

INSIGHT

BIOTECHNOLOGY DAY CONTINUED INSIDE »

A review of our one-day life sciences festival

Each year, the Master of Biotechnology Program hosts Biotechnology Day, a one-day life sciences festival designed to inspire and inform curious minds. This year's event was a huge success, allowing us to engage, educate, and connect with over 250 members of the scientific community! We would like to thank our wonderful volunteers and co-sponsors, the Office of STEM Education Partnerships (OSEP) and the Biotechnology Training Program (BTP) at Northwestern University, for helping to make this day possible.

Over 100 students from Lindholm Math & Science Academy participated in hands-on activities and small-scale scientific experiments during our community outreach portion of the event. Students explored career paths in the biotechnology field through round-table discussions with industry professionals and Northwestern MS and PhD students held over lunch. An extensive tour of the Northwestern University campus and various laboratory facilities concluded their visit.

The afternoon portion of Biotechnology Day focused on professional development opportunities for anyone and everyone interested in biotechnology. Technical and non-technical career panels comprised of 10 industry professionals



representing 10 different companies delved into the details of the many diverse career possibilities offered by the biotechnology field. A new format for the panels was introduced this year, with guests rotating between individual panelists every 15 minutes to allow for a more intimate setting.

Dr. Jeffrey Baker, Deputy Director of the Office of Biotechnology Products at the Center for Drug Evaluation and Research at the FDA (US Food & Drug Administration),

delivered a keynote speech which focused on the development, manufacturing, and regulation of biopharmaceuticals. Biotechnology Day concluded with an open networking session and reception in the beautiful Guild Lounge, overlooking the heart of the university.

We would like to thank everyone for a wonderful Biotechnology Day. We hope to see you again next year—until then, stay curious!

— Kara Mui

High school students take part in hands-on demonstrations during Biotechnology Day





High school students explore Northwestern lab facilities and learn about biotech career possibilities through round table discussions with PhD students and industry professionals

MBP students and guests attend career panels comprised of industry professionals (bottom right)



Dr. Jeffrey Baker, Deputy Director at the FDA (above left), delivers the keynote speech

Students, panelists, faculty, and staff mingle at the open networking mixer



STUDENT RESEARCH

Announcing our students' research preceptors and projects



SIMI ABRAHAM

Effects of Silver and Titanium Dioxide Nanoparticles on Environmental Microorganisms and the Transfer of Antimicrobial Resistance Genes (Dr. Kimberly Gray)



IBRAHIM ALQEMLAS

Characterizing biological and drug recalls (Dr. Arthur Felse)



YEONGEE (ESTHER) CHAE

Developing reporter gene bioassay for Pfizer's biomolecule (Dr. Julie TerWee)



TANNER COOK

Determining the effect of needle length of the Type III secretion system on secretion titers in *Salmonella* (Dr. Danielle Tullman-Ercek)



DANIEL FERNANDEZ

Engineered extracellular vesicles as novel therapeutics (Dr. Joshua Leonard)



XIAOZHI (KEVIN) GAO

Optimization of cardiomyocyte differentiation and proliferation (Dr. Paul Burrige)



MAYA HALTHORE

Investigation of Solid Lipid Nanoparticle (SLN) Based Spherical Nucleic Acids (Dr. David Giljohann)



NING HAN

Spatial distribution and function of spicule matrix proteins in the Sea Urchin embryo (Dr. Derk Joester)



GIULIA HINDERMANN

Dynamics of migration and connectivity in newly born Hippocampal neurons (Dr. Yevgenia Kozorovskiy)



FREDERICK HSU

Synthesis, purification, and characterization of Oligonucleotides for Spherical Nucleic Acid (SNA) therapeutic Applications (Dr. David Giljohann)



YAROSLAV KAMINSKIY

A combinatorial nanomaterial strategy to alleviate off-target effects of drug therapy (Dr. Evan Scott)



MICHELLE KOFORD

Role of NF90 in Prostate cancer (Dr. Jindan Yu)



CHUANLU (JASON) LIU

The correlation between patterns and products in the business developments of the pharmaceutical industry (Dr. Sara Moreira)



JESSICA LONG

The role of DYRK1A phosphorylation of UTX in DS-ALL (Dr. John Crispino)



NIKHIL MAHESHWARI

Rare cancer clinical trials and mechanism of action approval trends (Dr. Arthur Felse)



