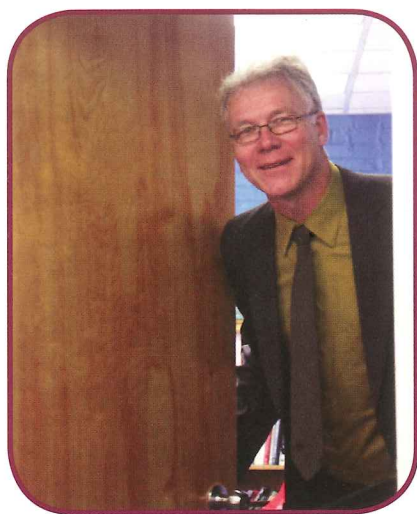


# ELEMENTS

The Alumni Magazine of the Department of Chemistry  
Virginia Tech Fall 2012

Volume 18, Issue 2

## From the Department Chair: Prof. Jim Tanko



Fall 2012 marks the beginning of my third year as chair of the Department of Chemistry. It has been a remarkable experience, and it is a joy to share in the many noteworthy achievements of our talented faculty, staff, and students. My absolute favorite part of the job—save for handing out diplomas at graduation—is recruiting and hiring new faculty members. In that context, we are delighted to welcome Prof. John Matson to the Department. John earned a B.S. from Washington University, his Ph.D. from CalTech (working with Nobel laureate Bob Grubbs), and completed a postdoc at Northwestern before joining the Department this semester. We are also pleased to welcome several new staff members: Kristen Cox (fiscal assistant), Joli Huynh (graduate coordinator) and Nathan Yoder (lab tech supporting general chemistry). Several members of chemistry department have left the university including Sungsool Wi (now at Florida State), Danielle Lehsten (who left to help

with her family business—an indoor rock climbing gym in Christiansburg), and Angie Kritak (who left for an employment opportunity closer to her home). We wish them all the very best. We are also happy to announce the promotions of Lou Madsen to associate professor with tenure, and Mike Berg to advanced instructor.

The Department continues to thrive in all aspects of its mission: Teaching, Research, and Service. The long tradition of excellence in our undergraduate program continues. Faculty commitment to our classes (lecture and lab) is enthusiastic, and senior exit interviews confirm that our students value and appreciate their experience. The Department's major reinvestment in undergraduate education continues. Both chemistry majors and the much larger group of non-majors who enroll in our service classes have direct, hands-on experience with a variety of new instrumentation including GC/MS, NMR, UV/Vis, fluorimeters, atomic absorption spectrometers, a powder X-ray diffractometer, a flash calorimeter, and more.

Our graduate program offers state-of-the-art classes, research opportunities that range from studying the fundamental properties of molecules to addressing some of society's biggest problems, and a well-funded, internationally-recognized faculty. The success of our Department, as evidenced by nearly 200 published peer-reviewed papers in top journals with most co-authored by graduate students, confirms that our research programs provide an outstanding platform for students earning an advanced research degree in chemistry. Our faculty remain successful in attracting funding that ranges from large, multiple-investigator to single-PI grants. Locally, nationally, and internationally, our faculty continue

to be recognized with prestigious awards. Faculty and staff in chemistry continued their active engagement in notable leadership, service, and outreach for the profession, University, and community. Most notably, Virginia Tech hosted the 2012 IUPAC (International Union of Pure and Applied Chemistry) World Polymer Conference (with approximately 1200 attendees). In terms of service, faculty have taken on major leadership roles that will profoundly shape our future, and will increase the recognition and prestige of our department. The K-12 outreach and education initiatives of our faculty continue to influence and motivate the next generation of scientists.

The collegiality and cohesiveness of the Department's faculty, staff and students remain strong. This past summer, Prof. Amanda Morris coordinated the first Chemistry Department Summer Olympics, which included golf, volleyball, running (5K), soccer, and softball. In August, the Department held what has become a new tradition, a camping trip to the Peaks of Otter.

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VirginiaTech



## Faculty Highlight

### John Morris Personal Perspective



One could fill a small museum with the number of toasters, vacuums, radios, and other small household appliances that I tore apart as a young boy growing up in the small rural town of Ithaca, Michigan. My love of all things mechanical grew throughout high school and when those interests began to merge with the chemical

world, my future was set. I was a stereotypical science geek, save for two major distractions. First, I loved the game of basketball. Secondly, I was raised as a Roman Catholic and had a major interest in deepening my understanding of my religion. It was God, science, and basketball that drew me to Aquinas College in Grand Rapids Michigan in 1987, where I spent the next four years as an undergraduate student.

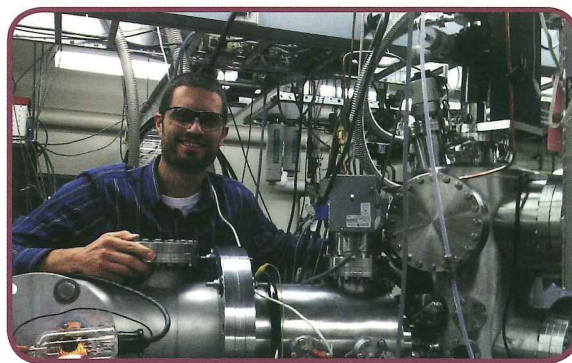
While searching for a graduate school where I could continue my interest in science, I had the fortune of meeting Professor Dennis Jacobs at the University of Notre Dame. Dennis ran a research group that focused on studies of gas-surface reaction dynamics: The picture to have in mind is that of a pool table set for a game. As the cue ball strikes the hexagonally close packed lattice of billiard balls, the lattice is shattered and balls scatter to all reaches of the table. The dynamics of that collision describe the motions and energy transfer events that lead to the final positions of all of the balls. Dennis told me that the same things happen when a metal surface is struck by an impinging molecular ion and we could figure out those dynamics if we built and invented new methods to detect where all the atoms went after the collision. I was hooked. And to top it all off, he showed me his lab, which was filled with vacuum equipment on steroids!

While at Notre Dame, I became interested in other types of gas-surface reactions that play a major role in environmental chemistry. At the time, the scientific community had recently discovered that molecular reactions on the surface of liquid droplets and ice crystals in the stratosphere played a major role in the creation of the ozone hole over Antarctica.

