Department of Chemistry and Biochemistry

FLORIDA INTERNATIONAL UNIVERSITY

Newsletter Fall 2012

chemistry.FIU.edu

IN THIS ISSUE

FIU | Arts & Sciences
Integrated Science and Humanity

FIU Launches Ph.D. with Environmental Track

In order to address the increasing need for doctoral training in Environmental Science, FIU has recently approved and implemented a Ph.D. track in Environmental Chemistry, situated within the current doctoral program in the Department of Chemistry and Biochemistry.

This track will prepare students with an interest in the chemical aspects of environmental science with coursework and research experience at the doctoral level. Graduates of the program will have developed a strong expertise in both environmental science and chemistry, and are therefore expected to be competitive in seeking employment in both these areas in industry, government and academia.

For information please visit the chemistry website under "Graduate Programs" or contact Dr. Rudolf Jaffé, the Environmental Chemistry Track program director, at jaffer@fiu.edu.

Alumnus Assumes Leadership Position at MDC

FIU alum Pablo Sacasa has been named chairman of the Department of Chemistry/Physics/Earth Sciences at Miami Dade College-North Campus. He oversees 11 full-time faculty and adjunct professors, and manages a major STEM grant. The North Campus was the first and one of the largest, at MDC. The campus offers a unique collection of programs and certificates and enrolls more than 50,000 students. MDC-North is home to the School of Science housed in a new Science Complex that includes state-of-the-art laboratory facilities for all the sciences.

A native of Nicaragua, Dr. Sacasa received a B.A. in Chemistry in 1997 from Florida International University. He completed his master's in Chemistry in 2003 and the Ph.D. in Chemistry in 2010 under the direction of Professor Stanislaw F. Wnuk. As a master's student, his research focused on synthetic medicinal chemistry; the design and synthesis of analogs of S-adenosyl-L-homocysteine with 5', 6'-double bond (or halovinyl) moieties incorporated in place of the sulfur atom employing different cross-coupling approaches. As a Ph.D. student, Sacasa developed a radical-mediated germyldesulfonylation reaction utilizing less toxic germane hydrides to produce germyldesulfonylation reactions to avoid toxicity of more commonly used tin reagents. Dr. Sacasa also developed a radical mediated thiodesulfonylation reaction of the (α-fluoro) vinyl sulfones with arylthiols in either organic or aqueous media providing an environmentally friendly way to access (α-fluoro)vinyl sulfides. Dr. Sacasa has published one book chapter and eight peer-reviewed publications from his graduate work at FIU in such respected journals *as J. Med. Chem., Tetrahedron Lett.,* and *Bioorg. Med. Chem.*

Sacasa aspires to grow at Miami Dade College in order to better serve his students and his community. He is very grateful to his parents and feels that the time they devoted to educate their children left him with the best inheritance that a parent can leave a child — a solid education. Dr. Sacasa's motto is "An education in this world is the key to success in this life."

Letter from the Chairman

The Department of Chemistry & Biochemistry and I extend our greetings and our hope that this has been a good year for you. I am happy to report that FIU and the Department are growing, the world economy notwithstanding. FIU reached an enrollment of 48,000 students this year, with even more anticipated in fall 2012. The chemistry graduate program has grown to roughly one hundred students. This year we inaugurated a PhD program in Biochemistry, in addition to the existing PhD program in Chemistry, and we plan to double it in size next year.

We are very excited about our new hires. Yuk-Ching Tse-Dinh, who works with DNA topoisomerase, will help expand the biochemistry program and also lead the establishment of a brand-new institute, the Institute for Biomolecular and Biomedical Science that will bring together faculty from a variety of fields in multidisciplinary research. Francisco Fernandez-Lima, who applies mass spectrometry to the characterization of biological nanodomains such as cells, will become director of our Advanced Mass Spectrometry Facility and lead its development into an analytical facility serving the entire South Florida region. Sandra Stojanovic, instructor of organic chemistry, will help lead expansion of the undergraduate organic program as FIU grows.

