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FIU Launches Ph.D. in Biochemistry

FIU unveiled a brand new Ph.D. program in Biochemistry in January.

The program is a collaborative venture with the Department of Chemistry & Biochemistry teaming up with the Department of Biological Sciences and the Herbert Wertheim College of Medicine to run the program. Biochemists and molecular biologists from all three units pool their intellectual capital for research, teaching and mentoring.

Thirteen faculty from this department are joining forces with 15 faculty from the other two units, all with active biochemical research agendas, to initiate the new degree program. The research areas of participating faculty from the Department of Chemistry & Biochemistry alone give a sense for the breadth of the new program, spanning:

- enzymology
- nucleic acid biochemistry
- biochemical toxicology
- physical biochemistry
- bioinorganic chemistry
- biochemistry of the retina
- forensic DNA chemistry
- metalloprotein chemistry
- medicinal chemistry
- computational biochemistry

Furthermore, this department is searching for two new cross-disciplinary faculty in bioinorganic and bioanalytical chemistry. We



will be a department of 33 faculty at the end of the year!

Students entering the Biochemistry Ph.D. program can anticipate exciting research, state of the art facilities, a fine seminar series dedicated to biochemistry, and collaborations with scientists from different disciplines and with many perspectives. Please spread the word about this new degree and help us build a vital biochemistry program at FIU.

School of Integrated Science and Humanity Formed

FIU recently announced the formation of the School of Integrated Science and Humanity (SISH), which houses five signature departments including the Department of Chemistry and Biochemistry. The school is part of a unique organizational structure undertaken by the College of Arts & Sciences to develop thematic schools that articulate and enhance the research strengths of FIU's largest college, according to Dean Kenneth G. Furton. Suzanna Rose, former senior associate dean for the College of Arts & Sciences, has been named the director of SISH.

SISH is designed to be a premier school for multidisciplinary research with a focus on human health in fields including the biomedical, behavioral and cognitive sciences. Other departments in SISH include Mathematics and Statistics, Philosophy, Physics and Psychology.

In addition to SISH, the College of Arts & Sciences also has formed the School of International and Public Affairs (SIPA) and the School of Environment, Arts and Society (SEAS).

Letter from the Chairman

Greetings to you all, alumni, students and friends of the department!

We would like to tell you about recent developments in your Department of Chemistry and Biochemistry. Much has transpired since the last issue of the newsletter. We vow to make our contact with you more regular.



We are a growing department, currently at 31 faculty. In this issue you will find articles about three of our new faculty: Joong-Ho Moon, an organic chemist interested in chemical nanotechnology with applications such as drug delivery; Anthony DeCaprio, a forensic chemist and toxicologist, researching biomarkers for identification of drug use; and Joseph Lichter, a biochemist with expertise in chemical education. We are now in the process of hiring two new faculty members in the areas of bioanalytical and bioinorganic chemistry.

We recently said farewell to Art Herriott, who retired after 35 years of service, including 13 years as dean of the College of Arts & Sciences. You may still see him around campus, as he so loves university life that he has been teaching freshmen in the Honors College. Look for Len Keller's article about Art later in this issue. Bruce Dunlap, dean after Art Herriott, also retired two years ago. And you'll never guess who is now dean of Arts & Sciences — none other than our own Kenneth Furton!

Our graduate and undergraduate programs have grown by leaps and bounds. The department has more than 100 graduate students, offering M.S. and Ph.D. degrees in Chemistry as well as housing an M.S. program in Forensic Science. The undergraduate program now graduates about 65 students a year in the B.A. and B.S. programs and is one of the largest undergraduate chemistry programs in the state. Our recent undergraduate majors have gone on to graduate programs at excellent institutions such as Caltech, Berkeley, Yale and Michigan State. We are proud of them all!

Last year we instituted a chemical education track within the B.A. in chemistry. Chemistry students interested in secondary education take courses in science pedagogy and earn a teaching certificate, in addition to a full set of chemistry courses. Formerly, prospective science teachers majored in education and often took only a smattering of science courses. We believe this is promising for the future of science education, which is critical for the future of our country. Please help spread the word to prospective students.

Grants drive research, and our faculty bring in more than \$4 Million annually in external grants. This allows us to offer competitive programs for our students, both graduate and undergraduate, while making a scientific impact. We are proud of our success and continue to strive to grow. One professor's research is highlighted in this issue.

