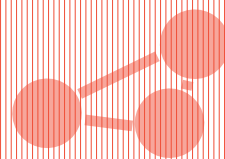


# Chemistry & Biochemistry



VOLUME 4 NUMBER 1

LAFAYETTE

Spring 2008

## Freedman '08 and Vasta '10 Awarded Goldwater Scholarships

**Jaryd Freedman '08** and **James Vasta '10** are the latest biochemistry majors to receive the Goldwater Scholarship, the nation's premier undergraduate award in math, science, and engineering.

Freedman, a 2007 Goldwater recipient, plans to obtain an M.D. and Ph.D. in biochemistry. He would like to conduct research at a university



Jaryd Freedman '08



James Vasta '10

hospital to develop cheaper, less toxic antiretroviral treatments to ease the suffering and extend the lives of HIV-positive patients. He did research on gamma-hydroxy butenolides as an EXCEL Scholar with Professor **William Miles** and an honors thesis under the direction of Assistant Professor **Yvonne Gindt**. He also was a standout performer on the varsity swim team for four years.

Vasta, awarded the Goldwater this year, plans to obtain a doctorate in biochemistry. He would like to conduct research in biochemistry and metabonomics and teach at the university level. Last summer, he did EXCEL research using high performance thin layer chromatography under the guidance of **Joseph Sherma**, Larkin Professor Emeritus of Chemistry, and **Bernard Fried**, Kreider Professor Emeritus of Biology.

Vasta's essay on the significance of Grignard reagents in organic chemistry was the winner of a \$1,000 scholarship competition sponsored by the Lehigh Valley Section of the American Chemical Society.

In the last seven years, five biochemistry majors and three chemistry majors have been awarded Goldwaters.

**The Goldwater is the nation's premier undergraduate award in math, science, and engineering. With 16 recipients in the last seven years, Lafayette is unmatched by any other exclusively undergraduate liberal arts and engineering college.**

## Goergen '08 Works With Mylon in Australia

**Alex Goergen '08** participated with **Steven Mylon**, assistant professor of chemistry, in a collaborative research project at the University of New South Wales, Sydney, Australia, for 10 weeks last summer.

Working in the laboratory of David Waite, director of the School of Civil and Environmental Engineering at UNSW, Goergen learned methods for the synthesis of zero-valent iron nanoparticles for use in both batch and column perchlorate reduction experiments. His trip was funded through the EXCEL Scholars program and a \$25,000 grant Mylon received from the National Science Foundation.

"We hoped to show that an abiotic method of perchlorate remediation is possible at a fairly low cost. Should we be successful, this will open up avenues for enhancing our perchlorate separation and remediation project that was originally sponsored by the NSF," Mylon says. "I pointed Alex in a direction, but he did the work by himself and with others."

Having worked in Mylon's lab at Lafayette for two summers, Goergen took full advantage of the opportunity to work at a new research institution with graduate students and postdoctorates in a different country. "I learned many things about myself and in



**Alex Goergen '08 (L-R) and Assistant Professor Steven Mylon at Bondi Beach near Sydney.**

science. This gave me a good preview of what working at a large graduate school would be like," he says, adding, "I also developed a good feel for the Australian culture."

# From the Department Head

Students in the class of 2007 are pursuing graduate school at Harvard, Yale, Vermont, Brown, Maryland, Illinois, and Florida State; attending medical school at UMDNJ, Harvard, and Miami; and working in industry at Millennium Pharmaceuticals, St. Luke's Hospital, Trevigen, and Beth Israel Medical Center.

Greetings from Hugel Science Center! It's hard to take over after the excellent job **Dave Husic** did as head for nine years, but here I am. I have settled into my role as head for the last year and a half, serving as the departmental representative in various ways. Perhaps the nicest part of my new job is that I get to talk to or correspond with alumni and friends.

On top of our list of exciting developments in the department is the addition of a new tenure-track position, which gives us nine tenure-track lines in the department. We were very lucky to hire **Jennifer Rutherford** as assistant professor of chemistry this year. Jennifer comes to us from industry, where she worked for Pfizer for five years. Jennifer, a physical organic chemist, primarily will be teaching organic chemistry courses. I am also very excited and pleased to announce that **Yvonne Gindt** will be granted tenure and promoted to associate professor. In more good news, **Chip Nataro** received the Thomas Roy and Lura Forest Jones Faculty Lecture Award this year.

