

DEPARTMENT OF
BIOMEDICAL
ENGINEERING
AT THE UNIVERSITY
OF ROCHESTER

WINTER 2020-2021



UNIVERSITY of
ROCHESTER



ON THE COVER

Students practice social distancing on the steps of Rush Rhees Library. Rochester has adopted a mixture of remote, hybrid, and in-person learning experiences during the pandemic. By adhering to science-based protocols including social distancing, wearing face masks, using hand sanitizer, and checking in with Dr. Chat Bot daily, we have been able to keep COVID-19 cases well within acceptable limits.

contents

| | |
|---------------------------|----|
| Message from the chair | 02 |
| Department news | 04 |
| UR BME COVID-19 response | 04 |
| Celebration 2020 awardees | 8 |
| New appointments | 11 |
| Faculty awards | 12 |
| Student awards | 15 |
| Student awards | 16 |
| Design Day | 20 |
| New funding | 22 |
| Alumni corner | 26 |
| BME centers | 30 |
| Degrees awarded | 31 |

message from the chair

The UR BME department has faced many challenges this year as we all navigated the COVID-19 pandemic. Our BME faculty quickly adapted their courses to hybrid and online learning, we transformed our academic and research environments to enable many COVID safety guidelines, our research laboratories and core facilities are operating under new safety protocols and social distancing, our faculty and staff have adapted to working from home and in new virtual environments, and, above all, our students have shown remarkable dedication, resilience, and perseverance to continue on their academic paths. Our BME students, faculty, and staff have been amazing in response to all of these challenges.

Some of our faculty and students quickly responded to the pandemic and applied their expertise directly towards combating the COVID-19 crisis through their research and project innovation (pages 4-5). Overall, this year our BME faculty members had great success in securing new funding for their ground-breaking research. I invite you to review all the new grants garnered by our faculty from the NIH, NSF, and other agencies on topics spanning the field of biomedical engineering (pages 22-25). Additionally, many of our faculty have developed productive industry partnerships to translate their research advances to commercial products and clinical practice.

This year, we are celebrating the 20th anniversary of the founding of the Department of Biomedical Engineering. While many of our in-person event plans have been placed on hold due to the pandemic, we have focused efforts on strengthening our connection with our alumni, particularly through providing avenues for them to mentor students. Our alumni are an important facet of our department. In the past 20 years, we have built an amazing base of BME alumni that are leaders in a wide variety of successful and exciting career paths. This year we established the new BME Alumni Insight Series, a program wherein we bring alumni back to UR BME to provide a seminar and spend a half day interacting with our students and faculty (pg. 29). The goal of this program is to give our current students the opportunity to learn from the many career journeys and successes of our amazing alumni! I invite you to explore the many different opportunities for alumni and friends to engage with our department and reach out to me for more information (pg. 29).

I'm also pleased to share with you some outstanding honors of our faculty (pages 12-14), students (pages 15-18), and staff (pages 8-12). Professor Scott Seidman was the recipient of the Goergen Award for Excellence in Undergraduate Teaching, the most prestigious teaching honor awarded by the university, for his long-standing excellence in undergraduate teaching, mentoring, and curriculum development in BME. Professor Hani Awad was named the Donald and Mary Clark Distinguished Professor in Orthopaedics, and I was humbled to be installed as the Kevin J. Parker Distinguished Professor in Biomedical Engineering. Our BME Senior Research and Grants Administrator, Bonnie Lipari, was the recipient of the 2020 Hajim Outstanding Staff Award in recognition of her expertise in grants management and the positive impact of her work on our BME research enterprise. Our talented BME students continue to garner many prestigious awards, honors, and fellowships for their academics, research, entrepreneurial activities, and more. Be sure to also review some of our BME students' projects that were presented at the Hajim School Design Day (pages 19-20) which was held in a new, virtual format.

At our 20-year point, we look ahead and invite you to help shape the future of UR BME. We have established three new BME department funds that enable you to have an immediate impact on the mission of the BME department: the BME Undergraduate Program Fund, the BME Graduate Programs Fund, and the BME Research and Innovation Fund (pg. 29). Please consider being a part of our next 20 years by supporting these funds! Your contribution can create academic and research opportunities for students and faculty and have a profound effect on human health and well-being.

I hope that you enjoy reading about all of these updates from Rochester in this issue of the UR BME magazine.

Diane Dalecki

Chair, Department of Biomedical Engineering



bme-affiliated research centers & institutes

Aab Cardiovascular Research Institute
Center for Emerging & Innovative Sciences
Center for Medical Technology and Innovation
Center for Musculoskeletal Research
Center for Oral Biology
Center for Visual Science
Clinical & Translational Science Institute
Institute for Neuroscience
James P. Wilmot Cancer Center
Rochester Center for Biomedical Ultrasound
Center for Advanced Brain Imaging and Neurophysiology

research areas

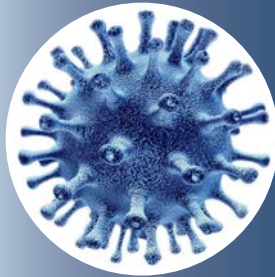
Biomechanics
Biomedical Imaging
Biomedical Optics
Biomedical Ultrasound
Biomedical Nanotechnology
Neuro & Sensory Systems Engineering
Regenerative Medicine
Biomaterials

about this publication

This magazine is an annual publication of the Department of Biomedical Engineering at the University of Rochester. For questions or comments about this issue, or to request a hard copy, please email Diane Dalecki at dalecki@bme.rochester.edu.

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UR BME COVID-19 RESPONSE

In March 2020, as the severity of pandemic became clear, the university made the decision to transition the remainder of the academic year to remote learning. In response, our BME faculty quickly transformed all of our courses to online learning, enabling our students to complete their courses and stay on-track in their curricula. Through the summer, they worked hard to prepare our courses and environment for hybrid learning so that our students could return to campus in the fall and continue on their academic paths. We are enormously proud of all of our students, faculty, and staff for the dedication, resiliency, and perseverance that they have shown this year. As described below, certain members of our UR BME community have even contributed directly to combating the COVID-19 crises through their research and project innovation.



Intubation Box Provides Extra Protection for Caregivers Fighting the Pandemic

For the engineers, this was not only an opportunity to lend support to their medical colleagues on the front lines, but also to “practice what we preach to our students,” says project leader Greg Gdowski, associate professor of biomedical engineering. Gdowski also directs a medical device design program for master’s students.

