



# Department of Chemistry

## Newsletter 2001



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## ● A Year of Change Launches Department's New Vision

2001 has brought sweeping changes and many successes to the chemistry department. From extramural funding to a new strategic plan for the department, faculty and students have exceeded expectations for excellence, and the department has set even higher standards for the years to come.

The chemistry faculty had a very fruitful year in securing extramural funding; we have reached a record high of \$3 million this year and have done so from a diversity of sources. We have also hired three new faculty members who will greatly strengthen our academic and research programs. The department now has a team in place to generate a first-rate curriculum for our science, engineering, and technology students. The team also will implement student-oriented undergraduate initiatives that proactively recruit, nurture, advise, retain, and graduate chemistry majors.

Through our Chemistry Scholars program and our focus on student life, we have recruited excellent chemistry students to UAB this year, and we have seen a significant increase in the number of declared chemistry majors. With this fall's conversion to the semester system, a major revision of the graduate curriculum has been implemented. We also initiated an assessment of our undergraduate program through an exit questionnaire that students complete upon graduation. This questionnaire is designed to show us student perceptions of program strengths, weaknesses, and overall quality. These efforts focus on our goal of offering premier undergraduate and graduate programs.

The much-anticipated conversion to the semester system has created concerns about adverse changes in credit-hour production and the adequacy of our laboratory facilities. The three-quarter general and organic course sequences have been reformatted into two-semester sequences, with a subsequent loss

of one credit for each sequence. The lecture and laboratory portions of all 100- and 200-level courses will now be offered with separate credit. To counter possible losses in credit-hour production due to student scheduling conflicts, we are offering multiple sections of the high-demand, lower-division courses.

However, the new semester's early and orientation registrations have produced higher than expected enrollments in the lower-division courses, and we are faced with an inadequate amount of laboratory and lecture-hall space to meet semester enrollment demands. This will really hit us hard in the spring 2002 semester, when the full complement of lower-division sequence courses will be offered—and watch out for fall 2002. We have addressed this facilities crisis by requesting a lower-division addition to the north of the Chemistry Building, with renovation of the third floor to focus on the upper-division laboratories.

The department's 2000-2005 strategic plan, completed and adopted this year, has allowed us to articulate our vision for the department's future, with goals and objectives, established benchmarks and timelines, and a mechanism for monitoring and assessing progress. Because strategic planning is a dynamic process, we have a lot to do collectively over the next five years to take the department to new heights of distinction and to make the appropriate adjustments for unanticipated internal and external changes. However, we have an outstanding faculty who are committed to this vision; they have the "can do" spirit required to make our goals a reality.

I hope you enjoy reading this issue of the newsletter and catching up on what is going on in your department. We always like to hear from you and welcome your support. All our best wishes to you for 2002.

—Larry K. Krannich, Chair

## New Faculty Join the Chemistry Crew

Three faculty were hired for key positions in the department after an extensive nationwide recruiting process. Assistant Professor Jacqueline Nikles, Ph.D., assumed the position of coordinator of undergraduate organic chemistry instruction in June. Assistant Professor Christina Borgford-Summerlin, Ph.D., was appointed to coordinate student recruitment, advising, and retention for the department. Both Nikles and Borgford-Summerlin will work with Joe March, Ph.D., to develop a first-rate lower-division chemistry program that services the science, engineering, and technology students. Sergey Vyazovkin, Ph.D., joined us as an assistant professor in August. He brings to the department his expertise in model-free kinetics and thermal analysis, which will complement the department's materials research thrust and also afford him numerous collaborative opportunities at UAB.

## Annual Student Award Program Takes Off

The department recognized the accomplishments of undergraduate and graduate students during the second annual Student Awards Reception. The program spotlighted exceptional chemistry and non-chemistry majors and graduate students who have distinguished themselves in our courses,

programs, and curricula. Each of these students is key to our vision of being recognized as a premier department for providing an outstanding undergraduate and graduate education in chemistry. Jimmy Mays, Ph.D., the 2001 recipient of the Ireland Award for Scholarly Distinction, gave a brief presentation on his current research in green polymerization chemistry. The program's sponsor base grew this year (including the Alabama Section of the American Chemical Society; American Institute of Chemists Foundation; CRC Press LLC; Harcourt College Publishers; Prentice Hall; SOLEN, Inc.; and W. H. Freeman and Co.), and several representatives were present to offer their congratulations to the students and to present awards.

### Undergraduate Student Awards

- *Outstanding Introductory Chemistry Award*: Allyson Mobley
- *Outstanding General Chemistry Award*: Jared Parker and Lisa Nowoslawski
- *Excellence in Freshman Chemistry Award*: Heather Fujio, Marianthe Grammas, Phoenix Mann, and Yumi Vardaman
- *Outstanding Organic Chemistry Award*: Ebone Jenkins
- *Outstanding Performance in Inorganic and Physical Chemistry Award*: Karen Samples
- *American Institute of Chemists Award*: Nathan Smith
- *SOLEN Scholarship Award*: James Sasser

- *Outstanding Chemistry Undergraduate Student Award*: Cheryl Polley

### Graduate Student Awards

- *Phi Kappa Phi Nominees*: Haining Ji, Eric Johnson, and Jinchuan Yang
- *Samuel Barker Award Nominee*: Haining Ji
- *Alabama Section ACS Outstanding Graduate Student Fellowship Award*: Eric Johnson
- *Outstanding Chemistry Graduate Student Award*: Jinchuan Yang

## Annual Extramural Research Expenditures Reach \$3 Million

During the 2000-2001 term, the total annual extramural research expenditures for designated chemistry principal investigators reached an all-time high of \$3,000,000, which is the highest funding level for any department within the School of Natural Sciences and Mathematics. This achievement attests to the productivity, competitiveness, and entrepreneurship of the faculty and their commitment to aggressively seek external support for their research and graduate students. When additional annual extramural expenditures are added for chemistry co-PIs, the annual funds generated from external sources is roughly 1.5 times the annual state budget for the chemistry department. Faculty efforts to focus the research thrusts of the department, foster collaborative research ties, and assemble a critical mass of research personnel in target areas are paying off.

## Implementing an Improved Graduate Curriculum

The Department of Chemistry's Graduate Education Focus Committee has critically reviewed the current graduate curriculum, which has undergone only minor revisions in the last two decades. The committee recommended and the faculty unanimously approved a new graduate curriculum, which was implemented this fall. The new curriculum is developed around two foundation courses, each of which will be



Student Awardees (from left): Eric Johnson; Phoenix Mann; Marianthe Grammas; Cheryl Polley; Heather Fujio; Allyson Mobley; Ebone Jenkins; Haining Ji; Jared Parker; Yumi Vardaman; Lisa Nowoslawski; Karen Samples; Nathan Smith; Jinchuan Yang.

offered in alternate fall semesters. The Foundations I course concentrates on organic and inorganic synthesis and the methods of purifying and characterizing new compounds; the Foundations II course deals with molecular structure, equilibrium, and kinetic phenomena.

The advantages of the foundations curriculum are many. The courses would be offered every other year without exception, and the new graduate students would be exposed to the ideas and expertise of many of the research faculty over the two-year period. Laboratories (such as spectroscopy, computational, separations, and vacuum methods) would also be included as modules. This structure allows entering students to build comradeship by competing in the same courses and also uses faculty time efficiently. The courses would be team-taught by most of the graduate faculty; one faculty member would serve as a course master for each course and attend all lectures.

In addition to the foundations curriculum, four new core courses will be team-taught, in coordination with the respective foundation courses upon which each core course's content is built. Students will be required to take at least two of the four core courses, with their selections reflecting their research interests. Special short courses on literature search and seminar preparation will also be offered during the spring semester. These classes will prepare students for the literature seminar that will be offered in the summer term.

