CHEM/BIOCHEM

Newsletter for Alumni and Friends Spring 2017

# From the Chair's Desk

Peter Geissinger

Dear Friends of the Department of Chemistry & Biochemistry,

Welcome to our Spring 2017 newsletter. We hope that you will enjoy reading about the exciting research, teaching, and service that is happening in our (and your) Department!

As always, there were quite a few comings and goings.

First, congratulations to Drs. Rasha Abuflasha, Brett A. Beaupre, Robert Hoppe, Bradley Moran, Lisa Mueller, Md Rezaul Karim, Christopher Witzigman, and Nina Yuan, all of whom graduated with the PhD in the second half of 2016. Congratulations also go to Surajudeen Omolabake, who earned his MS degree. We are excited for all of them as they embark on the next step in their careers.

In their places, we welcome our spring 2017 cohort of graduate students, Trevor Hagemann, Shahama Alam, Oliver Edwards, Anahit Campbell, Md. Mohiminul Islam, Kamal Pandey, Ganga Wijesinghe, and Sree Roy. They have hit the ground running, taking courses, teaching laboratory and discussion sections, and doing research group rotations.

We are also happy to welcome new staff members whose arrival was eagerly anticipated. The instruction laboratory staff is again complete with the addition of Dr. Matthew Huisman as Instructional Laboratory Manager and Ms. Morgan Smith as Laboratory Technician. Their energetic presence has already been felt! Moreover, we welcome Ms. Annette Pirrung as the Department Undergraduate and Communications Coordinator. She also put together this newsletter. You may recall that last year we welcomed Dr. Shama Mirza as Shimadzu Laboratory Manager. Now we have the pleasure of reporting that she has been appointed to an Assistant Professor position in our Department.

I am sure that you have heard about the difficult budget situation at UW-Milwaukee, which is exacerbated by negative demographic trends. We are happy the enrollments in our programs are holding steady (in contrast to university-wide declining numbers), which is testimony to the strength of our programs, which in turn is based on the dedicated and tireless efforts of all chemistry students, staff, and faculty. A great example of the engagement of the Department in attracting future scientists is our hosting of the 2017 Wisconsin Science Olympiad State Final Competition for the middle school and high school divisions. This event brought 1,500 of the best STEM students in Wisconsin to UWM! We used this opportunity to offer many recruiting events to show the visiting students, parents, and teachers that UWM is definitely for outstanding research and instruction. Organizing such an event requires a massive organizational effort. This year's organizing genius is Prof. Anja Blecking! Thanks, Anja, for your hard work!

The rebuilding of departmental shared instrumentation and shop facilities continues with the NMR laboratory. UWM was awarded a National Science Foundation Major Research Instrumentation grant (PIs Profs. Geissinger, Moran, Pacheco, Silvaggi, and Qu) for a new NMR spectrometer, which was urgently needed. We are using the opportunity to renovate the NMR laboratory to provide more and better work spaces and small group instructional areas. This effort is masterfully coordinated and managed by our Department Manager and Building Chair, Mr. Kevin Blackburn. We couldn't do it without you, Kevin!

**Continued on page 2**

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**Chair's Letter continued from page 1**

There is more exciting news to share. One of last year's Chemistry Nobel Prize winners, Prof. Ben Feringa, was the PhD and MS advisor of our own Prof. Alexander "Leggy" Arnold. And, even more exciting, Prof. Feringa will be the keynote speaker of the 2017 University of Wisconsin System Chemistry Faculties meeting, which is organized by and will be held at UW-Milwaukee (Prof. Kristen Murphy is the meeting general chair).

He will also present at our Department Colloquium. We will post updates (including the dates and venues) on our website. If you are in the area, you may not want to miss Prof. Feringa's colloquium presentation!

We are always happy to hear from you, our alumni and friends, and to follow your careers. We were able connect with alumnus Dr. Anton Wallner, who received a BS in Chemistry from our Department in 1986. He went on to be a chemistry professor and associate dean at Barry University in Florida and recently joined Webster University as the Dean of the College of Arts and Sciences. Congratulations on this new appointment. And, we just learned that Dr. Linda Hamaker, who graduated from our Department in 1995 with a PhD in organic chemistry (advisor Professor James M. Cook) has been appointed Chief Administrative Officer of the Community Reach Center (Denver, Colo. area), which employs almost 500 people who are dedicated to providing mental health services to the community, from infants to senior citizens.

