

We're in

Selected chemistry faculty members (Drs. **Bisht, Jung, McLaughlin, Turos**) and their research operations entered the new NES Building starting December 6. Space in the building is being shared with the Department of Geography and Environmental Science and Policy. The Mass Spectrometer/Peptide synthesis Facility moved there as well, and the X-ray facility is scheduled to move next. This is truly a signature building (please see picture).

While chemists were moving from Science Center and BSF buildings, chemists were also vacating the Chemistry building (CHE), and the last day in the building was December 10, 2004. Drs. **Braman** and **Johnston** now have their offices in the Science Center; Dr. **Weinzierl's** office is in BSF. The move was ably coordinated by Dr. **Rosa Walsh**, Assistant Chair.

All of our teaching laboratories are currently in NES, but biochemistry,



NES Building, February, 2005.

clinical, physical chemistry, and methods laboratories will move back to CHE when the renovation is complete

So far every thing has moved smoothly with some tinkering and fine-tuning still in progress. To celebrate, a reception for all graduate students and faculty was held Thursday, January 13, with over 60 in attendance on the front halls of the third floor.

Recognition...

FIMS: The 2004 FIMS (Florida Inorganic Mini-Symposium) was hosted in

October at USF by Department of Chemistry Graduate Students and their advisors. **Giordano Z. da Silva** was the Student-Organizer. He was assisted by **Gregory J. McManus**, **Jarrod Eubank**, and **John Perry IV**. Eight oral presenters from USF and UF as well as 15 posters presentations were presented during the daylong well-attended meeting that was opened by **Dr. Li-June Ming** and closed by **Dr. Mohamed Eddaoudi**. The student organizers are to be congratulated on their initiative and effectiveness. (Please see picture of the

group on the Department Web page.)

Out and about...

The “Jewel Box” of the Chemistry Building is no more. It was destroyed on January 11 and 12 as part of the extensive revision of this building.

Staff members you should know...

John Seals is the Department’s Senior Teaching Laboratory Specialist and manager of undergraduate and graduate teaching laboratories. He has been associated with the department since 1981 when he came here after being graduated from Michigan State University with a B. S. in Biochemistry. He obtained his M.S. in 1986 working with **Dr. Steve Grossman**. His thesis was concerned with the purification and characterization of dimeric arginine kinase from sea cucumbers. Subsequently, he was hired by **Dr. Stewart Schneller**. Currently he is supervisor of, and has the over-all responsibility for, eight laboratories and approximately 108 sections. In addition, he has responsibility for ordering bulk solvents and compressed gas cylinders for the department.

Spotlight on...

[Continuing our series on departmental faculty members]

Dr. Rebecca O’Malley is a long-time member of the Chemistry Department, who joined the faculty in 1980. She was tenured in 1985 and promoted to full professor in 1994.

She originally trained as a Physical Chemist and her Ph.D. (University of Sheffield, England, 1970) was in the area of gas phase ion-molecule reactions. At this time, there



Dr. Rebecca O’Malley.

was a lot of interest in the fundamentals of such reactions because of the importance placed on the space program and the significance of ion-molecule reactions in space. Much of the experimental work in this field was carried out using mass spectrometers of various designs. Over the years, the underlying theme in Dr. O’Malley’s research has been the application of different types of mass spectrometers to challenging problems.

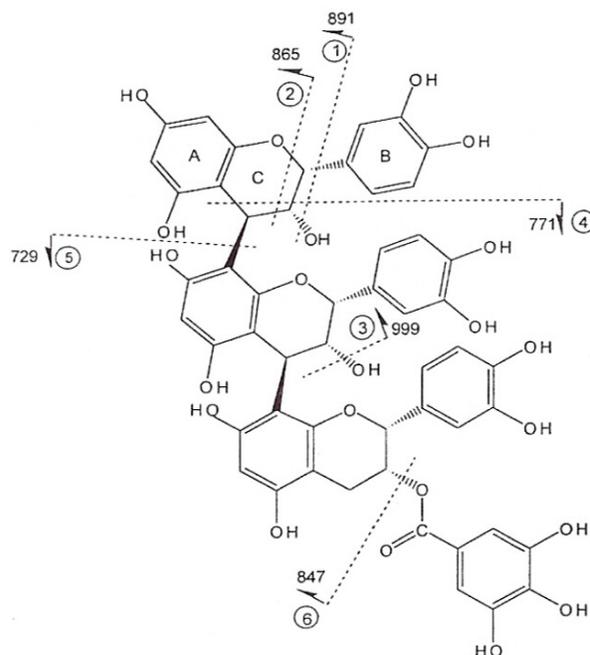
When she was appointed, the Chemistry Department had a second-hand, 1960s vintage, time-of flight instrument. This had been found standing idle at New College in Sarasota and was subsequently given to her to start a research program. She obtained research funds from NSF, Research Corporation, and the Petroleum Research fund. The funds were used to buy a pulsed (10 Hz, 15ns) Nd:YAG laser plus state of the art digitizing and signal averaging equipment.