In 1998, I began to interview for faculty positions at universities around the country. Although a number of institutions were interested in me joining their departments, I had not found what I thought was the right fit for Martha, me, and the daughter we expected to arrive in early 1999. Then, I interviewed at Virginia Tech. I knew early on in

my interview that VT had everything that I was looking for in a department: excellent laboratory space, a growing reputation for surface science, a good machine shop, and an outstanding group of potential colleagues. Blacksburg likewise met our needs as a young family and we felt at home here the moment we met Professors Jill and Rich Gandour, with whom we stayed during one of our visits.

Since moving here in 1999, we have truly loved calling this small town home and the Department of Chemistry has been an outstanding place to develop my research program. Today, my laboratory is filled with vacuum equipment and



instruments that I can tear into anytime my curiosity gets the best of me. Most importantly, I am pleased to lead a group of outstanding graduate and undergraduate students who are all interested in learning about reaction dynamics on surfaces.

Our studies focus on two key problems of practical importance. One of our projects is aimed at trying to build a fundamental understanding for the reaction rates and mechanisms of collisions between highly oxidizing gases found in the atmosphere, like hydroxyl radicals, ozone, and nitrate radicals, and the surfaces of organic materials. These reactions have a significant influence on the chemical composition of the atmosphere and environment. The second area of research for my group lies in the development of new catalysts and photocatalysts for the targeted decomposition of highly toxic compounds such as chemical warfare agents. One of the most exciting developments in recent years associated with this work is that we have been invited to construct a new laboratory on an Army base in Aberdeen Maryland, which is the one place in the world where we can conduct surface science studies involving actual agents. The information from this work is being used to develop more effective strategies for protecting soldiers against the dangers of highly toxic compounds.



# Department Updates

## Davidson Hall Undergoing \$31.1 M Transformation

The majority of Davidson Hall has been demolished to make way for the first phase of a renovation project that will increase the functionality and efficiency of chemistry labs and classroom space. The structure is scheduled for completion in Jan 2014. The renovated building will include a lecture hall with the latest in instructional technologies and modern, energy efficient ventilation systems for its laboratory spaces. Davidson Hall dates to the 1930s. It was named after Robert James Davidson, a chemistry professor, Dean of the Department of Applied Science, and a chemist for the Agricultural Experiment Station. Three floors of the front section and part of the two-story middle section were completed in 1928 with other sections added in 1933 and 1938. The building was renovated in 1964 and again in 1965.



Aerial view of Davidson construction

## Davidson Hall Hokie Stone Prevails

Hokie Stone, the signature limestone that defines Virginia Tech's campus building, has long been a symbol of tradition, strength, and perseverance. The demolition and renovation of

Davidson Hall provides a unique opportunity to bridge Virginia Tech's past, present, and future symbolically with the reuse of Hokie Stone. The two-year renovation project will provide 45,000 square feet of state-of-the-art lab space and a new lecture hall that will seat 320 people. A second phase has been proposed for renovation of the front part of the building. During initial demolition phases, contractor Barton Malow followed a specific removal process to minimize damage



Artist rendering of Davidson Hall after renovation

to the stone from the old building's exterior walls in order to be able to reuse it to fulfill the transition to the new Davidson Hall. Approximately 110 tons of Hokie Stone has been saved for reuse which will allow Virginia Tech to meet certification requirements. Aesthetics is an additional factor for reusing the stone. The stone color can vary depending on when and where it was mined at the quarry. Weatherization and the natural color variances of Davidson Hall's facade on the Drillfield would be a noticeable contrast if the new structure was comprised of all new stone. Integrating the original stone will blend the old and new seamlessly.



## Crawford Receives 2012 Alumni Award

T. Daniel Crawford, professor of chemistry has received the 2012 Alumni Award for Excellence in Research. Sponsored by the Virginia Tech Alumni Association. The award is presented annually to as many as two Virginia Tech faculty members who have made outstanding research contributions. Each recipient is awarded \$2,000. Crawford is the first author and lead developer of a suite of quantum chemical computer programs that he and his collaborators distribute freely under an open-source software license. Computational chemists around the world have applied these programs to an array of chemical problems, and 10,000 copies of the program have been distributed. Crawford has authored or co-authored 88 peer-reviewed publications and received nearly 100 invitations from around the world to lecture on his work. In 2009, he was a visiting professor at two universities in Norway, and he has active research collaborations with researchers in 10 different countries.



# 44th IUPAC World Polymer Congress

Naya Sou

Virginia Tech and the Macromolecules and Interfaces Institute hosted the **44<sup>th</sup> IUPAC World Polymer Congress** in Blacksburg, USA, June 24-29. Profs. Timothy E. Long, S. Richard Turner, and Robert B. Moore organized the conference that attracted more than 1400 attendees from 52 countries with 60% international attendees. The Congress provided an international forum for scientific discovery, professional networking, research collaboration, interdisciplinary education, and dissemination of the most recent scientific advances. More than 1200 presentations (766 oral and 475 poster presentations) ensured a diverse technical program, and 12 plenary speakers provided some key focal points.

The theme of the conference focused on “Enabling Technologies for a Safe, Sustainable, Healthy World.” Polymers continue to enable many emerging technologies including topics such as tissue regeneration, multilayer structures, processing, drug delivery, water purification, security, biomedical technologies, alternate energy, sustainable resources, smart surfaces and interfaces, high performance engineering, polymers, energy storage and generation, sensors, and electro-active devices.

The congress comprised of 11 parallel symposia and 145 technical sessions were organized by leading scientists in the field of polymer science from across the globe. Lectures and topics presented in these symposia were very diverse and highlighted the up-to-date research in the polymer field. The conference also provided mechanisms for professional networking through evening poster sessions and the participation of industrial, national laboratory, government, and academic scientists and engineers. Additionally, the program ensured an integration of polymer design with recent advances in polymer characterization techniques with a focus on morphological structure and correlation of structure with properties and performance.

In addition to the 11 parallel symposia, the conference also featured a total of 12 (5 U.S. and 7 international) plenary speakers who presented on a wide range of topics related to the themes of the conference. Plenary speakers were selected based on the diversity and impact of their research in the polymer science field.

