

CHEMISTRY DEPARTMENT NEWSLETTER

Colgate University - Fall 1999



Greetings alumni and friends,

Introducing our first departmental newsletter—I want to say hello from all of us at Colgate. We have been busy as usual, teaching chemistry and biochemistry to the undergraduates and pushing back the frontiers of science in our own small ways. We wanted to let you know about some of the things that are going on in Hamilton and we want to find out about changes in your life, hence our first (hopefully not last) departmental newsletter.

Ernie Nolen

Who's New?

As you look through our first alumni newsletter you will surely notice some new names. What happened to the old guys? I will try to update you with the changes over the last 5 years or so. Starting in the basement of Wynn and working up, Jim Bovee, our favorite grumpy stockroom manager, has retired and is comfortably settled in Florida. Roselle Damiano, our favorite non-grumpy stockroom manager, has stepped in and is doing a fine job. The General Chemistry lab instruction had been the domain of Mike Wells. Family concerns called him back to Arkansas, where he is teaching sciences in a local high school. Julie Chanatry has now taken over the job in the General Chemistry labs. Several part-

time lab instructors have come and gone: Garry Lewis is teaching chemistry at SUNY-ESF, and Nathan Cook is working toward his Masters in Musical Performance at Rice. Filling out our general chemistry laboratories these days are Jane Hough, a previous visiting professor, and Ann Marie Weeks, a former high school chemistry teacher.

Moving to the first floor, we have had several Visiting Assistant Professors covering for sabbatical leaves. Dave Modarelli has moved on to the University of Akron, his hometown, and has initiated a vigorous research program with prestigious support from the NSF by way of a CAREER Award. John Young quickly moved on to do post-doctoral work in 3D NMR at Cornell University. Finally, Chifuru Noda has been our most recent Visiting Professor and he is now teaching at Bridgewater State in Massachusetts.

The second floor faculty has remained constant over the past five years.

The third floor has had some big shoes to fill (size 13 at least). Dave Lewis left Colgate for a position at Connecticut College, where he is now Dean of the Faculty. Steve Cartier initially stepped into these shoes and has since moved on to Regis College in Colorado. Bob Bowman is our new physical chemist and has had a great first year.

Faculty News

Emeritus Faculty

Joe Thurner retired during the academic year 1986-87, the exact time being hard to define, since the last year was devoted mostly to assisting Colgate with accreditation by the Middle States agency. This year, he celebrates the 50th reunion of his graduation from Hartwick College. He also celebrates his 50th year of membership in the American Chemical Society.

Since retirement, the Thurners (Joe and Jean) have traveled widely, with featured one-month stays in Nice, France, Portugal and Turkey. There have been briefer stops in Hong Kong, Greece, Spain, Germany, Cyprus, Ireland, Scotland and Great Britain, along with most of the United States and some parts of Canada. They spend one month each year on Maui, and two weeks each year at Colgate Camp on Upper Saranac Lake.

While at home, Joe gardens and requirement-renovates his home during the summers, spends equal amounts of time cooking, playing bridge and playing tennis all year round, and skis cross country when weather permits.

Daughter Laura, '80, lives in Honeoye Falls, near Rochester, with husband Mike Barclay, '79, who has a Chair at the William Simon Business School. Son John is Director of Technology at Belmont Hill School in Belmont, Massachusetts, while wife Agni works at the Harvard Business School. They have provided two grandchildren: Philip, 12, and Mark, 5.

Dr. Thurner's current email address is: Jthurner@mail.colgate.edu.

Elmer (Spade) Trumbull and his wife **Pat** have resided in Athens, Georgia since their retirement from Colgate. He writes: "When we came to Georgia about a dozen years ago, there was some thought that I might work part time in Bill Pelletier's group at UGA doing alkaloid research. However, he lost some funding and that

didn't come about, so I have settled into the role of a gentleman of leisure. We live in an interesting area about ten miles outside of Athens proper in a county that is an interesting blend of farming and bedroom community.

What I do aside from watching the passing parade is to help as a volunteer for students having trouble in the county school system. This year I had one in Chemistry, one in Algebra, and one in fourth grade studies, which covered a bit of everything. I've also tied in with the county historical society and helped with a project to publish a listing of all the burials in the county. Many of these are in small family cemeteries or in county churches that aren't easily found, so the search involved driving down lots of unpaved back roads and pushing through a lot of underbrush. For the first time, I've come to see why someone would describe himself as being from Oglethorpe County rather than as from any town. In this whole county of about 500 square miles, there are only two settlements that you might call a town, nothing as big as Hamilton. We (the residents, not us personally) grow pulpwood, chickens and, I gather from the helicopter searches, pot.