The establishment of the **Joseph A. Sherma** Chemistry Summer Research Fund is a wonderful testament to Professor Sherma's long and productive career at Lafayette College (see article). Dr. **Peter Duffy**, class of 1976, provided

both a strong leadership role and a generous donation to create Sherma Fund, which we will use to support students doing summer research in the department. We thank the many alumni who responded to Peter's request for donations. Our first two Joseph A. Sherma Scholars are **Meghan Breheny** and **Katie Sokolowsky**, two very talented ascending juniors. We also were delighted when Professor **Russell Grimes** (University of Virginia), class of 1957, made a very generous donation to the College, directing the gift to the department.

The class of 2008, with 26 chemistry and biochemistry graduates, is the largest class we have had in as long as anyone can remember. As I write this letter, they are making plans to go to graduate school or medical school, or have found jobs or are seeking them.

We, the faculty and staff, take enormous pride in the accomplishments of our alumni. Please let us know where you are and how you are doing. And if you are in the area, please stop by and say hello.

William H. Miles  
Professor and Head



## Inaugural Joseph A. Sherma Scholars

A new fund established in honor of Joseph A. Sherma (center), Larkin Professor Emeritus of Chemistry, provides stipends for students performing summer research. This summer, Katie Sokolowsky '10 (front left) and Meghan Breheny '10 (front right) will work with Assistant Professor Yvonne Gindt (back left) and Associate Professor Chip Nataro, respectively.

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# Student Research Fund Honors Sherma

A new fund established in honor of **Joseph A. Sherma**, Larkin Professor Emeritus of Chemistry, will provide stipends for students performing summer research in the chemistry department.

This summer's inaugural Sherma Scholars will be chemistry majors **Meghan Breheny '10** and **Katie Sokolowsky '10**. Breheny will investigate new methods of making and breaking sulfur-sulfur bonds with **Chip Nataro**, associate professor of chemistry. Sokolowsky will work with **Yvonne Gindt**, assistant professor of chemistry, on measuring the reduction potential of an enzyme that repairs single stranded DNA in order to better understand the repair mechanism.

Since initiating his student research program in 1958, Sherma has worked with more than 150 students in the fields of pesticide analysis and chromatography. He also has collaborated on an interdisciplinary student research program with **Bernard Fried**, Kreider Professor Emeritus of Biology, for the past 20 years. In 1995, the American Chemical

Society honored Sherma with the Award for Research at an Undergraduate Institution. Much of his work has been supported by the College's EXCEL Scholars program.

**Peter Duffy '76** took the lead in acquiring donations for the fund and received a great deal of support from other alumni, including **Russell Grimes '57**.

"Joe Sherma was an icon at Lafayette when I was a student," Duffy says. "He had a national reputation in his field, clearly loved what he was doing, and was incredibly patient but very demanding. People like him, who dedicate their lives to their work, advance the cause of humanity and science, and mentor generations of leaders in all areas of science."



Joseph Sherma (L-R), Larkin Professor Emeritus, and Professor William Miles at the annual senior luncheon, where the chemistry department recognized Sherma's 50th year at Lafayette.

"Professor Sherma has been a mentor and role model," says William Miles, professor and head of chemistry. "His passion and devotion to undergraduate research are exemplary. Many students cite their experience in Joe's research laboratory as a defining moment in their academic careers."

## Ponder '04 Wins Award From *Biochemical Journal*

*Biochemical Journal* honored **Beth Ponder '04** with its Young Investigator Award for the best scientific poster presentation at the general meeting of the International Proteolysis Society in Patras, Greece.

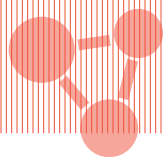
"The meeting included both academic and industry researchers studying the structure, function, and regulation of proteases," she says. "Proteases are a class of enzymes that process other proteins. They are known to play a role in many biological functions and diseases including cancer progression and pathogen invasion."

