

# *ChemConnections*



DEPARTMENT OF CHEMISTRY & CHEMICAL BIOLOGY

## ALUMNI NEWSLETTER



**Volume 1; Issue 1**

**IUPUI, Spring, 2017**

Dear Friends,



We are excited to bring to you the first issue of *ChemConnections*! We continue to grow as a department and it is my hope that you enjoy the updates and news we have to share.

This year's commencement saw three of our graduate students earning Ph.D. degrees (Drs. Yifan Ge, Meghan Teunis McLeod, and Alicen M. Teitgen), as well as one MS degree (Matt Snyder). We congratulated 70 students who graduated with BA or BS degrees. 7 of those students were named among the Top 100 Students of IUPUI and graduated with distinction. The Peer Led Team Learning (PLTL) program continues to be a cornerstone of undergraduate educational experience. Out of 47 students from the School of Science named in the IUPUI Top 100 Students, 22 of them were involved in the PLTL program through our department.

Our students continue to make history. One exciting highlight of this year was the trip to Cuba arranged under the guidance of Research Professor, Dr. Bill Scott, in which two of our students accompanied him to instruct an organic chemistry laboratory. This was a mutually rewarding experience for both our students, and the students and faculty in Cuba.

Last year the department saw several personnel changes. Among them were the retirement of Dr. Barry Muhoberac, retiring after 31 years of teaching and research. Dr. Muhoberac has stayed on in the department as Professor Emeritus. Also retiring was Mr. Cary Pritchard after 31 years of service as the department's instrument engineer. There were transfers out of the department by front desk assistant, Ms. Christina Kilgore; instrumentation scientist, Dr. Karl Dria; and Assistant Professor, Dr. Lisa Jones. Sadly, we mourn the loss of Research Professor, Dr. James McCarthy, a passionate chemist and reliable colleague.

Additions to the department include new faculty colleague, Dr. Sébastien Laulhé, an organic chemist who came to us from Duke University. We welcomed back Ms. Lynn Gerrard who returned after three years of hiatus. Ms. Patricia Beddow joined the department as the instrument engineer. And yours truly assumed the department chair position in July. I came from Duquesne University where I was a faculty member for 18 years. We are also happy to report that Dr. Rajesh Sardar was promoted to Associate Professor with tenure.

In 2016, our faculty and students published 36 peer-reviewed publications and gave 97 scientific presentations. Many of our colleagues enjoyed external support for their research. For example in this past year, the National Science Foundation funded Dr. Rajesh Sardar for his

research on nanomaterials; Dr. Lei Li received funding from the American Cancer Society for his research on DNA photolesions and our Ph.D. graduate student, Mr. Brandon Bills, received a pre-doctoral fellowship from the National Institutes of Justice. These efforts serve to underscore our research frontiers!

In this issue you will find profiles of our newest faculty member, Dr. Sébastien Laulhé, and of one of our senior faculty colleagues, Dr. Martin O'Donnell. You will also find an article about the history of the department as well as a list of award-winning students, staff and faculty. We are always interested in learning about you and invite you to keep us informed about your own career. You are most welcome to visit us when you can; please note that you are a part of the CCB family!

Best Regards,

Partha Basu  
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## Martin J. O'Donnell

By William Scott



As one of the longest-serving members of the Department of Chemistry and Chemical Biology, Dr. Martin O'Donnell has witnessed chemistry at IUPUI grow from a small outpost opposite the Fairgrounds on 38<sup>th</sup> street, to a lively multidisciplinary department in a bustling urban campus. He knows what it is like to go from small to big. Marty grew up in Williams, a small farm town in Iowa with a population of about 500. His father owned a general store and Marty was one of only 11 students in the elementary/middle school he attended. His small world changed when, inspired by an uncle who was a professor of physical chemistry at Grinnell College, he left Williams to attend the University of Iowa (BS, 1964-1968). While there he immersed himself in independent undergraduate research. This confirmed his commitment to chemistry and would lead to his “pay it forward” dedication to teaching/mentoring students at IUPUI in regular undergraduate and graduate classes, and independent research.