Apart from the technical program, the participants were welcomed by the Virginia Tech Hokie Bird and President Thomas Jefferson. They also enjoyed an evening at the welcoming reception, dinner receptions during poster sessions, a banquet reception with a presentation on origami by Dr. Robert J. Lang, several musical performances including the renowned Poly and the Mers (our “in-house” band comprised of Virginia Tech faculty).

The IUPAC MACRO World Polymer Congress 2012 received generous financial supports from 39 sponsors. Virginia Tech ensured the success of the conference with financial support and access to the university auditorium, lodging, lecture rooms, and poster ballroom.



IUPAC MACRO 2012 organizers, from left to right: Bob Moore, S. Richard Turner, and Timothy E. Long



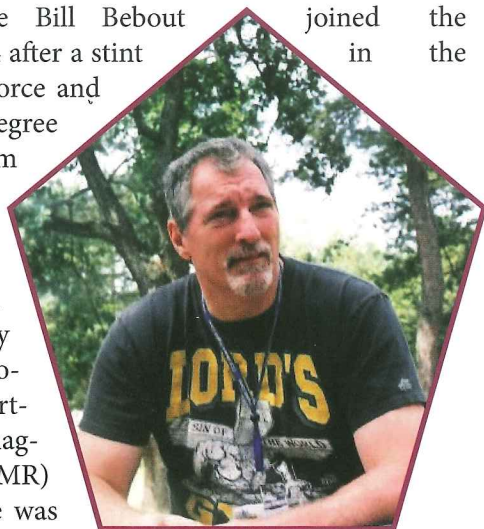
# Staff Profile

## Bill Bebout

Laurie S. Good

Had it not been for the fact that Bill Bebout grew a foot in one year, he could now be an ex-New York Yankees shortstop instead of Chemistry's analytical services spectroscopist. But the accompanying ungainliness of such a dramatic growth spurt sidelined a childhood dream and took him in another direction.

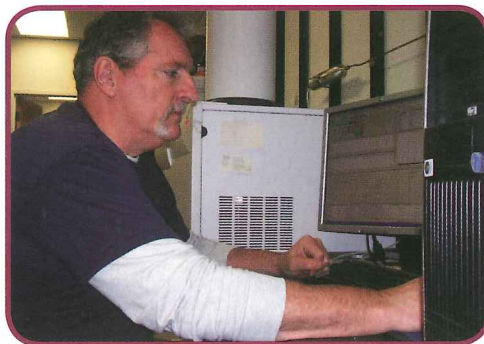
New Jersey native Bill Bebout joined the Department in 1984 after a stint in the United States Air Force and an undergraduate degree in chemistry from Virginia Tech. In fact, former Associate Department Chair, Jack Graybeal, literally offered him the position of the department's nuclear magnetic resonance (NMR) spectroscopist as he was about to walk across the stage and receive his diploma. Because of his earlier work with avionics for the F4 fighter during his military years, Bill developed a natural affinity for the similar electronics of the NMR equipment of the time, which he was able to "troubleshoot with ease." After 15 years in the NMR facility as one of the "nuts and bolts guy" with Geno Iannaccone, Bill transitioned to mass spectrometry in 1999 and has been performing accurate mass analysis ever since. According to Bill, "The job is interesting because I help keep the 'Wheels of Research' rolling. Whether it is NMR or mass spectrometry, helping the graduate students and professors accomplish their research is job satisfaction. In the accurate mass analysis, the researcher has to know they have successfully created the compound of interest before moving onto the next reaction. How many Master's theses and doctoral dissertations have been successfully defended and papers published because of the information provided by the accurate mass analysis? Although my job may be 'in the wings' and out of the spotlight, I still find satisfaction in helping others succeed."



Bill participates in CCX English Camp in the Ukraine

When not in the lab, Bill can twice a year (January and July) be found in, of all places, a sanatorium outside the city of Kiev in Ukraine. In 2004 a friend from Intervarsity Christian Fellowship, which is an evangelical campus mission serving students and faculty on college and university campuses nationwide, invited Bill to accompany him to Ukraine. Having long been fascinated with that part of the world, Bill works with college students wishing to improve their English, as well as to learn other important skills such as team-building, business ethics, and strategies for passing the challenging TOEFL exam, which is required for the kinds of professions many of these students will eventually pursue. "CCX English Camp," as it is now known, is home for a week to 120 Ukrainian university students who work with native English speakers in a variety of ways—for example, through scripture readings/discussion, small group bible study, and group activities. Despite some "brisk" January conditions (he recalls a -13°F day), Bill looks forward to the January trip even more than the mid-summer experience, since the activities are geared more toward "believers."

Bill has been married to Sara Bebout, who has worked in Newman Library for many years, since 1981; they are parents to sons, Will (now working on his Master's in English at VT), and Sam (currently at New River Community College)—both of whom completed military



Bill working on the mass spectrometer

service including tours to Iraq and Afghanistan, respectively. Bill himself served in the Virginia Army National Guard for over 21 years (he retired from military service in January, 2001). He is also an active member of Grace Covenant Presbyterian Church, which sponsors his twice-yearly trips to Ukraine. And when time and weather permit, Bill can also be found pursuing another of long-time hobbies—riding roller coasters. And the bigger the better!





# Student Profiles

## Tyler Motley & Jessica Knoll

Laurie S. Good

**Tyler Motley.** It was just this past spring when he happened to be in Rome (Italy) during their annual marathon that Tyler Motley decided to take up running. He'll be competing in his first full marathon in April 2013. That's the kind of focus and dedication that this impressive senior chemistry major devotes to what interests him. And given the fact that he has a perfect 4.0 GPA in his major, chemistry definitely seems to interest him. Growing up in Danville, VA, Tyler has always been good in school, and by 10<sup>th</sup> grade he knew he wanted to do chemistry—especially after getting into the lab and doing hands-on synthesis. As he noted, "Chemistry seemed like a puzzle that had to be solved—and I wanted to solve all the little pieces. In fact, my favorite moments even today are those ah-ha moments when I've struggled to figure something out." Since entering Virginia Tech, Tyler has worked primarily with Prof. Brian Hanson, who quickly recognized Tyler's potential. Tyler's research projects have included the preparation of carbon silica thin films by chemical vapor deposition, and the preparation of high surface area activated carbons that are suitable for application as electrodes for supercapacitors.