We invite you to visit the department or give us a call. We always enjoy hearing from former students. If you are an alumna or an alumnus, stay tuned, as we would like to develop an alumni association chapter. Visit our website, chemistry.FIU.edu, to learn more and give us your comments, especially about ways you would like to stay in touch. I close in wishing you a very good year!

Best regards,
David Chatfield, Chairman



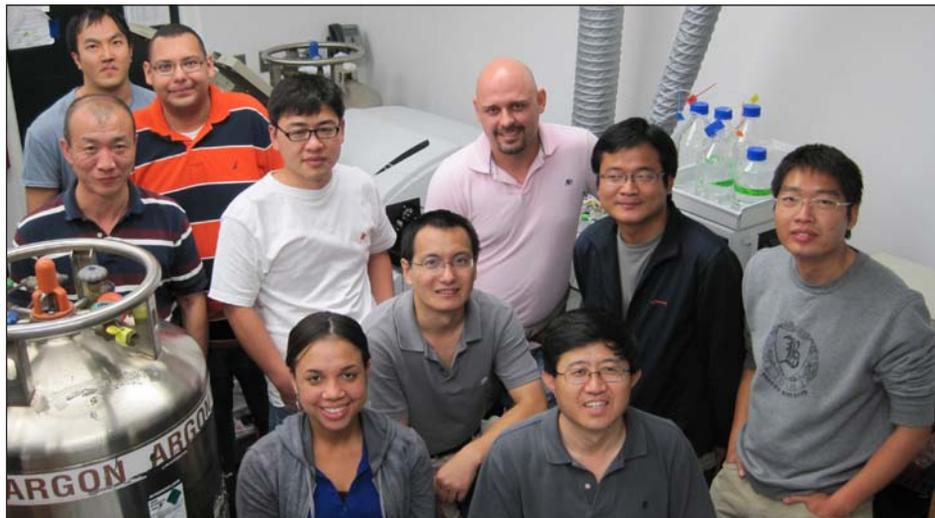
Spotlight on Research

TRACE ELEMENTS AND THE ENVIRONMENT

Dr. Yong Cai is an environmental chemist with a large and active research group. Among his many projects is an investigation of the effects of trace elements such as mercury and arsenic on the environment and on human health.

Trace elements, many of anthropogenic origin, can have significant impact on plant and animal life in the natural environment. Accumulation may occur over decades, and not every form of an element will have the same impact. Therefore it is crucial to understand the transport and transformation of such elements in the natural environment. Cai has been doing just that for more than 10 years with work focused on Hg and supported by USEPA and the National Park Service through the Everglades Regional Environmental Monitoring and Assessment Program (R-EMAP). Recently, his group has analyzed Hg species distribution patterns among ecosystem compartments in the Everglades at the landscape level to explore the implications of Hg distribution for Hg bioaccumulation (e.g., *Environ. Sci. Technol.* 2009, 4361). It has also performed a mass budget estimation for Hg seasonally deposited into the Everglades (*Environ. Sci. Technol.* 2008, 1954) and developed a novel method for the speciation of MeHg and EtHg (*Anal. Chem.* 2008, 80, 7163).

Cai also studies the potential hazards of wood that is treated chemically to prevent decomposition. Treated wood is used widely throughout the community, for example for



Dr. Cai (front row) joined the department in 1997, following a research appointment at FIU's Southeast Environmental Research Center, with which he still maintains an association. He earned his Ph.D. in Chemistry at Nankai University, Tianjin, China. He did postdoctoral work at the Max Planck Institute for Chemistry in Mainz, Germany and the Consejo Superior de Investigaciones Cientificas in Spain.

park benches and tables. He studies the leachability and toxicity of As, Cr, and Cu associated with treated wood (e.g., *Environ. Sci. Technol.* 2006, 4059; *Chemosphere*, 2010, 989; *Environ. Poll.* 2010, 1479) as well as the transport and fate of As in soil. This research has been supported by the NIH. Dr. Cai's research group, in collaboration with Dr. Lena Ma's research group at the University of Florida, has studied As uptake by *P. vittata* (*Nature*, 2001, 579), a plant that hyperaccumulates As. They have developed a novel method for the large-scale purification of As-induced phytochelatin

in the leaflets of *P. vittata* on a large scale (*Anal. Chem.*, 2003, 7030). In collaboration with Dr. Larry Boise at Emory University, Cai's group developed As speciation methods for identifying As metabolites present in cancer patients undergoing As chemotherapy. These methods may also be useful for studying the interactions between different As species and thiols present in biological systems, and eventually for assessing the effectiveness of As in multiple myeloma treatments (*Mol. Cancer Ther.* 2009, 8, 1197; *J. Anal. At. Spectrom.*, 2009, 24,1397).

