

Chemistry & Chemical Biology News

CCB Faculty Win Notable Awards

Two Chemistry and Chemical Biology (CCB) professors won major honors last fall: Assistant Professor KiBum Lee was awarded the 2009 National Institutes of Health (NIH) Director's New Innovator Award in September, and Associate Professor Babis Kalodimos received The Protein Society's 2010 Irving Sigal Young Investigator Award in December.

The NIH award is given to projects that can have a significant impact on an important biomedical or behavioral research problem. In Lee's case, he hopes to ultimately develop therapies for neurodegenerative diseases. "They liked my proposal because I was trying to combine nanotechnology with stem cell biology, and make a big impact on stem cell and cancer research," he explains. The proposal, "Combinatorial Approaches for Studying Multiple Cues Regulating Human Pluripotent Stem Cell (hPSC) Fate," focuses on manipulating stem cells using small-interfering RNA (siRNA) transfection tools and microfluidics methods. The \$2.3 million award will be paid out over five years.



Award winners KiBum Lee, *left*, and Babis Kalodimos, *right*

Lee is grateful for the recognition. "I am so lucky," he says. "And I do hope that I can make some kind of an impact. All I can say is, 'thank you!' I dearly appreciate my students and my colleagues and all of their support. I hope that this helps motivate other scientists to jump into new areas."

Though he wasn't always involved in this particular specialty, the Korean native says that as far back as elementary school he was interested in "understanding natural reactions, because they are the fundamental basis for life." Lee did his B.S. and M.S. in Korea, then spent a year working at Samsung before moving to the United States to

get his Ph.D. in nanomedicine at Northwestern University. Because he wanted his research to help save people's lives, he next spent three years at The Scripps Research Institute, involved in cell biology.

Lee says that he came to Rutgers in 2007 because, "the atmosphere and infrastructure here were perfect for my research." He wanted to combine his "background in nanotechnology with stem cell biology, and Rutgers had a very good stem cell and neurobiology department, plus good research and a very good nanotechnology center." Since his arrival, he

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RUTGERS

Welcome! A Note from the Chair

Welcome to the 2010 summer edition of the Rutgers Chemistry and Chemical Biology (CCB) Department newsletter! Although the national and state financial crises have affected Rutgers, the Department still prospers in many ways. Enrollment in chemistry courses continues to grow at all levels; we now teach well over 5,000 students per semester. Our extensive research programs in health, energy and the environment are progressing exceedingly well, with current funding at about \$30 million a year, ranking us amongst the top 10 departments in the U.S. for over five years.

Two faculty members moved to Rutgers this past year with their research groups, and both have quickly relaunched very active programs. G. Charles (Chuck) Dismukes, who comes to us from Princeton University, is helping to lead an ambitious new cross-disciplinary program working closely with the Rutgers Energy Institute (REI). Tewodros (Teddy) Asefa is an expert in catalysis who joins us from Syracuse University and is helping to launch a new Catalysis Center. A third new faculty member, Darrin York, one of the younger stars in the world of computational chemistry and biology, will arrive this summer from the University of Minnesota.

Several faculty members have received very prestigious awards over the past year. Babis Kalodimos won The Protein Society's Young Investigator Award, Bob Moss has been honored with an Author C. Cope Scholar award, Chuck



CCB Chair Eric Garfunkel

Dismukes was honored with an Excellence in Catalysis award, KiBum Lee won the prestigious NIH Director's New Innovator award, and Kai Hultsch has been granted a National Science Foundation (NSF) CAREER Award.

In our continuing effort to enrich the international experience of our students and to attract the best students and post-graduates to Rutgers, we have begun to globalize. During the past year, six of us visited the University of São Paulo in Brazil, and four of us spent a week in China, where we visited seven universities. We gave lectures and discussed longer-term exchange programs. Both trips were highly successful, resulting in return visits and excellent new applicants to our graduate program.

Kathryn Uhrich, the Associate Chair of CCB in 2008-09, was appointed School of Arts and Sciences Dean of Mathematical and Physical Sciences in July 2009. She oversees six departments (including CCB).

Kathryn, former chair Roger Jones, and I are currently leading an ambitious program to build a new home for the Department. We have the strong support of the administration and state politicians, and are currently working on both building design and fundraising. As we envision it, the building will be energy efficient, sustainable, attractive and reconfigurable. It will provide critically needed laboratory, teaching and collaboration space. It will enable our internationally recognized faculty to expand and accelerate groundbreaking research in drug design, alternative energy, biomaterials, nanotechnology and molecular engineering. And it will repay its economic investment many times over. We welcome your suggestions and clever ideas on how to realize this vision, and we encourage you to join us in bringing this new building to life.

—Eric Garfunkel
Chair

Trying to connect with former students? Write to us and let us know what you and other CCB graduates are up to!