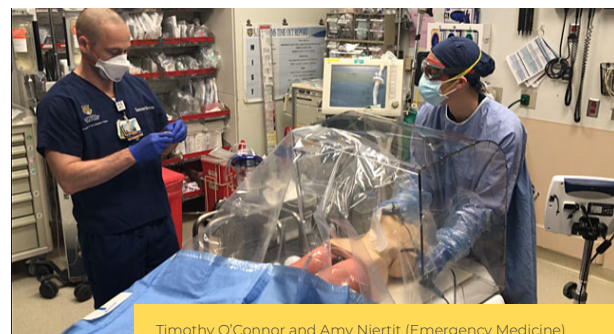
“I will be bringing this up as an example to my students for years to come.”

COVID-19 patients who cannot breathe on their own require ventilator support in order to survive. A tube must be placed through the mouth into the trachea. This procedure – called endotracheal intubation – is one of most dangerous scenarios confronting health care providers fighting on the front lines of the coronavirus pandemic.

Patients often cough during the procedure, which can result in the spread of droplets and aerosols. Even if a doctor or nurse is wearing a face mask, there is a risk of being infected if droplets are not contained. Even when the patient merely breathes, there is a risk that contaminated aerosolized particles will remain suspended in the air. A common practice is to place enclosures over the patient to contain the hazards and protect caregivers. But this can greatly complicate the procedure, especially in emergency room settings where intubation must be done quickly and efficiently.

Determined to tackle this problem, two University of Rochester engineering professors and a machine shop supervisor worked hand in hand with emergency room clinicians at Strong Memorial Hospital to customize an intubation enclosure system that provides an extra safeguard during these procedures. Their “intubation box” encloses patients, and any contaminated particles they have exhaled, yet still allows the clinicians access to perform the lifesaving procedure quickly in the ER.

The intubation boxes were used at Strong Memorial Hospital until they found treatment methods that minimized ventilation usage.



Timothy O'Connor and Amy Niertit (Emergency Medicine) demonstrate use of an intubation box created by engineers at the University of Rochester as a safeguard for treating COVID-19



Scott Seidman, a professor of biomedical engineering (pictured at left), is teaching some courses online and some in person this semester. Colleagues say his expertise in online education has been critical to the department.

Biomedical Engineering Professor Scott Seidman, who mastered online teaching years ago, shares invaluable skills during the pandemic

When the University moved strictly to distance learning last March in response to the COVID-19 pandemic, many professors worried about teaching online courses. Scott Seidman was ready and willing to help.

“We were given a few weeks notice that this might happen,” says Seidman, a professor in the Department of Biomedical Engineering. “I knew what a hurdle the other faculty would be facing, so I emailed our chair (Diane Dalecki) and quoted Liam Neeson in the movie Taken. I told her, ‘I have a particular set of skills.’”

Seidman, a member of the department since its inception 20 years ago, held an orientation for his BME teaching colleagues and introduced them to “tools they had access to that they’d never known about.” The next day, he held a Zoom session for other faculty members in the Hajim School.

“Scott’s expertise and experience in online education was critical to us last semester as we suddenly transitioned to online learning,”

Dalecki says. “His willingness to dive in to share his expertise was truly invaluable and he’s now a recognized leader in the University for online engineering course design and laboratory-based education.”

Seidman’s distance-learning skills were honed five years ago, when he took courses on how to develop online classes at the Warner School of Education. He redesigned BME 150 as a two-credit online course, allowing students to access the simulation on their own time by purchasing inexpensive kits and turning personal desktops into laboratory space. It was the Hajim School’s first online course for credit and one of the few online labs offered anywhere.

“It’s fortuitous that the skills I’ve developed over the past few years really came into play,” Seidman says. “I think staying on top of new educational ideas and methods is super important to keep our value proposition right. We have to keep students interested in coming to universities and think about what we can offer them that they can’t get out of a tidal wave of information that’s overwhelming them.”

BME researchers pursue quick ways to detect COVID-19—and better understand it



Professor James McGrath



Professor Benjamin Miller

McGrath and Miller say their tests could not only help detect COVID-19 in individuals, but also improve understanding of the mechanism by which the disease damages human tissue. The result may lead to new treatments and vaccines.

Professor Benjamin Miller: Finding the virus with optics at the nanoscale

Miller’s lab uses the optical properties of nanostructured materials to create new biosensors and diagnostic tools. The lab is developing tiny sensor chips that use coronavirus proteins to “very quickly” detect the presence of the immunoglobulin G and immunoglobulin M antibodies that humans develop within two days of exposure to the virus.

James McGrath: Using ultrathin membranes to capture and study

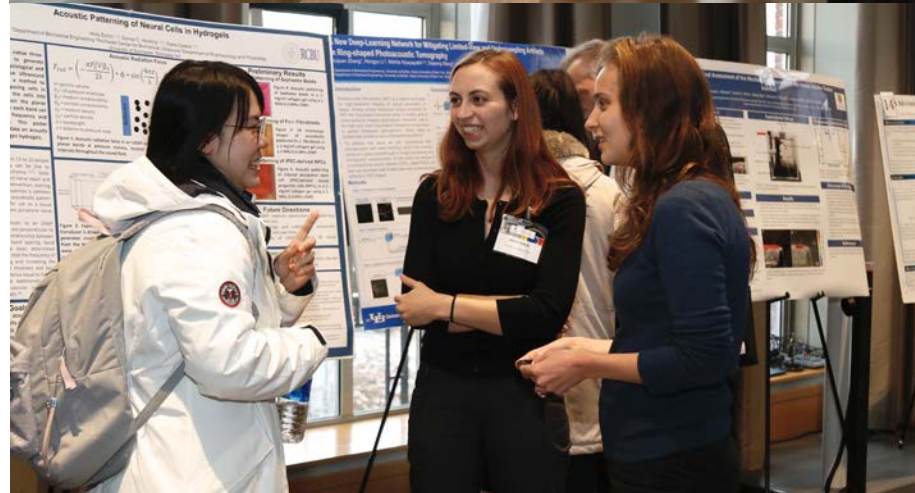
McGrath’s lab will use ultrathin silicon nanomembranes—less than 200 nanometers thick—to test samples of sputum, nasal mucus, or blood, “instantly” determining whether individuals have been infected with COVID-19. The membrane technology, which was developed based on work done in McGrath’s lab, is produced by SiMPore Inc., which McGrath

department news cont.

cofounded. McGrath says his lab can apply the membranes in two ways to address COVID-19: as a sensor and as a platform for discovering pathogenic mechanisms.

