ANNUAL REPORT 2021-22

Northeastern University
Chemical Engineering

Northeastern
College of Engineering

With 215 tenured/tenure-track faculty and 18 multidisciplinary research centers and institutes with funding by eight federal agencies, the College of Engineering is a leader in experiential education and interdisciplinary research focused on discovering solutions to global challenges to benefit society.

Northeastern University

Founded in 1898, Northeastern is a global research university and the recognized leader in experiential lifelong learning. Our approach of integrating real-world experience with education, research, and innovation empowers our students, faculty, alumni, and partners to create worldwide impact.

Northeastern's comprehensive undergraduate and graduate programs lead to degrees through the doctorate in nine colleges and schools across our global system of campuses. Learning is personalized and experiential, with a curriculum that emphasizes the intersection of data, technology, and human literacies–uniquely preparing graduates for lives of fulfillment and accomplishment.

Our research enterprise, with an R1 Carnegie classification, is solutions-oriented and spans the world. Our faculty scholars work in teams that cross not just disciplines, but also sectors–aligned around today's highly interconnected global challenges and focused on transformative impact for humankind.

NORTHEASTERN

We are a leader in experiential education and interdisciplinary research, focused on Engineering for Society

DEAR COLLEAGUES, FRIENDS, AND STUDENTS,

At the Northeastern University Department of Chemical Engineering, our mission is simple: to educate and train students in chemical engineering practice. As we continue to grow and expand the department, our efforts to best prepare our students evolve. This year, we are launching the Pharmaceutical Engineering MS program in collaboration with the Department of Pharmaceutical Sciences to directly apply engineering principles to biopharma. The implementation of inclusive teaching and mastery grading in our core undergraduate courses has shifted the classroom paradigm from lecture to learning. Our doctoral students are also getting hands-on experiences through cooperative education and internships that supplement their classes and research. At every level, our students learn that leaders in engineering will address global challenges that may not yet exist, so diversity of experience and thought is critical for their future.

With over 40 primary and affiliated faculty, we continue to grow, including welcoming three new faculty members this year with expertise in biomedical imaging and biosensing, CO_2 electroreduction, and computational catalysis. We had an NIH MIRA (young investigator) grant recipient this past year, along with other awards to our faculty for their scholarship and service. We are supported by multiple areas of research: biomolecular & biomedical systems, complex & computational systems, energy & sustainability, engineering education & pedagogy, and materials & nanotechnology, providing a wealth of opportunity for students to innovate in the food-water-energy nexus, healthcare systems, and computational and data engineering.

Northeastern's top-rated cooperative education (co-op) program plays an important role in our success. Chemical engineering co-op positions span the areas of consumer products, plastics, biotechnology & biopharmaceuticals, nanotechnology, alternative energy, and energy storage, with students placed in positions both domestically and internationally. Through a combination of rigorous academics, research excellence, and professional experience, recent graduate students have taken industry and research positions at leading organizations such as Moderna, Takeda, SpaceX, SES, Lockheed Martin, and Intel, to name just a few.

I invite you to explore highlights of our Department of Chemical Engineering and research of our faculty and students through this Annual Report.

Sincerely,

Rebecca Kuntz Willits, PhD
Professor and Department Chair
Chemical Engineering
r.willits@northeastern.edu

For more details, visit our website at CHE.NORTHEASTERN.EDU.

Photo by Bella Martinez

Quick Facts **CHEMICAL ENGINEERING**

36 **TENURED/ TENURE-TRACK** including Affiliated

24 **Young Investigator** Awards, including **10** **National Science Foundation** CAREER Awards

12 **Professional** Society Fellowships

534 Students, **47%** are Women (Fall-2021)

41 **Visiting Scholars** (2017-2022)

$15M **External Research Awards** (2020-2022)

2022 Young Investigator Award

Ryan Koppes
Assistant Professor
NIH R35 MIRA (Maximizing Investigator's Research Award) Early-stage Investigator Grant

National Academy Member

Arthur Coury
University Distinguished Professor

Degree Programs

UNDERGRADUATE:

BS Chemical Engineering
BS Chemical Engineering and Biochemistry
BS Chemical Engineering and Bioengineering
BS Chemical Engineering and Computer Science
BS Chemical Engineering and Environmental Engineering
BS Chemical Engineering and Physics

GRADUATE:

PhD Chemical Engineering
MS Chemical Engineering
MS Pharmaceutical Engineering - **NEW**

Announcing the MS in Pharmaceutical Engineering

The Master of Science in Pharmaceutical Engineering is an interdisciplinary program offered through the Department of Chemical Engineering and the Department of Pharmaceutical Sciences at Northeastern University. Through coursework and rich experiential learning, the program prepares engineers with a unique blend of advanced skills in state-of-the art pharmaceutical design, manufacturing process engineering, and regulatory and quality issues to meet the evolving and growing needs of the biotechnology industry.