Building Bridges

Rutgers has long been on Tewodros (Teddy) Asefa's radar. "I've been very keen to come here for a while, because I was impressed by the variety of research," he says. "If there's an area of research you're interested in, I'm sure somebody's doing it at Rutgers." Asefa became a faculty member last August, when he took a joint position in the CCB and the Chemical and Biochemical Engineering departments. "There are many reasons I love being at Rutgers," he explains. "The school is great, there are friendly, well-known scientists and engineers to work with, and it's an exciting area geographically—close to major chemical, pharmaceutical and petrochemical companies, other schools, you name it!"

Asefa came to the United States as a Fulbright scholar, landing at University at Buffalo, The State University of New York. Before that, he received a B.S. in his native Ethiopia, after being inspired by his older brother to become a chemist. At SUNY Buffalo, he studied nanotechnology with Paras N. Prasad, receiving his M.S. in nanomaterials synthesis and their application in photonics. Next he went to the University of Toronto to work with Geoffrey A. Ozin, doing his Ph.D. research in nanotechnology, self-assembly of nanomaterials, and organic-inorganic hybrid nanostructures. Though he planned to do his post-doctoral studies at the University of California, Berkeley, he wasn't able to get a visa in the aftermath of the September 11 attacks. Instead he went to McGill Univer-

sity, in Montreal, where he worked with R. Bruce Lennox. "Working with him was an exciting experience," notes Asefa. "I was able to investigate synthesis of metal and silicon nanostructures with solution and chemical vapor deposition on patterned surfaces and within nanoporous substrates."

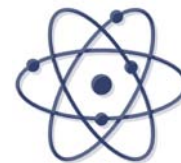
It was in 2004 that the scientist first visited Rutgers, meeting with faculty in the Materials Science and Engineering and CCB departments. The following year, he took a position as an Assistant Professor at Syracuse University. During his fourth year at Syracuse, Asefa learned that a new position had been created at Rutgers to help bridge the CCB and Chemical and Biochemical Engineering departments, the Institute for Materials, Devices and Nanotechnology (IAMDN) and the Rutgers Energy Institute (REI), with a focus on nanomaterials and catalysis. "As soon as I saw the position, I knew that it was a perfect fit for me," he enthuses. "I love challenges, I love to play major roles, and I am very keen on collaborating with many people."

The NSF CAREER Award winner's research includes the design, synthesis, and self-assembly of novel inorganic nanomaterials and organic-inorganic hybrid nanoporous materials for catalysis, drug delivery and cancer treatment, and for solar cell applications. "We can take

advantage of the unique characteristics of nanomaterials in so many ways," he points out. He is particularly fascinated with developing new nanomedicine for treating cancer. "The conventional treatments have negative side effects, but nanotechnology can offer a way to lessen them, partly by creating nanomedicine that binds only to cancer cells," he explains. "Knowing that makes me work a bit harder every day. I know several people with cancer, and if I can contribute even a little bit to a better treatment, it would make me very happy."

Along with his research, Asefa is the key player helping to form a new center for catalysis at Rutgers. "There are many people working on catalysis in different

Asefa's new position helps bridge the CCB and Chemical and Biochemical Engineering departments, the Institute for Materials, Devices and Nanotechnology, and the Rutgers Energy Institute.



Chris Pedata

departments and schools here, and one of the ways that I can help build bridges is to create such a center," he explains. "These scientists don't necessarily know what their colleagues are doing across the campus—this center would make interdiscipli-

**Associate Professor
Tewodros (Teddy)
Asefa**

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Faculty Members Take on Administrative Roles

Chemistry and Chemical Biology professors Kathryn Uhrich and Jing Li are both busy and successful researchers and teachers, yet a year ago they also took on new administrative roles. Both women say taking a position that could affect the department and the university was an opportunity they could not refuse.

Uhrich is now Dean of Mathematical and Physical Sciences in the School of Arts

and Sciences. She previously held the position that Li now fills, Vice Chair for the Graduate Program. Uhrich's lab focuses on the synthesis and characterization of biocompatible polymers for medical applications. Although she notes that taking on the new position was a big decision for her, "it was an opportunity that would allow me to do something positive and different for the University, so I said yes."

The dean is enjoying her new

role. "It's great to enable people, and I really like making connections between scientists and research programs. Science is becoming even more cross-disciplinary, and I can help build bridges." She adds that being actively involved in research helps with the bridge-building, and allows both her and Li to bring unique perspectives to their jobs. Uhrich also points out the importance of their both being women, saying it allows them to bring a different per-

FACULTY PROFILE Charles Dismukes

New Professor Searches for New Energy

Chemistry was Plan B for the young G. Charles (Chuck) Dismukes. Plan A? Becoming an astronaut.

"I grew up during the Mercury-Apollo days," the Professor explains. "But the job market for astronauts was pretty slim. So I chose chemistry, because it allowed me to be on the frontier, making something original that possibly no one had ever dreamed of before. That process of creatively not knowing where I was going harkened back to why I had wanted to be an astronaut in the first place."