Our undergraduate programs are expanding to meet the needs of the immediate Miami community in particular. The Department was awarded a prestigious REU (Research Experience for Undergraduates) grant by the NSF. With it we will develop a summer research program for undergraduates from other colleges and universities, based on the research topic of sensing. If you know undergraduates who might be interested, please encourage them to check it out at our website.We are seeking to form a Chemistry Chapter of the FIU Alumni Association, with a kick-off event in October. Look for details later in this issue. We think it is high time that our alumni have the opportunity to network and reconnect with the Department. Please think about participating!

Best wishes,
David Chatfield, Chairman

Did you know?

The Department now has 35 full-time faculty members whose research encompass every major field in chemistry and biochemistry, with particular emphasis on environmental, biomedical, and forensic chemistry.

Working in conjunction with the International Forensic Research Institute, the department has several facilities available for research, teaching and development. These facilities include the Forensic DNA Profiling Facility, the Trace Evidence Analysis Facility, the Mass Spectrometry Facility, and the Toxicology Facility. Additionally, the department has a state-of-the-art facility in Nuclear Magnetic Resonance. The department boasts more 100 graduate students.

In the past three years:

- Grant funding has reached an all-time high, with an average of $4.4 million generated per year. This year's total should be more than $5 million.
- Faculty members and students have presented more than 550 papers at local, national and international meetings.
- Faculty members have generated more than 250 publications in peer reviewed journals; most of them with graduate or undergraduate student co-authors.
- The department has conferred more 170 B.S. degrees, 27 M.S. degrees and 30 Ph.D. degrees.

Spotlight on Research

DEVELOPING ANALYTICAL METHODS FOR USE IN FORENSIC SCIENCE

Dr. José R. Almirall joined our Chemistry Department in August of 1998 as an assistant professor after working at the Miami-Dade Police Forensic Laboratory for 12 years. He earned a B.S. in Chemistry at FIU ('83), a M.S. in Chemistry at the University of Miami ('88), and a Ph.D. in Chemistry at the University of Strathclyde, UK ('98).

He was promoted to Associate Professor in 2004 and to Professor in 2009. His research laboratory currently consists of 10 Ph.D. students, one Master of Science student in Forensic Science and four undergraduate B.S. Chemistry students. Dr. Almirall's research interests include the development of analytical chemistry tools for use in forensic science. His group has been interested in developing methods and instrumentation improving the application of inorganic mass spectrometry (LA-ICP-MS) and atomic spectroscopy (LIBS) to better characterize materials of interest to forensic science such as glass, paint, soils, and cotton.

He has led an effort to gain court acceptance of the use of elemental analysis and comparison of materials to establish associations between crime scene evidence and known sources of a material. His group has also developed the use of extraction substrates coupled to ion mobility spectrometry (IMS) to better detect trace amounts of drugs and explosives in the field. One recent publication reports the detection of homemade explosives by capturing the volatiles associated with the explosive on a substrate and subsequent detection with an inexpensive field IMS instrument. One prevalent theme of their research is to take analytical chemistry closer to the forensic samples. Dr. Almirall has graduated four Ph.D. students in the past two years for a total of nine Ph.D. graduates and 16 M.S. in Chemistry and M.S. in Forensic Science graduates to date. His students are employed in forensic laboratories, national labs, industry and academia. Dr. Almirall has authored one book and more than 95 peer-reviewed publications in the fields of analytical and forensic chemistry since arriving at FIU, presented more than 450 papers and workshops and attracted more than $5 million in external funding to support his research efforts. He and his students have applied for a patent on technology to detect explosives. It is currently being commercialized by a Florida company. Dr. Almirall was recently honored with the Provost Award for Mentorship of Graduate Students (2012) and with one of the FIU Top Scholars Awards (2012).

Dr. Jose Almirall (left) and members of his lab are developing new forensic science analytical methods.

Web site: www.fiu.edu/~almirall.

Is Zaida Morales-Martinez Really Retired?

