



[Home](#) > [AIChE 35 Under 35: Bioengineering](#)

AIChE 35 Under 35: Bioengineering



1/1 in the series [AIChE's 35 Under 35](#)

With support from the AIChE Foundation, AIChE and its Young Professional Committee (YPC) are honoring 35 notable young professionals under the age of 35 based on achievements in seven categories: bioengineering, chemicals, energy, innovation, education, leadership, and safety. You can learn more about the award [here](#).

The winners in all seven categories were announced in the [August 2017 issue of CEP Magazine](#). Here on ChEnected, we're featuring interviews with the winners conducted by YPC. Each week, we'll focus on a different category, starting with bioengineering. Winners are presented below in alphabetical order, by last name. You can also click on their names in the list below to go directly to their interview. Be sure to congratulate the winners by sharing on social media with the hashtag #AIChE35Under35.

- [Eun Ji Chung, 33](#)
- [Cole A. DeForest, 33](#)
- [Jeffrey R. Millman, 34](#)
-

[Holly Murphy, 33](#)



by AIChE's Young
Professionals Committee
(YPC)

AUG 10, 2017

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- [Akash Narani, 30](#)
- [Nemoy Rau, 33](#)
- [Matthew J. Webber, 33](#)

Eun Ji Chung, 33

Pursuing her goal to help patients



Eun is a Gabilan Assistant Professor in the Department of Biomedical Engineering at the University of Southern California. Her research group focuses on molecular design, nanomedicine, and tissue engineering to generate biomaterial strategies for clinical applications. Dr. Chung received her B.A. in molecular biology with honors at Scripps College and her Ph.D. in biomedical engineering at Northwestern University.

Her postdoctoral training was completed at the University of Chicago. Her recent awards and honors include the 2017 Emerging Investigator Issue of the journal *Biomaterials Science* [among many others](#).

AIChE YPC: Tell us about your current and past involvement in AIChE.

Eun Ji Chung: I have been a member of AIChE and have been attending and presenting at the AIChE Annual Meeting since 2013. I also took part in the Future Faculty poster session and now as faculty, I am actively an organizing member of the Materials Engineering and Sciences Division program. For the 2017 Annual Meeting, I will co-chair the "Area Plenary: Leaders in Biomaterials (Invited Talks)" session.

AIChE YPC: Chemical engineering is a diverse field. How did you get involved in your speciality?

EJC: My specialty is bioengineering/biomedical engineering. In undergrad, I pursued a degree in molecular biology and conducted basic biology research in unicellular organisms. While I had a strong foundation in biology, I wanted to pursue a field that could help human health and patients. This led me to pursue biomedical engineering as a graduate student and choose a lab that focused on biomaterials research.

AIChE YPC: What professional achievement are you most proud of?

EJC: I'm most proud of being a recipient of the NIH K99/ROO Pathway to Independence award. When I applied the first time, my application was streamlined and rejected. Despite the statistics and critics confirming the high likelihood of being streamlined again in the resubmission, I persisted, addressed all of the reviewer comments diligently, and received a top score the second time around.



AIChE YPC: What personal achievement are you most proud of?

EJC: Pursuing both an academic career and family life ambitiously is a juggling act that I fine tune and consider an achievement. Towards this pursuit, every December, I write out my career and family goals for the upcoming year, as well as any additional personal goals that I might have and categorize them into a timeline of seasons. In addition, I have longer, five-year goals. This way, I can approach ambition in a holistic manner. There will always be times when one area of your life will need more attention, and so adjustments will need to be made. I am very proud of my family and lucky to have mentors who have always supported me to take on opportunities to rise to any challenge.

AIChE YPC: What do you enjoy most about your job?

EJC: I love working with my graduate and undergraduate students and postdoctoral trainees on their projects and making progress toward their individual aspirations. While it takes continuous dialogue, planning, and learning together, every small milestone that we achieve towards the larger goals makes me feel proud and gives me a sense of pride in my work and role.



AIChE YPC: What lesson do you wish you would have learned sooner?