Luckily for Rutgers,

Dismukes is not currently living aboard the Space Station. Instead, he became a

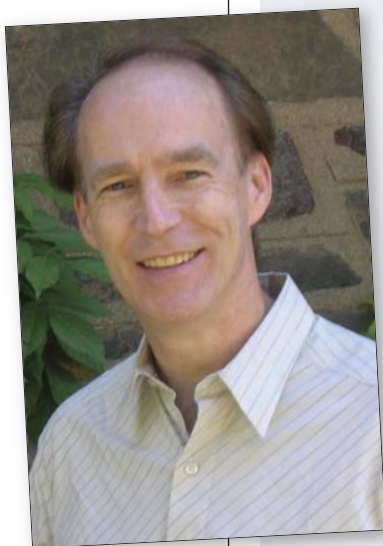
member of the faculties of the CCB and Biochemistry and Microbiology departments and the Waksman Institute of Microbiology last August.

An early love of chemistry led Dismukes to the Lowell Technological Institute in his home state of Massachusetts, where he received his B.S. By then he knew that he wanted to work in the energy field, and he decided to do his M.A. and Ph.D. work in radiation chemistry at the University of Wisconsin–Madison. He anticipated working in nuclear energy, but the presence of protesters at the first international conference he attended changed his mind: "It became apparent to me that there were strong opinions about the

downside of nuclear energy, and I saw that maybe I had undervalued that aspect of the challenges that lay ahead in that field. So I changed my career track."

He decided to do post-doctoral work studying photosynthesis in the Calvin (Radiation) Laboratory (now the Laboratory of Chemical Biodynamics) at the University of California, Berkeley. "I wanted to learn nature's way of doing chemical conversion, and see if that form of science had any answers for practical energy generation," he explains. "And so I got drawn into the fantastic world of unsolved riddles and puzzles of photosynthesis and continued on that path for 20 years."

Dismukes spent three years in California before moving



Professor
Charles Dismukes

spective to their positions, and to serve as models for students and researchers.

Of the woman who is filling her old role, Uhrich says, "Jing is a great choice, because she's involved in research and thinks broadly. She knows how to move a project forward, and she's also very efficient, effective and fair." Li's research is primarily in the areas of solid-state inorganic and inorganic-organic hybrid materials that possess interesting and useful properties. She says her new position affords her the opportunity to help shape the graduate program, and that it's a "good expe-

rience" for her. Her goals are to "increase the number of full time Ph.D. students significantly, and to help improve the quality and ranking of the graduate program."

Li agrees with Uhrich's statement that holding these positions can create a "constant struggle between how to find time for one's own research and how to enable others to do theirs." But both women are glad to have the opportunity to make a difference. And they both manage to find the time to do research, mentor students and help guide Rutgers toward becoming an even better institution.



Nick Romanenko



Chris Pedota

CCB Professor and Dean of Mathematical and Physical Sciences, Kathryn Uhrich, *left*, and CCB Professor and Vice Chair for the Graduate Program, Jing Li, *right*

east again to take a position in the chemistry department at Princeton University. After his two-decade exploration of photosynthesis, he says he "became much more concerned about fulfilling my original vow of trying to do something about the energy problem, so I began doing more problem-oriented—a.k.a. applied—research. I decided to attempt to use nature's solutions to create energy conversion in artificial systems."

He says he made the move to Rutgers because the program is larger than Princeton's, "and it's growing by leaps and bounds in the energy and catalysis fields." His specific research focuses on bioinspired artificial photosynthesis, and it has two components. The first has to do with making catalysts that can split water into hydrogen and oxygen, using cheap and abundant materials. "For this to happen," he ex-

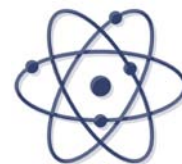
plains, "we use chemistry to make very specialized structures similar to the efficient ones found in nature." The second component is working with natural and transgenic microbial photosynthetic organisms (algae).

"We're trying to use algae as cell factories, to make fuels or precursors to fuels in high abundance. Algae can synthesize precursors to biofuels such as carbohydrates (for making hydrogen and carbon dioxide by fermentation), lipids (for making biodiesel) and proteins (for methane or co-products)," Dismukes notes. "It's basic science—trying to understand the metabolic pathways by which the intermediates are formed, then applying genetic engineering to redirect the flow of intermediates to make the desired precursor in high abundance." He points out that one of the challenges lies in understand-

ing the available energy reservoirs (ATP and reductants) that the cell has for making these precursors and figuring out ways to make more while rebalancing the ratio for optimal growth.