Her undergraduate research with **Bernard Fried**, Kreider Professor Emeritus of Biology, and **Joseph Sherma**, Larkin Professor Emeritus of Chemistry, focused

on the effects of *Echinostoma caproni* and *Schistosoma mansoni* parasite infections on metabolite profiles in snail intermediate hosts and factors affecting shed parasite survival. A biochemistry major, Ponder also completed an individualized major in cultural biomedicine.

Now in the fourth year of her doctoral program in the Department of Microbiology and Immunology at Stanford University, Ponder is researching the parasite *Plasmodium falciparum* as a potential target for antimalarial drugs. She plans to enter the science policy or public health field to promote research and funding for research and treatment of parasitic diseases that disproportionately impact developing countries.

"Working with Drs. Fried and Sherma really helped prepare me for graduate school," Ponder says. "I gained experience in all aspects of the research process, from project design through preparing manuscripts for publication."



# Faculty Update

## Yvonne Gindt

### Assistant Professor

The Gindt laboratory continues to work on understanding important protein-protein interactions and protein-DNA interactions using a combination of spectroscopic, thermodynamics, and kinetic techniques. Seven Lafayette students have contributed to this work in the past year. During the summer of 2007, **Sarah Sykes '09** and **Laura Bochner '10** used a stopped flow mixer to study the mechanisms of protein association and dissociation in the chromoprotein, phycocyanin. **Karen Murray '08** and **Margaret Tammaro '08** continued these kinetic studies for their senior theses in chemistry. **Caroline Richardson '10** is exploring a new direction for the protein oligomerization studies; she has initiated cross-linking studies for a better characterization of our protein samples under specific solvent conditions.

**Jaryd Freedman '08** is completing a senior thesis on the characterization of cryptochrome from the DASH family of cryptochromes, a family of enzymes that appear to have DNA repair activity. We are interested in this enzyme since it appears to repair UV-damaged DNA in a manner similar to that of DNA photolyase, an enzyme extensively studied in the Gindt laboratory. The comparison is especially significant since DNA photolyase repairs all types of DNA structure (single-stranded, double-stranded, and supercoiled DNA) while the cryptochrome repairs only single-stranded DNA.

In addition to our work on DNA and proteins, **Sandra Rodriguez '08** is taking our laboratory in a different direction with a collaboration with **Tina Huang**. Sandra is completing a senior thesis in which she is studying the toxicity of functionalized nanotubes on cell lines used in our laboratory.

## Kenneth Haug

### Associate Professor

Haug and his student assistants have continued to explore the decomposition reaction of small molecules on metal clusters. In particular, they are using density functional computations to explore sample reaction pathways for  $\text{CH}_4$ ,  $\text{CHF}_2\text{Cl}$ , and  $\text{CO}$  on  $\text{Ni}_{19}$  and  $\text{Al}_{13}$  clusters as well as bimetal alloys (Ni-Cu and Ni-Pt) to better understand the metal cluster effects and the effects of interstitial H on the decomposition. In a second project, they are using time-independent and time-dependent density functional methods to examine the energy structure and absorption spectrum of interacting quantum dots. The quantum dot system examined specifically is tuned to approximate the interaction of excess electron defect sites in the solid state material sodalite zeolite, but should also be an analogue of quantum dot structures in a variety of materials. In the past year, **Marco Tjioe '09** and **Will Isley '10** have been working with Haug on these two projects.

## Tina Huang

### Assistant Professor

There are several research projects currently on-going in Huang's research group in the areas of surface chemistry, nanoscale science, and biosensor development. In one project, she and her research students have been developing nanoscale measurement techniques using atomic force microscopy to investigate proteins immobilized on surfaces. EXCEL Scholar **Jen Czocho** '09 studied the various oligomeric structures of a model protein system, phycocyanin, on ultra-flat gold surfaces. Czocho presented her research in March 2008 at the Pittsburgh Conference for Analytical Chemistry and Applied Spectroscopy. Another EXCEL Scholar, **Sandra Rodriguez '08** (who previously worked on projects dealing with protein surface studies), has been conducting her senior thesis in a project (in collaboration with **Yvonne Gindt**) that studies the cytotoxicity of functionalized carbon nanotubes on biological systems such as cyanobacteria and *E. Coli*. In April 2008, Sandra presented her work at the National ACS Meeting in New Orleans.