Northeastern is one of only a few programs nationwide to combine engineering and pharmaceutical sciences to address growing market need. Students gain the knowledge and skills to work in the pharmaceutical field to analyze and design the engineering aspects of pharmaceutical development, operations, and manufacturing processes. They are also prepared to describe the regulations and good manufacturing practices that are specific to the pharmaceutical industry, as well as communicate effectively within pharmaceutical engineering, in multidisciplinary teams, and between regulatory and quality programs.

Quick Facts **COLLEGE OF ENGINEERING**

With **215** tenured/tenure-track faculty and **18** multidisciplinary research centers and institutes with funding by eight federal agencies, the College of Engineering is a leader in experiential education and interdisciplinary research focused on discovering solutions to global challenges to benefit society.

5 **Engineering Departments**

116 **YOUNG INVESTIGATOR** Awards

Including **64** NSF CAREER Awards, and **18** DOD Young Investigator Awards

102 **Professional Society Fellowships**

2,897 **Total Co-op Hires** (2022)

2,200 **Co-op Employer Partners** (2020-2022)

TOTAL ENROLLMENT (Fall 2021)

8,542 54% Graduate
46% Undergraduate

Enrollment Growth (2016 to 2021)

48% **MS**
31% **PhD**
11% **BS**

Our Newest Faculty

Magda Barecka

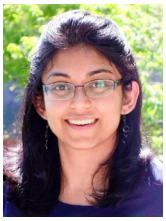
Assistant Professor

Jointly Appointed: Chemistry and Chemical Biology

PhD: TU Dortmund University, Germany, 2017

Previously: Postdoctoral Fellow, University of Cambridge

Scholarship Focus: Discovery and scale-up of (electro)chemical CO_2 utilization methods; accelerating the adoption of carbon neutral chemical manufacturing



Srirupa Chakraborty

Assistant Professor

Jointly Appointed: Chemistry and Chemical Biology

PhD: University of Buffalo, 2017

Previously: Postdoctoral Fellow, Los Alamos National Laboratory

Scholarship Focus: Modeling and theory of complex biomolecular dynamics, geared towards modern therapeutic design

Allison Dennis

Associate Professor

PhD: Georgia Institute of Technology, 2009

Previously: Assistant Professor, Boston University

Scholarship Focus: Semiconductor quantum dots for biomedical imaging and biosensing

Awards:

- Scialog ABI (Advanced Biomedical Imaging) Fellow, 2021-2023
- MAVEN Sr. Scientist, 2021-22

Hannah Sayre

Assistant Professor

Jointly Appointed: Chemistry and Chemical Biology

PhD: Ohio State University, 2018

Previously: Postdoctoral Fellow, Princeton University

Scholarship Focus: Design photocatalysts to improve efficiency and reactivity; understand light-activated chemical reactions with time-resolved spectroscopy

Rebecca Sherbo

Assistant Professor

Jointly Appointed: Chemistry and Chemical Biology

PhD: University of British Columbia, 2019

Previously: Postdoctoral Fellow Harvard University and Harvard Medical School

Scholarship Focus: Electrochemical and biological ways to make important chemical products, like foods and fuels, from gases and renewable energy

Qing Zhao

Assistant Professor

PhD: Massachusetts Institute of Technology, 2019

Previously: Postdoctoral Fellow, Princeton University

Scholarship Focus: Computational catalyst and material design for sustainable energy applications

Faculty by Research Area

Biomolecular and Biomedical Systems

Mansoor Amiji
Debra Auguste
Sidi A. Bencherif
Rebecca L. Carrier
Srirupa Chakraborty
Arthur Coury
Allison Dennis
Eno Ebong
Adam Ekenseair
Edgar Goluch
Sara Hashmi
Abigail Koppes
Ryan Koppes
Carolyn Lee-Parsons
Steve Lustig
Ming Su
Rebecca Willits
Benjamin Woolston

