

Biochemistry News

Kansas State University – Alumni and Friends Newsletter

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News from the Department Head



Greetings from the Department of Biochemistry. We have reached the end of a busy semester and look forward to a productive summer of research.

We welcome a new assistant professor, Rachel Zufferey, who joined the department in September. Dr. Zufferey came to us from the University of Connecticut Health Center. Her research involves understanding phospholipid metabolism in the human parasite *Leishmania*. She has moved into a laboratory in Chalmers Hall and has begun to assemble her research group. Dr. Zufferey will teach the "lipids and membranes" section of Biochemistry II, a graduate course on lipid biochemistry, and Introduction to Organic and Biochemistry. You may read more about her later in this newsletter.

After a very long wait, all of our space in Chalmers Hall is scheduled to be completed by the end of July. We will then move our research and teaching laboratories now in the Chemistry/Biochemistry building and our department administrative offices in Willard Hall into the newly completed space in Chalmers Hall (an addition to Ackert Hall that we will share with the Division of Biology and the Center for Basic Cancer Research). The department will then be housed in two buildings (Burt and Chalmers), an improvement on our current situation in which we are spread in four buildings. That will be an advantage, with more frequent opportunities for daily interactions among all of our faculty and students.

We would like to keep up to date with our alumni and friends. Please let us hear from you with your news, and stop by to visit if you happen to be in Manhattan.

Mike Kanost

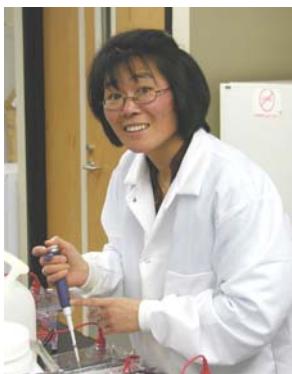
Biochemistry Undergraduate wins Goldwater Scholarship



Meg Fasulo, senior in chemistry, biochemistry, and microbiology was one of four Kansas State University students to be awarded \$7,500 Barry M. Goldwater Scholarships. Fasulo plans to earn a doctorate in chemistry and then teach and conduct research at the university level. Fasulo is conducting supramolecular chemistry research on the formation of co-crystals. Her project is under the supervision of Christer Aakeroy, associate professor of chemistry. She is a 2003 graduate of Olathe North High School.

The Goldwater Scholarship competition is for students who major in science, math or engineering and plan a career in research. The scholarship provides up to \$7,500 annually for a student's final one or two years of undergraduate studies. K-State students have now won 53 Goldwater Scholarships since the program began in 1989. K-State is ranked first in the nation among state universities in the number of Goldwater winners. Among all colleges and universities in the nation, only Princeton, Harvard and Duke have produced more Goldwater scholars.

The Department Welcomes New Faculty Member Rachel Zufferey



Dr. Rachel Zufferey joined the Department of Biochemistry as an Assistant Professor in September 2005. She obtained her Bachelor/Master degree in Biochemistry from The Federal Institute of Technology of Zurich, Switzerland. She earned her PhD in Microbiology from the same institution, performing research focused on understanding the assembly and biogenesis of a novel type (cbb_3) of cytochrome c oxidase. This enzyme is essential for the symbiosis of the nitrogen fixing bacteria *Bradyrhizobium japonicum* with the plant host, the soybean. Dr. Zufferey received her postdoctoral training at Washington University School of Medicine, St Louis, MO and became interested in studying the biosynthesis of the virulence factor lipophosphoglycan of the human parasite *Leishmania*. Then, she moved to the University of Connecticut Health Center, Farmington, CT, to take a position as Research Assistant Professor and pursued her interest in human parasites, focusing primarily on lipid metabolism in *Leishmania* and malaria.

Dr. Zufferey's present research interests include the initial steps of glycerolipid biosynthesis in the protozoan parasite *Leishmania* that causes serious diseases in humans as well as in animals. Due to the lack of effective vaccines and adequate pharmacological agents, better drugs are urgently needed for the treatment of parasitic diseases. Her research is aimed at understanding how this pathogen synthesizes its membranes and lipid-based virulence factors, with a goal of identifying potential targets for drug development. She has been focusing on the initial acyltransferases of the glycerolipid biosynthetic pathway, the glycerol-3-phosphate acyltransferase and dihydroxyacetonephosphate acyltransferase. Dr. Zufferey's research is currently funded by a Scientist Development Grant from the American Heart Association.