His world continued to grow. After college he did graduate studies at Yale (Ph.D., 1968-1973), under the direction of the renowned physical organic chemist, Ken Wiberg. His migration from small to big was complete when he crossed the Atlantic to do postdoctoral work (1973-1975) with Leon Ghosez at Université Catholique de Louvain in Belgium where he was involved in prostaglandin synthetic methodology.

Marty came to IUPUI in 1975, at a time when only bachelors and non-thesis masters degrees were awarded, and research was carried out primarily with undergraduates. Two “stars” in the group, Tom Eckrich and Robin Polk, went on to obtain Ph.D.'s at Harvard and Columbia, respectively, followed by prestigious careers, Tom at Lilly and Robin at Arizona. Marty was

instrumental in establishing a Coop thesis master's program in our department in the early 1980's. His first Ph.D. student, Bill Bennett, came from IU Bloomington and was the beginning (1982-1986) of IUPUI's advancement to a Ph.D. granting department. His research has been funded through grants from the Research Corporation, ACS Petroleum Research Fund, NSF and NIH, as well as funding for several postdocs through collaborations with Lilly. Marty's research was supported by an NIH R01 grant ("Schiff Base Synthons in Amino Acid Chemistry") from 1980 to 2009. His synthesis of unnatural amino acids was initially accomplished by introducing racemic side chains onto a protected and activated glycine catalytically in a biphasic medium using phase transfer catalysis (PTC). Two landmark publications in 1988 and 1989 in the *Journal of the American Chemical Society* reported the origin of the chemoselectivity and the catalytic enantioselective synthesis of  $\alpha$ -amino acids by PTC. This has become known as the "O'Donnell Amino Acid Synthesis" and is the basis of a royalty-producing patent. As befits his long career in research he has ~100 publications in premier journals and books.

In 2003 he joined his colleague Bill Scott (Research Professor at IUPUI) in implementing the Distributed Drug Discovery (D3) program. Together they have developed simple, inexpensive, reproducible and powerful solid-phase synthetic procedures that enable undergraduate students throughout the world to learn fundamental chemistry and biology while they participate in the search for drugs to treat neglected diseases. D3, started at IUPUI, which has trained >1,800 IUPUI second semester lab student, has also been conducted at five different schools in the US and internationally, in Russia, Poland, the Czech Republic, Spain and, this past October, in Cuba.

While Marty pursued his research interests, teaching always has remained a passion. He is a firm believer that "the best way to learn something is to teach it" and he loves his interaction with students, especially seeing them improve ("...if someone was a C student when they arrived, I worked hard to get them to be a B student..."). In the course of his career at IUPUI he has mentored 55 undergraduate researchers, 35 M.S. and five Ph.D. students, 19 postdocs and four visiting scientists. His dedication to teaching was acknowledged when he was awarded IUPUI's 1995 Chancellor's Award for Excellence in Teaching. In 2007 he was named as a Chancellor's Professor.

In his "retirement," Marty continues his research and teaching as an active member of the department. He enjoys more time with his wife, Kitty, three children (Patrick, Michael and Kathleen) plus four grandchildren. At the same time he continues to pursue some of his interests outside of school. He loves music, especially classical music. While growing up he sang in groups at both his high school and college, and has sung in the Indianapolis Symphonic Choir, performing with them in New York's Carnegie Hall.

Now, with a little more free time, Marty has been pursuing a long-term interest in tracing the genealogy of his family. "The O'Donnell name comes from Ireland, of course!" as he spoke of tracing his roots back to 1833 and a small, poor village in Western Ireland where his great, great grandfather grew up, leaving Ireland and coming to the US on a sailing ship across the North Atlantic in November 1861! What a journey Marty's family and life have taken; from a small village in Ireland in the 19<sup>th</sup> century all the way to IUPUI in the 21<sup>st</sup> century. Our department has been a rich recipient of the wisdom, skills and experiences he gained along the way.

# Sébastien Laulhé

By Erwin Boschmann



What do Venezuela, Mexico, France, and the U.S. have in common? Or for that matter, what do Spanish, French, and English have in common? The answer is, they are all centered on the newest faculty member in our department, Dr. Sébastien Laulhé, who joined us in August of 2016.