Tyler at an active volcano in Italy

Tyler is definitely not your "typical" science/math (his minor) geek. As a Presidential Global Scholar (sponsored through Virginia Tech's Honors Program), Tyler spent the Spring 2012 semester at Tech's Riva San Vitale campus near Lugano in southern Switzerland, where he studied geology, viticulture, politics ... and life. He considers it a life-changing experience, especially for a country boy from Southside, Virginia. In fact, he indicated that he is still discovering lessons from his European adventure—especially about the potential global impact of national or even local events.

Tyler is in the process of applying to PhD programs in chemistry, with Northwestern, Berkeley, MIT and UNC Chapel Hill among the frontrunners. Although he isn't certain whether he wants to focus on organic or inorganic chemistry, he does envision a future in academia. Tyler Motley wants to be able to help other young chemists discover the same passion for chemistry that he clearly exhibits.

### Jessica Knoll

"Exceptional" is the descriptor that her PhD advisor, Prof. Karen Brewer, uses to describe Jessica Knoll, who will likely receive her own doctorate in Spring, 2013. An Indianapolis native, Jessica received



Jessica in Sweden

her BS in Chemistry from the University of Dayton. On the advice of Dayton associate professor, Shawn Swavey—who completed a postdoc with Prof. Brewer—Jessica applied to Virginia Tech and started working in the Brewer lab the summer before she officially became a chemistry grad student. Jessica knew early on that graduate school was in her future since she could not envision a career without "the excitement of not knowing what's going to happen every day." And what has been happening for Jessica has already been pretty remarkable. For starters, she is one of the few chemistry graduate students who will have been funded on a full fellowship (a VI Graduate School Dissertation Fellowship) for her entire five years. In addition, her undergraduate institution has already hosted her for a seminar visit on her work.

Jessica's research principally involves the area of photochemistry—driving chemical reactions with light. For example, Jessica has been working on the development of mixed metal complexes as photocatalysts for solar energy conversion. Her PhD dissertation will examine the effects of component modification on excited state dynamics and H<sub>2</sub>O reduction photocatalysis in polyazine-bridged Ru(II),Pt(II) supramolecular complexes. In addition to presenting her work at national ACS meetings, Jessica has spent time at UNC-Chapel Hill working with Prof. Tom Meyer, a pioneer in solar energy research and photochemistry. In fact, Jessica is hoping that collaboration might lead to a postdoc offer after she completes her degree. Alternatively, a postdoc opportunity abroad may be of great interest to her, since travel is high on her list of outside interests—as are knitting and reading.

Jessica attributes much of her success to the support of her family and friends and to the tight collaborations she enjoys in the Brewer lab with her fellow graduate students, not to mention the inspired direction of Prof. Brewer, who has challenged her from Day 1. Clearly, Jessica has had little difficulty meeting—and in most cases—exceeding those challenges.



# Alumni Reflection - Beth Calvey

## A Hokie is Made

Thirty five years ago, today I was celebrating my 18<sup>th</sup> birthday, I stepped onto the Virginia Tech campus and became a Hokie. I left the state of New Jersey and began a new lifetime adventure. Back then VA Tech was primarily known as VPISU, Virginia Polytechnic Institute and State University. I choose VPISU for several reasons: it offered a degree in Biochemistry; it had a cooperative education program; and it was less expensive than in-state NJ universities.

Although I received an undergraduate B.S. degree in Biochemistry, by my third year I came to the realization that I was an analytical chemist at heart and so I decided to get a dual degree with a B.A. In Chemistry.

Like now, 1982 was not friendly for college graduates to readily find a job. One of my job interviews was cancelled, because the company was downsizing and they chose to fill vacancies from within. Graduate school seemed an appropriate alternative and luckily the VT Chemistry

Department in the late summer of 1982 offered me the opportunity to get a M.S. degree. Larry Taylor became my mentor and major professor.

While in graduate school, I became engaged to my husband, Robert (Bob) Calvey. I met Bob while co-oping at the U.S. Food and Drug Administration (FDA). I finished my course work

during the fall of 1983; got married in December 1983; and defended my thesis in the Spring of 1984. Prior to actually "graduating" I got a full time job in the Division of Contaminants Chemistry, Bureau of Foods, FDA. Once I started earning "real money" I began to donate to Virginia Tech because it is a part of me. Later, I started designating my donation specifically to the Department of Chemistry.

During the 86-87 academic year I returned to Tech multiple times to take those dreaded cums and managed to get through them... I was able to get a long-term training assignment through the U.S. Department of Health and Human Services and returned to B'burg for the 87-88 academic year to complete my classwork and start research toward my Ph.D. I continued my research upon returning to the FDA at the end of the academic year and began writing my dissertation in August 1989 and defended it in December. I

had my son, Robert James, in April; and graduated with a Ph.D in May.

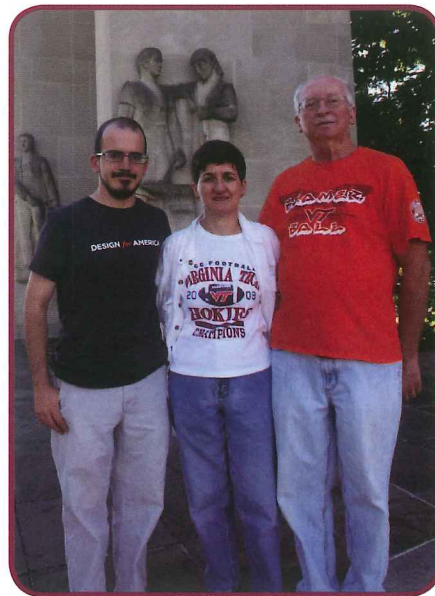
In 1998, Larry invited me to be a member of the newly established Department of

Chemistry Alumni Advisory Board. I became one of the initial members and began visiting B'burg once or twice a year. I enjoyed watching Blacksburg grow from the small rural town I lived in for five years to the town it has become.

## We are a Hokie Family

Our son, Rob, grew up in Fairfax County. He became a world traveler by

participating in the People-to-People program visiting Spain, France, and Italy. We celebrated his High School graduation and our 25<sup>th</sup> Anniversary by taking a two week cruise around South America visiting Chile and Argentina. Our son graduated from the Thomas Jefferson High School for Science



The Calvey family

and Technology. He applied to several universities including VA Tech because it has a top rated School of Architecture. And it came to pass that my son became a Hokie in the fall of 2008. Thus, Bob as a spouse of a Hokie and as a Hokie Dad, is a Hokie too! Since 2008, Bob and I have been visiting B'burg not only for the Department of Chemistry Advisory Council meetings but also to take care of the house we bought for our son to live in with several roommates. Although we will be selling the house in 2013 after he graduates, both I and Bob will still find our way to B'burg for visits. I will also continue to support the Department by designating my donations to either the General Fund or one of the endowed funds.