Pat is the principle resource for assistance with Red Cross blood drives in Athens. In this respect, she's continuing what she did in Hamilton, except that now she has more free time. And we both have kept up our interest in choral singing by working with the community chorus and other groups from time to time.

Aside from such activities we spend a fair amount of time traveling. We have favorite spots on the Georgia coast, but much of the time we are playing grandparents with families located in Pennsylvania, North Carolina and Berlin, Germany.

A few colleagues from Colgate have found the way to our door in the past decade, but we'd be happy to welcome more. We always search through the class notes in the *Scene* looking for familiar names. Perhaps you'd be surprised at how many we remember."

Current Faculty

BOB BOWMAN

It has been a busy and exciting first year at Colgate as “the new physical chemist.” I arrived in July, 1998 after seven years at the University of Kansas. My first order of business was to place several summer research students’ as well as a few faculty members’ lives in peril as we moved my two ton laser table off the moving van down a crooked ramp. After moving the table through the third floor window of Wynn Hall with the use of a crane without any damage, life has been a lot calmer!

The laser table is part of a femtosecond laser system (a femtosecond is 10^{-15} seconds!) which is now operational in Wynn Hall. My group uses it to study how and how fast chemical reactions take place. We are currently investigating the charge carrier dynamics in nanometer-sized metal and semiconductor particles. These systems have important applications in environmental chemistry as well as catalysis. Stop by and take a look at the laboratory if you are on campus – it is quite flashy (pun intended!).

It has been a real pleasure to teach such bright and motivated students. My teaching efforts focused on General Chemistry and Physical Chemistry. I will be teaching a new freshman Scientific Perspectives core course entitled Crime and Chemistry this fall which focuses on forensic chemistry. It should be a lot of fun!!

JULIE CHANATRY

Hi, I’m a relatively new member of the department. I received my B.A. from Hamilton College and my Ph.D. from Northwestern University in Biochemistry/Biophysics. I joined the department in 1997 after a post-doctoral position at Princeton University. I teach general chemistry lab and I’m a member of the Health Sciences

Committee. I’ve recently been working with Professor Rowlett on some carbonic anhydrase mutants and plan to continue this work during the upcoming year. I’m originally from upstate New York, so coming to Colgate feels like I’ve come home. The Colgate community is great and I really enjoy teaching here.

JOHN COCHRAN

Research in my laboratory has shifted away from the long running study of reactivity of vinylstannanes with electrophiles. The newer areas of interest have still involved the chemistry of organotin compounds but have become more synthetic in nature. The first area of interest was the syntheses of disulfides by a palladium-catalyzed reaction of sulfonyl halides and organostannanes. The second and current project involves the syntheses of a series of molecules that contain both a tin group and a diethyldithiocarbonate group. Both of these functional groups have anti-fungal activity and the goal of the project is to see if a compound with both groups has enhanced bioactivity. The bioassay part of the project will be carried out through a collaboration with an organotin research group at The University of Malaya.

I have been teaching primarily in the second-year Organic Chemistry course with a general chemistry section every once in a while. Organic is still at 8:30 A.M. when we have one section, but 8:30 and 10:30 when we have two sections.

I have served for several years as a member of the Chemistry Council of the Council on Undergraduate Research (CUR). This organization is a lobby group for research funds for undergraduates. I have also been guest editor for two issues of the journal Main Group Metal Chemistry that were devoted to papers resulting from research with undergraduates. Also I have been the co-chair, with Dr. Merrill Miller, of the Health Sciences Advisory Committee.

GERMAINE GOGEL

In recent years, my research has moved into the area of neurochemistry. I have been collaborating with Jun Yoshino in Neuroscience, and we often have senior research students or summer research students who use both of our labs. We are investigating the biochemical basis of communication in cells of the nervous system, with particular focus on damage and repair in the nervous system. Basically we are investigating cellular events that occur at the onset of such diseases as Multiple Sclerosis. Several of our students have presented their work at the American Society for Neurochemistry meetings. We have submitted a NSF proposal for funds that will enable us to expand this research and use laser confocal microscopy to examine the cells. This multidisciplinary project would also involve our new physical chemist Bob Bowman. My research in the area of photosynthesis continues, as well, with our ongoing investigations of the assembly of the pigment-protein complexes. We make an annual trip to present student results at the regional photosynthesis conference, a meeting I volunteered to organize for Spring 2000. This is my first time for organizing a meeting, but new challenges are fun!

