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ALUMNI GIFT TRANSFORMS TEACHING AND RESEARCH AT THE SMITH SCHOOL

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MESSAGE FROM THE DIRECTOR: ABE STROOCK

DEAR ALUMNI AND FRIENDS OF THE SMITH SCHOOL,

Hello from Ithaca. Here, and almost certainly in your home too, it has been a tumultuous year. I will start by expressing my gratitude for being part of the Cornell community during these challenging times. The faculty, staff, students, and alumni have rallied to be supportive and to find creative ways to pursue our missions under these unprecedented circumstances. I have been buoyed by the undiminished spirit of our students, by the devotion and ingenuity of my faculty and staff colleagues, and by the generosity of our alumni through gifts of wisdom and resources. As I write, Cornell's thorough investment in preparing the campus for activation under COVID-19 is working. We are delivering our full curriculum to cohorts of undergraduates and graduate students through the internet and in-person in Olin Hall: our freshmen are discovering the dimensions (and dimensional analysis) of chemical and biomolecular engineering with Professor Chris Alabi on the second floor while our seniors are running unit operations in the basement. In brief, we can be proud of how Cornell has navigated this year of crisis.

As you will read in the pages that follow, the Smith School has had a year of great successes and losses. We are still reeling from the tragic, untimely passing of Professor Paul Steen, a cherished colleague, instructor, and advisor, and a renowned scholar (page 14). We are also adjusting to the retirements of Professors Brad Anton and Bill Olbricht, after their decades of service to the School (page 13), and to the return of Dr. Kathy Vaeth to a position in industry after two and a half exceptional years as an Industrial Practitioner in our program (page 12). Thankfully, though, we are also gaining the talent, energy, and experience of two new faculty, with the arrival of Professors Qiuming Yu (page 11) and Sarah Hormozi (page 10). We can also celebrate many successes of our faculty, including their impact on the current pandemic (pages 2-4) and in the selection of one of our own, Professor Lynden Archer as Dean of the Cornell College of Engineering!

Despite the challenges presented by this year, the class of 2020 brought exceptional energy through to the completion of their degrees. Their strong placement in a diversity of industries and graduate programs suggests that training in Chemical and Biomolecular Engineering remains as relevant as ever. As you will read in the profiles of undergraduates on pages 28-32, our students continue to take their talents far and wide both while at Cornell and afterwards. Maddie Mills '21 has made us proud since her first year as a star member of Cornell's top-ranked, women's hockey team. Catherine Gurecky '20 invested in her fellow students as a peer-advisor and co-authored a book that celebrates Cornell women in STEM, including notable alumna from the Smith School; and Ellen Park '20 after broad engagements across Cornell's campus as an undergraduate has joined a Ph.D. program in Chemical Oceanography in a top program at Woods Hole Oceanographic Institute. Our graduate students have also navigated the tumult of 2020 successfully, reopening our research labs over the summer, gaining recognition for their research (pages 22-23—Fleming Fellows), and leading important initiatives in and around our community (pages 19-21—CBE Women and DIP).

As we look toward the future, the Smith School is investing in the development of a next generation of learning experiences and research opportunities. In this pursuit, we have received a critical boost from Craig Wheeler B.S.'82, M.S. '83 and Momenta Pharmaceuticals, the company of which he is CEO: Craig and Momenta donated a suite of state-of-the-art equipment for mammalian cell bioprocess (see cover story on page 5). This gift puts the Smith School in a unique position to train students in advanced processes on industry-standard instruments. It also opens unprecedented routes to the translation of research innovations in biomolecular engineering; and, finally, it defines a template that we are pursuing for hubs of educational and research innovation that will distinguish the experiences of students and faculty in Olin Hall over the coming decades.

I hope you enjoy this issue of *Olin Hall News*. Thank you all for your engagement with the Smith School. As always, please be in touch—we are very much open for business—and we hope to be able to welcome you in-person soon.

Stay safe and be well.

Sincerely,

Abe Stroock
Gordon L. Dibble '50 Professor and
William C. Hooey Director

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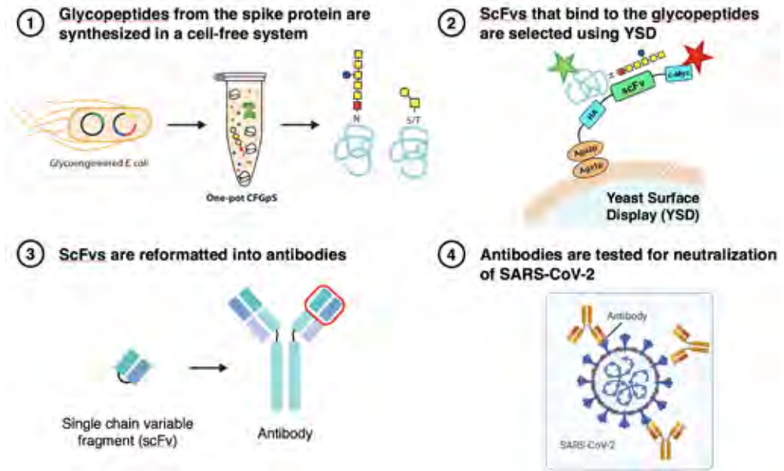
Photos provided by Thomas Hoebbel Photography and Jon Reis Photography

SMITH SCHOOL FACULTY PROVIDE CRITICAL COVID-19 RESEARCH

Cornell University announced a temporary suspension of non-critical research on March 15, 2020. Among the research deemed critical were projects essential for the understanding and reduction of COVID-19. Highlighted below is the work of four CBE faculty who sought and were granted exemption to continue their research to benefit Cornell, society, and humanity.


Matthew DeLisa

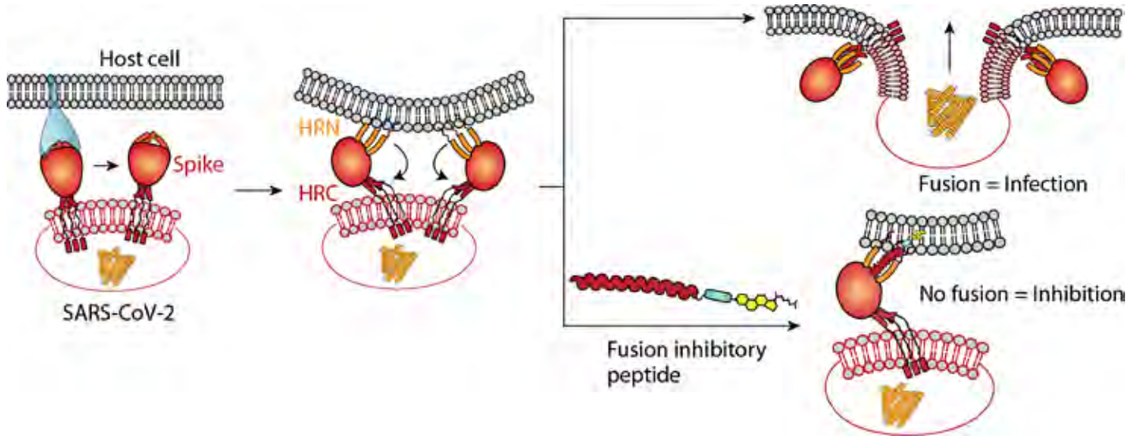
Cornell engineers have streamlined a glycoengineering strategy for antibody discovery to help fight the novel coronavirus (COVID-19). Using cell-based and cell-free biomanufacturing platforms, the DeLisa team was able to produce a collection of peptides derived from the coronavirus spike (S) protein adorned with defined complex sugars or glycans. These glycosylated peptides were then used to screen for effective antibodies against the S protein using a yeast surface display technique. Compared to conventional methods, which require several months to discover drug and vaccine candidates, this integrated approach reduces the timeframe to just a few weeks.



"We combined our expertise in producing chemically-defined glycosylated peptides with our ability to screen for a potent antibody that can bind to those peptides. This created a streamlined platform that can quickly identify antibodies that interact with a specific region on the coronavirus surface. Some of these antibodies could be effective in neutralizing the virus, while others will help shed light on the effect of glycans during viral infection," said Matthew DeLisa, the William L. Lewis Professor in the Smith School of Chemical and Biomolecular Engineering and project team leader. "The implications of glycans in viral biology are profound and elucidating the role of these glycans during host cell entry is critical for designing safe and effective therapeutics and vaccines that are much needed to end the current pandemic," DeLisa added. Other contributors to this project include graduate students Thapakorn Jaroentomeechai and Natalia López Barbosa, experts in bacterial glycoengineering and yeast display technology, respectively.

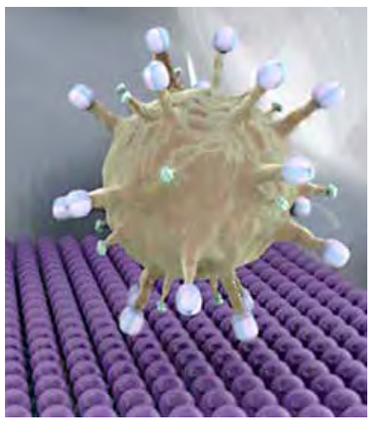

Chris Alabi

Viral fusion with the host cell membrane is a vital step for infection by all enveloped viruses. Following binding of SARS-CoV-2 to the ACE2 receptor on the host cell, the spike protein inserts its fusion protein into the cell membrane which triggers association of the N-terminal (HRN) and C-terminal heptad repeat (HRC) domains to form a six-helix bundle (6HB). The 6HB brings the viral and host cell membranes in close proximity for fusion and infection. In collaboration with the Porotto and Moscona groups at Columbia University, the Alabi group has developed lipid-conjugated fusion inhibitory peptides that block this transient, yet compulsory, fusion step. First generation lipid-modified fusion peptides have shown promise against the live-virus in an animal infection model and are thus promising for the rapid creation of shelf-stable inhibitors at a relatively low cost.




Susan Daniel

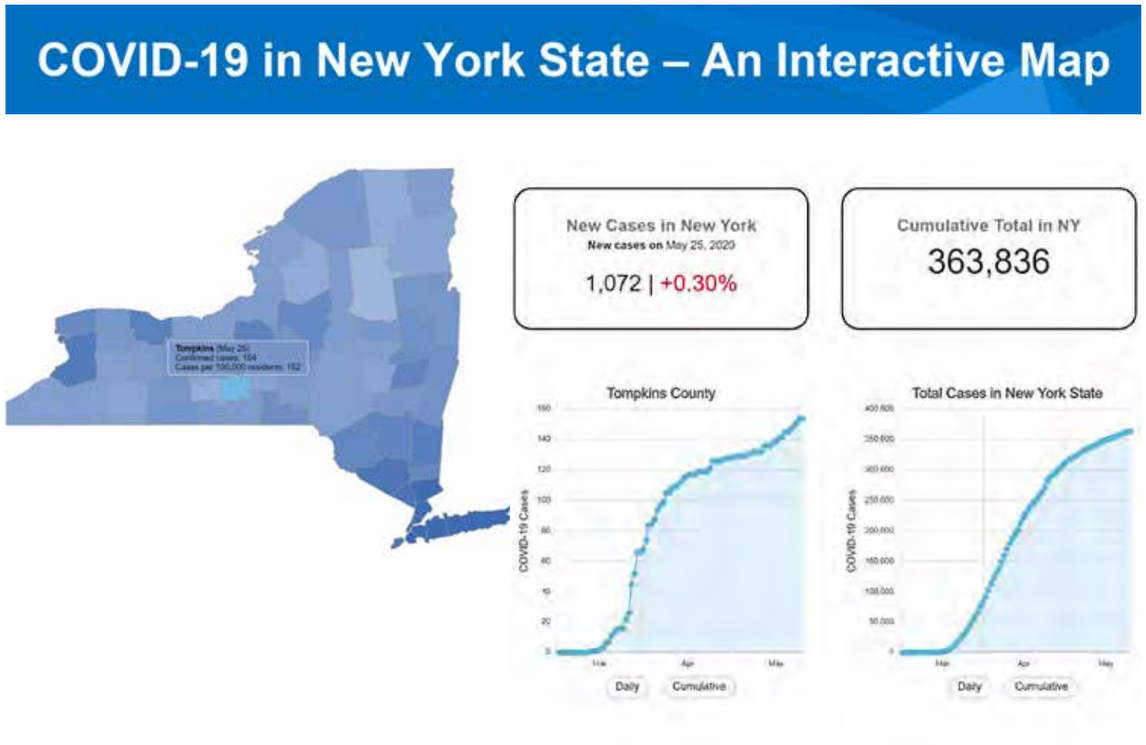
The Daniel Research Team, funded by a NIH R01 grant, has been studying for several years how coronavirus enters host cells. Now they are putting to practice what they have learned scientifically about the entry process, that is, that CoV relies on the availability of ions to assist in anchoring to the host cell membrane. Thanks to a Fastgrant from the Mercatus Center awarded in April and the availability of BSL3 labs at Cornell, they have recently completed a study that shows SARS-CoV-2 infection of lung cells can be eliminated by treatment with FDA-approved drugs that modulate the level of calcium in cells. These drugs, often used to treat cardiac conditions, now may have a new purpose. And because these drugs are already FDA-approved, they will be able to be repurposed faster than developing a completely new drug to treat COVID-19. The team is now aiming to explain the mechanism behind the result, with the hope that this understanding will provide doctors and drug designers important insight that will lead to a permanent cure.




