

IPPH NEWSLETTER

December 2017



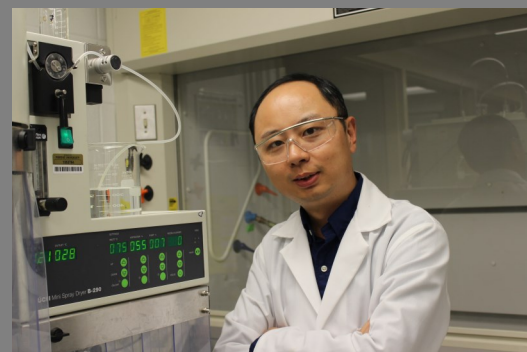
IPPH extends its thanks to:



**Dr. Liz Topp for eight years
of service as IPPH
Department Head**



**Dr. Ray Galinsky as he
retires after twenty-two
years of teaching & research**



**Dr. Qi (Tony) Zhou, recipient of a
NIH/NIAID R01 award**



GREETINGS FROM THE HEAD



First of all, on behalf of the department, I would like to thank Prof. Liz Topp for her leadership over the last eight years as the department head. Now returning to her regular faculty role, Liz spends more time with her research group and continues to take leading efforts in LyoHub and

NIIMBL (National Institute for Innovations in the Manufacturing of Biopharmaceuticals).

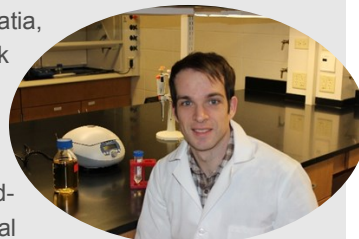
Over the summer, Prof. Ray Galinsky retired after 22 years of service in the department and becomes professor emeritus. We thank him for his invaluable contributions to the department and wish him the best for his next phase of endeavors. This fall we also welcome our new assistant professor, Sandro Matosevic, joining the department. Sandro obtained his Ph.D. from the University College London and did his postdoctoral training at the Scripps Research Institute in Florida. Sandro is working on cancer immunotherapy and gene delivery. We are excited to have him on board.

As interim head, I work with our staff and faculty to keep the business as usual. Six new graduate students joined IPPH, and we are ready to start recruitment for 2018. Importantly, the College has identified a few top candidates for the department head position and we are looking forward to their visits. We anticipate that the new head will start in mid-2018 and lead us forward amidst today's fast-changing practice and need in pharmaceutical development.

I hope this issue of the newsletter keeps you connected to IPPH. Whether you graduated years ago or are simply a friend of the department, please feel free to drop us a note. Believe it or not, I still keep a copy of the department newsletter (called "News Capsule") from when I was admitted to IPPH. Please see the picture on the back page. Memory does fade but never the feeling for Purdue. Because of you and your achievements, IPPH has enjoyed prominence in graduate education of drug development. We do want to hear your suggestions and have your support as we move forward. Hope to see you soon.

Dr. Sandro Matosevic

Growing up on the Adriatic coast in Croatia, Sandro's fondest memories harken back to walking along the beach next to his home, picking up pebbles and throwing them into the crystal-clear sea. He left his homeland to complete his undergraduate and graduate studies in biochemical engineering at University College London, resulting in a 10-year stay in England. London's unique vibrancy profoundly impacted Sandro, who says it will forever "be a special place for me."



Sandro says that he always enjoyed the challenge of chemistry and biology, and knew from a young age that he wanted to be in the health/medical field. A GlaxoSmithKline internship after his freshman year was the catalyst for his interest in pharmaceutical research, discovery, and development. His trek across the pond took place when he came to New York to get his Master's degree at the Rensselaer Polytechnic Institute, followed by post-doctoral work at The Scripps Research Institute in sunny South Florida. He stayed in Florida, working as the Director of Research and Development at Akron Biotech. He also kept his foot in academia as an Adjunct Faculty member in Biotechnology and Instrumentation at the Palm Beach State College. A co-worker described Sandro as "one of the quickest of mind and best of mentors."

Sandro was very close to coming to Purdue for his master's degree, but an exchange program guideline took him to New York instead. Purdue had remained on his radar, so when an opportunity to join the faculty was available, he was eager to investigate. "Purdue is a leader in discovery with groundbreaking science. It is an honor to be a part of all of the growth," says Sandro. When asked about what he wishes to accomplish while here at Purdue, he responded that he wishes to make a medically meaningful impact in the field of immunotherapy. He also enjoys working with students to help them personally contribute in the lab in a meaningful way during their stay here at Purdue, as well as best preparing them for their future careers.

Sandro's research program at Purdue builds on his prior work while advancing new areas in cancer immunotherapy. Cancer immunotherapy "has shifted our perception of an outcome following a cancer diagnosis, and there is so much more that we can do," Sandro says. Immunotherapy is based on training cells of our immune system to more effectively fight tumors. Sandro uses cells of the immune system, such as natural killer cells, and re-engineers them genetically for enhanced anti-cancer function. His lab uses approaches in cell engineering, immunology, gene therapy and nanoengineering and cryopreservation to develop new immunotherapies. "Purdue's environment is unique because of so many opportunities for cross-collaboration, which is critical to ensure we can bring these new immune-medicines to fruition," he says.

