MASS Transfer

News from Chemical & Biomolecular Engineering at Illinois

Fall 2011

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From the Department Head’s Desk

Dear Alumni and Friends,

In my first few months as department head, I have already had the pleasure to meet many of you during recruitment visits or homecoming. Finding out where all of you have gone and hearing about some of your amazing achievements is one of the most enjoyable aspects of being the head of a department with such a rich history. In August I took over for Ed Seebauer, who has moved on to become a Fellow in the Provost office and is now responsible for the University’s international programs. On behalf of my colleagues, I thank Ed for his six years of service as the leader of our department.

Continuing the trend of the last few years, we welcomed around 150 new freshmen this year, bringing our total enrollment off at more than 550, the largest it has been in our 110-year history. Students interested in food, health, energy and sustainability continue to flock to our programs. We are pleased that, despite difficult economic times, our graduating seniors are still very high in demand. To teach our increasing number of undergraduates, Jerrod Henderson became a full-time lecturer, and we hired Troy Vogel as a new lecturer. Unfortunately, we said goodbye to lecturer Marina Mileic, who moved to New Mexico. This past spring, Dr. Henderson and Dr. Mileic introduced a curricular innovation to integrate design projects into core classes throughout the undergraduate curriculum. This program was launched to give students experience with oral presentations, working on a team and practical, open-ended design projects early in their undergraduate years, well before the capstone courses in their senior year.

This fall the university welcomed a new chancellor, Phyllis Wise, who finds the university in strong shape. Faculty hiring has started in full force again, including a campus-wide Strategic Excellence Hiring program with our department participating in the Energy and Health initiatives. In addition, the department seeks to add several faculty in the next few years to strengthen traditional areas of the discipline. In January, we will welcome a new faculty member, Hong Yang, who will join us as a full professor. He spent 10 successful years at the University of Rochester. Dr. Yang will strengthen the department’s research and education in chemical reaction engineering, catalysis and nanotechnology.

Our faculty also continue to receive awards: Ed Seebauer was elected Fellow of the AIChE, Joon Kong won the President Young Investigator Award from the Korean Institute of Chemical Engineers, Charles Schroeder just won the Packard Fellowship and Huimin Zhao was invested as the Centennial Chair. Also, Professor Bill Hammack’s videos that educate the general public on engineering have gone viral. Find them on EngineeringGuy.com or YouTube. And our newly tenured associate Professor Chris Rau was recently named a Petal Scholar.

Enjoy reading this newsletter, and don’t hesitate to contact me with your feedback or suggestions for topics (your story?) for future newsletters.

Best Regards,

Paul J.A. Kenis
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Assistant Professor Charles Schroeder has won a 2011 Packard Fellowship to advance his research on developing a new class of fluorescent probes for super-resolution microscopy. These fluorescent probes will facilitate higher resolution imaging and will enable the study of bacterial cells, live mammalian cells and intracellular molecular events that cannot be addressed with existing methods.

For centuries, optical microscopy has been the standard workhorse to study cellular events. However, light microscopy is limited to a lateral spatial resolution of approximately 200 nanometers due to the diffraction of light. Over the last few years, advances in super-resolution microscopy have broken the diffraction barrier for optical imaging. Current technology for super-resolution has enabled imaging at a resolution of 20 to 25 nanometers for biological systems. Schroeder and his team hope that their discoveries will allow imaging at molecular scale resolution, approximately 1 to 5 nanometers. A nanometer is one-billionth of a meter; and a human hair is about 40,000 to 60,000 nanometers wide.

Schroeder will use the $875,000 grant, distributed over five years, to study the relationship between molecular organization in chromosome structure and gene expression in bacteria, which plays a major role in cell decision-making but has been poorly understood. In addition, Schroeder will study the process of retroviral budding and interactions between viral machinery and host cellular factors during viral assembly. Retroviral budding and assembly are key steps in the life cycle of human retroviruses.

