DEPARTMENT OF BIOCHEMISTRY
KANSAS STATE UNIVERSITY

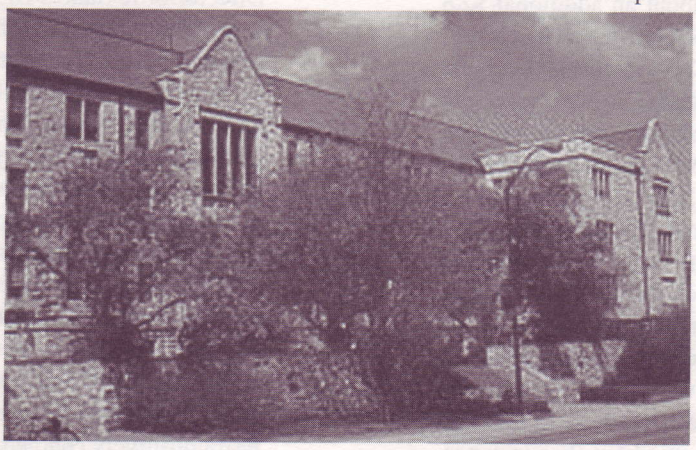
Alumni and Friends Newsletter
Spring, 1998

NEWS FROM THE DEPARTMENT HEAD

TOM ROCHE

New Developments

The last two years have seen two developments that should have long term repercussions. The Department has hired three new faculty to bring the number of faculty back to the "traditional" level of fourteen faculty members. This exciting advance for the Department could also be described as a small contribution to European brain drain. Secondly, plans have progressed for a combination of new construction and renovation. There are some uncertain aspects, but, if fully executed as projected, this would constitute a stride forward for the Department. As explained below, the new construction is dependent on the recruitment of funds.



New Faculty

In the Spring of 1996, the Department conducted a search for a computational biochemist. Dr. Paul Smith was hired. Paul obtained his Ph.D. in Chemistry at the University of Liverpool and did postdoctoral research with Monte Pettitt at the University of Houston and with Wilfred van Gunsteren in Switzerland. Paul was then a Research Assistant Professor at the University of Houston for three years. Paul uses molecular dynamic simulations to analyze the structure and dynamics of small polypeptides (see enclosed description). His computational research is carried out in Willard Hall. Paul finished off his first year by making a ceremonial return to Houston, returning to Manhattan with a new bride, Courtney.

This Spring the Department initiated a search for a faculty member in the broad area of signal transduction research. The exciting outcome was a dual couple hiring of Dr. Anna Zolkiewska in that area and her husband Dr. Michal Zolkiewski, a physical biochemist. Anna and Michal have held postdoctoral positions at NIH Bethesda since 1990. Both obtained their doctoral degrees in Warsaw; her degree was from the Nencki Institute of Experimental Biology and his degree was from the Institute of Physical Chemistry, Polish Academy of Sciences. Anna conducted postdoctoral research with Joel Moss; their focus on regulation by ADP-ribosylation led to the discovery of a new integrin family member whose role in intercellular and intracellular signaling will be the focus of Anna's future research. Michal's postdoctoral studies were with Ann Ginsburg investigating the pathways of folding and unfolding and assembly and de-assembly of oligomer-forming proteins. His recent and future research has centered on a new class of heat-shock proteins that appear to actively contribute to protein de-aggregation. Greater details on their research are enclosed.

(continued on page 2)