He has taken on his new appointment by storm assembling a research team, establishing his laboratory, and seeking to develop new methods to generate and harness the power of organic radicals. It is his goal to develop new methodologies resulting in electroorganic synthesis, photoredox catalysis, and metal-catalyzed activation. This will be achieved, he hopes, through strategies to induce selectivity in radical-based bond forming reactions.

Not only is he energetic in his approach to research, but he also manages large organic classes, and eagerly talks with many students and all faculty – his goal is to have lunch with every faculty member before his first year at IUPUI is over. He lives by the dictum that work and luck operate in a symbiotic relationship: “The harder I work, the luckier I get” (Samuel Goldwyn). He believes that great challenges greatly mature a person. I asked him about the intensity of his extrovert personality. “I adapt to my environment. This department operates on a high energy level, and so do I do. However, when I get home in the evening I turn into an exhausted, but happy introvert.”

Sébastien was born and raised in Caracas, Venezuela, where he went to grade school and high school, enjoyed the beach, went fishing and hunting with his dad, and became politically active protesting the Hugo Chávez regime. For a while the family moved to Mexico. He went to Montpellier, France for his B.S. in Chemistry, and M.S. in chemical engineering degrees, followed by his Ph.D. in organic and analytical chemistry from the University of Louisville under the direction of Professor Michael H. Nantz.

Sébastien’s personal goals for the next five years include grants, patents, publications, and being ready for tenure. It looks like he is well on his way.

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## Did you know that the Department . . .

- ... has 15 tenure track faculty, and 13 associate faculty?
- ... is teaching 6379+826 (Fall 2016/Spring 2017 + Summer 2017) undergraduates, and 19 graduate students?
- ... has 268 chemistry majors?

## Chemistry & Chemical Biology Awardees:

### School Faculty Awards

Trustee Teaching Award  
Full-Time Lecturer Service Award  
Academic Advising Awards

**Tamiko N. Porter, Ph.D.**  
**Keith S. Anliker, M.S.**  
**Lin Zhu, Ph.D.**

### School Staff/Student Awards

Partners in Education  
Full-Time Staff Award  
Chancellor's Scholar Award  
Chancellor's Undergraduate  
Research Award Nominee  
Frank G. and Ernestine M.  
Lambertus Scholarship  
William and Donola Orr Scholarship  
Women in Science Scholars

**Catherine (Kitty) A. O'Doherty**  
**Phillip C. Witcher**

**Martin Kurek**

**Zachary Thom**  
**Anna E. Martin**  
**Jennifer R. Bendickson, Emma C. Brown,**  
**Viridiana Carrillo, Grace A. Connoly,**  
**Kastnerine P. Haskell, Lydian J. Hawthorne,**  
**Olivia D. Johnson, and Fernetia T. Powell.**

### Departmental Student Awards

Patricia A. Boaz Award  
Loren T. Jones Award  
Frank J. Welcher Award  
American Institute of  
Chemists Student Research  
and Recognition Award  
Theodore W. Cutshall Scholarship  
Bonner-Ferguson-Kelley Scholarship  
Outstanding Undergraduate  
Analytical Chemistry Student  
Scott Alan Kent Memorial Scholarship  
Loren T. Jones Memorial Scholarship  
CRC Freshman Chemistry  
Achievement Award  
Rich-Keller Elementary  
Chemistry Scholarship  
Graduate Dissertation Scholar

**Marita K. Miller**  
**Tori L. Leturgez**  
**Jacob R. Hitchens**

**Amna Sohail**

**Matthew B. Murray**  
**Ibrahim Khan**

**Martin Kurek**  
**Ian M. Burke**  
**Huiwen Yang**

**Gabriel A. Hodge**

**Ngun Len and Sarah Readinger**  
**Meghan T. McLeod**

# A Short History of the Department of Chemistry

IU Indianapolis Extension/IUPUI

By Erwin Boschmann

It was interesting to negotiate the IU Extension Center's buildings. Upon entering one of these high rises, a small foyer, with no staff, had signs directing you to the various offices and classrooms. Approaching the single elevator on the left you were greeted by an elderly, jolly lady sitting on a stool inside this 'rising room', and she asked what floor you needed. Then she hand-pulled a double iron-meshed door, and proceeded to turn a brass handle to the proper floor number, and the assembly began to move – slowly. I do remember the brass handle was shiny where she handled it, but was darker where she had not touched it much.