In the area of teaching, I still keep busy teaching general chemistry and biochemistry, of course, but also have begun to teach in the Scientific Perspectives component of the Core program. I am enjoying teaching "Critical Analysis of Health Issues: Cancer" on a pretty regular basis. I have also begun to teach the summer course in introductory chemistry for Science and Math Initiative program of the Office of Undergraduate Studies, and this is also a great experience.

Aside from that, my life is occupied by trying to keep up with my two sons (Andy and Kevin, ages 7 and 5), who have re-introduced me to the joys of childhood. Best wishes to all you alums. The faculty

think of you often. Write, email, or visit if you are nearby!

PATRICIA JUE

During the 1997-1998 academic year, I taught the physical chemistry class (Chem 333 and 334) during Mike Shen's sabbatic year. Being in the lecture room was quite a change from being in the organic labs. This year, I'm back in the labs.

In recent summers, several students have worked with me to probe the gelation of tetraalkyl siloxanes in alcohol/water systems. Colgate allocated funds for new, actively vented storage cabinets for the organic stock room, so I will spend most of this summer rearranging, inventorying and moving chemicals and glassware rather than doing research. It's not as fun, but the upside is that we hope this will make Wynn 202 less stinky, and I prepared the many vials for the qualitative experiments (the infamous "unknowns") while all of the bottles are out.

In collaboration with Jen Wei-Fan of Manhattan College, I was awarded an educational PEW grant to develop computer interface experiments. This grant included the purchase of a Labworks II interface.

CHI FURU "CHIEF" NODA

What an experience it has been! I spent a year (1998 - 1999) here as Visiting Assistant Professor, and got to teach Instrumental Methods and General Chemistry II. The students here are excellent, the department is supportive and, and the area is scenic and quiet. My only gripe is that we did not have much snow this year.....

At a departmental seminar (and in classes), I managed to show off my collection of fluorescent rocks and oscillating chemical reactions. Some of the fluorescent rocks are left behind to the department (my collection is getting too heavy to tote around!)

In short, I had a wonderful year and it's been educational to me as well. Quite likely, I learned more than my students did. I've just accepted a position at Bridgewater State College in Massachusetts, hoping to put my Colgate experience to good use.

ERNIE NOLEN

During the Fall of '98, I took a study group to the National Institutes of Health. My stay was productive in several ways. First, I taught a Medicinal Chemistry course and supervised a course on the literature of the biomedical sciences. The environment at NIH led to an opportunity to work in a medicinal chemistry lab, where I synthesized a tumor-associated antigen. (Ah...so many molecules, so little time.) My family was able to come along to Maryland and my wife, Susan, home schooled our kids for the semester, taking them to the Smithsonian and the Zoo weekly.

We have been happy to return to Hamilton and I have enjoyed teaching Advanced Organic (including the name reactions of the week) and my CORE Scientific Perspectives course, Juggling Science and Judeo-Christian Thought. The Templeton Foundation supported that course with a grant of \$10,000, which was used to bring in many authors of the texts we used.

This summer I have three students (two have previous experience in my lab). We will be attempting to finish up one of the cofacial porphyrin dimer/trimer projects and we will be initiating a carbon-linked glycopeptide project.

The little league baseball team that I coach is only 1-3, but as Peter Sheridan would say at least we came in second in our losses.

MARTHA REYNOLDS

Central New York winters haven't been cold enough for me, so I decided to spend my 1998-99 sabbatical leave at the University of Minnesota in Minneapolis. What the Twin Cities lack in snowfall (they get less than half of what Central NY gets) they make up for in low temperatures. I was fortunate this year, because the eyelash-freezing, sub-zero temperatures ended after the first couple of weeks of January, and spring came unusually early. Blake Aronson '94 is just finishing her Ph.D. in chemistry at the University of Minnesota, and it has been fun to see her around the department. I have been doing research involving IR spectroscopy and electrochemistry of peroxometal complexes, elaborating on some of the themes of my work at Colgate. I've also learned some computational chemistry, especially density functional theory. Professors Bill Tolman, Kent Mann, and Chris Cramer and their research groups have graciously provided me with lab space, equipment, and helpful discussions. In January 1999, I attended the Metals in Biology Gordon Research Conference in Ventura, California, where I presented a poster entitled, "Peroxo Complexes of Vanadium(V), Molybdenum(VI), and Tungsten(VI): Correlations among Reactivity and Spectroscopic Properties." In addition to the stimulating scientific atmosphere, I looked forward to some Southern California warmth and sunshine, but it ended up being one of the coldest, rainiest weeks in local memory. Before heading back to Minnesota, I visited Lisa Linquest (former Associate Dean of the College) and family in San Diego. They are doing great, including daughter Sarah, born June 1998. I will present another poster at the Ninth International Conference on Bioinorganic Chemistry, to be held, conveniently enough, in Minneapolis in July 1999. After the meeting, I'll make the drive back to Hamilton, stopping to visit family along the way. Having spent the better part of a year

