

# MASTER OF BIOTECHNOLOGY PROGRAM

# FERMENT

JULY 2015

## A NEW HOPE: THE CLASS OF '15



**The MBP sends 35 Masters of Biotechnology into the commercial ecosystem**

On June 20th, 2015 the MBP celebrated the graduating class of 2015 at the Hilton Orrington Hotel in downtown Evanston. Savory foods complimented sweet remembrances as students and their families filled the ballroom with stories and laughter.

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## PERCEPTIVE PRECEPTORS

This year, the MBP welcomed Fang Lai, PhD to our growing roster of research preceptors. Though the program had an existing relationship with Ohmx Corporation, Dr. Lai joined their team in the autumn of 2014 – and we at the MBP couldn't be more excited to have our students work with her.

Like any scientist worth their salt, Lai has an incurable curiosity and a contagious sense of enthusiasm for her work. It's a theme that's run the course of her life.

As a child, Lai enjoyed reading 100,000 Why's, a series of books that offered answers to questions like "Why do leaves turn color?" or "Why do you see lightning before you hear thunder?" Clearly Lai had an inquisitive mind in search of answers, one that matured as

she pursued a career in science.

Lai's curiosity brought her to matters of medicine. "For me, the opportunity to bring technology to market, and to improve healthcare is exciting," she said. The demand for invention and improvement provides a lot of work for young biotechnologists, and it's this enthusiasm that Lai hopes to share with her students. "I want them to be excited about doing something with the potential to benefit people's health."

At Ohmx, Lai is involved in the development of high-sensitivity assays with electro-chemical detections, as well as seeking out new markers for cancers. At present, the markers for prostate cancer are not as accurate as they could be—improving diagnostic methods can save patients from the agony and ex-

pense of unnecessary over-treatment.

MBP students play an important role in speeding up the development of these new diagnostic tools by allowing the company to investigate multiple research avenues simultaneously. "MBP students are very smart, energetic, and anxious to learn," Lai commented. She expressed surprise at finding so many self-motivated, competent students ready to "dive in," and continues to be delighted by their contributions.

When students apply for an internship with Ohmx Corporation, Lai and her team assess a student's individual strengths to match them with appropriate tasks and projects. "In a startup, everyone is playing multiple roles," Lai

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Northwestern | ENGINEERING

## PRECEPTORS CONT.



Home of Ohmx Corporation in Evanston, IL.

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**Fang Lai, PhD**

remarked. The students not only work closely with a project's lead scientist, they learn how to design and run experiments, to analyze and share the data gleaned from said experiments.

Weekly meetings train students to share their results succinctly, as they present their findings to their colleagues. "It takes time to put it together, but it's worth it," Lai said. "When they sit down to think about how to share their results, they have to organize their thoughts. The process also promotes them to seek for better solutions." Students emerge from their internship with stronger technical and communicative skills, as well as more robust resume.

The start-up culture prepares students for a variety of roles and settings, be they academic or industrial in nature. By taking on the myriad of tasks, students become professionally nimble while providing an important contribution to a local company.

## HAVE PIPETTE, WILL TRAVEL

The MBP will sponsor a site visit to Cambridge, MA this August for company tours and networking



## HERALDING SUCCESS : THE CHALICE CEREMONY



**Chalice designed by William Butterfield, 1856-1857. (Actual MBP chalice not pictured.)**

For centuries, the chalice has served as more than a mere sippy cup. Religious communities, trade guilds, fraternity houses, and any other group in search of ceremonial fodder have imbued their footed stemware with the traditions of their culture. Imbibing becomes a symbolic act, as the chalice-holder displays their commitment before their peers.

Or, if you're in Dr. Zoe Hoepfner's class, you hold the chalice aloft over your peers to the tune of "In Da Club" by 50 Cent.

In Technology Commercialization (MBIOTECH 411), Hoepfner honored Team Blockbuster's academic achievements at the end of the spring term with a Chalice Ceremony. As a reward for their success, Karen Zuo, Ron Ellis, and Tommy Hsaio each received sparkling beverages, sugary sweets, and the traditional bragging rights that accompany any bestowed honor or award. In addition, Team Blockbuster enjoyed a free lunch at the Cohen Commons, McCormick's faculty & staff dining room.

I asked Zuo about the choice of the team name: "I love the word, and the idea. It's what I wanted our team to be-- positive and optimistic." In working with Novalex Therapeutics, their positive team dynamics emerged through email exchanges, in- and out-of-class meetings, spending their Saturdays wrangling with heavy market research. Each team member was flexible, willing

to brainstorm, and exhibited a strong flair for efficiency.

In this course, students take the lessons of their previous course work to the task at hand: Consulting for a client. Through market research and client meetings, MBP students explored possible user populations, customer demand, competition, and market access. They then knit these market conditions into their clinical design strategy, while navigating ethical and intellectual property concerns.