## Mays Wins Coveted Ireland Award

Professor Jimmy Mays, Ph.D., was recognized this spring as the recipient of the Caroline P. and Charles W. Ireland Award for Scholarly Distinction. UAB presents this award annually to a faculty member in the Schools of Arts and Humanities, Natural Sciences and Mathematics, or Social and Behavioral Sciences, for professional and academic achievements and contributions made to the university and the local community. The award comes with a \$5,000 honorarium, funded by an endowment established at UAB by Caroline Ireland and the late Charles W. Ireland. Mays was honored at a dinner and reception at The Club and gave an outstanding



Jimmy Mays wins the prestigious Ireland Award.

presentation entitled "Making Alphabet Soup with Polymers." He had a great turnout from members of his research group. The department is very proud of his many accomplishments and of the recognition this prestigious award gives to one of our faculty and to the department.

## New Chemistry Scholar Fellowships Awarded

This year four incoming first-year chemistry majors—Jullian Bonds, Sparkle Ellison, Jessica Phillips, and Heather Turner—were designated Chemistry Scholar Fellows and awarded four-year fellowships. They join the four fellows from last year, providing the department a cadre of Chemistry Scholars to assume peer teaching roles in the undergraduate program.

## Brewing a Chemistry Student Society

This year students majoring in chemistry took a big organizational step forward by forming a student group affiliated with the American Chemical Society. The UAB Student Affiliate American Chemical Society (SAACS) launched in late January with a pizza party, at which 25 majors and nearly all faculty members came together to discuss interests and plans for the group.

The society's well-attended meetings throughout the year focused on a range of topics: undergraduate research presented by Gary Gray, Ph.D.; a discussion of graduate research by chemistry grad students Troy Knight, Ben Davis, Stephanie Weiss, Dustin Myrex, Brandon Farmer, and Jennifer Butler; "The Chemistry of Brewing Beer" by Tracy Hamilton, Ph.D.; and "The Return of Frankenberg and Leegor: Chemical Demonstrations to Ask Your Professors About," presented by Lee Summerlin and Christie Borgford-Summerlin. SAACS officers for 2001-2002 are: Ryan Cantor, Chair; Daniel Killilea, Chair-elect; Nicki Thomas, Secretary; Khaldoon Barakat, Treasurer; and Eddie Reaves, Historian.

SAACS welcomes offers from alums to speak or to host a group to visit your workplace. The society is also planning a job fair for the spring semester and would welcome alums who are employed in industry to come and interview undergraduate and graduate chemistry majors for employment in their companies. Please contact Gary Gray at [gmgray@uab.edu] if you are interested in participating in any of these activities.



The annual fall picnic kicks off another year of good chemistry.

## Keep Tabs on Us

To keep up with faculty publications, grantsmanship, and other chemistry news, please visit the department's Web site at [www.chem.uab.edu].

# Five-Year Strategic Plan

Effective planning has proven to be one of the most important activities undertaken by the department. During 2000 and 2001, the faculty put effort into developing a new five-year strategic plan, "2000 and Beyond: Vision, Goals, Objectives, and Strategies for 2000-2005," that now serves as our vision for the department's future and a guide to a common direction and focus in our operations.

The planning document outlines the chemistry department's vision, mission, and guiding principles/core values statements, which are placed in the context of corresponding statements for the university:

## OUR VISION

The Department of Chemistry will:

- be recognized as a premier department for an outstanding graduate and undergraduate education in chemistry;
- double extramural funding, create stronger collaborations, and foster the designation of a center of excellence in specified thrust areas; and
- have a strong presence in the community through educational outreach, industrial interactions, and technical expertise activities.

## OUR MISSION

The Department of Chemistry is dedicated to providing scientific leadership, education, and development to the people of Alabama through quality teaching, research, and service. It assumes responsibility for:

- providing the best possible instruction to all its students;
- engaging in original and meaningful research; and
- providing service to the university community and society by making available the knowledge and expertise of its faculty.

## GUIDING PRINCIPLES/CORE VALUES

The chemistry faculty value:

- academic freedom and the role it plays in advancing excellence and cutting-edge contributions by the department in teaching, research, and service to the university community and society;
- community involvement in providing in-service courses/workshops to Alabama science teachers and expertise in assisting and collaborating with local industry;
- a diversity of ideas and people to advance excellence in education, research, and service and thereby strengthen society;
- premier education programs in chemistry that are accessible to a diverse community of learners and address their intellectual, professional, and ethical development;
- a cost-effective and efficient infrastructure that will empower high-quality teaching, research, and service activities;
- efforts to attract, mentor, and retain individuals who share our and the university's vision, are committed to

the mission of the department, and are valued for their contributions;

- a learning community of faculty, staff, and students who constantly strive to improve and advance the teacher/learning process in a setting that promotes the advancement of critical thinking skills;
- research as critical to the advancement of knowledge in the field of chemistry, the promotion of intellectual growth through teaching, and the maintenance of UAB as a top research university; and
- a responsible stewardship of our state and extramural resources and an ongoing assessment by all stakeholders to facilitate program and infrastructure improvements.

To develop this plan, several focus committees identified and addressed issues, objectives, and strategies that were then incorporated into the overall plan after review and adoption by a coordinating committee and the entire faculty. Discussions were serious, engaging, and sometimes frustrating, but they always centered on the chemistry department's vision and embodied a "we can do it!" spirit.

The plan targets five programs with specific goals and objectives for achievement during the next five years. These five programs challenge the department to have in place:

- student-oriented undergraduate initiatives
- high-quality teaching and research facilities
- premier undergraduate and graduate programs
- a mechanism for hiring, supporting, and motivating personnel
- a chemistry research program ranking in the NSF top 100.

Goals and objectives for each program are included in section III of this year's annual report.

Strategic planning is a dynamic process and is never really completed. Every year the plan needs to be evaluated. Coordinating and focus committees will be retained to address issues and help identify changing or new priorities that can modify the strategic plan. The coordinating committee will meet once a year to develop an annual operating plan for the department that operationalizes the strategic plan and projects or earmarks resources to commit to the plan. Input for this assessment will be provided by the focus committees and any other committees that have been formed to address parts of the strategic plan. Based upon this input and assessment, the coordinating committee will recommend appropriate adjustments be made in the implementation of the plan. Once a chemistry advisory board is formed, the coordinating committee will annually review the progress and assessment of the strategic plan with the board.

## Gobet Advincula

**Gobet Advincula, Ph.D.**, sends a warm welcome to the new members of his group, **Suxiang Deng** and **Prasad Taranekar**. “Both are bona fide organic synthesis enthusiasts!” Advincula says. “They will also become thin films people in no time.” The group has been progressing very well in terms of research direction, balanced with teaching responsibilities and academic requirements. “From the number of presentations and conferences we had, the last ACS spring meeting in San Diego tops them all! Twenty-one presentations were divided between eight attendees from the group, including **Akira Baba** who is doing a post-doc at the Max Planck Institute in Mainz, Germany. I gave several presentations—I will not tell how many, but it was a record—and chaired a session. It was fun and I enjoyed seeing Jason, Mi-kyoung, Chuanjun, Xiaowu, Derek, QingYe, and Akira all enjoying science in San Diego. They met a lot of people. What was the name of that cheap Italian place we went for dinner?”

Advincula’s group swelled during the summer—as usual—because of the influx of the students from different programs. Anthony Dale, a high-school student, came from a separate mentoring program within UAB. Elijah Kindred was with project SEED. Alaina Tarver and Jordan Madaris were with a mentoring program from the Department of Biomedical Engineering at UAB. Cara Monroe was back from the Alabama AMP program. “These students investigated ultrathin polymer films using the layer-by-layer technique,” Advincula says. “Hilary Spencer and Andrew Prussia were with the REU program. Andy went to Japan for three weeks as part of REU and the U.S.-Japan exchange program we have. Hilary was involved in organic synthesis.