EJC: I am a classic perfectionist which comes with being my own harshest critic during times when something doesn't work. It takes a balance between an unwavering persistence vs. enjoying the ride. To my younger self: Sometimes, you can't rush the process, and time will allow you to perfect it.

AIChE YPC: What are your goals for the future?

EJC: Part of my future research goals include providing cost-efficient nanodiagnostics and therapeutics for patients with diseases that are not well-understood or often overlooked. To achieve this goal, an interdisciplinary team of scientists, clinicians, and trainees are needed. In order to train the next generation of the STEM workforce, I hope to inspire students and convey biomedical engineering and biomaterials research as both tangible and compelling.

Fun facts about Eun

- Favorite snack food: Haribo gummies and kettle chips
- One of your favorite books: *When Breath Becomes Air*

To my younger self: Sometimes, you can't rush the process, and time will allow you to perfect it.

[Learn more about Eun in CEP Magazine.](#)

Cole A. DeForest, 33

Pushing the boundaries of biomaterial research



Cole is an assistant professor in the Department of Chemical Engineering at the University of Washington. In addition to teaching classes on reactor design, polymer chemistry, and biological frameworks for engineers, he manages a research group that develops novel biomaterial-based strategies for human health applications. His numerous awards include the 2017 Emerging Investigator Award, *Journal of Materials Chemistry*, [among many others](#).

AIChE YPC: What inspired you to pursue chemical engineering?

Cole A. DeForest: Three main factors contributed to my decision to pursue chemical engineering: 1) Having demonstrated success in high school chemistry, physics, and biology courses, I was always encouraged by my mentors to pursue a challenging major that combined fundamental aspects from all three sciences. 2) Following in the footsteps of my father who is also a card-carrying engineer, I wanted to work on and solve problems with real-world applications. 3) I also wanted a career that was guaranteed to be intellectually stimulating for the entirety of my working life.

AIChE YPC: Chemical engineering is a diverse field. How did you get involved in your speciality?

CAD: Even before my first ChemE lecture in mass and energy balances, I was drawn to the biological aspects of chemical engineering. Through an NSF REU program at the University of Colorado, I had the opportunity to work in Professor Kristi Anseth's research laboratory during the summer between my junior and senior undergraduate years. Kristi was and continues to be a pioneer in tissue engineering and biomaterial design, and exemplifies perfectly the power and impact that a classical chemical engineering mindset can have in advancing contemporary topics beyond the traditional scope of the discipline.

Her scientific creativity, passion, and enthusiasm were extremely contagious, so much so that I opted to return to her research group for my doctoral studies. The direction that I received in Kristi's lab, as well as her continued mentorship over the past 12 years, has firmly guided me towards a successful career as a ChemE specializing in the biomedical sciences.

AIChE YPC: What professional achievement are you most proud of?

CAD: I received the 2016 Presidential Distinguished Teaching Award, the highest recognition for teaching excellence at the University of Washington (awarded to one assistant professor university wide each year).



Cole enjoying skiing

AIChE YPC: What personal achievement are you most proud of?

CAD: One of my biggest priorities is to maintain a healthy work-life balance. Despite all of the hecticness that comes with being on the tenure track, I continue to find time to live life to the fullest with my family and friends.

AIChE YPC: What is the most challenging part of your job?

CAD: Saying goodbye to students as they graduate continues to be challenging for me, even when I know that they are headed off to bigger and better things.

AIChE YPC: What do you enjoy most about your job?

CAD: Being able to work with such a fantastic and diverse group of students on a wide range of important topics, as well as helping them develop into the next generation of independent scientists, are my favorite aspects of being a professor.



AIChE YPC: What are your goals for the future?

CAD: After becoming a tenured faculty member of Chemical Engineering at the University of Washington, I look forward to playing a more active role in institutional change. In addition to revamping existing courses to include expanded opportunities for active learning and participation, I will introduce new course- and laboratory-based classes on contemporary concepts in chemical engineering. I look forward to expanded involvement in several professional societies (including AIChE, Society for Biomaterials, Materials Research Society, and the American Chemical Society), where I have already made major efforts to promote the professional development of young scientists. I expect to continue pushing the boundaries of the biomaterials research space, with the goal of successfully engineering functional, multicellular, complex tissues for transplantation.