AUSTIN MILLER

Engineering metabolite-responsive biosensors (Dr. Josh Leonard and Dr. Keith Tyo)



ROHAN MOHINDROO

Nanoparticles for measuring human performance (Dr. Shad Thaxton)



CAMERON NIAZI

Targeted epigenetic modification using CRISPR-Cas system (Dr. Alex Yemelyanov)

**FAITH OGUNGBE**

Therapeutically targeting diapedesis and the inflammatory response
(Dr. William Muller)

**YIDAN WANG**

Modulation of inhibitory pathways for reversing T cell exhaustion
(Dr. Pablo Penaloza-MacMaster)

**NISAR PAREKH**

TBA
(Dr. Bryan Bernat)

**YIFAN XU**

High throughput screen of small organic molecules for inhibition of A β O's binding with NaKATPase
(Dr. William Klein)

**ZACHARY PAUL**

The Effect Jet Lag has on Performance in Major League Baseball
(Dr. Ravi Allada)

**DANIELLE YOESEP**

Ribosome engineering
(Dr. Michael Jewett)

**MICHAEL REED**

The role of engrailed homeobox 2 on glioblastoma
(Dr. Atique Ahmed)

**DIAN ZHANG**

Centromere dysfunction in Cancer
(Dr. Daniel Foltz)

**SUCHITRA SANKARANARAYAN**

Elucidating a novel regulator of inflammation: the TLR4 Inhibitory Complex (TIC)
(Dr. Joshua Leonard)

**AFRA SIDDIQUI**

Micro Bioreactor development for ex vivo platelet production
(Dr. William Miller)

**XIAOLEI (CHARLOTTE) SITU**

The molecular mechanisms of the autophagy protein Beclin 2 in the regulation of Alzheimer's disease
(Dr. Congcong He)

**SUSMIT SUKTHANKAR**

The Integration of Automated Liquid Handling for Bioassay Development
(Dr. Julie TerWee)

**KATHERINE TAN**

Application of Surface Plasmon Resonance Technology (BiaCore) in Biosimilars Pharmaceutical Product Development
(Dr. Julie TerWee)

During the fall quarter, about 40 preceptors from varied areas including cancer biology, bionanotechnology, synthetic biology, and neurobiology presented more than 60 research projects to MBP students. Students explored the breadth of projects, met with several preceptors, and chose a project that fit their needs and expectations.

— Arthur Felse

NEW ABS BOARD

Introducing our new executive board for the Association of Biotechnology Students!

The Master of Biotechnology Program (MBP) also welcomed our 2018 Association of Biotechnology Students (ABS) executive board. Elected by our first year students, these students will continue an MBP tradition of organizing academic, social, community service, and professional development events and outings for all MBP students throughout the academic year. **Please meet the 2018 ABS executive board:**

MAYA HALTHORE, PRESIDENT



Maya Halthore, from Springfield, VA (a suburb of Washington, D.C.), graduated from Virginia Tech with degrees in Biology and Economics. She worked for three years as a Pricing Analyst at a government contracting firm, Booz Allen Hamilton, before deciding to return to school to pursue her masters degree in Biotechnology. The decision was tough to make but it ultimately stemmed from her innate curiosity and passion for the ever-evolving field of science- and she is thrilled with the outcome. In her free time, Maya enjoys attending concerts, travelling, and spending time with her wonderful friends and family. She hopes that as ABS President she is able to help facilitate communication and cooperation within and beyond

MBP to help her peers achieve their professional goals while building lasting connections and enjoying their time here in Evanston.

SIMI ABRAHAM, VICE PRESIDENT



Simi Abraham, a native to the breathtaking great state of Colorado, graduated from the University of Colorado (Denver) with a major in Biology and minors in Chemistry and Honors Multidisciplinary Research Methods. She took a year off to work as a Clinical Research Coordinator at a dermatology clinic and was inspired by one of her patients to pursue a Master's degree in Biotechnology. She has a passion for sustainability and global health issues and hopes to pursue a career that allows her to have the best of both worlds. Simi loves to travel, is a dedicated foodie, brags about how awesome Colorado is to anyone who will listen, and is currently obsessed with taking black and white themed pictures of other members of the

Master of Biotechnology Program. She hopes that through her role in ABS, her fellow cohort members will be able to enjoy and make the most out of the resources and opportunities that the program can offer to its students!