“Khaldoon Barakat was a former organic chemistry student of mine who was crazy to join the group and do part of his senior research . . . and finally, Wally Blanton with Project SEED is back. Wally is a scientist masquerading as a high-school teacher

at Montevallo High. He has done an exceptional job of introducing high-school students to polymer thin films. He also has produced some scientific breakthroughs in investigating H-aggregation in oligothiophene ultrathin films! He and his advanced high-school chemistry



Graduate student Tim Fulghum spent most of the year in Japan.

students carried out a class project that was featured in *Shelby News*. When I gave a talk at Montevallo High, his students were just beaming with enthusiasm to learn about science as a career—a product of Wally’s enthusiasm and dedication as a teacher, no doubt.

“**Tim Fulghum** spent most of the year in Japan, but he returned this fall. He got some good results in Japanese! And **Chuanjun Xia** spent three months at the Max Planck Institute in Mainz, Germany, polishing his German.

“As for me, everything involves balancing, mentoring, writing papers and proposals, teaching classes, going to conferences, and other extracurricular activities, including the ACS local section. In terms of family life, Abigail and Paul are growing by leaps and bounds, and I just want to spend most of my weekends with them. Carolyn enjoys seeing them grow up. All in all, it was a year of challenges, growth, and blessings for us.”

## Christie Borgford-Summerlin

**Christie Borgford-Summerlin, Ph.D.**, is happy to report that there are more than 125 UAB chemistry majors pursuing degrees leading to graduate school, medical school, business, and industry. To those who have graduated, please send e-mail to [borgford@uab.edu] and let us know what you are doing! Borgford-Summerlin herself is teaching Chemical Problem Solving, Introduction to Chemistry, an MCAT prep course, and the cross disciplinary course for freshmen, U101. Her spare time is devoted to raising vegetables and flowers.

## Wayne J. Brouillette

**Wayne J. Brouillette, Ph.D.**, and his research group continue to work in the area of synthetic medicinal chemistry to develop potential new drugs. Brouillette was honored by his recent election as vice-chair (2001), chair (2002), and past chair (2003) of the national Division of Medicinal Chemistry (about 10,000 members) of the American Chemical Society. Duties as vice-chair this year include chairing the Division of Medicinal Chemistry Long Range Planning Committee, which plans all scientific programs for the division at national meetings.

Current research areas continue to include new antibiotics and antifungal agents, oral drugs for influenza and parainfluenza, and chemoprotective and chemotherapeutic agents for cancer. Students, postdocs, and staff chemists involved in these projects include:

- **Reddy Atigadda, Ph.D.**, a research associate who continues to work with **Donald Muccio** and Brouillette on the retinoid (vitamin A) project. Reddy has recently been involved with scale-up synthesis (up to 50 grams of product) of retinoids for feeding studies in rats, which isn’t his favorite activity. Reddy is now assisted by a new postdoctoral fellow, **Riaz Khan, Ph.D.**, who joined us in September.

- **Liyuan Mou, Ph.D.**, who joined the group as a postdoctoral fellow last year. Liyuan completed a synthetic chemistry postdoctoral position in England before coming to UAB in July 2000. She works on the antibacterial drug project and has become quite good at solution phase parallel synthesis.
- **Sadanandan Velu, Ph.D.**, a staff chemist who is working on the antibacterial drug project and acts as the senior chemist in that capacity. Sadanan attended the National ACS meeting in Chicago in August to present progress for his research. He recently had to sharpen his cooking skills when his wife, Anitha, underwent major surgery. Everyone is pleased that Anitha has now fully recovered.
- **Kim Vines, Ph.D.**, who recently completed her doctoral studies on the retinoid project (joint with **Donald Muccio**). She successfully defended her dissertation and now works as a synthetic chemistry postdoctoral fellow at the University of Mississippi under Mitch Avery, Ph.D. At UAB Kim developed several compounds that are selective for nuclear retinoid receptor subtypes, and one has exhibited good activity in rat models for breast cancer chemoprevention.
- Ph.D. student **Eric Johnson**, who is completing his dissertation research work—the only hurdle between him and that degree. Eric continues to work on a project involving solution phase combinatorial chemistry (if he ever gets the key intermediate!) as applied to the design of new drugs that target influenza or parainfluenza neuraminidase.
- **Stephanie Weiss**, a Ph.D. student associated with the pharmaceutical design program. Stephanie is working on the antibacterial drug project (inhibitors of NAD synthetase). She is now buried in the library, working on the second part of her qualifying examination for the Ph.D. degree, which is the original research proposal. This year Stephanie spent two quarters directing a senior research project for an undergraduate, Ryan Cantor.
- Ph.D. student **Ben Davis**, who is also a pharmaceutical design program student. Like Eric, Ben works in the lab on new inhibitors of influenza and parainfluenza neuraminidase. He has been directing an undergraduate research student, Whitney Beysse, for the summer.

## Juan Pablo Claude

The Claude group had a strong surge in members this year. **Troy Knight**, a Birmingham-Southern College graduate, joined the group last fall to do some semiconductor nanoparticle research. Troy has been extremely active in his research for a first-year graduate student and was awarded a NASA Fellowship. Congratulations! Troy's research has dealt with the synthesis and electrosynthesis of CDs particles within block copolymer micelles. Troy is also succumbing to the siren calls of photophysics, and he will undertake some research projects in this area in the coming year.

**John Vesely** (a UAB Chemistry graduate), and **Kerry McElvey** also joined the Claude group last fall. Both John and Kerry were initially interested in photophysics and laser spectroscopy and started projects in that area. Unfortunately, the golden shimmer of a "real job" lured John away from us, and Kerry decided her real calling was for mathematics. Both John and Kerry will be missed.

**Arun Narayanaswamy, Ph.D.**, came to us in October 2000 from the Indian Institute of Technology in Bangalore, India, as a postdoctoral fellow. He is also working in the NASA-

funded semiconductor nanoparticles project, and he has made exciting contributions to our synthesis protocols. Arun has fine-tuned the group's methods and can now reliably prepare fairly monodisperse samples of CDs quantum dots.

**John Kestell**, the senior student in the group, clearly sees the carrot at the end of his Ph.D. stick and is moving in full force towards that goal. He conducted some important experiments dealing with emissive properties of a metal complex at very low temperatures and in different solvent mixtures. Now that the data has been fully analyzed, we are convinced that these experiments represent the first observation of quantum beats in condensed phase. The origin of this observation is the periodical nature of the vibronic overlap between the ground and excited states as the energy difference between them is varied by the medium or temperature.

The Claude group also had the pleasure of having Deon Thompson, a summer REU student from Indiana, and Kimberly Walker, an AMP student from Mississippi. Deon and Kim were enthusiastic students who brightened up our summer in the laboratory. We certainly hope they will return next year.

On the personal side, **Juan Pablo Claude, Ph.D.**, took a summer off from teaching, allowing him to spend some time in the laser lab playing with his favorite toys. During the rest of the year, his teaching included General Chemistry III, Advanced Inorganic Chemistry, and his favorite: Photophysics for Graduate Students. This year photophysics had an unprecedented enrollment of six students, making the lectures a pleasure.

## Gary Gray

**Gary Gray, Ph.D.**, has a number of new faces in his research group this year. **Cheryl Polley**, **Jon Threadgill**, and **Jennifer Butler** completed their undergraduate research in the last year, and all three received their degrees at the June 2001 commencement. Cheryl was the outstanding undergraduate chemistry major, and both Jon and Jennifer successfully defended their honors research projects. Cheryl is currently working with **Christie Brouillette, Ph.D.**, in the Center for Biophysical Science and Engineering. Jon entered the UAB School of Dentistry this fall, and Jennifer started the Ph.D. program in chemistry at UAB during the summer quarter.