In his limited free time, Sandro can be found keeping in shape with a Crossfit class, watching a foreign film, or spending time with his dogs Theo and rescue dog, Pixie.

Faculty Updates

Dr. Stephen Byrn with coauthors George Zografi and Xiaoming (Sean) Chen have published a new book entitled *Solid State Properties of Pharmaceutical Materials*. The publisher is John Wiley and Sons. He continues his teaching endeavors in Africa. Also Dr. Byrn has been appointed as the director of the Center of Drug Abuse Deterrence in NIPTE.

Dr. Gregory Knipp has been appointed to the Faculty Advisory Committee for the Purdue Translational Pharmacology Facility in Bindley Bioscience Center. Dr. Knipp is a co-founder and has served as the director of the PTP over several years and has helped grow the center's pharmacokinetic and pharmacodynamic preclinical testing in the rodent and porcine models for collaborative publicly and privately funded projects.

Dr. Tonglei Li has stepped down as Associate Dean for Graduate Programs and serves as interim head for the department. He has been working with Prof. Park on the Digital Human for Drug Development (DHD2) project.

Dr. Sandro Matosevic has been awarded access to the flow cytometry facility at the Purdue Center for Cancer Research for his proposal, "Molecular nanomachines for reprogramming of innate immunity for personalized cancer immunotherapy.". He also received an Indiana CTSI PDT award for his project, "Fueling natural killers: translating metabolism into clinically improved cancer immunotherapies."

Dr. Kinam Park is a member of an interdisciplinary team of Purdue engineers, pharmacists, and veterinarians working to establish a predictive framework for rapidly screening and identifying effective and safe drug candidates and their delivery systems for treating cancers and other diseases. This effort focuses on developing computational modules, including pharmacokinetics and biodistribution of drug delivery systems, spatiotemporal distribution of drugs at major organs and tumors, transmembrane transport and intracellular distribution, and cellular signaling pathways and pharmacodynamics of drug molecules.

The project is an extension of Purdue's global efforts behind the ambitious Digital Human for Drug Development (DHD2) project, a collaboration between Purdue researchers and the Korean Institute of Science and Technology (KIST).

Dr. Rodolfo Pinal will serve on the organizing committee and co-chair the next Arden House Conference to be held in April.

Dr. Lynne Taylor received a grant from Bristol-Myers Squibb Company, to support her project entitled, "Mechanistic Understanding of Drug Release from Amorphous Solid Dispersions to Improve Drug Loadings."

Dr. Elizabeth Topp stepped down as IPPH Department Head on June 30th after eight years in the role, returning to the faculty. Dr. Topp and LyoHUB launched a 10-year technology roadmap for lyophilization in September of 2017, completing a two-year process.

Dr. Yoon Yeo has received a NIH/NIBIB R01 Administrative Supplement for Participation in the Concept to Clinic: Commercializing Innovation (C3i) Program to support her effort to translate the albumin-coated nanocrystal systems (Abxtals) to commercial products.

Dr. Qi (Tony) Zhou received a grant from the Showalter Trust, to support his project entitled, "Novel inhalation therapies for treatment of fatal Gram-negative lung infections", as well as the New Investigator Award from the International Society of Aerosols in Medicine. He also received a NIH/NIAID R01. Titled "Combating Deadly Gram-negative Lung Infections: An Inhalation and Systems Approach," the project will develop novel inhaled antibiotic formulations for treatment of multi-drug resistant lung infections using particle engineering techniques, investigate drug delivery by cutting-edge imaging, optimize dosage regimens, and make the outcomes translational by mechanism-based pharmacokinetics/pharmacodynamics. Led by Prof. Zhou, it involves collaborations from Monash University of Australia and the University of North Carolina. Dr. Zhou also received funding from the Center for Pharmaceutical Processing Research (CPPR) for his proposal, "An advanced surface characterization platform understanding in aerosol performance of dry powder inhaler formulations."

Graduate Student Highlights



Associate Dean Danzhou Yang presents the 2017 Keinly Award for Outstanding Graduate Teaching to Kelsey Lubin



Associate Dean Danzhou Yang presents the 2017 Jenkins-Knevel Award for Outstanding Research to Yihua Pei

Siddhi Hate (Taylor group) was awarded a College of Pharmacy's McKeehan Graduate Fellowship.

Monika Lavan (Knipp group) was awarded the 2017 Herbert Lieberman Award. This award is given to graduate students who demonstrate strong citizenship in the department and beyond. She was also the recipient of a Ronald W. Dollens Graduate Scholarship from the College of Pharmacy and the School of Biomedical Engineering.

Kelsey Lubin (Knipp group) received the Keinly Award as an outstanding graduate student teaching assistant.