MICHELLE KOFORD, COMMUNITY SERVICE CHAIR



Michelle Koford is a first year student in the Masters MBP program and will be serving as the community service chair for the ABS board. Michelle Koford graduated from The Ohio State University in 2012 with a Bachelor of Science in Human Nutrition and a minor in Exercise Science. After completing her degree, Michelle went on to attend the University of Cincinnati, where she received a Master of Science in Health Education with an emphasis in Exercise Management.

After completing her second degree, Michelle went on to work in industry at TriHealth in Cincinnati, Ohio. She worked at TriHealth for three years starting as a Health Fitness Specialist and then working her way up to Personal Training Manager at Procter & Gamble. While working at TriHealth, Michelle focused on her passion to help others by educating employees of Procter & Gamble about the importance of health and fitness and serving on the Vibrant Living Board for the Fabric and Home Care site in Cincinnati. In her second year at P&G, she moved to the general operations building and continued to promote health and fitness through multiple events including health expos and 5Ks.

After working in the health and fitness field for some time, Michelle decided to make a career change that she believes will be beneficial to her and the community. She is excited for the new opportunities that the MBP program will bring and to share her knowledge from past work experiences with MBP classmates.

JASON LIU, CAREER DEVELOPMENT CHAIR



Jason Liu is from China and finished his undergraduate study at Sun Yat-sen University with a major in Biotechnology. In addition to being the Professional Development Chair of ABS, he is also the president of Northwestern Chinese Students & Scholars Association (NU-CSSA). In his leisure time, he likes traveling and watching sports games. His own career goal is to work in finance department at a pharmaceutical company. His duty as the Career Development Chair is to find more jobs and networking opportunities for MBP students.

AUSTIN MILLER, SOCIAL COMMITTEE CHAIR



Austin Miller grew up in Clovis, New Mexico. He graduated from Rensselaer Polytechnic Institute with a BS in Biochemistry and Biophysics. As an undergraduate, he served as a student senator and is a brother of the Sigma Chi Fraternity. He also participated in research in which he helped engineer bacteria to produce fuels from common waste products. He believes in the potential biotechnology has to make chemical production more sustainable, and contributes to this field by participating in research in synthetic and systems biology. In his free time, he enjoys preparing fine New Mexican cuisine and discussing the importance of reducing carbon emissions.

IBRAHIM ALQEMLAS, TREASURER



Ibrahim Alqemlas graduated from the University of Nottingham with a Bachelor of Science in Biotechnology. Throughout his undergraduate studies, he worked in a variety of fields ranging from synthetic biology to bioremediation while simultaneously maintaining a leadership position in his university's Society of Biotechnology. In his spare time, he likes to watch movies, play sports, and write fiction. Upon graduation from Northwestern, Ibrahim hopes to obtain a position in business development at a pharmaceutical company.





SPRING SITE VISIT

MBP returns to Bay Area Biotech Cluster

Site visits organized by the Master of Biotechnology Program are designed to provide firsthand insight into the biotechnology industry. These visits enable students to explore different aspects of various companies by touring innovative laboratory facilities and interacting directly with industry professionals.

This spring, MBP students returned to the Bay Area Biotech Cluster, one of the largest biotechnology hubs in the country. Located near San Francisco, CA, this cluster is home to an impressive network of academic institutions, entrepreneurships, and diverse pharmaceutical and biotech companies. Over 1,400 life sciences companies comprised of over 52,000 people contribute to the Bay Area's success, generating revenue exceeding 29 billion dollars per year.

On March 29th, MBP students visited Celgene and Genentech. Celgene is a global biopharmaceutical company committed to chang-

ing the course of human health through their bold pursuit of innovative drugs and life-enhancing therapies. Celgene focuses on the discovery, development, and commercialization of products designed to treat cancer and other severe immune or inflammatory conditions. Currently, there are more than 300 clinical trials involving Celgene's compounds being conducted at major medical centers across the world.

Considered the founder of the industry, Genentech has been delivering on the promise of biotechnology for over 40 years. Genentech discovers, develops, manufactures, and commercializes medicines to treat patients with serious or life-threatening medical conditions. They are among the world's leading biotechnology companies, with multiple products on the market and a promising development pipeline.