The new set of fluorescent probes is based on photoswitchable dendritic nanoconjugates, which are macromolecules in which the fluorescence emission can be “turned on” and “turned off” by exciting the molecules with distinct emission wavelengths using laser excitation. Moreover, these fluorescent probes are brighter and more stable than existing ones, which enhances imaging resolution.

“We plan to apply these tools to study regulation of anaerobic metabolism with exquisite resolution in single bacterial cells,” Schroeder said. These types of research studies are helpful because large-scale fermentation reactions, which are used to synthesize alcohols, fuels and some high-value small molecule pharmaceuticals, are performed in anaerobic conditions.

These fluorescent probes also appear to be cell permeable under many conditions for mammalian cells, which enables straightforward delivery to study how live cells behave, a major advantage. Schroeder is the first University of Illinois professor to win a Packard fellowship. In 2010, University of Illinois Physics Professor Benjamin Lev won the fellowship to study unusually exotic quantum phases, which combine properties of every day matter, solids, liquids and liquid crystals with superfluidity.

Packard Fellows must be faculty members who are eligible to serve as principal investigators engaged in research in the natural and physical sciences or engineering. They are encouraged to think big and look at complex issues with a fresh perspective. Packard Fellows have gone on to receive additional awards and honors, including the Nobel Prize in Physics, the Fields Medal, and MacArthur, Sloan, Searle and Guggenheim Fellowships.
Undergraduate Education

Projects like this give students an opportunity to glimpse the relevance of the other courses they are taking.” – Ed Seebauer

Graduate Education: Student Awards

Students honored at Graduate Research Symposium

The Department of Chemical & Biomolecular Engineering and members of the CBE Graduate Student Advisory Council organized the 10th annual Graduate Research Symposium, which was held in early October.

During the symposium, 10 graduate students presented posters and 10 gave oral presentations about their research. Industry leaders served as judges, including Ahmad Hilaly from ADM, Brian Anderson and Abdigader Zamani from Abbott Laboratories and Dennis Guthrie from the Dow Chemical Company.

Guthrie, associate R & D director for external technology at Dow, said the graduate students in Chemical and Biomolecular Engineering are doing some exciting research and presented it well.

“All the students did a nice job,” he said. “However, in both the posters and oral presentations, a small number of students stood out from the rest, so narrowing it to say the top three was not overly difficult, but selecting the best of the three was difficult.”

Oral presentation awards

Ryan Cole – First Place
Advisor: Haiming Yang
Title: Characterization and Directed Evolution of FR6 for Combinatorial Biosynthesis of Novel FR-900098 Derivatives

Steven Callant – Second Place
Advisor: Brendan Harley
Title: The Effect of Scaffold Microstructure and Soluble Factor Presentation on Cell Viability for Tendon Tissue Engineering

Ross DeVelder – Third Place
Advisor: Hyun Joon Keng
Title: Directed Blood Vessel Growth Using an Argon-rich Microparticle Microparticle Composite Patch

Poster presentation awards

Matthew Naughton – First Place
Advisor: Paul Kenis
Title: Effects of Hydrophobicity and Catalyst Binder on Alkaline Fuel Cell Electrod Performance

Sachit Goyal – Second Place
Advisor: Paul Kenis
Title: Micrfluidic Platform for Evaporation-Based Solid-Form Screening of Pharmaceutical Compounds

Bhushan Mahadik – Third Place
Advisor: Brendan Harley
Title: Multiphase Hydrogels to Decode Extrinsic Regulation of Hematopoietic Stem Cell Fate

Graduate student Kim wins the 2011 Doh Wonsuk Memorial Award

Chemical & Biomolecular Engineering graduate student So Youn Kim has earned the 2011 Doh Wonsuk Memorial Award.

Since 2004, the US Chapter of the Korean Institute of Chemical Engineering has given the award annually to one to two Korean students studying Chemical Engineering in doctoral programs in the United States.

Kim is expecting to finish her doctoral degree this year, and she is working under the direction of Professor Charles Zukoski.

Competition for the award was intense, according to Dong-Shik Kim, the chair of award committee. In choosing Kim and another doctoral student from the University of Toledo, the committee focused on the applicants’ number of publications, presentations in national and international conferences, recognitions and department/community services.