The professor is enthused about the future of his work at Rutgers. "This place has been phenomenal to me," he says. "I've had more opportunities presented to me to grow professionally and more colleagues here to work with in the energy field than I have ever had in my independent professional life!" One recent opportunity that he found particularly exciting was leading a team of Rutgers faculty (including CCB colleagues Alan Goldman, David Case, and Teddy Asefa) in preparing a Department of Energy grant on solar fuels. "It's sort of like being back in the Apollo days," he notes. "I feel like a kid in a candy shop."

"I decided to attempt to use nature's solutions to create energy conversion in artificial systems."



The CCB Advisory Board

Jn the spring of 2009, then Associate Chair Kathryn Uhrich and Chair Eric Garfunkel assembled the CCB's first Advisory Board. The individuals that make up the board each contribute to the department's mission to "achieve their goals of providing state-of-the-art education, training the next generation of global scientists, and meeting the needs of New Jersey industry."

Maxine Ballen is President and CEO of the New Jersey Technology Council (NJTC), which she founded in 1996. The council offers its over 1,100 member companies access to resources, financing and information. Prior to NJTC, Ballen founded the Business Development & Training Center and the Pennsylvania Innovation Network. She is also credited with founding the NJTC Venture Fund in 2000.

Sol Barer, Chairman and Chief Executive Officer of Summit, NJ-based Celgene, joined the Celanese Research Company in 1974, creating the Biotechnology group that spun off to form Celgene. His honors and awards include the Children's Brain Tumor Foundation's Dream & Promise Award, the Center for Medicine in the Public Interest's Odyssey Award, Gilda's Club's Corporate Vision Award, Ernst & Young's Master Entrepreneur Award, the Rutgers University Alumni Federation's The Hall of Distinguished Alumni Award and the Research and Development Council of New Jersey's Science and Technology Industry Medal. Barer received a Ph.D. in organic chemistry from Rutgers.

Suresh Damle, a retired science manager, currently acts as a consultant for the chemical industry. He spent the last 22 years of his career working in various industrial research and development positions with PPG Industries, and helped the company develop a new business in pharmaceutical intermediates. Damle's research interests have been in synthetic organic, organometallic and phosphine chemistry. He has more than ten US patents and over 25 publications. Both he and his wife were graduate students in chemistry at Rutgers, where he received his Ph.D. in 1964.

Carl P. Decicco leads Discovery Chemistry at Bristol-Myers Squibb. The division is responsible for the conceptualization, chemical synthesis and optimization of compounds to derive clinical candidates for human testing. During his 20-year career in the pharmaceutical industry, he has led teams that have advanced several compounds to human testing, participated in programs that have led to several new chemical entities, and advanced late stage compounds currently in development.

Nader Fotouhi works at Roche, where he is Vice President of Discovery Chemistry, Head of Discovery Technologies, and Center Manager for Nutley (NJ) Research. He has held leadership roles on two drug discovery projects in the areas oncology and inflammation, and been a member of an international life cycle management team responsible for the development of a cell-cycle inhibitor for the treatment of solid tumors.

Robert Ianniello is Vice President of Chemicals, Polymerization, and Refining Catalysis Research at BASF. He is responsible for new materials research and development, materials characterization, precious metals analysis and methods development, and new technology discovery in the areas of petroleum refining, chemicals and polyolefin catalysis. Ianniello has directed the research activities of a product and formulation research development department in the areas of pharmaceutical, agricultural and beverage science. He received his Ph.D. from Rutgers, and in addition to his responsibilities at BASF, he is an adjunct professor of Chemistry at Union County College in Cranford, NJ.

Paul Keimig received his B.A. in chemistry from Rutgers, then went to work in research and development with Union Carbide's Specialty Polyolefin Division (now part of Dow Chemical). In 1989, he joined Solvay Polymers Polypropylene Division, where he became a Senior Sales Account Manager and increased sales from 30 million pounds to more than 200 million pounds. In 1995, Keimig started his own company, Chemical Resources, now a global supplier of commodity and engineering resins. Headquartered in Princeton, NJ, the company consists of three core divisions: resin distribution and compounding, plastic packaging and industrial recycling.

Valerie Kuck worked as a chemist at Bell Labs for 34 years. Her research included crafting a procedure for reproducibly measuring the oxidative stability of polyolefins. Kuck has authored 41 publications and been granted 21 US patents. Since retiring in 2001, she has conducted research on gender differences in

*Each of the CCB
Advisory Board's
13 members
contributes
experience and
expertise to help
further the
department's
mission.*



the training and hiring of physical scientists. Kuck has been an active member of the ACS for over 30 years, and established the North Jersey Section's Careers in Transition Group. Kuck is an adjunct professor at the College of St. Elizabeth's, in Morristown, NJ.