Complex and Computational Systems

Magda Barecka
Rebecca L. Carrier
Srirupa Chakraborty
Francisco Hung
Steve Lustig
Richard West
Qing Zhao

Energy and Sustainability

Magda Barecka
Joshua Gallaway
Edgar Goluch
Sara Hashmi
Francisco Hung
Carolyn Lee-Parsons
Laura Lewis
Steve Lustig
Courtney Pfluger
Ming Su
Richard West
Benjamin Woolston
Qing Zhao

Engineering, Education, and Pedagogy

Adam Ekenseair
Edgar Goluch
Lucas Landherr
Courtney Pfluger
Behrooz Satvat
Rebecca Willits

Materials and Nanotechnology

Debra Auguste
Magda Barecka
Sidi A. Bencherif
Rebecca L. Carrier
Arthur Coury
Allison Dennis
Eno Ebong
Adam Ekenseair
Joshua Gallaway
Sara Hashmi
Francisco Hung
Ryan Koppes
Laura Lewis
Steve Lustig
Ming Su
Ronald Willey
Rebecca Willits
Qing Zhao

NIH MIRA Early-Stage Investigator Award for Human Organs-on-a-Chip to Improve Drug Toxicity Testing

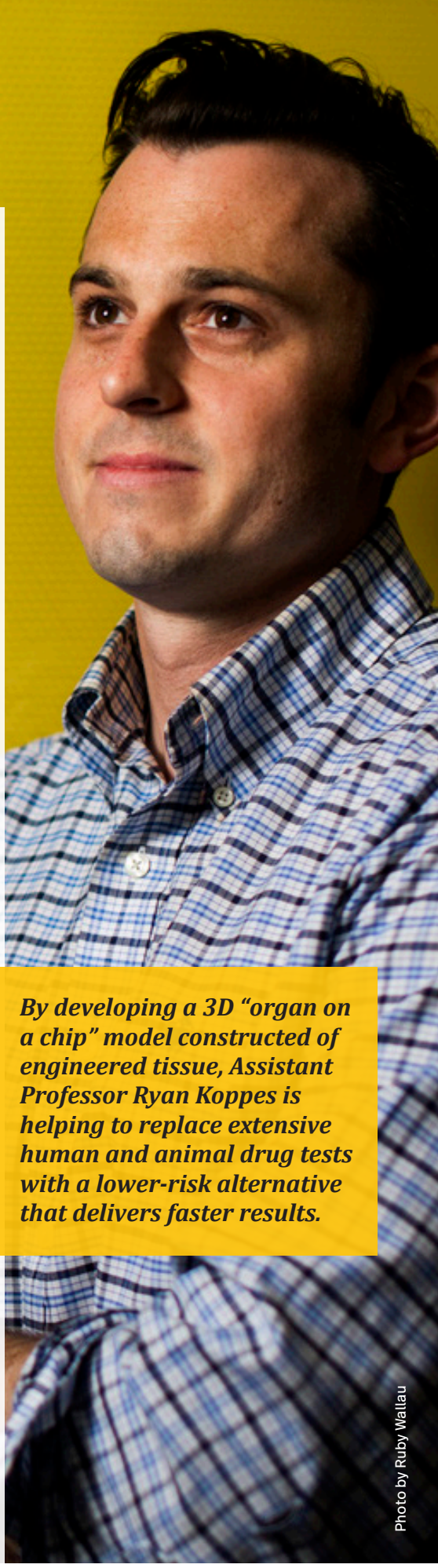
The National Institutes of Health (NIH) has recognized Assistant Professor **Ryan Koppes**, chemical engineering, with a $1.96 million R35 MIRA (Maximizing Investigator's Research Award) Early-Stage Investigator grant, titled "Engineering Multifaceted 3D Human Organ Platforms for Toxicity Testing," to support his groundbreaking work to improve the effectiveness of drug delivery. Given to young faculty members who demonstrate exceptional promise, Early-Stage Investigator awards are part of NIH's Next Generation Researchers Initiative, aimed at promoting the growth, stability, and diversity of the biomedical research workforce.