New Renovations

As indicated previously, construction developments are in the offing. A great deal of effort has been put into a new construction scenario designed to aid Engineering, Biology, Biochemistry, and Chemistry with $11 million in hard State funds. Engineering has leveraged half these funds with matching funds donated from outside. The remainder is planned to partly support an $11 million dollar addition to Ackert Hall with the other half of the required funds needing to be recruited from external sources. Major targets are donations and Federal funding. Biochemistry is scheduled to occupy 24,917 square feet on two floors of the addition to Ackert; the Cancer Center will also be located on a floor with Biochemistry, and Biology will occupy the third floor. The plan is for Biochemistry to move from both Willard Hall and the Chemistry-Biochemistry building (CB). Thus, this would involve moving nine faculty research programs, teaching laboratories, and the High Field NMR Center. The administrative offices in Willard would be relocated to renovated space on the first floor old Ackert (1225 square feet of Biochemistry space and 550 square feet of space to be shared with Biology). Chemistry would inherit the vacated research and teaching space in CB which would then undergo some renovation. Any donations and insights into potential prospects for pursuing funds towards this construction effort would be greatly appreciated. Simple math indicates that $5.5 million needs to be recruited. The Central Administration is pursuing Federal funding and the Cancer Center is leading the way in pursuing private donations. I cannot avoid noting that about an additional $2.3 million would allow all of the Biochemistry research programs and the Biotechnology Core facility which are located in Burt Hall to also participate in the move into new space in Ackert II. A large contribution to this construction is definitely associated with a building naming oportunity.

In the mean time, minimal but expensive ($1.3 million) renovation in a 3-stage process is scheduled for Burt Hall. New utilities (cooling condensation and steam lines, electrical service), a central make up air system with considerable cooling capacity, and new windows will be added; each laboratory will be served by two fume hoods. The present situation is one fume hood with little or no make-up air except through leaky windows. For instance, in my Burt Hall laboratory, one hood with a near zero flow rate serves 10 researchers while we attempt to do both biochemistry and organic chemistry research (a status that I have operated with for 23 years). The final stage of Burt renovation is scheduled after new construction (in 2002) with some laboratories (particularly the Takemoto laboratory) being temporarily vacated. Yes, this would require some faculty to temporarily stay in CB and a CB to Burt move is possible.

BIOCHEMISTRY NEWS

CHANNEL FORMING PEPTIDES AS CYSTIC FIBROSIS TREATMENT

KSU News Services

Research directed toward finding new therapies for cystic fibrosis is being led by Kansas State University biochemist John Tomich along with colleagues at the University of Kansas Medical Center. Professor Tomich and co-workers have successfully constructed a synthetic molecule that forms channels in mouse kidney cells and induces chloride and fluid secretion, The National Institutes of Health and the Cystic Fibrosis Foundation have funded Tomich's research. He is an Associate Professor of Biochemistry and Director of K-State's Biotechnology Core Facility. Principal collaborators at the KU Medical Center are Jared Grantham M.D., and Lawrence Sullivan M.D., who tested the molecule's cellular activity.

The findings were reported in the May issue of the American Journal of Physiology: Cell Physiology. The paper is "Synthetic Peptide Derived From Glycine-Gated Cl- Channel Induces Transepithelial Cl- and Fluid Secretion." Co-authors are Darren Wallace, John Tomich, Takeo Iwamoto, Kyle Handerson, Jared Grantham and Lawrence Sullivan. Wallace and Henderson are graduate students in Sullivan's labs; Takeo Iwamoto is Assistant Director of K-State's Biotechnology Core Facility.

In normal cell functioning, pores or channels are essential. Through them, ions move across a cell membrane. The channels are specific for the atoms they carry. Sodium atoms use sodium channels, and chloride atoms use chloride channels. In cystic fibrosis patients, the major chloride transport system is faulty. Without chloride atoms, cells cannot secrete enough fluid, and a sticky, thicker mucus accumulates. The cystic fibrosis syndrome includes difficult breathing; digestive problems and hard-to-treat infections. Many sufferers do not live beyond age 30.

The new molecule Tomich and Iwamoto have synthesized at K-State is a modified version of a glycine receptor chloride channel forming protein from the brain. Extra positively charged residues at one end of the peptide make it more water soluble. The peptide, when delivered to cell membranes, inserts spontaneously and then four to five of these molecules associate to form the artificial channel.

Thus far, the group has been able to create a water-lined pore in mouse kidney cells. It will be several years before a drug therapy based on the synthetic molecule can be developed and tested with cystic fibrosis patients. The next level of research is to test the molecule using whole

tissues instead of just cells. The team will begin with the gut tissue taken from mice with cystic fibrosis.