Chailu Que (Taylor group) has received the 2018 IPPH Migliaccio/Pfizer Fellowship for her academic performance and service to IPPH student activities.

Joonyoung Park (Yeo group) wrote a successful Lilly Endowment Gift Graduate Research Award application which was awarded to him as a 2017-18 assistantship.

Yihua Pei (Yeo group) was the winner of the Jenkins-Knevel Award for Outstanding Graduate Research.

Jun Xu (Yeo group) received a travel grant from the Purdue Graduate Student Government and the Graduate School to attend the November 2017 AAPS meeting. He was also awarded an AAPS Graduate Student Research Award in Biotechnology and received the 2017 American Chinese Pharmaceutical Association (ACPA) Research award at the 2017 AAPS meeting.

*Monika Lavan
(Knipp group)
being awarded the
2017 Herbert
Lieberman
Award
by Interim De-
partment Head,
Tonglei Li.*



IPPH STAFF HIGHLIGHTS

Jennifer Gray received a Bravo Award from the College of Pharmacy. The Bravo Award provides recognition and reward for substantial accomplishments that extend well beyond regular work responsibilities. Jen's Bravo Award recognizes her outstanding contributions as our Communications Coordinator, particularly in planning for this year's Peck Symposium and the LyoHUB consortium annual meeting.

Graduate Student Spotlight



Kelsey Lubin

Fourth year graduate student in Dr. Knipp's lab, Kelsey Lubin, grew up in Mount Sinai, NY playing sports and going on field trips with the various science clubs

which she was involved with. Those field trips, which involved guided lab sessions investigating genetically modified foods and genetic mutations, was where she realized that she enjoyed science and wanted to continue her education by majoring in Biochemistry at Siena College in Loudonville, NY.

An undergraduate summer research project led to interest in seeking a Ph.D. "Pharmaceutical science interested me because of its direct impact on societal needs. The IPPH department at Purdue landed at the top of my list because of the impactful research in a wide variety of areas and its direct connections with industry experts," stated Lubin.

Her current research involves developing and optimizing a novel *in vitro* cell model of the blood-brain barrier. The model involves plating multiple brain cell types in a unique configuration to better mimic the brain physiology. The focus of her project is further optimization of this model with other cell lines to improve the performance of the model as a drug screening assay. This involves validation with model compounds and developing the model for potential high throughput screening. The goal of the project is to develop a physiologically relevant model of the blood-brain barrier that can be used for down-screening of drug candidates. "There is an ever present need for the development of neuropharmaceuticals, which is difficult to meet due the difficulty in developing drugs that cross the blood-brain barrier. We hope that by developing this model into a high throughput screening assay that is physiologically relevant, those who utilize it would be able to select drugs that are more likely to be successful in later stages of development."

"Purdue has an immense amount of resources to utilize for research projects between core facilities and collaborations between departments. I've enjoyed the wide range of courses that I have been able to take and utilize for my own research and interests. Being in the Knipp lab has allowed me to play a role in multiple projects and develop a wide range of skills applicable to the pharmaceutical industry. I have been lucky to have colleagues in the lab that have willingly given input to progress my projects and help me to become a better scientist."



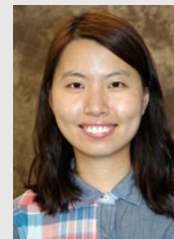
Monika Lavan

Monika is a fifth year graduate student in Dr. Knipp's lab from Phnom Penh, the capital city of Cambodia located in Southeast Asia. Her parents were from different provinces and moved to the Phnom Penh, a completely empty city at the time with all the citizens being evacuated when the Khmer Rouge Regime started, within a few years after the genocide had ended. Despite limited resources available at the time, her parents encouraged her to learn and be active at school, a gift for which Monika is grateful.

During high school, Monika thought that she would be an engineer. "There was only one engineering school in Cambodia and most of the courses were taught in French. After my second week in French class, a big opportunity opened up and I was informed that I had received a scholarship for undergraduate studies at Louisiana State University starting in 2009. I was given access to incredible resources at LSU and it helped open up more opportunities for me to become a pharmaceutical scientist. Back in Cambodia, this was an impossible dream. I am passionate about pharmaceutical science because it uses knowledge from many different scientific fields for the research and development of drug products that can help improve people's lives around the world."

In Dr. Knipp's lab, she is working on the development of poorly soluble anticancer compounds including tyrosine kinase inhibitors using different approaches. The solubility enhancing techniques she is studying are the reversible binding of drug to mono-PEGylated human serum albumin at different molecular weights and polymer-based amorphous solid dispersion. Her final project is to create a pediatric platform mini-tablet formulation for expedited preclinical studies. The mini-tablets are 2 millimeters in diameter and she is producing them in the IPPH manufacturing suite.

In her free time, Monika likes to work on "do-it-yourself" projects. "Last year, I made some lip balm samples and shared them with my coworkers. I collected information on their reactions and responses to different textures and flavors in order to create personalized products."