Koppes will use the NIH funding to develop new benchtop models of the human cardiovascular system from engineered tissue. These 3D models, part of a class of research platforms called "organ on a chip," can be used for various analysis and testing purposes, without relying on human or animal subjects.

In his Laboratory for Neuromodulation and Neuromuscular Repair, Koppes will culture cells and construct in vitro platforms that can be used to replicate the biological effects of administering therapeutic drugs. These tissue-based models—which include all the primary components of the human cardiovascular system—will demonstrate characteristics such as blood flow, oxygen saturation, and bioelectric response. As Koppes simulates different drug delivery methods and dosages, he can assess their impact on human health, without putting actual patients at risk.

"My research is part of a larger effort in the global medical community to deliver more personalized care, recognizing that every human body is unique," explains Koppes. "A specific dose of a therapeutic drug might be well received by one patient. Yet it might cause a rapid heartbeat, or even cardiac arrest, in another patient. My work is aimed at discovering why that happens, so we can arrive at the best possible outcome for every patient."

By developing a 3D model constructed of engineered tissue, Koppes is helping to replace extensive human and animal drug tests—which are time-consuming, expensive, and accompanied by both health and ethical issues—with a lower-risk alternative that delivers faster results. His work is intended to leapfrog current benchtop models, which are only two-dimensional and therefore limited in their ability to replicate blood flows and other physical characteristics of human organs.



By developing a 3D "organ on a chip" model constructed of engineered tissue, Assistant Professor Ryan Koppes is helping to replace extensive human and animal drug tests with a lower-risk alternative that delivers faster results.

Photo by Ruby Wallau

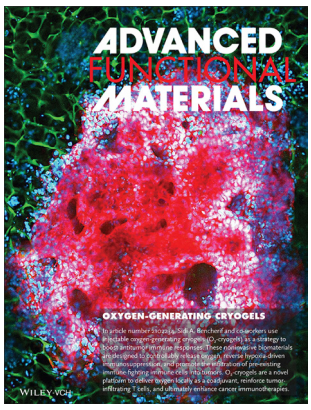
Photo by Matthew Modoono

$2.1M DOE Grant for Novel Magnetic Materials to Address Supply Chains Issues and Enable Green Technology

Distinguished University and Cabot Professor **Laura Lewis**, chemical engineering, and mechanical and industrial engineering, has been awarded a $2.1 million grant from the Department of Energy (DOE) to discover Nature's rules for creation of competitive magnetic materials comprised of non-critical elements. The research is focused on developing new types of strong, permanent magnets that allow the wireless transmission of energy and are used in everything from wind turbines to electric vehicles to cell phones and computers.. These magnets typically contain metals that are very expensive and/or involve geopolitical issues that make refining and distribution of them difficult, and they are a limited resource. Leading this three-year grant, Lewis is collaborating with the University of Delaware, Northeastern University Physics department, and University of Warwick, UK. The team is working from computational, theoretical, and experimental viewpoints to find fundamental recipes to develop magnetic strength at the atomic level using temperature, pressure, and magnetic fields.

Research Featured on Cover of Two Journals

The research of Assistant Professor **Sidi A. Bencherif**, chemical engineering, on "Biomaterials and Oxygen Join Forces to Shape the Immune Response and Boost COVID-19 Vaccines" was featured on the front cover of ***Advanced Science***. Additionally, his research on "Oxygen-Generating Cryogels Restore T-Cell Mediated Cytotoxicity in Hypoxic Tumors" was featured on the cover of ***Advanced Functional Materials***.



I&EC Research 2021 Class of Influential Researchers

Associate Professor **Eno Ebong**, chemical engineering and bioengineering, Assistant Professor **Sidi A. Bencherif**, chemical engineering, and Associate Professor **Richard West**, chemical engineering, were featured on the cover of ***I&EC Research*** as three of 36 scientists recognized as the 2021 Class of Influential Researchers for their research as follows:

Ebong: Regeneration and Assessment of the Endothelial Glycocalyx to Address Cardiovascular Disease

Bencherif: Avian Egg: A Multifaceted Biomaterial for Tissue Engineering

West: Extensive High-Accuracy Thermochemistry and Group Additivity Values for Halocarbon Combustion Modeling