The award was presented at the Korean-American Chemical Engineers Forum during the 2011 AIChE Annual Meeting in October, and Kim received a certificate and a cash award.

Putting curricular pilots in innovative undergraduate program

This past spring, a curricular innovation was introduced to integrate design projects into core courses throughout the undergraduate curriculum in Chemical & Biomolecular Engineering.

The program was launched to give students experience with oral presentations, working in a team and practical projects including open-ended design as early as their freshmen year. The design projects help students develop skills in creative problem solving and communication. The overall approach was inspired by project-oriented engineering curricula at small, private technical universities such as Worcester Polytechnic Institute, Rose-Hulman Institute of Technology and Illinois Institute of Technology.

“The idea was to emulate key aspects of the open-ended, design-oriented project experiences those sorts of institutions provide, but with the large student-to-faculty ratios we have at a large public research university. Peer mentor- ing by the students is the linchpin,” said former Department Head Ed Seebauer, who helped implement the new curriculum.

“So far, it appears that it was very successful,” said Marina Miletic, a lecturer in the department who helped develop the program and taught several of the classes that included the new design projects.

The skills and predispositions being cultivated by the program lie at the core of what many engineers in industry consider crucial for American economic competitive- ness and job creation. According to the National Academies Report: ‘The Engineer of 2020 - Visions of Engineering in the New Century,’ these include analytical skills, practical ingenuity, creativity, communication skills, agility and an appreciation for life-long learning.

An important goal of the program is to give students a taste of the actual work that engineers do early on in the curriculum.

“They don’t really understand what engineering is until they get to their senior year and they have to design a major process,” Miletic said.

Design projects throughout all four years of courses allow students to get a feel for the type of work they will do as engineers, as they work through difficult math and science courses.

“Projects like this give students an opportunity to glimpse the relevance of the other courses they are taking,” Seebauer said.

Freshmen in the Chemical Engineering Profession class in the spring were required to design a new chemical product. Their ideas ran the gamut from a color-changing mascara, deodorant that helps inhibit hair growth, silicone coating for bake ware and silver nanoparticle socks.

Sophomores in the Thermodynamics course were required to design a heating and cooling system for a home using a chemical reaction, and not just a furnace that burns natural gas, Miletic said. Juniors designed a reactor to perform hydrodesulfurization of a chemical.

Groups of four students worked together on the design projects and were mentored by a student who was one year ahead of them in the program. The mentors received individual-study course credit for their work and were graded on their mentoring skills.

Students were required to give 20-minute “sales presentations” about their designs. Surveys indicated that the design projects were most helpful in teaching the students practical application of engineering, teamwork and presentation skills.

“When students start working at a company, there is this time for decompensation from academic life into the workforce,” said Jerrod Henderson, a lecturer in Chemical & Biomolecular Engineering who administered the design project program with Miletic in the spring and did so in the fall with new lecturer Troy Vogel.

Students are often challenged by the change in culture from the academic environment to the job. On the job, students are expected to know how to give quality presentations and how to work well on a team.

“Previously in our curriculum, with a few exceptions in elective courses, only in our senior year would students work in teams,” Henderson said.

The program has already attracted outside attention in the form of financial support. BP has donated $35,000 to support the program this school year. Top student presenters will receive prizes and awards, and industry leaders will serve as judges.

The program this past spring also included co-curricular social activities such as a “Sushi Bowl,” in which students and faculty were invited to go bowling and dine on sushi, and this outing was important to help them get to know each other.

Students participating in the program this past spring included the new design projects. According to Jerrod Henderson, who helped implement the new curriculum, the programs in the United States.

Kim is expecting to finish her doctoral degree this year, and she is working under the director of Professor Charles Zukoski.

Competition for the award was intense, according to Dong-Shik Kim, the chair of award committee. In choosing Kim and another doctoral student from the University of Toledo, the committee focused on the applicants’ number of publications, presentations in national and international conferences, recognitions and department/community services.