Zaida Morales-Martinez was born and raised in Puerto Rico where she graduated with a B.S. in Chemistry from the University of Puerto Rico in 1957. After she completed her M.S. in Analytical Chemistry at The Pennsylvania State University in 1962, she returned to the University of Puerto Rico as an assistant professor. She became an instructor of Chemistry at Florida State University in 1967, and joined FIU in 1973. In 1982 she was officially recognized as coordinator of Chemistry Laboratories, a task she had been performing since her arrival at FIU. During her years here, FIU grew tremendously — from a two-year, upper level school to a full-service university with a growing mission in education. While there were many changes and new faces in the department, one constant in the halls of chemistry was Zaida — always there encouraging students to do their best.

From 1994 until she retired in 2003, Morales-Martinez served as Coordinator of Premedical Advising and Science Recruitment and Retention. In 2003 Morales-Martinez was named Emeritus Professor of Chemistry. She has been recognized with numerous awards including Excellence in Teaching, Service, and Advising and most recently she was awarded the University's prestigious FIU Medallion.

Throughout her career, she has exemplified what a mentor should be, and as such, she coordinated the American Chemical Society's Project SEED Program for South Florida. In 1999 she became mentoring consultant for the ACS Scholars Program, and she remains in that position today. Her overall mentoring efforts were recognized in 2004 by the American Chemical Society with a prestigious national award "for encouraging disadvantaged students into careers in the chemical sciences." Just last year, Zaida was again recognized for her contributions to the chemical profession with the National Award for Service to the ACS. A new ACS award for mentoring has been established in her honor — The Zaida Morales-Martinez ACS Scholars Mentor Award," which will be presented annually to someone who does an outstanding job mentoring ACS scholars. Now you understand why this article is titled "Is Ms. Morales-Martinez really retired?" ….We will keep you posted.

The joys in Zaida's life are her three beautiful grandchildren, Danielle and Derek, 13, and Noah, 12 and her children and their spouses, Luis and Cindy and Olga and Jayson.

Alumni Notes

Rolando Perez, '75, B.S.
After working for Dow Chemical, Ciba-Geigy and Betz PaperChem, Rolando founded ADPEN Laboratories in 1989. Located in Jacksonville, FL, ADPEN Laboratories provides analytical services for the Agrochemical, Pharmaceutical and Food Safety industries worldwide. Way to Go, Rolando!

Wilmo Andollo, '79, B.S.
After working for the Dade County Water Department, Wilmo joined the Miami-Dade County Medical Examiner's office as a Forensic Toxicologist in 1983. He is currently the Quality Control Supervisor for the Toxicology Laboratory at the Medical Examiner's office. Wilmo is looking forward to retiring in 2014 and spending more time sailing and playing with his grandchildren!

Joseph Rein, M.S. '91, with Dr. Furton.
Joe was Dean Furton's first graduate student way back when our Dean was a new Assistant Professor. Joe is a Forensic Toxicologist for the Miami-Dade County Medical Examiner where he has worked for the past 27 years. He is looking forward to retiring in 2015 and attending culinary school! He is married to our own Professor Rein!

Yuk Sham, '94, B.S.
Yuk Sham received his Ph.D. from the University of Southern California in 1999. This was followed by post doctoral studies at the National Cancer Institute and IBM. Dr. Sham is currently an Assistant Professor at the Center for Drug Design at the University of Minnesota.

Angela Padilla, '01, B.S.
After working for Schering-Plough for three years, Angela went back to graduate school in 2004 and received her Ph.D. in organic chemistry from the University of Texas at Austin in 2009. Dr. Padilla currently works for Dow Chemical in Freeport, Texas.

Frank Gonzalez, '05, B.S.
Frank belonged to FIU's ROTC while he was a student. After graduation, Frank served as an Army Ranger for four years. He was promoted to captain while serving in Afghanistan. After returning, Frank completed a second bachelor's degree in biology. He has been accepted to medical school at Columbia University as a US Uniformed Services student.

Jamie Winshell, '05, M.S./ Bio-Organic with Dr. Rein.
After studying dinoflagellates at FIU, the only eukaryotes which lack histones, Jamie moved on to manage the laboratory of Dr. David Allis at Rockefeller University in New York City, a lab that studies histone modification.