**Sam Owens**, a Ph.D. student in the group, left the program after the fall 2000 quarter and is now working at Avanti Polar Lipids. **Dustan Myrex** and **Susan Green**, two first-year Ph.D. students, joined the research group this year, and **Reham Abou-Elkhair**, an M.S. student, spent one quarter in the group before moving to Atlanta with her husband. Two undergraduates, **James Sasser** and **Reggie Freeman**,



John Kestell is headed toward the doctoral finish line.

also carried out undergraduate research projects during the last year. James finished his project at the end of the summer 2001 quarter; Reggie will continue to work on his project during the coming year. Tina Duffey, Ph.D., spent the fall 2000 quarter here on sabbatical from Samford University and reorganized the X-ray crystallography facility. She and four Samford undergraduate students continued her X-ray crystallography work during the winter and spring 2001 quarters and were able to solve four X-ray crystal structures for an undergraduate research project. Houston Byrd, Ph.D., and Jeremiah Harden from the University of Montevallo spent the summer at UAB, supported by the NSF-REU program.

Jennifer Butler, Jon Threadgill, Reham Abou-Elkhair, and Reggie Freeman each carried out research in the metallacrown ether project. Jennifer has continued her studies of an unsymmetrical metallacrown ether derived from 2,2'-biphenol. She has demonstrated that this ether binds lithium tetraphenyl borate in an unusual manner, and she is currently attempting to determine how this binding occurs using a combination of X-ray crystallographic and NMR spectroscopic studies. Jon studied the metal binding properties of tetracarbonylmolybdenum- and dichloroplatinum-metallacrown ethers and was able to demonstrate that the ethers are extremely metal selective. Reham initiated and Reggie has continued work on the synthesis of a new phosphine-substituted crown ether closely related to some of the ligands used in the synthesis of the metallacrown ethers. All of the metallacrown ethers research is funded by a grant from the American Chemical Society's Petroleum Research Fund.

Houston Byrd, Jeremiah Harden, and Dustan Myrex have worked on various aspects of the poly (alkylene phosphate) project. Houston and Jeremiah are attempting to perfect the method for nonoxidative chlorination of the polymers. Dustan is preparing new polymers via the transesterification of dimethylphosphonate and a variety of diols for various applications, including surface modification and the controlled release of biological materials.

Research has continued on metal-organic nonlinear optical materials in collaboration with **Chris Lawson, Ph.D.**, a UAB professor of physics, and **Wenfang Sun, Ph.D.**, a research assistant professor of physics at UAB—and the work has been very productive. Reggie Freeman and Susan Green are continuing to synthesize new pentaaza macrocyclic complexes for use as nonlinear optical materials. Susan and James Sasser are preparing new face-to-face bimetallic complexes that may have applications as third-order NLO materials. The project is funded by the Army Research Office as part of the DEPSCoR program. Wenfang will be leaving the project shortly to take a position as an assistant professor of chemistry at North Dakota State University. This is a great compliment to her research abilities, and we are proud of her.

All the members of the Gray family are keeping busy. Gary Gray led small group studies of Salvation History in the Old Testament and of a book entitled *Finding Darwin's God* at Our Lady of Sorrows Catholic Church during the last year. Rita continues to work as a research associate in the Center for Biophysical Science and Engineering at UAB. She currently has several experiments involving protein crystallization running on the International Space Station. Rita also served as a catechist for the eighth-grade confirmation class

at Our Lady of Sorrows last year. Erin, now 17, is a senior at Vestavia Hills High School this year and currently considering which college to attend. Caitlin, now 14, is looking forward to starting ninth grade at Vestavia Hills. She won two trophies in Math Team tournaments last year at Pizitz Middle School and anticipates competing on the high-school math team this year. Both girls fill their spare time with piano lessons and playing with their new cat, Purrl.

## Tracy P. Hamilton

**Tracy P. Hamilton, Ph.D.**, had a relatively quiet year. He has just finished the third and final year of the NSF-funded REU (Research Experiences for Undergraduates) program. This program involved a lot of meetings and activities with the 10 visiting students, which was fun but time consuming. The students had a good experience, except for delays in getting paid. "They were a great bunch of kids," Hamilton says, but he adds that submitting the competitive REU site renewal to NSF left him feeling like a truck had run over him.

One feature that makes the UAB Department of Chemistry different from most others is that faculty from local universities also participate in the REU program. They receive support from the NSF grant and from their universities to conduct research in UAB laboratories. This helps them maintain research projects—something that is increasingly factored into tenure decisions even at liberal arts schools. Their research takes more effort during the academic year because of infrastructure obstacles and time demands. The program benefits UAB by developing collaborations with the visiting faculty, who are also excellent mentors to the students.

The students this summer were nine juniors and two sophomores, mostly from within Alabama or very close to it: Bill Hancock, Alisa Hicks, Deon Thompson, Carla Ayala, Reggie Freeman, Hilary Spencer, Andrew Prussia, Jeremiah Harden, Whitney Beysse, Khaldoon Barakat, and Roy Schleicher. The visiting faculty were David Garza, from Samford University, and Houston Byrd from Montevallo.

Some of the work that Morgan Ponder from Samford has been doing in the lab has been written up. This is continuing work on the structure of the retinoids that **Donald Muccio** and **Wayne Brouillette** have made in their drug design program. The parallel computer is actually able to make good calculations on the whole molecules (not models) in a reasonable amount of time. Hamilton also did a few calculations with **Gary Gray** and **Jennifer Butler** on why an unsymmetric diol was holding water so strongly. Now that Jennifer is a grad student, she will be encouraged to come in and learn how to do the rest of the calculations. A paper on a method to save about 20 percent in computer time in many high-level quantum chemistry calculations will finally be submitted this year. That is a lot of time saved when you think of how many people are running jobs. It turns out that there can be such a thing as a free lunch!

On the peroxyxynitrite front, Hamilton attended a Memorial Day conference at a place in Asilomar, California, with no televisions in the rooms. The conference was the only entertainment, unless you count deer and other wildlife and the ocean beach.

Hamilton's family is doing well and growing up fast. Jackie has been playing a lot of tennis and doing some volunteer work. She works at Player's Choice—a store devoted

exclusively to tennis. Jennifer went to the Rose-Hulman Institute of Technology (a private engineering school in Terre Haute, Indiana) in civil engineering last fall, and she returned this year as a mechanical engineering major. She traveled to Prague this fall to visit a friend (and UAB student) who is doing an overseas program there. She is working at the Outback Steakhouse in Terre Haute for spending money, so she is quite busy. The poor box outside Hamilton's office door didn't get many contributions last year. Oh, well. Joseph, 9, is in fourth grade and was on swim team this summer. He is also in a kids tennis league called Rally Ball.

One final note: Hamilton's fall seminar, "The Chemistry of Brewing Beer," set an attendance record for chemistry seminars. He sends "best wishes to all, for whatever season the newsletter finally comes out in!"

## Larry Krannich

**Larry Krannich, Ph.D.**, was delighted that the final phase of the department's five-year strategic plan was completed and approved by the coordinating committee and departmental faculty. "Collectively we have a lot to do to achieve the goals and objectives established between now and 2005, but we will get it done," he says. After a couple of years of planning and being part of the Semester Conversion Project Team, he was very happy to see fall semester 2001 arrive. "For chemistry, semester conversion occurred without a scheduling hitch, but our laboratory facilities were exhausted for both general and organic chemistry in the fall. We anticipate a reoccurrence of this in the spring semester and will probably offer the lab courses during a May term to accommodate student needs. Twenty-seven-year-old laboratories designed at a time when undergraduate enrollment was about 3,000 on a quarter system just cannot accommodate current enrollments on the semester system. Thus, this year has been spent trying to gain commitments for the construction of an addition to the Chemistry Building that would provide laboratory space to meet the long-range needs for the lower-division chemistry program, general large lecture hall space, and laboratory space for biology, which is also facing a lab space crunch in the semester system. No doubt we will be feverishly working on this all next year.

"This fall turned into a grant-writing time, with a renewal being submitted in September for the highly successful NSF GK-12 program. That process occurred almost simultaneously with an NSF site visit, which went very well. We also submitted an Undergraduate Scholars project to the Howard Hughes Medical Institute for a four-year program of scholarships to support advanced undergraduate students in biology and chemistry who are involved in the K-12 science edu-



Department Chair Larry Krannich oversaw development of the strategic plan.

cation outreach programs. This involves leveraging NSF funds to provide unique opportunities for our undergraduates. Meanwhile, writing still continues on several manuscripts from our research with **Dr. Omar Kekia.**" 2002 should be busy with a planned retirement that targets early spring 2003.