Earlier studies done by Tomich's group in collaboration and Mauricio Montal at the University of California–San Diego set the stage for the new developments. In the late 1980s, a number of peptides were prepared and tested based on the sequences numerous kinds of channel-forming proteins including sodium, calcium, GABA receptor, glycine receptor, acetylcholine receptor, and the cystic fibrosis transmembrane conductance regulator, CFTR. This approach was used to define the pore forming components of the parent ion channel protein.

By using this minimalist approach to building the channel pores, Tomich hoped to answer the question: is there a common motif that's responsible for making the pores in cell membrane? The answer is yes. Each synthetic channel-forming protein assembled so far is a bundle of helices each containing 20 or more amino acids. Knowing the rules for constructing an ion specific channel was the advance that lead to the development of peptides that might alleviate a number of medical maladies.

NEW BIOCHEMISTRY FACULTY MEMBERS

Paul Smith

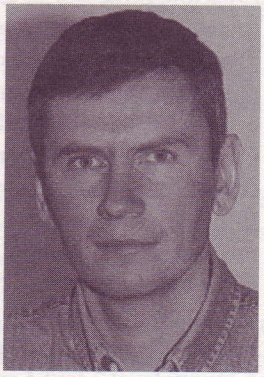
The group is currently interested in using computer simulation techniques to probe the properties of several systems of general and biological significance. In particular, we are currently studying the effects of a variety of salts and cosolvents on the interactions between the different functional groups common to all proteins, and developing a simplified representation of proteins to aid in our studies of the detailed mechanism(s) of protein folding. An undergraduate student (Clint Leonard) has also been using nmr and molecular dynamics simulations to study the conformational properties of a small serine proteinase substrate. A joint collaboration between Biochemistry, Physics, Chemistry and Chemical Engineering has resulted in an NSF grant for a 16 processor upgrade to the Convex parallel computer. This is an important acquisition which will enable the study of larger systems for longer times and with better precision. Any undergraduate or graduate students interested in using computers for the study of biological systems should drop by my office in Willard Hall for an informal chat. It's an exciting time for computer oriented research at K-State. On a more personal note, I recently married a sweet Texas girl (Courtney) and together we managed to buy our first home. Thanks for all the help during the last year.

Anna Zolkiewska

The major objective of my studies is to delineate molecular events involved in the process of formation of skeletal muscle. Skeletal myogenesis is a multi-step process involving muscle cell differentiation, fusion, maturation of the resulting muscle fiber, and formation of specialized structures such as neuromuscular and myotendinous junctions. Understanding of each step at the molecular level is essential for planning strategies to enhance muscle regeneration after injury or denervation, as well as to optimize gene therapy employing myoblasts as vehicles for targeted gene delivery into mature muscle. My research explores the role of cell adhesion molecules in myoblast differentiation, cell-cell recognition, adhesion, alignment, and membrane fusion. Two classes of molecules are of particular interest: integrins, a family of ubiquitous heterodimeric transmembrane receptors providing a link between extracellular matrix and cytoskeleton, and meltrins, a group of muscle-specific proteins which contain disintegrin and metalloprotease domains. By using a combination of biochemical, biophysical, and molecular biological methods, my goal is to identify specific ligands for each group of the adhesion molecules and to dissect the signaling pathways triggered upon ligand binding which are essential for the execution of the myogenic differentiation program.

Michal Zolkiewski

Hsp100 (Clp) is a recently discovered and rapidly expanding family of proteins found in both prokaryotic and eukaryotic cells which are involved in vivo in the quality control of protein folding and degradation. My research focuses on the structure and function of two closely related proteins: ClpB from E. coli and Hsp104 from yeast. Hsp104 participates in vivo in the reactivation of aggregated proteins. This remarkable function is significantly different from that of other Hsp families, which are believed to prevent aggregation by keeping protein substrates on the productive folding pathway, but are not able to rescue them from off-pathway conformations. The molecular mechanism of Hsp104 action is unknown and a major effort of other research groups has been to analyze the Hsp104 function using genetic manipulations in yeast. My research on ClpB and Hsp104 employs a



combination of biochemical and biophysical approaches to study macromolecular binding and conformational effects. The failure of protein folding and accumulation of aggregates is now recognized as a serious problem in molecular biology, biotechnology and medicine. The ability to control protein misfolding and to resolubilize aggregates has obvious potential significance, however, it still remains a theoretical possibility. The studies on Hsp100 can answer questions related to possible use of molecular chaperones as bio-reagents in practical protein folding problems.