Fengqi You

As the spread of coronavirus (COVID-19) became a major health crisis for New York State and the world, a common question arose from the public, "how many confirmed cases are there in our county or nearby counties?" While a number of interactive maps were available to track COVID-19 cases globally or nationally, they lacked sufficient data relative to specific counties. As New York State's number of confirmed COVID-19 cases grew rapidly, residents in New York and those with family members and friends in New York, were most interested in knowing how the virus spread across counties, seeking accurate and timely information on confirmed cases in every county of New York State. This became a relevant and important issue in the broader context of chemical and biomolecular engineering and health care.

In collaboration with faculty and students across Cornell's campus, the You research group led the development of a cyberinfrastructure; creating an interactive county-level map tracking confirmed cases of COVID-19 in New York State. The map displays data over time (in days) to depict the temporal and spatial spread of the virus. (Screenshots provided below). The map can be accessed from the website: https://covid19.cheme.cornell.edu/



ALUMNI GIFT TRANSFORMS TEACHING AND RESEARCH AT THE SMITH SCHOOL

BY CHRIS DAWSON

The exterior of the Robert Frederick Smith School of Chemical and Biomolecular Engineering's (CBE) Olin Hall might not look much different today than it looked 40 years ago, when Craig Wheeler was a sophomore chemical engineering major at Cornell. But the inside has seen some remarkable changes in that span.

The north end of Olin Hall recently underwent an extensive renovation that created the Samuel C. Fleming Molecular Engineering Laboratories. These labs facilitate research into drug design, drug delivery, biomedical diagnostics, and the discovery of new materials. The much-loved (and sometimes-dreaded) Unit Operations Lab was upgraded considerably back in 2015, providing flexibility to meet the current and evolving needs of the undergraduate curriculum.

And in the east wing of the building there is now a collection of bioprocess engineering tools and equipment collectively known as the Momenta Suite. Craig Wheeler, '82 '83 M.S., is the President and CEO of Momenta Pharmaceutical, and the state-of-the-art equipment in the suite is Momenta's gift to his alma mater.


Craig Wheeler

"I have always had a strong relationship with and dedication to Cornell and its mission," says Wheeler. "When I arrived at Cornell in 1978 I immediately knew it was a special place. I was the first from my family to attend college, so as you can imagine, landing at Cornell opened many new doors of opportunity and expanded my intellectual reach. As I have advanced through my career I have always supported Cornell through commitment of my time as well as financial donations. I feel it is important for all of us, especially those who have been successful in life to pay forward where we can."

Smith School associate professor Matthew Paszek describes the gift this way: "It is a modern biomanufacturing suite primarily for mammalian cell-based production of bio-products. The products could be protein-based therapeutics or cells for contemporary cell-based therapies that are showing extraordinary promise in fighting cancer, or really lots of other things. It allows us to go from small vials of cells up to large volumes of purified products."

"FROM CRAIG'S CV AND HIS CURRENT POSITION AS CEO OF MOMENTA, YOU WOULD THINK HE HAD LONG AGO LEFT BEHIND HIS INTEREST IN ENGINEERING, TO THE CONTRARY, HE HAS PASSION FOR, AND DEEP INSIGHT INTO, THE CRITICAL ROLE BIOPROCESS ENGINEERING PLAYS IN THE VIABILITY AND IMPACT OF TODAY'S BIOPHARMA INDUSTRY."

— ABE STROOCK

Matthew Paszek

This being the summer of 2020, Paszek explains the gift over a recent Zoom meeting and, as he describes the possibilities, his eyes light up and a smile plays across his face. He is clearly very happy to be able to teach using the Momenta Suite.

"Experiential learning is something the students say is very important to them," says Paszek, "and I have seen the benefits of it in my ChemE 2880 class. With this equipment, we are able to go back and forth between the lecture and the lab. The fact that students can actually work with and handle these things makes the lecture seem a lot less abstract."

It is not just students that benefit from the Momenta Suite. CBE researchers are excited to now have the chance to translate some of the technology that is developed in their labs in Olin Hall into products that can be used to have a real impact on the world. Paszek is excited to work with Cornell's College of Veterinary Medicine to design and create therapeutics that can be used to advance animal health and welfare. CBE Associate Professor Susan Daniel is exploring the possibility of using the suite to produce antibodies as part of her research into the virus that causes COVID-19.

CBE Industrial Practitioner and Senior Lecturer Alex Woltornist has known Craig Wheeler since they worked together at Merck Pharmaceutical in the 1980s. Woltornist played a role in securing the gift from Wheeler, though as he tells the story it becomes clear the gift was Wheeler's idea from the beginning. "This whole thing really was serendipitous," says Woltornist. "Craig and I had reconnected and were catching up and I told him that I was at Cornell—where he had gone to school—and he told me Momenta had some surplus equipment and that he wanted to do something meaningful for Cornell. It just worked." Woltornist put Wheeler in touch with Smith School Director Abe Stroock and they hashed out the details.

"From Craig's CV and his current position as CEO of Momenta, you would think he had long ago left behind his interest in engineering," says Stroock. "To the contrary, he has passion for, and deep insight into, the critical role bioprocess engineering plays in the viability and impact of today's biopharma industry."

Wheeler explains further, "Two years ago, our company faced a strategic turning point. We had two sides to the business, one in the biosimilar business, and the other in novel drugs. Due to a series of business events, we had to make the hard decision to focus on only one of our businesses. This resulted in a major downsizing of the company. I was aware that Cornell's chemical engineering department did not have a modern state of the art laboratory/pilot facility to help attract and educate students in the tools and techniques used in the development of biotech drugs. This hatched an idea."

"I couldn't be happier with the way the Cornell Chemical Engineering faculty have put this equipment to use in the program. One of my very specific goals for the donation was that it be used extensively in undergraduate teaching. The equipment, combined with Cornell's world-class faculty in the bioprocessing area, ensure students will have experience with the exact type of equipment that they will encounter in today's modern industry labs. It really is a win-win-win, where the students get the training needed, the faculty get a world-class lab to use in their research and teaching, and industry gets access to even better trained Cornell engineers to staff their companies in the future."

"BIOTECHNOLOGY IS IN THE MIDST OF A REVOLUTION RIGHT NOW. THE FIELD IS AT A SIMILAR PLACE TO WHERE COMPUTER ENGINEERING WAS IN THE 1970S WITH THE DAWN OF MICROPROCESSORS AND ADVANCES IN THE PRODUCTION OF SILICON CHIPS. WE HAVE MADE HUGE PROGRESS IN THE FABRICATION OF DNA, WHICH IS THE INSTRUCTIONS FOR MAKING PROTEINS. AND THIS EQUIPMENT IS PART OF THAT REVOLUTION."

—MATTHEW PASZEK

Woltornist is thrilled to have access to the suite of equipment for his class. "The whole reason I was brought into the department was to help add practice to theory," says Woltornist. "And Momenta's gift allows us to show students how things work. They can feel it, hear it, touch it, and see it and not just read about it. Back in the fall we successfully piloted two new lab modules within the CBE Bioprocess Engineering course I co-teach with Professor Matt DeLisa. The modules were centered around two different purification unit operations used extensively in the pharmaceutical industry today. We not only got very positive feedback from the lab exposure but I have already heard back from some students that the hands-on experience helped them land a job." Woltornist also believes that this initial equipment donation is just the beginning and hopes it may initiate a longer-term strategic move within CBE to develop a fully functional and diverse bioprocess suite where students can be fully immersed in bioprocess developmental scale work.

The timing of Momenta's gift could not be better, says Paszek. "Biotechnology is in the midst of a revolution right now. The field is at a similar place to where computer engineering was in the 1970s with the dawn of microprocessors and advances in the production of silicon chips. We have made huge progress in the fabrication of DNA, which is the instructions for making proteins. And this equipment is part of that revolution." Paszek sees the opportunity students have to learn on these tools as invaluable.

Students in Paszek's ChemE 2880 class are often surprised at how easy it is to order DNA to their specifications. "One of the things that surprises them—and also scares them a little bit—is how far biotechnology has come and how straightforward it is to design and make custom DNA." Paszek says that this realization leads to valuable discussions on the ethics of biotechnology. "We talk about these things in our class. We talk about the ethics and the responsibility of the biomolecular engineer. That has been a wonderful benefit of having this suite of tools on hand—students see how powerful this technology is and at the same time it opens their eyes to the responsibility that comes with that power."

Stroock sees the Momenta Suite as a real differentiator for the Smith School. "With this gift, Craig and Momenta have placed Cornell on the cutting edge of possibilities in education and translational research in this domain, with the ability to truly engineer from the molecule, through the cell, and across state-of-the-art unit operations," says Stroock.

"It is really special to be able to keep such close ties to Cornell over the years," says Wheeler. "Cornell, and the Smith School, meant so much to me as a student those many years ago. Today, as an active alum, it means even more that I can help today's students create their own opportunities as they enjoy their Cornell experience and look toward their own future beyond Cornell's borders."

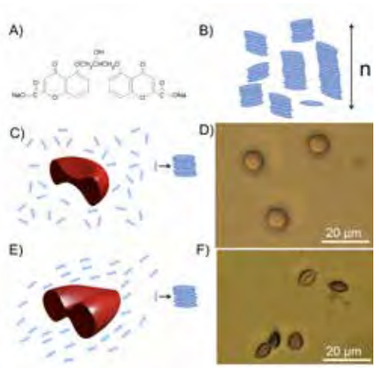
SHARING THE STRAIN: SQUEEZING RED BLOOD CELLS WITH SYNTHETIC LIQUID CRYSTALS (ABBOTT RESEARCH GROUP)


Nick Abbott

Red blood cells are soft and pliable, which allows them to squeeze through small capillaries. Disruption of their dynamic mechanical response results in hematologic diseases, such as sickle cell anemia; diseased cells are stiffer and exhibit shapes (e.g., crescent-like shapes) that differ from healthy cells. These changes lead to alteration of the rheological properties of blood and blocking of capillaries. Research in the Abbott Group, led by postdoctoral fellow Karthik Nayani, has recently led to the discovery that it is possible to prepare aqueous liquid crystals that are in osmotic equilibrium with red blood cells, thus enabling investigations of the shape-response of red blood cells to elastic stresses imposed on the cells by liquid crystals.