in the Twin Cities, I can easily identify the single biggest difference between New York and Minnesota: their governors.

ROGER ROWLETT

It is probably no surprise to any recent alumni that my students and I are still investigating the structure and chemical mechanism of carbonic anhydrases, a research project that has been a mainstay for nearly 17 years. What might be surprising are the dramatic changes in our activities in recent years. Now, my students are as likely to be doing molecular biology and recombinant DNA technology as protein purification or rapid enzyme kinetics. During the last two years, my students (you know who you are) and I have cloned, overexpressed, and prepared many site-directed mutants of a plant carbonic anhydrase from the molecular biologist's favorite weed, *Arabidopsis thaliana* (mouse-ear cress). In the immediate future, we plan on using recombinant DNA methods to produce and purify the two different carbonic anhydrases from *Helicobacter pylori*, the pathogenic organism that is the primary cause of gastric and duodenal ulcers in humans.

Many of the changes in my research laboratory were made possible by an extended stay at the National Institutes of Health. In the Fall of 1996, I led the National Institutes of Health off-campus study group to Bethesda, Maryland, where a very talented group of 16 Colgate students and I immersed ourselves in the ways of modern biomedical research. I stayed on at the NIH during the spring semester on sabbatical leave, working in the laboratory of Dr. Edith Miles learning how to be a "gene jockey"—or is it "protein engineer?" In an interesting twist, the project I worked on at the NIH was closely related to my undergraduate research project some 21 years before.

In the classroom, I continue to regularly teach both General Chemistry ("think moles") and Biochemistry (remember the

Krebs cycle?). I also teach regularly the laboratory and/or course in Instrumental Methods. My Instrumental Methods students, who used to provide a valuable analytical service by analyzing my airplane's engine oil for wear metals using atomic absorption spectroscopy, have now graduated on to analyzing my chili peppers for "hotness" using reversed-phase HPLC.

During the last few years, I have served as Coordinator of Undergraduate research (1994-1996) and as Acting Chair of the department (1998). Outside the classroom and teaching laboratory, I continue to enjoy flying my 4-seat single engine airplane (for which I am now instrument-rated) and playing duplicate bridge.

MIKE SHEN

I had the "pleasure" of serving as the Chair of the Department from 1994-97. The sabbatical leave in the Fall of 1997 came at just the right time. Most of the leave was spent at Colgate to write up some of the finished research projects and to finish some of the unfinished projects. I did find time to spend one month in Oregon working in the laboratory of Professor Ken Hedberg. It was a very profitable stay for me. We did several electron diffraction experiments, converted the electron diffraction computer programs onto the PC platform, and worked on a manuscript for publication. I also found time to participate in the 7th European Electron Diffraction meeting in Czech Republic.

In terms of research, I will be doing the same things—gas phase molecular structure. With the speed of the new PC we are routinely doing *ab initio* molecular orbital calculations to supplement our electron diffract analysis whenever it is deemed necessary. Molecular mechanics calculations is a thing of the past. We are moving towards independence from the VAX system and move into the PC world for all of our electron diffraction analyses.

PETER SHERIDAN

When Dr. Shen changed offices a few years ago, I saw my chance, and seem to have been aggressively seeking the “Messiest Office” title; the past year or two has been good for chaos in Wynn 305. With that title clearly in sight, I turned my attention to developing an Environmental Chemistry course, designed to be part of the Core Program. The current version of the course is for students who have not taken the Chem 101/102 sequence (or Chem 111), and it has given me a new appreciation for just how much material is in that introductory chem course. I’ve continued to teach my favorites, the 101/102 sequence, and look forward to getting it right this year. The Inorganic course (Chem 411) is still part of the mix, and I will be teaching it to a reasonably large group this fall.