Yihua Pei

Yihua was born and raised in Yanji, China, a town in which approximately 40% of the residents have been born in China but have Korean heritage. Her father is a pharmacist who had previously worked in research & development. When she found herself interested in chemistry and biology in high school, she decided to study pharmacy.

Prior to her arrival at Purdue, she was working on natural product isolation for identifying active compounds from natural sources as potential candidates for new drug discovery. The most problematic issue she encountered frequently at that time was that some isolated compounds were sub-potent due to the lack of efficient delivery to the target cells or toxicity issues because of non-specific delivery.

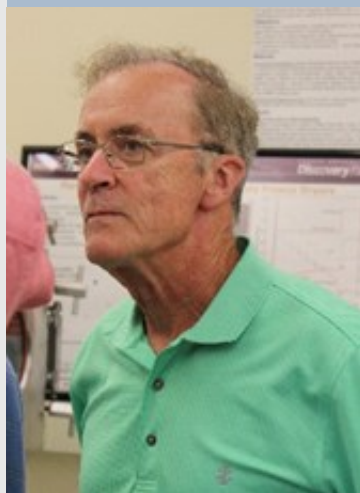
"This intrigued my interests in the drug delivery field and encouraged me to study under Dr. Yoon Yeo, who is an expert in this field."

Antibiotics have helped control the spread of bacterial infections for nearly a century. However, they are losing significant potency against many types of bacterial strains. Methicillin-resistant *S. aureus* (MRSA) is particularly difficult to treat due to its rapid spread as well as resistance to known β -lactam antibiotics and reduced sensitivity to current treatments such as vancomycin, daptomycin, and linezolid. These risks increase substantially when the pathogens invade host cells such as macrophages, the first defenders responding to bacterial infection, and survive inside them. The intracellular residence protects the bacteria from the antibiotics, which do not enter these cells easily due to the size and/or polarity. To overcome the limited intracellular delivery of antibiotics, Yihua developed a particulate drug delivery system that can efficiently transport antibiotics into the host cells macrophages. She aims to achieve this by taking advantage of the ability of phagocytes to internalize particles and releasing the antibiotics intracellularly to reach the intracellular MRSA. "I hope that at the end of my research, my vancomycin-encapsulated nanoparticles can eradicate all the intracellular MRSA and reduce the mortality and relapse rate" says Pei.

"I feel so lucky to be a member of my group. My group is a big family. We work hard, play hard, and eat hard."

Alumni and Friends Focus

Dr. Steven Nail

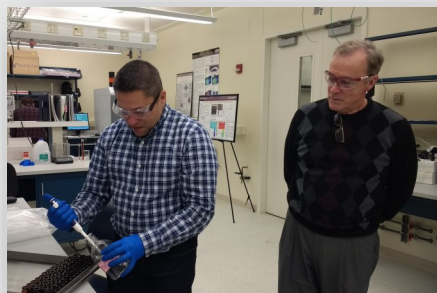


Dr. Steven Nail is a 1975 graduate of IPPH and was honored as the 2013 Distinguished Pharmacy Alumni. He is the Principal Scientist at Baxter Biopharma Solutions, in Bloomington, IN where he most enjoys the great group of people that he works with, as well as the job content and their very well equipped laboratory. His main area of current research is in a field that he was introduced to early in his career, the science and technology of freeze drying which he finds to be both

“scientifically interesting and practically important.”

Some of his fondest memories of his time at Purdue were at CPPR dinners with Dr. Dane Kildsig. “He (Dr. Kildsig) was a terrific host, and very much in his element at that type of function. He could take teasing very well, and give it right back. He was also an excellent information source on very good, and not very expensive, bottles of wine. I particularly miss Dane when I’m in a wine department, and feeling overwhelmed by the sheer numbers of wines available.”

When not puzzling the complexities of freeze drying, he enjoys his “Read to Succeed” volunteer work at Klondike Elementary, keeping in shape, and spending time with his wife and four grandsons. He also enjoys playing guitar and ball-room dancing with his wife Lisa, of 45 years, who he met while they were both studying here at Purdue.



Greg Sacha ('99) and Steve Nail on campus

Dr. Kenneth Morris joined the Industrial and Physical Pharmacy Department at Purdue University in the fall of 1997 where he worked with Pharmaceutical Materials Science and Industrial Pharmacy. He was also a professor and associate head for the department. He is currently the Director of the Lachman Institute for Pharmaceutical Analysis and holds a University Professorship at Long Island University in Brooklyn, New York. The majority of his research is in the discipline of Pharmaceutical Material Science. This area can be described as the study of the impact of processing on the physico-chemical properties of formulation components and on the performance of the final pharmaceutical dosage form.

By his own description, Dr. Morris was a “transition person” when Dr. Steve Byrn assumed the chairmanship of IPPH and hired him as the first faculty member specifically for IPPH at Purdue. The new IPPH program really began to take shape with the addition of Drs. Lynne Taylor, Rodolfo Pinal and Teresa Carvajal joining the department.