Malcolm MacCoss obtained his Ph.D. in organic chemistry from the University of Birmingham in the U.K. in 1971, and began his career at Argonne National Laboratory. In 2003, he became the Vice President of Basic Chemistry and Drug Discovery Sciences at Merck and in July, 2008 was appointed Group VP for Chemical Research at Schering-Plough. After retiring from Schering Plough in January, he embarked on a consulting career. MacCoss serves on the Advisory Council for the Executive Dean of the School of Arts and Sciences at Rutgers. His many awards include two Thomas Alva Edison Awards, most recently for his contributions to the inventorship of Januvia. MacCoss has authored 152 publications, and has 93 issued U.S. patents.

Sheri S. McCoy is Worldwide Chairman of Johnson & Johnson's Pharmaceuticals Group, and a member of the company's Executive Committee. She joined the company in 1992 as an Associated Scientist in research and development and worked her way up through positions including Worldwide Franchise Chairman of Ethicon and Worldwide Chairman, Surgical Care Group. McCoy earned a master's degree in chemical engineering at Princeton and an MBA from Rutgers. She serves as a board member of FIRST, a non-profit organization created to inspire young people's interest and participa-

tion in science and technology.

Robert Pierce, Vice President, Personal Care R&D for Colgate-Palmolive, has global research and development responsibility for the company's \$3.5 billion personal care business. After graduating *summa cum laude* in chemistry from Rutgers in 1969, Pierce went on to get his Ph.D. at Cornell University. He was a research associate at Brookhaven National Lab before joining Colgate 33 years ago, where he has also had responsibility for Oral Care Global R&D product development, Oral Care Global Marketing and Household Care Global R&D. He also led the design and construction of new laboratories in India and China.

Donald Schulz is Senior Scientific Advisor at the Corporate Strategic Research Laboratories of the ExxonMobil Research and Engineering Company, in Clinton, NJ. Schulz earned his Ph.D. from the University of Amherst, Massachusetts, and was a Group Leader at the Central Research Laboratories of the Firestone Tire

and Rubber Company before coming to ExxonMobil. His research interests include polymer synthesis and modification, catalysis, functional polymers, and structure-property relationships. He has co-edited five books, authored or co-authored over 90 publications and holds over 55 U.S. Patents.

Ann E. Weber is Vice President Discovery & Preclinical Sciences and Chemistry Head at the Rahway, NJ, site of Merck Research Laboratories. She joined Merck in 1987 after earning her Ph.D. from Harvard University. Weber's research interests include the design and synthesis of ligands for G-protein coupled receptors, ion channels and enzymes. She has authored over 70 publications and is the co-inventor on 25 issued US patents, with over a dozen additional patents pending. Among Weber's honors and awards is a Thomas Alva Edison Patent Award from the Research and Development Council of New Jersey for her contributions to the development of Januvia.

In Memoriam

It is with sadness that we report the death of our former colleague Donald D. Denney, Ph.D. Don came here as an assistant professor in 1954, after a few years with the DuPont organization. He rose through the ranks to Professor II and retired in 2000. One of his missions was to develop a strong organic chemistry program at a time when Rutgers was aspiring to become a nationally recognized research institution. Don quickly put together a first-class research program that attracted international attention when it used isotopic labels to elucidate mechanisms of organic chemical reactions. His interests turned to innovative uses of ^{31}P nuclear magnetic resonance studies of the chemistry of organo-phosphorous structures and reactions. In his later years, he was involved in computational chemistry. Don's work put us on the map and stimulated the start of the expansion of other research programs in what was then the School of Chemistry. He contributed greatly to the progress of chemistry at Rutgers, and he is remembered with respect and affection by those who knew him. Don is survived by his wife and colleague, Dorothy Z. Denney, Ph.D., who was also a great asset to both his group and the department.

And the Reid Award goes to...

Jn January five graduate students received the Reid Award, a \$4,000 fellowship for outstanding performance in thesis research. The awards come from a fund established by the late Thomas Reid, who studied at Rutgers as an undergraduate and went on to have a successful career as an organic chemist at the 3M Corporation, where he developed the material that is the basis for Scotchgard.

The five Reid recipients are united in both their passion for their research and their admiration of their faculty advisors. In **Alexander Reznichenko's** case, the latter would be CCB Assistant Professor, Kai Hultzsch. Reznichenko liked Hultzsch and his work so much in fact, that in 2007 he followed Hultzsch to Rutgers from the University of Erlangen-Nuremberg, in Germany. "He is a great mentor," Reznichenko says. "I like that he gives his students the freedom to come up with their own ideas, but he's there when you need his help."

The third-year student's research involves trying to develop atom-economic catalysts (which generate no waste) for selective organic transformations. His Reid presentation was, "Novel Catalysts for Asymmetric Hydroamination." "I really like what I do," he explains, "because every day there is a new challenge—maybe big, maybe small, but new. I never get bored."