The research underwent a renaissance during the 1998-99 academic year, and Mike Neidig ('99) and John Sanders ('00) started working on some biguanide complexes of cobalt. Mike did very well at Colgate: in addition to earning High Honors in Chemistry, he received a prestigious Churchill Fellowship, and will spend next year studying bioinorganic chemistry at Churchill College at Cambridge University. We should get a paper or two from the work he and John did last year.

For years, I have taken a week or so in June to read (grade) the free-response portion of the Advanced Placement Chemistry exams. Offered by the College Board, and created, administered and evaluated by the Educational Testing Service, the AP exams give thousands of high school students the opportunity to take Chem 101/102 (or something very close to it) during their junior or senior year of high school. For the past 3 years, I have been the Chief Reader, so it is my responsibility to organize the 100 or so chemistry educators gathered to read the exams. Last June, we graded a bit over 49,000 exams in a 7-day period.

Finally, in my role as little league umpire, I got to watch Dr. Nolen as a manager of a little league team. His son Corey pitched, and Dr. Shen’s son Stephen was a catcher on this Hamilton Blue Jays juggernaut; it was a strange experience knowing that Corey was throwing baseballs at me, and that my only protection was Stephen Shen.

A WORD FROM THE STAFF...

LYNDA CASE

Hello to all. If you are thinking that there must be a new/different secretary in Chemistry, think again. Mrs. Stetson is now Mrs. Case. Yes, I am still here (after 17 years), trying to keep track of all the faces on new students and faculty. And while all of you former concentrators have been out there working, studying, marrying and having families, I have become a grandmother four times. I had the rewarding experience of going to Germany twice, for the births of my two youngest grandsons. While over there, I toured briefly in Switzerland, Austria and Liechtenstein. What beautiful places. My oldest son lives nearby, my daughter and family are now in California for three years in the military, and my youngest son is currently in South Korea as a helicopter mechanic in the Army. My husband and I continue our music engagements, having had the pleasure to open shows for, among others, Loretta Lynn, Waylon Jennings, Jeannie C. Riley and Little Jimmy Dickens.

I always enjoy seeing a familiar face when one of our Alum comes walking into the office. I do hope you will stop by if you are ever in Hamilton. And remember, when you call and “Mrs. Case” answers, you do know me!!!

ROSELLE DAMIANO

Hi. I am one of the new faces in the basement of Wynn, having taken over the job of maintaining the Chemistry Stockroom, from which Mr. Bovee retired. I am a graduate of LeMoyne College in Syracuse, with a BS in Chemistry. I have previously worked in a number of industrial and environmental settings, including laboratory supervisor/research chemist at Indium Corporation in Utica, analytical chemist at both Xerox Corporation in Webster, and AlliedSignal in Buffalo, and as manager of the sample custody department at Upstate Labs in Syracuse. My first two years have been an enjoyable experience, and I look forward to many more.

BOB PINNEY

Some of you may remember me as the elusive technician that magically appeared when needed. I left the Procter & Gamble Corporation in 1985 to work for the Chemistry department at Colgate. It was the right decision and Colgate University is a wonderful environment to work in. The instruments, computers and laboratories have changed dramatically over the years and it has been a continual challenge to stay abreast with new technology.

I built a home in Sherburne, in 1989, and my third son Shawn was born that same year. In 1992, I opened a karate school in Hamilton, and have subsequently opened another in North Norwich. I direct five martial arts clubs for Colgate, and also direct a Self-Defense Seminar Series.

My wife Grace and I recently dropped off our son Robert Jr., at Union College for his sophomore year, and our son Ryan is attending his first year at Ohio Northern University.

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## John Cochran Wins Teaching Award

Professor **John Cochran** won the Sidney French Teaching Award this spring. As the Maroon News reported, the organic chemistry course is the "hardest course at Colgate." Does this mean that if Cochran teaches the hardest course, he must be the smartest professor?

His steady stream of publications on organostannanes with students as co-authors has been the standard of our department for years. It is his ability to take students to that higher level that is remarkable.

Teaching such a demanding course and shaping scientists for the future only describe one side of his persona at Colgate. As a mentor, and practically lifelong member of the Health Sciences committee, Prof. Cochran displayed the wisdom and care that has inspired students and bonded them to Colgate.

