From the Director/Chair

Welcome to the Biochemistry Quarterly! This is the first issue of an electronic newsletter designed to maintain contact among alumni and friends of the Department/Division of Biochemistry at the University of Missouri.

Several times a year, the Biochemistry Quarterly will provide information about our unit. It will highlight current students, graduates and members of our faculty and staff. A central part feature will be “Alumni Notes”, information provided by you, the readers, about your own lives, activities and accomplishments. It appears that this feature will be popular, since we received an impressive number of submissions in response to our first request for contributions. Please consider submitting a note for the next issue.

To put an article in this issue context, let me remind you that for over 30 years we have been jointly affiliated with the School of Medicine and the College of Agriculture, Foods and Natural Resources, identified as the Department of Biochemistry in the former and the Division of Biochemistry in the latter. Our joint affiliation has been a success story for teaching and research.

However, a complication of joint affiliation was that some of us were located at the northeast corner of the campus and others will located almost a mile away in the Medical Sciences Building at the southwest corner. As you can read in this issue, that separation is now a memory. Construction of a $10 million addition to Schweitzer Hall, combined with location of 8 faculty laboratories in the interdisciplinary Life Sciences Center consolidated the department and is bringing many benefits.

In the coming months, the Biochemistry Quarterly will be describing other new developments, so please stay in touch. We would love to hear from you.

Gerald L. Hazelbauer, Professor and Chair
The researchers in the new labs and offices of Mizzou’s biochemistry addition to Schweitzer Hall have a couple of things in common.

First, they all are performing research related to human health and disease. Sue Deutscher and Tom Quinn, for example, work on early detection methods for breast cancer. Grace Sun does breakthrough work on identifying the causes of Alzheimer’s disease. Other researchers tackle cardiovascular disease and other life-threatening illnesses.

The second thing they all have in common now is one roof over their heads. The Department of Biochemistry has joint affiliations with the School of Medicine and the College of Agriculture, Food and Natural Resources (CAFNR), and its researchers have been scattered for many years. But since the ribbon was cut on the new addition, people now work together there.

"Now we’re at the north end of a life-sciences corridor on campus,” says Gerald Hazelbauer, chair of biochemistry. The new facilities on College Avenue seamlessly add onto Schweitzer Hall, built in 1912 in the white-limestone part of campus. The $10 million construction and renovation adds seven new high-tech labs for researchers, plus a bridge to Schlundt Annex that connects the biochemistry buildings and offers lounge space.

**Home for a rare machine**

The Schweitzer addition offers a new home for something else, too — a $2.3 million high-powered nuclear magnetic resonance spectrometer (NMR), only the second of its generation in the U.S. and the only one in Missouri.

"NMRs are basically MRIs for molecules," Hazelbauer says. "You see molecules in three dimensions and view their interactions. Understanding these interactions is crucial to understanding health and disease."

Mizzou researchers such as Steven Van Doren — who studies the protein-protein interaction in inflammatory diseases such as cancer and atherosclerosis — will use this rare machine, but so will researchers statewide.
Chun Tang ‘sees’ how HIV matures into an infection

With the assistance of the department’s new 800-megahertz nuclear magnetic resonance (NMR) spectrometer, a researcher who recently joined the University of Missouri faculty actually has watched the HIV-1 protease mature from an inactive form into an active infection. This process had never been directly visualized before.

“We actually saw the process occur,” said Chun Tang, an assistant professor of biochemistry in the MU School of Medicine who conducted the research while a postdoctoral fellow at the National Institutes of Health (N.I.H.).

“We now understand more about the maturation process. We hope this will be a stepping stone to intervening before the infection progresses. The more we understand about the virus, especially about the maturation into infection, the more we can do to identify novel therapeutics.”

The study “Visualizing transient events in amino-terminal autoprocessing of HIV-1 protease” was published in the journal Nature in fall 2008.
Randall confirmed for 2nd National Science Board term

Then-president George W. Bush named Douglas D. Randall to the National Science Board in 2002. After serving a six-year term, he was honored yet again, as he was nominated to serve a second term on the board. The United States Senate confirmed his reappointment to the board on November 20, 2008.

Randall, a professor of biochemistry at MU, joined the faculty in 1971, when he worked as a plant biochemist in the Agricultural Chemistry Department. His research at the university has focused on plant metabolism; signal transduction; regulation of plant enzymes; and understanding the metabolic interactions between photosynthesis, photorespiration and respiration.