Fun facts about Cole

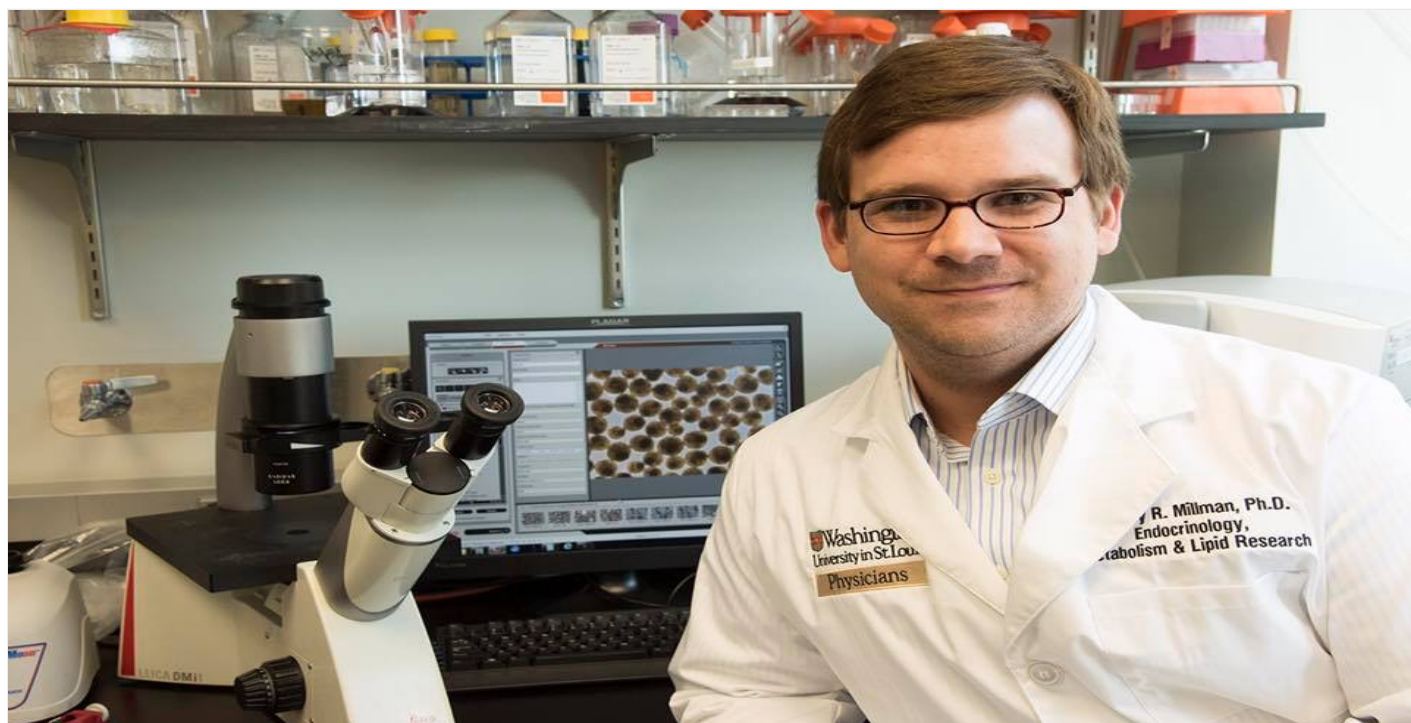
- Most used app: Google Inbox
- Favorite book: *Into the Wild* by Jon Krakauer
- Last online purchase made: *Leavenworth Rock* climbing guidebook by Viktor Kramar
- If you were not a chemical engineer, what would you be? Professional skier

I wanted a career that was guaranteed to be intellectually stimulating for the entirety of my working life.