## Churchill Fellowship to Michael Neidig '99

**Michael Neidig** became Colgate's first Churchill Fellow. He receives financial support for one year to work at Churchill College at Cambridge University on some organometallic chemistry before heading off to graduate school at Stanford University. The department held a surprise luncheon on April 29th to honor Mike's achievement.

## Enrollments in Chemistry and Biochemistry

Over the years there is a natural ebb and flow with enrollments and numbers of concentrators. The average is around 15 concentrators per year, with the classes of '99 and '00 being on the low side. No fear though, the class of '01 has just declared the concentration and we have 22 students moving on for their junior year in chemistry and biochemistry.

## Roger Rowlett Awarded Several Major Grants

Professor **Roger Rowlett** has been awarded grants from the National Science Foundation (NSF), the National Institutes of Health (NIH), and the U.S. Department of Agriculture (USDA) to support his work on site-directed mutagenesis of plant Carbonic Anhydrase. The NIH and the USDA grants totaled just over \$140,000 and will support this project for three years, covering costs of supplies and stipends for undergraduate research assistants. The NSF award, joint with several molecular biologists, for about \$39,000 was used to purchase an automated DNA sequencing instrument.

Numerous departmental faculty have received grants to help support summer student research, but none in the past year have been large enough to get a headline in this newsletter. In the past we have supported several summer students thanks to grants and gifts from Merck/AAAS, Pfizer, and AlliedSignal.

## National Science Foundation – Research Experience for Undergraduates

Colgate has remained a nationally supported site for summer undergraduate chemistry and biochemistry research for over 8 years. Our grant has supported 71 students over this time period. Many of these students were from Colgate, but NSF requires that we host students from around the nation. This past summer we welcomed students from Russell Sage, Richmond, Swarthmore, Bucknell, Villanova, and Louisiana State / A&M.

Our grant has now drawn to a close and we, along with the Development Office, are always looking for donors to endow a fund to help support a part of our student summer research.

## 1999 Departmental Honors and High Honors

(Thesis Title)

**Melissa McKay:** High Honors in Biochemistry (“Site Directed Metagenesis of Amino Acid Residues in *Arabidopsis thaliana* Carbonic Anhydrase and the Purification and Kinetic Characterization of the Mutant H216N”)

**Michael Neidig:** High Honors in Chemistry (“Recent Advances in Biguanide Coordination Chemistry”)

**Melanie Rehder:** Honors in Chemistry (“The Molecular Structure and Conformational Composition of 1-Bromo-2,3-epoxypropane as Determined by Gas-Phase Electron Diffraction and *Ab Initio* Molecular Orbital Calculations”)

If you think the titles are long, then you should see the theses!

## 1999 Awards

**CRC Chemical Prize:**

*Gina Manziello '02*

**Haskell-Schiff Memorial Prize:**

*Kyle Chepla '02*

*Daniel Fowler '02*

*HeeChoon Lee '02*

*Matthew Reese '02*

**Lawrence Chemical Prize:**

*Erin DeRose '01*

*Laura Sweeney '01*

**Edwin Foster Kingsbury Prize:**

*John Sanders '00*

**ACS Analytical Chemistry Prize:**

*John Sanders '00*

**Roy Burnett Smith Prize:**

*Marianne Miller '99*

**McGregory Fellowship:**

*Michael Neidig '99*

**Joseph Thurner Prize:**

*Melissa McKay '99*

**Silver Banana:**

*Alex Goolsby '99*

## Most Recent Publications

(1998 & 1999)