## Joe L. March

**Joe L. March, Ph.D.**, worked the last year to convert our general chemistry program to the semester system. "The conversion has required us to evaluate our program and determine how we will provide students with enough breadth so that we can consider our course a general chemistry course," he says. "What to leave in and what to leave out has been a very arduous task, but we feel that we've met the challenge.

"The biggest decision was to change textbooks to *Chemistry: The Molecular Science*, authored by Moore, Stanitski, and Jurs. This text uses a conceptual approach to the traditional topics and includes many real-world applications of chemistry. It is very readable, and students are commenting favorably on the change.

"The laboratory course has also undergone a dramatic change: It is now separated from the lecture course. Students will receive a separate grade for the two components of the General Chemistry program—allowing us to focus on new laboratory skills. We will be able to use the laboratory to teach investigative skills to students, rather than simply to support and demonstrate the topics introduced in the lecture hall. This approach will strengthen our program and will better prepare students for other laboratory experiences."

March completed his project with Addison Wesley Longman (AWL) this year. The project prepared online tutorials for AWL's preparatory chemistry textbooks. These tutorials are now included as the companion Web site for all three of AWL's preparatory chemistry textbooks.

March is still working on online material for our students. He and **Larry Krannich** have become extensive users of WebCT, an online course management tool. They've entered more than 1,200 questions, and students are completing all of their graded homework assignments over the Web. The system provides students instant feedback on their progress and, surprisingly, encourages faculty interaction with students.

March completed his tenure as local section secretary of the Alabama Section of the American Chemical Society this year. The work was interesting and challenging. The section established an e-mail distribution list to communicate rapidly with our members, and March hopes that you will contact the local section to receive news and notes.

"On a personal note," says March, "my family expanded by one this past year. Caelan Victor March joined us on January 1, 2001. He has been a joy. Madison has been into everything this past year, and she is very excited about having a brother to pester. Ann and I are doing well and look forward to every moment of rest we can get."

## Jimmy Mays

It looks like 2001 will be the last full year for **Jimmy Mays, Ph.D.**, in the UAB Department of Chemistry. The University of Tennessee (UT) and Oak Ridge National Laboratory (ORNL) will move his group to Knoxville early next year, where he



Jimmy Mays, here with members of his group, will be sorely missed when he leaves UAB in 2002—but his collaborations with UAB will remain.

will be distinguished professor at UT and distinguished scientist at ORNL. "It has been a great 14 years in Birmingham, and UAB has been enormously supportive in facilitating the development of our programs in polymer chemistry," says Mays. "I hope to be appointed as adjunct faculty so that I can remain involved with the department as it continues to work toward even higher levels of achievement and productivity. I will greatly miss Birmingham, UAB, and all my friends there. However, I anticipate continued collaborations, visits, and other interactions well into the future."

## Donald Muccio

**Donald Muccio, Ph.D.**, and his laboratory have been very active this year. His laboratory has been involved with five new NIH or foundation grants starting in the academic year 2000. **Brandon Pybus** (a Ph.D graduate student) is studying the mechanism and substrate specificity of NAD synthetase, a key enzyme of the pyridine nucleotide pathway. He has made significant progress in characterizing the enzyme's kinetic and inhibition parameters for this enzyme, and he has made several presentations at scientific meetings on his progress. **Yi-Chien Lee** (a Ph.D graduate student) finished the third project for his Ph.D. dissertation and graduated in the spring of 2001. He used transferred NOE NMR techniques and molecular modeling to understand the protein bound conformation of deamido-NAD, a substrate of NAD synthetase, and NAD, one its products. Yi-Chien is now a postdoctoral student in the Department of Medicine; he is using magnetic resonance imaging to study cardiovascular disease. **Mike Jablonsky** (NMR Facility director) is working on several NIH-funded projects for the Muccio laboratory. In collaboration with Roswell Pfister, M.D., a noted ophthalmologist at Brookwood Medical Center in Birmingham, he is carrying out NMR and CD studies on tripeptides that are important in alkaline damage of the eye. Also, he is studying peptides important in the activation and regulation of a Cl<sup>-</sup> channel that, when mutated, results in cystic fibrosis in children (the CFTR channel). This work is in collaboration with **Kevin Kirk, Ph.D.**, in the Department of Physiology and Biophysics. **Pat Jackson, Ph.D.**, who was formerly with the Muccio laboratory and now has a research faculty position in physiology and biophysics, is also participating in this work.

Muccio and **Wayne Brouillette** have just started a new research initiative using retinoids as chemopreventive agents for breast cancer. Their new five-year NIH grant on retinoid design and synthesis for cancer chemoprevention is part of UAB's breast cancer SPORE—a grant from the National Cancer Institute that funds five research projects on breast cancer therapy and prevention. The project that the Brouillette and Muccio laboratory is directing includes **Clint Grubbs, M.D.**, and **Donald Hill, M.D.**, of the UAB Chemoprevention Center, as well as surgeon **Samuel Beenken, M.D.**, and **Kirby Bland, M.D.**, chair of the Department of Surgery and principal investigator of the breast SPORE. The synthetic work on this project is being conducted by **Reddy Atigadda**, who is a research associate in the laboratory under Brouillette's supervision. Reddy has made great strides in developing sufficient quantities of UAB retinoids for study in animals. One example, 9-cis-UAB30, is being tested in vivo in mice, and preliminary data show that it is very effective in preventing breast cancer. **Kim Vines**, a Ph.D. student working on the retinoids project, also was active in the synthesis of this analog, as well as other 9-cis-analogs of retinoic acid. Kim has now finished her dissertation and is busy studying as a postdoctoral student at the University of Mississippi. Another new grant from the Komen Foundation has just been received for additional studies on this important molecule for chemoprevention of cancer.

## Jackie Nikles

**Jackie Nikles, Ph.D.**, recently joined the department as coordinator of undergraduate organic chemistry. She comes from the University of Alabama in Tuscaloosa, where she was involved in research with her husband, David, to develop new materials for optical recording. She earned her doctorate in physical organic chemistry at Case Western Reserve University and completed a postdoctoral fellowship at Rutgers University. She and David, an associate professor of chemistry at the University of Alabama, reside in Tuscaloosa with their two children: Sarah, 14, and Daniel, 11. Sarah is an aspiring ballerina/veterinarian, and Daniel is a serious soccer player.

Nikles has spent most of her time at UAB on the conversion of organic chemistry from quarters to semesters and on learning the ropes. She's looking forward to several changes that are in place for the spring, including the addition of recitations for both Organic I and II. She is now busy incorporating WebCT materials into the undergraduate organic course.

## William K. Nonidez

"Again I am closing out another happy and successful year here at the old UAB chemistry department," says **William K. Nonidez, Ph.D.** "First I am celebrating the graduation of **Haining (Helen) Ji** with a Ph.D. degree. Helen has accepted a postdoctoral position with **Jimmy Mays** and hopes to knock out some high-grade research. I might also say that Helen was the chemistry department's nominee for the Sam Barker award for the outstanding graduate student at UAB.

"Meanwhile I am venturing into a new area—pyrolysis GC/MS spectrometry. Jimmy Mays and I were able to adopt an unwanted instrument from our friends in engineering, and, if we can keep it running for a while, we will be able to apply it to all sorts of problems in polymer analysis.

"Finally I am very pleased about the arrival of my new colleague **Sergey Vyazovkin**. Sergey is a true analytical chemist and brings a wealth of knowledge to us in the area of thermal analysis. It will be good to have another analytical chemist to talk to."