On March 30th, MBP students visited Bolt Threads and Zymergen. Bolt Threads' team of scientists,

engineers, and apparel experts are developing the next generation of performance fibers and fabrics to transform what we wear and how we live. Using proprietary breakthroughs in industrial biotechnology, Bolt Threads aims to revolutionize the textiles market, turning renewable raw materials into products with outstanding properties that meet specific consumer needs. Zymergen is a technology company that approaches biology with an engineering and data-driven mindset. They believe that true innovation is about finding new and better ways to solve complex, multiindustrial issues which affect agriculture, chemical manufacturing, and healthcare. Their platform accordingly integrates the most sophisticated aspects of technology, automation, and biology to deliver unprecedented levels of predictability and reliability in microbial engineering.

— Kara Mui

CONGRATULATIONS, BILL!

Bill Miller receives the 2018 Cell Culture Engineering Award

Bill has served the cell culture community for 30+ years through pioneering contributions, leadership, and training. Common themes in his research are (1) cell plasticity and the importance of the culture environment for modulating cell responses and (2) taking inspiration from the in vivo environment to develop more effective culture systems for cell-based therapies and tissue engineering. Bill's most significant contributions include:

- **Biotherapeutic protein production:** Bill's PhD and independent research played a leading role in exploring environmental effects on cell growth, metabolism, and protein production, and helped provide the foundation for efficient biotherapeutic protein production. His papers on dilution rate, pH, and the levels of nutrients and metabolic byproducts have been highly cited and generated substantial interest in the biotechnology industry. Subsequent research elucidated the mechanisms responsible for cell inhibition by elevated pCO₂.

- **Blood stem cells and megakaryocytes:** Bill and collaborator Terry Papoutsakis were the first to show that low pO₂ greatly enhanced stem and progenitor cell expansion, which has since been reported for a wide variety of stem cells. They developed mathematical models of the bone marrow O₂ distribution and confirmed that stem and primitive progenitor cells likely reside at low pO₂ in vivo. Bill's team discovered that differentiation of megakaryocytic and erythroid cells, which must reach the bone marrow sinuses before they fully mature into non-motile platelets and red blood cells, is greatly enhanced at higher pO₂ and pH. These findings facilitated development of an efficient multi-stage culture process for megakaryocytic cells and platelets.

- **Bioreactors for blood cells and tissue engineering:** Bill and collaborators were among the first to develop bioreactors for blood stem and progenitor cells. They demonstrated the benefits of continuous perfusion for progenitor cell expansion, and showed that blood cells could be more effectively cultured in controlled, stirred-tank suspension bioreactors than in static flasks. More recently, Bill's team used computational fluid dynamics to design a uniform-shear-rate microbioreactor to study platelet production, and developed well-characterized and controlled bioreactors to support renal cell expansion and differentiation in decellularized kidney scaffolds.

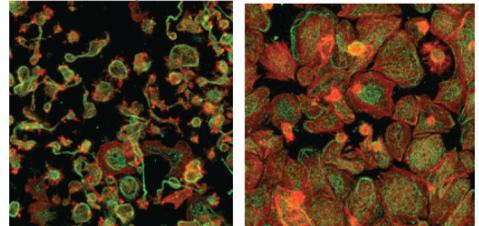
- **Mentorship and Service:** Bill has directed Northwestern's MS in Biotechnology Program for 10 years, directed the NIH Predoctoral Biotechnology Training Program since 2014, and co-directed a postdoctoral NIH training program at the intersection of engineering/data science and pediatrics since 2015. He has trained 39 PhD students, 7 postdoctoral fellows, and many MS and undergraduate students. His former trainees work and play leadership roles in a wide range of (bio)pharmaceutical and biotechnology companies. He has also been an active member of the cell culture engineering community, having chaired CCE VII with Richard Schoenfeld in Santa Fe, NM and the Scale-up and Manufacturing of Cell-Based Therapies V conference with Tom Brieva.

This prestigious award recognizes outstanding contributions to the field of cell culture and is given bi-annually at the Cell Culture Engineering Conference

— Cell Culture Engineering Conference



Resting (β tubulin ; F-actin) Activated



This prestigious award recognizes outstanding contributions to the field of cell culture.

INTERNSHIP SPOTLIGHT

Dubby Wiseman '16 writes about his time at Genentech

Genentech's motto is "doing now what patients need next." On the surface, this may appear an obvious goal of the pharmaceutical industry as a whole, constantly striving to deliver the most modern and efficient medicines to patients in need. However, Genentech stands out in this regard because of their commitment to consistent improvement and never staying complacent with the status quo.