The liquid crystals used in the work are so-called chromonic phases, formed from aqueous solutions of disodium chromoglycate (DSCG). The DSCG molecules stack into column-like assemblies, via π-π interactions of their polyaromatic cores (panel A and B of the figure), which in turn exhibit long-range orientational order and give rise to mesophases (liquid crystals) with elastic properties. Unlike many synthetic surfactants, which also form aqueous mesophases at high concentrations, DSCG molecules are not substantially amphiphilic and thus weakly interact with biological membranes. At the outset of the study, however, it was not obvious that it would be possible to strain red blood cells using liquid crystals because the osmotic pressures of the liquid crystalline phases relative to the interiors of red blood cells were unknown (osmotic imbalance leads to the swelling or shrinkage of cells). By using vapor pressure osmometry, compositions of liquid crystals in osmotic equilibrium with red blood cells were found.

After dispersing human red blood cells in the liquid crystals, the cells were found to undergo complex yet reversible shape transformations—from initially biconcave disk-like shapes to elongated and folded shapes—that reflect deformation of solid-like membrane elastic properties (see panels C-F in the figure). Importantly, whereas cell shapes prior to straining in the liquid crystal were uniform, the responses of individual cells to elastic stresses generated by the liquid crystals were found to be highly heterogeneous, unmasking high levels of cell-to-cell variation in mechanical properties. Numerical modeling of the sharing of strain between red blood cells and liquid crystals reproduced experimental observations and revealed cell shape-responses to occur at constant membrane area but with large variation (order of magnitude) in membrane shear moduli between cells. Model diseased cells differed strikingly in their shape-response from healthy cells, and continuous cell shape-transitions accompanied changes in temperature and liquid crystal elastic properties.



Overall, the observed sharing of strain between the liquid crystals and red blood cells provides new approaches for quantifying variations in cell mechanical properties (at the single cell level), including during aging and diseases such as malaria and sickle cell anemia. The approach is general, and potentially applicable to a range of soft biological cells (mammalian and bacterial) as well as organelles and vesicles. For example, recent work by Abbott group graduate student Purvil Jani has extended the approach to straining of organelles of plants (chloroplasts). Karthik Nayani will join the Department of Chemical Engineering at University of Arkansas as a tenure-track assistant professor in August 2020.

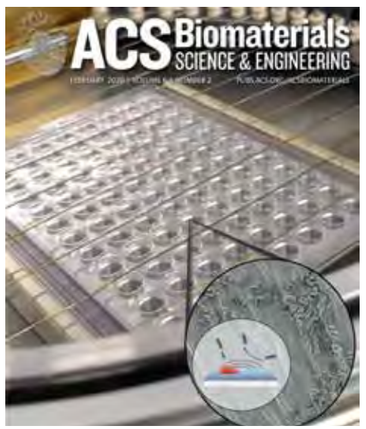
AN EVOLVING CONVERSATION BETWEEN MICROBES AND FUNCTIONAL MATERIALS (YANG RESEARCH GROUP)


Rong Yang

The Yang Research Group specializes in interface engineering, developing new materials with multi-functional interfaces (e.g. antifouling, catalytic, stimuli-responsive interfaces etc.) to advance the understanding, treatment, and prevention of infections and biofouling; fundamentally, forming new understanding of how functional materials could dictate the behavior / phenotype of microbes.

Using a specialty interface engineering platform, initiated Chemical Vapor Deposition (iCVD), the Yang Group synthesized multifunctional polymer thin films to control the interactions and the exchange of energy and matter at the microbe-material interface. A unique capability of the technique is to fabricate surfaces with nanometer-scale heterogeneities in terms of surface energy because the all-dry polymerization process is not limited by surface tension effect or insolubility of different monomers. They have demonstrated that by blending 50 percent of superhydrophilic zwitterionic repeat units into a superhydrophobic polymer coating, the surface bacterial adhesion was reduced to a level lower than that of zwitterionic polymers, a gold standard for antifouling materials. Current research involves manipulating environmental cues, via interface engineering, to program biofilm phenotypes and functions, with the goal of achieving control over cellular functions like metabolic activities. They've identified surface iron chelating as an unprecedented approach to control the bacterial expression of siderophore, an iron scavenger that also serves as a virulence factor and regulates quorum sensing. From 'living' paint to medicine-producing biofilms, the Yang Group aims to leverage the bacteria-polymer interactions to remake engineered materials by introducing living organisms, such as microbes, during material synthesis to enable novel functions.

Inspired by the dynamic interactions and exchanges at the material-microbe interface, the Yang Group designed catalytic nanomaterials that could convert the metabolic products of bacterial pathogens into potent antimicrobials in situ, eradicating infections. The nanotherapeutics have been tested in a chinchilla model of otitis media (OM) and successfully eradicated infections caused by a ciprofloxacin-resistant bacteria strain, Streptococcus pneumoniae, in 100 percent of the treated animals. Rong chose to focus on OM because it is the most common reason for antibiotic prescription to U.S. children, and a bottleneck to reducing antibiotic exposure among the general population.



This interface engineering capability has also enabled devices that block the transmission of infectious diseases. This will allow the group to fabricate porous membranes to remove pathogens and sterilize aerosols.

In collaboration with teams from Harvard University, MIT, and University of North Carolina at Chapel Hill, Yang group creates devices for undersea oxygen generation. By leveraging their interface engineering expertise, they improve the performance of membranes used in the generation, separation, and storage of oxygen. They've successfully improved the performance of off-the-shelf membranes by narrowing their pore size distribution, leveraging the nano-confinement-dependent polymerization kinetics enabled by the iCVD technique. A molecular-collision model has been developed using statistical methods and validated by systematic kinetics experiments to unravel the key role played by radical-surface collisions during polymer growth, which will improve control over polymer nanocoating growth during membrane production.

WELCOMING NEW FACULTY TO CBE

BY CHRIS DAWSON

Sarah Hormozi

Associate Professor Sarah Hormozi has joined the faculty of the Cornell's Smith School of Chemical and Biomolecular Engineering (CBE). Hormozi's lab studies slurries of complex fluids, which is crucial in understanding industrial and natural problems and designing materials such as injectable hydrogels, manufacturing feedstocks, soft robotics, and shock absorbers.

Before coming to Cornell, Hormozi was an associate professor of mechanical engineering at Ohio University. The underlying foundation of her work at Ohio was an effort to better integrate the separate fields of colloidal science and non-Brownian suspensions. Despite their ubiquity, the mechanics of these complex fluids are not well understood. At Cornell, Hormozi will be building on that earlier work and using novel experimental tools and efficient computational techniques she developed. These tools and techniques have created new paths to approach key fundamental questions in physics and engineering.

Hormozi grew up in the historically-known city of Shiraz, Iran and says that engineering runs in her family. She has always liked math and physics and as a teenager Hormozi was invited to attend Iran's eminent National Organization for Development of Exceptional Talent (NODET). The roots of Hormozi's current research can be seen even as far back as her years at NODET. "At that age, the question that challenged me was how to express the motions of fluids in the language of mathematics," says Hormozi. "That question motivated me to choose mechanical engineering as my major and to specialize in fluid mechanics."

Hormozi's approach to problem-solving also took shape while she was at NODET. She explains, "We were given complex problems to solve, which would have taken weeks or months. The most valuable takeaway was to persevere when tackling problems. I learned that it didn't matter if I tried something x number of ways, and it didn't work. However, when I figured out the solution, I not only understood one correct solution but also why the other x-1 number of ways did not work. This perspective leads to greater knowledge and insight, as well as new questions and challenges."

From NODET, Hormozi went on to earn her B.Sc. at Shiraz University and her Master's at Tehran's Sharif University of Technology. She then moved to Canada and completed her M.Sc. in mathematics and her Ph.D. in mechanical engineering at the University of British Columbia in the lab of Professor Ian Frigaard. Hormozi found Frigaard's mathematical approach to solving engineering problems especially valuable.

After earning her doctorate, Hormozi had a one-year post-doctoral position in applied mathematics, supported by the Schlumberger Corporation. The following year she was awarded a prestigious postdoctoral fellowship by the Natural Sciences and Engineering Research Council of Canada, which allowed her to study anywhere in the world. "At that time, I had several challenging problems in mind that I wanted to solve with a couple of scientists in France," explains Hormozi. "So, I moved to France and performed research in several labs in Paris and Marseille. I mainly worked with scientists in the areas of experimental physics and mechanics at Le Centre National de la Recherche Scientifique."

Hormozi then began her position at Ohio University and now, in July 2020, she has come to Cornell. Hormozi is excited to be part of the faculty of the Smith School. Knowing Cornell Engineering's reputation for collaborations across departments and even across colleges, Hormozi is eager to get started.

"My expertise lies in applied mathematics, transport phenomena, and soft matter physics, all of which resonate with the strengths of Cornell," says Hormozi. "My lab focuses on solving fundamental problems with profound practical implications. I am looking for graduate students who want to gain a well-developed skill set that spans all the way from hardcore computations to lab-scale experiments to applied mathematical techniques. Moreover, inspired by the recent pandemic, I want to do research on viral diseases to understand how the combination of rules and randomness governs the mechanics of restless inhabitants of life. These include viruses, bacteria, and proteins."

Qiuming Yu

For Professor Qiuming Yu, teaching at Cornell is a homecoming of sorts. After receiving her B.S. and M.S. in Chemistry from China's Nanjing University, she moved to Ithaca, where she earned her Ph.D. in chemical engineering in Olin Hall. Yu officially joined the faculty of the Smith School of Chemical and Biomolecular Engineering (CBE) in July.

Since earning her Ph.D. in 1995, Yu has had a rich and productive career in research and teaching. That career has taken her from a post-doctoral fellowship in the Micro-Devices Lab at NASA's Jet Propulsion Laboratory to a research position at Kansas State University to a full professorship in chemical engineering at the University of Washington.

At Cornell, Yu's research will focus on the fundamental studies of plasmonic and semiconductor materials and the development of devices for biosensing and optoelectronic applications. Yu's approach to these fields is both computational and experimental. Scrolling through the titles of Yu's papers on Google Scholar, one gets a sense of the breadth of her research interests.

That breadth is even more obvious when reading a description of the work her lab is doing today. Some of the areas of research Yu is involved in currently include:

- Biosensing using surface plasmon resonance and surface-enhanced Raman scattering as transducing mechanisms,
- Developing biocompatible conducting polymers and organic electrochemical transistors,
- Studying structural and optoelectronic properties of halide perovskites, organic semiconductors, and nanocomposites, as well as fundamental physics of charge generation, separation, and transport in devices,
- Integration of plasmonic nanostructures into photovoltaic devices and photodetectors to utilize hot electrons, and to manipulate light absorption and electric field distribution, and
- Develop light and mechanical flexible photovoltaic devices and spectral-selective photodetectors for energy harvesting and light sensing.

"I REALLY ENJOY TEACHING, BOTH UNDERGRADUATE AND GRADUATE STUDENTS," "I ALSO LIKE TO HAVE UNDERGRADUATES IN MY LAB, WORKING ALONGSIDE GRADUATE STUDENTS. THE STUDENTS AT CORNELL ARE SO SMART AND THEY WORK HARD TO UNDERSTAND THINGS."

— QIUMING YU

Yu is thrilled to be back at Cornell. "I really enjoy teaching, both undergraduate and graduate students," she says. "I also like to have undergraduates in my lab, working alongside graduate students. The students at Cornell are so smart and they work hard to understand things." As she says this, Yu gives a little laugh and adds parenthetically, "Both of my children attended Cornell as undergrads, so I have to say this. But also, it is true."

Another advantage to being back at Cornell for Yu is the many opportunities for collaboration with researchers in the Smith School as well as from other schools, departments, and colleges across campus. Her work covers a broad range of topics and interests and many of these overlap with work being done by materials scientists, biochemical engineers, and others. "Cornell is the perfect place for me to continue my work," says Yu. "There are potential collaborators everywhere with so much knowledge."

FACULTY NEWS & AWARDS


Lynden Archer

Lynden A. Archer named dean of College of Engineering

Lynden A. Archer, the James A. Friend Family Distinguished Professor in Engineering, has been named the Joseph Silbert Dean of Engineering for a five-year term beginning July 1. Archer succeeded Lance Collins, who served two terms as dean.