PLANTS AS ENVIRONMENTAL CLEAN-UP AGENTS

KSU News Services

It's a problem occurring across the country. Hazardous chemicals left behind in landfills and dump sites threaten water supplies and health. Clean-up is expensive and time-consuming. But research at Kansas State University, including the laboratory of Larry Davis in Biochemistry, into plant-based bioremediation is showing that an answer to those problems could be helped by something as simple as planting a tree.

"Essentially, bioremediation is using organisms to clean up contaminants," said Davis, Professor of Biochemistry. "Usually it means bacteria or fungi-emphasizing plants which are present in the root zone." In essence, the vegetation serves as a pump bringing contaminated water close to the surface. Depending on the type of chemical present, bacteria on the plant roots can feed on some types of chemicals, while other chemicals are brought closer to the surface, which can hasten their degradation because oxygen is present. In some cases, we have actually seen 10 pounds per acre a day removed," Davis said. "It really depends on what's present there."

In either case, using plant-based bioremediation is cheaper then more traditional methods of clean-up such as pumping and treating or excavation, according to Larry Erickson, professor of chemical engineering. "I would say society is going to save many millions of dollars," he said. "We're finding the use of vegetation has use in a number of environments and a number of problems."

That's hopefully going to be the case in Riley County, which is the home county of both K-State and the city of Manhattan. Facing clean-up costs at a closed landfill, they drew on K-State's expertise in the area of bioremediation for a solution. Drawing on work by both students and faculty, the county decided to adopt bioremediation as a solution. This spring, 5,000 poplar trees were planted at the site. "It's really an application of university research to a county level," said Ann Feyerharm, special projects assistant for Riley County. "I never would have heard of it if it hadn't been for Dr. Erickson and Dr. Davis." Feyerharm said one of the most attractive aspects of bioremediation to Riley County was the cost. Traditional clean-up methods could have cost an estimated $4 million in the first year, and $8 million over 20 years. The total cost of the bioremediation is expected to be around $15,000. But the aesthetic qualities of bioremediation were also an attraction. Feyerharm said the planting of the trees will help control erosion problems and attract wildlife, something traditional treatments wouldn't do. "We think this a no lose opportunity for us," Feyerharm said.

Erickson and Davis, along with other K-State professors, are continuing research into bioremediation, both in areas of genetic research and practical application. The Great Plains/Rocky Mountain Hazardous Substance Research Center, a consortium of 14 universities with headquarters at K-State, funds a number of bioremediation research projects across the country. Considering there are approximately 300,000 sites across the United States in need of clean-up, many are hoping research will lead to a cleaner environment.

K-STATE BIOCHEMISTRY STUDENTS WIN MAJOR SCHOLARSHIPS

Four undergraduate Biochemistry majors have recently been succesful in winning prestigous scholarships. Craig Behnke, Lance Davidson, Sonja Koo, and Paul Robben, have won $14,000 Goldwater scholarships for math and science, which can be used for up to two years of undergraduate studies. Behnke, from Manhattan, graduated in Spring 1996 and is now a graduate student in Biochemistry at the University of Washington. Davidson, from Salina, graduated in spring 1997. Lance also received a Fulbright scholarship for foreign study. He plans to study sustainable agriculture in India at the M.S Swaminathan Research Foundation and plans additional course work at the University of Madras.

K-State students have won 30 Goldwater Scholarships since the program began in 1989. K-State is ranked first in the nation among public universities in the number of Goldwater winners. Only one private school, Princeton University with 32, has produced more. K-State is tied with Harvard with 30. K-State scholars rank sixth in the nation for success in four elite scholarship competitions for the period 1984–96. Since 1984, among state schools K-State ranks first in Truman competition nationwide, first in Goldwater competition, and second in Marshall, and Rhodes scholarships.

