms of redox active enzymes. Her current focus is on methionine synthase and methylmalonyl CoA mutase, the two known cobalamin (Vitamin B12)-dependent enzymes present in mammals. She also studies the regulation of B12-dependent metabolism during oxidative stress.

Katrin Karbstein

The Karbstein lab uses a combination of approaches – including biochemistry, mechanistic enzymology, protein engineering and yeast genetics - to study the complex biological process of eukaryotic ribosome assembly at the molecular level. Their ultimate goal is to understand the function of assembly factors, the order of events as well as the rationale for this order, aiming to delineate principles important for the assembly of other large RNA-protein complexes, such as the spliceosome or the signal recognition particle.

Steven Ragsdale

Presently the Charles E. Bessey Professor, in the Department of Biochemistry at the University of Nebraska, and the Director of the Molecular Biosciences and Biotechnology Integrated Graduate Training Program at Nebraska. Dr. Ragsdale is a leader in the field of one-carbon metabolism and of enzymes that use metals as cofactors. His work

on xenobiotic detoxification by anaerobic bacteria will likely prove to be of significant practical importance.

Hisashi Umemori

Neurons analyze and transmit information in the brain. Information is transferred from one neuron to another at functional contact sites called synapses. Precise assembly of synapses is critical to process information underlying all neural activity, and thus for proper functioning of the nervous system; abnormal synapse formation causes various neurological and psychiatric disorders. The goal of Dr. Umemori's laboratory is to reveal the molecular mechanisms of proper neural connection and synapse formation in vivo, and to implicate them to treatment of diseases with synaptic malfunction.

Yali Dou

Dr. Dou holds her primary appointment as an Assistant Professor in the Department of Pathology and was recently appointed jointly in the Department of Biological Chemistry. The broad objectives of the Dou lab are to understand the mechanism of how chromatin regulatory events regulate gene expression and thus affect different biological pathways. The current lab focus is on one of the histone lysine methyltransferases MLL1 (mixed lineage leukemia protein) and its interacting partners.

Doctor of Philosophy Degrees Granted

The Department extends its congratulations to the following students who have completed their PhD degrees

Christine Clouser

“Processing and Trafficking of the Luteinizing Hormone Receptor”

KunYoo Shin

“The Role of PATJ in Mammalian Epithelial Cell Polarity and Tight Junction Formation”

Andrew Andrews

“Function of Inner-sphere metal ions in RNase P catalysis”

Adam Avery

“Elucidation of UNC-51-like kinase signaling pathways”

Student

Rebecca Haeusler

“tRNA Genes as Organizers of Genetic Information”

Julia M. Coppola

“Cell-based Assays for Proteolytic Activity and their Application in Drug Discovery”

Narinporn Pattaramanon

“Conformational analysis of Heat Shock Factor 1 C-terminal domain”

News

The Department of Biological Chemistry welcomes this year's new students

Kari Anderson received her Bachelor of Arts degree from St. Olaf College in Northfield, Minnesota in 2005. Kari is conducting her thesis research with Dr. Janet Smith and Dr. David Sherman. Her thesis project explores how the catalytic domains at the end of the curacin A biosynthetic pathway form a terminal alkene. She is particularly focusing on the role of a putative sulfotransferase and a thioesterase.

Heather Claxton received her Bachelor's degree from Saginaw Valley State in University Center, Michigan in 2005. Heather's thesis research with Dr. Suzanne Admiraal studies polyketides synthases which are assembly line proteins that produce complex biologically active compounds, many of which are potent antimicrobial agents. Specifically she is looking at the efficiency of these synthases by measuring the rate of production for aberrant and the desired products.

Ryan Evans received his Bachelor of Science degree from Lafayette College in Easton, Pennsylvania in 2005. Ryan is conducting his thesis research with Dr. Audrey

Seasholtz. The Seasholtz lab is interested in the mammalian stress response, which is primarily mediated by corticotropin releasing hormone (CRH). In this niche, Ryan is specifically studying a known and a putative CRH binding protein and their roles in regulating CRH activity and the response to stress.

Li Li received her Bachelor of Science degree from Zhejiang University in Hangzhou, People's Republic of China in 2003. Li is currently studying the activation mechanism of the unfolded protein response transducer IRE1 and PERK with Dr. Randal Kaufman.

Mo Weng received her Bachelor of Science degree from Peking University in Beijing, People's Republic of China in 2005. Mo is working with Dr. Kun-Liang Guan on a newly emerging pathway coordinating cell proliferation and cell death which is essential to maintain homeostasis in multicellular organisms. Several components have been identified which are evolutionarily well conserved. She is focusing on identifying other players in this pathway in order to better understand how this pathway is regulated and what outcome it leads to.

Remember to Save This

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**Department Social Hour
ASBMB Meeting
Sun., April 29, 2007 5:30-7:30 p.m.
Washington Grand Hyatt Hotel**

**Structural Enzymology Symposium
honoring Rowena Matthews
Fri. May 18 - Sat. May 19, 2007**

**For more Information
<http://www.biochem.med.umich.edu>**