[Learn more about Cole in CEP Magazine.](#)

Jeffrey R. Millman, 34

Working to eliminate the need for insulin injection in diabetes patients



Jeffrey is an assistant professor of medicine and biomedical engineering at Washington University School of Medicine in St. Louis. He runs a regenerative medicine research lab that uses stem cells by leveraging bioengineering principles. He was also a postdoctoral research fellow at Harvard University under the mentorship of Dr. Douglas Melton, world-renown stem cell biologist, studying stem cells and diabetes. Jeffrey's awards include the 2017 JDRF Career Development Award [among others](#).

AIChE YPC: Tell us about your current and past involvement in AIChE.

Jeffrey R. Millman: I joined AIChE in 2003 as an undergraduate and have continued to be involved through my research. I have published as co-first author in the AIChE journal *Biotechnology Progress* on using transport phenomena to reveal new insights into stem cell differentiation to cardiac muscle. I have presented my scholarship using bioengineering principles to develop regenerative medicine applications at the 2011 and 2014 AIChE meetings and the SBE stem cell engineering meetings in 2014 and 2016.



AIChE YPC: What inspired you to pursue chemical engineering?

JRM: Chemical engineering is inherently multidisciplinary, and working in a "pure" discipline felt too restrictive. My training has prepared me for the regenerative medicine work that I currently focus on, allowing me to pursue research directions that otherwise would not be open to me.

AIChE YPC: Chemical engineering is a diverse field. How did you get involved in your speciality?

JRM: I decided to specialize in bioengineering after an amazing undergraduate research experience I had at North Carolina State University. I had never seriously considered bioengineering before, but while writing the resulting research article with my mentor at the time, Dr. Orlin Velev, I became aware of the implications my research had for many biological applications. This motivated me to seek out opportunities in bioengineering, and while selecting a lab to do my dissertation work in at MIT, AIChE member and bioengineering pioneer Dr. Clark Colton offered me the perfect opportunity to perform bioengineering research with stem cells.



Jeffrey in Peru.

AIChE YPC: What professional achievement are you most proud of?

JRM: I am very proud of the work that my research team at Washington University School of Medicine in St. Louis is doing on generating insulin-producing tissues in bioreactors. I believe that transplantation of these engineered tissues will one day replace the need for insulin injections in diabetes, greatly improving their quality of life.

AIChE YPC: What do you enjoy most about your job?

JRM: Every week, my students and trainees show me something new—important scientific observations that I, and likely no one else, has ever seen before. There are very few jobs where this is true, and I am genuinely excited to wake up and go to work every morning.

AIChE YPC: What lesson do you wish you would have learned sooner?

JRM: You will never be 100% ready to try something new. Learn to embrace this and move forward, confident that your failures will lead to growth and success.

AIChE YPC: What are your goals for the future?

JRM: I want to continue growing my group into a world-class research program on the cutting edge of diabetes and regenerative medicine research in order to make a real difference in patients' lives.

Fun facts about Jeffrey

- Who do you admire most? My wife
- Favorite snack food: Nutella by the spoonful

...move forward, confident that your failures will lead to growth and success.

You can congratulate Jeffrey on Twitter at [@JeffreyRMillma](#)

[Learn more about Jeffrey in CEP Magazine.](#)

Holly Murphy, 33

Keeping grocery stores stocked



Holly Murphy is a confections performance analyst at Mondelez, a company that produces some familiar snack foods. She was drawn to chemical engineering because of the various professional pathways it offers, which she's taken advantage of, choosing food and beverage over more-traditional paths. Her previous experience includes work in productivity at Ritz Brand and as a production supervisor at a Lehigh Plant. Murphy has also presented research at previous AIChE conferences.

AIChE YPC: What inspired you to pursue chemical engineering?

Holly Murphy: I enjoyed chemistry and math, but was drawn to the fact that there are many different professional paths ChEs can take.

AIChE YPC: What professional achievement are you most proud of?

HM: I am most proud of my time in manufacturing. Manufacturing can be an extremely challenging environment that I am proud to say I "survived"!