“There is an expectation that COVID-19 is going to be a seasonal problem for a while,” says McGrath. “COVID-19 is going to be with us for some time. If we move quickly but deliberately, I think the device could be ready in time to help with the current pandemic.”

University of Rochester hosts 2nd Annual RCBU Biomedical Ultrasound Symposium Day



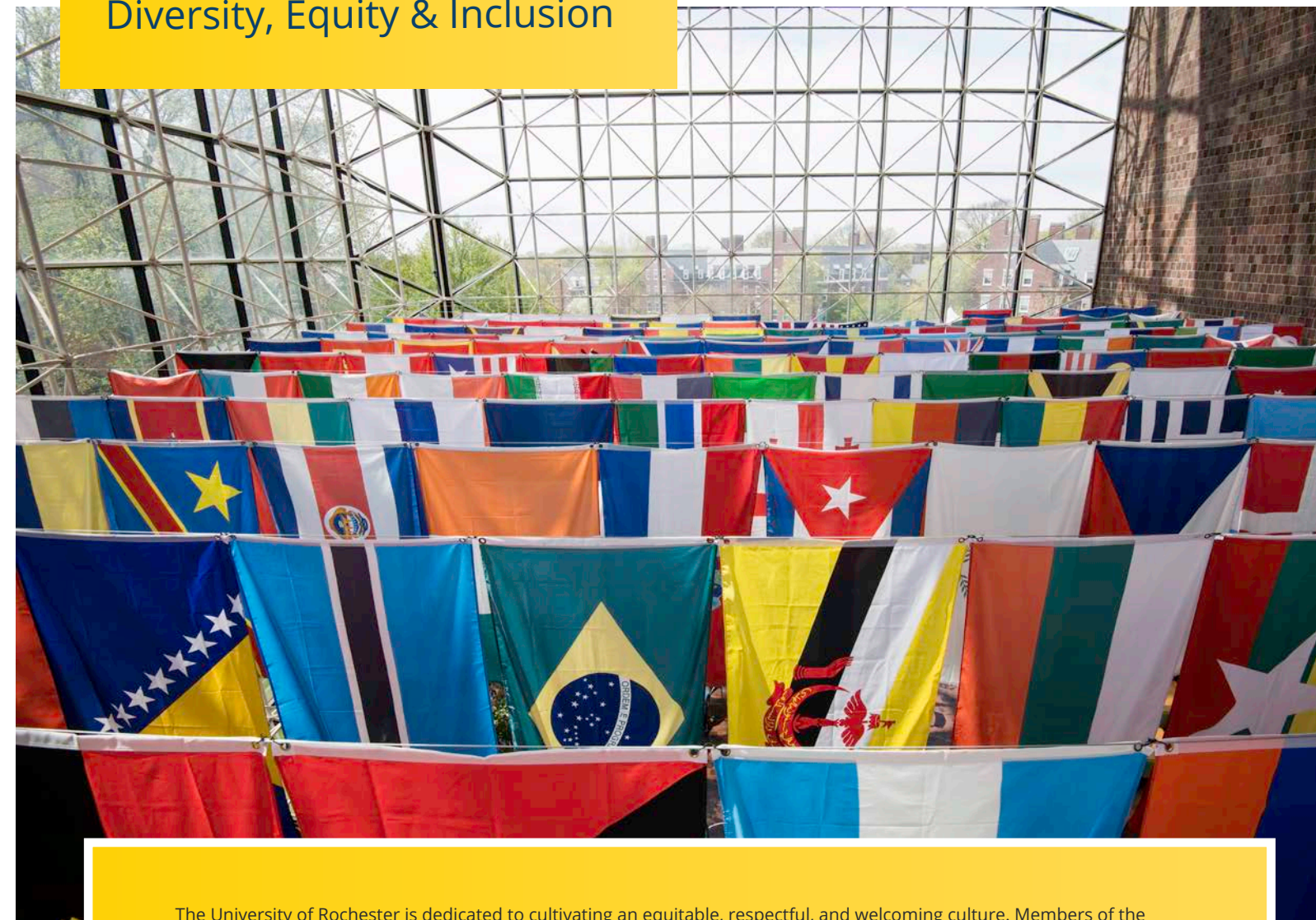
The Rochester Center for Biomedical Ultrasound (RCBU) at the University of Rochester unites scientists, engineers, physicians, and clinicians to advance the use of ultrasound in imaging and therapy. The RCBU Symposium Day is now an annual day devoted to sharing advances in biomedical ultrasound. The symposium is designed to showcase ultrasound research, foster collaborations, and provide a platform for trainees to present their research and connect with scientists, engineers, and clinicians from Rochester, other institutions, and industry partners.

Last year, the symposium featured the Distinguished Edwin L. Carstensen Lecture titled, “Improving Urinary Stone Lithotripsy: One Outgrowth of RCBU Research,” delivered by Michael Bailey Ph.D., Senior Principal Engineer at the Applied Physics Laboratory, and Associate Professor of Mechanical Engineering and Adjunct Associate Professor of Urology at the University of Washington.

Also featured was the Distinguished RCBU Alumni Lecture titled, “Tele-Ultrasound Deployment in Rural Areas of Peru,” delivered by Benjamin Castaneda Aphan, Ph.D., Professor and Chair of Biomedical Engineering, and founder of the Medical Imaging Laboratory, at the Pontificia Universidad Católica del Perú (PUCP). The day’s events also included special lectures, a scientific poster session, lunch and networking.

Support for the RCBU Biomedical Ultrasound Symposium Day is provided in part by the Edwin and Pam Carstensen Family Endowment.

