

IPPH NEWSLETTER

INDUSTRIAL & PHYSICAL PHARMACY



GREETINGS from the department head

Dear Alumni and Friends,

Welcome to the IPPH e-newsletter! After the “long cold lonely winter” of 2014, the campus has finally thawed, giving way to a gorgeous Indiana summer. We hope all of you have thawed, too, and that you’re golfing—swimming—surfing—hiking—and—barbequing your way through the season. In the midst of the summer, we hope you’ll take a few minutes to catch up with the latest IPPH happenings in this newsletter. Celebrate with Dr. Tonglei Li, who’s been appointed Associate Dean for Graduate Programs in the College, and with Dr. Yoon Yeo, who’s been named a Showalter University Faculty Scholar. Learn about Dr. Keith Chadwick’s work on controlling crystallization. Meet Chris Kulczar, a graduate student in Dr. Greg Knipp’s group with a passion for pharmaceutical manufacturing, and catch up on the many awards and accomplishments of our students and faculty. Take a look back with us, too, at the 2014 Garnet E. Peck symposium, held in downtown Lafayette on March 6 & 7 with more than 100 in attendance.

Enjoy every minute of the summer! Thanks for reading — and Boiler Up!

Liz Topp
Dane O. Kildsig Chair and Department Head

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FACULTY HIGHLIGHTS

Dr. Tonglei Li has been appointed as Associate Dean for Graduate Programs for the College of Pharmacy and has been elected as a fellow of the American Association of Pharmaceutical Scientists (AAPS). [Read more](#)

Dr. Yoon Yeo's R01 proposal entitled "Environmentally-adaptive nanoparticles with focal irradiation for cancer therapy" will be funded by NIH/NIBIB. She has also been selected for Purdue's "Study in a Second Discipline" program for the Fall 2014 semester and has been named a Showalter University Faculty Scholar. [Read more](#)

Dr. Rodolfo Pinal's proposal entitled "From Compacts to Integrated Systems: A New Paradigm for the Design and Manufacture of Pharmaceuticals" has received funding from the NSF I-Corps program. [Read more](#)

Dr. Greg Knipp's project entitled "Porcine Pharmacokinetics of Novel Sorafenib Amorphous Dispersion Formulations" has received funding from the Indiana Clinical and Translational Sciences Institute (CTSI) under the Project Development Teams (PDT) program. The award provides funding for two years. Dr. Stephen Byrn is a co-investigator on the project. [Read more](#)

Dr. Stephen Byrn has received funding for his project entitled "Study on Evaluation of Drug Product Formulation In-Vitro Performance Characteristics related to Abuse-Deterrence." [Read more](#)

More Faculty Highlights

GRADUATE STUDENT HIGHLIGHTS

Senior graduate student **Saradha Chandrasekhar** (Topp group) won the American Association of Indian Pharmaceutical Scientists (AAIPS) Research Award for 2013. [Read more](#)

Steven Dale received a Teaching Academy Graduate Teaching Award from Purdue University's Center for Instructional Excellence (CIE). [Read more](#)

Mitulkumar Patel was selected to receive a Lilly Endowment Gift Graduate Research Award for his proposal entitled "Modulating crystallization kinetics and nucleation of active pharmaceutical ingredients using polymeric heteronuclei". [Read more](#)

Jainik Panchal, Saradha Chandrasekhar, Ehab Moussa, and Lavanya Iyer received travel awards to attend the AAPS National Biotechnology Conference in San Diego in May. All are graduate students in Dr. Liz Topp's group. [Read more](#)

More Graduate Student Highlights



Chris Kulczar adjusts a tablet press.



SPOTLIGHT
IPPH graduate student

Meet CHRIS KULCZAR

Chris Kulczar believes that making good medicines available will make the world a better place. He has experienced that by working in Tanzania as well as at Purdue.

Kulczar, a third-year PhD student in Industrial & Physical Pharmacy (IPPH), spent this past August teaching 27 African pharmaceutical students to make acetaminophen and antimalarial drugs. He taught two labs a day as part of Dr. Stephen Byrn's "Sustainable Medicines in Africa" program at the Kilimanjaro School of Pharmacy (KSP) in Moshi, Tanzania. His students came from various African countries, including Tanzania and Kenya. He describes them as "...very thankful to have someone like Dr. Byrn and the other

professors...come over and teach them.”

Interested in supporting Dr. Byrn's work in Tanzania?

Contact [Dr. Stephen Byrn](#).

Kulczar, of Bremen, IN, became interested in pharmaceutical manufacturing when his mother was diagnosed with melanoma while he was in high school. “My mom’s cancer was definitely a big factor in getting me interested in science. During her clinical trials, I was really interested in what they were using and how they worked, and that sparked an interest in pharmaceutical sciences,” he says. “Unfortunately, she passed away in 2005 from her melanoma, but she taught me well, and doing things that would make her happy is pretty big motivation for me.”

He earned his BSPS from Purdue in 2011, and began his graduate studies in IPPH that fall. He chose IPPH in part because he knew and liked the IPPH faculty, having taken Dr. Gregory Knipp’s “Advanced Pharmaceutics” (IPPH 583) course. Now a part of Dr. Knipp’s lab, Kulczar focuses on the blood-brain barrier and making better cell models than are currently available. He says the World Health Organization predicts that by 2040 more people will die from neuro-degenerative diseases than from cancer, so good cell models are very important in pharmaceutical research now. “We think it’s important to have a good model for preclinical research for all neuro-degenerative diseases,” he says. “We use cell models for a quick way to screen a whole lot of drugs.”

This summer, Kulczar will work as an intern at the Food and Drug Administration (FDA) in Maryland, where he has received a Department of Energy fellowship. He’ll test pediatric formulations on pigs, and looks forward to learning how the FDA approaches research projects.