## Lee Summerlin

**Lee Summerlin, Ph.D.**, led the effort to write a highly successful new lab program, which is now in full swing. He has been enjoying the activities of the new chemistry student society, the UAB Student Affiliate American Chemical Society (SAACS), at which he and **Christie Borgford-Summerlin** gave the kick-off presentation, "Return of Frankenberg and Leegor: Chemical Demonstrations to Ask Your Professor About." His spare time is spent tilling vegetables.



Lee Summerlin demonstrates "some chemistry to ask your professor about."

## Sergey Vyazovkin

**Sergey Vyazovkin, Ph.D.**, joined the Department of Chemistry this year. He received his bachelor's and doctoral degrees from Belorussian State University and served as a research fellow at the Technical University of Vienna, a visiting professor at the University of Toledo, and a senior research

associate and research associate professor at the University of Utah before coming to UAB.

Vyazovkin's research interests are in fire-resistant polymeric materials, synthesis and properties of metallopolymers, thermal stability of pharmaceuticals, and mechano-chemical reactions of explosives. "We study structures, properties, and reaction mechanisms of the aforementioned materials using a variety of techniques, including IR- and mass-spectroscopy and thermal analysis techniques of TGA, DSC, TMA, DMA, and so forth," says Vyazovkin. "Kinetic analysis of thermal data plays the key role in our work. We use an original kinetic methodology called 'model-free kinetics.'"

## Charles Watkins

**Charles Watkins, Ph.D.**, served as associate dean for the School of Natural Sciences and Mathematics again this past year. "There were many challenges, such as semester conversion and state proration of funding, to make life interesting," he says. "It is gratifying to see the Department of Chemistry—and NSM in general—continue to grow in terms of grants and contracts, national visibility, and quality of programs." Watkins remains in the chemistry department on a half-time basis and this past year enjoyed teaching physical chemistry and the graduate NMR spectroscopy course. In collaboration with **Larry Krannich**, he presented a paper at the spring ACS meeting in San Diego on orthometalated aluminum-nitrogen dimers. Work continued on computer applications in the physical chemistry laboratory in collaboration with **Danny Miles, Ph.D.**, at Mount St. Mary's College in Maryland. Miles visited again this past summer and he and Watkins worked on some new kinetics experiments for physical chemistry. Papers were published with **Eric Styron**, a former Ph.D. student, and **Omar Kekia, Ph.D.**, a postdoctoral fellow from Dr. Arnie Rheingold's group at the University of Delaware.

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## Postdocs

### Durairaj Baskaran

**Durairaj Baskaran, Ph.D.**, a postdoc with **Jimmy Mays**, received his Ph.D. at the institute of physical chemistry, University of Mainz, Germany, under the supervision of Axel Mueller. He worked as a scientist in the polymer chemistry division at National Chemical Laboratory in Pune, India. He has more than 10 years of research experience in the field of anionic polymerization. He has 23 publications and six U.S. patents to his credit in the field of anionic living polymerization.

His current interests at UAB are in the area of synthesis and characterization of interface cross-linked micelles from poly (caprolactone) and poly (ethylene oxide) copolymers as drug-delivering vehicles. A provisional U.S.

patent with Avanti Polar Lipids Ltd., USA, is being filed for a novel tetrablock copolymer developed through this project. He is also engaged in synthesizing fluorescent-probe containing diblock, the triblock copolymer consisting of polystyrene, polybutadiene, and polymethylmethacrylate for a morphological study. He also coordinates the research activities on the syntheses of nylon macromonomer.

### Manisha Chakraborty

**Manisha Chakraborty, Ph.D.**, has been working as a postdoctoral fellow with the **Mays** group since May 2000. She received her Ph.D. in chemistry from the University of Akron in Ohio in 1998 and worked as a research associate on biodegradable polymers for drug

delivery and other biomedical applications with Joachim Kohn at Rutgers University in New Jersey. At UAB she has worked on the development of glass polymer composites for bone cement and dental cement applications; she presented her research at American Chemical Society and Biomedical Engineering Society meetings. Presently she is working on synthesis of monodisperse oligoamides for developing ballistic protective materials.

### Arun Narayanaswamy

**Arun Narayanaswamy, Ph.D.**, is a postdoctoral fellow in **Juan Pablo Claude's** laboratory. He received his master's and doctoral degrees from the Indian Institute of Science in Bangalore, India. His current project is

synthesis and characterization of semiconductor and metallic nanopartilces within block copolymer micelles.

### Sadanandan E. Velu

**Sadanandan E. Velu, Ph.D.**, works in the chemistry department as a part of the Center for Biophysical Sciences and

Engineering (CBSE). His research is on the development of inhibitors of NAD synthetase as potential antibacterial agents. He is working on the structural modifications of the identified lead inhibitors to improve their activity. His wife, Anitha, recently graduated from the UAB School of Engineering, and his son, Karthik, has started preschool.

### Ji Ho Youk

**Ji Ho Youk, Ph.D.**, is a research associate working on the nanoparticle project with **Gobet Advincula** and **Jimmy Mays**.

## (St) Staff

### Tricia Boyd

**Tricia Boyd** is a graduate of Jacksonville State University and has been with the chemistry department for three years. She has worked for **Jimmy Mays**, **Bill Nonidez**, **Gobet Advincula**, and **Juan Pablo Claude** for the past year and a half. Tricia has recently been recognized for her accomplishments by being promoted to an administrative specialist. Away from work Tricia enjoys spending time with her much-loved and very spoiled dog, Rosie-Q.

### Em Davis

**Em Davis** has been in the chemistry department for almost 24 years—and counting! During the last year she received a very nice promotion; she is now manager of chemistry laboratories. Em oversees storeroom personnel, receives and dispenses student kits, makes up the annual order, receives, dispenses, and authorizes payment for all orders, and manages the preparation of chemistry laboratory materials—among other duties too numerous to list! Also, in this last year, Em hired **Kimberly Armstead** as her right-hand person. A number of years ago Kim worked in the storeroom as a student assistant while in school. Also working in the storeroom are student assistants **Jelani Newton**, **Tana Patton**, **Jonathan Matlock**, **Terrence Walker**, and **Wesley Jones**.

During this past year, Em helped **Lee Summerlin** and **Christie Borgford-Summerlin** prepare new laboratory manuals for the two introductory chemistry laboratories taught in the chemistry department. The two manuals have been published and are in use.

Em continues to enjoy Alabama football, UAB basketball, reading, working crossword puzzles, and spoiling her two granddaughters, Olivia Marie and Sydney Grace.

### Steven Harville

**Steven Harville, Ph.D.**, is a native of Birmingham and a former graduate student in UAB's chemistry department. He is starting his fourth year as manager of the department's mass spectrometry facility, which involves overseeing the operations of the LC-MS, MALDI, and Pyrolysis-GC-MS spectrometers. In addition, he provides assistance to graduate students in applying mass spectrometry to their research projects. During football season he and his wife, Kim, enjoy spending Saturdays on another campus about 100 miles down Highway 280.

### Michael Jablonsky

**Michael Jablonsky, Ph.D.**, is managing and maintaining the department's 300 and 400 MHz NMR spectrometers and the CD spectrometer. He is always available to provide technical support and guidance (and coffee) for all chemistry department users. He is continuing to work on several projects with **Donald Muccio**, including ligand interactions with NAD synthetase, interactions involving peptide fragments from a cystic fibrosis transmembrane channel, and the binding of retinoic acid derivatives to retinoic acid receptors.

### Laura Knighten

**Laura Knighten** is working on her third year in the chemistry department. She is responsible for our graduate students' files, scheduling seminars, ordering keys, and a myriad of other duties. Laura enjoys her job almost as much as she enjoys her coworkers. She and her husband, David, have two active teenage boys, Jake and Josh, who keep them on their toes.

### Tammie Ridley

**Tammie Ridley** has been with the chemistry department for 11 years as our administrative associate. This year Tammie has been very busy preparing for the semester conversion. Thankfully, everything fell into place with no major problems. Away from the office Tammie is kept busy by her three children: Jordan Chase, who is one this year and into everything; Amber, who is 13; and Dustin, who is five. Tammie and her husband, Bo, also closed on a new house and both are glad that things will soon settle down.