Mossine discovers how tomatoes help prostate health

Valeri Mossine conducts research into tomato products’ role in preventing prostate cancer.

New cancer research from the University of Missouri suggests that eating a certain form of tomato product could be the key to unlocking the prostate cancer-fighting potential of the tomato. The positive effect of tomato products has been suggested in many studies, but, until now, researchers did not know exactly what caused this effect.

“It appears that the greatest protective effect from tomatoes comes from rehydrating tomato powder into tomato paste,” said Valeri Mossine, research assistant professor of biochemistry. “Processing of many edible plants through heating, grinding, mixing or drying dramatically increases their nutritional value and cancer-fighting potential. This knowledge may lead to other avenues of research and drug development for prostate and other cancers.”

The study appears in the June issue of Cancer Research, a journal of the American Association for Cancer Research. The research was funded by The Prostate Cancer Foundation and the MU Agriculture Experiment Station Chemistry Lab.
The MU College of Agriculture, Food and Natural Resources is pleased to announce that Dr Shari Freyermuth has become the new assistant dean of academic programs for the College. In her new position, Dr. Freyermuth will advise students in biochemistry, general agriculture and those whose major is undeclared in the College. She will also oversee the CAFNR undergraduate research internship program.

“The main thing I would say about my new position is that it allows me to interact with more students,” Dr. Freyermuth said. “The Academic Programs office in CAFNR is there to help students find their paths to success at MU and beyond. I am fortunate to work with such a strong team that dedicated to ensuring student success.”

Dr. Freyermuth will also remain a teaching assistant professor for the Department of Biochemistry.
Outstanding Graduates

My Favorite part of Mizzou biochemistry

An extremely strong collaborative research effort. The fun and friendly environment allows research communities to work together, students and faculty to broaden their scientific knowledge and the department to succeed as a whole. Also, I have been able to turn to the faculty for help with class work, and they have also been very helpful outside of the classroom. They are more than willing to answer any questions that arise from time to time in my research.

Melissa Taylor
Fourth-year graduate student from Bolckow, Mo.

The environment of the department. We’re mostly close together, which provides for several intra-department collaborations. If there is a question in our lab, we go to one of the five labs in the same building and get more background information to help us answer the question. That atmosphere of helping each other is rare in many science fields, so I appreciate the effort this department makes to do that.

Kirby Swatek
Second-year graduate student from Webster Groves, Mo.
Outstanding Graduates

On Faculty support

I started with no lab/science experience whatsoever and received a lot of help and encouragement. My committee — and especially my mentor — are very helpful in focusing and directing my project.

Anna Slusarz
Sixth-year graduate student from Warsaw, Poland

My Favorite part of Mizzou and biochemistry

Mizzou is a great school for plant science. Plus, the biochemistry department offers a diversity of research interests and talented faculty.

Severin Stevenson
Third-year graduate student from Carson City, Nev.
**Outstanding Undergrads**

**ON STUDYING ABROAD**
I have had the most amazing experiences through CAFNR’s study-abroad programs. Biochemistry is a very rigorous major, but I have had very little trouble scheduling my courses so that I can study abroad each summer. The summer after my freshman year I went to Costa Rica. The summer after my sophomore year I went to Prague, Czech Republic. I also traveled around Europe quite a bit while I was there. This past summer I went to Australia, where I traveled and did 12 dives on the Great Barrier Reef. I have grown so much through the experiences I have had both at Mizzou and abroad.

Diana Plain  
Senior from Columbia, Mo.

**ON LAB EXPERIENCE**
I am currently working on my honors thesis and Life Sciences Undergraduate Research Opportunity Program (LSUROP) fellowship project on a protein called DRP2Bm, focusing on its role in plant innate immunity. I have also worked in Antje Heese’s lab since March 2006. During the past couple of years, I have received a valuable laboratory education and have developed into a more independent undergraduate lab assistant.

**Katie Walker**  
Senior from Kirkville, Mo.

**ON FACULTY SUPPORT**
Students receive a faculty member as an adviser from day one. When I arrived for Summer Welcome, Virginia Peterson spent an hour of her time creating my first-semester schedule with my dad and me. Since then, my biochemistry professors have devoted much of their personal time to helping me apply for scholarships, research funding and internships, which I wouldn’t have been able to do without their help.