\*represent undergraduate authors

1. C. Larry Bering, Jennifer S. Kuhns\*, and Roger S. Rowlett, "Purification of Bovine Carbonic Anhydrase by Affinity Chromatography: An Undergraduate Biochemistry Laboratory Experiment," *J. Chem. Ed.*, **1998**, 75, 1021-1024.
2. Roger Rowlett, Li-Hong Yang, S. Ashraf Ahmed, Peter McPhie, Kwang-Hwan Jhee, and Edith Wilson Miles, "Mutations in the Contact Region between the  $\alpha$  and  $\beta$  Subunits of Tryptophan Synthase Alter Subunit Interaction and Intersubunit Communication," *Biochemistry*, **1998**, Vol. 37, No. 9, 2961-2968.
3. Kwang-Hwan Jhee, Li-Hong Yang, S. Ashraf Ahmed, Peter McPhie, Roger Rowlett, and Edith Wilson Miles, "Mutation of an Active Site Residue of Tryptophan Synthase ( $\beta$ -Serine 377) Alters Cofactor Chemistry," *The Journal of Biological Chemistry*, **1998**, Vol. 283, No. 19, 11417-11422.
4. Shen, Q., and Hedberg, K. "An Investigation of the Equilibrium  $N_2O_4 = 2NO_2$  by Electron Diffraction: Molecular Structures and Effective Temperature and Pressure of the Expanding Gas with Implications for Studies of Other Dimer-Monomer Equilibria," *J. Phys. Chem.*, **1998**, A32, 6470-6476.
5. Shen, Q., Wells, C.\*, and Hagen, K. "The Molecular Structure and Conformation of Dimethyltrisulfane,  $CH_3SSSCH_3$ , as Determined by *Ab Initio* Molecular Orbital Calculations and Gas-Phase Electron Diffraction," *Inorg. Chem.*, **1998**, 37, 3895-3898.
6. Shen, Q. "The Molecular Structure of 1,2 Diphenyl-ethane as Determined by Gas-Phase Electron Diffraction," *J. Mol. Struct.*, **1998**, 471, 57-61.
7. Novikov, V., Tarasenko, S.A., Samdal, S., Shen, Q., and Vilkov, L.V. "The Structure and the Puckering Potential Function of 1,1 Dimethylsilacyclobutane Determined by Gas Electron Diffraction and Relaxed Constraints from *Ab Initio* Calculations," *J. Mol. Struct.*, **1999**, 477, 71-89.
8. Aarset, K., Shen, Q., Thomassen, H., Richardson, A.D., and Hedberg, K., "Molecular Structure of Aluminum Halides,  $Al_2Cl_6$ ,  $AlCl_3$ ,  $Al_2Br_6$ ,  $AlBr_3$ , and  $AlI_3$ , Obtained by Gas-Phase Electron Diffraction and *Ab Initio* MO Calculations," *J. Phys. Chem.*, **1999**, 103, 1644-1652.
9. Q. Shen and C. Bickford\*, "The Molecular Structure and Pseudorotational Motion of Gaseous Decamethyl Cyclopentasilane," *J. Mol. Struct.*, **1998**, 446, 223.
10. Martin Gabriele\*, Henry G. Kuivila and John C. Cochran, "Catalysis of the Diels-Alder Reaction by Organotin Halides," *Main Group Metal Chemistry*, **1998**, 21, 207.

## Presentations

(1998 & 1999)

1. Quang Shen and K. Hedberg, "The Measurement of Gaseous Equilibria by Electron Diffraction. What is the Effective Temperature and Pressure of the Expanding Gas? A Study of the reaction  $N_2O_4 - 2NO_2$ ," 17th Austin Symposium on Molecular Structure, March 1998.
2. Quang Shen, K. Aarset, and K. Hedberg, "Molecular Structure of Aluminum Halides,  $Al_2Cl_6$ ,  $AlCl_3$ ,  $Al_2Br_6$ ,  $AlBr_3$ , and  $AlI_3$ , Obtained by Gas-Phase Electron Diffraction and *Ab Initio* MO Calculations," 17th Austin Symposium on Molecular Structure, March 1998.
3. Martha Reynolds, "Peroxo Complexes of Vanadium(V), Molybdenum(VI), and Tungsten(VI): Correlations among Reactivity and Spectroscopic Properties," Metals in biology Gordon