Herriott Retires After 35 Years with FIU

We take this opportunity to look back over the career of Arthur Herriott who retired in 2009 after 35 years at FIU.

Art was raised in Ohio and graduated from the College of Wooster with a B.A. in chemistry. He earned his Ph.D. in organic chemistry from the University of Florida and was a National Science Foundation Postdoctoral Fellow at Princeton University. In 1968, he moved to the State University of New York at Albany where he served as an assistant professor of chemistry until joining the faculty at FIU in 1973, when the university was just a year old.

In 1976, after teaching chemistry and contributing to the early development of the department, Professor Herriott was named associate dean of the College of Arts & Sciences. Fourteen years later he was appointed Dean of the College by President Mitch Maidique when Dean James Mau became University Provost.

During his years as dean, Herriott presided over the phenomenal

growth of the College of Arts & Sciences. As its steward, he oversaw the hiring of hundreds of professors, the development of 12 doctoral programs and three masters' of fine arts programs, as well as the rise of the college's prominence as the premier research arm of the university. One of Herriott's greatest accomplishments was establishing a chapter of Phi Beta Kappa at FIU in 2001. Phi Beta Kappa is the oldest and most prestigious academic honor society in the United States, and only a select number of colleges and universities is privileged to have a chapter.

Herriott has been accompanied throughout his career by his wife Polly and by his two sons, Greg and Jeff, both of whom are FIU graduates. Greg is now a construction manager in Texas, and Jeff continues in his father's footsteps as an academic; he is an associate professor of Music Composition at the University of Wisconsin - Whitewater. The Herriotts are the proud grandparents of two granddaughters.

Although officially retired, Herriott has not quite left the university. He continues to teach as a Fellow of the Honors College.



Alumni Notes

Tielean Xu, '07, Ph.D./Organic Chemistry with Professor O'Shea and Weihua Song, '06, Ph.D./Organic Chemistry with Professor O'Shea

Dr. Xu works as an analytical chemist for a pharmaceutical company in Southern California, and Dr. Song is a postdoctoral fellow doing environmental chemistry at the University of California at Irvine. Dr. Xu and Dr. Song have a three-year-old son named William.

Daniela Andrei, '06, Ph.D./Organic Chemistry with Professor Wnuk

After completing a postdoctoral fellowship at the NIH-National Cancer Institute, Dr. Andrei joined the faculty at Dominican University in River Forest, IL where she is currently an assistant professor of chemistry. She teaches organic chemistry and is doing research with undergraduate students.

Ross Harper, '05, Ph.D., Forensic Track with Professor Furton

Dr. Harper is employed by ICx Technologies, which develops and integrates advanced sensor technologies for homeland security, force protection and commercial applications. He is a senior staff scientist in their explosives division focusing on explosives detection using optical techniques.

Yunping Xu, '05, Ph.D./Environmental Chemistry with Professor Jaffe

After completing a two-year postdoctoral appointment at the University of Toronto, Canada, Dr. Xu assumed a faculty position at the University of Peking, the most prestigious university in China.

Duk Kim, '03, Ph.D./Organic Chemistry with Professor O'Shea

Dr. Kim is currently an assistant professor of chemistry at the University of Alabama, Montgomery. He and his wife recently had their third child.

Ralph Mead, '03, Ph.D./Environmental Chemistry with Professor Jaffe

After graduating from FIU, Dr. Mead was a postdoctoral fellow at the University of South Carolina in the Marine Sciences Program. He then relocated to Miami and was a research scientist at the University of Miami Rosenstiel School of Marine Science. He is currently an assistant professor of Chemistry at the University of North Carolina at Wilmington. Dr. Mead, his wife, and two daughters love living in Wilmington.