Rachel Waller  
Junior from St. Louis, Mo.
Why Mizzou

As an undergraduate, I was asking around to find out which schools were good for plant research. One of my teaching assistants had been at Missouri and recommended it to me. When I went on the interview trip, I just knew it was the right place for me — interesting research and great faculty. It just seemed a lot more professional than the other places I looked at.

C. Nathan Hancock
PhD, Mizzou, biochemistry
BS, University of Arizona, plant science

Career Preparation

My undergraduate education gave me a good foundation that was built upon in graduate school. My graduate area of study, protein crystallography, is a somewhat mature field, whereas my current field of cryo-electron microscopy is immature but following along quickly in protein crystallography’s footsteps. Many of the skills that I have from protein crystallography are applicable to my new field, especially the sample manipulation and computation. My training as a scientist at Mizzou has given me the critical skills to assess what components are required for a scientific publication and their subsequent assembly for submission.

Tommi A. White
PhD, Mizzou, biochemistry,
BS, Mizzou, biochemistry

The future

I really want to find something that truly affects our biological or medical life. I am hoping that 20 years from now, when people are talking about something interesting and functional, they could mention my name in a positive way. This sounds too idealistic, but my career goal would be either staying in academia or entering the pharmaceutical industry, contributing what I’ve learned and what I know as a scientist.

Zhongji Liao
PhD, Mizzou, biochemistry
BS, Nanjing University in China
1950s

John Gullion, BS Agriculture Chemistry '54, reported that the youngest of his seven grandchildren graduated from high school in May 2008 and is now in college.

1960s

Roscoe Dickison, BS Agriculture Chemistry '64, obtained a PhD in biophysical chemistry. He now teaches and researches the structure of proteins at Rockhurst University in Kansas City.

1970s

Andy Graf, BS Biochem '79, is the science department chair at St. Vincent High School in Perryville, MO. He is also the 2009 Chair of the local chapter American Chemical Society, Southern Illinois.

Richard Orr, BS Biochem '79 and MD '83, has been a plastic surgeon in Evansville, IN since 1990. He is married and has three children.

1980s

Gary West, BS Biochem '82, is an optimization manager for Lafarge in Davenport, IA. He and his wife Tami continue to enjoy raising their children.

Barbara Wilhelm Lips, BS Biochem '83, married Ned Lips in 2007. They recently moved to a new house in St. Louis West County.

Young-Ki Paik, PhD Biochem '83, is a professor and director at Yongsei University in South Korea. He current serves as the president of HUPO and AOHUP.

Michael Stafford, BS Biochem '84 and DVM '89, was appointed Attending Veterinarian to Missouri State University

David Volz, BS Biochem '84 and DVM '88, is the owner and veterinarian with the Animal Clinic in Woodland Park, CO

Clay Anderson, BS Biochem '86, is an associate professor of clinical medicine in the Department of Internal Medicine and is Director of the Missouri Palliative Care Program. He is also has a faculty appointment in the MU Center for Health Ethics as a clinical ethicist and in the Sinclair School of Nursing as a teacher and research collaborator, as well as a part-time medical director for Community Hospices of America, Inc. -- North Central Missouri Office. After graduating from MU, Clay received an MD degree from Stanford University, and did his postgraduate training with the University of Colorado in Denver and University of Texas - M. D. Anderson Cancer Center in Houston, Texas. He lives in Columbia with his wife Michelle and their three children.

Rod Winkler, PhD Biochem '86, is a Bioinformatics Manager with SAIC.

John Bultas, BS Biochem '87, is a supervisor for Sigma-Aldrich.
1990s

Nathan Rummel, BS Biochem ’90, is a chemist with the US FDA and resides in Maryland.

Hillel Brandes, PhD Biochem ’91, is a principal chemist for Sigma-Aldrich / Supelco in Bellefonte, PA.

Deborah Vassar, BS Biochem ’92, is a research and development scientist with Sigma-Aldrich in St. Louis, MO. She recently published an article in Genetic Engineering and Biotechnology News entitled “Measurement of Global DNA Methylation”.

Ann (Rueff) Heikkinen, BS Biochem ’93, is a doctor with the Family Practice Associates and resides in Houston, TX.

David Austin, BS Biochem ’94, is a sales manager with Sentinelle and works with small start-up companies in the medical devices industry. He and his wife Elizabeth (BA ’95) have 3 children: daughter Reagan, 5, and sons Ryan, 4, and Rory, 10 months.

Laura Bloomfield, BS Biochem ’94 and DVM ’98, is an associate veterinarian for Animal Care Hospital in Cedar Rapids, IA.