Finally, we would like to express our heartfelt gratitude for your donations to our Department. The funds are used for the professional development of our students and to recognize their accomplishments. This brings me to the annual Chemistry & Biochemistry Student Awards Day, which will be held on May 23, 2017 in the UWM Union. Please join us for this event if you are in the area. We would love to see you there!

Best Wishes,

## 2016 Fall Doctoral Degrees

**Rasha Abuflasha** "Electrical Measurements and Attenuated Total Reflection Infrared Spectroscopic Study of Aromatic Isocyanides and Thiols on Gold"

**Brett A. Beaupre** "The Function of Renalase"

**Robert Hoppe** "Molecular Recognition in Water: Design, Synthesis, and Characterization of Rigid Molecular Receptors and Enzymatic Mechanistic Probes"

**Bradley Moran** "Experimental Methods in Cryogenic Spectroscopy: Stark Effect Measurements in Substituted Myoglobin"

**Lisa Mueller** "Structural and Functional Characterization of Acetoacetate Decarboxylase-Like Enzymes"

**Md Rezaul Karim** "The role proteome in cellular $Zn^{2+}$ trafficking and in the ability of fluorescent zinc sensors to image intracellular labile $Zn^{2+}$"

**Christopher Witzigman "**Part 1: Design, Synthesis, and Evaluation of Novel Gram-Positive Antibiotics. Part 2: Synthesis of Dihydrobenzofurans Via A New Transition Metal Catalyzed Reaction. Part 3: Design, Synthesis, and Evaluation of BZ/$GABA_A$ a6 Positive Allosteric Modulators."

**Nina Yuan** "Development of Cellular High Throughput Assays To Determine the Electrophysiological Profile of $GABA_A$ Receptor Modulators for Neurology and Immunology"

## 2016 Fall Master's Degrees

**Surajudeen Omolabake** "The Synthesis of Fluorescent 3, 6-Dihydroxyxanthones: A Route to Substituted Fluoresceins"

## Alumni Spotlight

Anton Wallner, UWM alumni of 1986, is a chemistry professor and associate dean at Barry University in Florida and recently joined Webster University as the dean of the College of Arts and Sciences. Wallner received his bachelor's degree in chemistry from UWM and then moved on to receive his master's from University of Michigan-Ann Arbor and his doctorate from Case Western Reserve University.

Wallner found his passion for chemistry at an early age and that passion amplified during his time at UWM. He was influenced by the physical chemistry faculty, Dr. Bahe and Dr. Tysoe, who encouraged him to advance his studies. "Having a faculty member suggest and support the idea of graduate work really motivated me to pursue my PhD," said Wallner.

Wallner also emphasized the importance of undergraduate research. "The opportunity to conduct research as an undergraduate was invaluable to my future career. It is an experience and an idea that I continue to emphasize as a faculty member. Working with undergraduates and providing them with a research experience is a key to my professional philosophy. As scientists, we can best prepare the future generation by exposing them to what scientists actually do in the field. Research shows students the joys and challenges of a practicing chemist."

In addition to his dedication to chemistry, Wallner was also on the bowling team at UWM and was captain for two years. Wallner described that being captain of the bowling team "provided me with great leadership and organizational experiences that I continue to use. I certainly encourage students now to be as active as possible and participate in a variety of campus activities. All knowledge and experience is valuable."

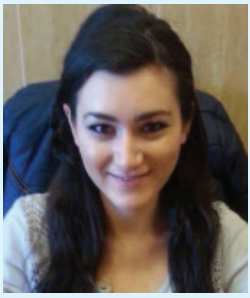
Congratulations to Dr. Wallner on his new appointment! We know your dedication and innovative ideas will help students excel!

## Welcome!

We would like to offer a warm welcome to our new graduate students: Shahama Alam, Anahit Campbell, Oliver Edward, Trevor Hagemann, Mohammad Mohiminul Islam, Kamal Pandey, Sree Roy, Ganga Nilmini Kumari Wijesinghe Mudiyanselage.
The graduate students are diving head first into coursework, studying and teaching discussion and laboratory sections. Keep up the good work!

**Sree Roy**

**Md Mohiminul Islam**



**Anahit Campbell**

We are also excited to welcome our exceptional new staff members. Dr. Matthew Huisman is the new Instructional Laboratory Manager, Morgan Smith joins us as the Laboratory Technician and Annette Pirrung is added to the team as the Undergraduate and Communications Coordinator. Congratulations to Dr. Shama Mirza as she has been appointed to an Assistant Professor position.