"I'll be honest," Ellis admits, "I wasn't sure about this class. It wasn't until a few weeks into it that I realized how useful these strategies really were." Building on the knowledge taken from Tech Comm Fundamentals (MBIOTECH 410), Ellis found the practicum highly relevant to his professional ambitions. Hsaio expressed a similar relief about the course, "it let me know a lot about the business side of science. I had no exposure to commercial issues before this program, so it was an interesting experience."

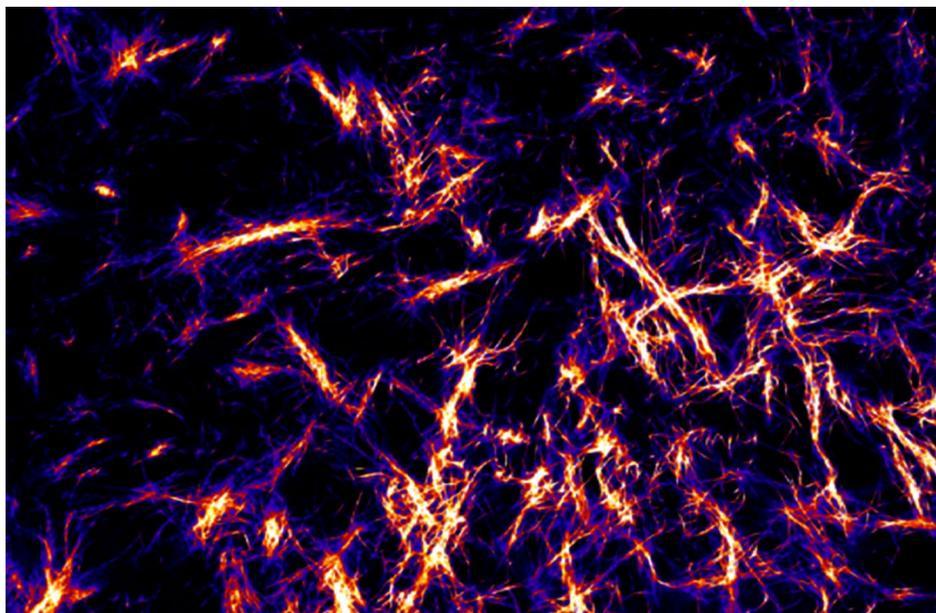
Ellis, Hsaio, and Zuo didn't work in total isolation – they had the benefit of good mentors. "We all loved Dr. Sargent" Zuo smiled, "he was so patient, always willing to explain things to us." Zuo also had the serendipitous fortune to share a CTA ride with Dr. William Sargent on her way to campus one day-- enough time to chat (and maybe get a competitive edge).

Team Blockbuster welcomed the insight of both Dr. Sargent and Dr. Sharon Sintich (the class contact for intellectual property issues), each of whom served as a wealth of knowledge, offering perspectives from both industrial and academic sectors.

Tech Comm continues McCormick's tradition of applied science and research. MBP students broaden their perspectives beyond the microscope, and gain a holistic view of their field-- not by analyzing from above, but by entrenching themselves in real-world environments.



## MINIMIZING MISCHIEF: MBP INTRODUCES BIOIMAGING COURSE



*By making skill-building courses available, the BIF supports MBP's mission to prepare students for industry.*

Is it possible to get job in biotechnology without knowing your way around a microscope? Maybe. But we wouldn't recommend it.

Besides, microscopy is hip again-- last year's Nobel Prize in chemistry went to three scientists responsible for developing super-resolved fluorescence microscopy. Before, the best resolution a scientist could hope for was half the wavelength of light (0.2 micrometers). But as chemists bend (and break) the limits of the technology, microscopy comes to the forefront as a research technique in contemporary science.

Fortunately for MBP students, our lab is mere steps away from Northwestern's Biological Imaging Facility (BIF), shared-use lab available to students and faculty.

While the BIF has always offered individualized training in microscopy to those who need it, for the first time this year, MBP students took a ten-week elective course in microscopy with William Russin, PhD, to hone their skills in confocal and fluorescence techniques.

The course developed out of a series of conversations between Russin and MBP's faculty. "We started to see a need for implementing a course in mi-

croscopy and imaging for the program," Russin explained, "Since confocal and fluorescence techniques are almost commonplace, it makes sense that someone preparing for a career in a technical field like this should have hands-on experience."

Russin's winter-term course covered light microscopy, some electron microscopy, specimen preparation, physiological techniques, analytical techniques, and image ethics. In an age when data visualization and imaging are increasingly important to scientific communication, it is more important than ever to respect and adhere to the constraints imposed by ethical representation.

"There is always a chance for what you might call 'unethical' presentation of data" Russin said. Sometimes the infraction is deliberate, and other times unintentional, but the potential for manipulation remains high as technology allows a greater and greater degree of control over imaging.

Students in Russin's course left with a greater sensitivity to representation, as well as the challenges of working with the technology itself.