Beth-Rob-Bob Calvey





# Profiles of Department of Chemistry Advisory Council



**Roger Wayne Ogden** (B.S. '72; M.S. '75). Wayne transferred to Virginia Tech as a senior on the G.I. Bill, having served in the U.S. Army in Germany, Greece, and Vietnam. His undergraduate work,

directed by Harold Bell, was in part supported by a work-study position in analytical services. After receiving his B.S., Wayne was accepted into a new, non-thesis Master's program intended primarily for high school teachers. He attended VT in summers while teaching chemistry, math, and mechanical drawing. He finished the program in 1974 under the direction of Prof. John Mason, and then joined the Westvaco Corporation in Covington, VA, as a senior chemist. Wayne remained there, in various roles, until the facility closed in 2002.

Wayne retired from Westvaco in 2005 but has continued to work as a contractor and consultant. He remains active in the pulp and paper industry trade organization known as TAPPI, serving on their standards committee. Wayne enjoys coin collecting, hunting, genealogy, and choral music. His nephew, Michael Wayne Ogden, earned a Ph.D. in Chemistry from Virginia Tech and is employed by RJ Reynolds.

**William H. ("Bill") Starnes, Jr.** (B.S. '55) After receiving his Ph. D. in Chemistry from Georgia Tech, Bill spent nearly 25 years at Esso (now Exxon Mobil) Research and AT&T Bell Laboratories ("Bell Labs"), where he held both administrative and senior technical positions. He became the first Floyd D. Gottwald, Sr., Professor of



Chemistry at the College of William and Mary, where he has directed the research of Chemistry students and Ph. D. candidates in Applied Science. He retired to Emeritus status in 2006 but still performs all of his previous professional duties except the teaching of formal courses. His recognitions include, among others, selection as a charter inductee into the Southwest Virginia Walk of Fame, identification by the Plastics Pioneers Association as one of fewer than a thousand individuals worldwide (past and present) who have had the greatest impact on the history of plastics, designation as the first recipient from academia of the annual Technical Contributions to Vinyl national lifetime achievement award of the Society of Plastics Engineers, and most recently (in November 2012), being named the inaugural recipient of the Distinguished Alumnus Award of the Georgia Tech School of Chemistry and Biochemistry. Bill's most vivid memories of his student days at Virginia Tech include his service as Chief Defense Attorney of the Civilian Honor Court and going to football games away from campus in a fire-engine-red 1930 Henney hearse with an exceptionally lively group of friends who might be described euphemistically as "colorful." He now resides in Williamsburg with his wife, Sofia, who is the current Poet Laureate of Virginia.

**Bill Bryant** (Ph.D., '99) Currently living in Atlanta, GA, with his wife, Kerry Bryant, and three daughters, Caitlyn, Callie and Courtney. After graduation from Tech in 1999, Bill and his family moved to Pennsylvania to work in the R&D department of Minerals Technologies in Easton and Bethlehem. His research focused on unique mineral coatings for precipitated calcium carbonate, unique carbonates for use in plastics reinforcement, and mineral additives for antiblocking



in thin films. He received his MBA from Rutgers in Marketing in 2004 and then went to work for his current employer, Imerys, in Atlanta. As a Product Manager and Export Sales Manager, Bill is responsible for the management of the mica and kaolin product portfolio sold in various markets such as paint, plastics, automotive, and specialty areas.



DCAC members from left to right: Josh Bryson, Michael Borgerding, Frank Akers, Tom Piccariello, Jerry Bass, Bill Starnes, Rob Shenton, and Beth Calvey (front center)



# Profiles of Department of Chemistry Advisory Council (continued)



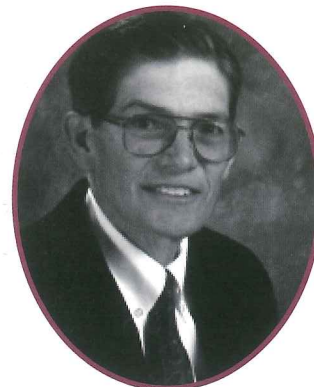
Bill and Linda Coleman

**William Coleman** (Ph.D., '77) Coleman obtained his Ph.D. while working for Professor Larry Taylor. Upon completion of the Ph.D., Bill returned to active duty in the US Navy and was assigned to the Office of Naval Research

Virginia Tech Department of Chemistry to embolden its scientific initiatives in polymeric drug delivery.

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**Rob Shenton** is the Vice President of Sustainable Operations for Aerojet. In his 37 years of service at Aerojet, he has held an assortment of assignments in research, technology, manufacturing, engineering, test, quality, safety and environmental engineering. Mr. Shenton graduated from Virginia Tech with a degree in chemistry, and started his aerospace career as a propellant development chemist for



Atlantic Research Corporation (since acquired by Aerojet). As a researcher, he published a number of papers in the area of propellant development, rocket motor performance and material properties.

Mr. Shenton's career progressed into manufacturing engineering where he had the opportunity to transition a number of his research projects into full scale production including new facilities construction. Over the last 20 years, Mr. Shenton has been responsible for multiple Atlantic Research Corporation and Aerojet facilities operations throughout the United States, as well as the Tactical, Automotive Air Bag, and Advanced Materials Strategic Business Units Leader. Operational responsibilities today include manufacturing, test, facilities engineering, maintenance, safety, environmental, production line managements, capital and manufacturing engineering.

In addition to operating a total of 7 manufacturing sites across country, Mr. Shenton is the chairman of Aerojet's Operational Excellence Initiatives. In this role, he guides the overall strategy of Aerojet's activities in deployment of Lean Manufacturing, Six Sigma Problem Solving and Design for Six Sigma. He also serves as a member on the GenCorp Foundation Board of Directors and on the Industrial Operations Board for Virginia's Commonwealth Center for Advance Manufacturing. Mr. Shenton enjoys outdoor sports such as boating, fishing, scuba diving, skiing and hunting.