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Dear ChBE Alumnus,

One of the great pleasures of my work is connecting with our outstanding alumni throughout the world. Upon graduation, they go on to lead lives of great impact, and they represent figures of achievement, innovation, and leadership in virtually every corner of industry. In hearing these terrific stories of life and career experience from our alumni, I am often overwhelmed by the depth of influence that their Illinois experience continues to have on their lives.

As you will read in this newsletter, the stories of our success at Illinois continue to be written through the work of our tremendous faculty and talented students. As you are no doubt aware, much of our recent success has been achieved in spite of challenging financial circumstances. While we continue to address such challenges and evaluate near-term and long-term outlooks for the department, it is clear that private support will remain a pivotal component in the continued delivery of our academic mission.

In addition to diminished support from the state of Illinois, the rising cost of supplying an exceptional academic experience defines each gift to our department as one of critical importance. We are honored to work with so many of you on the establishment of your educational legacy at Illinois within the scope of your big-picture philanthropic goals. As you may know, some of the most significant and impactful gestures of support come to us through these more sizable legacy gifts of current or deferred assets.

While these legacy gifts are indeed vital pillars of support, many of our alumni are surprised to know that their seemingly modest annual gifts to the department are of equal importance. Whereas major gifts are often dedicated for specific use, the unrestricted nature of annual gifts allows the department to fund current needs, address unexpected challenges and respond rapidly to new opportunities. In all of these ways, it is difficult to overstate the essential purpose that annual participation gifts continue to serve in the daily operation of the department.

You’ll be proud to know that your department remains an academic destination for scholars of all kinds—it is a place where the Illinois tradition of excellence is still recognized as the platform from which future generations will move forward in addressing the challenges of the world. Whether you are considering a gift in the establishment of your educational legacy, or a gesture of loyalty through your annual gift to the department, I would encourage you to act in support of our common mission. If you are considering a gift to the department, and would like to discuss your desires, I would be happy to meet with you. Thank you for your consideration, and all that you do in support of your department.

Best Wishes

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For more on giving to the Chemical & Biomolecular Engineering Department, please visit http://chbe.illinois.edu/alumni-and-friends/giving

The Dow Chemical Company has pledged more than $13 million to the University of Illinois Department of Chemical & Biomolecular Engineering. Dow will provide support for four graduate student fellows (who will be named Dow Chemical Company Fellows), funds to enhance the start-up packages of junior faculty hires (who will be named Dow Chemical Early Career Fellows) and funds for three sponsored research projects.

The three sponsored projects will be performed by teams of faculty from the department and from the departments of Chemistry and Materials Science & Engineering. This support totals more than $13 million over five years. The investment will be used to strengthen research in traditional scientific fields that are important to Dow. The funding will begin in 2012.

The pledge is part of Dow’s larger commitment to donate a total of $25 million a year for 10 years, for a total of $250 million, to advance research and development at 11 U.S. universities, including the University of Illinois at Urbana-Champaign.

Over the last decade, a shift has occurred in Chemical Engineering departments across the United States, which concerns Dow, according to Theresa G. Kotanchek, vice president of sustainable technologies and innovation sourcing at Dow. Today, more than 45 percent of faculty in chemical engineering departments are focused on bioengineering versus traditional chemical engineering skills, so fewer students are receiving critical training and “fewer are conducting research in areas of strategic importance to industry,” according to Kotanchek.

Although the number of doctorates awarded in engineering increased 50 percent to about 9,900 over the decade that ended in 2010, the number of chemical-engineering Ph.D.s is still not enough to satisfy demand, according to the Wall Street Journal.

“As a major employer of scientific and engineering talent, Dow is committed to the development of the 21st-century workforce, which will work to solve society’s most pressing challenges while cultivating a more competitive U.S. marketplace,” said Andrew N. Liveris, Dow’s chairman and chief executive officer. “Excellence in scientific education and the development of innovative solutions go hand-in-hand. We are pleased to partner with academia to ensure that a vital pipeline of talent and research is available to fuel the discoveries and solutions of tomorrow.”