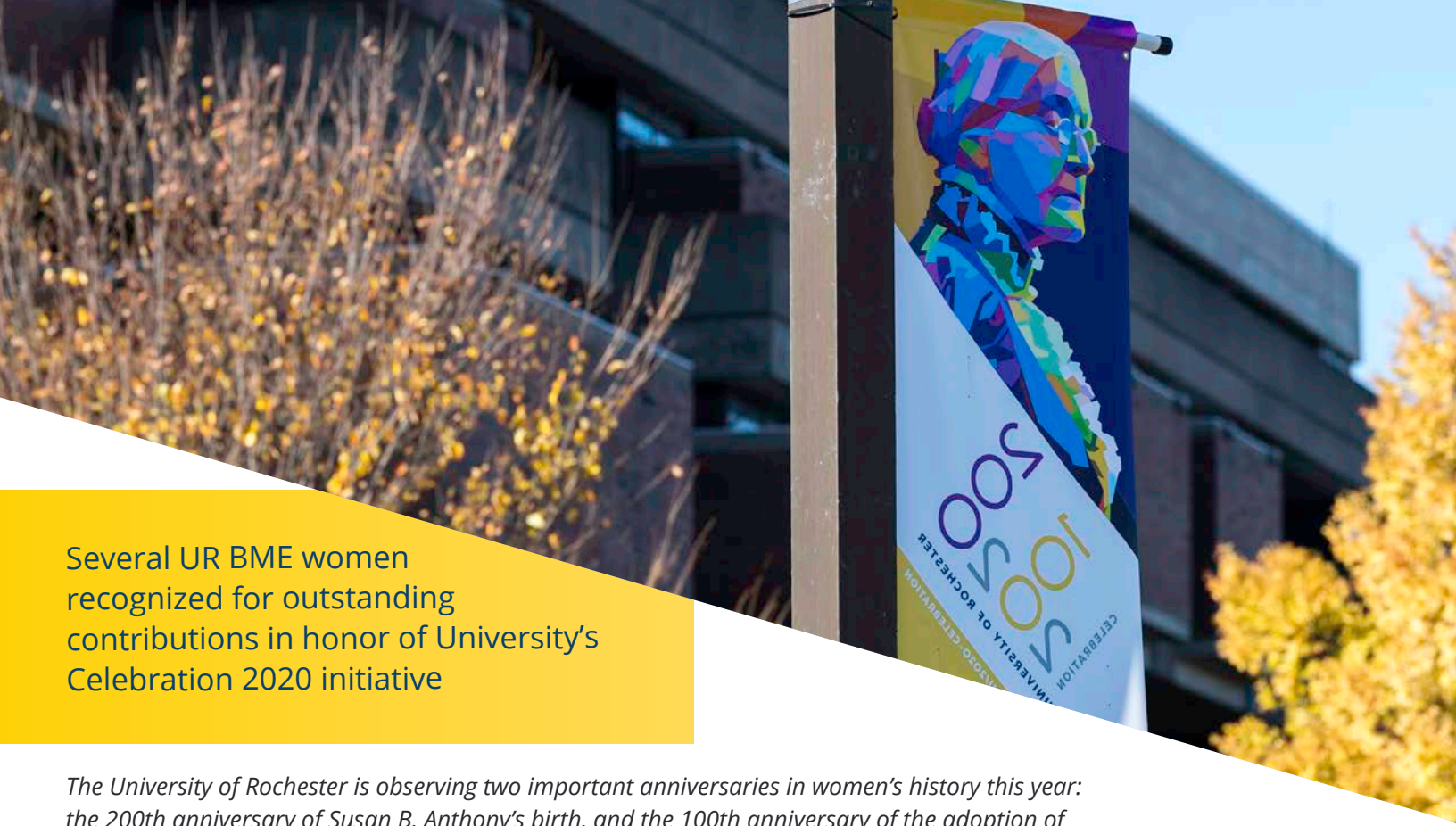
Diversity, Equity & Inclusion



The University of Rochester is dedicated to cultivating an equitable, respectful, and welcoming culture. Members of the University’s community come from different geographical areas, represent differences in ethnicities, religious beliefs, values, socioeconomic backgrounds, and points of view; they may be physically different, have different intellectual interests, or have different abilities. The University not only welcomes such differences in the members of its community but, in fulfilling its own missions and in preparing the leaders of tomorrow’s world who will necessarily be operating in an equally wide-ranging environment, it actively seeks to recruit and include diverse personnel in all aspects of the institution’s operations.

The Department of Biomedical Engineering values and embraces an environment of diversity, equity, and inclusion to advance our research, education, and innovation mission. We are committed to providing a rich and inclusive learning, research, and work environment for all our constituents. Our faculty are dedicated to this mission, and several of our faculty members are leading the way at the university. Professor Amy Lerner was recently recognized with the Presidential Diversity Award for her leadership of the Commission on Women and Gender Equity in Academia. Professors Mark Buckley and Laurel Carney were each honored with the David T. Kearns Faculty Mentoring and Teaching Awards that recognize outstanding faculty members who excel at mentoring and teaching low-income, first-generation, and/or underrepresented minority students. Professor Mark Buckley is also the new URM BME Diversity, Equity, and Inclusion Officer.

Our department has established a new BME Diversity, Equity, and Inclusion Committee dedicated to assessing and continually improving our programs, practices, and environment. Initial efforts of the BME DEI Committee will focus on the following areas: ensuring that all of our students have role models to help them envision their future as a BME, convening focus groups to listen to our constituents, evaluating how best to enhance our student support efforts, increasing representation and participation of diverse groups in our academic and research programs, providing access to appropriate training for all our BME community, and developing a departmental operational approach to foster continual growth and improvement. We are working to advance these areas in concert with exciting efforts underway across university, the Hajim School of Engineering and Applied Sciences, and the UR School of Medicine and Dentistry.



Several UR BME women recognized for outstanding contributions in honor of University's Celebration 2020 initiative

The University of Rochester is observing two important anniversaries in women's history this year: the 200th anniversary of Susan B. Anthony's birth, and the 100th anniversary of the adoption of the 19th Amendment, giving women the right to vote.



Sally Child, MS

Drop by the annual Rochester Center for Biomedical Ultrasound (RCBU) Symposium, and you will invariably hear former students, now pursuing successful careers in academia or industry, sing the praises of the senior lab associate who showed them how to do the experiments necessary for a master's or PhD thesis.

Indeed, "if you talk to anyone around the world about biomedical ultrasound research, or the biological effects of ultrasound, they will know her name," says Diane Dalecki, director of the RCBU and chair of the Department of Biomedical Engineering. And small wonder. Sally Child's name appears on nearly 70 journal articles, including first authorship of "really seminal papers that are important for understanding how sounds interacts with tissues, and the safe use of ultrasound," Dalecki says. That's pretty impressive. Especially when you consider that Child began working at the University in 1965 without knowing "anything about engineering," she says.