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**Joshua M. Bryson** (Ph.D., '09) was born in Cincinnati, Ohio, in 1981. He received a B.S. in Chemistry from the University of Cincinnati and subsequently obtained his Ph. D. in 2009 from Virginia Tech under the mentorship of Prof. Theresa Reineke. After graduate school, Dr. Bryson helped launch Techulon Inc. as

Principal Scientist and is in charge of directing polymer-mediated nucleic acid delivery initiatives. Techulon is currently commercializing several key platform technologies developed in the Virginia Tech Department of Chemistry by Professor Tim Long. Dr. Bryson is in charge of these enabling polymeric delivery technologies and maintaining partnerships with major drug companies and the US Department of Defense. Techulon Inc. continues to invest in and utilize the scientific prowess and powerful intellectual property available in the



# Alumni News



**Alvin A. Holder** has been an Assistant Professor in Chemistry at The University of Southern Mississippi since 2006. He was a postdoctoral fellow at Virginia Tech. He has published more than 45 articles, 1 textbook, and 3 book chapters. Recently, he was awarded an NSF Career Award, entitled "CAREER: Ruthenium(II)-cobalt(II)/cobalt(III) mixed-metal

complexes for photocatalytic hydrogen production from water."



Susanne receiving the ACS SERMACS award and a book

**Susanne M. Dana** (B.S., '91; M.S. '93) received the Southeast Regional Award for Excellence in High School Teaching from the American Chemical Society at the recent SERMACS meeting in Raleigh, NC. Dana, who has been a chemistry teacher at Blacksburg High

School since 2000, earned the award for the quality of her instruction, her ability to inspire students both inside and outside the classroom, and her leadership in chemistry instruction.



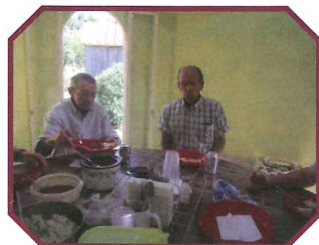
## Chemistry Department Retired Old Men (CDROM)

**Meet:** First Friday of every month

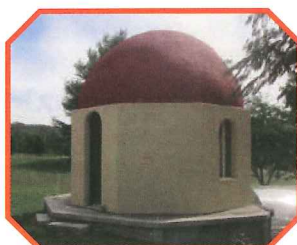
**Chair:** Prof. Jim Viers

**Agenda:** Eat and Reminisce

**Recent Meeting of CDROM:** Prof. Paul Field's house



Profs. Ward (left) and Field (right) having lunch in the out-house with other CDROM



Paul's out-house constructed by Paul

**Patrick W. Bates** (B.S., '11) and Elizabeth Payne Bates (Pensacola, FL) were married 11/10/11.

**Matthew A. Smith** (B.S., '07) earned a Ph.D. in pharmaceutical and biomedical sciences at the Medical University of South Carolina.

**Matthew Shoulders** (B.S., '04) received the Outstanding Recent Alumnus Award from the College of Science for 2012-2013.

**Joseph M. DeSimone** (Ph.D., '90) Chemistry University of North Carolina and his firm, Liquidia Technologies are collaborating with GlaxoSmith Kline to research and develop vaccine and inhaled-product candidates using Liquidia's proprietary PRINT technology.

**Joseph M. DeSimone** was elected a member of the National Academy of Sciences in recognition of his distinguished and continuing achievements in original research.

**James L. Hedrick** (Ph.D., '85) of IBM's Almaden Research Center won one of the annual Presidential Green Chemistry Challenge Awards with his collaborator, Robert M. Waymouth, for their work to develop a family of organocatalysts for efficient meal-free synthesis of biodegradable polyesters and other polymers.

**James Rancourt** (Ph.D., '84, Chemistry) was selected from a pool of more than 50 nominees for the Virginia Tech Entrepreneur Hall of Fame. James is founder and CEO of Polymer Solutions Inc. (PSI), the industry's premier independent testing lab. For the past 25 years, Rancourt has grown PSI through complementing his passion for helping others with his love of analytical chemistry, while building a team of brilliant scientists and support staff. PSI has given more than 55 presentations, has offered testimony in 60 trials, has 7 U.S. patents, and has 60 publications to its credit.

**Victor E. Sower** (B.S., '68) published a book entitled "Better Business Decisions Using Cost Modeling," Business Expert Press.

**John A Slocum** (B.S. '48) Chemistry Major, deceased





# Take it Twice with Brice



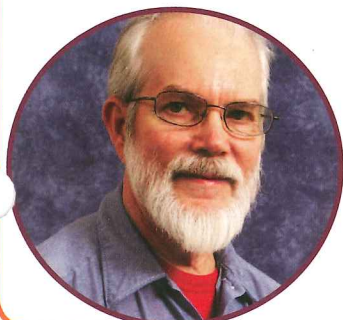
I retired in 1986, after 32 years on the Virginia Tech faculty, and moved to Washington, D.C., where I have lived since then. For the first eight years in Washington D.C. I was on the faculty at American University where I was adjunct professor and taught the usual stuff: general chemistry, physical chemistry and a graduate course in chemical kinetics. In Washington I live in a condominium near Dupont Circle, six blocks north of the Obamas. Washington is a place where there's always lots to do, and I do some of it. Museums, memorials, theater, concerts, lectures, etc. One of my current activities, with a local friend, is to attend weekly lectures at the Smithsonian on the history of the Crusades. I should be an authority on that subject by the end of November. I've done a good bit of travel with friends since retiring from Tech, to England, France, Spain, Portugal, Morocco, Mexico, South America, and on a cruise ship through the Panama Canal out into the Pacific Ocean to see a total eclipse of the sun. My social life includes hosting a cocktail hour for some of the local riff raff, drunks and working poor on Fridays after work. We call it the Young People's Temperance Union. Of course those people are neither young nor temperate. It's like the Holy Roman Empire, which was neither holy nor Roman. Other activities in retirement include researching aspects of the history of chemistry, my own family history, the history of Dupont Circle neighborhood in Washington since the Gilded Age, and the Dow Jones Industrial Average since 1900. In 1990 I developed an empirical formula for  $\log(\text{Dow})$  vs. time since 1900 which I used to forecast future trends in the market. And guess what: The Dow's 10 year moving average has been and is still very close to my forecast value.