Biochemist Earns Sarachek Award

Biochemistry graduate student **David Hogenkamp** was awarded the 2005 Sarachek Predoctoral Honors Fellowship for his work studying chitin metabolism in insects. The fellowship provides a \$15,000 award to a resident graduate student enrolled in a Ph.D. program at Kansas State University. The student's research must be in a field of study relating significantly to contemporary molecular biological techniques.

Hogenkamp, who is working under the direction S. Muthukrishnan and Karl Kramer, is studying chitin, the second most abundant polymer in nature, next to cellulose. "Chitin provides the structural support in insect structures much like the steel rods do in reinforced concrete," Hogenkamp said. "Because chitin is absent in mammals and higher plants, chitin metabolism represents a selective target for the development of insect growth regulators (IGRs), insecticides. These IGRs may be valuable for use in agriculture." He is using the tobacco hornworm and the red flour beetle as model insects for studying chitin metabolism.

A native of Canada, Hogenkamp has both U.S. and Canadian citizenship. After graduation with honors from Brock University, he joined the U.S. Army and was stationed at Fort Riley, Kansas, where he served on active duty in an infantry unit for four years.



David Hogenkamp receives his award from **Forrest Chumley**, Associate Director, Agricultural Experiment Station.

After serving in the army, Hogenkamp worked as an instructor for the TRIO program, Upward Bound Math and Science, teaching chemistry to high school students who were considering studying science in college.

Dave has completed his Ph.D. in Spring 2006. He has moved to Purdue University, where he has accepted a postdoctoral position.

Philip Nordin

Dr. Philip Nordin, one of the founding members of the Department of Biochemistry at Kansas State University, died Monday, Aug. 22, 2005, at the Stoneybrook Retirement Community in Manhattan, at the age of 83. He was born March 21, 1922, in Buchanan, Saskatchewan, Canada, the son of John Emil and Erika (Forsman) Nordin. He served in the Canadian Air Force during World War II as a pilot officer. On Aug. 23, 1947, he was married to the former Norma Morganroth. Mrs. Nordin survives of Manhattan.

Dr. Nordin graduated from Buchanan High School in Saskatchewan in 1940, obtained his bachelors in 1949, his Masters in 1950, both from the University of Saskatchewan, and his PhD in 1953 from Iowa State University in biochemistry. In 1954, he joined the faculty at Kansas State University. In addition to being one of the founding members of the Department of Biochemistry, he had held positions in the Department of Chemistry and the Department of Grain Science and Industry. He taught general courses in biochemistry, and graduate level courses in his specialty, carbohydrate chemistry.

In addition to formal classroom teaching, he served as major professor for 17 graduate students and as a member of supervisory committees for many more graduate students from disciplines related to biochemistry. He was an authority in the field of carbohydrate chemistry and published more than 30 research papers dealing with the chemistry and biochemistry of carbohydrates.



Dr. Nordin in his laboratory in 1980. (Photo courtesy of John Nordin)

Dr. Nordin is remembered by his family and by members of the Biochemistry Department as a gentle, kind person who lived simply, always put others first, and thought the best of everyone. A teacher by vocation, his family said he taught by example in the family, instructing his children in integrity, decency, modesty and honor by how he conducted his own life. His family said he dealt with the trials of this world with quiet good humor and was an unfailing support to his wife and children in times of difficulty.

Memorial contributions may be made to the Philip Nordin Memorial Fund which has been permanently endowed at the Kansas State University Foundation. (See p. 7)

Hageman Lecture

This year's Richard H. and Elizabeth C. Hageman Distinguished Lecturer in Agricultural Chemistry was Dr. Stephen Tanksley of Cornell University in Ithaca, N.Y. Tanksley, whose work has focused frequently on tomatoes, spoke on "The Molecular Basis of Quantitative Trait Variation: Examples from the Tomato" and he led a colloquium on "Use of Wild Genetic Variation in Plant Improvement".