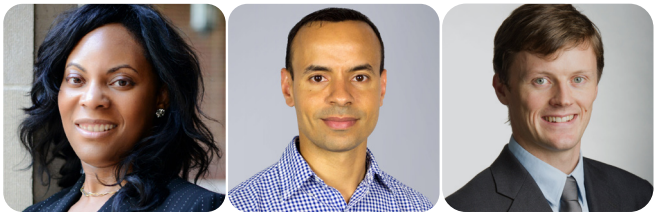


Photo by Adam Glanzman

Developing Women in Engineering Faculty

Abigail Koppes, associate professor of chemical engineering, joined Northeastern as part of the ADVANCE Office of Faculty Development, where she received mentoring and support for a year before becoming a tenured-track assistant professor. Koppes is now an associate professor and has been awarded two patents, an NSF CAREER Award, an NIH Trailblazer New and Early Stage Investigator Award, and the Rita Schaffer Young Investigator Award, among others. Her research focuses on the complex interplay between the nervous and enteric systems, the so-called 'gut-brain' connection. *See the full story by scanning the QR code.*

$2M NASA Grant to Build Long Lasting Neurovascular Model

Associate Professor **Guohao Dai**, bioengineering, and Associate Professor **Abigail Koppes** and Assistant Professor **Ryan Koppes**, both of chemical engineering, received a $2 million grant from NASA, titled "Bioengineer Long-lasting 3D Neurovascular Microphysiological System to Model Chronic Inflammation-mediated Neurodegeneration." They are developing a long-lasting 3D neurovascular model, which would be valuable to evaluate the impact of chronic stressors on the brain, such as drugs, environmental toxins, bacterial/viral infection, inflammation in neurodegeneration, as well as microgravity and radiation in long-term space flight. Current organ/tissue on-a-chip models only last one month, which is inadequate to model chronic diseases.

Photo by Matthew Modoono

AIChE Excellence in Engineering Education Research Award

Teaching Professor **Luke Landherr**, chemical engineering, was selected to receive the 2022 Award for Excellence in Engineering Education Research from the AIChE (American Institute of Chemical Engineers) for their outstanding research on inclusive teaching in chemical engineering through the development of comics, visualization, and modules for novel STEM teaching tools for all-ages education.

Lab Spinouts Selected Finalists in Massachusetts Innovation Network's Competition

QSM Diagnostics, which is a spinout company for the lab of Associate Professor **Edgar Goluch**, chemical engineering, and Syncell Biotechnology, which is a spinout of the research of **David Medina Cruz**, PhD'20, chemical engineering, were selected as finalists for the Massachusetts Innovation Network's innovation competition, The Eddies. The Eddies (formerly known as NE Innovation Awards) is the oldest and longest running innovation competition in New England. QSM Diagnostics, offers pet owner mail-in and in-clinic bacterial testing products that improve the standard of care. Their testing products empower veterinarians and provide peace of mind to dog owners by delivering tests before their visit and simplifying the testing process overall. Syncell Biotechnology is developing nano-therapeutics for the prevention and treatment of skin infections. Their team is developing microbially-synthesized nanomaterials that are disguised as bacterial cells and kill the same bacteria that produced them, like a tiny Trojan Horse. This novel class of nanotechnology-based antimicrobials will also potentially enable a future free of antibiotic resistance.

MASS INNOVATION NETWORK

Best Papers at Annual ASEE Conference

Associate Teaching Professor **Courtney Pfluger**, chemical engineering, won the Best Paper in the Design in Engineering Education Division and the Best Paper in the Professional Interest Council 5 at the 2022 Annual American Society of Engineering Education Conference. Pfluger also received the "2021 Award for Innovation in Chemical Engineering Education" from the American Institute of Chemical Engineers for the development of an immersive, sustainability-focused, global learning experience through an innovative in-country and virtual faculty-led program applying chemical engineering concepts to global issues.

ASEE AMERICAN SOCIETY FOR ENGINEERING EDUCATION

Learn more about our accomplished faculty

Student Successes

SELECTED HIGHLIGHTS

Northeastern's First Churchill Scholar

Photo by Ruby Wallau

Cameron Young, E'22, chemical engineering and biochemistry, has an impressive resume in the field of biomedical research.

As a researcher at prestigious hospitals, and a coauthor of 10 medical-related papers, Young's accomplishments throughout his time at Northeastern earned him the Churchill Scholarship, an award granted to outstanding American students to attend England's Cambridge University. He is the first Northeastern student to receive this scholarship. Young began a one-year master's degree in medical science at the British university in fall 2022.