With some help from the Engineering College, her group was able to interface the laser to the time-of-flight mass spectrometer. This allowed production of gas-phase ions using multi-photon ionization. Wavelengths of 532nm (green), 355nm (blue) and 266nm (UV) became available using harmonic generating crystals with the Nd:YAG laser. One of the first homemade laser time-of-flight mass spectrometers was built! At this time all the experimental work was done in the gas phase.

Later, she obtained a career advancement award from NSF to modify the source of the time-of-flight instrument again so that laser desorption of solids, in particular polymers, could be carried out. For this work, the fundamental of the Nd:YAG was used (1064nm, in the IR). In mass spectrometric analysis of desorbed polymers the molecules go into the gas phase as neutral species and it is necessary to add a cation in the gas phase. This is done using a gas phase ion attachment reaction. Experiments were completed and published that showed which gas phase metal ions were optimal for mass spectrometric analysis of different types of polymers.

More recently, Dr. O'Malley has been working in collaboration with Dr. David Fitzpatrick (Pharmacology Department, USF – retired 2003). This work has involved the mass spectrometric characterization of some endothelium-dependent vasorelaxing compounds extracted from grape seed extracts. The grape seed extracts were obtained by (1) grinding and extraction of the grape seeds with methanol, (2) initial separation into seven fractions using Toyopearl chromatography, and (3) HPLC separation of the seven Toyopearl fractions. After HPLC separation, the different components were tested for vasorelaxing activity using rat aorta and then further characterized using mass spectrometry. The

mass spectrometric technique used for this is electrospray ion trap mass spectrometry. Electrospray ionization is a relatively recent innovation, which has opened up the vaporization and ionization of certain low volatility compounds. Ion trap mass spectrometry allows MS/MS (mass spectrometry/mass spectrometry) data to be obtained. MS/MS is an extremely powerful technique: an ion is initially selected, and then collisionally activated. The activation results in the production of fragment ions, which are then detected and measured by mass. These fragment ions frequently carry definitive structural information about the initially selected ion. Most of the compounds isolated from the grape seeds are oligomers ($n = 2$ to about $n = 12$ units) of procyanidins. Some of the units within the oligomers are galloylated and some are not. As an example of the conclusions it has been possible to draw about these compounds, see the structure below, which is a trimer gallate, i.e., a trimer unit with one gallate substituent.



Trimer gallate, a trimer unit with one gallate substituent.

The mass spectrum (negative ion) gave the molecular weight as 1018 Da, which indicated that the structure contains three procyanidin units with a substituent gallate group somewhere. MS/MS applied to the molecular ion gave fragment ions at the masses indicated in the figure and allowed the conclusion that the three units are arranged as shown: the gallate group is definitely on the bottom of the three units, and not on either the middle or the upper unit. [For further details of this work see: D.F. Fitzpatrick, R. C. Fleming, B. Bing, D. Maggi and R. M. O'Malley. Isolation and Characterization of Endothelium-dependent Vasorelaxing Compounds from Grape Seeds, *J. Agric. Food Chem.* **2000**, 8, 6384-

6390.] Future work will involve further exploration of the structure of certain others of the vasorelaxing compounds identified and also other sources of similar compounds.

Off campus, Dr. O'Malley is an avid bird watcher, a member of her church choir, and a member of the Krewe of St. Brigit.

The joy of our present, the hope of our future

[Continuing our series on chemistry graduate students...]

Jarrold Eubank was born in 1980 in Morganfield, Kentucky, and grew up in a quaint little farming and coal-mining community called Sturgis, better known

as "Little Sturgis" to avid bikers. In 1998, Jarrod was graduated as co-valedictorian of Union County High School with a 4.0 GPA. He received an Award of Excellence scholarship to attend Western Kentucky University, and moved to Bowling Green, Kentucky the following fall. Though he began as a 3-year Pre-Veterinarian major, he quickly decided to complete a 4-year degree. While at WKU, Jarrod worked as a resident assistant at Keen Hall (2000-2001) to gain leadership skills while living on campus. In the fall of 2000, he was awarded the USDA, APHIS, PPQ William F. Helms Scholarship by the U. S. Department of Agriculture, and was given an excellent opportunity to work for the USDA and experience first-hand our government at work. Jarrod also worked on several undergraduate research projects, leading to a publication under the guidance of USF alumnus **Ralph N. Salvatore** (Ph.D.'01). In May 2002, he was graduated from WKU with a double major in Recombinant Gene Technology and Chemistry. He heard about USF while working for Dr. Salvatore, and visited here for the Open House in spring '02. By summer, Jarrod had been admitted to the Ph.D.