Tanksley is an L.H. Bailey Professor and the director of plant breeding and genetics. He has a bachelor's degree in agronomy from Colorado State University and a Ph.D. from the University of California at Davis. In the early 1990s Tanksley made major contributions to the sequencing and genetic mapping of the tomato. Among his interests has been studying how wild tomato plants, with small, blueberry-sized fruit, became the modern cultivated tomato. He also has looked at how wild varieties of plants might help their cultivated relatives by boosting agricultural performance while also improving genetic diversity.



K-STATE BIOCHEMISTS DISCOVER ENZYME RESPONSIBLE FOR HARDENING OF A BEETLE'S SHELL

K-State News Service

Kansas State University researchers think their discovery of an enzyme involved in the hardening of a beetle's exoskeleton or cuticle could lead not only to better pest control, but also help create similar strong, lightweight materials for use in aircraft and armor. After a beetle first molts, its exoskeleton is soft and hydrated. Somehow, it dries out and forms a hard, stiff exoskeleton. Since the 1940s, scientists have wondered which oxidative enzyme among several possible candidates was involved in the hardening process.

The K-State researchers have found that by knocking out an enzyme called laccase-2, cuticle tanning, the process of hardening and pigmentation, can be prevented in the red flour beetle, *Tribolium castaneum*.

A paper in the Proceedings of the National Academy of Sciences presents the research results of a K-State team including: Yasuyuki Arakane, research associate in biochemistry; Subbaratnam Muthukrishnan, professor of biochemistry; Richard Beeman, adjunct professor of entomology; Michael Kanost, professor and head of the department of biochemistry; and Karl Kramer, adjunct professor emeritus of biochemistry.

Kramer said K-State researchers wanted to find out what happens between the times when the cuticle is soft and when it is hard. They studied the cuticle's composition and how the components interacted to give it stiffness, flexibility and lightness. The main components in the cuticle are proteins and chitin, which also are found in crustaceans and other invertebrates.

The researchers knew one of two classes of oxidative enzymes, tyrosinases or laccases, is likely responsible for catalyzing the exoskeleton's hardening by cross-linking cuticular proteins, Kanost said.



"When we knocked out tyrosinase, everything was normal," Kramer said. "When we knocked out laccase-2, we prevented tanning from taking place. "When the laccase-2 gene was not expressed, the newly formed cuticle remained soft and white instead of becoming hard and dark-colored. These results indicated which protein was responsible for the hard shell's formation, Kanost said.

The identification of laccase-2 as the catalyst for cuticle tanning opens up possibilities of targeting this protein as a way of weakening the beetle's physical defenses against mechanical, chemical and biological injuries, Muthukrishnan said. Better insecticides could be developed as a result of having a more insect-specific target like laccase-2, Kramer said.

"Gaining knowledge about a molecular process required for insect development, but absent from humans and other vertebrate animals, such as cuticle tanning, may be useful for developing new, bio-rational methods for controlling pest insect populations," Kanost said.

Armed with this new information, a number of practical applications are possible. Materials based on the chemistry of the insect exoskeleton could be developed to make lightweight materials for aircraft and military armor, Kramer said. Collaborative research with scientists at the University of Kansas is in the beginning stages to analyze quantitatively the mechanical properties of insect cuticles and to perform cuticle protein cross-linking experiments that are catalyzed by insect laccase. KU scientists will test the strength of the synthetic cross-linked biopolymers that are created. This could be used for the development of strong, lightweight materials.

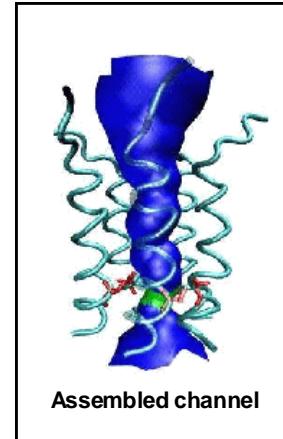
This research has been supported by a grant from the National Science Foundation.

From the Laboratory of John M. Tomich



Our lab is quite diversified with regard to the synthetic, analytical, physical and electrophysiological approaches we employ to study peptides.