This investment will increase collaboration between Dow and key universities, and it will help develop America’s future pipeline of Ph.D-level talent, according to William F. Banholzer, executive vice president of Ventures, New Business Development & Licensing and Chief Technology Officer at Dow.

“It is vital that we support academic research to ensure universities can continue the tradition of excellence in chemical engineering, chemistry and materials science to help address the needs of the industry and of our country,” he said.

Dr. William Banholzer, executive vice president of Ventures, New Business Development & Licensing and Chief Technology Officer for Dow Chemical Company, gave the Samuel W. Parr Lecture in early September for the Department of Chemical & Biomolecular Engineering.

The topic was “The Future of Fuels and Feedstocks: Addressing Hype, Limitations and Research Strategies.”

He discussed that energy — how we acquire it, how efficiently we use it and how our use affects the environment — looms as one of society’s biggest challenges.

The lecture examined the idea that all the materials supplied by the chemical industry today could conceivably be made from renewable resources. But is this something scientists should do? Mass and energy balances, capital investment and resource requirements should be considered before engineers are certain that wholesale conversion to biomass feedstocks will provide a truly sustainable future, according to Banholzer’s lecture. Their focus cannot solely be on discussions of the possible. Rather, engineers must begin to discuss options that provide practical solutions for improving the way we acquire and use energy.

Banholzer earned a bachelor’s degree in chemistry from Marquette University and master’s and doctorate degrees in chemical engineering from the University of Illinois.
Meet our newest professor

Professor Hong Yang will join the department in January, 2012. He received his BS in Chemistry from Tsinghua University, Beijing, China, 1989; his MS in Chemistry from University of Victoria, 1994; and his PhD in Chemistry from University of Toronto, 1998. Yang is interested in synthesis and understanding the structure-property relationship of nanostructured materials and their applications to energy, catalysis and biotechnology. His group has developed several approaches to the control of composition, size and shape of multifunctional nanoparticles. The use of gas reducing agents is his latest development for the preparation of uniform faceted defined metal alloy nanocrystals. His group has developed nanoparticles including octahedron-based platinum nickel alloy nanocrystals and platinum-on-palladium heteronanostructures, which represent active and durable electrolyt catalysts for the oxygen reduction reaction that is important for fuel cell and lithium-air battery applications.

Significant Honors
- Invited Guest Editor, Accounts of Chemical Research (special issue on Nanoparticle Catalysis), scheduled for the middle of 2012
- Invited Guest Editor, Advanced Materials, 2007
- National Science Foundation CAREER Award, 2005
- NSERC Canada Doctoral Prize (four each year for the entire nation - two in Science and two in Engineering), 1999
- NSERC Canada Postdoctoral Fellowship, 1998-2000
- Member, American Chemical Society, 1999; Materials Research Society, 1998; American Association for the Advancement of Science, 1998; and American Institute of Chemical Engineering, 2002

Undergraduate secretary Lyle earns School of Chemical Sciences Outstanding Staff Award

The School of Chemical Sciences recently recognized Becky Lyle, an office support specialist in the Department of Chemical & Biomolecular Engineering, with an Outstanding Staff Award. Lyle works with both faculty and students, and she is responsible for scheduling the department’s commencement each year. Her nominator wrote that Lyle is “hard working, well organized, diligent and independent.” According to the nomination, Lyle is also helpful and quickly accommodates last-minute requests, such as arranging additional rooms for course exams when faculty forget to request them, and generally making life easier for the people she works with.

New employees join the department

Greta Weiderman joined the department as the Assistant Director of Communications in June. She helped with the redesign of the department’s website this past summer. She creates newsletters and print pieces, writes news stories and press releases and updates the department’s website.

Nick Jaeger recently joined the School of Chemical Sciences as Assistant Director of Development. As part of his job, he visits with alumni of Chemical & Biomolecular Engineering and facilitates their relationship with the department.

Eric Thome has been the Director of Advancement for Corporate Relations for the College of Engineering at The University of Illinois at Urbana-Champaign since 2009, and this past May, he started doing advancement for the Chemical & Biomolecular Engineering Department.