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Kevan Flaming, (BA 1984) worked as undergrad in Tom Roche's lab: After getting my DVM and MS (Anat and Phys) from Kansas State in 1988, I moved to the Ames, IA, area to pursue a Ph.D. at Iowa State Univ. I received my Ph.D. in Immunobiology in 1995. By wife, Brenda (KSU, DVM 1988), and I now have two children, a girl Billie, 2 years, and a boy, Garth, 6 months. Brenda works in a small animal hospital in Des Moines. I'm currently employed as an Adjunct Instructor here at the Iowa State College of Veterinary Medicine. I have been coordinating an experimental veterinary curricular option using problem based learning and other active learning strategies. We enjoy Iowa but certainly miss the Flint Hills of Kansas. Tell Tom Roche hello. I certainly appreciate the many valuable things (mostly not biochemistry) I learned in his lab during my time there. Go cats! Kevan Flaming, College of Vet Med, kpflamin@iastate.edu,Iowa State Univ.

Dr. Terry W. Sherraden, (BS 1974) I am a physician in Tallahassee, FL, the home town of my wife Sarah. I have a busy practice in Endocrinology so I still use bits and pieces of that Biochem education that I received soooo many years ago. I have three sons, aged 13, 11, and 9 that keep me busy. I have transplanted well to Florida. I yell just as loudly now for F.S.U. as I did for K.S.U. I've learned a lot about salt water fishing, and believe me, the Gulf of Mexico is a bit larger than Tuttle Creek Lake! I still enjoy my trips back to Kansas and remember fondly my KSU days. Every Man A Wildcat!

Xiaorong Wang, (MS 1995) I enjoyed the two years of research and study in the biochemistry department. I can not forget the extensive help and support from my two thesis advisors, thesis committee members, and professors in the biochemistry department. After I graduated, I moved to Philadelphia, I entered the biomedical graduate study program for my Ph.D. education. During the two years, I took lots of very interesting courses and I rotated through several labs to expose myself to many interesting areas of biomedical research. Two months ago, I finished all required course work and lab rotations and passed the preliminary exam. I entered one of the best labs in Penn. for my thesis work. My advisor is a leading scientist in the field. My husband is a Ph.D student in the chemistry department in UPENN, his major is polymer chemistry. He is also enjoying his research work.

Yoichi Aso, (Post doc in Kramer's Lab) My family (Yukiko, Tatsuo, & Haruko) and I were inhabitants in Jardine Terrace for two years (1981–83). We can see strong Wildcats at the Independence Bowl game in our scrapbook and miss our Kansan lives. My post doctoral studies on the enzymes from M. sexta were done in Dr. Kramer's lab. Now I am an associate professor at Kyushu University, Fukuoka, Japan. My studies are on the disassembly mechanism of the pyruvate dehydrogenase complex (PDC) from Bacillus stearothermophilus, silkworm enzymes including DOPA quinone imine conversion factor responsible for melanization, and the subsite structure of an enzyme. A variety of work keeps my brains from denaturation, but sometimes confusable. I wish my Ph.D. students would also be able to join in a research program at The Little Apple. Dr. Yoichi Aso, Laboratory of Protein Chemistry & Engineering, Kyushu University, Fukuoka 812–81, JAPAN

Tom Bolden (Ph.D. 1983 with Dr. Mueller) who has been a faculty biochemist at Alcorn State University since-graduation, was a co-principal investigator on an NIH grant that was funded for over 3 million dollars. Most of the money is to be used to buy research equipment for the Departments of Chemistry, Physics (where Tom is located) and Biology which will be used to provide undergraduate research training for minority students. The grant also includes funds for student support, including summer internships.

Betty Shi (M.S. 1991 with Dr. Davis) is living in Nutley, NJ, working full time for Hoffman LaRoche, studying specific inhibitors of the cell cycle as potential anticancer agents. Her parents have been visiting her from China for a year and may remain for a time while she starts a family. In her spare time she has written two novels— the first is just published and she is doing a book signing at the local Barnes and Noble before the holidays. The second book is in press.

Binghui Shen (Grad student in Davis' lab) is an Assistant Professor at City of Hope in Los Angeles. His research focuses on specific endonucleases that he partially characterized during his post-doctoral years at Los Alamos.