A Cornell faculty member since 2000, Archer directed the Robert Frederick Smith School of Chemical and Biomolecular Engineering from 2010 to 2016. In the fall of 2017, he was named the David Croll Director of the Cornell Energy Systems Institute, a position he will maintain until a new director is selected.

"Lynden has made many tremendous contributions, to science and society, through his work in energy storage and carbon-capture technology, and he has demonstrated great leadership with the Cornell Energy Systems Institute," Provost Michael Kotlikoff said. "He is not only one of our most innovative scientists but is deeply engaged in taking discoveries directly to application; his insight, creativity and commitment to excellence will ensure the university remains a world leader in engineering research and education."

NAMED PROFESSORSHIPS


Fernando Escobedo

Fernando Escobedo has been named the Samuel W. and Diane M. Bodman Professor in Chemical and Biomolecular Engineering.

Tobias Hanrath has been named the Marjorie L. Hart '50 Professor in Engineering.

TENURE AND PROMOTION


Matt Paszek

The Cornell Board of Trustees has approved the promotion of Matthew Paszek to the rank of Associate Professor with indefinite tenure. This notable outcome recognizes Paszek's excellence in research, teaching, and service.


Kathy Vaeth

Kathy Vaeth '94 departs for OLEDWorks

Kathy Vaeth, senior lecturer and industrial practitioner in CBE, has taken a position as the director of OLED user experience at Rochester-based OLEDWorks, beginning in early August. We thank Kathy for her continued service and support of CBE, its programs, and students.

Abe Stroock, the William C. Hooey Director, stated: "Over these past two years, Kathy has made extremely valuable investments in our programs and our students. She has led and matured our curriculum in product design, established and delivered a curriculum in professional development, cultivated productive relations with industries, and advised our students both formally and informally. Thankfully, Kathy told me she will be happy to give us guidance as we proceed."

AWARDS HIGHLIGHT

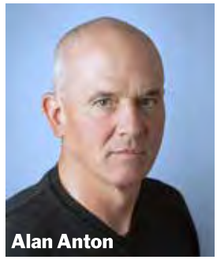

Fengqi You

Over the past year, Professor Fengqi You was recognized by the chemical engineering and broader scientific community with multiple distinguished awards. In fall 2019, Professor You was selected by an panel of leading experts on process development in the chemical, pharmaceutical and energy sectors, to be the single recipient of the 2019 *AIChE Excellence in Process Development Research Award*. This highly competitive award sponsored by Pfizer recognizes Prof. You's research accomplishments and industrial impacts on sustainable process design, batch process optimization, and process intensification for shale gas processing. In spring 2020, Professor You received the 2020 *Curtis W. McGraw Research Award* from the American Society for Engineering Education (ASEE). The McGraw Award was established in 1957 to recognize significant achievements of engineering researchers and educators with outstanding research abilities, trajectory, and potential. In summer 2020, the American Automatic Control Council (AACC) awarded Professor You and his Ph.D. student, Chao Ning, the 2020 *O. Hugo Schuck Award,* a prestigious award in the control and automation community, for their work on electric power systems control under renewable energy generation uncertainty. In fall 2020, Professor You will receive the 2020 *Program Committee's Award for Innovations in Green Process Engineering* by the AIChE to recognize his contributions to the field of green process engineering for sustainable energy and environment. In addition to these awards, Professor You was invited to serve as an associate editor of the AAAS journal *Science Advances* and *IEEE Transactions on Control Systems Technology*.

EMERITUS PROFESSORSHIPS


William Olbricht

William (Bill) Olbricht has been on the Cornell faculty since 1980. He earned his B.S. at Stanford University and his Ph.D. at California Institute of Technology, both in Chemical Engineering. Bill rose through the faculty ranks at Cornell based on his scholarship and teaching excellence. He is a respected fluid mechanician and has been, in the past two decades, an impactful contributor to biomedical technologies. He served a term as director of Chemical Engineering in the 1990s and played a leadership role in the founding of Cornell's Department of Biomedical Engineering, including a term as interim chair. Bill was a cherished instructor across both departments, having been a mainstay delivering central parts of our core curriculum and having developed several popular electives.


Alan Anton

Alan (Brad) Anton has been a member of Cornell faculty since 1986, and an associate professor in CBE since 1993. He earned his B.S. at Virginia Tech in 1979 and his Ph.D. at Caltech in 1986, all in the field of chemical engineering. He completed a one-year post-doctoral fellowship at the Institut für Grenzflächenforschung und Vakuumphysik, Germany. Anton's research focused on fundamental experimental and theoretical approaches in catalysis. Over his career, he made large contributions to undergraduate education in the School, taking on and redesigning courses from across our curriculum. Notable over this past decade, Anton led intellectually and technically, the multi-million-dollar renovation of our Unit Operations laboratory and the revitalization of the associated course, CHEME 4320 "Chemical Process Design." Anton has been an exceptionally generous colleague, teacher, and mentor, and he has developed strong relationships with generations of our students and alumni. His excellence in the classroom has been recognized with multiple College of Engineering teaching awards, most recently in 2018.

Both professors were granted emeritus status in CBE by unanimous vote of the faculty with approval by the Dean.

PROFESSOR PAUL STEEN PASSES AWAY ON SEPTEMBER 4

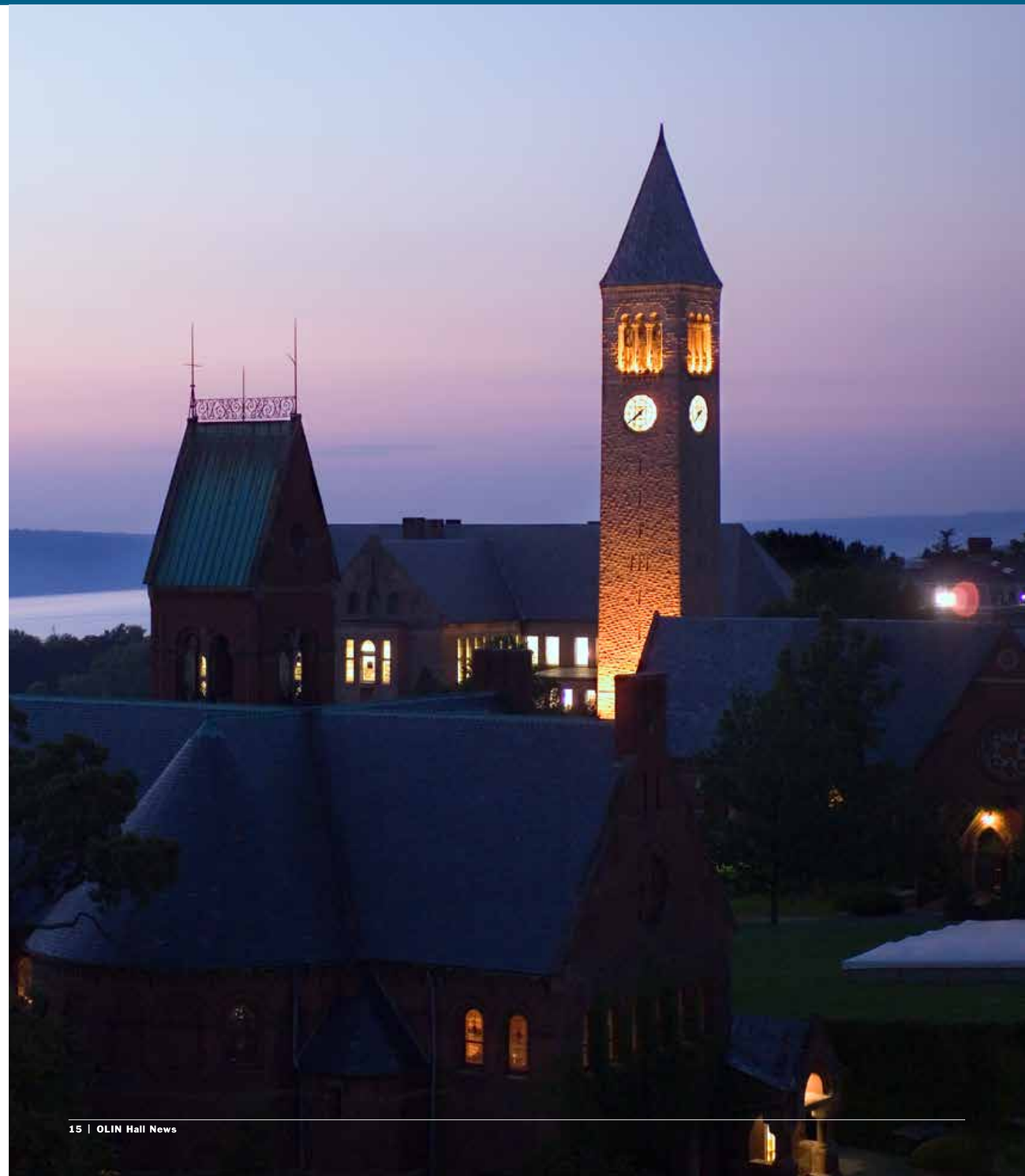
It is with great sadness that we share the news that our colleague and friend Professor Paul Steen passed away on September 4, 2020.

Paul H. Steen, the Maxwell M. Upson Professor of Engineering, joined the School of Chemical Engineering at Cornell as an assistant professor in 1982, after completing a Ph.D. at Johns Hopkins and post-doctoral training at Stanford. He holds undergraduate degrees in Engineering and English Literature from Brown University. At Cornell, Professor Steen was a valued colleague, teacher, and advisor across departments and graduate fields in the College of Engineering and an internationally recognized scholar in fluid mechanics.

In research, Professor Steen brought applied mathematics together with experiments to provide deep insights into complex processes involving fluids. He focused on questions of stability, often working with fluids at interfaces, as in droplets, bubbles, and thin films. His experiments were visually striking and his theories elegant and insightful. Professor Steen is known world-wide for a clever, switchable "spider man" adhesion device he co-invented and patented, wherein electroosmotic pumping of liquid water droplets is used to create reconfigurable sticky surfaces. He is also known internationally for his technical contributions in the area of nonlinear dynamics. There, Professor Steen brought the method of 'problem deformation' or 'homotopy' to solve difficult problems in chemical engineering practice. Professor Steen brought to his work a special skill for identifying basic scientific questions within important engineering contexts and carried out productive collaborations with companies, including Kodak on printing and Metglas on casting of amorphous metals. At the time of his passing, he was working on projects sponsored by NASA on microgravity and with a start-up, InCaveo on the commercialization of a recent invention from his lab on capillary adhesion. Professor Steen engaged broadly and generously with the international research community, serving as an Associate Editor of the *Journal of Fluid Mechanics* for more than a decade and co-edited "*A Gallery of Fluid Motion*," published by Cambridge University Press. He is a fellow of the American Institute of Chemical Engineers, the American Physical Society, and the Alexander von Humboldt Foundation.

Professor Steen was a skilled and successful teacher and advisor. The alumni of his lab populate top academic and industrial positions around the globe. Notably, he always welcomed and cultivated undergraduate students through engagement in his research, often mentoring them from their freshman through their senior year.

We extend our deepest condolences to Paul's family, including his wife Kyra Stephanoff, Visiting Scientist in CBE, and his daughters Ana and Frances.



ALUMNI NEWS

JEFF GOLDBERG '94

Jeff Goldberg was named CEO and director of Immunitas Therapeutics; a company that studies human immunology using novel single cell analyses to develop targeted therapeutics for patients with challenging, complex cancers.

SHAOYI JIANG PH.D. '93

Shaoyi Jiang has been named the first Robert S. Langer '70 Family and Friends Professor at Cornell. Jiang's wife, Qiuming Yu, Ph.D. '95, also joined the Smith School faculty.

LUCAS LANDHERR PH.D. '10

Lucas Landherr received a promotion to full teaching professor at Northeastern University. Landherr was also awarded the Ray Fahien Award by the American Society for Engineering Education (ASEE). This award is given in honor of Ray Fahien, who was editor of Chemical Engineering Education from 1967-1995.