Jarrold Eubank.

program at USF, and had moved to Tampa. He joined **Dr. Mohamed Eddaoudi's** lab the following fall, and began research on the design and synthesis of Metal-Organic Frameworks, specifically chiral networks. Jarrod has presented his research at several local and regional conferences and currently has one publication accepted by Chemical Communications. He received third place in the inorganic poster division of the Third Annual Raymond Castle Student Research Conference in 2003 and was a co-recipient of the George Bursa Award last year for his research and teaching efforts. Jarrod plans to continue his research efforts at USF under the guidance of Dr. Eddaoudi until his expected graduation in 2006.

Alumni News

Dr. David Austin (B.A./M.A. '89) is an associate professor of chemistry at Yale, where he and his research group are doing research on the synthesis of biologically interesting molecules and protein engineering for biological catalysis and recognition. At South Florida, he worked with Dr. Terence Owen

Glenn Gates (Ph.D. '01) was one of four speakers at a symposium on Color Field Painting held at Harvard University December 4th. He was an Andrew W. Mellon Post-doctoral Fellow in Conservation Science at Harvard University Art Museums. He is scheduled to be Senior Scientist at the Detroit Institute of Arts.

Marion T. Doig III (Ph.D. '73), Professor of Chemistry at the College of Charleston and his wife attended the SE regional ACS meeting at the Research Triangle in November where we had a chance to visit.

Maria C. Flynn, M.D. (M.S. '89) is a staff Radiologist in the U.S. Navy and is stationed

at Portsmouth Naval Center. She and her husband Dan Sutton have a son, Camden.

Dr. Frank F. Fowler (B.A. '64) served as a Martin Lecturer on December 3. He is Professor of Chemistry at SUNY Stonybrook.

Maria Gallardo-Williams (Ph.D. '99) and her daughter were granted citizenship on November 9th. She was also a member of the organizing committee of the SERACS. An undergraduate poster prepared in collaboration with students won a blue ribbon at the November SERACS meeting. She is the co-author of two laboratory manuals for organic chemistry used at North Carolina State University

Dr. W. Karl Olander (M.S. '68) wrote that his two sons were visiting him and his wife, Zuli, for the holidays and that they planned to see the Rose Parade in Pasadena for New Years.

Eileen Perez (Ph.D. '99) continues at HCC in Brandon where she noted that she "changed the CHM1045L College chemistry laboratory I from a traditional lab environment where students follow a procedure to obtain predetermined results, to a guided-inquiry laboratories in which students are given an open-ended real-life chemistry problem to solve in the lab. Students are given background information. They work in groups to come up with a scientific procedure to analyze/solve the problem, making use of the scientific method. Research performed by the Consortium for Science Advancement and research performed by Clemson University indicates that this type of environment is most beneficial for the success of minority groups, particularly women, and for the nontraditional student. Science can be challenging, daunting and scary to these groups. Working in cooperative learning groups helps build their self-esteem as they rotate the group roles,

improve verbal and written communication skills, and promotes critical thinking.” The guided-inquiry lab is much more challenging than the traditional lab. At first students seem distressed by the lack of explicit instructions, but as the semester progresses they overcome this and seem to enjoy the challenge, she noted.

Ralph Salvatore (Ph.D. '01) Assistant Professor of Chemistry at Western Kentucky University, wrote that he had recently received a Cottrell Research Corporation Research award (\$52,000.00) for “Organobarium Chemistry: Novel Mechanistic Concepts and Synthetic Applications.” Also, he served as the Co-PI in order to obtain a new 500 MHz NMR with variable temperature and multinuclear capabilities (\$349,000.00).

Sirus Yoo, M.D. completed medical school at Michigan State in 2003 and is currently a resident in Otolaryngology at the University of Washington. He was a masters candidate and worked with Dr. Jung before going transferring to medical school.

Other news...

Dr. Towner Scheffler (Chemistry Faculty 1985-92), Mine Safety Appliances Co., offered a one-day course, “Chemical Warfare Agent Detection, at Pittcon 2005 in Orlando.

Dr. Joseph Stanko (Chemistry Faculty 1973-03), Dr. Jay H. Palmer, and Heidi Kay (Ph.D. '99) co-authored (with colleagues in Public Health and the H. Lee Moffitt Cancer Center) a paper on novel platinum compounds. The paper was published in *Molecular Cancer Therapeutics* and investigated potent anti-tumor activity of the compounds.

Dr. Douglas Raber (Chemistry Faculty 1970-91) established GreenPoint Sciences, a

consulting business in science and science policy. Clients have included the American Chemical Society, Chemical Heritage Foundation, and Auburn University.

What are they up to?

Please look at our web page (“Graduate Alumni”) and see if you (and or your friends and fellow alumni) are accurately listed. It is hard to keep up with the growing list of alumni (would you believe over 275 graduate alumni). We would be grateful if you could bring us up-to-date on what you or some of your friends are doing ...

News and feedback

For additional information on faculty, staff, students, and programs, please see our Department Home Page: <http://chemistry.usf.edu>

For past issues you may have missed, please see the Home Page.

And if you have news for us, please contact us at: dmartin@mail.cas.usf.edu