Reznichenko's journey started in Siberia, where he grew up. A high school teacher inspired his interest in chemistry, and he took part in Russia's popular Chemistry Olympics. After studying or-

ganic chemistry at M.W. Lomonosov State University, in Moscow, he moved to Germany to pursue graduate studies in organo-metallic chemistry. "Professor Hultzsch was doing the kind of research that I was interested in, and it's worked out great with him." Reznichenko is "happy" to be at Rutgers, and glad to have the Reid award, which he says is "motivating me to do more—I see it as an award for future accomplishments."

Aniruddh Solanki's journey to Rutgers began in India, where he studied pharmaceutical sciences at the Mumbai Institute of Chemical Technology. It was the pursuit of an M.S. in industrial pharmacy at St. John's University in New York City that brought him to the United States. He says that at first he wanted to go into industry to make a respectable salary, but he realized he "really enjoyed" research. "I want to obtain an academic position where I can have the freedom of doing research and collaborating with scientists across various disciplines," the third-year student says. "That's why I joined the chemistry department at Rutgers."

Solanki was impressed by CCB Assistant Professor KiBum Lee's "passion for research, his contagious enthusiasm, and his excellent qualifications." As a result, he began working with Lee, researching nanomaterials for drug and gene delivery. "This work is so interesting," he explains. "We believe that we have found a technique involving biodegradable polymers that would prove beneficial for controlling cellular behavior *in vivo*. We will soon be using human pluripotent stem cells for investi-

gating and controlling their various behaviors. I believe using these cells for regenerative medicine will revolutionize medical science." Solanki's Reid presentation was, "Surface Chemistry for Regulating Cancer/Stem Cell Behavior". Of the award, Solanki says, "All I keep thinking is, 'Thank you.'"

Sarah Sparks, whose Reid presentation was, "Functionalized Amphiphilic Polymers for Biomedical Applications," is also grateful and "honored" to have received the award. The fourth-year student says her current scientific explorations had their roots in a childhood passion. "I always liked doing puzzles, because all of the pieces fit together," she explains.

"Science is like that too—what we learn through research is like one piece of a giant puzzle."

This interest in science led her from Balston Spa, NY, to Union College in Schenectady, to Rutgers. It was a talk given by the woman who became her thesis advisor, CCB Professor Kathryn Uhrich, that drew her to Piscataway. "It was the first time I consciously realized that science could be relevant," she explains. "Professor Uhrich was so enthusiastic about how the research she does can directly impact people." When Sparks came to visit the campus, she felt like she "fit," and joined Uhrich's lab.

"I make biodegradable polymers for drug and gene delivery," she explains, praising Uhrich for pushing her and the rest of the students to follow their interests. "I've been able to learn about and participate in things I'd never thought I'd be able to do as a chemist, like performing *in vitro* work with cells

The five Reid Award recipients each received a \$4,000 fellowship for outstanding performance in thesis research.



and being involved in some preclinical *in vivo* studies," she enthuses. Sparks says she's motivated by knowing that what she's doing will have an impact. "I like that I can make these polymers that I know down the road will help people," she says. "It's nice to be part of that piece of the puzzle."

One of the things that motivates fifth-year student **Anna Zhachkina** is the desire to "learn something new every day." She says that's not difficult to do in CCB Professor Jeehiun Katherine Lee's lab. "Our research is at the intersection of organic chemistry, physical chemistry, analytical chemistry and biochemistry. In my opinion, the progress of science nowadays is the fastest and most fascinating at the intersections of different fields."

Specifically, Zhachkina is doing theoretical and experimental gas phase studies of thermodynamic properties of damaged nucleic bases, hoping that those studies can yield insights into the mechanism of damaged base removal by enzymes. Her Reid presentation was titled, "Gas Phase SN_2 : Leaving Group Ability and Enzyme Mechanism," and she too was thrilled to receive the award. She joined Lee's group in 2006 and has "never regretted it. Not only do I learn physical organic chemistry from her, but I also learn how to run a lab, write proposals and papers, be a leader and be a better scientist."

Zhachkina grew up in Russia and received the equivalent of an M.S. from Moscow State University. It was her engineer father who guided her toward the sciences, telling her that a life in science can be "fascinating, challenging and interesting, that I'd never be bored, and that

I'd be doing something that made a difference." Zhachkina has discovered that he was right.

Fifth-year student **Chen Zhang** credits curiosity as one of the things that inspires his research. That curiosity is part of what landed him at Rutgers after his undergraduate studies at The University of Science and Technology of China. He calls his group's research "fantastic", and enjoys working with his advisor, Daniel Seidel. "The concept our group came up with is pretty novel, and the product we make is very useful," he explains. That product is a ring-fused amination, "a skeleton that should be useful in medicinal chemistry." He adds that deoxyvasicinone and rutaecarpine are both obtained from the skeletons.

Zhang's specific area of study is the design of novel C-H functionalizations and their application in cascade reactions, and his Reid presentation was, "Redox Neutral Reaction Cascades." He feels it is a "great honor" to have won the award, and says he chalks it up to luck, as "there are lots of good students in our department."