Child earned an associate degree in laboratory technology from SUNY Morrisville in June 1965 and was hired that same month to work in the lab of Edwin Carstensen, a young professor of electrical engineering who became a pioneer in the bioeffects of ultrasound and the founding director of the RCBU. Child went on to earn a BS in general science in 1973, and a master's degree in environmental science in 1979, at a time when women rarely participated in engineering research. Child's research partnership with Carstensen lasted for more than 30 years. In 2000, after Carstensen's retirement, Child became senior lab associate for Dalecki, who was Carstensen's last PhD student. During that 52-year span, Child engaged in a wide range of research.

Equally important has been Child's role as a mentor for dozens upon dozens of students -- an increasing number of them women -- who have worked with her in the labs. "She's a great listener," Dalecki says. "But she really wants to teach students the rigorous scientific method and how to be a good scientist. And she was never one to just hide in the lab. She has been a contributor to the department in every way, going to senior design events, pitching in when we need people to help out with special events, and welcoming and interacting with people who are new to the department. She's an important part of our community."



Donna Porcelli

After joining the University in 1976, Donna Porcelli spent 25 years in the Department of Chemical Engineering, working her way up the ranks from secretary to administrative assistant. She handled nearly every aspect of the department's budget and its undergraduate and graduate programs at one time or another. Along the way, she accumulated a wealth of knowledge about departmental procedures and university policies.

So, she was a godsend when she joined the newly formed Department of Biomedical Engineering in 2001. At the time it had a department chair, four brand new junior faculty members, and one other staff person.

"We were all newbies," said Richard Waugh, the department's founder and first chair. "I had never been a department chair, none of the faculty had been faculty before, and Donna was the one who provided us with the guidance and the knowledge it took to really build this department into what it is today."

Initially, Porcelli's duties included administering the graduate program and faculty grants, assisting with the budget, and "pretty much administrating a new faculty search every year -- so basically everything," current chair Diane Dalecki recalled.

Porcelli, who received a University Witmer Award for Distinguished Service in 2017, has had her biggest impact in recent years as the department's graduate program coordinator. That included traveling each year to the BMES annual meeting as part of her efforts to recruit students; tracking master's students, PhD candidates, and postdoctoral fellows every step of the way through their programs; scheduling graduate student committee meetings; and handling graduate student payroll.

Graduate student Christine Massie praised Porcelli for going "above and beyond" in helping her students. "We are constantly going into her office with either really big things, like preparing a defense, or stressing over something little, like how to do a title page. Donna is always there for us."



Dottie Welch

For 13 years, anytime students had a question about undergraduate requirements in the Department of Biomedical Engineering, they would talk to Dottie Welch.

Transferring credits? Students would have the form signed by Dottie Welch. And those red forms listing the classes they just pre-registered for? Students would turn those in to Welch as well. And when stress got them down, or they doubted their ability to keep up with their course load, well, students could go to Dottie for encouragement and advice too.

With her retirement as BME's undergraduate coordinator, that is no longer the case. However, her legacy and commitment lives on after her retirement. Each year, the Hajim School presents an annual Dottie Welch Student Enrichment Award to a Hajim staff member "whose performance and dedication enriches the student experience in the tradition exemplified by Dottie Welch."

Welch began working at the University 26 years ago in electrical and computer engineering. She moved to BME 13 years ago when Waugh was putting together the new department. Now, BME's undergraduate enrollment is more than 300. Welch "was always two steps ahead of me in anticipating what students' needs would be and then carving time out of her own life to make it happen," Waugh said.

The interaction with students by Welch and other BME staffers has paid off. As one PhD student acknowledged in his dissertation, "I could not have endured the stringent requirements of the undergraduate program and the confusing formalities of the graduate program without the help of our program coordinators. Thank you for your constant encouragement and unsurpassed patience."

The interaction with students -- watching them "grow so much from being freshmen to seniors" -- has been the most enjoyable part of her job, Welch says. It is especially rewarding to give encouragement to students who have been struggling, to urge them to stick with it, and then see them accomplish something they never thought possible, such as landing a good job. They return as alumni, and tell her about their families, their promotions, or how they went into industry for a while and then went back to grad school. "It's like watching your own children grow up," Welch said. "It makes you feel like a proud parent."



Danielle Benoit, PhD

"The more time I spend in academia the more amazed I am with how Dr. Benoit manages to keep up with so many things," says Janet Sorrels, now a PhD student at the University of Illinois at Urbana-Champaign.

What is equally impressive is how Danielle Benoit excels at so many things. The professor of biomedical engineering at the University of Rochester is:

- A recognized leader in the field of therapeutic biomaterials for drug delivery and regenerative medicine, with a bevy of honorary awards, 9 patents, and continuous research funding from federal agencies, private foundations, and industries
- An outstanding teacher, who has provided "real" research experiences for more than 80 undergraduates in her lab
- An enthusiastic ambassador for science, who contributes to her community, her University, and her professional field through multiple forms of outreach and service.

And, as if that were not enough, she recently became director of the University's Materials Science Program, which includes over 60 affiliated University faculty members from across the River Campus, Medical Center, and the Laboratory for Laser Energetics.

Benoit's dedication to the success of her students is apparent in her ability to inspire, motivate, and serve as a role model for them. In 2019, Benoit became the second recipient of the College Award for Undergraduate Teaching and Research Mentorship at the University of Rochester. Tim Felong '14, now at the University at Buffalo's Jacobs School of Medicine and Biomedical Sciences, says he especially appreciated the culture of the lab, which was more like a family environment.

"She takes the time to really get to know her students—their interests and hobbies. Danielle suggested that I apply for the Research Initiative Award for Undergraduates, which is much like a grant application," Felong says. "I never would have thought that I had a shot at winning that grant, but I applied and ended up getting it." Benoit, as well as Andrew Shubin '16 (PhD), '18M (MD), the graduate student with whom Benoit paired Felong in her lab, "saw potential in me that I didn't see in myself."

Benoit has gone above and beyond to share her passion for research with the Rochester community. For four years she invited a fourth-grade classroom to her lab for a day of learning and hands-on experimentation. Each year, she holds a lemonade stand at local farmers' markets to raise funds for Alex's Lemonade Stand Foundation and raise awareness of the need for research in childhood cancer.