Hellen Thomson, '02, M.S./Chemistry with Professor Winkle

Hellen came to FIU from England and earned her M.S. degree doing DNA research. While at FIU she vitalized the Chemistry Graduate Student Organization (GSO). After leaving FIU, she went to Imperial College, London and received her Ph.D. in 2006.

Saiful Chowdhury, '01, M.S./Organic Chemistry with Professor Wnuk

After graduating from FIU, Saiful earned his Ph.D. at Washington State University. He was a postdoctoral fellow at the Pacific Northwest National Laboratory and has recently accepted a position as a research fellow at the National Institute of Environmental Health Sciences (NIEHS) at Research Triangle Park, North Carolina. His research specialty is in the area of high resolution mass spectrometry in the study of biological systems.

Carlos Valdez, '00, B.S./Chemistry with Professor Wnuk

After graduating from FIU, Carlos earned his Ph.D. in chemistry from the University of California at Berkeley in 2006. He joined the laboratory of Nobel Prize winner K. Barry Sharpless at the Scripps Research Institute in La Jolla, CA as a postdoctoral fellow. He spent a year and a half as synthetic chemist at Rigel Pharmaceuticals in South San Francisco, CA and is currently a scientist at the Lawrence Livermore National Laboratory in Livermore, CA. He and his wife, Angela, have two children.

Ruben Gonzalez Jr., '95, B.S./Chemistry with Professor Winkle

After graduating from FIU, Ruben attended the University of California-Berkeley where he earned his Ph.D. in biochemistry under Professor Ignacio Tonoco. After completing a Burroughs-Wellcome postdoctoral fellowship at Stanford University, he joined the faculty at Columbia University. Ruben has a thriving research group at Columbia and a thriving family. He and his wife Limarys have two children, Noel and Isabel. And he still listens to rock and roll.

Department of Chemistry Staff News

Yvette Arango has joined the department as the new graduate secretary. A wonderful addition to the department, she is Professor Mebel's right-hand helper and is deftly designing an electronic database to help our efficiency in administering the graduate programs. In her spare time, Yvette loves to read history and enjoys the classical music offerings here on campus. She is also working toward a bachelor's degree - a course at a time - in the evenings. She will get there, we're sure of that!

Chemistry Hires New Faculty

Joseph Lichter joined the department as a lecturer in fall 2009. He earned his Ph.D. at Emory University where he investigated the structure and function of thymidine kinases (TK's) in humans and bacteria. While at Emory, Dr. Lichter was awarded a Dean's Teaching Fellowship and an NSF GK12 fellowship to work in Atlanta high schools and to bring problem-based learning methods into natural science courses at Emory.



At FIU, Dr. Lichter teaches general and analytical chemistry and coordinates the organic and analytical teaching labs.

Joong-Ho Moon joined the department in 2009. Moon earned his Ph.D. in inorganic and materials chemistry at Pohang University of Science and Technology (Korea) in 1999. From there he moved to a postdoctoral position at MIT where he studied the synthesis of new



poly(phenylene ethynylene) polymer brushes and the effect of unique surface structures on chemical sensing. In 2001, Moon joined the Nomadics Life Sciences/Advanced Materials Laboratory in Cambridge, MA. His current research focuses on the development of novel fluorescent materials for the detection of target molecules, and he is developing conjugated polymer nanoparticles for labeling cancer cells and delivering therapeutic agents to targeted cells.

Tony DeCaprio, an analytical toxicologist, joined the department in 2009. He directs the International Forensic Research Institute (IFRI) Forensic Toxicology Facility and the Forensic Science Certificate Program. Prior to joining FIU, DeCaprio served on the faculty of Environmental Health Sciences at the University of Massachusetts,



Amherst. He has also held positions as director of the Exposure Assessment Laboratory at the University at Albany and as a research scientist with the New York State Department of Health where he was involved with the Love Canal chemical waste site and the Binghamton State Office Building PCB transformer fire investigations. During that time he played a key role in the development of methodologies for risk assessment of dioxin- and PCB-containing chemical mixtures using toxicity equivalence factors (TEFs). Professor DeCaprio received a B.S. in biology from Rensselaer Polytechnic Institute and a Ph.D. in toxicology from Albany Medical College.