Synthetic Anion Channels- Over the past 12 years, we have focused on the channel properties of the second transmembrane domain of the glycine receptor (M2GlyR). This channel is chloride selective, however it is relatively insoluble and has a tendency to form aggregates in solution. We have synthesized and tested more than 200 analogs of M2GlyR with an eye towards developing a compound that is both water soluble and does not form aggregates, yet preserves the desirable characteristics of the native channel. Analogs showing reduced concentrations for assembly and higher transport activities have been identified. The structures of the native and several high activity analogs have been solved using multi-dimensional solution NMR techniques. *They are being tested as a possible therapeutic intervention for treating patients with cystic fibrosis.* These patients are missing an essential chloride channel. We have identified the residues that appear to be involved in the anion selectivity. The goals for the next few years include- determining the stoichiometry of the helical segments that make the pore, studying the hydrogen bonding pattern of the pore lining hydroxyl groups with chloride and designing and building a planar non-peptidyl organic compounds that position the hydroxyls as they occur in the selectivity filter(s) of the assembled pore.



Peptide Modulators of Tight Junctions in Cells- Epithelial and endothelial cells come together and attach to one another to form barrier layers in animal tissues. Examples of these are the air/ tissue interface of the cornea or lung, the liquid/tissue interface in the digestive tract or the blood/brain barrier. This barrier is a major impediment to drug delivery in a number of tissues. A class of peptides discovered while preparing the M2GlyR derivatives described above formed a channel but also caused monolayers of epithelium to briefly lose the cell to cell connections. Six different epithelial cell types were tested and all showed the same effect at low peptide concentrations. Cells were repeatedly exposed and then washed free of the peptide for several weeks. With each exposure the cells responded as before. Upon removal of the compound the cells regained fully their connections after 24 hrs. The transport of large molecules was tested when the cell connections were broken. Compounds with masses up to 70 KDa but not greater than 1.5 MDa were transported between the cells during the treatment phase.

We are now exploring potential applications of these peptides as short-acting modulators of the corneal epithelial barrier in the eye. You apply eye drops to the exterior surface of the cornea. *Pretreatment of the cornea with this peptide should greatly enhance drug delivery into and across the cornea.* We have measuring transport of antibiotics across isolated cornea using mass spectrometer in the presence and absence of our lead compound as well as several control sequences. Initial trials appear promising. These studies will identify specific target tissues in the eye that can be therapeutically modulated by this peptide as well as the areas of the eye that can be accessed using this approach.

Model Peptide Adhesives- Most commercial adhesives contain chemicals that are harmful to the environment. *The development of safe bio-based adhesives could alleviate many of these environmentally harmful effects.* Most protein adhesives work through receptors or cross-links to bring about adhesion. The new peptide adhesive sequences developed in our laboratory require no receptor or cross-links to achieve maximal adhesive strength. More than 20 peptides with different degrees of adhesive strength have been designed and synthesized. These peptides contain a hydrophobic (greasy) sequence flanked by positively or negatively charged residues. The adhesive strength of the peptides in gluing wood strips was investigated at different pH values and hot press temperatures. Based on these studies, a novel synthetic peptide was identified with high adhesive strength toward wood (dry: 3.7-4.0 MPa). The best adhesive peptide is only 11-amino acid residues in length. Adhesive strength reflects contributions of hydrogen bonding and van der Waals interactions. Using multi-dimensional NMR, the chemically modified sequence is being analyzed to determine its structure. Computer modeling is planned to explore the three-dimensional structure of the cured adhesive. To our knowledge this is the smallest known peptide adhesive. Our latest studies are introducing cross-linking reagents to further improve adhesion.

Concurrent B.S./M.S. Degree Program in Biochemistry

In the time it takes many college students to finish one undergraduate degree, some Kansas State University biochemistry students are earning both their bachelor's and master's degrees through a new concurrent degree program. Our new combined B.S./M.S. program provides exceptional undergraduates an opportunity to obtain both a Bachelor of Science and a Master of Science in Biochemistry in 5 years. Students in the dual degree program can include as many as nine hours of graduate-level credit toward their undergraduate requirements. The courses that can be counted toward both degrees include Biochemistry I, Biochemistry II, and Physical Biochemistry. Students can begin their research toward the M.S. early enough in their program. Our intention is that graduates from our B.S./M.S. program will be well prepared to enter the biotechnology job market or to pursue a Ph.D. if they decide to pursue further graduate study.