One of the challenges that Dr. Morris tackled was that of securing peer reviewed funding when the criteria for tenure only looked at NIH/NSF etc. funding sources. Most of his dynamic colleagues, including Garnet Peck, Dane Kildsig, Steve Nail, Kinam Park and Ray Galinsky had either worked in industry or had their own companies and had strong expertise and support from Industry. The goal was to find peer-reviewed industrial support. Dr. Morris joined Drs. Byrn, Peck and Stowell in building the CAMP consortium with MIT and cofounded NIPTE, a multi-university research center to provide Purdue and the member schools with a broader funding base primarily from the FDA. The funding effort was greatly enhanced by the significant support from “exceedingly generous alumni.”

Dr. Morris says that Purdue was and remains head and

shoulders above everyone in Industrial and Physical Pharmacy and that his time at Purdue “made my career.”

When asked what he has enjoyed about his work, he sums it up with BUILDING. He helped build the pharmacy school from scratch when he was at the University of Hawaii at Hilo from 2008-2015. He worked to build programs at Purdue such as CAMP and NIPTE, and when I interviewed him, the HVAC system was being installed for his research center at LIU. He also enjoys working with students because they help him “maintain optimism”. On his breaks from “building”, Dr. Morris is a FDA special government employee where he hopes to help modernize the FDA by marrying the quality mentality with technical advancements, especially on the generic side of the industry.

Dr. Kenneth Morris



Alumni and Friends Focus

Dr. Angela Falzone



Dr. Angela Falzone, a 1990 graduate of IPPH Purdue and an Awardee of the 2017 Distinguished Pharmacy Alumni Award, has enjoyed a lengthy career working in various subsidiaries of Johnson and Johnson. Her initial role was as a formulator for the Robert Wood Johnson Pharmaceutical Research Institute where she developed a variety of products from anti-infective agents to oral contraceptives. Some of her many professional experiences included developing products from early formulation through approval and launch,

providing technical support for commercial products in production facilities, designing processes and procedures for small scale formulation devel-

opment to support initial human dosing, manufacturing clinical supplies to support studies at all phases of development, renovating and modernizing pilot plant facilities, and supervising scientific teams in the U.S. and Europe.

After more than a decade in pharmaceuticals, Angela moved to Cordis Corporation where she led teams designing equipment and developing manufacturing processes for drug device combination products. Her team grew into an internal consulting resource for other Johnson and Johnson subsidiaries developing combination products. After several years working in combination product development, she moved to McNeil Consumer Healthcare where she was responsible for designing and implementing new product validation processes and procedures. She became part of the team that successfully restarted the Fort Washington production facility with primary responsibility for equipment qualification and cleaning validation.

Angela currently serves as Scientific Director in the Portfolio Management Group of Janssen Pharmaceuticals. In this role she leads cross functional teams in executing the pharmaceutical product development for new active pharmaceutical ingredients. She resides in Pennsylvania with her husband, Robert, and their two daughters, Rachel and Sara.

Dr. Chetan Pujara (1997) is Vice President, Small Molecule Development at Allergan Inc, Irvine, CA. In this role, he is responsible for formulation development, manufacturing process development & scale-up, analytical method development & validation, stability testing, microbiology, and packaging development departments. His organization designs and develops dosage forms intended for clinical trials and commercialization. Dosage forms in development include, solid & liquid oral products, topical dermal products, sterile ophthalmics & injectables including sustained-release ocular biodegradable implants. In this position he enjoys helping design and develop pharmaceutical products that help patients, mentoring the next generation of pharmaceutical scientists and continuing to learn everyday.

Prior to joining Allergan, Chetan was employed by Abbott Laboratories (Abbvie) in Illinois, where he held various positions in Global Pharmaceutical R&D gaining experience in development of solid oral dosage forms and pediatric oral suspensions.

Chetan contributes to the pharmaceutical sciences community as a volunteer for several non-profit organizations. He is a member of the USP Dosage Forms Expert Committee and serves on the USP <771> Ophthalmic Preparation Expert Panel. He is also a Scientific Advisor to the Editors of Journal of Pharmaceutical Sciences and an Adjunct Professor in the Department of Industrial and Physical Pharmacy, Purdue University, IN. He served as Chairman of the Industrial Advisory Board of NSF's Center for Pharmaceutical Processing Research and contributed to the Physical Properties Working Group of Product Quality Research Institute (PQRI).

Chetan received his B.S. degree in Pharmacy from BITS, Pilani, India and PhD in Pharmaceutics from Purdue University, West Lafayette, IN. When asked about his time at Purdue, Dr. Pujara replied, "Dr Dane Kildsig taught his students not only to excel in science but also develop as leaders. The two most important words I learned from Dr. Kildsig were 'Intrinsic Motivation' (this was in the context of not looking for external factors to motivate you to perform well). The IPPH department provided a solid foundation that has helped me throughout my career both to develop as a scientist and a leader. It is wonderful to see that the current students in IPPH are getting the same solid foundation from IPPH professors and Purdue University."

