PURDUE UNIVERSITY
COLLEGE OF PHARMACY

IPPH Newsletter

Industrial & Physical Pharmacy — June 2012

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EA/EOU

Greetings from the Department Head

Dear Alumni and Friends;

They say you can learn a lot about a person by looking at her desk. My desk is usually pretty clear …. except for a bunch of unreadable reminders, scribbled on hot pink Post-it notes and plastered by my computer. (Go ahead, Sigmund, analyze that!) Those sticky little squares of paper have crept out of our offices and into popular culture. There are Post-it dresses, Post-it sculptures and references to Post-its in literature and theater. There are even Post-it tributes to leaders in the pharmaceutical sciences, on the occasion of their 60th birthday. Look for that in this edition of our newsletter. You'll also learn about our newest faculty members, about the accomplishments of our faculty and students, and about our ongoing renov

We hope you'll take just a minute to catch up with IPPH in this newsletter. Think of it as a bunch of Post-it notes, from us to you, all of them black and gold. Thanks for reading – and hail Purdue!

Liz Topp
Dane O. Kildsig Chair and Department Head

Department Highlights

Faculty Highlights

- **Dr. Lynne Taylor** was promoted from Associate Professor to Professor. The promotion will become effective in August 2012.
- **Dr. Lynne Taylor**, alumnus **Dr. Jared Baird** and postdoctoral fellow **Dr. Bernard van Eerdenbrugh** received the APhA 2012 Ebert Prize for their paper entitled "A Classification System to Assess the Crystallization Tendency of Organic Molecules from Undercooled Melts". The Ebert Prize is awarded to the best paper in *JPharmSci* containing original investigation of a medicinal substance. Their paper appeared in the September 2010 issue.

Graduate Student Highlights

- **Yen Ng** (Green group) has been selected to receive a student travel award from the Society of Nuclear Medicine Technologist Section. The award will support Yen's travel to the SNM Annual Meeting in Miami, Florida, where she will present her research.
- **Lindsay Wegiel** (Taylor group) received a Committee for the Education of Teaching Assistants (CETA) Teaching Award from Purdue University. Lindsay was honored at the Annual Celebration of Graduate Student Teaching Excellence on April 25th.
- **Wyatt Roth** (Knipp group) received the 2011 Dr. Herbert Lieberman Award from our Department. The award recognizes Wyatt's outstanding service as a Teaching Assistant in IPPH 562 and his many contributions to the Department since 2008. The award was funded by Mr. Bruce A. Lieberman to honor his father, Dr. Herbert A. Lieberman, who co-authored *The Theory and Practice of Industrial Pharmacy*.

As one of the surprise events, the symposium participants created a mosaic image of Prof. Kinam Park with Post-its.

(Design credit: Prof. Tonglei Li)

Kinam Park Honored

Dr. Kinam Park was honored in March at the 6th International Symposium on Intelligent Drug Delivery in Seoul, South Korea. The symposium was dedicated to Dr. Park in honor of his 60th birthday and for his outstanding contributions to the field of drug delivery sciences. Among the 220 attendees were 20 of Dr. Park's friends, including his postdoctoral advisor, Professor Stuart Cooper (Ohio State University), and his polymer professor, Professor Emeritus Hyuk Yu (University of Wisconsin). Fourteen alumni from his group, including **Dr. Yoon Yeo** and **Dr. Tonglei Li,** gave memorable presentations on their research to celebrate his birthday and achievements.

Do you recognize the protein here and on page 1?

(RCSB PDB image 1hgu): This is an image of human growth hormone, which is used as a drug. Aggregation is a problem for protein drugs in general, and for this one in particular.

(See also *Graduate Student Spotlight* on page 3.)

Dr. Keith Chadwick of MIT has accepted our offer for an appointment as Assistant Professor in IPPH. Dr. Chadwick is completing postdoctoral fellow research at MIT and will join IPPH in August 2012.

Recent IPPH Ph.D. Graduates: Congratulations!