Students doing well in their first two years of courses may be recommended to the program by their undergraduate advisors. Those who have begun an undergraduate research project by their junior year have an opportunity to use that experience as a basis for developing a master's thesis level research project. With some hard work and good time management, it is certainly feasible to complete both degrees by the end of the fifth year. Our first two students in the program, Shawna Frazier and Veronica Pierce, are finishing their degrees in spring and summer 2006. Several additional students are currently in the program, which we expect to grow in the next few years.

DEPARTMENT HEAD RECOGNIZED AS NEW UNIVERSITY DISTINGUISHED PROFESSOR

Our own Dr. Michael Kanost was among those honored at fall commencement ceremonies this December as university distinguished professor. It is a lifetime title that represents the highest honor K-State can bestow on its faculty.

Provost M. Duane Nellis said the newly named university distinguished professors have made outstanding contributions to teaching, research and service and have made major contributions to their professions and communities.

Kanost, a Fellow of the American Association for the Advancement of Science, leads what has been called one of the world's premier laboratories dealing with research on insect immunity. Kanost's research includes investigating proteins from insect blood to understand how the proteins function in the insect's immune responses. He also studies the biochemistry involved in formation of the insect exoskeleton. His research on caterpillars, mosquitoes and beetles has been supported with nearly \$7 million in grants from agencies such as the National Institutes of Health, National Science Foundation, U.S. Department of Agriculture and others. He is the author of 115 journal articles and book chapters. He has mentored numerous undergraduate and graduate students and postdoctorates, who have gone on to successful careers in universities, government laboratories, medicine and industry. He has been invited to present his research findings at many national and international meetings and serves on the editorial boards of four journals in the areas of insect biology and comparative immunology. He has provided service on several grants panels and is currently a member of the National Institutes of Health Vector Biology study section. He teaches an array of undergraduate and graduate courses, from General Biochemistry to Recombinant DNA Laboratory to Advanced Topics in Insect Biochemistry.

Kanost earned his bachelor's degree from Colorado State University and his doctorate from Purdue University. He was a postdoctoral fellow in the department of biology at Queen's University, Kingston, Ontario, Canada from 1983 to 1986. He also was a research associate in the University of Arizona's department of biochemistry from 1986-1991. He joined the K-State faculty in 1991 and was promoted to professor of biochemistry in 1999. He serves as an ancillary professor of entomology at K-State, and in October 2002 was named interim head of the biochemistry department, and then promoted to department head in fall 2003.

Biochemistry Undergraduate Students elected to Phi Beta Kappa

Biochemistry undergraduate students Meg Fasulo and Andrew Jurgensmeier have been elected as members of the Phi Beta Kappa honorary society. Phi Beta Kappa is the oldest honor society in America. It was started at the College of William and Mary in 1776. This spring only 50 students were elected from the entire Kansas State University student body. After the honor society reviewed records of seniors and some juniors, Meg and Andrew were elected to be a part of this distinguished few.

Recent Biochemistry BS/BA Graduates

Willis Barrow (BS 2005)	Joseph Haynes (BS 2005)	Rose Ochieng (BS 2006)
Chad Beiser (BS 2006)	Andrew Jurgensmeier (BS 2006)	Ryan Peck (BS 2006)
Adam Brooks (BS 2006)	Adam Kretzer (BS 2006)	Veronica Pierce (BS 2006)
Tyler Buser (BS 2005)	Qixin Liang (BS 2006)	Jerry Robben (BS 2005)
Jessie Coleman (BS 2006)	Peter Lundquist (BS 2006)	Michelle Stadler (BS 2006)
Cara Crumbliss (BS 2006)	Curtis Mick (BS 2005)	Lucinda Sullivan (BS 2005)
Christopher Grennan (BS 2006)	Erin Miller (BS 2006)	Matthew Warner (BS 2006)

Recent Graduates from the Biochemistry Graduate Program

Gabriel A. Cook (PhD 2005, Tomich). *Structural Studies of Anion Channel Forming Peptides* (Postdoc, University of California, Department of Chemistry and Biochemistry).