Dr. Chetan Pujara



Alumni and Friends Focus

Dr. Dave Engers



Dr. David Engers (2006) lives in West Lafayette and is the General Manager for SSCI, a division of Albany Molecular Research, Inc. SSCI was co-founded by IPPH Professor Steve Byrn and his wife, Sally Byrn over a quarter-century ago to provide comprehensive cGMP solid state chemistry research and analytical services to the pharmaceutical industry.

Dr. Engers attended Purdue during a period when many of his fellow graduate students had

previous professional experience. This very unique and "experienced" group managed to cross the Office of Student Activities and Organizations (SAO) frequently, as they set out to found the student chapter of the American Association of Pharmaceutical Scientists (AAPS). Despite having many IPPH professors as fellows, most notably Drs. Dane Kildsig, Garnet Peck and Gilbert Banker that had a guiding influence in creating this professional organization, Purdue University did not (in 2001) have an AAPS student chapter. One of first orders of business in creating a student organization was to draft a constitution, "to which we took the ill-fated step to apply the Purdue Seal (ninth design introduced in 1968 by Al Gowan) as a watermark. Needless to say, that watermark innocently used "to make it look official" required approval (that we did not get). We were eternally grateful for the outpouring of support and encouragement from IPPH alumni for this new student chapter. That generous financial support helped provide programming and grow our membership (as 6 graduate students does not make a sustainable chapter); however, the pace at which that support came (e.g., fund raising) also drew SAO scrutiny ... all before crowd funding was a thing," says Engers.

"Another grand distraction to getting research done was recasting IPPH 562 (Manufacturing Processes). On my arrival to campus in 2001, I came to Purdue with process and product technology transfer experience at Pfizer. IPPH 562 at that time was devised as merely a demonstrative laboratory, meaning teaching assistants set-up, demonstrated different unit operations, and cleaned up. This classroom dynamic did NOT work for me or my partner in crime, Dr. Peter Wildfong (now a professor at Duquesne University), who came to IPPH with his own deep knowledge of pharmaceutical science and love for teaching. From this collaboration, a student-led laboratory format, with a laboratory manual fashioned after a master batch record, was born. It is extremely gratifying to see this format continues to be used today as part of the regulatory affairs degree program and the programming for the Kilimanjaro School of Pharmacy in Tanzania, Africa."

Today, much of his free time is spent supporting two active teenagers (Sam, 16 and Julia, 13), with Sam now gearing up for college. "As an aside, Sam was very much part of my graduate student experience. Born in 2001, he was 2 years old, when he started attending Morris Group Meetings. While learning his ABCs, he learned to recite the Ideal Gas Law AND name each of the variables. That was his contribution to group meeting, which coming from the mouth of a 2 year old, always brought down the house!"



Dave Engers with Dr. George Zografi and Eyal Barash at the 2017 Peck Symposium

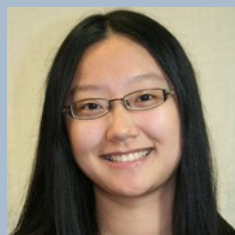
CONGRATULATIONS IPPH AUGUST 2017 GRADUATES!



Anura Indulkar, PhD



Jing Ling, PhD

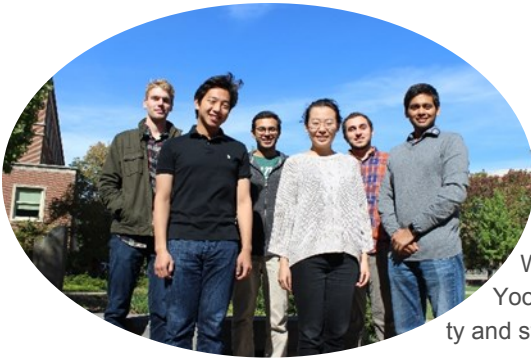


Hitesh Purohit, PhD





IPPH News and Events



PURDUE IPPH WELCOMES NEW FACULTY AND STUDENTS!

IPPH welcomed new faculty member, Dr. Sandro Matosevic and new Ph.D. students: Nicholas Huls, Soonbum Kwon, Kyle Lupo, Tarun Mutukuri, Dishan Shah and Ruochen Yang at a reception in Dauch Alumni Center in late August. Welcome remarks were graciously presented by Associate Department Head Dr. Yoon Yeo and Dean Eric Barker with introductions of the new Ph.D. students, faculty and staff.



Dr. Yoon Yeo provides remarks.

Students enjoy a beautiful evening on the patio



HOMECOMING 2017 - IPPH STYLE!



IPPH alumni were welcomed back by the current students and faculty at a fun reception at the J Nine Club in Mackey Arena during Purdue University's 2017 Homecoming campus wide celebration. It was great to see so many familiar faces and get caught up on alumni news! Look for Homecoming 2018 information and plan to join us for next year's celebration!