Kim Truong, BS Biochem ’95, is a CV specialty manager for Daiichi-Sankyo, Inc. and resides in Mundelein, IL.

Scott Haching, BS Biochem ’96, received his DVM in 2003 and works at the Veterinary Care Center in O’Fallon. He and his wife Laurie have three children: Emma, Alex, and Abby.

Jennifer L’Hote-Gaston, BS Biochem ’97, is a development specialist for Dow Chemical Company in Midland, MI.

Eric Mullins, BS Biochem ’97 and MD ’01, is an Instructor of Pediatrics in Pediatric Hematology/Oncology at Cincinnati Children’s Hospital Medical Center. He is primarily a lab based physician-scientist with an emphasis in studying the cross-talk between the coagulation system and inflammation/immune function.

Billy D. Wyatt, BS Biochem ’98, is a doctor at the Stillwater Medical Group in Minnesota.

Chris Benjamin, BS Biochem ’99, graduated from the MU School of Law in 2002. He is a law partner with Benjamin, McLaughlin, Benjamin in Harrisonville, MO and was recently appointed the Municipal Judge for Garden City. He is also building a political consulting firm, Regional Growth Solutions, and worked on several municipal races in April.

Stephanie Yates Hartman, BS Biochem ’99, and her husband Curtis welcomed son Emmett Wayne on March 25, 2009. He was born in Chicago, IL where the family is living until July 2009. Curtis has taken a faculty position as an Orthopedic Surgeon specializing in Hip and Knee replacement. Stephanie graduated from the University of Nebraska Medical Center with her MD on May 1, 2009.

Heidi Rubach Kallivayarli, BS Biochem ’99, is married and has two beautiful boys. She graduated from Nova Southeastern University - College of Pharmacy in May of 2005. She then completed her Pharmacy Practice Residency in the summer of 2006 and began working at Mayo Clinic in the hospital and clinic. She continues to run half-marathons, plays with her boys, and loves to travel.

Christy VanGennip Roberts, BS Biochem ’99, attained senior professional in human resources. She works as the human resources manager for Bethesda Southgate in St. Louis, Mo.
2000s

Kevin Allison, BS Biochem ’00, is moving to London to assume a new position with the Financial Times. He joined the newspaper in 2003 and has reported from London, New York and San Francisco.

Amanda Brodeur, BS Biochem ’00 and MD/PhD Biochem ’06, is finishing her pediatrics residency at University of Missouri Health Care in June, and will be starting as a Genetics Resident here at the University in July. She has two boys: Cole is 3, and Chase is 7 months old.

Nicholas Hamilton, BS Biochem ’00, is a Surgery Resident at Barnes-Jewish Hospital in St. Louis.

Mark Pogemiller, BS Biochem ’00, is a pediatrician with the US Air Force and resides in Oklahoma City, OK.

Nathan Brinker, BS Biochem ’01, graduated from Kansas City University of Medicine and Biosciences with a medical degree in 2005. He is currently finishing his Emergency Medicine residency through Midwestern University and will become an attending on staff at Saint Mary of Nazareth hospital in Chicago in July, 2009. It has been a long road of education and he thanks all of his professors at the University of Missouri for building a foundation for pursuing his life’s dreams. Go Mizzou!

Ryan Carter, BS Biochem ’01, will complete his fifth deployment in July; this one a 7-month stint in Afghanistan. Since 2002, he has had the distinct pleasure of serving the United States Navy in 37 other countries including Pakistan, Nicaragua, South Korea, and nearly every nation in the Middle East. In September, he’ll transfer from Norfolk, VA to New London, CT for a short, six month tour. After that, he hopes to get back down south to GA for a couple of years.

Mary Fisher, BS Biochem ’03, is a research chemist at Acceleration and has been living in Kansas City for the last two years. She recently competed in the Boston Marathon on April 20!

Dan Ruzicka, BS Biochem ’03, graduated from University of Georgia with a PhD in Genetics in May 2008. He started a post-doc at the Donald Danforth Plant Science Center in St. Louis working on an NSF funded research project investigating the effects of mycorrhizal symbiosis on nutrient sensing and transcription in organically farmed tomato roots.

Bryan Sisk, BS Biochem ’03, married Kay Geter (a nutritional sciences alum) in May of 2008. The couple now lives in Cleveland, Ohio where Bryan is a medical student at the Cleveland Clinic Lerner College of Medicine. This is a 5-year, research intensive medical program that is taught at the Cleveland Clinic; however, the degree granting institution is Case Western Reserve University.