I've seen this standard of excellence firsthand within Purification Development, as many of my co-workers are involved with process optimization in modeling, product recovery, and impurity removal. While this high level of rigor can certainly presuppose an unfriendly and cutthroat atmosphere, this is not the case at Genentech. Every person I've come into contact with, from fellow interns to executives, has been warm, welcoming, and excited to talk about the goings-on about the company.

My own work is in a subsection of Purification Development, on a critical reagents synthesis team.

Protein reagents are needed across the company for assay development across various areas of the company, from research and development teams to other technical development departments.

As a support group, my interdepartmental team's job is to produce and purify these reagents as quickly as possible, without compromising on quality. It has given me the opportunity to utilize and expand upon my protein purification knowledge from my time in the Jewett lab, as well as learn entirely new chromatography and analytical techniques.

Genentech's internship has presented an opportunity to cultivate not only new laboratory skills, but also soft skills and networking. Both the individual departments and the company as a whole host regular networking events, where I've been able to meet and interact with all sorts of employees and executives. Taken together, these skills will certainly benefit me in my future career, and I have thoroughly enjoyed my time at Genentech so far.

— Dubby Wiseman '16



"[My] internship has presented an opportunity to cultivate not only new laboratory skills, but also soft skills and networking."

SUMMER SITE VISIT

MBP headed to New Jersey this July



On July 12th and July 13th, MBP will be traveling to the east coast to visit 4 great pharmaceutical and biotechnology companies. The summer site visit trip will be released on May 4th.

If you have any questions about the site visit, please follow up with Natalie Champagne.

East Coast Here We Come!

— Natalie Champagne

ELECTRONIC LAB NOTEBOOKS

New technology introduced in MBP Bioprocess Engineering lab course

Electronic lab notebooks (ELNs) are better equipped to handle contemporary life science and engineering experiments that generate large data sets and require high levels of data integrity. ELNs facilitate better workflow, quick data retrieval, and remote accessibility of data. Moreover, ELNs are becoming the industry standard for compliant record keeping.

MBP Lecturer P. Arthur Felse recently published an article in the *Journal of Biological Engineering* which describes the implementation of a cloud-based ELN in MBP's Bioprocess Engineering laboratory course. The use of ELN streamlines workflow in the lab, facilitates data sharing and collaboration among student teams, and creates a culture of ELN use for the future workforce. Most importantly, ELN promotes superior data integrity.

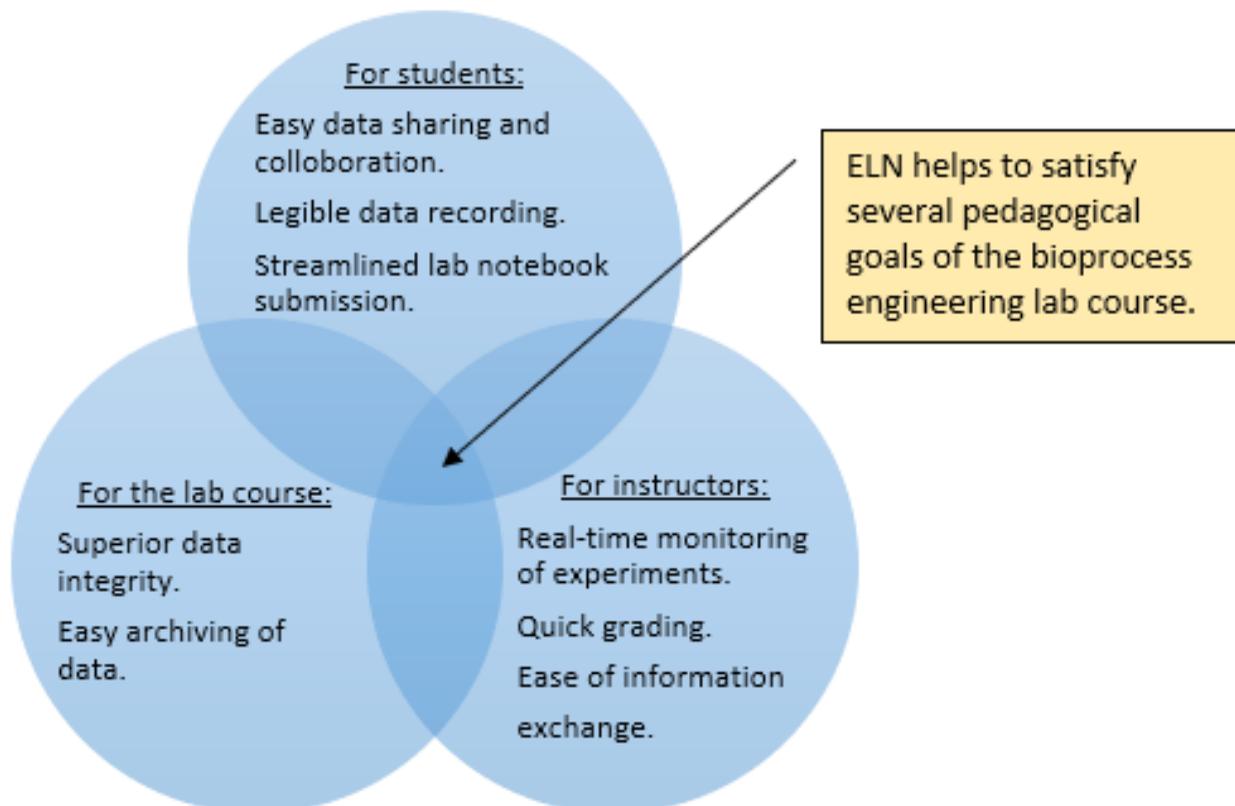
Cloud-based ELNs are no more expensive than paper lab notebooks but they tremendously improve the logistics of experiment workflow. Instructors have greater control of the lab experiments and can provide quick and streamlined feedback to students. Through the robust audit trail in ELNs, lab experiments are compliant with all elements of data integrity as defined by Food and Drug Administration's guidance on data integrity requirements, which state that scientific data should be Attributable, Legible (and long-lasting), Contemporaneously recorded, Original, and Accurate (or ALCOA).