In collaboration with the Warner School of Education, she brings Rochester City School District science teachers into her lab each summer for hands-on demonstrations and take-home activities for the classroom, with a particular focus on biomaterials and biomaterial-ell interactions.

"Importantly, Professor Benoit always involves the undergraduate students and graduate trainees in her lab in these events," says Diane Dalecki, biomedical engineering department chair. "She is helping to instill the importance of community outreach to the next generation of engineers."



Diane Dalecki earned a bachelor's degree in chemical engineering and master's and PhD degrees in electrical engineering—all at the University of Rochester.

She was mentored by two of its most prominent scientists – Edwin Carstensen, a pioneer in biomedical ultrasound, and Kevin Parker, a pioneer in sonoelastography.

And yet, if you add up all that she has received from the University, it will be at least matched—if not greatly exceeded—by all she has done for the institution in return.

Diane Dalecki, PhD

Now a full professor in the Hajim School of Engineering and Applied Sciences, her novel use of ultrasound for tissue engineering and wound healing is a shining example of the multidisciplinary research made possible by the close proximity of the University's River Campus to its Medical Center. Professor Dalecki is a three-time recipient of outstanding teaching and education awards from the University and its students. She now directs the Rochester Center for Biomedical Ultrasound where she cut her teeth as a graduate student, and is chair of the Department of Biomedical Engineering, which she helped build from the ground up.

So, when Dalecki was installed as the Kevin J. Parker Distinguished Professor in Biomedical Engineering last year, it seemed entirely appropriate that Donald Hall, the Dean of the Faculty of Arts, Sciences & Engineering, would describe her as "Rochester through and through."

Much of Dalecki's early research with Carstensen and Parker, and then with her own lab, involved gaining a better understanding of the interactions between ultrasound and biological systems and helping set standards for safe use. She was the first person in the world, for example, to pace heartbeats with pulsed ultrasound. More recently her lab has explored new therapeutic applications of ultrasound. Together with Denise Hocking, professor of pharmacology and physiology, and an expert in the mechanisms of wound healing, she explores the use of ultrasound for wound healing and to create artificial tissues and organs.

For a wide range of research achievements in ultrasound, Dalecki has been elected a fellow of the American Institute of Medical and Biological Engineering (AIMBE), the Acoustical Society of America, and the American Institute of Ultrasound in Medicine. But with all of her accolades, she remains extraordinarily accessible to her students.

Professor Dalecki has a very warm and welcoming leadership style, says Dean Hall. "Her door is always open to faculty, staff and students."



Each week, Laurel Carney coaches her younger faculty colleagues in how to prepare a successful grant application.

The MaryLou Ingram Professor of Biomedical Engineering at the University of Rochester is eminently qualified to do so.

For example, the first National Institutes of Health grant she received in 1999, "Auditory Processing of Complex Sounds," has been continuously renewed ever since for a total of \$9.2 million. Another, "Developing and Testing Models of the Auditory System With and Without Hearing Loss," has been renewed since 2011 for a total of \$3.2 million.

Laurel Carney, PhD



"Oh, if I could but live another century and see the fruition of all the work for women. There is so much yet to be done."

-Susan B. Anthony

"This is a remarkable achievement, and provides clear testimony to the quality and relevance of her research, and to the high regard and respect that her scientific peers around the world hold for her work," wrote Diane Dalecki, chair of the department, in support of the Hajim Outstanding Faculty Award that Carney received in 2018.

Her research focuses on hearing and hearing loss – specifically, on a better understanding of why the brain in a healthy person can easily distinguish sounds in noisy environments, but has trouble doing so when even a small degree of hearing loss occurs. The answers could hold the key to developing hearing aids that make human speech louder and clearer, by doing a better job of blocking out the background "noise."

In recent years, Carney has expanded her weekly grant mentoring sessions to mid-career faculty members. "These sessions have been wonderful for our faculty and have been a key component for their success in grants funding," Dalecki says.

Students have also benefited from her mentoring and teaching skills. In 2019, she was one of five inaugural recipients of the David T. Kearns Faculty Mentoring and Teaching award for her work with undergraduates who do research in her lab each summer through programs supported by David T. Kearns Center for Leadership and Diversity. Benjamin Richardson '21, a Kearns Summer Research Scholar, said that Carney "exceeded every expectation I could have had for a faculty mentor. It is clear in everything she does that she is not only incredibly passionate about what she studies, but passionate about the success of her students." Students "are instructed to interrupt any presentation in order to ask questions" and "receive consistent and helpful feedback on presentations and analyses we prepare."

In other words, Carney has excelled as both researcher and teacher – a valuable combination indeed. No wonder the department chairs she has served under at Rochester are unstinting in their praise.

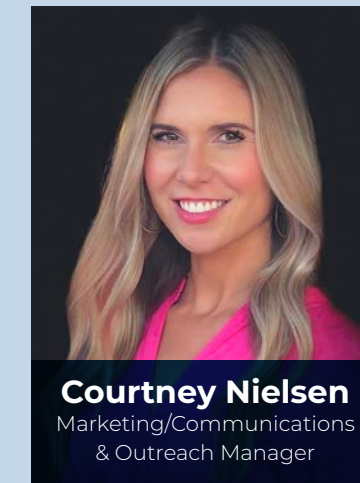
"Laurel contributes to the department and the University in more ways than I can count, as an educator, as a mentor, and in multiple service roles," says Richard Waugh, founding chair of the department of biomedical engineering. "Laurel is simply a fantastic BME faculty member," says Dalecki, "and a treasured member of our University!"

new appointments



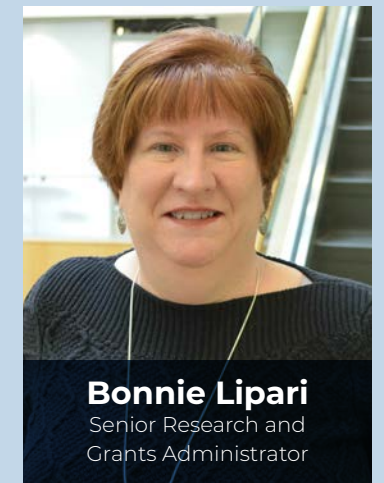
Nancy Gronski
Senior Accountant

Nancy Gronski was promoted within the Department of Biomedical Engineering to the position of Senior Accountant. As Senior Accountant, she is responsible for managing all post award activities for sponsored projects, and operating accounts along with overseeing the department's equipment inventory, and purchasing. A longstanding member of our BME staff, Nancy has been with the department for 18 years.