Besides EXCEL Scholars, Huang also mentored several independent research students. **Nathaniel Mast '07** and **Marc Lisi '08** conducted research in the surface study of nanomaterials using atomic force microscopy, and **T.J. Lao '08** looked at self-assembled polymer formation at gold surfaces for biosensing applications using electrochemical techniques. Huang was recently awarded a Summer Research Fellowship by the ACS Petroleum Research Fund. She and her research students will be working on collaborative projects dealing with carbon nanotube-polymer composite for solar energy applications with Prof. Slava V. Rotkin, a theoretical physicist at the Department of Physics at Lehigh University.

## H. David Husic

### Larkin Professor

In the research laboratory, Husic has continued studies on the enzyme carbonic anhydrase in the unicellular green alga *Chlamydomonas reinhardtii*. This enzyme is a critical component of an effective  $\text{CO}_2$  concentrating mechanism that allows this organism to utilize  $\text{CO}_2$  for photosynthesis much more effectively than most terrestrial plants. The unique heterotetrameric structure of this enzyme and the relationship of this structure to the catalytic properties of the enzyme have been an ongoing focus of the research in the Husic lab. Recent contributors to this work have included **Michael Brown '07** and **Jeffrey Bolstridge '11**, and a presentation of some recent studies including work carried out by **Evgenia Nikolova '06** as part of her honors thesis work will be presented at the American Society for Plant Biology annual meeting in Mérida, Mexico, in June 2008.

Husic continues to teach the departmental lecture and laboratory courses in biochemistry, and, in the fall of 2007, taught a section of the non-majors introductory chemistry course for the first time.

### William Miles

#### Professor

Miles has refocused his research on the chemistry of  $\gamma$ -hydroxybutenolides, an interesting functional group that has not been extensively exploited by synthetic chemists. **Jayrd Freedman '08**, **Daniela Duca '09**, and **Elliot Goodzeit '08** brought two pieces of work to publication, with the foundation laid by **Kristin Hamman '07**, **Brandon Selfridge '06**, and **Chiquita Pahla De Sousa '08** the previous year. One paper described the addition of titanium reagents to chiral  $\gamma$ -hydroxybutenolides, which appeared in *Heterocyclic Chemistry*, and the other paper reported the amine-catalyzed epimerization of chiral  $\gamma$ -hydroxybutenolides, which appeared in *Tetrahedron Letters*. **Matt Coughlin '07** tackled a difficult project that required the handling of two pyrophoric reagents in sequence, and completed a very nice senior thesis.

**Evan Cohen '08** and **Barbara Naimoli '09** initiated research on the Diels-Alder reactions of chiral  $\gamma$ -hydroxybutenolides and the related compounds. **Nick Albano '09** has continued the work on the Diels-Alder reaction of  $\gamma$ -hydroxybutenolides this spring. In the course of our Diels-Alder studies, Cohen uncovered a new method for making 1,2-diketones, which **Zain Ahmed '10** followed up on during the past interim. **April Tang '08** initiated a project last spring exploring the reactions of chiral anions to  $\gamma$ -hydroxybutenolides, which has been very fruitful, and completed an honors thesis this year. Her work last summer was generously supported by a small grant from Bristol-Myers Squibb. And finally, **Aleksey Karulin '10** found some interesting chemistry related to the acylation of paraformaldehyde.

### Steven Mylon

#### Assistant Professor

Through a grant from the National Science Foundation, Mylon spent six months, from June to December 2007, as a Visiting Research Fellow at the University of New South Wales in Sydney, Australia. His research there focused on the use of zero valent iron nanoparticles (nZVI) for contaminant remediation. Depending on conditions, nZVI can be used to affect either an oxidative or reductive pathway for contaminant destruction. Mylon's project sought to develop methods for increasing the efficiency of the oxidative process. EXCEL Scholar **Alexander Goergen '08** had the opportunity to spend two months at UNSW with Mylon. He has been attempting to use nZVI to reduce perchlorate, a possible endocrine disruptor that has been detected in the groundwater in more than 25 states.