Sophi Martin recently joined the College of Engineering as the Manager for Research, and as part of that role, she assists the Department of Chemical & Biomolecular Engineering.

Vogel joins department as lecturer

Troy Vogel recently joined the Department of Chemical & Biomolecular Engineering as a lecturer to strengthen the department’s undergraduate program. He will be teaching Process Design, a senior level course, helping to implement new design-based projects into the curriculum, doing undergraduate advising and helping the department with ABET accreditation.

“I am excited about teaching design because the way that I like to teach is to put the students into a learning environment and let them teach themselves,” he said. He believes this way of teaching helps students to retain knowledge better than a traditional lecture.

The design-based curricular innovation was piloted as a component of several courses this past spring to give students experience working on teams, giving presentations and doing design. Vogel said the group work is a very important element of the curricular innovation, and he’s excited to help implement it.

Born and raised in a small town in northwest Ohio called Paulding, Vogel received his PhD in August from Ohio State University in Chemical & Biomolecular Engineering and received his undergraduate degree there in Chemical Engineering in 2006.
Max S. Peters
Passed away June 20, 2011

Dr. Max Peters, a former faculty member and former department head of the Department of Chemical Engineering at the University of Illinois at Urbana-Champaign, passed away on June 20, 2011 at the age of 90.

During his life, Peters was a chemical engineer, university professor and dean, author, researcher, athlete, member of the 10th Mountain Division during World War II and father.

Peters was a decorated war hero and earned numerous awards, including two Bronze Star medals and a purple heart. After World War II, Peters earned his M.S. Degree in Chemical Engineering in 1947 at Penn State and earned his PhD. there in 1951, also in Chemical Engineering.

He joined the Chemical Engineering faculty at the University of Illinois in 1951 as a professor and became department head in 1957. In 1962, he took a position as dean and professor of Chemical Engineering at the College of Engineering and Applied Science at the University of Colorado, and he later became chair of the Department of Chemical Engineering there.

Peters authored many technical papers and several textbooks on Chemical Engineering. His most widely known text is "Plant Design and Economics for Chemical Engineers," which has had its 5th edition published by McGraw-Hill in 1995.

After Max wrote the original book, the later editions were coauthored with K. D. Timmerhaus, and the 5th edition added Ron West as an additional co-author. The second edition of his text "Elementary Chemical Engineering" was published by McGraw-Hill in 1994.

Dr. Peters participated in a large number of professional activities, including: President of the American Institute of Chemical Engineers (AIChE); member of the Board of Directors for the Commission on Engineering Education; Chairman of the President's Committee on the National Medal of Science; and Chairman of the Colorado Environmental Commission.

Information courtesy of Centre Daily Times and reprinted with permission. Photo courtesy of Crist Mortuary, Boulder, Colo.

Lee Jack Thomas
Passed away April 11, 2011

After receiving his Ph.D. from the University of Illinois Department of Chemical Engineering in 1960, L. Jack Thomas went to work for the Eastman Kodak Company as a research chemist and remained a vital member of the corporation until his retirement in 1994. He was named director of their Research Laboratories in 1977, chairman of the subsidiary Sterling Drug in 1988, president of the Imaging Group in 1989 and executive vice president of Kodak in 1994. He was active in scientific organizations, being a member of the New York State Science and Technology Foundation and chairman of the Resource Development Committee of the University of Illinois.

He was elected to the National Academy of Engineering and served as a member of the Academy Council. He was also elected to the American Academy of Arts and Sciences, was a founding fellow of the American Institute for Medical and Biological Engineering and received a University of Illinois Alumni Honor Award for distinguished service in engineering, along with numerous other awards.

John H. Sinfelt
Passed away May 28, 2011

John H. Sinfelt, who received his Ph.D. from the University of Illinois Department of Chemical Engineering in 1954, joined the Standard Oil Development Company, now ExxonMobil, where he performed research on noble metal catalyst. After developing a new approach to bimetallic catalysts, which he called "clusters," Sinfelt invented a superior platinum-iridium catalyst that was important in the quest to produce lead-free, high-octane gasoline cheaply. His work also provided a scientific base for other processes to produce petrochemicals in high volume.