Zhang says he plans to go into academia to do research at a university or institution. Along with enjoying his work in the lab, he also likes to teach, and currently works with undergraduate students as a teaching assistant. The young scientist's future—along with those of his fellow Reid Award winners, Reznichenko, Solanki, Sparks and Zhachkina—does look bright indeed.

STUDENT AWARDS AWARDED JANUARY 2010

Graduate Students

REID AWARD: Presented for outstanding performance in thesis research. **Alexander Reznichenko, Aniruddh Solanki, Sarah Sparks, Anna Zhachkina** and **Chen Zhang** received \$4,000 fellowships.

CHEMISTRY 171 EXCELLENCE IN TEACHING

AWARD: Given to the most outstanding first-year teaching assistant for this laboratory course in the 2008-2009 academic year. **Kathleen Field**, the winner, was awarded \$100.

RIEMAN PRIZE: Awarded for outstanding performance as a teaching assistant during the 2008-2009 academic year. Winners **Joseph Cusick, Wojciech Jankowski, Priti Tiwari** and **Michael Vitarelli** each received a certificate and \$500. **Eric Klauber, Lauren Klein, Boyan Lazarov, Kristina Paris, Alexander Reznichenko** and **Mojgan Roushan** were awarded Honorable Mentions. Each received a certificate and \$100.

EXCELLENCE IN LEADERSHIP AWARD: **Elizabeth Veliath-Houston** was awarded \$1,500.

VAN DYKE AWARD FOR EXCELLENCE IN RESEARCH: **Joseph Cusick, Alexander Harmon** and **Min Liu** were each awarded \$1,500.

KRISHNAMURTHY AWARD FOR OUTSTANDING PAPER OR THESIS IN SYNTHETIC ORGANIC CHEMISTRY: **Chandrakanta De** was awarded \$1,500.

DEGREES CONFERRED

OCTOBER 2009

Ph.D.

Ashley Carbone, "Natural Bioactive-based Polyanhydrides for Controlled Release Applications"

Advisor: K. Uhrich

Ramiro Rojas Escontrillas, "Exploration of Biomaterials Design Space Through combinatorial and high-throughput approaches: Tyrosine-derived polycarbonates as a case study"

Advisor: J. Kohn

Jianxi Xiao, "NMR Conformational and Dynamic Characterization of Triple Helical Peptides"

Advisor: J. Baum

M.S. (with thesis)

Qi Jiang, "Surface and Interface Modification of Alternative Semiconductor Materials for Advanced Transistors"

Advisor: E. Garfunkel

Stephen Spinella, "Transitional Metal Catalysis for Organic Synthesis"

Advisor: X. Zhang

M.S.

Sandip Murarka

JANUARY 2010

Ph.D.

Sabuj Kundu, "Reaction of (PCP)Ir Complex with Small Molecules"

Advisor: A. Goldman

Michael Romanelli, "Molecular Lanthanide Fluorides: Highly Luminescent Materials from Novel Architectures"

Advisor: J. Brennan

Xuejun Sun, "Gas Phase Studies of Hypoxanthine"

Advisor: J.K. Lee

Kuen-Phon Wu, "NMR Characterization of Intrinsically Disordered α -Synuclein: Implication for Aggregation in Parkinson's Disease"

Advisor: J. Baum

M.S. (with thesis)

Yu-Ming Chie, "Synthesis of New Phosphorous Ligands for Regioselective Hydroformylation"

Advisor: X. Zhang

HIGHLIGHTS

Rutgers Science Career Symposium

Luming Li (SAS '11), President of the Rutgers Chemistry Society, established the Rutgers Science Career Symposium, an educational event aimed at helping science students learn about various job opportunities available in both academic and industrial settings despite the current state of the economy. With a \$1,000 grant from the ACS and the assistance of regional affiliates and a career consultant, the event attracted more than 100 science students. More than ten employers, including Bristol-Myers Squibb, BASF, National Starch and CRODA, as well as graduate schools such as Fairleigh Dickinson University and Stevens Institute of Technology were also in attendance. The evening included valuable networking, two keynote speakers and a panel discussion featuring scientists that use or apply chemistry in various aspects of their career.



CCB faculty and student award winners, left to right, front row: Martha Cotter, Lauren Klein, Kristina Paris, Min Liu, Anna Zhachkina, Sarah Sparks, Chandrakanta De, Kathleen Field, Mojgan Roushan, Chen Zhang, Jing Li; back row: John Taylor, Eric Garfunkel, Elizabeth Veliath-Houston, Alexander Harmon, Eric Klauber, Aniruddh Solanki, Joseph Cusick, Michael Vitarelli, Alexander Reznichenko, Wojciech Jankowski

Graduate Student Attending 60th Annual Lindau Meeting

Graduate student **Michael Drahl** has been selected to attend the Lindau Meeting of Nobel Laureates held annually in Lindau, Germany. He has the honor of being the first Rutgers student to be invited to attend the meeting, which will take place this summer. Drahl, along with 74 other students, is being sponsored by the Department of Energy, the National Science Foundation, and the National Institutes of Health.