Roberto Perez, '06, Ph.D./ Bio-Organic with Dr. Rein.
Dr. Perez is currently a Research Assistant Professor at the University of Miami School of Medicine's Department of Pathology, working with Nobel Laureate Dr. Andrew V. Schally. Roberto now leads the Breast Cancer Division in the Department of Pathology's Endocrine, Polypeptide, and Cancer Institute.

Francesca Alvarez-Calderon, '05, B.S./ '07, M.S. with Dr. Landrum.
Francesca is in her fourth year as an M.D./ Ph.D. student at the University of Colorado.

Alexandra Alvarez-Calderon, '07, B.S.
Alexandra, who is Francesca's sister, is in medical school at USF.

Darwin Babino, '06, B.S. Chemistry and Biology/ '10, M.S. Chemistry with Dr. Landrum
Darwin is in the pharmacology Ph.D. program at Case Western Reserve University. His research involves the use of knockout mice to study carotenoid cleavage enzymes 1 & 2.

Gangadhar Dhulipala M.S., '10, with Dr. Miksovska.
Gangadhar is working as Research Associate II at Regeneron Pharmaceuticals, Inc, New York.

Simona Horsa M.S. '10, with Dr. Miksovska.
Simona is working at Regeneron Pharmaceuticals Inc, New York as a Research Associate II.

Chemistry Hires New Faculty

Yuan Liu came to FIU in 2010. She earned her Ph.D. in Biochemistry at the University of Rochester School of Medicine and Dentistry in 2003. She did her postdoctoral training at the National Institute of Environmental Health Sciences / National Institutes of Health, where she studied the molecular mechanisms of DNA base excision repair and its correlation with the prevention of human cancer and neurodegenerative diseases. Through her current research, Liu hopes to identify new targets from DNA repair pathways for prevention, diagnosis and treatment of human cancer and neurodegeneration. Her research has been funded since 2009 by an NIH K99/R00 award.

Yi Xiao joined FIU in 2011. She earned her Ph.D. in Biochemistry at Nanjing University. After graduation, she went to Israel and began her first postdoctoral appointment in Itamar Willner's group at the Hebrew University of Jerusalem. She moved to UC-Santa Barbara in 2004 for her second postdoctoral position under the direction of Alan Heeger (Physics) and Kevin Plaxco (Chemistry). There, she extended her work into biomedical diagnostics by developing label-free, electronic biosensors that function effectively in complex mixtures such as serum and cell lysates. She has achieved a number of extraordinary breakthroughs in critical areas of biotechnology such as "in vitro Directed Evolution" and "on chip DNA and small molecules detections." Xiao's research is directed towards employing new biomaterials and new platforms to design ultra-sensitive, amplified sensors for in vivo sensing for point of care testing.

Judy M. Whitt, 1946-2012

It is with regret that we inform you that Judy Whitt, a beloved former colleague and friend, passed away Jan. 20. You may remember her as the "face" of the department; the first person one would see when visiting the second floor of Owa Ehan and later Chemistry and Physics. Judy received her Associate in Arts at Miami Dade Community College and continued her studies at FIU. She was the sole department secretary in 1985, later becoming senior secretary. Judy, who returned in 2006, was appointed a member of the University's Access and Equity Committee by President Maidique in 1996, serving as chair of various subcommittees. Judy had a gift for common sense; that, combined with her experience at FIU and her caring nature, made her a valued resource of advice for new students, faculty and department chairs. Despite great personal tragedy she was a source of strength to her family and friends. Judy is survived by her two sons, Alphonso and Kenneth, one daughter-in-law, eight grandchildren, two sisters, and numerous cousins.

A History of Chemistry at FIU

1976 — 1982

This is the second installment in a series outlining the history of chemistry at Florida International University. Each segment will be written by a chemistry faculty member who has been part of the FIU chemistry story over the years.

By LEONARD KELLER

The period from 1976-1982 was one of slow but steady growth and consolidation of the chemistry program at FIU.