With support from a National Science Foundation Instrumentation grant, Mylon was able to acquire a state-of-the-art light scattering instrument capable of performing simultaneous static and dynamic light scattering measurements. With this, he will continue to study aggregation phenomena in aquatic systems. **Katherine Buettner '07** did her senior thesis examining the factors that affect the stability of cerium oxide nanoparticles. She presented her findings at the national meeting of the American Chemical Society in Chicago.

Currently EXCEL Scholar **Claudia Rinciog '10** is completing this project.

**Alison Paul '07** performed independent research on the effects that naturally occurring organic matter have on the photo-induced degradation of ibuprofen. This is particularly important research because pharmaceuticals have been detected in the drinking water supplies of 24 major metropolitan areas affecting more than 41 million people. In a joint project with **Laurie Caslake** of the biology department, **Christine Fitzherbert '08** is examining some factors that control copper limitation in denitrifying bacteria. Her work seeks to understand trace metal acquisition by bacteria in suboxic systems.

Mylon continues to be part of an NSF-funded collaboration with faculty from biology, chemical engineering, and civil engineering. They are developing a novel method for the remediation of perchlorate contaminated waters. So far, this project has supported research opportunities for 10 students. The most recent results of this research were presented in December 2007 at the national meeting of the American Geophysical Union in San Francisco.

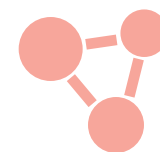
### Chip Nataro

#### Associate Professor

The research that has been performed in Nataro's lab since the last newsletter has enabled him to have some wonderful links to the past. This started in March of 2007 at the ACS national meeting in Chicago. At this meeting Nataro's graduate advisor, Robert Angelici of Iowa State University, was presented with the Distinguished Service in the Advancement of Inorganic Chemistry Award. Nataro was one of six speakers at the symposium in Angelici's honor, the only one from an undergraduate institution. Three of Nataro's students, **Annalese Maddox '07**, **Dan Jarem '07**, and **Jim Berstler '08**, came to the meeting and presented their research in poster sessions. At the conference they visited with former group members **Chris Thomas '01**, **Dan Ruddy '03**, **Abby O'Connor '03**, and **Alison Campbell '04**. Nataro saw Abby again at the Organometallic Gordon Research Conference in Newport, R.I.

Work in Nataro's lab continues to focus on bidentate phosphine ligands with metallocene backbones. This work has been partially funded by the Petroleum Research Fund. As part of her senior thesis, **Lauren Sites '08** has been investigating how these ligands impact the ability of ruthenium hydrides to act as hydrogenation catalysts. This past summer, **Steph Fosebenner '10** and **Hilary Carroll '10** worked on preparing the selenium adducts of metallocene bisphosphine ligands while Jim Berster examined the coordination of these ligands to chromium, molybdenum, and tungsten centers. These metallocene bisphosphineselenides have displayed some very interesting reactivity and electrochemistry. For the foreseeable future, students in Nataro's lab will be investigating these

(continued on page 6)



## Faculty Update continued

compounds, looking at both the structures of the compounds and the reactions that they can perform.

### Charles Nutaitis

#### Associate Professor

Nutaitis' research is in the area of organic synthesis, focusing on the development of new synthetic methodologies utilizing sodium borohydride/carboxylic acid reagent combinations, the preparation of new heterocyclic ring systems, and the total synthesis of natural products.

Since the last newsletter (Fall 2006), four students have conducted research in the Nutaitis group. **Ashley Posey '07** worked on the optimization of the synthesis of 7-aminoquinoline, **Thao Nguyen '07** researched the selective sodium borohydride reduction of ketones with different electronic properties, **Kyle Modes '08** studied the reduction of thiazolyl alcohols with sodium borohydride/trifluoroacetic acid, and **Vijay Ramdeen '08** pursued the synthesis of novel paracyclophane molecules.

A research project based on the work of a previous Lafayette graduate has come to completion. **Kimberly Smith '05** co-authored the manuscript "Preparation of Novel Quino[3,4-c]-, Quino[4,3-c]-, Quino[5,6-c]-, Quino[6,5-c]-, and Quino[7,8-c][2,7]naphthyridine" which was published in the journal *Organic Preparations and Procedures, International*.