Kenneth Dokken (PhD 2006, Davis). *Infrared Microspectroscopy To Study Plant Root Anatomy and to Monitor the Fate of Organic Contaminants In Those Roots.* (Postdoc, University of Texas at El Paso)

Shawnalea Frazier (MS 2006, Tomich). *Hydrogen Bonding Contribution to Ion Permeation Rates and Selectivity in a Self-assembling M2GlyR Derived Channel-forming Peptide.*

David Hogenkamp (PhD 2006, Muthukrishnan). *Chitin Metabolism in Insects: Chitin Synthases and beta-N-Acetylglucosaminidases.* (Postdoc, Purdue University)

Shane Kasten (PhD 2005, Roche). *Distinct features of Kinase Isoforms 2 and 3 function in the phosphorylation and inactivation of Pyruvate Dehydrogenase* (Medical College of Virginia, Massey Cancer Center).

Maoyin Li (PhD 2005, Wang). *Functional characterization of phospholipase D ζ 1 and ζ 2 in root development and in response to phosphate deficiency in Arabidopsis Thaliana.* ().

Maria Aparecida Seabra (MS 2005, Tomich). *Studies of a Channel-forming Peptide Inserted into Liposomes Formed by PopC:PopS and PopC:PopE* (Senior Biological Lab Technician, Department of Pharmaceutics, University of Florida).

Xinshuo Wang (MS 2005, Zolkiewski). *Purification and Characterization of Human TorsinA: an AAA+ Protein Involved in Early-Onset Torsion Dystonia* (PhD Student, University of North Carolina, Chapel Hill).

Haiqing Yi (MS 2005, Zolkiewska). *Molecular Characterization of the Extracellular Domain of ADAM12* (Postdoc, Duke University Medical Center, Department of Ophthalmology).

Qingsong Zhu (PhD 2005, Muthukrishnan). *Characterization of Families of Chitinase-Like Genes and Proteins from Tribolium Castaneum, Drosophila Melanogaster and Anopheles Gambiae.* (Postdoc Kansas State University, Department of Biochemistry).

Making a Difference



Biochemistry Research Assistant Professor Maureen Gorman (pictured at right) received a 2006 "Making a Difference Award" from the Women in Engineering and Science Program. Biochemistry Graduate Student Emily Ragan (left) nominated Dr. Gorman for the award, citing her as someone who has made a positive difference for her during her time as a student in the sciences at K-State.

Investor Honor Roll

We would like to recognize and thank all of the generous investors in the Biochemistry Department. Whether your gifts went toward department operations or for student scholarships, you are helping to continue teaching and learning excellence in the field of Biochemistry.

\$1,000 and Above

Mr. Stephen D. and Mrs. Marcia A. Bailey
Dr Karen Nickel-Creusere and Mr Melville C Creusere
Immunetics Inc.

Dr. Richard L Cate
Mrs. Elizabeth C. Hageman
Mrs. Norma R Nordin

\$500 - \$999

Dr. Myron K and Dr. Elaine L Jacobson

\$100 - \$499

Ms Susan C Artz
ExxonMobil Foundation
Mr Brian A Hardeman and Mrs Jayme N Morris-Hardeman
Dr Kenneth N and Mrs Anli Kuan
Mr Charles R and Mrs Lisa A Madden
Dr Larry M and Mrs Celia G Nicholson
Dr Brenda S and Mr Steve Oppert
Dr David L Roerig
Dr Terry W and Mrs Sarah Sherraden
Mr Les and Mrs Edie Waldeck

Ms Lee A Beausang
Mr Ling Gan and Mrs Sherry Y Guo
Mr Willis H and Mrs JoAnne Hart
Mr Ronald C and Mrs Maren K Lundquist
Dr Subbaratnam and Mrs Asha Muthukrishnan
Mr John P and Mrs Debra Nordin
Dr Paula D Ravnikar
Schering-Plough Foundation
Mr Daniel L Turner and Dr Carol A Dziadik Turner

\$1 - \$99

Dr Oliver M Brown
Eli Lilly and Company
Mrs Theresa S and Mr David Hogenkamp
Mr David K and Mrs Cameron B Jeter
Dr Rick and Mrs Barbara H Johnson
Dr Puliyur S and Dr Sheba J Mohankumar
Dr Abbas and Mrs Yasaman Noorbakhsh
Mr Larry P Paris and Dr Christina L Chang
Jatin Shrivastav
Dr Richard J and Mrs Jessica D Suderman
Mr Blake E and Mrs Lisa Wendelburg