While at Northeastern, Young completed a co-op at Boston Children's Hospital where he studied a rare condition, Multisystem Inflammatory Syndrome in Children, that almost exclusively affects kids. The condition causes vital organs to become inflamed after exposure to COVID-19. He also worked in cancer research at Mass General Brigham, where he helped develop a device that prevents radiation from reaching healthy tissue during cancer therapy.

As a Churchill Scholar, Young is working with Cancer Research UK, the world's largest independent cancer-research charity. He is analyzing the genetics of a large pool of breast-cancer patients in order to study and catalog different ways that the disease manifests.

Upon completion of his master's at Cambridge, Young plans to attend medical school. Though he's not entirely certain yet what field of medicine he wants to work in, Young thinks he would like to study cancer in children.

"I love working with kids," says Young. "It's so rewarding watching kids recover, and from a medical perspective, kids are more interesting. They're more resilient than adults, and the ways that diseases present themselves are more complex in children."

"Cancer is fascinating because it's such a diverse field," he says. "It's hard to treat and understand, and I'm looking forward to tackling more of these challenges in oncology at Cancer Research UK."

2022 Outstanding Graduate Student Award in Research

Li Jiao, PhD'22, chemical engineering, received 2022 Outstanding Graduate Student Award in Research from Northeastern University for showing an exceptional ability to conduct high-level research and make contributions to the scholarly literature in their fields.

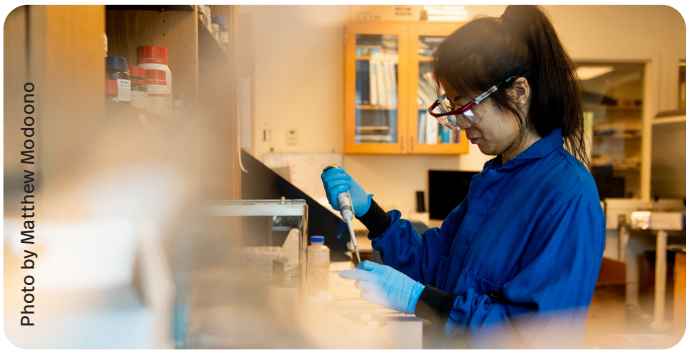


Photo by Matthew Modoono

Selected as Future Leader in Chemical Engineering

Lauren Gerbereux, E'21, chemical engineering, was selected for the 2021 Future Leaders in Chemical Engineering Symposium organized by North Carolina State University. This highly selective research symposium recognizes the finest undergraduate researchers in chemical engineering in the United States. Students are chosen based on academic achievement, research contributions, and apparent potential.

National Science Foundation Graduate Research Fellowship Program Award Recipients

Trinity Cookis, chemical engineering and biochemistry, E'20

Beth DiBiase, chemical engineering and biochemistry, E'21

Owen Porth, chemical engineering and biochemistry, E'20

This prestigious award recognizes and supports outstanding graduate students who have demonstrated the potential to be high achieving scientists and engineers early in their careers.

2022 Hodgkinson Award

Hannah Boyce, E'22, chemical engineering, was named a winner of the Harold D. Hodgkinson Award for 2022, one of the highest honors a senior can receive. While at Northeastern, Boyce did three co-ops, the last one at ETH Zurich in Switzerland conducting research in extracellular vesicles, a new field of drug delivery. She was also president of Northeastern's chapter of the AIChE. She is now pursuing her PhD in chemical engineering at Massachusetts Institute of Technology.

Student Spotlights

Pranali J. Buch, PhD'22

CHEMICAL ENGINEERING

Advised by Edgar Goluch,
Associate Professor of Chemical Engineering

Originally from India, **Pranali Buch** joined the PhD program at Northeastern in the fall of 2017. Prior to graduate school, she worked for bluebird bio in their lentiviral vector process and analytics group as a scientist, and subsequently as a consultant. Her research interest lies in solving drug delivery challenges and developing delivery systems for biological applications.