**Angie Miller** lives in Pilot, VA. She came to the Department July 1987 as a Program Support Technician. Previously, she worked for John Cairns and Betty Higginbotham in the University Center for Environmental Studies. She has been very active for over 30 years in Girl Scouts. She enjoys her church activities, but most of all Angie can be found enjoying her grandchildren. When she officially retired from the University, she was the designer of Elements and the administrator for graduate applications and records. She did much to ensure the success of annual graduate recruiting weekends.

## Retired Staff

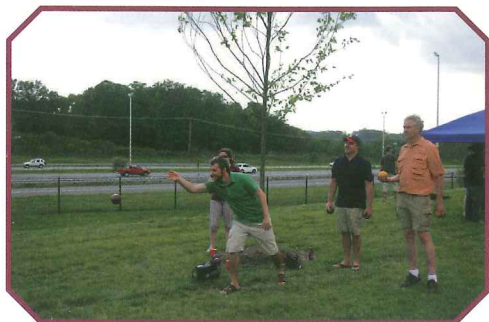
**Judy Spicer** came to the Department in 1974 as a Fiscal Technician. For many years before computers became popular, Judy placed all the orders and paid all the bills from research accounts for the faculty, graduate students, and postdocs. Her daughter, Kezia, currently works in the Chemistry Department. Judy is enjoying retirement as it gives her more time with her grandchildren. She still comes to campus occasionally to have lunch with staff in the Department.



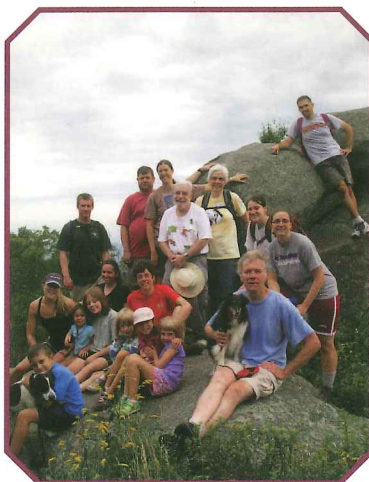
**Mike Johnson** came to the Department July 2005. His title when he retired was Instructor in Physical Chemistry. For many years Mike served as the General Chemistry lecture demonstrator. This job involved making up the chemicals, getting them to the lecture hall, and teaching the faculty how to conduct the experiment. He was an important part of the Mobile Chemistry Laboratory that served southwest Virginia 2000-2004. Mike enjoys doing blacksmith work and playing in a blue grass band.



# Department Events



Fall welcome back event



Camping trip



Camping trip

## Chemistry Department Summer Olympics



Soccer game



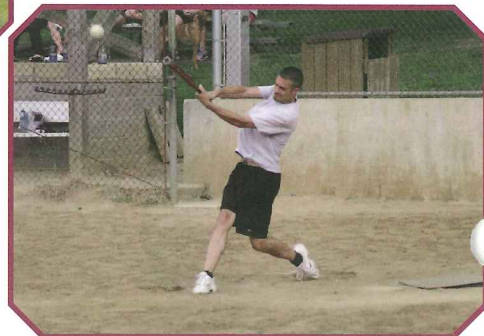
Soccer game



Golf competition



Softball game



Softball game



# Faculty Highlights



**Felicia Etzkorn** recently presented research ongoing in her group at the ACS National Meeting in Philadelphia. Her talk on “Stereospecific Cdc2 kinase phosphorylation of proline isosteres elucidates conformational regulation of the cell cycle” was part of a session for the ACS Division of Organic Chemistry. A summary of the session’s topics was recently featured in a C&E News article on “Tweaks Boost Protein Stability” (Chem. Eng. News, Sept 3, 2012, 68-71).

.....

**Amanda Morris** recently was interviewed by WVTF/NPR’s Robbie Harris regarding her work in solar energy storage. The story focused on the Morris research group’s development of catalysts for the oxidation of water reduction of carbon dioxide to form useful fuels and chemical feedstocks.

.....



**S. Richard Turner** recently received a three year Division of Materials Research NSF grant (\$390,000) to explore the synthesis and properties of highly functional alternating copolymers with sterically-congested backbones. Such copolymers have potential applications ranging from films in optical devices to high surface area polymer particles and membranes for gas storage and gas separations.

.....

**Karen Brewer** and **Shamindri Arachchige** were awarded College of Science Outreach Excellence Awards for 2012. They were recognized for their continuous service in outreach within the public school system by promoting science—particularly among women and minorities. According to Dean Chang (College of Science), their efforts have “opened doors to many students, alums, and friends.”

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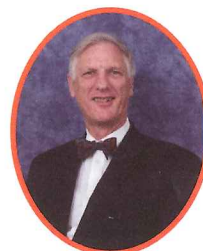


**Herve' Marand** has received the 2012 Clifford Faculty Service Award. This award, named in honor of Prof. Alan F. Clifford who served as department chair from 1966-1981, recognizes outstanding service to the department. Prof. Marand has a long career of service, having served on both of the department’s elected committees (Executive and Personnel), numerous faculty search committees, ten years on the Graduate Honor Court, and has most recently participated in the Executive Development Institute—a university program to identify and mentor future leaders. Prof. Marand also serves as the Associate Chair of the Department of Chemistry.

.....

**David G. I. Kingston**, a University Distinguished Professor and director of the Virginia Tech Center for Drug Discovery, was the featured speaker for the fourth annual Stephen E. Straus Distinguished Lecture in the Science of Complementary Health Therapies at the National Institute of Health in December.

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# An Invitation To Be Part of Something Special



## The Department of Chemistry Annual Fund



*A photomosaic of Davidson Hall created from the faces of the department's faculty and staff*

### One person can make a big difference!

The Department of Chemistry has a rich history, a strong international reputation, and a bright future. Our curricula provide the educational foundation for all Virginia Tech science and engineering students. Our undergraduate and graduate degree programs prepare society's future scientists. And our outstanding faculty members conduct cutting-edge research that impacts society as a whole.