- Research Conference, Ventura, California, January 1999.
4. Robin L. Apblett and Germaine E. Gogel, "Studies of the Effect of Protein Surface Changes on the Reassembly of the B873 Core Light Harvesting Complex of *Rhodospirillum Rubrum G-9*," Sixteenth Annual Eastern Regional photosynthesis Conference, Woods Hole, Massachusetts, April 16-18, 1999.
  5. Ernest Nolen, "Hydrogen-Bonded Assemblies: Porphyrins and Janus Molecules," National Cancer Institute on the NIH campus, Bethesda, Maryland, November 1998.
  6. Robert Bowman, "Time-Resolved Laser Spectroscopy: Clocking Chemical Reactions on an Ultrafast Time Scale," Colgate University, Division of Natural Sciences & Mathematics Science Colloquium, October, 1998.
  7. Robert Bowman, *ibid.*, Hamilton College, Clinton, NY, January 29, 1999.
  8. Robert Bowman, *ibid.*, Rochester Institute of Technology, Rochester, NY, February 9, 1999.
  9. Robert Bowman, *ibid.*, Clarkson University, Canton, NY, April 15, 1999.
  10. Martha S. Reynolds, "Oxygen-17 NMR, Electronic, and Vibrational Spectroscopy of Peroxo Metal Complexes: Correlation with Reactivity," Connecticut College February 10, 1998.
  11. Martha S. Reynolds, *ibid.*, SUNY Buffalo, March 20, 1998.
  12. Roger S. Rowlett, "Structure and Catalytic Mechanism of Spinach Carbonic Anhydrase: How Nature Solved the Carbonic Anhydrase Problem Twice," St. Lawrence University, February 3, 1998.
  13. Roger S. Rowlett, *ibid.*, SUNY Potsdam, NY, February 3, 1998.
  14. Roger S. Rowlett, *ibid.*, SUNY Albany, October 6, 1998.
  15. Roger S. Rowlett, "Clonin Around with Tryptophan Synthase: A Protein Engineering primer," Colgate University February 20, 1998.
  16. Nicholas D.K. Petraco\* and John C. Cochran, "A Theoretical Study of Trisubstituted Tin Hydride Addition Across a Triple Bond," 12<sup>th</sup> NCUR Conference, Salisbury, MD, April 20, 1998.
  17. Nicholas Petraco\*, Dinee Collings\*, Alexandra Frank\*, John Magnan\*, Ann Searfoss\*, John C. Cochran, "Efficient Synthetic Schemes for the Synthesis of Organostannanes with potential Biocidal Activity," NCUR, Salisbury State University, Salisbury, MD, April 23-24, 1998.
  18. Jacob Strong\* and Roger Rowlett, "Purification of *Arabidopsis thaliana*  $\beta$  Carbonic Anhydrase Overexpressed in *E. coli*," Undergraduate Chemistry Research Symposium, Skidmore College, Saratoga Springs, NY, April 18, 1998.
  19. George Donovan\* and Roger Rowlett, "Site-Directed Metagenesis (Cys280  $\rightarrow$  Leu) of *Arabidopsis thaliana* Carbonic Anhydrase," Undergraduate Chemistry Research Symposium, Skidmore College, Saratoga Springs, NY, April 18, 1998.
  20. Brian J. Conti\* and Roger Rowlett, "The Construction of the Overexpressed Vector pRRX," Undergraduate Chemistry Research Symposium, Skidmore College, Saratoga Springs, NY, April 18, 1998.
  21. Rebecca G. Balkin\* and Roger Rowlett, "Cloning and Overexpression of Carbonic Anhydrase from *Helicobacter pylori*," Undergraduate Chemistry Research Symposium, Skidmore College, Saratoga Springs, NY, April 18, 1998.
  22. Jay T. Afragola\* and Ernest G. Nolen, "Progress Towards the Assembly of a Model System for the Bacteriophotosynthetic Reaction Center," Undergraduate Chemistry Research Symposium, Skidmore College, Saratoga Springs, NY, April 18, 1998.

*Department of Chemistry  
Colgate University  
13 Oak Drive  
Hamilton, NY 13346*

### **Colgate Connections in our Seminar Series**

During the Fall of 1997 we were treated to two seminars by former students. Jennifer Finnegan, '91, from Merck, returned as part of Women in Science Week to talk about her career experiences. Brian Bronk, '89, gave a departmental seminar on Pharmaceutical Research based on his work with Pfizer.

The Fall of 1998 brought another two alumni back to campus. Jenna Siracusa Trommel, '94, came to campus to recruit students for Emory University and she presented her Ph.D. research on Vitamin B12 Models. Professor Jane van Doren, '80, currently at Holy Cross, visited and spoke on her investigations on ion-molecule reactions.

#### **Check Out Our Web Page**

For more information about the department, go to the department website at <http://departments.colgate.edu/chemistry>. It is an excellent site and we owe a special thanks to Roger Rowlett for putting it together.

### **Your News?**

Obviously not all of you are planning on returning to Colgate to give a seminar in our department, like those mentioned before. Nevertheless, we would love to hear from you. You should see us in the departmental office after the *Scene* is published. We are all trying to glean news about our former chemistry and biochemistry concentrators. Please send us your news so that we can include an alumni news section in our next newsletter. Just drop us a note in the mail or email one of us. Looking forward to hearing from you.

### **Alumni Contributions to the Department**

We welcome any contributions that you can make to the university. We would particularly like to see an endowment established to help support one or more deserving students for summer research. When (or if) you are giving money to Colgate, you can specify that your contribution go to the Chemistry Department.