Buch conceptualized and designed her own doctoral project that was aimed at developing lipid nanoparticles with a poly-(ethylene glycol) (PEG) alternative polymer. Since PEG does not have excellent stealth properties, and anti-PEG antibodies are increasing in the general population, having an alternative polymer with superior stealth properties is beneficial. She demonstrated the functionality of this system in bacterial biofilm infection models. During the process, she published two literature review articles and a results manuscript that is currently in the review process. She also mentored four undergraduate students during her graduate studies and helped them secure Northeastern research awards. In addition, she authored the technical sections of R03 and R21 National Science Foundation grants, and SBIR Phase I grant applications for various projects.

Buch presented her work multiple times at the American Institute of Chemical Engineers and presided over the biomedical sensors oral presentation session at Pittcon in 2019. She has received several recognitions, including the Kanojia Fellowship, a Graduate Thesis Research Grant, Best Teaching Assistant Award, Best Student Seminar Presentation Award, and a Dissertation Completion Fellowship. After graduation, she started working as a drug delivery consultant for a biotech venture in the Boston area.

Ada Vernet-Crua, PhD'22

CHEMICAL ENGINEERING

Advised by Rebecca Willits,
Professor and Chair of Chemical Engineering

Ada Vernet-Crua joined Northeastern in 2018 to complete her master's thesis in nanoscience and nanotechnology in collaboration with Rovira and Virgili University in Spain, where she also completed her bachelor's degree in chemistry in 2017. During those brief six months, she fell in love with the city and the research and decided to join the PhD program in chemical engineering in the fall of 2018.

Vernet-Crua's primary research focused on the discovery of new nanoparticle formulations that could defeat cancer and antimicrobial resistance of antibiotics at the same time, specifically the use of the rare metalloid tellurium to create nanoparticles designed to treat melanoma and skin-derived infections simultaneously. She also dedicated herself to understanding alternative routes to synthesize nanomaterials in order to help reduce the environmental impact in engineering processes. For that reason, she contributed to more than 15 papers, reviews, and book chapters. Vernet-Crua also participated in several national and international conferences, winning the best poster in the American Association for the Advancement of Science, as well as both the innovation and graduate research awards at Northeastern's Research, Innovation, Scholarship, and Entrepreneurship exposition.

During her time at Northeastern, she participated in the graduate co-op program, working at Takeda Pharmaceuticals in Lexington, Massachusetts, where she discovered her passion for bringing the science from the lab to truly help patients around the globe.

Upon graduation, Vernet-Crua joined Replimune in Framingham, Massachusetts, as a scientist in the process development group, helping to design new drugs and optimize processes to bring hope to cancer patients.

Vyshnavi Karra, PhD‘22

CHEMICAL ENGINEERING

Advised by Francisco Hung,
Associate Professor of Chemical Engineering

Vyshnavi (Vy) Karra earned bachelor’s and master’s degrees in chemical engineering from Rutgers University. As a PhD student, she used molecular simulation to model two families of biocompatible nanomaterials. In her first project, Karra developed a coarse-grained model for rosette nanotubes, self-assembled cylindrical structures of molecules composed of guanine and cytosine from DNA. Her model groups four non-hydrogen atoms into a coarse-grained bead with chemical specificity. This model is key to understanding the interactions between rosette nanotubes with cell membranes and biomolecules while simultaneously being able to model larger system sizes for longer times than those accessible to all-atom molecular simulations. Understanding these interactions is relevant to using these nanotubes in drug delivery and molecular sensing.

In her second project, Karra used a combination of all-atom and coarse-grained models to study liposome formulations. These drug-delivery platforms, similar to current COVID vaccines, consist of active pharmaceutical ingredients encapsulated in a lipid nanosphere. Karra aimed to fundamentally understand the mechanical properties of the formulations to develop ultra-deformable liposomes that could squeeze through fibrous tissue and efficiently deliver drugs to treat cancer and human fibrotic diseases.

In 2020, she published the book Necessary Symbiosis: What Happens When Science and Government Work Together (and When They Don’t). In her book, Karra carefully argues that scientists have a duty to fight misinformation and anti-science policies. During her PhD study, Karra also worked as a Chemical Engineering Communication Lab Fellow, offering graduate students peer-to-peer coaching in disseminating their scientific accomplishments. While at Northeastern, she completed a co-op at Novartis and worked as a teaching assistant in several undergraduate and graduate chemical engineering courses. Following her recent graduation, Karra plans to pursue a career as a computational scientist in the private sector.