Your support is critical to our success. Any monetary contributions you make could be used to support deserving students, provide necessary equipment, or extend our research activities. *This year we are focusing our fundraising efforts on three important funds – Department of Chemistry General Fund (881327), Friends of Larry Taylor Chemistry Endowed Fund (886047), and James P. Wightman Lecture Series Excellence Fund (860634).*

When you receive your College of Science Annual Fund letter or phone call, please earmark your support for the Department of Chemistry and one of these special funds. Simply make a notation on the gift card or let the caller know that you want to direct your donation to the Chemistry Department and then include the specific fund name and number. To make an immediate contribution, you may visit the university's web site at [www.givingto.vt.edu](http://www.givingto.vt.edu) or contact the Office of Gift Accounting at (800) 533-1144.

For more information about these funds or to learn more about other ways to give, please contact Jenny Orzolek, Director of Development for the College of Science, at (540) 231-5643 or [jorzolek@vt.edu](mailto:jorzolek@vt.edu). We thank you in advance for your support!



# Donors to Chemistry

Appreciation is extended to all alumni, friends, faculty and organizations that have contributed to the Department of Chemistry at Virginia Tech over the years. Your gifts truly make a difference and can be designated for general department needs or specific programs and scholarships. The following names are donor for the period January 1, 2012 – June 30, 2012.

## GENERAL FUND

### Alumni and Friends

Maria Arner  
Randolph Bower  
Paul Chirik  
Campbell Epes  
Jennifer Filbey  
Megan Finn  
Sarah Hulls  
Roy Lewis  
Kathryn Lysko  
Edith Marsh  
Kimberly Morgan  
Robert Pafford  
Leela Raja  
Christopher Salver  
Robert Shenton  
Robert Schmidt  
Margaret Sleevi  
Nick Snow  
Michael Tydings  
Steve Unger  
Dean Webster  
William Worrell

### Companies

Aerojet  
Altria Group Inc.  
Union Pacific Corp.  
Fidelity Charitable  
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Sherwin-Williams  
Chevron Phillips  
Science Applications  
Exxon-Mobil  
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Juanita & James  
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**JAMES P. WIGHTMAN  
LECTURE SERIES  
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Rufus Honeycott

**FRIENDS OF LARRY  
TAYLOR CHEMISTRY  
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Michael Johnson

**HAROLD McNAIR  
SCHOLARSHIP**  
Xiaowei Sun  
Novartis

**WALTER B. ELLETT  
SCHOLARSHIP**  
Anna Ellett

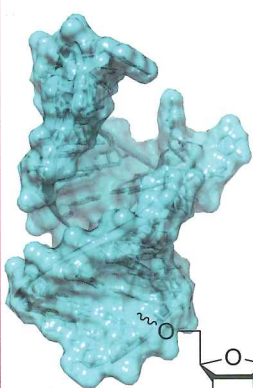
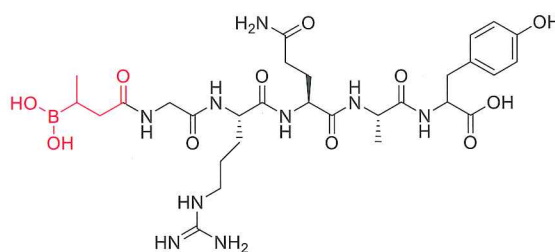
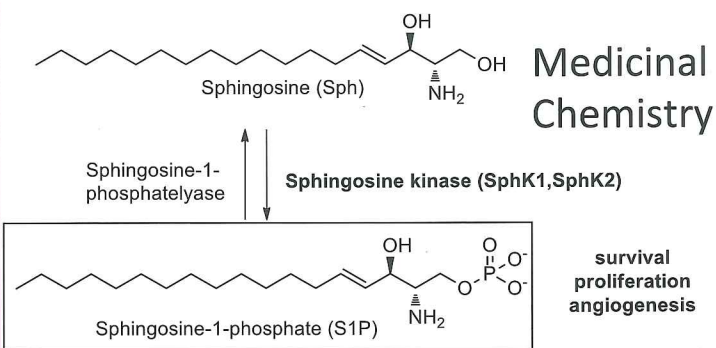
The Department of Chemistry acknowledges the generous contributions of the following faculty members to the Department's gift fund, which is used to support end-of-year holiday gifts to our staff.

Patricia Amateis, Shami Arachchige, Tom Bell, Karen Brewer, Paul Carlier, Neal Castagnoli, Daniel Crawford, Paul Deck, Harry Dorn, Alan Esker, Rich Gandour, Harry Gibson, Tijana Grove, Mike Johnson, David Kingston, Tim & Vicki Long, Lou Madsen, Herve' Marand, Jim McGrath, Harold McNair, Joe Merola, Amanda Morris, Webster Santos, Carla Slebodnick, Jim Tanko, Larry Taylor, Diego Troya, Brian Tissue, Diego Troya, Richard Turner, Ed Valeev, Tom Ward, Jim Wightman, Jim Wolfe, Gordon Yee.

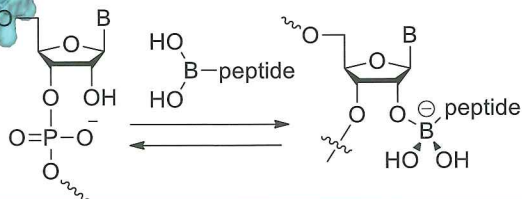
**ACKNOWLEDGEMENT.** The Department of Chemistry is indebted to Prof. Larry Taylor, Ms. Naya Sou, and Ms. Laurie Good for their efforts in the publication of Elements.



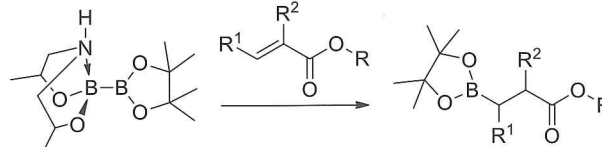
## Webster Santos Research



### Chemical Biology



### Organic Synthesis



The Santos group is interested in using chemistry to understand biological processes. The primary focus is the development of chemical toolboxes to address problems in biology. Currently, the group's work is aimed at the following:

- Development of novel diboron reagents for the mild and selective boration of activated carbon-carbon bonds
- Development of medium-sized branched peptides to target RNA structures associated with HIV as the next generation anti-HIV therapeutics
- Defining the roles of sphingosine kinases in hyperproliferative diseases by developing cell permeable small molecule libraries as probes
- Development of N-terminal peptidic boronic acids as protease inhibitors



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