AIChE YPC: What personal achievement are you most proud of?

HM: Building a family with my husband!

AIChE YPC: What do you enjoy most about your job?

HM: I enjoy the people I work with, and how everyone can greatly contribute to an organization in their own way.

AIChE YPC: What lesson do you wish you would have learned sooner?

HM: I wish I had learned to prioritize myself and my development sooner. If I am not setting myself up for success, I will never get there.

AIChE YPC: What are your goals for the future?

HM: My main goal for the future is to continue learning in the field I work in. I would like to be able to grow and develop myself in technical and non-technical paths.

Fun facts about Holly

- Favorite snack food: Triscuits
- Favorite book: *A Tree Grows in Brooklyn*

Manufacturing can be an extremely challenging environment that I am proud to say I "survived"!

[Learn more about Holly in CEP Magazine.](#)

Akash Narani, 30

Realizing the potential of alternative fuels



Akash Narani is a senior process engineer in the advanced biofuels and bioproducts process demonstration unit (ABPDU) at Lawrence Berkeley National Laboratory. Here he works with clients to help them scale up their early-stage advanced biofuels from lab to commercial relevance. Akash received the 2015 & 2016 Lawrence Berkeley National Laboratory SPOT Award for recognition and appreciation of the excellent contribution to the intense scale-up campaigns for client projects.

AIChE YPC: Tell us about your current and past involvement in AIChE.

Akash Narani: I have been consistently active in AIChE's Norcal Local Section, currently as 2017-18 chair and previously as vice chair, secretary, and director at large, public relations.

AIChE YPC: What inspired you to pursue chemical engineering?

AN: My parents are both specialized medical doctors and they have been the greatest motivation factor in my life. They nurtured my talent and encouraged me to choose my own career path and have instilled in me the value for sincerity and perseverance in realizing my dreams. I wanted to be an engineer as I was good at math and chemistry. I knew chemical engineering was not as glamorous and not as high paying as computer science engineering but I have been motivated to solve energy and environmental sustainability issues since my high school days.



AIChE YPC: Chemical engineering is a diverse field. How did you get involved in your speciality?

AN: I was fascinated with energy-related research during my bachelor degree and completed an independent study on the production of biodiesel from waste cooking oil. This helped me realize the untapped potential of alternate resources of fuel such as biodiesel and bioethanol and prompted me to pursue my Masters of Science in Chemical Engineering.

AIChE YPC: What professional achievement are you most proud of?

AN: My first job after my Masters in Chemical Engineering was in a very small town called Havre, Montana. I worked as an entry-level process engineer in Bio-Energy Center (now Advanced Fuel Center) with Montana State University-Northern. I felt proud when my colleagues and I made the front page of the Havre Daily Newspaper for developing a novel process to convert plant-based oils to jet fuel and other high value chemicals.

AIChE YPC: What personal achievement are you most proud of?

AN: Getting married to my amazing wife Madhuri is a personal achievement that I am really proud of. She helps me keep my eyes open for any new opportunities. She is there with me during the ups and downs and motivates me to keep working hard.

AIChE YPC: What are your goals for the future?

AN: I want to be a successful chemical engineer with strong leadership and project management skills. I want to continue to develop bioprocess technologies that improve environmental sustainability and human health for applications in biochemicals, food science and renewable fuels. In future, I would like to advance to a business management role.

Fun facts about Akash

- Most used app: Whatsapp
- Who do you admire most? My mother
- Favorite snack food: Samosa and chutney (Indian snack)
- If you were not a chemical engineer, what would you be? a doctor or chef

I have been motivated to solve energy and environmental sustainability issues since my high school days.

[Learn more about Akash in CEP Magazine.](#)

Nemoy Rau, 33

Navigating entrepreneurial endeavors



Nemoy is the co-founder & vice president of US Biometrix. US Biometrix is a brain sciences company that uses big data analytics to create an objective platform to measure cognition, behavior, and functional effectiveness for behavioral healthcare. Nemoy has consistently been involved in entrepreneurial pursuits at companies such as Stealth Mode Medical Device Company, among others. He is a regular contributor to *Forbes*, *Inc Magazine* and *Entrepreneur Magazine* and received the honor of Emerging Science and Technology, Top 30 Under 30.