For his breakthrough, President Jimmy Carter presented Sinfelt with the President's National Medal of Science for his invention. Sinfelt received more than 40 patents, and he was a member of the National Academy of Sciences and the American Academy of Arts and Sciences.

Emertius Professor Alkire delivered the Plenary Lecture at the 42nd meeting of the International Society of Electrochemistry in September in Niigata, Japan.

The lecture was titled, "Earth, Water, Air and Fire: Elemental Challenges for Well-Engineered Electrochemical Systems."

In it, Alkire suggested molecular scale engineering methods needed to transfer discoveries based on electrochemical phenomena into technological products and processes. The meeting was attended by scientists from 34 countries in six continents.

Professor Seebauer named AICHe fellow

The American Institute of Chemical Engineers (AIChE) recently named Chemical & Biomolecular Engineering Professor Edmund Seebauer a fellow in the organization.

He was cited for his distinctive professional accomplishments and contributions to the field.

National Science Foundation supports professors’ research to generate biomaterials

The National Science Foundation has awarded Professor Brendan Harley a grant to support his research in generating biomolecularly-patterned biomaterials.

Harley, the principal investigator, is an assistant professor in Chemical & Biomolecular Engineering. The co-investigator, Ryan C. Bailey, is an assistant professor in Chemistry.

In their research, Harley and Bailey are reimagining how biomaterials can be used to control cell behaviors. This research provides valuable multidisciplinary training experiences for undergraduates across campus.

"The goal of this research is to be able to create biomaterials that better mimic the complex environment found in the body, namely the non-uniform patterns of biomolecule such as growth factors and proteins found within tissues," Harley said. "We’re developing biomolecule-generic tools that will enable us to flexibly create multiple overlapping patterns in space and time within collagen biomaterials currently used to regenerate tissues."

The ability to control the display of proteins within three-dimensional biomaterials doesn’t exist, but this research is working to bridge that gap in order to develop next generation biomaterials for use in the body – to regenerate tissues, and outside of the body – to study how cells sense and respond to their microenvironment.

This $150,000 renewable grant has been approved for approximately three years.
Chemical & Biomolecular Engineering Department Head Paul J.A. Kenis is among six Urbana campus faculty members recently recognized as University Scholars.

The University Scholars program recognizes excellence while helping to identify and retain the university’s most talented teachers, scholars and researchers.

Kenis is an expert in the field of microchemical systems. His research program is focused on development of novel microfluidic tools for applications in energy and health. Over the past 10 years, he has built a highly productive and internationally well-known research program at the University of Illinois. Kenis is also affiliated with the Institute for Genomic Biology, the Beckman Institute for Advanced Science and Technology, the Frederick Seitz Materials Research Laboratory, and the departments of Bioengineering and Mechanical Science & Engineering.

http://chbe.illinois.edu/news/department-head-kenis-named-university-scholar
http://www.scs.illinois.edu/kenis/

Bill Hammack’s playful video showing how a photocopier works won the grand prize in Scientific American’s Inaugural Science Online Film Festival.

In the video, Professor Hammack drags the copier through hallways, a tunnel and an elevator before he takes it apart and explains how it works.

Scientific American also recently ran a feature and Q and A about Hammack and his videos. The article describes how Hammack’s video and radio pieces explore the technological world by emphasizing the human dimension to technology, “from the trial, tribulations, and triumphs of inventors and scientists to the effect of technology on our daily lives.”

Hammack shares his background, his public radio appearances and how he creates and distributes his videos, including some tips for up-and-coming videographers.

In addition, Hammack recently won University of Illinois at Urbana-Champaign’s Branding Leadership Award, a campus award for communications and marketing excellence.

Hammack received the award in recognition of doing an amazing job as a one-man Illinois Brand machine, through his videos (surpassing 3 million hits) and other social media. The award was presented at the 5th annual Public Affairs seminar, Brand U: 2011.

His videos are available on YouTube and at engineerguy.com.