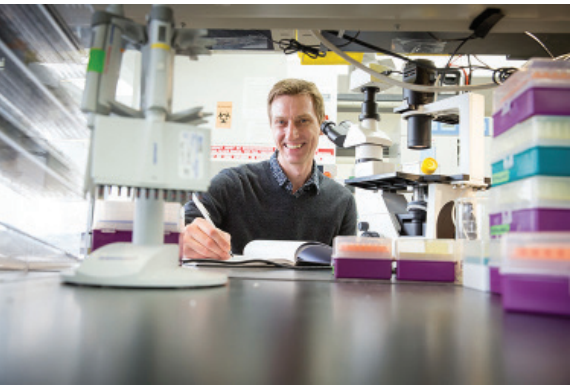
**Matthew Huisman**
Instructional Laboratory Manager

**Morgan Smith**
Laboratory Technician

**Annette Pirrung**
Undergraduate & Communications Coordinator

**Shama Mirza**
Assistant Professor

## UWM Research Foundation Licenses Novel Cancer Drug



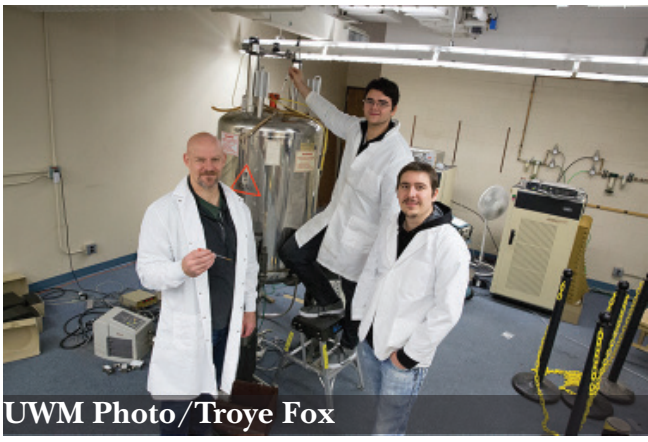
UWM associate professor of chemistry and biochemistry Alexander "Leggy" Arnold discovered a compound that Systems Oncology, an Arizona-based biotechnology company, licensed as a patented drug compound. The compound offers safe and effective suppression of tumors by disrupting the interaction between the vitamin D receptor (VDR) and proteins that control certain genes. Normally, the VDR interacts with a form of vitamin D to "turn on" the right genes to drive proper cell growth differentiation. Interaction with certain genes degrades the active form of vitamin D, which leads to cancer growth and a change in the area around the tumor that makes it less responsive to cancer drugs and immunotherapy.

The new compound discovered by Dr. Arnold prevents the degradation by blocking the interaction of certain genes. "Initial studies with new drug candidates suggest that VDR can be a successful therapeutic target for some difficult-to-treat cancers," Arnold said. "By using these newly discovered molecules, we can change the regulation of VDR target genes." Other new anti-cancer drugs in clinical trials are also based on vitamin D. VDR is also the "master regulator" of the body's calcium, however Arnold's compound alters the VDR's action without interfering with calcium regulation needed for normal health. Arnold's research was supported by the UWM Research Foundation, a nonprofit corporation that provides research, entrepreneurship and innovation programs at UWM. For a video detailing this cancer research, visit *https://youtu.be/bsanAmxb9wk*.

To learn more about Dr. Arnold's research, visit *http://uwm.edu/news/uwm-research-foundation-licenses-novel-cancer-drug/*.

## Grant Trifecta

The National Science Foundation awarded UWM with three Major Research Instrumentation (MRI) grants totaling over $1.7 million to fund equipment that supports research and teaching in the fields of chemistry and biochemistry, engineering, astrophysics, physics and medicine. A single institution is only allowed to submit three applications each year, so it is highly unusual to be awarded for all three.



UWM Photo/Troye Fox

The Chemistry Department will be using its grant funding to replace the aging nuclear magnetic resonance (NMR) spectrometer. The NMR is an instrument used to identify unknown substances, reveal arrangements of atoms within molecules, and to study how molecules interact. "There's no method comparable to NMR for establishing the unique connectivity of atoms within a molecule. It's a powerful tool that is essential to all chemistry disciplines," said Graham Moran, UWM professor of biochemistry. The tool also has industrial applications, which is why Deyang Qu, the Johnson Controls endowed professor in energy storage research at UWM, is included on the grant. Qu's research group uses NMR to answer questions related to the performance of materials that make up batteries.