### Jennifer Rutherford

#### Assistant Professor

Rutherford joined the chemistry department as an assistant professor in the fall of 2007. Prior to her arrival, she had been a principal scientist in chemical research and development at Pfizer Inc. in Groton, Conn. During five years at Pfizer, she worked as a physical organic chemist in the Technology/Automation group, implementing, utilizing, and disseminating new technologies in the process research and scale-up environment. Her contributions included development work

on asymmetric hydrogenations, palladium-catalyzed bond-forming reactions and flow chemistry.

Jennifer received her B.S./M.S. from Bucknell University in 1995, from a four-year joint degree program. She was a Goldwater Scholar. She completed her Ph.D. from Cornell University in

2000 with Professor David Collum, studying the structure and reactivity of organolithium species. As an NIH postdoctoral fellow at the Massachusetts Institute of Technology with Professor Stephen Buchwald, she applied the palladium-catalyzed  $\alpha$ -arylation of ketones to the synthesis of indoles.

Her research program at Lafayette will focus on pharmaceutically relevant synthetic chemical transformations, studied from a physical organic perspective. Palladium-catalyzed bond-forming reactions are groups of reactions that are frequently utilized as synthetic tools, yet little is understood mechanistically. It is typically necessary to screen a multitude of reaction conditions and many different variables to optimize a specific desired reaction. Rutherford's research aims to understand these types of transformations through systematic structural and reactivity studies and develop predictive, mechanistic models for these reactions. Spectroscopic tools, such as *in situ* ATR-FTIR and UV spectroscopy, will be utilized. **Jeffrey Bratz '10**, a B.S. biochemistry major, will conduct research in the Rutherford laboratory as an EXCEL scholar in the summer of 2008.

### Joseph Sherma

#### Larkin Professor Emeritus

Sherma continues an active research program working with students in analytical method development using quantitative high performance thin layer chromatography. A second research area involves collaboration with **Bernard Fried**, Kreider Professor Emeritus of Biology. Nine papers with student co-authors resulting from this research were published during 2007 and 2008. Current students who have co-authored one or more of these papers are **Daniel Massa '08**, **Karen Murray '08**, and **James Vasta '10**. **Mark Brown '10** and **Jessica Counihan '10** have papers submitted for publication. In addition, Karen Murray (in 2006), Dan Massa (in 2007) and Jim Vasta (in 2008) presented at the Student Award Symposium sponsored by the Chromatography Forum of the Delaware Valley at Mid-Atlantic Regional ACS meetings.

Sherma and Fried's interdisciplinary research program in analytical chemistry and invertebrate biology has been supported for the past seven years by Camille and Henry Dreyfus Foundation Senior Scientist Mentor Program awards. A 2007 invited journal article describing in detail the Sherma and Fried collaborative program over the past 20 years and listing many of their publications with former and current research students is available at [http://www.soc.nii.ac.jp/scs/Journal/pdf/28-3\\_137.pdf](http://www.soc.nii.ac.jp/scs/Journal/pdf/28-3_137.pdf).



## Recent Faculty Publications

**Yvonne M. Gindt, Frank B. Cortazar '07**, Olga Sokolova, Christine Cecala, Anand Gopal, Carla McDowell-Buchanan, Aziz Sancar, and Johannes P.M. Shelvis, "Resonance Raman Spectroscopic Investigation of the Light-Harvesting Chromophore in Escherichia coli Photolyase and Vibrio cholerae Cryptochrome-1" *Biochemistry* (2007) 46, 3673-3681.

**Tina H. Huang, Yvonne M. Gindt, Sarah L. Kahn '06**, and Gail Salter, "Redox titration of ferricyanide to ferrocyanide with ascorbic acid: illustrating the Nernst equation and Beer-Lambert law" *Journal of Chemical Education* (2007) 84, 1461-1463.

**William H. Miles, Daniela G. Duca '09, Jaryd T. Freedman '08, Elliot O. Goodzeit '08, Kristin B. Hamman '07, Chiquita A. Palha De Sousa '08, and Brandon R. Selfridge '06**, "Diastereoselective addition of organotitanium reagents to chiral  $\gamma$ -hydroxybutenolides" *Heterocyclic Communications* (2007) 13, 195-198.