Fall 2011

Zohreh Amoozgar

Lori Beth Karpes

Jutarat"Pete"Kitsongsermthon

Ziyang Su

Spring 2012

Xin Chen

Basma Ibrahim

Welcome New Faculty: Tonglei Li

In May 2012, alumnus **Dr. Tonglei Li** was appointed as Professor and the first Allen Chao Chair in Industrial and Physical Pharmacy in the College of Pharmacy. He comes to Purdue from the Department of Pharmaceutical Sciences at the University of Kentucky where he served as Associate Professor. Dr. Li's research interests include solid-state chemistry, formulation and drug delivery. He has a long-standing passion in molecular modeling and computational chemistry. His recent focus has been on applying electronic calculation methods for describing intermolecular interactions in the solid state. Combining experimental approaches, his lab aims to understand crystal packing and discover molecular mechanisms of crystal growth and other phase transition behaviors. The ultimate goal is to predict physicochemical and mechanical properties and drug action kinetics in humans based on the molecular structure of a drug compound.

"This fall I will be teaching Dosage Forms I to Pharm.D. students, which I took almost 20 years ago," says Dr. Li. "This in part signifies both the honor and excitement I have felt by returning to West Lafayette. The honor cannot be greater considering the fact that I am working in the same department where Dr. Allen Chao and I both graduated."

Dr. Li received his undergraduate degree in Chemistry from Nankai University and obtained a Ph.D. in Pharmaceutics and an M.S. in Computer Sciences from Purdue University. He joined the faculty at the University of Kentucky in 2002. He has received several recognitions including the NSF CAREER and AAPS New Investigator Awards. He is married to Tongxiao (Catherine) Zhang, who earned her M.S. in Consumer Sciences and Retailing from Purdue and a Ph.D. from the University of Maryland. She will lecture in the Department of Consumer Sciences this fall. They have two children, Jing Jing and Ray Yang.

Graduate Student Spotlight: Saradha Chandrasekhar

Saradha Chandrasekhar (Topp group), a second-year graduate student, decided to go into pharmaceutical research after completing her M.S. in Biotechnology at Northeastern University and spending nine months working for Novartis in Boston. One of her Northeastern professors, **Dr. Mansoor Amiji**, an IPPH alumnus, recommended that she attend graduate school in pharmaceutical research. His recommendation and IPPH's reputation pointed her to Purdue.

She found a big difference between being in industry and being in academia. But Saradha's no stranger to adjustment. She had already made the cultural adjustment from Chennai, India to the U.S., and then from big-city Boston to our small Midwestern city of West Lafayette. And part of her heart is still in Botswana, Africa, where she lived from ages 8 to 14. "Most of the person I am is because of Botswana," she says.

Saradha researches protein stability in Dr. Topp's group, studying how to prevent disulfide scrambling in human growth hormone. She says, "I've definitely learned a lot from Dr. Topp – she's a great mentor." She also enjoys the fact that her fellow IPPH students are of various nationalities and academic backgrounds.

Saradha preparing samples from a kinetics study for HPLC analysis.

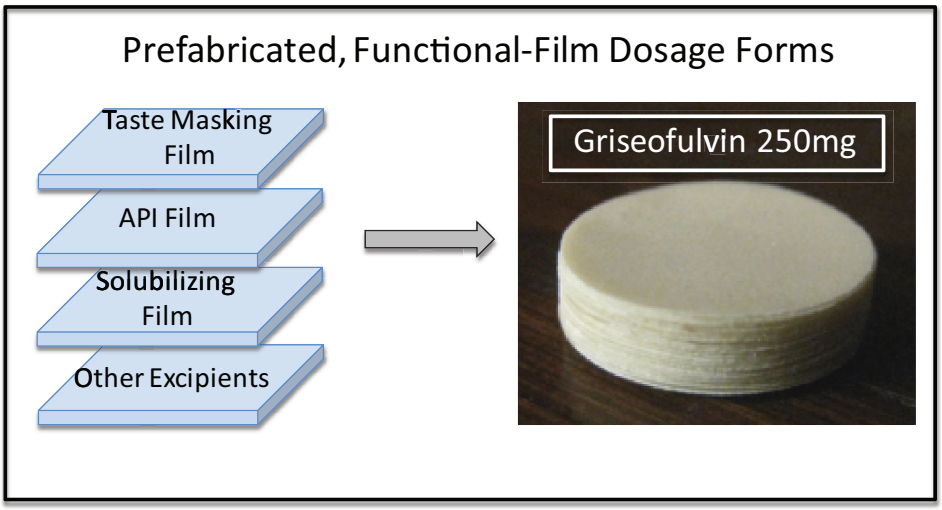
Saradha is the first in her family to go into pharmaceutical research, but may be blazing a family path for other relatives. Some of her cousins have also become interested in the field thanks to her example.