Marilyn Baguinon (Ph.D. 1992 with Dr. Davis) is doing a lot of teaching at Kutztown State University in Kutztown, PA. This fall she constructed DNA electrophoresis apparatus for one of the labs using plans she learned at KSU.

Lei Zhao (M.S. 1994) with Mike Kanost is working in the cardiovascular research department at Berlex Biosciences in the San Francisco area, and living in Richmond, CA.

Yanling Huang (M.S. 1992 with Dr. Davis) is working at the Institute of Metabolic Disorders, in the Obesity Group at Bayer Corporation in West Haven, CT. Her address is 12124 Town Walk Dr., Hamden, CT 06518.

Christina L. Chang (M.S. 1979 and Ph.D. 1988) is now a research faculty member at UCSD in Medicine—gastroenterology. She has expertise in tumor regulator genes and is searching for related functions in inflammatory bowel disease.

Jianhua "Leo" Liu, (Ph.D.) Email: liu@main.chem.ohiou.edu. One year ago, I left my postdoc position in Dr. Ramaswamy Krishnamoorthi's lab and took my current position as the NMR Facility Manager in the Department of Chemistry at Ohio University. This is a major step toward my academic career. I don't think I could accomplish this without the training at the Department of Biochemistry at Kansas State University. During the time I worked at KSU, I started and finished the studies of internal dynamics of CMTI-III and CMTI-V. The training with NMR spectroscopy, I had while working on these research projects benefits me greatly in my current working environment. Currently I am managing 3 NMR spectrometers, which include a Varian Unity Inova 500, a Varian VXR-400s with solid state capability, and a Bruker AF250. I am working with both small organic and large biological molecules. Also, the collaborative work with Dr. Krishnamoorthi's lab continues and I am looking forward to getting some results with this new project in this new year. If you are interested in knowing more about this facility, please visit my NMR homepage at http://www.chem.ohiou.edu/~liu/nmr I would like to convey my deepest condolences toward the loss of professor Joseph Pauksteilis, who had been my mentor and a good friend and helped me profoundly both in my academic and daily life.

Doug Brandt (B.S. degree 1979 and Ph.D.1982, with Tom Roche) is the Division Head at Abbott Laboratories for the Research and Development ARCHITECT Assay Development Program. This involves oversight over the development of Abbott immunoassays done by automated systems. He oversees 185 workers in U.S. and 30 in Japan. His division will be launching a new assay system in the next year that will move the state-of-the-art for the industry forward in number of different assays performed, speed of testing, and accuracy. They will have a capability of performing 29 tests on 200 samples in less than two hours. Doug and his wife Cheryl have 3 boys, Jonathan, Ryan, and Paul (ages 10 to 16) and a daughter, Sonya, eight.

Rich Cate (Ph.D. 1979 with Tom Roche) has been a Section Head for several years at Biogen Inc. and was just appointed Director of Molecular Genetics. His research team has been investigating genes in kidneys and bone that control development. Rich and Barbara continue to enjoy ocean sailing, regularly in the caribbean or up to Maine. Barbara has started her own biotech company.

Lin Li (M.S. 1988 with Tom Roche) After conducting research in the National Cancer Institute, he returned as a Cancer Prevention Fellow to John Hopkins, where he had obtained his Ph.D., to earn an M.P.H. degree in the area of epidemiology. He is now completing his fellowship at NCI where he is developing a project designed to detect genes that influence behavior related to nicotine dependency. This is clearly important because of the related cancer risk. Lin and his wife, Jingning Wang, have a son Austin who is 16 months old.

Bryan Lawlis (NIH postdoctoral fellow with Tom Roche, 1980–82) left his Vice President position at Genentech in 1996 to form and be president and CEO of his own company, now named Covance Biotechnology Services. Using his years of experience at Genentech and Genencore (and substantial start-up funds from Corning and Covance Inc.) Bryan's company brings to market products developed by smaller biotech companies by dealing with large scale production and obtaining FDA approval. Kirk Hayenga (M.S. degree with Charlie Hedgcoth, 1982) is the Director of Manufacturing in Bryan's company. While his company is in the research triangle park area in North Carolina, Bryan maintains a ranch in Mendocino county in northern California. His wife Patty continues to run Lawlis, Inc. and his daughter Shawna (age 15) is a bright high school student starting to think about what expensive university she is going to going to attend.