**Steven E. Mylon**, Benjamin S. Twining, and Gaboury Benoit, "Potential Role of Copper Availability in Nitrous Oxide Accumulation in a Temperate Lake" *Limnology and Oceanography* (2007) 52, 1354-1366.

**Chip Nataro, Brenna L. Ghent '05, Sarah L. Martinak '08, Lauren A. Sites '08**, James A. Golen, and Arnold L. Rheingold, "Electrochemistry and complexation of Josiphos ligands" *Journal of Organometallic Chemistry* (2007) 692, 2365-2374.

**Charles F. Nutaitis and Kimberly A. Smith '05**, "Preparation of novel quino[3,4-C]-, quino[4,3-C]-, quino[5,6-C]-, quino[6,5-C]-, and quino[7,8-C][2,7]naphthyridine" *Organic Preparations and Procedures International* (2007) 39, 611-615.

**Jennifer L. Rutherford**, Crystal G. Bashore, Michael G. Vetelino, Michael C. Wirtz, Paige R. Brooks, Heather N. Frost, Ruth E. McDermott, David C. Whritenour, John A. Ragan, Teresa W. Makowski, Steven J. Brenek, and Jotham W. Coe, "Enantioselective Synthesis of Nicotinic Receptor Probe 7,8-Difluoro-1,2,3,4,5,6-hexahydro-1,5-methano-3-benzazocine" *Organic Letters* (2006) 8, 5947-5950.

**Joseph A. Sherma, Bernard Fried, and James D. Vasta '10**, "High performance thin layer chromatographic analysis of neutral lipids in the urine of BALB/c mice infected with *Echinostoma caproni*" *Parasitology Research* (2008) 102, 625-629.

## Perspectives on 20 Years Biochemistry at Lafayette

By H. David Husic

The spring of 2008 marks the 20th anniversary of the establishment of a major program in biochemistry in the Department of Chemistry at Lafayette College. Lafayette is in the early stages of the implementation of an exciting and ambitious college-wide strategic plan that includes an emphasis on the life sciences with a focus on new and enhanced interdisciplinary approaches to studying the life sciences. It is an appropriate time to look back at the development of the biochemistry major program from a historical perspective, reviewing its strengths and successes and how it has impacted our department.

In 1988, we initiated the program's development with the establishment of the A.B. degree in biochemistry, followed two years later by the B.S. biochemistry major. Administered by the Department of Chemistry, both major programs offer a strong breadth in both chemistry and biology in addition to the three biochemistry courses required in the curriculum; the A.B. program offers greater flexibility than the B.S., with fewer specific course and laboratory requirements. Since the first biochemistry degree was awarded in 1990, biochemistry majors have made up 47 percent of our departmental majors. As new chemistry faculty members were recruited during those years, we were cognizant of the interest of many of our majors to carry out collaborative research with faculty whose areas of research are relevant to biological chemistry and the life sciences; in fact, most of the faculty members in the department include such an area among their research interests.

Through 2007, 118 students graduated with majors in biochemistry, with 77 percent choosing the B.S. degree. Of these students, 28 earned departmental honors and 55 co-authored at least one published article with Lafayette faculty. Five biochemistry majors have been awarded prestigious Goldwater Scholarships since 2003. We have been especially proud of the accomplishments of our graduates, which we believe offer compelling evidence of the overall success of the major in the preparation of our students for their future endeavors. After leaving Lafayette, 47 percent of our biochemistry graduates have entered graduate-degree programs and another 23 percent have entered medical-degree programs. The remainder have found employment in the chemical/pharmaceutical industry, education, and a variety of other diverse occupations. Of those numerous graduates seeking graduate school admission, all have been successful in their attempts to gain entry into Ph.D. or M.S. programs in chemistry, biochemistry, medicinal and pharmacological chemistry, microbiology, immunology, forensic science, plant biology, biophysics, oceanography, and other areas. In addition, over 95 percent of our graduates seeking medical school admission have been ultimately successful in achieving that goal. In general, these high levels of achievement and success are similar for students majoring in our departmental chemistry major programs as well.