BOB LANGER '70

Robert (Bob) Langer, co-founded Moderna Therapeutics, a company that develops treatments that leverage specialized transporter molecules in cells known as messenger RNAs. Messenger RNAs bring instructions from genes to the cellular machinery that makes proteins. By creating specially modified mRNA, Moderna believes it can develop therapies to treat and prevent a number of diseases in humans.

ROBERT F. SMITH '85 WILL BE HONORED WITH CORNELL ENGINEERING'S DISTINGUISHED ALUMNI AWARD

ROBERT F. SMITH '85

Robert F. Smith '85, founder, chairman and CEO of Vista Equity Partners, will be honored with Cornell Engineering's 2020 Distinguished Alumni Award.

The award—which annually recognizes an alum who has broken traditional boundaries to transform society, and whose professional accomplishments bring distinction to the college—will be presented at a later date.

Smith, named one of the "greatest living business minds" by *Forbes* magazine, founded Vista in 2002 as a private equity firm that invests in software-, data- and technology-driven companies. Under Smith's leadership, it became the fastest-growing private equity company in America, with a portfolio of 60 plus companies, 75,000 employees and more than $52 billion in cumulative capital commitments.

Smith received his bachelor's in chemical engineering from Cornell, and his MBA from Columbia Business School. He began his career at Kraft Foods, where he earned two U.S. and two European patents as a chemical engineer. In 1994, he joined Goldman Sachs, where he focused on technology investments, advising on more than $50 billion in acquisitions for some of the world's largest tech companies.

Smith received a 2019 Carnegie Medal of Philanthropy for helping enable equal access to health care and education, among other philanthropic efforts. He is chair of Carnegie Hall and chair of the Robert F. Kennedy Center for Justice and Human Rights. He is a member of the Columbia Business School Board of Overseers, the Cornell Tech Board of Overseers, the Boys and Girls Clubs of San Francisco Board of Trustees, and an emeritus member of the Cornell Engineering College Council.

The first African American signatory of the Giving Pledge, Smith is the founding director of Fund II Foundation, which focuses on: preserving the African American experience; safeguarding human rights; providing music education; preserving the environment while promoting the benefits of the outdoors; and sustaining American values.

Smith made the largest private donation to the Smithsonian's National Museum of African American History and Culture, and in 2019 surprised Morehouse College students by announcing a grant to eliminate student loan debt for the entire graduating class.

In 2016, Smith and Fund II Foundation gave $50 million to Cornell Engineering to advance teaching and research in chemical and biomolecular engineering and provide scholarships, graduate fellowships and program funding to help recruit and support underrepresented students. In recognition of his philanthropy, the university named the Robert Frederick Smith School of Chemical and Biomolecular Engineering in his honor.

IN MEMORIAM

Raymond C. Baxter	B CHEME, 1944	1/7/2020
George H. Bishop, Jr.	BS CHEME, 1955; Ph.D CHEME, 1965	4/13/2020
James W. Bryce	B CHEME, 1960	7/22/2019
Stephen R. Cohen	BS CHEME, 1951; Ph.D ENGR, 1956	1/31/2020
John C. Colman	B CHEME, 1949	2/26/2020
David J. Dittmann	B CHEME, 1962	9/25/2019
Robert R. Earley	B CHEME, 1950	10/25/2019
Robert John Entenman	B CHEME, 1951	12/3/2019
Franklyn A. Gardiner	B CHEME, 1950	11/7/2019
Arthur Gast	B CHEME, 1957	3/25/2020
William P. Haessly	BS ENGR, 1980	4/7/2020
Bruce D. Hainsworth	MS CHEME, 1950	3/12/2020
Uday S. Hattiangadi	MS CHEME, 1965	4/27/2020
Neil S. James	B CHEME, 1949	7/31/2019
John E. Lind, Jr.	B CHEME, 1957	5/25/2020
Howard Littman	BS CHEME, 1951	3/27/2020
Jim Lopata	BS CHEME, 1967	8/6/2019
Bruce C. Lorig	B CHEME, 1958	12/4/2019
James J. Melnyk	B CHEME, 1965	9/23/2019
Richard N. Moyer	B CHEME, 1959	4/12/2020
Dan E. Rathert	BS ENGR, 1972	5/21/2020
Harold B. Reisman	MS CHEME, 1959	7/29/2019
Donald M. Shrenk	B CHEME, 1961; MS CHEME, 1962	6/6/2020
Bert Singleton	B CHEME, 1950	11/30/2019
William V. Wagner, Jr.	B CHEME, 1949	5/29/2020
Robert W. Waring, Jr.	B CHEME, 1961	4/4/2020
Raymond D. Zelek	BS CHEME, 1957	11/17/2019

CBE WOMEN'S GROUP

The Chemical and Biomolecular Engineering Graduate Women's Group (CBE Women) is an organization that focuses on issues pertinent to female affiliates at Cornell and in CBE and encourages young girls to pursue engineering through outreach activities. The CBE Women programming is dedicated towards this mission and in the 2019-2020 academic year, hosted 16 events, with 4 additional events in the pipeline that were delayed due to COVID-19. These events include a mix of professional development, social, and outreach events to empower female graduate students with the leadership and interpersonal skills needed to pursue their careers.

The professional development programming of CBE Women specifically focuses on educating students with the variety of career options available through graduate education and equipping them with the skills and knowledge to thrive in a post-Cornell career. Members are provided an opportunity to dine and participate in candid conversations with external and internal faculty. From this experience, students can learn about the intricacies of pursing a faculty position and prepare accordingly. To encourage career explorations outside of academia, an entrepreneur and a data scientist are invited to speak about their career paths as well. Skill building workshops are hosted for the graduate community to learn complementary skillsets that may not be emphasized in their academic training. This year, the focus was on public speaking, social media branding, and sustainable practices. Finally, CBE Women hosts a variety of social events to promote fellowship amongst graduate students in the school.

We would like to thank alumna Lisa Walker '86, who has provided immense support for CBE Women for the last five years in bolstering our programming. We had three lunches with highly influential female faculty members in Cornell, all who

graciously shared their journey and difficulties in their career. We also supported unique travel opportunities for two female students to share knowledge with collaborators in Saudi Arabia and to present an oral talk at a conference in Texas. Finally, we arranged company tours with Regeneron Pharmaceuticals and General Electric so students can get a first-hand experience of the industrial setting, but the tour is indefinitely delayed because of COVID-19.

Our flagship programming, the WOMEN Event (Women's Outreach in Materials, Energy, and Nanobiotechnology), now in its 11th year, brings in 10th grade girls and their parents from the local N.Y. area for a day of engineering activities and discovery about engineering careers. The goal is to excite high school girls about pursuing a STEM career by having undergraduate, graduate, industry professionals, and faculty members share their journey in STEM and to provide resources on college applications. Feedback showed we were effective in doing so. Due to COVID-19, we had to revamp our programming so that it was available online. We leveraged the advantages of the online platform to expand our reach beyond the local N.Y. area, and we had roughly 40 participants around the globe, with representation from Mexico, Colombia, and India. The success of this event has inspired CBE Women to consider hosting more virtual outreach events as we can make an impact on the global scale and expand our reach.

DIVERSITY AND INCLUSION PROGRAM (DIP)

The Diversity and Inclusion Program (DIP) was born as an initiative to cultivate a culture of respect among identities and backgrounds within the Robert F. Smith School of Chemical and Biomolecular Engineering. DIP is committed to providing opportunities and skills to build a more equitable community where every faculty, student, postdoc, and staff member feels valued. To achieve this goal, DIP offers opportunities for skill development, social interactions, and education to the CBE community.

DIP is composed of a group of committed faculty, students, postdocs, and staff members that meet on a weekly basis to discuss current challenges faced by the school. Any member of the CBE community is welcome to participate in their level of comfort, ranging from attending workshops offered in a bi-semester basis to leading an initiative. The ability for DIP to provide a varying range of commitments allows a wider number of participants to engage in different activities that share a common goal: to make CBE a place where every member feels valued and respected.

The DIP initiatives are informed and driven by the Survey Initiative. This initiative, led by graduate student Hector Fuster of the Abbott Group, seeks to collect data from the community on an annual basis to quantify the impact of the program's efforts and to detect areas that require more attention. The following is a sample of new and continuing initiatives that have been deployed during the last year.

Building Ambiance. The physical space and amenities offered in Olin Hall have an impact on members of our community. This initiative, led by graduate student Ahmed Alsmaeil of the Giannelis Group, has changed the physical appearance of Olin Hall's entrance foyer by showcasing posters of diverse members of community, which celebrate different identities present within CBE. The Building Ambiance initiative has also been involved in key decisions regarding beverage and food options offered in vending machines and creating welcoming spaces that appeal to a wider range of identities during community-building events.

Community Agreements. Under the leadership of Dr. Annika Huber of the Stroock Group, this initiative drafted a group of guidelines to make the Smith School community more welcoming and supportive, and to encourage acts of personal and professional integrity. The initiative started as a follow-up to the inclusion statement effort that provides a written agreement with expectations from the members of the community. This document will serve as a way to hold community members accountable, to provide a more equitable space, and guide the behaviors of all members in CBE.

Let's Get Lunch. Understanding the diversity of the Smith School community starts by getting to know each other across identities. The Let's Get Lunch initiative, led by Trevor Donadt of the Yang Group, seeks to provide a space where anyone in CBE can meet someone new over lunch. This initiative has been of special importance during the COVID-19 pandemic by providing an opportunity for members of the community to socialize over Zoom even when physical venues were closed.

Inclusive classroom. In DIP, it is believed that an equitable environment extends to classroom interaction. This initiative, led by DIP coordinator Natalia Lopez-Barbosa of the DeLisa Group, seeks to provide training opportunities to faculty, postdocs, and teaching assistants (TAs) on how to improve equity in classes offered by CBE.

Skills Initiative. Under the leadership of Luis Nieves-Rosado of the Escobedo Group, this initiative organizes events and workshops that seek to educate the CBE community on skills required to create a change in departmental culture. In the past year, the initiative organized two Spread the Word Workshops on imposter syndrome and social justice.

Scholarship for Fellowship. This initiative, led by faculty champion, Professor Fernando Escobedo, brings together all members of the community to celebrate and learn about the experiences of CBE Ph.D. students who have recently published a first-author paper. This event is motivated by both a desire to recognize the efforts and successes of graduate students, and to provide a venue where each can share a bit of not only their scientific findings but also their personal struggles and acquired wisdom.

Seminar Speaker and Slides. The DIP seminar, led by DIP deputy coordinator William Tait of the Wiesner Group, aims to invite speakers bi-annually from academia or industry to present their broad experience in diversity and inclusion. A group discussion hosted after the seminar allows for in-depth conversations to gain insight on different perspectives and experiences. Before every CBE hosted seminar, DIP prepares slides to inspire conversation, promote community-building events, and share important resources related to diversity and inclusion.

None of these initiatives and efforts would be possible without the support of every member of DIP. The program is currently led by Natalia Lopez-Barbosa (Coordinator), Professor Fernando Escobedo (Faculty Champion), and William Tait (Deputy Coordinator). Weekly meetings are held on Mondays from 2:00 to 3:00 p.m. (currently over Zoom).

2020-21 FLEMING SCHOLARS ANNOUNCED

With a generous gift from Nancy and Samuel Fleming '62 to support graduate student research in the biomolecular program, the department selects students each year to be named "Fleming Scholars." Through a competitive process, the fellowships are awarded to outstanding Ph.D. students pursuing research in biomolecular engineering and who have distinguished themselves as promising scholars in their particular field. The scholars were evaluated by select biomolecular faculty members on the basis of their research productivity and career/professional development. The Fleming Scholars for 2020-2021 are named below with a description of their current research:

NATALIA LOPEZ-BARBOSA

Antibodies (Abs) are large, Y-shaped glycoproteins produced by plasma cells in the immune system that neutralize pathogens during infection. These molecules recognize motifs (antigens or epitopes) on the surface of the pathogen through the fragment antigen-binding (Fab) variable region. Once bound to an antigen, they also serve as "tags" for other effector cells of the immune system to clear an infection. Abs are secreted by plasma cells created after the differentiation of immature B cells during what is known as the humoral immune response. The B cell pool consists of several populations that are segregated anatomically, developmentally, and functionally. Among these, B1 cells secrete what is known as "natural" Abs, which are produced in the absence of deliberate immunization and without requiring interaction with T cells. Barbosa's research project seeks to understand the role of B1 cells in the secretion of Abs that recognize carbohydrate structures (a.k.a. glycans) and how these Abs might be directly involved in the development of autoimmune reactions.