LYOHUB RELEASES LYOPHILIZATION TECHNOLOGY ROADMAP



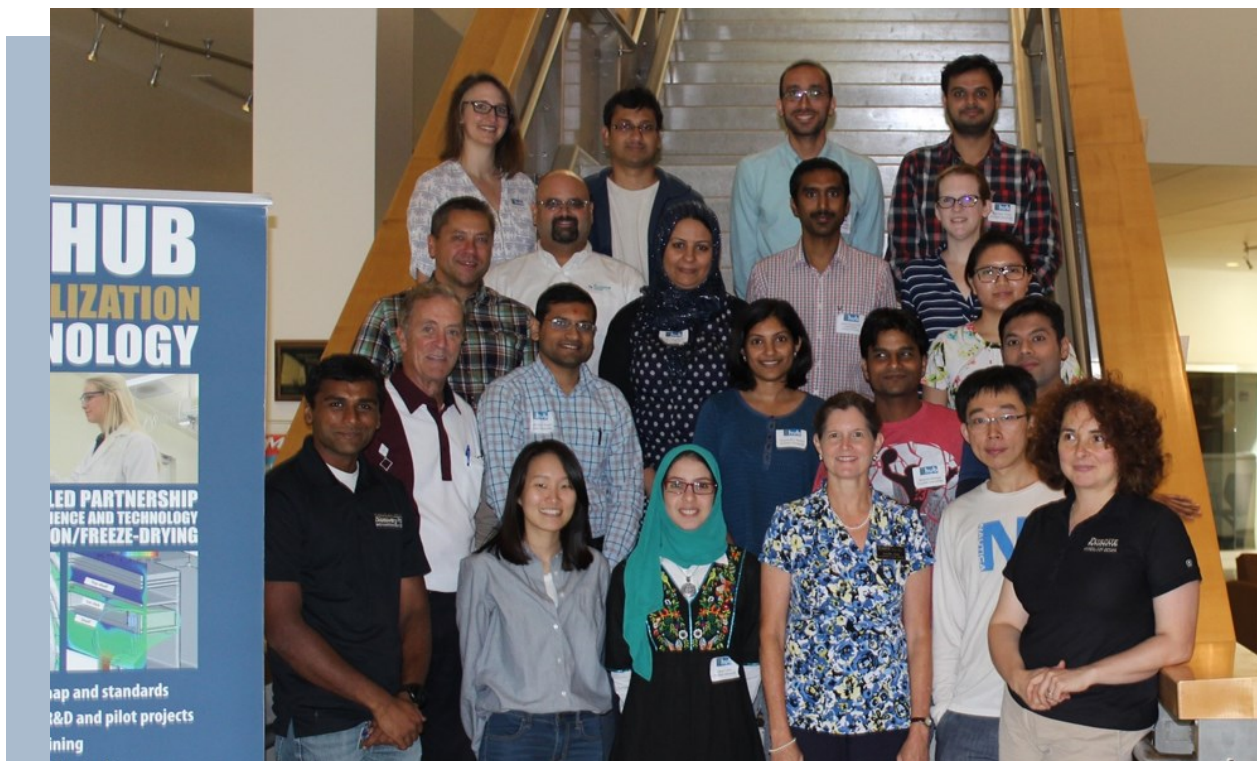
The Roadmap can be downloaded on their website at www.lyohub.org

LyOHUB, led by Dr. Elizabeth Topp, Professor of Industrial & Physical Pharmacy and Dr. Alina Alexeenko, Professor of Aeronautics and Astronautics at Purdue, has released its [Lyophilization Technology Roadmap](#). The roadmap, funded through a NIST grant, was the culmination of 2 years of workshops and meetings involving over 100 contributors who identified lyophilization needs in products, process, equipment, education and regulatory interface. To download a copy of the roadmap, visit www.lyohub.org.

LYOHUB Lyo101 COURSE WITH IPPH ALUMNI INSTRUCTORS ATTENDED BY IPPH STUDENTS

LyOHUB hosted a Lyo101 course featuring a full 2 ½ days of lyophilization training with some classroom, but primarily hands-on lab experience under the able instruction of Purdue Alumni Drs. Steve Nail, Lindsay Wegiel and Greg Sacha of Baxter. Representatives from Mettler-Toledo and McCrone were also on hand to instruct and provide hands-on training with DSC and FD microscopy. The class was divided into teams,

each with a project to work on over the 2 ½ days, with each team presenting their findings and challenges at the closing program. Social dinners were also offered where students could interact casually with the instructors. On Wednesday afternoon, 20 industry members from Indiana SMEs and LyoHUB members arrived for hands-on training in the LyoHUB demonstration facility followed by a day of classes on Lyocalculating and CFD, for industry as well as all of the students from the Lyo101 course. The keynote speaker on Thursday was Mike Pikal of the University of Connecticut with his talk, "Modeling in Freeze-Drying: Past, Current State and Future Perspectives."