In 1976, Chemistry was still part of the Department of Physical Sciences and would remain so until 1983 when the four programs (chemistry, physics, geology, and environmental studies) would begin their gradual split – first into autonomous programs and finally into separate departments in 1985. Professor Howard Moore replaced John Sheldon as department chairman and served in that capacity from 1977-1982. Both chemistry and physics moved into the Owa Ehan (OE) building in 1977, while the laboratories for earth sciences remained in Primera Casa (PC).

Howard Moore was responsible for settling chemistry into its new space, where there were finally enough laboratories to accommodate our growing program and faculty. It was not long, however, until we became overcrowded. Chemistry and physics were to remain in OE for fourteen years, even though space was already becoming a serious problem by the mid-1980's.

Under Professor Moore's leadership, the two chemistry programs, the B.S. and the B.A., matured into solid and successful undergraduate degrees. It took until 1983, however, for the B.S. degree program to become accredited by the American Chemical Society.

The number of chemistry majors grew significantly during FIU's first ten years – growing from just two or three in 1972 to over forty by 1982. From 1976-1979 FIU chemistry developed a close affiliation with Dow Chemical Company in Midland, Michigan, one of the largest chemical companies in the world. Dow began to invite FIU chemistry majors up to Midland to participate in its summer internship program, and many of them ultimately accepted permanent positions at Dow after graduation from FIU. Over the course of several years, 29 FIU graduates became full-time employees at Dow Chemical.

In 1977, Chemistry moved into Owa Ehan, providing the program with teaching labs, dedicated research labs, and faculty offices all in one place. The building was shared with Physics and Biology for 14 years until the construction and completion of Chemistry and Physics in 1991.

During the period 1976 to 1982 the University's budget was very tight, and the number of chemistry faculty remained at seven. In 1979, Kathryn Williams moved to the University of Florida, and was replaced for one year by Paul Edwards.

Then, in 1980, John Landrum (Ph.D., University of Southern California) was hired as the department's permanent inorganic (and analytical) chemist. Donna Ticknor (Ph.D., University of Florida) joined the department in 1981 as an adjunct instructor to teach organic chemistry lab, and became a permanent lecturer in 1983 when the department started teaching chemistry at the Bay Vista (now the Biscayne Bay) Campus.

There were changes in faculty in physics and earth sciences during this period as well. Grenville Draper (Ph.D., University of the West Indies, Jamaica) joined earth sciences in 1978 replacing Usman Sayeed. Ralph Morgenstern left physics in 1978, and Richard Bone (Ph.D., University of the West Indies, Jamaica) arrived as a lecturer in physics in 1980 thus bringing the number of physics faculty up to four.

The next phase of chemistry's evolution at FIU came in 1982. Leonard Keller became chair of the Physical Sciences Department, and chemistry started its move toward autonomy as well as to ACS accreditation. In the next issue, we'll revisit 1983-1991.

To be continued ...

Department of Chemistry and Biochemistry
Florida International University
11200 S.W. 8th Street
Miami, FL 33199

Postage

Stay in Touch

FIU Chemistry alums can be found all across the globe making their degrees work for them. Your FIU Department of Chemistry would like to stay in touch to find out what's new in your careers and lives. Email us at chemistry@fiu.edu or call us at 305-348-2606 or connect to us via Facebook by joining the FIU Chemistry Alumni group. There you can find out what your fellow alumni are up to, and you can let them know where your career has taken you.

Stay Connected

On Saturday, October 13 The Department of Chemistry and Biochemistry hosted a special event for chemistry alumni during FIU's homecoming weekend. Activities included a barbeque, campus and chemistry facilities tours, research posters, live music, fun and games for families. Prizes were awarded for the longest distance travelled and the longest time since graduation. Please stay tuned for future alumni events by visiting our website at chemistry.fiu.edu.

Stay Involved

As you know, chemistry degrees are hard to get, and not many students step up to the challenge. But one critical measure of successful programs (and university rankings nationally) is alumni participation in annual giving. This makes your participation all the more critical. If you would like to give back to your chemistry department and help the students of today, please contact us to find out how you can start supporting your chemistry department with an annual gift.

chemistry@fiu.edu | 305-348-2606

FIU | Arts & Sciences
Integrated Science and Humanity