Barbosa's work in the DeLisa Lab hypothesizes that the immune responses to glycans are T cell-independent and are governed by B1 cells, even when the glycan epitope is not seen as "self." Additionally, she thinks that the immune response to self-glycans is driven by monoclonal idiotypes. Although B1 cells have been shown to interact with foreign (i.e., bacterial or viral) glycans through a T cell-independent response, and to differentiate into Ab-secreting cells through innate signaling, their behavior outside of inflammation is poorly understood. Although Abs present in blood sera of humans and mice have been shown to react with multiple glycan epitopes, their origin, sequences, and functionality have yet to be elucidated. Relatively few Ab sequences are known to recognize glycans, especially when compared to their protein-recognizing counterparts. This is due to a lack of understanding regarding both the fundamental immunology of anti-glycan Abs and how to steer the immune system towards an anti-glycan response. Barbosa's work will contribute to filling this gap in knowledge by screening and isolating anti-glycan Abs from different B cell populations of the immune system.

MEGHAN O'LEARY

Bacteria's ability to rapidly evolve into antibiotic-resistant strains presents an imminent threat to global health and an urgent need to develop new classes of antimicrobial agents. People with compromised immune systems, such as those with the genetically inherited respiratory tract disease cystic fibrosis (CF), are particularly vulnerable to these resistant pathogens. *Pseudomonas aeruginosa* is one of the primary antibiotic-resistant threats to CF patients. It is a Gram-negative, opportunistic bacterium, whose treatment is further complicated by its ability to aggregate into enduring biofilms. The last resort for treating multidrug-resistant (MDR) *P. aeruginosa* and other Gram-negative bacteria is a class of antibiotics called the polymyxins; however, polymyxin-resistant isolates have already surfaced. In response to this crisis, antimicrobial peptides (AMPs) and their synthetic mimetics have been investigated as alternative therapeutic options. One class of AMP mimetics that has shown potent activity against both Gram-positive and Gram-negative bacteria is oligothioetheramides (oligoTEAS), which are synthetic, sequence-defined, cationic oligomers synthesized through rapid, orthogonal chemical reactions. A promising oligoTEA known as BDT-4G has been tested to evaluate its antibiotic potential against MDR bacteria. BDT-4G offers a therapeutic advantage over the polymyxins as it can evade mechanisms conferring resistance to these agents. Analogous to other AMP mimetics, however, BDT-4G exhibits systemic toxicity in vivo. To mitigate toxicity, O'Leary's work in the Alabi Lab assesses a prodrug methodology whereby polyethylene glycol (PEG) is conjugated to BDT-4G via a bacteria-susceptible, cleavable substrate. Antibacterial activity is recovered after site-specific cleavage of the linker by LasA, a secreted bacterial protease. This strategy concurrently reduces cytotoxicity and provides strain specificity, and it can be facilely translated to target other strains of bacteria by altering the linker.

TIFFANY TANG

Tiffany's research in the Daniel Group investigates the entry processes of human pathogenic coronaviruses (CoV), including severe acute respiratory syndrome coronavirus (SARS-CoV), Middle East respiratory syndrome coronavirus (MERS-CoV), and the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). CoV are a family of enveloped viruses that cause a variety of respiratory and/or enteric tract infections. The pandemic caused by SARS-CoV-2 as well as outbreaks caused by SARS-CoV and MERS-CoV have highlighted the dangers that CoVs pose to human health. As there are no commercially approved vaccines or therapeutics against CoV, it is important to study CoVs to control CoV outbreaks. A critical step in CoV infection is viral entry, in which the viral fusion peptide (FP) mediates viral-host cell membrane fusion so the virus can infect. The FP is amongst the most conserved region across the CoV family, meaning that trends observed for one CoV will likely apply to other CoVs, even for CoVs that are yet to emerge. The main themes of Tang's research include determining CoV fusion mechanisms, designing CoV anti-fusion strategies, and developing viral fusion detection platforms. Tang hopes to contribute to a greater understanding of CoV entry and use that knowledge to develop novel therapeutic and detection strategies.

DISTINGUISHED LECTURES

The 30th Annual Raymond G. Thorpe Lecture was presented by Lisa Walker '86 on Tuesday, November 5, 2019. Walker shared experiences from her career in chemical engineering in the talk titled, *Pursuing and Defining Your Success*.

Walker is the Managing Partner of Global Industrial Practice at DHR International. According to Walker, "In order to succeed, we must be able to figure out what we mean by success. We must also be able to overcome obstacles that we ourselves bring and that others put in our way. And in every career, there are times when we need to work really hard and there are times when we are going down the wrong road—we need to be able to tell the difference; a career is both a marathon and a sprint … at different points. Finally, every career journey includes ethical dilemmas; how we face these dilemmas defines who we are."

Prior to joining DHR International, Walker served as the Founder and Managing Director of Leadership Capital Advisors, a boutique retained executive search firm, where she was responsible for building revenue and infrastructure as well as managing entrepreneurial growth. Previously, she was a Senior Partner with Korn / Ferry International and a Partner with Heidrick & Struggles.

At Korn / Ferry, Walker initiated, built, and led the Global Sustainability practice, including co-authoring white papers, driving brand positioning, and delivering incremental revenue in new markets. She repeated the practice development when she initiated the Global Agribusiness practice. Walker has experience leading general management and key functional searches for clients seeking marketing, strategy, business development, technology and operations expertise. She specializes in commercialization roles and has built her reputation identifying talent with an emphasis on performance, potential, and culture fit.

Walker earned her MBA in Finance and Economics from the University of Chicago, and her Bachelor of Science in Chemical Engineering from Cornell University. Walker has been honored by The White House as "a Champion of Change for her outstanding leadership in entrepreneurial mentoring, counseling, and training." She serves on the not for profit Boards of the Cornell University Engineering College Council, of the University of Chicago Laboratory School, the company of RTM Engineering, the University of Chicago Medicine Kovler Diabetes Center, and the Women's Board of the University of Chicago.

Francis (Frank) Doyle of Harvard University delivered the 2020 Julian C. Smith Lectures in chemical engineering on Monday, April 13 and Tuesday, April 14. In the first of our distinguished lectures to be hosted online via Zoom, both Professor Doyle's talks including, *The Artificial Pancreas: From Engineering Research to Patient Care* and *Controlling Biological Time* were well attended from faculty, student, and staff across campus. Doyle is the John A. Paulson Dean of the Paulson School of Engineering and Applied Sciences at Harvard University, where he also is the John A. & Elizabeth S. Armstrong Professor. Prior to that he was the Mellichamp Professor at UC Santa Barbara, where he was the Chair of the Department of Chemical Engineering, the Director of the UCSB / MIT / Caltech Institute for Collaborative Biotechnologies, and the Associate Dean for Research in the College of Engineering. He earned a B.S.E. degree from Princeton, C.P.G.S. from Cambridge, and Ph.D. from Caltech, all in Chemical Engineering. He has also held faculty appointments at Purdue University and the University of Delaware, and held visiting positions at DuPont, Weyerhaeuser, and Stuttgart University. He has been recognized as a Fellow of multiple professional organizations including IEEE, IFAC, AIMBE, and the AAAS. He was the President for the IEEE Control Systems Society in 2015 and is the Vice President of the International Federation of Automatic Control. In 2005, he was awarded the Computing in Chemical Engineering Award from the AIChE for his innovative work in systems biology, and in 2015 received the Control Engineering Practice Award from the American Automatic Control Council for his development of the artificial pancreas. In 2016, he was inducted as a Fellow into the National Academy of Medicine for his work on biomedical control. His research interests are in systems biology, network science, modeling and analysis of circadian rhythms, and drug delivery for diabetes.

REUNION 2020

For the first time in Cornell's Reunion history, Reunion 2020 was hosted virtually. CBE alumni did not disappoint and on Friday, June 5, classes from years ending in 0 and 5 logged in from their homes to connect with each other and current faculty.

William C. Hooey Director, Abe Stroock, welcomed the large online group of over 100 returning alumni, with an update on the school, its initiatives and current state.

A panel of CBE faculty presented research updates, including Nick Abbott, Chris Alabi, Susan Daniel and Rong Yang, and a group of undergraduate student leaders fielded questions from inquiring alumni. We look forward to hosting events again in-person but are appreciative of the efforts of those who attended and remain dedicated to Cornell and CBE.

STAFF NEWS & HONORS

Annie Eller Receives Outstanding Staff Award

The 2019 William C. Hooey Outstanding Staff Award was awarded to Annie Eller, front office administrative assistant. The award, established in 2011 by the Smith School, recognizes a member of the staff who consistently goes above and beyond in their job responsibilities in supporting all stakeholders (students, staff and faculty) of the school.

Eller has managed the front office student staff, supported facilities initiatives, developed safety processes for safety glass purchases and lab inspections, and managed the daily front office workload. Her positive demeanor and can-do attitude are welcoming and engaging in the front office.

Welcome Thom Quinn

Thom Quinn joined Cornell as a Building Coordinator in August 2019. Quinn previously worked at Rheonix, a local bioengineering company, as the facilities and logistics coordinator. Prior to Rheonix, Quinn held positions as cellar master at an Oregon winery and as facility supervisor at the Deschutes County Juvenile Community Justice Department.

Quinn's facility experience includes support and management of multiple buildings, coordination of safety programs and safety trainings for labs, hazardous chemical management and facilities inspections, administration of buildings through computer software, keycard access management, maintenance and repair of building structures and laboratory equipment, project management, and communication across multiple stakeholders—scientists, staff, and vendors. In his spare time, Thom is a biker and recently built his own bamboo bicycle.

Farewell to Tamesha Muhammad

The department bid farewell to Tamesha Muhammad in February 2020 after the happy birth of her baby girl, Zia. Muhammad joined CBE in May 2017 and was instrumental in documenting processes and procedures, as well as handling day-to-day responsibilities in the department's finance department.

Thank You

The department extends a generous thank you to Karen Prosser and William Heilman, College of Engineering employees, who held temporary positions in CBE during the summer and fall of 2019. Thank you for keeping the finance department functioning properly while others were out.

STAFF ACHIEVEMENTS & AWARDS

Matt Pitcher returned to CBE finance after a nine-month rotational assignment in the audit department. This rotational assignment, under the direction of a licensed Certified Public Accountant (CPA), fulfilled the requirement for Pitcher to achieve his CPA licensing. Congratulations Matt!

Bianca Burns was the recipient of a 2020 President's Award for Employee Excellence in the category of The Culture of Belonging. Burns was recognized for her contributions to diversity and inclusion in our graduate programs.

In 2020, two employees reached significant service milestones of 30 years at Cornell. Polly Marion, Administrative Assistant, has held various positions throughout her career at Cornell. She, most recently, supports Dr. Jefferson Tester, energy education and the Earth Source Heat initiative. Carol Casler celebrated 30 years of service on June 26, 2020. Please read the employee spotlight to hear all about Carol's contributions to CBE and our undergraduates and alumni.

Acknowledgement of all staff

It is said that one's true character is seen in crisis. And, during the COVID-19 pandemic, our department staff have shown only their resilience and grit. In March 2020, the staff of the Smith School quickly removed themselves and their work from Olin Hall offices and began working remotely. Some thought (and hoped) this would be for a short, few weeks, but it was not. During it all, however, staff customer service, responsiveness and teamwork has not waned. This was while many staff managed home-schooling, daycare, and elder parent care. While the work environment has not been the same, we are honored to have our CBE staff team supporting the department. Thank you for all you have done during this challenging time.