Before and into the early 1970s, the IU Extension Center lay scattered among several buildings throughout downtown Indianapolis. Two were high rise buildings (some five-story high) located where the Federal Center is today, and one was across the street. One of the buildings had a large assembly room suitable for all-campus faculty meetings.

Contrary to other IU downtown buildings, which have since been demolished, the structure at 902 N. Meridian, also known as the *Turnverein* (sports club) has remained until today.



A 1917 photograph of



The Latin slogan chiseled into stone above the front windows, *Mens sana in corpore sano*, (healy mind in healthy body) describes the original function of the structure: taking care of body and mind.



Front entrance

The building was erected in 1914, and in 1983 was placed on the National Register of Historic Places. IU occupied this building for a number of years, and all chemistry classes were taught there. In 1970 I was assigned an office on the second floor, next to a faculty member from Political Science (other subjects were taught in this building as well).

The small paved area on the north side of the building served as the parking lot for faculty, and in an old garage, back in the corner, we found the chemistry store room. The basement contained chemistry laboratories (I don't remember anyone wearing safety glasses, or certainly not gloves) and the abandoned swimming pool in the basement had been converted into a small theater.



Registration took place in a large room in the back of the building's main floor. On the far side of the room, above long tables, hung letters from A through Z indicating where students were to go according to the first letter of their last name. Long lines snaked to these registration tables where staff worked to hand-register students. An official with a megaphone gave instructions to everyone about which classes were filled, and which were still available. While all this is archaic, of course, the content of the basic courses really has not changed that much – technology has.

The building had but one copy machine, then called a xerographic copier (or photostatic machine) which required special “copy” paper. This ‘machine’, was located in the building secretary’s office, I suppose to police access. Proper terminology about the copy process was just emerging. For example, a faculty member came in and asked the secretary how to duplicate. She responded: “Come back here and I will show you how we multiply.” I thought that was funny.

Dr. Patricia Boaz, and Dr. Frank J. Welcher, the only chemists on staff at that time, shared the entire teaching load with Dr. Boaz teaching physical chemistry, and Dr. Welcher teaching analytical and organic. I have no idea who taught other advanced classes – if anyone; and I assume that lower level classes were taught by both.

Dr. Boaz had a keen mind for things analytical and possessed a particular understanding for student needs, most of whom were first time college students. Because of her sensitivity in dealing with students, she later became a Dean of Students. Stephen A. Freeland, currently CEO of Cancer Care Group, recently said that Dr. Boaz was his favorite professor leaving a lasting impression on him. He says she was “Tough as nails on the outside and gentle as a puppy on the inside.” Her son, Joel, is a well-known pediatric neurosurgeon at Riley Hospital for Children here in Indianapolis. Dr. Welcher, (1907-2001) was a distinguished chemist with an international reputation who began his career in 1932 and retired



**With my mentor,  
Dr. Frank J. Welcher**

in 1978 – after some 46 years, likely longer than anyone else!! His student evaluations were only so, so; students saying that he was a bit boring. However, he had many students writing to him in deep appreciation after they left school. “You prepared me for the world,” was a typical comment.

In 1948 he published his four-volume set of *Organic Analytical Reagents* which sealed his international reputation. During his career he also published 16 other books. I asked him once how he was able to do all this work, since there were no research laboratories on campus. “Ah”, he said, “this is how I developed my research approach, by searching the literature.” I asked: “where?”, and he responded “In the huge downtown Lilly library where I spent many wonderful hours”.

He often spoke of the collaborative work with colleagues across the country (and around the world). He told stories such as how one scientist had lost all his data for a book he was writing, but then started re-writing again – a herculean task. In 1978, in time for his retirement, I honored him by organizing a symposium entitled the *F. J. Welcher Symposium on Analytical Chemistry*. It took an enormous amount of time to contact all these people he knew, to get funding, to arrange for housing, to organize the program itself, and on and on. We must have had some 40 people show up for the multi-day event, and each gave a talk on the specialty of their professional life.