A History of Chemistry at FIU

1972 — 1976

This is the first 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

When FIU first opened its doors in August of 1972, there was no Department of Chemistry. The Chemistry Program was part of the Department of Physical Sciences. In the University's first year, Physical Sciences encompassed undergraduate programs in chemistry, physics, and environmental studies. The five founding faculty consisted of three chemists: Ruth Weiner, Ph.D. (Johns Hopkins University), a physical chemist and the founding chairperson; John Parker, Ph.D. (University of California, Berkeley), a physical chemist; Leonard Keller, Ph.D. (Yale University), an organic chemist; and two physicists: John Sheldon, Ph.D. (Texas A&M University) and Kenneth Hardy, Ph.D. (Tulane University). Chemistry lab facilities consisted solely of three general laboratories: one lab for teaching general chemistry and quantitative analysis, one lab for teaching organic chemistry, and one lab for teaching physical chemistry, as well as a fourth, catch-all lab and a stockroom. There were no research labs. All of the labs were located on the third floor of Primera Casa (PC). Deuxieme Maison (DM), the University's second building and the one which would house faculty offices, was still under construction, so the department offices were housed in a trailer on the west side of campus until the spring of 1973.

From 1972-1981, FIU was an upper division, undergraduate institution with nearly all of its students coming to the University with an A.A. degree. Most were transfers from Miami-Dade Junior College (now Miami-Dade College).

By the fall of 1973 two more chemistry faculty were added: Arthur Herriott, Ph.D. (University of Florida), an organic chemist; and Kathryn Williams, Ph.D. (Florida State University), an inorganic chemist. The department also added a physicist: Ralph Morganstern, as well as two geologists: Florentin Maurrasse and George Shaw. In 1974, Ruth Weiner left the University to become Dean of



In 1970, the first modular building was erected on what is now known as FIU's Modesto A. Maidique Campus. It was the first modular building ever erected on a Florida university campus and housed the president and most university staff at the time.

the School of Environmental Sciences at Western Washington University, and John Sheldon became Physical Sciences' first elected department chair. By the fall of 1973 three more chemistry faculty were added: Arthur Herriott, Ph.D. (University of Florida), an organic chemist; Kathryn Williams, Ph.D. (Florida State University), an inorganic chemist, and Zaida Morales-Martinez, M.S. (Pennsylvania State University), an analytical chemist. The department also added a physicist, Ralph Morganstern, as well as two geologists: Florentin Maurrasse and George Shaw. In 1974, Ruth Weiner left the university to become dean of the School of Environmental Sciences at Western Washington University, and John Sheldon became Physical Sciences' first elected department chair. The year 1975 saw the addition of another chemist: Howard Moore, Ph.D. (University of Arkansas), a physical/ atmospheric chemist, as well as another physicist, Stephan Mintz, and another geologist, Usman Sayeed.

In August 1972 there were only a handful of chemistry students. Since the chemistry laboratories were completely devoid of equipment, there was a frenzy of activity during that first year trying to put into place the most basic components

of a chemistry teaching facility. The labs had to be stocked with everything from test tubes and ring stands to balances and basic instruments. In a like manner, the University Library had no chemistry collection, so a slow, steady effort was begun to build a collection of chemistry books, journals, and reference materials. Even the College of Arts & Sciences, of which the Physical Sciences Department was a part, had no structure at all, and the physical sciences faculty were deeply involved in the process of building an operating structure for the College itself.

By the end of 1976, the chemistry program had grown considerably with seven faculty members and two undergraduate degree programs (the B.S. in Chemistry and the B.A. in Chemistry). Although the number of students taking chemistry was growing rapidly (15 students, for example, took General Chemistry in fall 1972 while 76 students were enrolled in the course by 1976), we were still limited to the original three laboratories in PC. Construction was finally begun on a proper science building (Owa Ehan) which would house chemistry, physics, and biology. It was not completed until 1977.

To be continued ...

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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 and let us know where your career has taken you. Looking for a particular faculty member to reconnect with? Visit our website at chemistry.FIU.edu and click on the "People" tab.

Stay Connected

We also want to let you know what we've been up to since your days at FIU. For our latest news, visit the department's website at chemistry.FIU.edu. And remember, you have a standing invitation to visit us on campus and see how things have grown and changed. Call us anytime to schedule a visit.

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.



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