Courtney Nielsen
Marketing/Communications & Outreach Manager

Courtney Nielsen was promoted to the position of Marketing/Communications & Outreach Manager. Courtney develops and implements the strategic marketing plan for the Department of Biomedical Engineering. Through the development of marketing campaigns, publications, websites, email marketing, social media and other digital platforms, Courtney advances brand identity, enhances visibility of the department's programs and builds relationships with targeted audiences.



Bonnie Lipari
Senior Research and Grants Administrator

Bonnie Lipari was promoted to the position of Senior Research and Grants Administrator. In this role, Bonnie oversees pre- and post-award management of all sponsored projects, including proposal preparation and submission process, budget preparation and guidance to the faculty and staff to ensure compliance with agency and federal requirements. Bonnie started working at the University in 2008 in the Center for Musculoskeletal Research and has been with the BME Department since 2016.

Bonnie Lipari receives 2020 Hajim Outstanding Staff Award

Visit Bonnie Lipari's office in Goergen Hall, and you will see the big whiteboard that she uses to track which faculty members in the Department of Biomedical Engineering are planning to submit grant applications and their progress in submitting the myriad required reports and documents on time.

External funding is critical to sustaining a top tier research institution like the University of Rochester. And key to sustaining the flow of that funding are the unsung heroes like Lipari who create the research documents, budgets and applications for that funding – the departmental research administrators.

No one does this job better than Lipari, the recipient of the 2020 Hajim Outstanding Staff award. Just ask the people who work with Lipari, who has served as the senior faculty research administrator for 21 primary biomedical engineering faculty members since 2016.

"She has brought an 'extra gear' to our ability to apply for and manage grants," says James McGrath, professor of biomedical engineering who has written about 20 applications over the last two years. "We have asked more and more of Bonnie because she is competent, professional, pleasant to work with, and so very reliable. Fortunately for BME, Bonnie also seems inexhaustible."

Adds Laurel Carney, the Marylou Ingram Professor of Biomedical Engineering: "In addition to the familiar grant mechanisms, Bonnie is also undaunted when we toss new and unusual applications at her. A joint application between NSF and the Israeli equivalent? No problem! A collaborative application with colleague in Qatar? No problem! Knowing that she will help wade through the unfamiliar rules and

requirements for novel types of grant applications emboldens us to compete for these awards."

Lipari joined the University as an administrative assistant in the Center for Musculoskeletal Research in 2008, responsible for pre-award management. In 2012 she was promoted to grants administrator for the Center. Then in 2016, she transferred to the Department of Biomedical Engineering and was recently promoted to senior research and grants administrator.

"Under Bonnie's tenure in the department the number of submitted proposals per year has exploded and the success rate of grants in the BME department is now at an historic high," says Carla Boff, the department's lead administrator. "This success can be directly attributable to Bonnie's expertise and professional skills in pre-award submission and post-award management."

Cindy Gary, the Hajim School's assistant dean for grants and contracts – and a fellow recipient of the school's Outstanding Staff Award—says it best: "She is the best pre-award administrator in the Hajim School of Engineering and Applied Sciences and a pleasure to work with. There is no staff member who supports their department better than Bonnie."



Bonnie Lipari, Senior Research and Grants Administrator

Carla Boff, BME Lead Administrator

"Under Bonnie's tenure in the department the number of submitted proposals per year has exploded and the success rate of grants in the BME department is now at an historic high"

faculty awards

Two BME faculty members earn national recognition for excellence in engineering



Professor Marvin Doyley



Professor Benjamin Miller

The institute's College of Fellows is composed of the top 2 percent of medical and biological engineers, who are employed in academia, industry, clinical practice, and government.

Marvin Doyley, professor of electrical and computer engineering with joint appointments in biomedical engineering, and imaging sciences, was selected for "outstanding contributions in developing algorithms for elastography and the application of elastography to vascular mechanics and disease."

Doyley joined the University of Rochester in 2008. His Parametric Imaging Research Laboratory develops novel imaging methods for detecting disease more quickly and for determining how well patients are responding to therapy. Doyley's primary research interests include cardiovascular imaging, breast cancer imaging, ultrasound beamforming, contrast-enhanced ultrasound imaging, ultrasound elastography, magnetic resonance elastography, and pancreatic cancer imaging. Doyley was also one of 20 faculty members nationwide recently selected for the first cohort of the IAspire Leadership

Academy, a program aimed at helping STEM faculty from underrepresented backgrounds ascend to leadership roles at colleges and universities.

Benjamin Miller, the Dean's Professor of Dermatology with joint appointments in biomedical engineering, biochemistry and biophysics, and optics, was selected for "the development and application of versatile optical biosensor platforms, including Arrayed Imaging Reflectometry and integrated photonic sensors."

Diane Dalecki installed as Kevin J. Parker Distinguished Professor

Diane Dalecki was installed as the Kevin J. Parker Distinguished Professor in Biomedical Engineering in a ceremony that also honored the two mentors who most influenced her.

"(Edwin) Carstensen and (Kevin) Parker. Those names are simply giants in the field, and I have been so fortunate to have learned from and worked with them," Dalecki said.

The chair of biomedical engineering was praised as an outstanding researcher, educator and leader during the ceremony, which was presided over by University President Sarah Mangelsdorf and Donald Hall, the Robert L. and Mary L. Sproul Dean of the Faculty of Arts, Sciences & Engineering.

"As the department begins celebrating its 20th anniversary, we can have every confidence that Diane will continue to build the Department into a nationally prominent, internationally known BME program," Hall said.

In addition to serving as BME chair and running her own research lab, which develops novel diagnostic ultrasound techniques and new applications of ultrasound for therapy and tissue engineering, Dalecki leads a robust group of nearly 100 researchers as director of the RCBU. The center includes visiting scientists from across the country and is dedicated to advancing the use of ultrasound in diagnosis and discovering new therapeutic applications of ultrasound in medicine and biology.