Where is she headed in the future? "The pharmaceutical biotech industry is still developing in India in terms of its research and development," she says. "So I'd really like to get more experience in the U.S., where it's well established, before I'd go back and contribute to the developing field there."

Research Spotlight: The Move Toward Personalized Medicine - A Pharmaceutical Paradox

Personalized medicine offers the promise of drug therapies tailor-made for individual patients. The move toward personalized medicine presents a challenge to the pharmaceutical industry, which mass-produces identical drug products. The growing need for individualized medications in a mass-production based industry presents an interesting and challenging paradox. One way to address the paradox is through the use of prefabricated dosage forms.

Dr. Rodolfo Pinal and his group are creating dosage forms by putting together prefabricated working parts. In this approach, a dosage form is assembled from multiple layers of polymer films. Each layer is put into place according to a pre-established design and has a specific function. The functions can include API carrier, taste masking, absorption enhancement, pH control, and product identification. The prefabricated dosage forms can be made to look and feel like traditional tablets or caplets, or can be shaped into various shapes (e.g., sprinkles). The group is developing libraries of functional layers. Once a taste-masking laminate has been developed, for example, it can be used again and again, with virtually any API.



Dr. Pinal's group is also tackling the fundamental science needed to produce the individual layers. They are investigating hot melt extrusion as a way to produce fast-dissolving crystalline suspensions. They have found that, in some polymers, cocrystals can be formed efficiently during hot melt extrusion. They are also studying the anti-solvent method as a way to produce amorphous drug-polymer dispersions. The stability and interfacial properties of the films are also of interest. In all these activities, Dr. Pinal and his group are helping to unravel the paradox of personalized medicine – one layer at a time.

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(Industrial & Physical Pharmacy group)

Ground Floor Renovations

Renovation began in March 2012 and we expect to take occupancy of the renovated space in March 2013. Want to learn more? Check out our website http://www.ipph.purdue.edu/renovations/ to see short video clips that give updates on the renovation. We plan to add new video posts as the renovation proceeds. You'll also find floor plans http://www.ipph.purdue.edu/renovations/floorplans.php for the space, both before and after renovation.

Upcoming Events:

Peck Symposium 2012

The department will host the 10th Annual Garnet E. Peck Symposium on Thursday, October 11, 2012 on the West Lafayette campus. The symposium honors Dr. Garnet E. Peck, professor emeritus of the department and a pioneer in industrial pharmacy. This year's symposium will feature two focus areas: Globalization of the Pharmaceutical Industry, and Pharmaceutical Biotechnology. Globalization of the Pharmaceutical Industry speakers include Nancy Lilly (Eli Lilly), Maneesh Nerurkar (Piramal Healthcare) and Paul Owens (Eli Lilly). Speakers on Pharmaceutical Biotechnology include David Volkin (Univ. of Kansas), Steve Shire (Genentech) and Chris Roberts (Univ. of Delaware). The symposium will take place just before the annual AAPS meeting (October 14-18) in Chicago, so we hope you will come early to the Midwest to attend both events. *(Contact DeEtte Starr at starrd@purdue.edu for more information.)*

Dr. Garnet Peck

Tyler Lecture 2012

The College of Pharmacy will host the annual Varro E. Tyler Distinguished Lecture on November 16, 2012. The speaker will be Stephen P. Spielberg, M.D., Ph.D., Deputy Commissioner for Medical Products and Tobacco in the U.S. Food and Drug Administration. Dr. Spielberg provides high level coordination and oversight of the FDA's Centers for Drugs, Medical Devices and Biological Products, as well as the relatively new Tobacco Center.