To learn more about the grants awarded to UWM, visit *http://uwm.edu/news/uwm-scores-a-rare-trifecta-of-grants/*.

## The Milwaukee Master Teaching Partnership

In August 2016 the National Science Foundation (NSF) awarded a $2.4 million grant to the University of Wisconsin-Milwaukee and Milwaukee Public Schools for a five-year project that aims to improve the teaching of math and science in Milwaukee's public high schools.

The program, called the Milwaukee Master Teacher Partnership (MMTP), is led by UWM faculty, Mike Steele (PI, School of Education), Anja Blecking (co-PI, Department of Chemistry & Biochemistry), Craig Berg (co-PI, School of Education), and Barbara Bales (School of Education) in collaboration with MPS Science and Math curriculum specialists. Over five years, the project will train 25 MPS high school teachers with master's degrees through personalized professional development and classroom-based research. Participating teachers work with UWM faculty and MPS district leaders to analyze their classroom practice and lead professional development workshops for other mathematics and science teachers in the district and state.

"This collaborative effort in the areas of mathematics and science is absolutely critical to Milwaukee's future," said UWM chancellor Mark Mone. "Our aim is to bolster the professional capacity of high school mathematics and science teachers, teacher effectiveness in the classroom, and student learning in our urban schools."

This Noyce Master Teaching Fellowship project addresses the need for sustained, content-focused professional development for teams of secondary mathematics and science teachers in MPS. The specific aspects of the project include pathways for master teachers to build content knowledge for teaching in focused areas of mathematics and science, implement research-based best pedagogical practices to improve student learning, and develop teams to design and conduct action research projects that lead to iterative cycles of professional development.

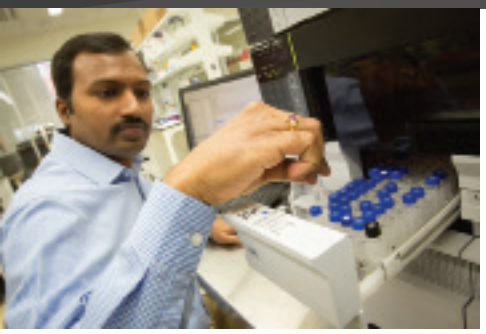
Over the course of the 5-year project the master teachers will acquire micro-credentials across three levels in content or pedagogical topic, such as the design of meaningful science lab experiences or the teaching of statistics in high school mathematics courses, as well as mentoring and leadership.

Teachers will identify areas of interest to study related to content and teaching practice, work with experts to learn new classroom techniques, and apply these techniques in their classrooms and study the student outcomes.

## Nobel Prize Connection

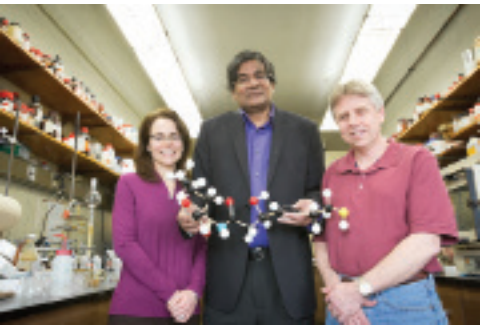
Each year Nobel Prizes are awarded to well-deserving intellectuals to recognize their academic, cultural or scientific achievements. Associate professor Dr. Alexander "Leggy" Arnold had a special connection to the 2016 Nobel Prize in chemistry recipient, Bernard Feringa. Dr. Arnold conducted his master's and doctoral research under Feringa, who shared the Nobel Prize in chemistry with Jean-Pierre Sauvage and Fraser Soddart. The scientists were honored for their work in developing the first nanomotors, molecule-size devices capable of human-controlled movement. Dr. Arnold described Feringa as a humble and well-deserving individual for the prize.

For the full story and more information on Dr. Arnold's research, visit *http://uwm.edu/news/nobel-prize-uwm-connection/*.



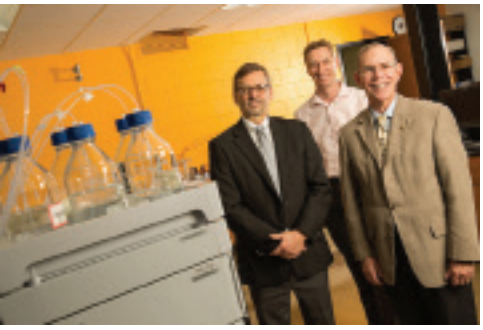
## Lifechanging Drug Developments Underway

Imagine a world with cancer fighting medication with fewer side effects, an improved treatment of asthma, and a treatment for alcoholism without debilitating side effects. This could be the future thanks to the research and drug development conducted by University of Wisconsin-Milwaukee scientists in the new Shimadzu Laboratory for Advanced Applied and Analytical Chemistry.