We are confident that the success of our graduates will continue in the future and optimistic that the college-wide life sciences initiative will increase even further the opportunities for students interested in biochemistry and related areas. As always, we especially welcome and value the comments and recommendations of our alumni as to how we can best continue to enhance the opportunities for our students in all of our departmental programs in the coming years.

H. David Husic is the John D. and Frances H. Larkin Professor of Chemistry



### Leigh Anne Alexander

A.B. Chemistry  
Working for Trevigen

### Benjamin Arthur

A.B. Biochemistry  
Sigma Xi  
Beth Israel Medical Center

### Michael Brown

B.S. Biochemistry  
M.D. candidate at UMDNJ

### Katherine Buettner

B.S. Chemistry  
Magna Cum Laude  
Honors in Chemistry  
Sigma Xi  
Phi Lambda Upsilon  
Pi Mu Epsilon  
American Institutes of  
Chemists Award  
EPA Fellowship  
Ph.D. candidate at Yale  
University

### Frank Cortazar

B.S. Biochemistry  
Summa Cum Laude  
Honors in Chemistry  
Sigma Xi  
Phi Lambda Upsilon  
American Chemical Society  
Prize  
American Chemical Society  
Division of Polymer  
Chemistry Award  
Goldwater Scholarship  
M.D. candidate at Miami  
University

### Matthew Coughlin

B.S. Chemistry  
Summa Cum Laude  
Honors in Chemistry  
Sigma Xi  
Phi Lambda Upsilon  
Pi Mu Epsilon  
American Chemical Society  
Undergraduate Award in  
Analytical Chemistry  
William Forris Hart ('27)  
Chemistry Prize  
J. Hunt Wilson 1905 Prize in  
Analytical Chemistry  
Goldwater Scholarship  
Ph.D. candidate at Harvard  
University

### Kristin Hamman

B.S. Biochemistry  
Sigma Xi  
Working for Millennium  
Pharmaceuticals

### Daniel Jarem

B.S. Chemistry  
Magna Cum Laude  
Honors in chemistry  
Phi Lambda Upsilon  
Ph.D. candidate at Brown  
University

### Annalese Maddox

B.S. Chemistry  
Ph.D. candidate at the  
University of Vermont

### Nathaniel Mast

A.B. Chemistry  
Working for Tyco Health

### Thao Nguyen

B.S. Chemistry  
Ph.D. candidate at the  
University of Maryland

### Jillian Nickel

A.B. Chemistry  
Lombardi Cancer Center  
M.S. candidate at Georgetown  
University

### Allison Paul

B.S. Chemistry  
Ph.D. candidate at Florida State  
University

### Ashley Posey

B.S. Biochemistry  
Working at St. Luke's Hospital  
M.S. candidate at DeSales  
University

### David Shellhamer

B.S. Chemistry  
Summa Cum Laude  
Honors in chemistry  
Sigma Xi  
Phi Lambda Upsilon  
Carl J. Staska Prize  
Ph.D. candidate at the  
University of Illinois

### Bradley Wertheim

B.S. Biochemistry  
Honors in chemistry  
Sigma Xi  
Phi Lambda Upsilon  
Merck Index Award  
M.D. candidate at Harvard  
University

## Alumni Update

**Donald W. Landry '75**, M.D., Ph.D., gave the Dean's Distinguished Lecture in the Clinical Sciences at Columbia University Medical Center.

**Christine M. Thomas '01** was appointed assistant professor of chemistry at Brandeis University. She will begin in July.

**Abby R. O'Connor '03** completed requirements for her Ph.D. at the University of North Carolina, Chapel Hill. She will do her postdoctoral studies with Karen Goldberg at the University of Washington.

**Daniel A. Ruddy '03** completed his Ph.D. work at the University of California, Berkeley. He will start work for Dow in Michigan this summer.

## THE LAFAYETTE Experience

- Student-focused teaching and mentoring by an exceptionally qualified faculty, committed to each student's success.
- A challenging, broad-based academic curriculum that offers strong programs in the liberal arts, sciences, and engineering.
- A small college environment with large college resources.
- A friendly residential community offering an exciting social life with a broad spectrum of extracurricular activities.