After I became Associate Dean of the Faculties at IUPUI, I prepared all the necessary documentation to bestow on him the “Honorary Degree of Doctor of Science from Purdue University,” which was given to him by the Purdue President during commencement in 1990.

In retirement he spent countless hours on his lifelong hobby, the study of the Civil War, culminating in the two-volume set of *The Union Army, 1861-1865, Organization and Operations*. He also published *Colburn's Brigade*, honoring the unit his grandfather served.

Frank Welcher was a gentle man, and true gentleman.

In the fall of 1967, while finishing my Ph.D. at the University of Colorado, I was invited to visit the IU Extension Center in downtown Indianapolis for an interview and a possible position. I saw the two chemists (Drs. Boaz and Welcher), Deans Jim East and Joseph Taylor, and was taken to Bloomington to visit with more people. IU was interested in me, not because I was a great chemist, but because I spoke Spanish. The Big Ten universities had just received a \$500 million grant from the Ford Foundation to improve the sciences at a university in Lima, Peru. Each of the Big Ten universities was to send one faculty member to Lima for either a short or longer term. I was offered a position with IU, assuming I would consider spending two years in Lima. To me that was a done deal, and my appointment began in June, 1968.

I returned to Indianapolis from my assignment in Lima in January, 1970. We began hearing of a possible merger with the Purdue extension center's departments located on east 38<sup>th</sup> Street, across from the State-Fair-Grounds, of which chemistry was one. Apparently, IU and Purdue had done a similar merger in Ft. Wayne, and the two institutions were ready to do it again here in Indianapolis. Some people became quite anxious about this rumor. Even more anxiety arose when we were told that Dean Ned Shrigley was about to announce the results of his search for a chair for the two, now joint, chemistry departments. When that new chair, Dr. Wilmer Fife, arrived from Muskingum College (Ohio), and began interacting with chemists on both sides, IU and Purdue, anxieties subsided and soon vanished completely. At 38<sup>th</sup> St. I met Ted Cutshall,

Peter Rabideau, Peter Gebauer, Clyde Metz, and, in 1975, Marty O'Donnell, all in the Purdue chemistry department.

In 1971 three buildings were completed on the West campus, close to the medical school: Lecture Hall, the Library, and Cavanaugh Hall. All the old downtown buildings were now vacated, and in our minds this really was the beginning of IUPUI, though the agreement had been signed in 1969. However, implementation took longer. Chemistry moved into the north end of the third floor of the Cavanaugh building. What a luxurious environment that was! Brand new laboratories, offices, even a small built-in research space in my office at CA 317. All lower level chemistry courses were taught in the adjacent Lecture Hall and the laboratories were conducted in the Cavanaugh building.

At the same time, courses for the majors, the chemistry office, the chair, the former Purdue faculty all remained at the 38<sup>th</sup> St. campus. The three of us from the IU side stayed "West", although I had an office on each campus and travelled the five miles between campuses on a routine basis, as I taught on both campuses.

Some 20 years later, in 1991-3, the present SL and LD buildings were completed and all chemistry from Cavanaugh and 38<sup>th</sup> St. was moved to these new 'downtown' facilities.

I have always thought that the LD building ought to be named the

**Frank J. Welcher Building.**

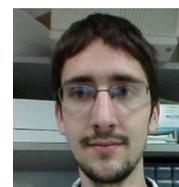
Maybe someday!

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Our colleague, **Dr. Tamiko Porter**, received the Salute to Excellence award from the American Chemical Society (ACS) Indiana Chapter. Salutes to Excellence is a recognition award that gives ACS members an opportunity to underscore outstanding accomplishments, achievements or service for individuals who have made a positive impact on everyday life. Since the program began in 2000, more than 500 honorees have received Salutes to Excellence awards.

**Brandon Bills**, a graduate student in our department, has received a fellowship from the National Institute of Justice. The Graduate Research Fellowship Program in Science, Technology, Engineering and Mathematics (GRF-STEM) program funds doctoral dissertation research relevant to the forensic sciences.



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Chemistry at IUPUI; Go to [chem.iupui.edu](http://chem.iupui.edu)