Liwen Xu (Ph.D. 1996 with Dr. Wang) I am a postdoc in the Dept. of Biological Sci. at Stanford Univ. My resesarch project is the regulation of proteolysis of HMG-CoA reductase, a key enzyme in cholesterol biosynthesis pathways. Briefly, I mutagenize some subregion within the membrane domain of HMG-CoA reductase, and analyze degradation of mutant protein under different conditions. In addition, I investigate the interaction of HMG-CoA reductase molecules and the effect of this interaction on protein degradation with UV-crosslinking approaches. My work is very interesting. The life in sunny California is very colorful and exciting. We have a lot of fun here.

Recent graduates from the Biochemistry Graduate Program

student	degree, year	major professor	current position
Azin Agah	Ph.D. 96	Reeck	Postdoctoral Associate, Harvard Medical School
Craig Behnke	M.S. 96	Reeck	Ph.D. student, Dept. of Biochemistry, University of Washington
Anthony Cole	M.S. 95	Andersson	Ph.D. student, Dept. of Plant Pathology, University of Missouri
Hyung Hyun Choi	M.S. 95	Muthukrishnan	Ph.D. student, Medicinal Chemistry, Purdue University
Kunwei Chen	M.S. 95	Muthukrishnan	Research Assistant, Analytical Chemistry Lab, Univeristy of Missouri
Jess Cunnick	Ph.D. 96	Takemoto	Postdoctoral Associate, Moffitt Cancer Center, University of South Florida
James Dyer	Ph.D. 96	Wang	Postdoctoral Associate, Biochemistry IV, ETH Zürich, Switzerland
Hong Gan	Ph.D. 96	Kanost	Postdoctoral Associate, Immunology, Baylor College of Medicine
Doreen Glodowski	M.S. 96	Wang	Ph.D. student, Dept. of Biomolecular Chemistry, University of Wisconsin
Yi Guo	M.S. 95	Davis	Technician, Pioneer Hibred International, Des Moines, IA
Jianping He	Ph.D. 96	Denell	Posdoctoral Associate, NIH
Seung Sup Kim	Ph.D. 96	Reeck	Postdoctoral Associate, New York University Medical Center
Congcong Ma	M.S. 97	Kanost	Ph.D. student, Biochemistry, KSU
Xiaolu Guo Smith	Ph.D. 96	Davis	Instructor, Biology & Biochemistry, KSU
Ali Turkan	M.S. 97	Riordan	Ph.D. student, Biochemistry, KSU
Dongmei Wang	M.S. 97	Takemoto	Res Asst, University of Kansas, Lawrence
Lei Wang	M.S. 95	Muthukrishnan	Ph.D. student, UCLA
Lijuan Wang	M.S. 95	Roche	
Xiaorong Wang	M.S. 95	Muthukrishnan	Ph.D. student, Dept. Of Biochemistry, Unviersity of Pennsylvania
Liwen Xu	Ph.D. 96	Wang	Postdoctoral Associate, Dept. of Biological Sciences, Stanford University
Daqing Yang	Ph.D. 96	Roche	Postdoctoral Associate, Dept. of Pharmacology, University. of Virginia
Kuo-Chang Zen	Ph.D. 95	Muthukrishnan	Postdoctoral Associate, UCLA
Karen Gonzalez	Ph.D. 95	Takemoto	Postdoctoral Associate, University of Puerto Rico
Wenyan Zhan	M.S. 97	Hedgcoth	Grad Student, Computer Sciences, KSU
Dimitri Tamalis	Ph.D. 97	Hedgcoth	Postdoc. New York University Medical Center
Xiaoqiang Yu	Ph.D. 97	Kanost	Postdoc Dept. Biochemistry, KSU

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Our home page contains information on the Department of Biochemistry, faculty, undergraduate and graduate programs, courses, seminars, and core facilities. Other K-State-related pages that might be of interest:

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