FACULTY NEWS

CCB Professor Emeritus **Robert Moss** was awarded the ACS 2010 Arthur C. Cope Scholar award and was recently featured in *Chemical & Engineering News* for his impressive work on reactive intermediates during his five-decade-long career.

A research consortium funded by a three-year grant from the U.S. Department of Energy in the amount of \$2.4M is being led by Professor **Edward Castner**. The consortium, which is investigating ionic liquids for solar energy applications, includes Rutgers, Brookhaven National Laboratory, The Pennsylvania State University,

the University of Minnesota and The University of Iowa.

Assistant Professor **Kai Hultsch** has been honored with a prestigious NSF CAREER Award. The \$600,000 award supports the development of novel early transition metal catalysts for the hydroamination reaction over a five-year period. A key goal of his project is to identify catalysts that combine high catalytic activity and high stereoselectivity for a broad range of substrates.

Recent work published in the *Journal of the American Chemical Society* by the research group of Assistant Professor **Daniel Seidel**, was

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FACULTY AWARDS continued from page 1

and his continuously growing lab have been working toward developing and integrating nanotechnologies and chemical functional genomics to modulate signaling pathways in stem cells and cancer cells towards specific cell lineages or behaviors. The professor notes that one particular focus is studying how microenvironmental cues functionally affect stem cell fate.

Looking toward the future, Lee says that the NIH award will further his goal of "developing new technologies in nanomedicine or nanobiotechnology that can be used to understand the mechanism of stem cell differentiation and how we can use that knowledge to treat brain cancer." But he adds that he loves being a professor, and that he also hopes to "train students to become leading scientists in 10, 20 and 30 years."

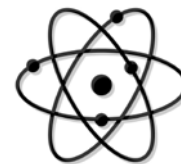
Another major award-winner was Babis Kalodimos. The Merck Laboratories-sponsored Irving Sigal award is given for contributions to the study of proteins by a scientist in the early stages of an independent career. Kalodimos was recognized for solving the structure of the SecA protein in complex with a signal sequence using advanced nuclear magnetic resonance (NMR) and isotope labeling techniques. "It was a breakthrough in the field of biomolecular NMR structural biology," the award-winner explains. "The structure we solved is really very unique in terms of the size and complexity of a biomolecular system, but at the same time we also addressed a very important biological question."

Kalodimos, who arrived in New Brunswick in 2008, goes on to explain that the system they studied is used by bacterial pathogens to infect humans and animals. "Once they infect the

human cell," he says, "they have a mechanism to secrete this protein, in effect hijacking the human organism to the benefit of the bacteria." His team was able to show how one very important piece of that mechanism works, providing insight into how bacteria go about secreting the protein.

A native of Greece who did his graduate and post-doctoral work in Paris and The Netherlands, Kalodimos is pleased that the award allows "people all over the world to see what we're doing and to get excited about our research." He is also glad that thanks to The Protein Society's interdisciplinary nature, people outside of structural biology will learn about his work. "This is very important," he points out. "We have shown how we can use these tools to investigate molecules that are very large and very complex. This isn't only important for our field, but for others as well."

Kalodimos is pleased that winning the Irving Sigal award will allow more people to learn about his research.



Four additional
Rutgers faculty
and alumni have
been named
50-year members
of ACS.



featured in the November 30, 2009 issue of *Chemical & Engineering News*. The article highlighted the group's new concept for asymmetric nucleophilic catalysis and its application to the kinetic resolution of amines.

Professor **Larry Romsted** has received \$1 million in research funding from the National Science Foundation and the United States Department of Agriculture for his work with understanding the forces behind the self-assembly of surfactant molecules in water.

RETIRED FACULTY AND ALUMNI NEWS

The April 12, 2010 issue of *Chemical & Engineering News* featured a list of 50-year members of the ACS that included the following Rutgers faculty

and alumni: **John A. Beisler** (Ph.D., 1964, Prof. Ronald Sauers); **Robert A. Moss**, CCB Professor Emeritus; **Roger P. Napier**, (Post-doc, 1962-64, Prof. Don Denney); **Harvey Jay Schugar**, Retired Professor.

ASEFA

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nary collaboration easier." Asefa was also the Principal Investigator on a grant proposal to the NSF for getting a new solid state nuclear magnetic resonance spectrometer. The grant was funded, and he expects the spectrometer to be installed within the next

few months. "It's exciting," he notes. "It will be the first of its kind among New Jersey's major academic institutions." Asefa, it appears, is already helping put Rutgers on the radars of even more scientists.

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