## WHAT'S THE DIF' AT THE "BIF"?

*The BIF answers the call for sound, ethical representation in scientific communication.*

When they're not offering custom-built courses to graduate programs, the BIF functions as a full-service facility, one that serves researchers in their investigations from start to finish. "We can take people from the living raw organism, the raw sample, all the way through to printing the poster for your presentation at a national meeting," Russin said.

With twenty-two instruments, and three suites in Hogan Hall, the BIF empowers the researcher by supplying both access and training necessary to work independently.

Although not everyone has a need to fold microscopy into their investigation, exposure to the techniques can radically alter the perspective with which a scholar views their work. "The world is inherently interesting, and the better you can see it, the better you can understand it," Russin said.

In a world where Instagram and Snapchat have replaced conversations, it's difficult to dismiss the power images to communicate complex (and not so complex) ideas.

### SEMINARS

#### Lurie Cancer Center Symposium & Scientific Poster Session

2pm Thursday July 9

Keynote Speaker:

Arthur Mercurio PhD

University of Massachusetts

**Baldwin Auditorium**

(Chicago campus)

#### Frontiers in Nanotechnology Seminar

4pm Thursday August 20

Prof. Luis M. Liz-Marzán

**Pancoe Auditorium**

(Evanston campus)

## OUTSIDE THE CLOISTER

### *MBP Shines at the Cures Within Reach Gala*

Last May, under the glass skylight of the Spertus Institute, faculty, staff, and students from Northwestern's MS in Biotechnology program attended the BioScience Awards (Midwest). Organized by Cures Within Reach, the event celebrates scientists who have improved patients' lives.

As a sponsor, the MBP is just one of many organizations contributing to the efforts of Cures Within Reach. Over 40 research institutions work together to promote transparency and efficiency across 24 different research projects.

In addition to honoring the work of individual researchers, attendees witnessed the launch of CureAccelerator, a new platform designed to speed the pace of research-sharing and collaboration. The accelerator's potential for lowering costs while advancing research may prove an effective model for future drug development



## AN AFFINITY FOR DIVERSITY: CENTER FOR HEALTHCARE INNOVATION HOSTS ANNUAL SYMPOSIUM IN THE LOOP

When your boss tells you, "You need more diversity in the workplace," they don't mean hiring equal numbers of blondes, brunettes, and redheads. Getting beyond a surface-level view of diversity & inclusion (D&I) remains critical to the success of any organization.

At the Center for Healthcare Innovation's 5th Annual Diversity, Inclusion and Life Sciences Symposium this past June, guest speakers and panelists shared their experiences fostering collaboration in the healthcare industry.

In an enlightening (and entertaining) welcome address from Julius Pryor III of Genentech, attendees were encouraged to embrace, rather than lament, the culture of disruption at play in contemporary culture. Pryor pointedly

commented that the language of demographic shifts continue to talk about "growing minorities," when in reality, these groups are "emerging majorities."

The change is already here-- it's time to stop talking about it in the future tense.

While our identities as human beings are indeed shaped by our ethnic experiences, and socio-economic backgrounds, the session speakers emphasized the importance of honoring and recognizing professional, educational, and philosophical diversities in the workplace.

Hosted in the Law Offices of Seyfarth Shaw, the event aimed to cultivate collaboration amid shifting cultural paradigms.



**The Citadel Center: Dearborn Street, Chicago.**



## INDUSTRIOUS ALUMNI

Peter Zhang ('14)



In sunny Oceanside, California, Peter Zhang is currently part of a research group responsible for developing and optimizing cell culture production processes for Gilead's biologics drug products.

"Unlike small molecule drug products, biologic drug products, such as antibodies and proteins, are produced by living cells and these production processes vary greatly between different products even if

the host cell is similar. So developing such processes is not trivial."

While he was a student in the MBP, Zhang participated in a co-op with Genzyme, where he gained critical experience in cell culture production processes. After a short three months, Zhang was right at home, handling routine lab work, responding to process deviations, and successfully maintaining perfusion bioreactors.

*MBP's bioprocessing courses provided me with a solid foundation... My supervisor was pleasantly surprised at how easy it was for him to teach me the scientific and engineering fundamentals of process development.*

**Peter Zhang**

## I ONCE CAUGHT A SPECIMEN THIS BIG...



Raj Desai and Xu Zhang bring new meaning to the word "fieldwork" as they collect samples from the Upper Des Plaines River. As a part of their research for Kimberly Gray, PhD and George Wells, PhD, Desai and Zhang help their team gather data on micropollutants and their impact on the microbial community.

## FOLLOW, LIKE, SHARE, CONNECT

Our program is a word-of-mouth phenomenon. If you tell someone this program is great, then someone else is going to hear this program is great.



**SHARE YOUR  
FAILURES,  
VICTORIES,  
DISCOVERIES,  
AND INSIGHTS  
WITH *FERMENT*.**