Dr Yi Cao
Lt Col Gerald M Feeney
Dr Jenq K Huang and Dr Lisa Wen
Dr Haobo Jiang and Mrs Yang Wang
Dr James L and Mrs Margaret A Mertz
Col David S and Mrs Brenda Noll
Dr Kirk L and Dr Loretta K Pappan
Dr Donald B Parrish
Lt Col (RET) Scott A Simpson
Mr Timothy W and Mrs Deborah Verschelden
Dr Xiaoqiang Yu and Mrs Wenyan Zhan

Alumni News

Two KSU Biochemistry department alumni recently found they had a lot to talk about when they introduced themselves to each other at the annual Association of University Technology Managers meeting in March in Orlando, Florida. Ronald C. Lundquist (B.S. Biochemistry 1969) (on the left in the picture) is currently a partner at the Fish & Richardson P.C. office in Minneapolis, Minnesota, working as a patent attorney in the areas of agricultural and medical biotechnology. Joe Jilka (M.S. Biochemistry, 1985 Tom Roche's lab) (on the right) is currently working at the University of Kansas Medical Center Technology as a Licensing Associate having previously worked in agricultural biotechnology at Monsanto and Pioneer Hi-Bred as well as several startup companies.



Dennis Bidney (PhD 1978, Reeck) was written up a year ago in his college alumni magazine (Graceland Horizons). For the past 17 years he has been at Pioneer in Des Moines, IA area where he is in charge of more than two dozen scientists working on plant transformation. He holds over 30 patents and has nearly as many scientific publications.

Marisol Castaneto (MS 2003, Reeck) is currently stationed at William Beaumont Army medical Center in El Paso, Texas. She is the Assistant Chief of Clinical Investigation. The department oversees the creation and implementation of both human and animal research. Her husband CPT David Smartt is stationed at Fort Bliss, Texas and her son Zachary is 3 and a half and loves playing on the computer.

Christina Chang (PhD 1988, Davis) has taken a position at a rapidly developing university in Taiwan. The last we heard she had four graduate students. She teaches and does research in the Institute of Molecular Medicine at National Chang Kun University in Taiwan. Her husband Larry Paris teaches courses in urban planning at the same university. Her work email is clchang@mail.ncku.edu.tw.

Jeff Fabrick (PhD 2003, Kanost), after a one-year Post-doc at the University of Arizona, he accepted a permanent position as a Research Entomologist with the USADA in Phoenix, AZ. He is now settling into his position and primarily studying Bt insecticide resistance mechanisms. His wife (Beth) and kids (Lauren – 5 yr and Peter- 2yr) have been enjoying the warm Arizona weather.

Weiqi Li (PhD 2004, Wang) is a professor of biology at the Kunming Institute of Botany, Chinese Academy of Sciences, Yunnan, PRC. He has his lab set up and a

research assistant, visiting scholar and three graduate students working with him. His work email is weiqili@mail.kib.ac.cn.

Willie Lin (PhD 1994, Muthukrishnan) is the Associate Vice President of Business Development for China Chemical & Pharmaceutical Company in Taiwan. His responsibilities include new business development, domestic/international collaboration, product/technology licensing, and investment evaluation. He also serves as Adjunct Assistant Professor, Graduate School of Finance, Fu-Jen Catholic University, Taiwan. His wife Echo Chang, also graduating from K-State, is an attorney in Taipei. They have two daughters: Jessica age 15 and Michelle age 11.

Congcong Ma (MS 1997; PhD 1999, Kanost) continues as a Senior Scientist at Applied Biosystems in the San Francisco area. She is working on developing a next generation sequencing technology, with a goal of lowering the cost of sequencing the human genome to \$1000. Her son is now a middle school student and having special success in cross country and math.

Elizabeth Rayburn (BS 2002) is currently a Ph.D. student in Pharmacology and Toxicology at University of Alabama, Birmingham. She has received a major predoctoral fellowship grant from the Department of Defense for her graduate work on prostate cancer therapy.

Binghui Shen (PhD 1991, Davis) is head of the Radiation Biology division and a professor at City of Hope in Los Angeles, California. His research focuses on nucleases involved in repair and replication of eucaryotes. His kids are rapidly approaching college age; Sherry will be attending this fall. Time really flies.