### Terence Roberts

**Terence Roberts** is the newest of the chemistry staff. Terence is filling the position of financial associate for the chemistry department and is looking forward to working with chemistry faculty and staff.

### Cindy Willingham

**Cindy Willingham** continues to work with area high-school chemistry teachers for the Science in Motion program. This year, three new teachers joined the group. Cindy also participates in the National Science Foundation GK-12 grant that provides assistance to K-12 teachers. This year, **Joy Johnston** is serving as a graduate assistant, and **Karen Leigh Samples** continues as an undergraduate assistant in the program.

## Suxiang Deng

**Suxiang Deng** earned his M.S. in engineering from the East China University of Science and Technology in 1996. He then worked as a researcher at Shanghai Chemical Reagent Research Institute for four years, giving him a solid background in organic synthesis. He joined **Gobet Advincula's** group in September 2000. "I'm really enjoying working for Dr. Advincula," says Suxiang. "He is a nice guy. Moreover, every member of his group is easy to get along with. His research interests are interdisciplinary, so our group members are from various backgrounds. I have learned a lot about other disciplines from these guys." Suxiang's current research project focuses on the precursor approach to synthesize conjugated polypyrrole derivatives. "My favorite sport is tennis," he says. "I play it quite well. However, I'm not tall enough to serve well. Fortunately, I have a tall wife. Just kidding."

## Brandon Farmer

**Brandon Farmer** is a third-year graduate student working with **Jimmy Mays** on anionic polymer synthesis and char-



Brandon Farmer researches anionic polymer synthesis.

acterization. This fall he will be visiting Adelaide, Australia, for three months to do research at Ian Wark Research Institute. In his free time

Brandon enjoys playing golf, watching movies, and keeping up with baseball.

## Susan Green

**Susan Green** received a B.S. in chemistry from Shorter College in Rome, Georgia, in May 2000; she joined the UAB chemistry department the following August. She works in **Gary Gray's** lab on the nonlinear optics project, a collaboration with the physics department. She also assists science teachers at Helena Elementary School through the NSF GK-12 program. Upon completion of her graduate studies, Susan hopes to become a professor.

## Wade Holley

**Wade Holley** is a graduate student in **Jimmy Mays's** lab. His project is amphiphilic diblock copolymer synthesis.

## Kunlun Hong

**Kunlun Hong** has worked for **Jimmy Mays** for the past five years. "Even though I finished my graduate studies here, I chose to stay because I am sure Dr. Mays still keeps some tricks from us, and my membership at the Birmingham Zoo has not expired yet—probably most of the animals know me by name, as does the newly updated train," says Kunlun. "Right now I am trying to connect various monomers together to make useful materials. However, it is the nature of this work to yield some not very useful stuff, occasionally. My biggest ambition in the coming 12 months is to get a title and tag for my old Nissan car."

## Haining (Helen) Ji

**Haining (Helen) Ji** is a Ph.D. student working under the direction of **William Nonidez** and **Jimmy Mays** on structural characterization of polymers. Helen wants to take this opportunity to thank the faculty, staff, and graduate students for their kind help and friendship during the past six years. There is light at the end of the tunnel, guys!

## Troy Knight

**Troy Knight** is working for **Juan Pablo Claude** on semiconductor nanoparticles and photophysics. He has also received the Alabama Space Grant Consortium Fellowship from NASA. "Other than



Troy Knight studies semiconductor nanoparticles.

that, I am still just a dirt-poor graduate student," says Troy.

## Jason Locklin

**Jason Locklin** is working on substituted oligothiophenes in ultrathin films and their properties, for possible applications as field-effect transistors and organic light emitting diodes. He enjoys fishing and playing soccer.



Helen Ji is finishing her doctoral studies with Professors William Nonidez and Jimmy Mays.

## Derek Patton

**Derek Patton** is in his second year of graduate studies and is working with **Gobet Advincula** on the fabrication and characterization of organic thin films. Derek's current project involves the characterization of azobenzene-functionalized dendritic structures within a polymer matrix. His time is split between research and working with K-12 students as part of the NSF GK-12 fellowship program. Derek also enjoys hiking, rappelling, and spending time with friends and family.

## Brandon Pybus

**Brandon Pybus** is a fourth-year graduate student in **Donald Muccio's** lab. His research is primarily focused in physical biochemistry, in particular, enzyme kinetics. His hobbies are numerous and include playing guitar, studying the martial arts, and spending time with his very busy but lovely wife, Amanda (a fourth-year medical student).

## Prasad Taranekar

**Prasad Taranekar** joined the department in fall 2000. He obtained his B.S. in 1997 from Jiwaji University and his M.S. in applied chemistry in 1999 from Devi Ahilya Vishwavidyalaya University in India. Prasad is working in the field of conducting polymers for thin film applications; the research involves an interdisciplinary approach of synthesis and electrochemical work. He is specifically working with the precursor polymer approach for the patterning of these electroactive polymers. Prasad intends to work in industry and has high hopes that the UAB Department of Chemistry will make his chances bright. He loves to play and watch cricket and other outdoor activities.

## Wei (Will) Wu

**Wei (Will) Wu**, a fourth-year graduate student in **Jimmy Mays's** group, has been working on the bone cement project for three years. He spends all of his spare time practicing and teaching Falun Gong. He hopes more and more people can realize what it is and get a healthy body and peaceful mind by practicing the exercise.

## Jinchuan Yang

**Jinchuan Yang** joined **Jimmy Mays's** lab in 1997. He obtained his M.S. degree from the East China University of Science and Technology in 1995, under the supervision of Zhongde Xu. Jinchuan has synthesized and characterized many diblock polymer materials, such as PS/PtBS, NaPSS/PtBS, PS/PtBuAc, PS/PAA, PS/P2VP, etc. Now he is finishing his research and plans to graduate at the end of this year. He hopes he can find a position either in industry or in academia to apply and practice the knowledge he has gained here.

## Hongwei Zhang

**Hongwei Zhang**, a graduate student of **Jimmy Mays**, is working on his Ph.D. His current project is room temperature ionic liquids polymerization, very promising green chemistry. Now in his second year, Hongwei is enjoying the leisurely Southern life here in Birmingham.

## Yanxi Zhang

"I am a second-year graduate student," says **Yanxi Zhang**. "I came from China in September 2000. I am doing research in living radical polymerization in TEMPO system under **Dr. Mays**. My hobbies are outdoor sports, such as swimming."

## Degrees in Chemistry

The following students were awarded degrees in the December 2000 and June 2001 Commencements:

### Bachelor of Science

Alireza Adhami  
Tisa Bryant  
Jennifer Butler  
Syreeta Cullins  
Amanda Henderson  
Trong Nhan Ho  
Timothy Morgan  
Amit Pahwa  
Cheryl Polley  
Nathan Smith  
Brian Sparks  
Jonathan Threadgill

### Master of Science

Johnathan McLean

### Doctor of Philosophy

Lujia Bu  
Chao-Cheng Wang  
Congxiang Zha



Can you find Dr. Summerlin?

This year we spotlight alumni and friends of the Department of Chemistry who work for BioCryst Pharmaceuticals, Inc., a biotechnology company located in Birmingham. These six individuals—**Philip E. Morris, Jr., Pooran Chand, Chris Reed, Tsu-Hsing Lin, Tracy Hutchison, and LaKetta Montague**—have either graduated from the Department of Chemistry or have been mentored by chemistry faculty; they are all currently involved in drug-discovery research and development at BioCryst.

Founded in 1986, BioCryst Pharmaceuticals develops pharmaceuticals for the treatment of infectious, inflammatory, and cardiovascular diseases and disorders. The company's drug-discovery activities are focused on structure-based drug design, an approach to drug discovery that integrates advanced biology, biophysics, and medicinal chemistry. Such methods are used to design and develop innovative small-molecule pharmaceuticals to treat a variety of medical problems. BioCryst's research and development specialists bring a wide array of experience to the company, from biochemistry and pharmacology to X-ray crystallography, synthetic organic chemistry, computational chemistry, and medicinal chemistry.