EMPLOYEE SPOTLIGHT

Carol Casler—Marking 30 Years of Service

"I'M MOST PROUD OF THE OPPORTUNITY 10 YEARS AGO TO CHANGE MY POSITION TO SUPPORT THE UNDERGRADUATE PROGRAM. ALTHOUGH MUCH HAS CHANGED OVER THE YEARS, ONE CONSTANT IS THE STUDENTS WHO ARE EAGER TO LEARN AND FIND THEIR WAY IN THE WORLD, GETTING TO KNOW THEM AND OFFER ADVISE AS THEY NAVIGATE THEIR COLLEGE YEARS IS EXTREMELY REWARDING".

"It has been quite a journey at Cornell; beginning in central administration in the Bursar's Office, then to a college position in the Engineering Registrar's Office, before finally joining CBE. It's amazing to be part of the CBE community, to work with faculty, staff and students for over 21 years.

I've most enjoyed working with students and improving existing processes. Early on I was invited to join a team tasked with following the Quality Improvement Process to reformat the Bursar billing statement. When I started in Engineering creating freshmen schedules was done with pencil and paper which I moved to a shared database to facilitate the scheduling process and balance the labs. I also developed a database template for graduation which is still being used. I've had the pleasure of training student employees and stayed in touch with many years after graduation.

My position in CBE started in the main office, some of the faculty may recall I rearranged the office several times to improve traffic flow, developed a system to log deliveries, created a student database as well as many other incremental changes. I'm most proud of the opportunity 10 years ago to change my position to support the undergraduate program. Although much has changed over the years, one constant is the students who are eager to learn and find their way in the world, getting to know them and offer advise as they navigate their college years is extremely rewarding. I have so many fond memories and I look forward to making many more."

UNDERGRADUATE PROFILES

Maddie Mills '21

Hometown: Sewickley, PA and/or Traverse City, MI

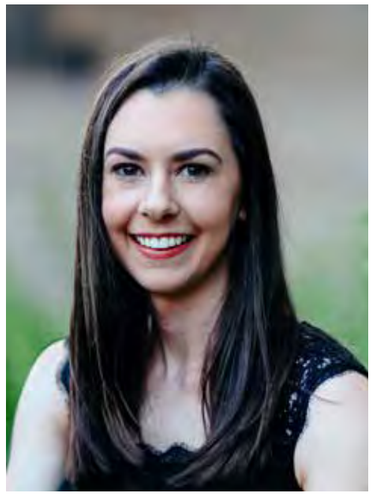
JOURNEY TO CORNELL: I committed to coming to Cornell the fall of my sophomore year of high school. As a hockey player the recruitment process is very early, so I had to know what I wanted early. I knew Cornell was the place for me because of the campus, the hockey coach, and the great engineering school. I chose the Smith School because I thought chemical engineering matched my interests but was a broad enough major that I didn't have to know what I wanted to do after college.

LEADERSHIP POSITIONS AND ACCOMPLISHMENTS:
- Red Key Athletes Honor Society
- Student of the Athletes Leadership Academy
- Ivy League Rookie of the Year
- 1st and 2nd Team All-Ivy

ADVICE FOR FUTURE STUDENTS: I recommend getting involved with as many things as you are interested in and never fear not having enough time. If you truly enjoy doing something there is time for it, you will simply become more efficient and productive.

POST-GRADUATION GOALS: I hope to find a job I enjoy in industry, play professional hockey, and take time to do mission trips.

FAVORITE OLIN HALL/CHEME MEMORY: Getting the fluids prelim handed out and the whole class laughing when we flipped it over. We all knew it was going to be a tough one... it was.



Catherine Gurecky '20

Hometown: Colleyville, TX

JOURNEY TO CORNELL: I found the breadth of opportunities at Cornell to be exciting and unmatched by other universities. In sixth grade, we were assigned to write letters to our future selves, and I wrote "I want to be a chemical engineer." By the time I was applying to colleges, I was still confident I wanted to be a ChemE, but I knew that I didn't want to be the traditional Chemical Engineer often found in my home state of Texas. I chose Cornell because it didn't place limits on my education. I had the opportunity to explore a variety of career paths from biomolecular engineering to product development while still learning the fundamentals of chemical and process engineering. At the same time, I had the opportunity to explore hobbies and interests outside of CBE.

LEADERSHIP POSITIONS AND ACCOMPLISHMENTS: I was highly involved with the Cornell Society of Women Engineers (SWE) since the onset of freshman year and served as the 2019-2020 Co-President. For my work with SWE, I was recognized with Cornell Diversity Programs in Engineering's Distinguished Service Award and have been recognized by the Society of Women Engineers at large with the Guiding Star Collegiate Leader Award and the Outstanding Collegiate Member Award. Additionally, I have written K-12 outreach blogs and newsletters at the SWE society level for the past two years.

Outside of SWE, I served as an Engineering Peer Advisor for three years and was the Vice Chair of Communications for the program. I was also a teaching assistant for Heat and Mass Transfer and Applied Process Controls.

One of my largest accomplishments was co-authoring and self-publishing a book this past year with two of my peers. The book features stories of Cornell alumnae who have become leaders in technological fields and is titled *Wall of Wonder: Cornell Women Leading the Way in Science, Technology, and Engineering* (available on Amazon and Barnes & Noble, net proceeds support Cornell SWE's K-12 outreach initiatives). We hope the book will inspire younger generations by increasing visibility of female innovators.

ADVICE FOR FUTURE STUDENTS: Stepping outside of your comfort zone is the only way you'll grow. Apply for the leadership position you don't think you'll get, speak up in class when you have an idea, and take the class you're interested in but don't think you'll do well in. When you push yourself to try new things and take risks, amazing opportunities can follow.

POST-GRADUATION GOALS: I plan to graduate with an M.Eng. in Chemical Engineering with a specialization in Product Design this December. I hope to work in R&D for a consumer product or food/beverage company.

FAVORITE OLIN HALL/CHEME MEMORY: The CBE holiday party! It was one of the last times the majority of our class was together, and I enjoyed being able to celebrate our accomplishments while looking forward to our final semester.

Margaret Seeman '20

Hometown: Darien, CT

JOURNEY TO CORNELL: During high school, I fell in love with the study of chemistry and knew that I wanted to become a chemical engineer. My father is an Engineering alum of Cornell University and when we visited, I knew I could see myself loving it here. I also realized that becoming a Cornell engineer required a tenacious amount of work and a heavy winter coat!

LEADERSHIP POSITIONS AND ACCOMPLISHMENTS: After affiliating with Chemical Engineering, I joined AIChE (American Institute of Chemical Engineers). My senior year, I was the AIChE social chair and had a blast planning the annual BBQ and arranging times for ChemEs to get together outside of the classroom. During the department holiday party, our AIChE executive board performed a skit, which told a story about each of our amazing professors. Being a part of AIChE was an important part of my career at Cornell. It created a family of people all studying the same major, and at the same time supporting each other. Spring semester of my senior year, I was a teaching assistant for Analysis of Separations Processes, a junior ChemE class. I was not only able to connect with the junior class, but I was also able to help students understand and work through challenging material that I had learned the year before. All four years I also participated in my sorority: Delta Gamma. In 2019, I was the Vice President of Social Standards for the Cornell chapter.

ADVICE FOR FUTURE STUDENTS: Embrace every second in the Smith School of Chemical and Biomolecular Engineering and every connection with students and professors. Cornell Chemical Engineering is something so special. The size of the major allows for students to become a family, as the Class of 2020 has. The faculty and staff are amazing. Whether it was class related or career related, I knew if I asked for help, I would find it in Olin Hall. I am so happy to go out into my post graduate life with these amazing connections and lifelong friends.

UNDERGRADUATE PROFILES

POST-GRADUATION GOALS: At the end of August, I will be starting my post graduate life at Stroud International, a consulting firm in Marblehead, MA as an Associate Consultant. Stroud consists of many Cornell ChemE alumni and I am so excited to be included among them. One of my biggest goals post grad is to continue learning and challenging myself in my future career. In a consulting position, I will be traveling, meeting many new people, and challenging myself to grow not only in my career but also personally.

Favorite Olin Hall/ChemE memory: There are honestly too many memories to even consider only one. When I think back to my time at Cornell—I always think of my Unit Operations group which became my Product Design group. My three teammates: Ali Moraveck, Priyanka Konan, and Colette Schissel, not only became my academic workmates but are some of my closest friends. We consistently met at College Town Bagels to work—whether it was late at night or early in the morning. After our work was completed, we would sit around a table and talk and laugh for another hour before finally packing up to go home for the night. My three teammates have incredible careers ahead of them, as do all of the ChemE Class of 2020!

Jay Bender '20

Hometown: Boulder, CO

JOURNEY TO CORNELL: I was interested in going to college out east after spending my entire life in Colorado. I toured several East Coast universities and happily selected Cornell because of its secluded, academically focused location and its emphasis on sustainability.

LEADERSHIP POSITIONS AND ACCOMPLISHMENTS: At Cornell, I was incredibly involved with our AIChE chapter. Junior year, I was the fundraising and outreach chair. I helped grow our FourC program, an educational outreach program to teach less privileged middle and high school students basic chemical engineering principles to expose them to the field of study. Senior year, I was our AIChE chapter president. I spent my last year promoting cohesiveness between graduating classes through social events and educational field trips and helping my classmates achieve professional goals through career panels and sending students to academic conferences to present research.

ADVICE FOR FUTURE STUDENTS: First, build a network of MULTIPLE mentors whom you can ask for academic/professional/personal advice as quickly as you can. Life is way too difficult to navigate solo. Second, ALWAYS ask for what you want and NEVER be bashful. The worst thing that can happen is someone says "No," and that rarely occurs.

POST-GRADUATION GOALS: This fall, I will be starting a Ph.D. in Chemical Engineering at the University of Texas at Austin as a National Science Foundation Graduate Research Fellow. My aspiration is to produce high-impact research during my graduate studies and have a career where I can positively impact others and make educational resources more accessible. Currently, this entails becoming a professor.

FAVORITE OLIN HALL/CHEME MEMORY: Running the Big Red Skid under programmed control in the UO Lab after more than 10 hours of step-testing and troubleshooting in CHEME 3700. This was the first time I felt like a true Chemical Engineer working as a team with my friends Anthony Brites, Spencer Hong, and Ian Morrison to get a real system working.

Ellen Park '20

Hometown: Scituate, MA

JOURNEY TO CORNELL: I visited Cornell the summer after my junior year on a college tour road trip, and I immediately fell in love. I loved that I could take classes in any college, regardless of my major (any person, any study!) and try out different areas of engineering before picking my major. Not to mention, Ithaca is gorgeous, and there are so many great running and hiking trails so close to campus.

LEADERSHIP POSITIONS AND ACCOMPLISHMENTS: During my time at Cornell I was an Engineering Peer Advisor (3 years), CHEM 2090 Academic Excellence Workshop Facilitator (4 semesters), and a Math 1920 Course Assistant (4 semesters). I also was a TA for ENGRI 1120 (Intro to ChemE) and ENGRD 2190 (Chemical Process Design and Analysis). Outside of academics, I was also a member of the Cornell Triathlon Club and served on the e-board for two years. At the end of my senior year, I was also named a Cornell Merrill Presidential Scholar and received the Frank H.T. Rhodes Award.

ADVICE FOR FUTURE STUDENTS:

- Try something new that interests/excites you. There are so many amazing opportunities available at Cornell, you never know where a path might take you. I was a big fan of taking classes for fun because I not only learned something new, but also met new people.
- Explore campus and the Ithaca area. There are so many great trails on Cornell's campus or just a short car ride away. I highly recommend getting outside and doing exploring because, for me, it's a great way to relieve stress. Ring the bell in the botanical gardens!