Lyo101 attendees and instructors

Dane O. Kildsig
CPPR Center for
 Pharmaceutical
 Processing Research

Work has begun on a project at Purdue being funded by the Dane O. Kildsig Center for Pharmaceutical Processing Research under lead IPPH investigators, Dr. Gregory Knipp and Dr. Stephen Byrn entitled, "Development of a Pediatric Platform Mini-Tablet Formulation for Expedited Preclinical Studies." This project is in response to the current paradigm shift in industry to meet evolving pediatric drug development initiatives. Traditional clinical development views have been to protect children *from* clinical research. However, the current regulatory paradigm shift is to now protect children *through* clinical research. Given that children are not miniature adults, several challenging needs emerge in response to the regulatory requirements including pediatric patient age classification, development of age appropriate formulations, and enhancing the translational potential for assessing child safety and efficacy in preclinical testing. This project aims to address some of these issues by developing a flexible mini-



tablet formulation capable of incorporating a variety of active pharmaceutical ingredients for adjustable pediatric dosing. Upon production, ontogenic differences in the pharmacokinetics of the drug product will be assessed in the juvenile and adult porcine model and contrasted with published human data. The approach builds off a previously funded CPPR project that led to the publication of Roth et al. "Assessment of Juvenile Pigs to Serve as Human Pediatric Surrogates for Preclinical Formulation Pharmacokinetic Testing," *AAPS J.* 15(3):763-774 (2013).

**15TH ANNUAL
 GARNET E. PECK
 SYMPOSIUM**

**Holiday Inn Lafayette - City Centre
 March 7, 2018**



TOPIC: *Pharmaceutical Manufacturing*

Co-chaired by

Dr. Elizabeth M. Topp, Professor of Industrial and Physical Pharmacy
 Dr. Qi (Tony) Zhou, Assistant Professor of Industrial and Physical Pharmacy

The Peck Symposium is hosted by the Department of Industrial and Physical Pharmacy, the Dr. Garnet E. Peck Graduate Scholarship, the Purdue College of Pharmacy, and the Anderson Lecture Fund.

For more information about the symposium, please contact Jennifer Gray, IPPH Communications & Events Coordinator, Department of Industrial and Physical Pharmacy, at (765) 494-1484 or gray160@purdue.edu. Registration and further details are available online at www.ipph.purdue.edu/peck.

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 Editor: Jennifer Gray, IPPH Communications Coordinator



Keeping Alumni and Friends of the Department of Industrial and Physical Pharmacy Informed

THE NEWS CAPSULE



PGSRM CELEBRATES 25TH ANNIVERSARY

- Conference Sponsors:**
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More than 300 participants representing graduate pharmaceuticals programs from throughout the nation's midsection converged at West Lafayette's University Inn to share research and to network with potential employers. Featured keynote speaker at the event was Richard Markum, then president of Merck. Purdue students presented research topics ranging from use of Polymers to Inhibit Crystal Growth of Phenytoin in Solution to Surface Morphology of Solid Powders and Nasal Delivery of Drugs.

In its earlier days, the conference was held on campus and attendees were housed in dorms and ate at campus cafeterias. "Our ability to host the meeting and provide top notch accommodations that the participants really enjoyed would not have been possible without the generosity of the pharmaceutical industry," says Renee Coffman, a Co-chair of the conference planning committee.

"Ramesh Krishnamoorthy, Jeff Lewis and I started planning the conference a year ago," says Renee. "In February and March, things really started coming together as we received reservations from students and industry participants and abstracts for the podium and poster sessions began rolling in."

Other committee members included Kim Hancock, Joseph Rinella, Raj Sahe, Rosalind Jackson, Tim McPherson, and Sam Lee. Renee credits the meeting's success in good part to the organizational skills of the department secretaries, Judi Yost and DiAnne Weldy. "They did the lion's share of the typing and facilitated the enormous amount of correspondence issued on behalf of the PGSRM."



PGSRM organizers share a moment with Richard Markum, featured keynote speaker at the annual meeting of pharmaceutical graduate students. From left to right are Joe Rinella, Ramesh Krishnamoorthy, Rosalind Jackson, Markum, Renee Coffman, Jeff Lewis and Raj Sahe.

NEW GRADUATE STUDENTS...

Eleven individuals have recently been admitted as IPPH graduate students. They are:

FRONT ROW – Alexandra L. Kim (Purdue University), Lana S. Burrell (Auburn University), Suchart Chongprasert (Chulalongkorn, Thailand), Gaysorn Chansiri (Chulalongkorn University, Thailand), Argaw Kidane (Addis Ababa University, Ethiopia), Marcela Cancino (Universidad Nacional de Grujillo, Peru).

BACK ROW – Bashar M. Al-Taani (Jordan University), Jorge V. Saca (Universidad Salvadorana, San Salvador), Seongboong Jo (Seoul

National University, Korea), Tonglei Li (Nankai University, PRC).

NOT PICTURED – Allen Paquette (University of Houston).



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and personal. Let us know about professional advancements, research progress, marriages, additions to the family. Simply drop us a note to: *The News Capsule*, c/o IPPH, 1336 Robert E. Heine Pharmacy Building, West Lafayette, IN 47907-1336.

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