Northeastern University
Chemical Engineering

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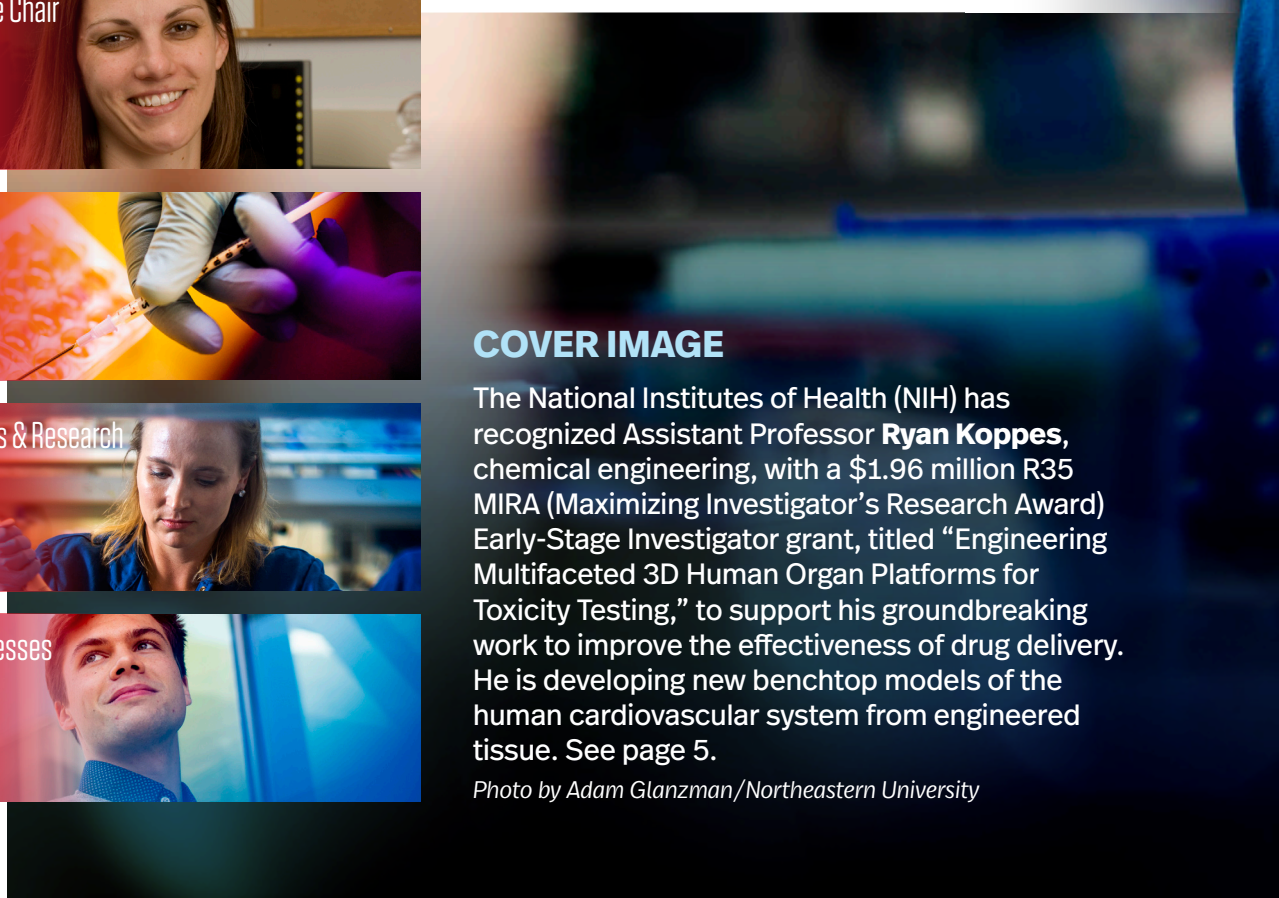

COVER IMAGE

The National Institutes of Health (NIH) has recognized Assistant Professor **Ryan Koppes**, chemical engineering, with a $1.96 million R35 MIRA (Maximizing Investigator's Research Award) Early-Stage Investigator grant, titled "Engineering Multifaceted 3D Human Organ Platforms for Toxicity Testing," to support his groundbreaking work to improve the effectiveness of drug delivery. He is developing new benchtop models of the human cardiovascular system from engineered tissue. See page 5.

Photo by Adam Glanzman/Northeastern University