Burachai Sonthayanan (PhD 1988, Muthukrishnan) started as an Assistant Professor of Biochemistry at Mahidol University Faculty of Science, and then moved to the Institute of Molecular Biology and Genetics. He is a Bioinformatics researcher at the National Center for Genetic Engineering and Biotechnology (BIOTEC), under the National Science and Administration Development Agency (NSTDA). NSTDA is an independent organization funded by the Thai government. His research interest is in comparative genomics of insects. He can be contacted at: burachai.son@biotec.or.th.

Richard Suderman (PhD 2004, Kanost) has recently moved to a postdoctoral position at the University of Georgia. He and Jessie are expecting a baby in May.

Larry Thrower (BS 1994) received an MS from Johns Hopkins, then worked at Aventis Pharmaceuticals for a few years before going to law school. He graduated from law school in 2003 and is now a patent attorney at a law firm in Menlo Park, California.

Youren (Tony) Tong (PhD 2004, Kanost) and **Yongli (Lily) Gu** (MS 2004, Kanost) are enjoying living in Boston, especially the museums and Chinese food. Lily is a research technician in the Department of Biology at Boston College. She likes her research which is focused on histone modifications and dynamics. Tony is a posdoc at Harvard Medical School and is studying molecular pathogenesis of Parkinson's disease using animal models, focusing on a recently identified PD-linked gene. Their daughter Annie is learning English and Chinese very quickly, with thousands of questions.

Xiaorang Wang (MS 1995, Muthukrishnan) is a "Ruth L. Kirschstein national Research Service Award" postdoc fellow at the University of California – Irvine. She is studying innate immunity in the lung in order to understand the pathogenesis of cystic fibrosis using the proteomic approach for cancer research. Along with her husband, Tristan, she is enjoying life in southern California.

Xiaowei Wu (MS 1996, Davis) has an MBA from Texas A & M and is working at Texas Instruments, as is her husband.

Qiang Xiao (MS 1997, Davis) has completed her medical board exams and is now starting a residency program in southern California, after several years doing research and raising a family. Her son William was born April 14, 2005.

KC Zen (PhD 1995, Muthurishnan/Kramer) is the Director of the Department of Food Science and Technology, Tung-Fang Institute of Technology (Tung-Fang means Orient) in Taiwan. His wife, Selina is a teacher in primary school. She has recently started working on her master degree. Their daughter, Formosa, is a sophomore (11th grade) in high school and son Willie is in middle school (9th grade) and will be taking his high school entrance exam this May.

Lei Zhao (MS 1994, Kanost), after working at Berlex in San Francisco for 11 years has begun a new position at TechExcel, Inc. (her husband Tieren's company), where she is working on introducing their project management software into the pharmaceutical area. She is enjoying a shorter commute and more time to spend with her children Jonathan (2nd grade) and Alan (prekindergarten).

Tian Zhou (MS 2002, Krishnan) joined Lexicon Genetics Incorp in 2004 and is currently working as senior research associate in GPCR group in the Department of Drug Discovery. Lexicon Genetics is a biotech/pharmaceutical company located in the suburban area of Houston. She is quite enjoying the wooded environment there, which is perfect for outdoor activities like hiking and fishing.

Yifei Zhu (PhD 2001, Kanost) has begun a new position at Invitrogen in San Francisco, and her son (now 3 years old) is preparing to enter preschool.



Howard Mitchell Returns for Visit

Howard Mitchell, former head of the biochemistry department (*in red*) is now living in the Detroit area. He visited Manhattan in October and met for breakfast with other emeritus faculty (*from left to right*) Ken Burkhard, Don Parish, Del Mueller, and Karl Kramer (not pictured)

Dear alumni and friends,

We hope you will keep in touch with us and your former classmates by contributing to our newsletter. Would you please take a minute to send us your news about you, your career, and your family?

The Department of Biochemistry would also like to thank you for your generous support. Your donations allow us to offer scholarships, improving our ability to recruit and retain outstanding and deserving students. General funds supplement the department's operating budget to enhance the quality of education and research experiences we can provide to our students and to attract and support new faculty.

If you wish to donate to any of the Biochemistry Foundation funds (see below) please send your contribution to the Department of Biochemistry and indicate which fund you wish to support. Please call us at 785-532-6121 or email biochem@ksu.edu if you have any questions.

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

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