Following are excerpts from an interview we conducted with these UAB-trained chemists.

*What do you find to be the most challenging part of your position at BioCryst?*

**Philip Morris** (Ph.D. '88, the section head of BioCryst's chemical development group): Finding an appropriate synthetic sequence that will allow us to make large amounts of a drug is always a challenge. Most people have the notion that if you want to make larger amounts of something, you just use a bigger pot; but in reality it is never that simple. In addition, my group has to prioritize projects and meet deadlines, all while making cost-effective therapeutics. Generally we have several projects that we are involved with at any one time, and we are always concerned with safety, impurity profiles, and ease of workup. Despite these challenges, it is gratifying to see our chemistry used to produce hundred-kilogram lots of BioCryst drugs.

**Pooran Chand** (Postdoc '86-88, the director of the medicinal chemistry department): Designing and synthesizing biologically active, complicated structures is an exciting challenge at BioCryst. We are constantly pushing ourselves to decrease lead times for delivering target molecules for biological activity.

**Tsu-Hsing Lin** (Ph.D. '87, who joined BioCryst in 1997): As a research chemist, the most challenging part of my job is trying to solve the problems related to organic synthesis I face every day—whether determining the right structure or finding the best route to the targets.

**Chris Reed** (B.S. '93, who has worked as a chemist at BioCryst since 1997): The most challenging part of my position at BioCryst is being able to keep up with multiple projects and the various tasks I juggle daily. Working at all levels with most of the other departments at BioCryst is demanding, but exciting. I provide multiple levels of support to all BioCryst projects, ranging from research and development to GMP.

**Tracy Hutchison** (Ph.D. '97, a research chemist in the chemical development group): Obviously the most challenging aspect is the chemistry. Things that look good on paper do not always work in the laboratory. My recent move to the development group has added new challenges to my job. Trying to take a working synthesis and improve it so that it can be scaled up is difficult, but rewarding.

**LaKetta Montague** (B.S. '99, a bioanalytical chemist): The most challenging part of my work at BioCryst is staying on top of the theory behind our drug-development assays, while remaining focused on the task of performing the assay itself. My position requires that I remain both flexible and organized in order to prioritize assays for several projects in clinical sample analysis and drug development—many of which



From left: Chris Reed; Pooran Chand; Philip E. Morris, Jr.; LaKetta Montague; and Tracy Hutchison. Not pictured: Tsu-Hsing Lin.

must be done concurrently. It's easy to get caught up in the methodology of the assay and forget the theoretical framework behind it, so performing my work efficiently is very exciting and keeps me on my toes.

*Does a particular aspect of your UAB experience stand out as most essential to preparing you for your current position?*

**Morris:** After my undergraduate studies at Birmingham-Southern College, I began research at UAB in synthetic carbohydrate chemistry, under the direction of **Donald E. Kiely, Ph.D.** (now at the University of Montana). This graduate work gave me a solid and valuable background in synthetic chemistry.

**Chand:** I received my doctorate in India, and I came to UAB for a postdoctoral position with **Dr. Koop Lammertsma**. The synthetic experience I gained in different fields of medicinal chemistry and the techniques for productivity I learned stand out the most.

**Lin:** I did my doctoral research under the direction of **Dr. Donald Kiely**. Working in his group was a wonderful experience. The financial aid available for UAB graduate students was also a big help.

**Reed:** The analytical portion of my undergraduate work was most important—I still refer to my quantitative analysis and instrumental analysis textbooks. The instrumentation and hands-on experience I received in the UAB laboratory gave me a feel of what to expect inside the business of chemistry.

**Hutchison:** After receiving my B.S. from Wabash College in Crawfordsville, Indiana, I chose to leave the snowy winters for the rather warm South. I did my Ph.D. work at UAB with **Wayne Brouillette**; the knowledge that I gained in the classroom was a great foundation, but working in the lab here at BioCryst while I completed my Ph.D. was the most helpful.

**Montague:** The part of my undergraduate degree program that has been extremely valuable for me in my current position was the biochemistry independent-research laboratory work, with my ACS mentor **Donald Muccio** and the guidance of **Steven Harville**. I specialized in the theory and application of high-performance liquid chromatography (HPLC), which is now one of my main responsibilities.

*What can the department do to better prepare graduates for employment in companies such as BioCryst?*

**Morris:** One way to help prepare graduate students for industrial positions would be to add industry chemists to graduate committees. Only through such interactions will students understand the needs of companies like BioCryst. The department should also emphasize developing excellent laboratory skills. These skills are crucial, as you are evaluated on your productivity in the lab.

**Reed:** In every degree program, you should put emphasis on working with others and the dynamics of interdisciplinary and interdepartmental team members. Also, familiarization in QA/QC, regulatory, and clinical practices is valuable knowledge in industry, while a working

knowledge of industrial hygiene and hazmat would be beneficial.

**Hutchison:** I would encourage graduate students to work as interns in industry or at least an industrial facility.

**Montague:** The department should emphasize the importance of maintaining a laboratory notebook. A laboratory notebook is a vital part of a GLP facility, and students need to understand its importance and to maintain one. Also, undergraduate students should try to work in industry as much as possible.

*If you were advising current students, what would you recommend they do to broaden their experience?*

**Morris:** Students with additional coursework in pharmacology and biochemistry are more attractive to companies like BioCryst. I would also encourage students to give as many presentations as possible and hone their writing skills, which are often used in industry. In addition, a basic statistics course would also be useful.

**Lin:** I would obtain a summer internship in industry. Also, background in chemical engineering is helpful.

**Reed:** Students should take classes in computers and information systems. I know these topics are constantly changing, but a working knowledge is imperative. Statistics is also a topic that I seem to visit on a daily basis.

**Hutchison:** I would say that my research at UAB did a pretty good job preparing me for work in industry. I would suggest chemical engineering courses for individuals interested in development work.

**Montague:** I would recommend that students pay attention in their statistical analysis and computer courses. It is very important to be able to look at your data and understand its meaning.

*How can the chemistry department serve as a valuable resource to local industry?*

**Morris:** Producing knowledgeable chemistry graduates who are proficient at every level (B.S., M.S., and Ph.D.)

for industry to draw on is important. It would also be good to include industry in your local seminar series.

**Lin:** You could provide more accessibility to the department facilities, and make everybody aware of the services you provide.

**Reed:** An organized internship with outside companies would be invaluable. A placement service or a co-op relationship with other companies

in the area would allow students to gain a greater understanding of what it's like outside academia.

**Hutchison:** I think the most helpful thing that UAB can do for graduate students is to set up an intern program with local industry.



Tracy Hutchison and Philip Morris in the Chemical Development Group's scale-up laboratory at BioCryst Pharmaceuticals.

**Chand:** I'd recommend medicinal chemistry courses and as much experience in the industry environment as possible—interaction with industry personnel and even working on projects that are of potential use to industry.

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## Gifts to the Department

The following alumni and friends have made contributions and gifts to the Department of Chemistry in 2001. We salute their generous donations and thank them for their support.

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## Keep the Chemistry Going

It's never been easier—or more timely—to make a contribution to further the goals of the UAB Department of Chemistry. We have completed the renovation of the second floor of the Chemistry Building, and we are beginning work on the third-floor renovation, where the undergraduate student laboratories will be housed.

If you would like to support the Department of Chemistry, you have many options: cash, check, or credit card (Visa, MasterCard, and Discover), payments on pledges, appreciated property (stocks, bonds, mutual funds, and

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Your support will help us: complete renovations of the Chemistry Building (naming opportunities are available); provide scholarships to academically deserving and financially needy undergraduate and graduate students; counteract tuition and fee increases and state funding decreases; ensure that chemistry majors benefit from the latest technology and teaching methods; and take advantage of new educational and research opportunities.

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