Sean Stoneking, BS Biochem ’03, graduated from SLU School of Medicine in 2008. He is now training in the Anesthesiology program at SLU.

Jessica Wieberg, BS Biochem ’03, graduated from the Mizzou medical school in May ’08 and started residency in pathology at MU Hospitals & Clinics.

Ryan Hobbs, BS Biochem ’04, is pursuing a PhD in Cell and Molecular Biology at Northwestern University in Chicago, IL. His research focuses on how cell-cell adhesion is dysregulated in diseases and cancer of the skin.

Erin Johnson, BS Biochem ’04, is a first year graduate student working towards a PhD in the Neurobiology and Behavior department at Cornell University.
Alumni Notes

Elizabeth Pierce, BS Biochem ’04, is a third-year medical student and is getting married on June 6, 2009. She lives in Lee’s Summit, Missouri with her fiancé Charles and their Goldendoodle named Truman.

Andrew Dalton, BS Biochem ’06, is finishing his second year of medical school at Kansas City University of Medicine and Biological Science. He is also pursuing MBA from Rockhurst in conjunction with the KCUMB program.

Karl-Henrik Lindell, BS Biochem ’06, married Ruby Lindell in Aug. 2008. He began work as a microbiologist for DeLaval in Kansas City, Mo after working for 5 months in formulation development as a technician.

Jared Engles, BS Biochem ’07, is in his first year of medical school atKirksville College of Osteopathic Medicine and will be getting married in June. He plans to graduate in 2012 and pursue a residency in radiology.

Andrew Brueggeman, BS Biochem ’08, was recently accepted into the biochemistry graduate program at the University of Nebraska and is pursuing a doctorate in agricultural biochemistry.

Jonathan Kaiser, BS Biochem ’08, is about to finish his second semester at Vanderbilt University in Nashville, TN where he is working towards a PhD in Biomedical Sciences.

Want to make a difference for the MU Biochemistry program?

In today’s environment, private support has never been more crucial to the success of our program. Simply put, recruiting the brightest biochemistry students and faculty from around the world requires the best resources. Your support is needed to help fund student scholarships, purchase state-of-the-art lab equipment, and bring together the best minds in the industry.

Checks should be made out to the University of Missouri-Columbia and sent to the address below. Please indicate how you would like your gift directed. You may also visit our giving website at: donatetomu.missouri.edu

If you would like to make a pledge, or to learn about bequests, matching gifts from your company, or gifts of stock, please contact:

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On behalf of the MU biochemistry students, faculty and staff – thank you!
Remembering Dr. Charles Gehrke

The MU Department of Biochemistry was deeply saddened to learn of the passing of longtime professor and world-renowned scientist Dr. Charles Gehrke on Tuesday, February 10. He was 91 years old.

Dr. Gehrke’s contributions to the department as well as to the scientific community cannot be understated. During his nearly 40 years at MU, Dr. Gehrke was a professor of biochemistry, manager of the Experiment Station Chemical Laboratories, and director of the University Interdisciplinary Chromatography Mass-Spectrometry facility. In 1967, he founded Analytical Biochemistry (ABC) Laboratories, a successful Columbia, MO company that is now has over 300 employees.

Under his direction, over 60 master’s and doctoral students received their advanced degrees in analytical biochemistry. In addition to his extensive contributions to amino acid analysis by gas chromatography, Dr. Gehrke and colleagues have pioneered in the development of sensitive, high-resolution, quantitative high-performance liquid chromatographic methods. He also authored over 260 scientific publications in analytical chemistry and biochemistry. Dr. Gehrke was perhaps most proud of his work with NASA during the 1960s, examining lunar samples collected from the Apollo missions to determine the presence extraterrestrial life.

Throughout his retirement Charles was an enthusiastic supporter of life sciences at MU. In 2004, Dr. Gehrke received official recognition of his service to campus and the scientific world in the form of a named facility, the Charles W. Gehrke Proteomics Center, located in the Bond Life Sciences Center. The Charles W. Gehrke Distinguished Professorship in Biochemistry was also established in his honor.

Charles Gehrke, left, and graduate student Robert Zumwalt examine a sample of lunar rock at Jet Propulsion Laboratories in Pasadena, Calif. in the late ’60s or early 70s. The moon rocks were brought home by one of the Apollo missions. Photo courtesy Dianna O’Brien.