The cutting edge equipment in the new laboratory allows for a whole new variety of research at the Milwaukee Institute of Drug Discovery. It represents initiatives in neuroscience, cancer and infectious diseases. The Shimadzu Laboratory also hosts brilliant collaborations among UWM departments, other academic centers and medical product companies, all conducting research leading to magnificent discoveries.

There are five drug development projects currently underway at UWM:



Doctoral student researcher V.V.N. Phani Babu Tiruveedhula and researchers in Dr. James Cook's lab are working on treating alcoholism by removing the debilitating side effects of depression.

Current and former UWM researchers, including chemistry professor Mahmun Hossain and his student Joseph Ulicki, are working on creating a two-for-one medication that fights cancer with fewer side effects as well as treats memory loss.

A research team compiled of UWM chemists James Cook, Alexander "Leggy" Arnold and Douglas Stafford is testing an unusual strategy to improve the treatment of asthma by developing a compound that targets receptors in the central nervous system that calm anxiety.

Dr. Arnold is also researching the link between cancer and the vitamin D receptor (see page 4).

Bio-organic chemist Xiaohua Peng is developing compounds that kill only cancer cells, as opposed to conventional cancer drugs that do not discriminate between malignant cells and healthy cells.

To view a video of the MIDD, visit *https://youtu.be/9OUkonH_2GE.*

For a detailed description of the research drug development projects conducted in the Shmadzu Laboratory, visit *http://uwm.edu/news/5-potential-drugs-of-the-future-incubated-at-uwm/.*

## Save The Date

**Awards Day and Symposium:** Graduate and undergraduate students have the opportunity to present their research and receive feedback and recognition for all the hard work they put forth. This will be held on Tuesday, May 23 in the UWM Union. Please join us in celebrating our students' hard work and view the incredible showcase of undergraduate and graduate influence in faculty-led research groups.

**UW-System Chemistry Faculties Meeting:** The 2017 UW-System Chemistry Faculties Meeting will be held on Friday. September 29 and Saturday, September 30 at UWM. The meeting theme is "Student Pathways in a Challenging Educational Environment." Nobel Prize winner Professor Ben Feringa from the University of Groningen, Netherlands will be giving the keynote address. The community is welcomed to attend Professor Feringa's seminar hosted by the Chemistry Department on Friday, September 29. Please check our website for updates at *www.uwm.edu/chemistry*.

## Friends of Chemistry

Your contributions enhance the educational experience of our students and strengthens the research and development of our faculty and staff. Please join us in thanking our friends. (gifts from March 2016 to January 2017):

***General Chemistry Fund***

- Pfizer Foundation Matching Gifts Program (matching gift for John Stodola)
- NewMarket Foundation (matching gift for Michael McLaughlin)
- Dr. David O. Staats
- Mrs. Shirley Weber McLean
- Benevity Community Impact Fund (matching gift for Tabby Lei in honor of E. Alexander Hill)
- Dr. Michael J. DiPierro
- Mr. Neil R. Kestner
- Dr. Gene A. Hiegel
- Mr. John Patrick Kinlen
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- Mr. Robert J. Doedens
- Mr. John D. Stodola
- Mr. Frederick P. Hinz
- Dr. Gregory S. Lannoye
- Dow Chemical Company Foundation (matching gift for Shirley Weber McLean)
- Mr. Michael J. Martin
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- Dr. Jay E. Wrobel
- Mr. Gerald L. Powers

***George Keulks Memorial Chemistry Fellowship Fund***

- Honeywell International Charity Meeting (matching gift for Suheil Abdo)
- Suheil Abdo
- Mr. James W. Espy
- Mr. Lixun Zhang

***Polyquinanes and Medicinal Chemistry Fund***

- Dr. James M. Cook
- Dr. Scott G. Van Ornum

*For more information on becoming a Friend of Chemistry and Biochemistry, please see the pledge form on the back, visit our website www.uwm.edu/chemistry/give, or contact Christina McCaffery at 414-229-4963 or email her at cmmakal@uwm.edu.*

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