ELNs also facilitate easy archiving of data. Historical data is now readily available for future reference, unlike paper lab notebooks (PLNs) which are typically discarded after the course and the data is permanently lost. ELNs can accommo-

date descriptive comments, protocol revisions, and data revisions as necessary, all of which are archived with a clear audit trail. The ELN thus becomes a true historical record of the lab course.

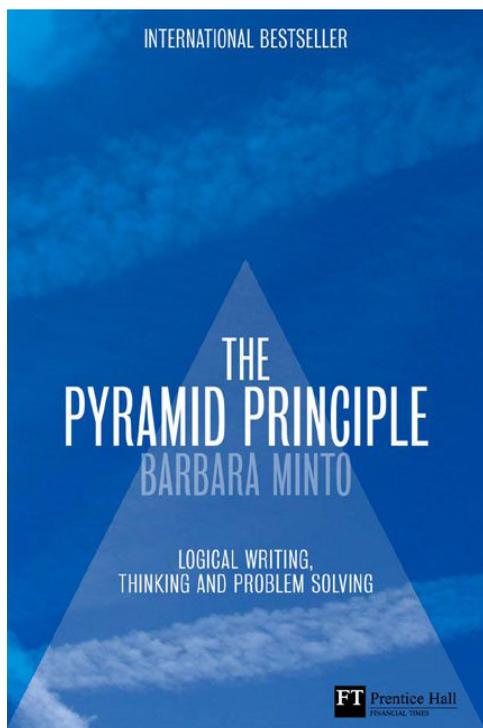
ELN permits full life-cycle data management in the lab course from creation to archiving while incorporating all aspects of data integrity with much less effort than is possible through PLNs. Notwithstanding the learning curve of about two weeks, a good majority of students prefer ELN over PLN for data compliance and other critical documentation tasks.

— Arthur Felse



CRITICAL THINKING

“The Pyramid Principle: Logic in Writing and Thinking” by Barbara Minto



If you find writing to be a chore and wish you were better at it, make Barbara Minto’s “The Pyramid Principle: Logic in Writing and Thinking” your next read. You will find this perennial favorite of the consulting firm McKinsey & Company to be packed with interesting and occasionally brilliant insights into clear writing (and thinking).

For instance, Barbara Minto does an excellent job explaining why the most important cause of unclear writing is its poor structure and makes a persuasive argument for using the pyramid principle to remedy it. The main advantage of the pyramid principle is that it places the most general ideas first to save the reader’s mental energy required to make sense of the information. The pyramid principle also facili-

tates memorization and recollection of information.