Kulczar plans to graduate in December 2015 and work in pharmaceutical formulation, preferably in Indiana or Chicago. He’s also interested in returning to Tanzania sometime since Dr. Byrn would like IPPH grads to teach at the Kilimanjaro School of Pharmacy. “I’d like to help as much as I can,” he says. “It’s very rewarding.”

When not in the lab or classroom, Kulczar might be watching a Purdue sports event. “I’m a big Purdue fan,” he admits with a smile. He likes the experience of attending Purdue football games in person, but prefers watching Purdue basketball on television. One of the perks of being nominated for Purdue’s “5 Students Who Move the World Forward” this past fall was receiving two tickets to any Purdue event he wanted. He chose the Purdue-IU basketball game and enjoyed watching Purdue triumph 82-64.

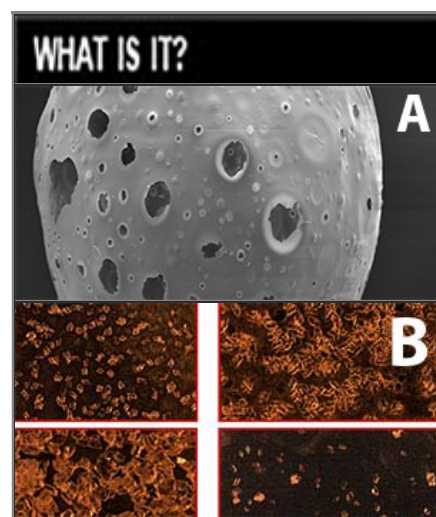
For more information, read [“5 Students Who Move the World Forward”](#) and [“Making Medicine in Sub-Saharan Africa”](#).



DR. KEITH CHADWICK

Crystallization is a process of immense importance both in nature and manufacturing. From the seashells you find at the beach to the electronics, foods and medicines humankind has become so reliant upon, crystallization plays a fundamental role in their production. However, not all crystallization is good news. Crystallization of minerals and organic compounds in biological tissues can lead to a variety of diseases including arthritis and stenosis. The Chadwick lab strives to understand crystallization processes at a molecular level in order to design novel disease treatments and materials and products of benefit to society.

At present, arthritis affects one in six of the U.S. population and costs the economy \$180 billion per year (equivalent to the GDP of New Zealand!). One of the leading causes of a variety of arthritic conditions is Calcium Pyrophosphate Dihydrate Crystal Deposition Disease (CPDD). The Chadwick group has built a sophisticated *in vitro* model of a human joint allowing them to study the crystallization of calcium



pyrophosphate in a physiologically relevant environment. The knowledge gained is being used to identify potential techniques for inhibiting crystallization, with the ultimate aim being to prevent CPPD and the arthritic conditions it causes.

Controlling crystallization is also a key challenge in manufacturing. This is because the shape, size and structure of the crystals are critical in determining the properties of a crystalline material, such as mechanical strength, melting point and solubility. The Chadwick lab aims to control crystallization in order to control material properties. This concept is especially important in drug manufacturing, where the properties of the drug in its crystalline state can greatly influence its efficacy and stability. Students in the Chadwick lab design polymeric materials to control the crystallization of a variety of drug compounds and create novel drug formulations. Their aim is to improve health care through the manufacture of drug products with optimized properties.

Crystallization can be a friend or a foe, and the Chadwick lab is highly motivated to utilize their expertise in this field to understand these processes so that they may be controlled in order to improve human healthcare and materials manufacturing.



IPPH Graduates: May 2014

Congratulations to our four IPPH PhD graduates: **Kevin Boksa, Ryan McCann, Shweta Raina, and Crystal Shin.**



Dr. Peck with alumni and friends.

2014 Peck Symposium

Over 100 people attended the 11th Garnet E. Peck Symposium on March 6 & 7, 2014 in downtown Lafayette, IN. Guests who arrived on March 6 attended a tour of the new Department of Industrial & Physical Pharmacy Ground Floor Labs at Purdue, followed by an evening reception. Chaired by Professor Tonglei Li, this year's symposium on March 7 focused on Pharmaceutical Manufacturing and Regulatory Issues. Eight renowned speakers — from the FDA, industry and academia — presented talks on topics including quality design, risk assessment, impact by excipients, and tablet and capsule development. Graduate students and others presented 22 posters. The symposium ended with a roundtable discussion on “The Future of the

Pharmaceutical Industry and Its Impact on Graduate Education”, moderated by the Purdue College of Pharmacy Associate Dean for Research Eric L. Barker.

Dr. Garnet E. Peck attended the special luncheon with three of his children, and enjoyed hearing some of his alumni and colleagues recount stories and memories to honor him. Speakers' biosketches, abstracts and a photo feature are available on the [2014 Peck Symposium](#) webpages.

Save the Date: Peck Symposium 2015

The 12th Garnet E. Peck Symposium will be held Feb. 25-27, 2015, at the Four Points by Sheraton Hotel in West Lafayette, IN. The topic will be “Drug Delivery”, chaired by Professor Yoon Yeo. Speakers TBA. Watch our website for more details. *For more information, contact IPPH Communications Coordinator DeEtte Starr at 765-494-1484 or starrd@purdue.edu.*

2014 Distinguished Alumnus

IPPH Alumnus Alan L. Fites was one of four College of Pharmacy alumni to receive a 2014 Distinguished Alumnus Award on April 4, 2014. Fites also attended a roundtable with IPPH graduate students. [Read more](#)

Keep up-to-date on IPPH happenings

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We'd appreciate hearing your feedback about this e-newsletter – please [contact us](#) with your comments.

Editor: DeEtte H. Starr, IPPH Communications Coordinator

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