POST-GRADUATION GOALS: Currently, I am a graduate student in the MIT-WHOI Joint Program and am pursuing a Ph.D. in Chemical Oceanography. I'm in Dr. Roo Nicholson's lab, which focuses on biogeochemical cycling. I hope to combine my chemical engineering background and my love of the ocean to leave the world better than I found it, but I'm still figuring out the most effective way to do it.

FAVORITE OLIN HALL/CHEME MEMORY: My favorite ChemE memory is operating the UO lab distillation column under continuous, steady-state conditions with my UO group. For me, this was like the culmination of everything I had learned in ChemE since ENGRD 2190, and it was exciting to see everything I had learned work in practice. It also was a group effort that really emphasized how well my UO group worked together.

Alex Wurm '20

Hometown: Armonk, NY

JOURNEY TO CORNELL: In high school I actually did not expect to become an engineer. My main extracurricular activity was the debate team, and my AP Literature teacher told me I should pursue a career in writing. As senior year approached, however, I could not help but feel I would be missing out on a great opportunity if I ended my education in math and science prematurely. A family friend gave me a tour of Cornell and I was blown away by the campus and the facilities, especially in the College of Engineering. After that tour I knew Cornell was at the top of my list of schools. I applied with the intent to study chemical engineering. Several months later I received my acceptance, and the rest is history.

LEADERSHIP POSITIONS AND ACCOMPLISHMENTS: During my time at Cornell I was involved in a number of student organizations. I was a member of the Zeta Psi fraternity where I assisted in our philanthropy and recruitment efforts and I received the Zeta Psi Educational Foundation Burkhardt Scholarship. I was the Treasurer for the Tau Beta Pi Engineering Honor Society where I received the Tau Beta Pi Scholarship. I also was a Project Manager on the Cornell DEBUT Biomedical Engineering student project team for multiple years.

Within CBE, I was a TA for Intro to Chemical Engineering, Chemical Engineering Thermodynamics, and Air Pollution Controls. Most importantly, I was the Junior Captain and then Senior Captain of CBE's own ChemE Car team! During my time on ChemE Car, the team placed in the top 10 nationally at the AIChE conference.

In addition to my time on campus, I held internships in chemical engineering disciplines at Procter & Gamble and PepsiCo, which helped shape my current career goals.

ADVICE FOR FUTURE STUDENTS: Find a healthy balance of work and leisure! The CBE curriculum can definitely be rigorous and feel overly time consuming at points. Make sure that you know yourself well enough to take breaks and enjoy all that Ithaca has to offer, whether that be with your peers in CBE, or with other friends on campus. My main takeaway from this unique spring 2020 semester is that college comes to an end faster than you think it will, so make the most of every minute!

POST-GRADUATION GOALS: This fall I will be moving to Chicago to start work as an Associate Consultant at Bain & Company. I would like to use the next few years to add some business experience to the solid technical foundation I built at Cornell and to get more involved in investing, real estate, and entrepreneurship. After a few years, I am planning on attending graduate school for an M.S. in Engineering/MBA and hopefully finding a nice mix of technical and managerial work as a full-time entrepreneur afterward. If it all works out, I'd love to come back and speak in the Career Perspectives course one day!

FAVORITE OLIN HALL/CHEME MEMORY: My favorite memories as a Cornell ChemE are the times when my friends and I would meet up to celebrate a tough week or a big prelim and make a late night Chipotle run, hang out at the DOTW and Rulloff's, have a board-game or video-game night, etc. Especially as a senior, I had the chance to get close with a lot of my classmates, and the sense of community in CBE let me know I picked a special major at Cornell.

CONGRATULATIONS TO THE CLASS OF 2020!

Class of 2020

1 Colette Schissel
2 Emma Jacob
3 Elyse Kauffman
4 Swetha Thiagaraja
5 Xuefei Kuang
6 Anjali Patel
7 Clara Walton
8 Sarah Steiner
9 Kristi Fok
10 Jee Won Yang
11 Cindy Wu
12 Margaret Seeman
13 Abbie Hasson
14 Angela Justin
15 Taylor Meyer
16 Han Tran
17 Shristi Varshney
18 Catherine Gurecky
19 Manisha Kunala
20 Sabrina Chen
21 Michelle Quien
22 Yeojin Min
23 Dylan Vu
24 Valentina Lohr
25 Jin Young (Josh) Park
26 Spencer Hong
27 Ruby Jin
28 Camelia Wu
29 Kasim Khan
30 Beverly Balasu
31 Natasha Jagnandan
32 MaryClare Kelly
33 Emily Costello
34 Jack Nicoletti
35 Brandon Drew
36 Ryan Cain
37 Anthony Brites
38 Micah Zick
39 KK Kim
40 Jody Mohammed
41 Julie Tan
42 Ellen Park
43 Ali Moraveck
44 John Wolford
45 Brianna Bannister
46 Yiqi Liu
47 Ian Warshawsky
48 Robbie Grooms
49 Avash Pandit
50 Chris Mulvaney
51 Daryl Choi
52 Ian Morrison
53 Alexander Wurm
54 Abby Kotwick
55 Jay Bender
56 Rahul Rambhatla
57 Mihoko Sakanaka
58 Priyanka Konan
59 Eleanor Daugerdas
60 Michael Delaney

Not pictured:
Aaron Neeck
Annie Yu

2020 UNDERGRADUATE AWARDS & HONORS

American Institute of Chemical Engineers Othmer Sophomore Academic Excellence Award
Yihui (Camelia) Wu '20
This award was established by the AIChE to recognize undergraduate academic excellence.

National Science Foundation Graduate Fellowship
James (Jay) Takashi Bender '20 and Duylinh (Dylan) Vu '20
The award recognizes high scholarship, extracurricular contributions, unusual promise of substantial achievement, and a program that advances the engineering profession.

Merrill Presidential Scholar
Ellen R. Park '20
This Cornell program honors outstanding seniors and their academic mentors who most inspired their scholastic development from high school and a Cornell faculty member who most significantly contributed to their college experience.

AIChE/Conoco-Phillips Undergraduate Scholarship
Clara Kyle Walton '20
Recognizing exceptional academic achievement with professional potential in the energy industry.

Genentech and George Scheele Outstanding Junior Award
Priyanka Konan '20
This award is sponsored by Genentech in memory of Professor George F. Scheele, former associate director of the school, to recognize academic excellence, and achievement in campus and professional activities.

Award for Outstanding Service to the School
James (Jay) Takashi Bender '20
This award recognizes outstanding service to improve the professional and social culture of the School.

Outstanding Undergraduate Teaching Assistant of the Year Award
Anthony Louis Brites '20
Chosen by the faculty for outstanding teaching by an undergraduate assistant and his contributions to ChemE 3130—Chemical Engineering Thermodynamics and ChemE 3700—Applied Process Control.

Outstanding Undergraduate Teaching Assistant of the Year Award
Michelle Quien '20
Chosen by the faculty for outstanding teaching by an undergraduate assistant and her contributions to EngrD 2190—Chemical Process Design & Analysis and ChemE 3230- Fluid Mechanics.

Chemical Engineering Outstanding Scholar Award
Ali Christine Moraveck '20 and Jack Thomas Nicoletti '20
This award recognizes outstanding scholarship, mastery of chemical engineering fundamentals, demonstrated application in the capstone laboratory and design courses and professional promise.

Ferdinand Rodriguez Outstanding Student Award in Polymers and Electronic Materials
Christopher Michael Mulvaney '20 and Kasim Adil Khan '20
Honoring Professor Rodriguez and recognizing outstanding achievements in academics and in the professional community.

Outstanding Research by an Undergraduate Award
Sabrina Serene Chen '20 and Duylinh (Dylan) Vu '20
This award recognizes a demonstrated record of ability, indication of leadership, and professional promise.

GIVING OPPORTUNITIES

CAPITAL PROJECTS

With expansion in our degree programs and faculty, the Smith School has outgrown Olin Hall. Further, the space does not serve our current and future research, teaching, and community objectives well. The first phase of renovations, the Samuel C. Fleming Molecular Engineering Laboratories is complete, we now hope to keep our momentum toward a re-envisioned and reinvigorated Olin Hall for its next 75 years. On this path, we have the following exciting opportunities and funding priorities:

Creation of Cornell Institute for Biological Design & Manufacturing
$1M – $10M

Chemical engineers at Cornell are using the principles of biological and engineering design to harness living organisms for manufacturing chemical products. The Institute for Biological Design and Manufacturing will capitalize on this trend to catalyze progress towards a new 'biomanufacturing economy', in which engineers develop biological systems to manufacture new products—materials, therapeutic drugs, and fuels—that address some of the world's most pressing problems. Gifts in support of the institute will allow the school to renovate and expand space in Olin Hall, as well as provide annual support for research and education programs in support of the institute's mission.

Creating: Heart of the Smith School in Olin Hall
$10M

For the first time in the history of the School and of Olin Hall, we have an opportunity to create a true home-base for Chemical and Biological Engineering. One that celebrates our past (the Rhodes Lounge mural) and hosts dynamic interactions between students and faculty as they design our future. Olin Hall occupies an iconic space on Ho Plaza in the center of Cornell's campus. This new space within Olin will serve as the beating heart of this center, showcasing the creativity and hard work of the ChemEs of today and tomorrow.

Creating: Next Gen Spaces for Active Learning & Research
$100K

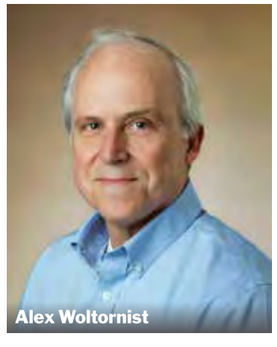
Within the scope of our complete renovation, we have opportunities to invest in state-of-the-art facilities for interactive learning, student project space, and research. With much of the building untouched since the cinderblocks were laid in 1942, we have spaces of all size and for our whole range of programs—from process and product design through to the discovery of advanced materials for energy storage—that need to be updated and renovated.

FACULTY

Chaired Professor of Practice
$3M

Industrial Practitioners (IPs) are chemical engineers with considerable practical experience who return to Cornell to serve as lecturers. Since the mid 1990s, CBE undergraduates have benefited greatly from continuous service of IPs in our capstone Chemical Process Design Course and Unit Operations laboratory. More recently, IPs have played a central role in the development of new components of our curriculum in Product Design and Professional Development.

Recent important additions to our industrial practitioner faculty include Alex Woltornist, currently a lean operations consultant with over 30 years of experience at Merck pharmaceutical; and Frank Lomax, a managing partner at engineering firm Headwaters Solutions who has over 20 years of experience in the chemical process industry.


Alex Woltornist


Frank Lomax

Alfred Center Endowment
$100K

Over the past 19 years, Alfred Center (B.S. '65, M.Eng. '66), the College of Engineering's first Professor of Practice, has defined the role of our IP program and positively impacted the education and careers of hundreds of our students. We aim to honor his legacy and provide enduring support with the Alfred Center endowment.

Endowed Professorship Biomolecular Engineering
$3M Endowment

Gifts to this fund will support salary and research start-up costs for hiring a member of the faculty who will facilitate growth of Biomolecular Engineering.

Faculty Start Up Funds—Faculty Renewal
$500K Current Use

Current use gifts to support the hiring of faculty in CBE. CBE continues to grow our faculty cohort and strives to hire top faculty in their fields.

CBE Discretionary Fund
Gifts of Any Size

Unrestricted gifts of any amount may be directed to CBE and will provide the Director the flexibility to support the priorities listed above, aggressively recruit and retain junior faculty, seize other opportunities, and address challenges at their discretion.

FOR MORE INFORMATION ON THESE OR ANY OTHER GIVING OPPORTUNITIES, PLEASE CONTACT

Stephen J. Smith CBE's Alumni Afairs and Development Officer

js422@cornell.edu • 607-255-8285

https://www.cheme.cornell.edu/alumni/giving.cfm

CornellEngineering

Robert Frederick Smith School of Chemical and Biomolecular Engineering