AIChE YPC: Tell us about your current and past involvement in AIChE.

Nemoy Rau: I am the 2017 past chair and 2015-16 current chair for AIChE's Management Division. In addition, I'm the Entrepreneurship Programming Chair for AIChE's Annual Meetings, where I create entrepreneurship, venture capital, and startup-related programming. Also, I am one of the managing board members for the Center for AIChE's Innovation and Entrepreneurship Excellence (CIEE) and involved in YPC, and the South Texas Section for Young Professionals.

AIChE YPC: What inspired you to pursue chemical engineering?

NR: I enjoyed applying mathematics to interesting problems. The ability to bring unique applications to model systems makes chemical engineering versatile and unique.

AIChE YPC: What professional achievement are you most proud of?

NR: As an avid water lover, I'm getting more into competitive kayaking, sailing, and want to get more into kitesurfing. For me, it is a challenge to go against Mother Nature. Similar to business, winning a competitive fleet race is often not about doing things right, but rather about making as few mistakes as possible.



Nemoy skydiving!

AIChE YPC: What is the most challenging part of your job?

NR: Putting together unique business models to new industries to push the envelope forward is extremely difficult. Talking to great industry experts and forming teams to overcome the greatest challenges can help navigate the path of creating a completely new product in a new revenue model never before seen.

AIChE YPC: What is the hardest decision you have had to make?

NR: Laying off employees to pivot company products.

AIChE YPC: What lesson do you wish you would have learned sooner?

NR: Having more of a background in corporate finance and accounting in school would have helped me more when building companies. Luckily, I had wonderful teachers and mentors who taught me how to make complicated business decisions through finance to better build companies.



Fun in the desert

AIChE YPC: What are your goals for the future?

NR: Being born and raised in the rust belt, I saw industries come and go first hand. With few early-stage venture funds in heavy industrials and chemicals, I want to start investing more and possibly raising a new fund to invest in high-tech manufacturing, chemicals and great companies innovating in analytics applied to heavy industrials. Finding great companies that are in need of capital at crucial times can be the catalyst for success.

Fun facts about Nemoy

- Favorite Book: *The Count of Monte Cristo*
- Odd or quirky habit: Participating in founder interviews via Facebook Live while driving (promise it's mounted, but you will always still be distracted).

I want to start investing more and possibly raising a new fund to invest in high-tech manufacturing, chemicals and great companies innovating in analytics applied to heavy industrials.

[Learn more about Nemoy in CEP Magazine](#)

Matthew J. Webber, 33

Advancing therapeutics to impact human health



Matthew is an assistant professor in the Chemical and Biomolecular Engineering Dept. and the Chemistry and Biochemistry Dept. at the Univ. of Notre Dame and is working to advance therapeutic strategies rooted in molecular engineering toward clinical applications that impact human health. He is an active member of AIChE, presenting at the 2016 and 2015 AIChE Annual Meetings. His awards include the Biomaterials Science "Emerging Investigator" for 2017 among others.

AIChE YPC: What inspired you to pursue chemical engineering?

Matthew J. Webber: I went to college intending to go to medical school. I decided after a short time that I was no longer interested in graduate education, and switched to being a chemical engineering major as I enjoyed chemistry and math and thought this would provide the best option to secure a job following my bachelor's degree. I became involved in research at the interface of chemical engineering and biology, really liked the challenges offered in doing research, and changed course to pursue graduate studies in order to gain more research experience.

AIChE YPC: Chemical engineering is a diverse field. How did you get involved in your speciality?

MJW: I liked engineering, insofar as I enjoyed solving challenging problems, but was especially inspired by the application of these tools to medicine. Thus, I went to graduate school to get a PhD in Biomedical Engineering in order to learn how to apply my chemical engineering training to solving biomedical problems.