The first three chapters of “The Pyramid Principle” are engaging and simple, but the rest of the book is much more complex and technical, casting doubt on one of Barbara Minto’s assertions that fixing the structure is much easier than rectifying weaknesses of writing style. Fortunately, a few of Barbara Minto’s ideas can be used without a time-consuming perusal of the entire book. For example, focusing on including a summary sentence at the top of each paragraph, in my experience, improves the clarity of writing rapidly and substantially. A fun way to practice constructing proper summary sentences is to play the board game “Codenames,” which I’m currently adapting for the classroom.

— Igor Kourkine

INTERNSHIP SPOTLIGHT

Siddhant Prabhu ‘16 writes about his diverse internship experiences

I joined the Masters in Biotechnology Program with an aim to build a career in the biotech world. Despite my limited prior experience in biology and bioprocessing, the program helped me acquire skills required to thrive in the lab. Coupled with this was the freedom to choose my desired electives, enabling me to explore cutting edge technologies.

I also worked at a lab in the Chemical Engineering department at Northwestern University as part of my MBP research project and was able to publish my data in a high-impact research journal.

The focus at MBP was not just on the technical aspects of biotechnology, but also on professional de-

velopment. A panel discussion organized by the program for our annual Biotechnology Day introduced me to a plethora of career options available post graduation.

It was here that I first learned about the career opportunities in Life-Sciences Consulting. Talking to consultants working with renowned biotech companies and questioning them on the challenges involved in their jobs made me realize that these were challenges that excited me. From this point onward, I focused my attention on getting an internship as a life-sciences consultant and the strong alumni network from our program made it easy to find an opportunity.



(cont.)

Photographs by Siddhant Prabhu.

Over the summer, I worked as an analyst at Deloitte, developing a clinical trial management system for a leading biotech company. I owe my success in this role to the sound understanding of the industry that I garnered through my classes at MBP.

With a desire to learn about global health challenges, I decided to pursue a certificate in Sustainability and Global Health Biotechnologies. The program gave me the opportunity to intern in South Africa. This experience was truly life-changing.

I got to interact with different stakeholders and get firsthand experience with the challenges involved in commercializing technologies in a resource-limited setting. I visited rural clinics operated by the Desmond Tutu HIV foundation and interacted with experts in the field of infectious disease. These interactions helped me make global connections and allowed me to contribute to impactful projects in South Africa.

MBP has prepared me to take on the present and future challenges in the biotech industry.

— Siddhant Prabhu '16



“MBP has prepared me to take on the present and future challenges in the biotech industry.”

ADVOCATING DIVERSITY IN STEM

Arthur Felse coedits Diversity Special Issue of *Chemical Engineering Education*

Addressing society's grand challenges such as improved healthcare, clean energy, space conquests, and cybersecurity will need an engineering workforce that can bring a rainbow of perspectives through their diversified gender, ethnicity, and life experiences. Thus, the engineering discipline should seek not only to recruit individuals of diverse backgrounds but promote best practices to retain diverse individuals, whether they are students or faculty¹.

Diversity refers to the counts of individuals in a particular gender or ethnic group. Inclusion refers to the intentional practices and processes used to build a diversity². Though many recognize the need for better diversity in engineering education, it is seen as an "important" but not "urgent" issue. Therefore, broad-

ranging conversations and debates on the benefits, challenges, and best practices for diversity and inclusion in the engineering education are immediately needed.

MBP lecturer and Assistant Director for Research Arthur Felse recently coedited a Diversity Special Issue for the journal *Chemical Engineering Education*. This special issue is the first of its kind in chemical engineering.

The special issue provided a platform for disseminating scholarly work in diversity-related research in chemical engineering and showcased the progress made in this area. It consisted of ten full-length papers, two invited guest editorials, a cartoon on diversity, and teaching tips on diversity.

Articles in the special issue covered topics ranging from PK-12

to undergraduate to graduate education and included thematic areas such as curriculum and pedagogy development, assessment tools to measure equity, change processes for better inclusivity, and implicit bias at the instructional and institutional level. The special issue bridged the knowledge gap in diversity-related research and informed the chemical engineering community of the opportunities, challenges, and efforts to promote diversity within the discipline.

— Arthur Felse

¹Bodnar, C., and Felse, P. A. (2018) Introduction to the Special Issue on Diversity, *Chem. Eng. Edu.*, 52, 70-71.

²Minerick, A., (2018) Why all the Clamor Over Diversity and Inclusion, *Chem. Eng. Edu.*, 52, 128.

Image credit: Landherr, L., and Keszler, M. (2018) Diversity Statement, *Chem. Eng. Edu.*, 52, 115-116.