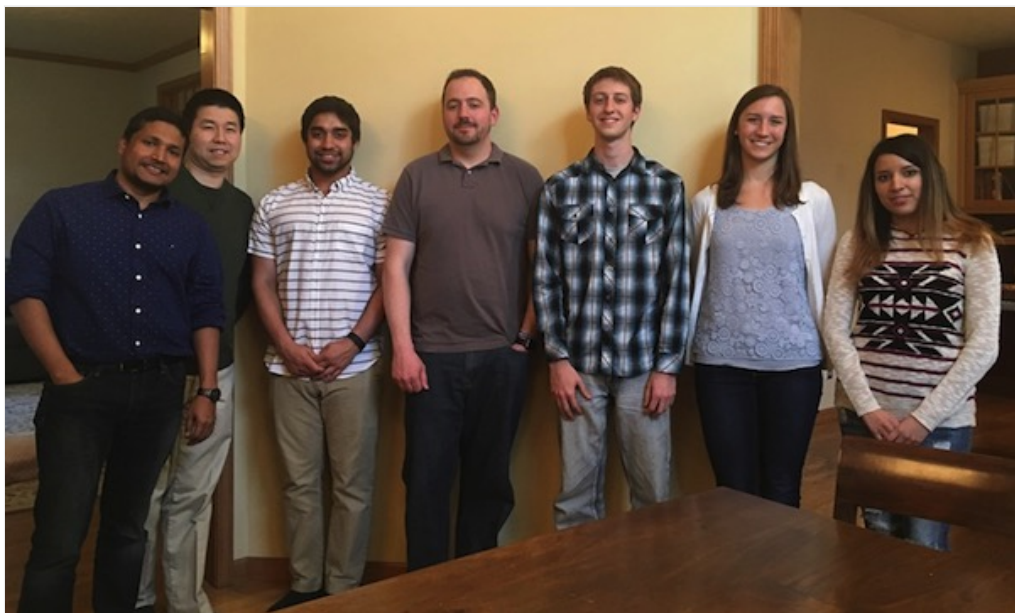
Matthew in the lab.

AIChE YPC: What personal achievement are you most proud of?

MJW: I am very proud to have married an amazingly supportive person. She has been beyond tolerant of the long path to reach my current position as an assistant professor, and provides me with constant support, encouragement, and motivation. She is typically right about everything.

AIChE YPC: What is the most challenging part of your job?

MJW: The most challenging part of my job is tailoring and individualizing my mentorship and teaching to each person. Everyone has different things that motivate them, different reasons for pursuing education, and different goals. This is in addition to different personalities and working styles. To be an effective teacher and leader, I continually work to tune my approach in order to access the talents and maximize achievements of each individual.



Matthew with his students.

AIChE YPC: What do you enjoy most about your job?

MJW: I come to work every day to teach and lead eager young people who are bright, engaging, creative, and driven. Coupled with this, we get to have a lot of fun thinking about creative solutions to problems that are really hard, and sometimes do things that no one in human history has done before in order to try to solve these problems.

AIChE YPC: What lesson do you wish you would have learned sooner?

MJW: I wish I would have learned earlier the joy that comes from uninterrupted creative thought, in lieu of getting bogged down in mundane details of daily life.

AIChE YPC: What are your goals for the future?

MJW: I would like to continue to advance therapeutic strategies, rooted in molecular engineering, toward clinical application in impacting people's health. I would love to look back on my career and be able to point to a technology originating from my lab that directly made a meaningful impact in improving healthcare for people. I would be even more honored to have produced a cohort of trainees who themselves are working to solve the world's problems with creative ideas.

Fun facts about Matthew

- Who do you admire most? Bob Langer

I come to work every day to teach and lead eager young people who are bright, engaging, creative, and driven.

[Learn more about Matthew in CEP Magazine](#)

Next week, ChEnected will be featuring the winners in the Chemicals & Education categories.

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This award is proudly supported by the AIChE Foundation. Learn more about the [Doing a World of Good campaign](#) and how you can be a part.

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