The ceremony was held as part of the Rochester Center for Biomedical Ultrasound Symposium Day. Carstensen, a pioneer in biomedical ultrasound, was founding director of the RCBU, followed by Parker and now Dalecki.

The endowed professorship is funded with royalties from blue noise mask, a novel half-tone imaging process that Parker co-invented with then PhD student Theophana Mitsa ('91). The royalties also provided seed money for establishing the Department of Biomedical Engineering.

"It's as if a number of threads are woven together today in this place, in a very wonderful way," said Parker, the William F. May Professor of Engineering and dean emeritus of engineering and applied sciences,

Dalecki, who earned a BS in chemical engineering and master's and PhD degrees in electrical engineering from the University, is "Rochester through and through," Hall said.

Miller, who was also recently named a fellow of the American Association for the Advancement of Science (AAAS), joined the Rochester faculty in 1996. He is focused on two areas of research: how molecules recognize RNA sequences; and how the optical properties of nanomaterials might aid in the development of new biosensors for biological investigations and clinical screenings. The Miller lab hopes to pave the way toward compact, inexpensive biosensors that could replace current floor-standing clinical diagnostic systems with a cell phone-sized device.



Pictured from left to right: Donald Hall, the Robert L. and Mary L. Sproul Dean of the Faculty of Arts, Sciences & Engineering, Diane Dalecki, Kevin J. Parker Distinguished Professor in Biomedical Engineering, Kevin Parker, the William F. May Professor of Engineering, Sarah Mangelsdorf, University of Rochester President

Scott Seidman receives Goergen Award for Excellence in Undergraduate Teaching



Professor Scott Seidman

Professor Scott Seidman was recognized this year with a Goergen Award for Excellence in Undergraduate Teaching. "I'm absolutely humbled by this award," he says.

Seidman came to Rochester after earning his PhD in 1993 from Case Western Reserve University. He began with a seven-year stint as a postdoctoral fellow and senior instructor in the Department of Neurology at the Medical Center. "I was the only person on campus who had a biomedical engineering degree and could teach," he says. "I was hired, and I've been here ever since."

The early days were challenging. "We had no curriculum and had to go looking for resources in the Medical Center and other departments, even borrowing faculty," he says. "The opening of Goergen Hall (in 2007) changed everything. It gave us a high profile right away, and a place to put our students." Seidman played an important role in developing an educational lab in Goergen, strongly advocating for a facility with both wet-lab capabilities and electronics gear at every work station. "This equipment has served at least three courses, and most of it is still in use today," he says.

Seidman is the only BME faculty member to teach physiology, a core subject for majors. "I started with nine students in our first graduating class, and it's up to 75," he says. "I've taught every single student that has ever graduated with a BME degree from this school, and it's been my honor and privilege."

Since 2007, he has worked with colleague Amy Lerner, a 2016 Goergen Award recipient, on coordinating and supervising the year-long BME senior design projects. They link students with outside companies, non-profits, and Medical Center labs to engage them in tackling "real life" problems. "This is the course where students really get to put their whole education together," Seidman says. "They have a customer they need to answer to, and they have to rely on other students—probably for the first time in their careers."

When the University moved strictly to distance learning last March in response to the COVID-19 pandemic, Seidman was instrumental to the transition, helping faculty learn necessary skills and tools for moving their courses online. Seidman's distance-learning skills were honed five years ago, when he took courses on how to develop online classes at the Warner School of Education. He had redesigned BME 150—Interfacing with Microcontrollers—as a two-credit online course, allowing students to access the simulation on their own time by purchasing inexpensive kits and turning personal desktops into laboratory space. It was the Hajim School's first online course for credit and one of the few online labs offered anywhere.

He says a large part of his teaching philosophy is giving students freedom with responsibility. "It can be very empowering for them to know that they don't need to sit in a classroom to learn absolutely everything," he says. "Some things are made for classroom education, but other stuff can really benefit from letting students experience and learn at their own pace. I prefer an asynchronous experience, where students can do the work from their dorm, their home, or two o'clock in the morning if they want."

WHAT HIS PAST STUDENTS ARE SAYING

—Connor Virgile, UR BME'19

"At any point, I felt I could approach Dr. Seidman to ask for advice, whether it related to classwork or not. I felt he respected all his students. Dr. Seidman is a very intelligent, caring, and selfless professor who wants to see all his students succeed."

—Brett Sternfield, UR BME '11, '14 (MS)

"His love for the subject matter and sharing it with students is obvious to anyone who spends two minutes in lecture. What I love most about him is his love for imparting knowledge and for creating a culture of creativity, exploration, critical thinking, and good old fun. When he is speaking with you, you feel like you're the center of his universe."

—Christian Keenan '18, '19 (MS)

"His passion for innovation and scientific education is unparalleled and truly inspiring. I aspire to have his level of dedication to education and kind heart in my career. His skills as an innovator, educator, inspiration to students, mentor, and role-model are unmatched."

Hani Awad named Donald and Mary Clark Distinguished Professor in Orthopaedics



Professor Hani Awad was named the Donald and Mary Clark Distinguished Professor in Orthopaedics. This prestigious honor recognizes and supports Professor Awad's outstanding research in musculoskeletal tissue engineering.

Professor Awad leads a state-of-the-art, productive research laboratory dedicated to advancing tissue engineering and regenerative medicine for musculoskeletal clinical outcomes. He is a Fellow of the American Institute of Medical and Biological Engineering (AIMBE).

"Hani leads a robust laboratory forging new advances in tissue engineering for tendon, cartilage, and bone repair," says Diane Dalecki, chair of the department of biomedical engineering. "Over the years, he has made many important

contributions to the research, teaching, and innovation mission of our BME department. I am delighted that his achievements and successes are recognized with the Donald and Mary Clark Distinguished Professorship."

Established in 1994, this professorship is intended to be used for the support, nurturing, and growth of musculoskeletal research in the Department of Orthopaedics. Dr. Awad joined the Department of Orthopaedics and the Center for Musculoskeletal Research as a Professor in 2020. Prior to this, Dr. Awad held positions as Professor of Biomedical Engineering, of Orthopaedics, and in the Center for Musculoskeletal Research (since 2013). Dr. Awad has been a member of the School of Medicine and Dentistry (SMD) faculty since 2004.

student awards

Daniel Green and Tiffany Nicholas receive Student Life Awards



Daniel Green



Tiffany Nicholas

Daniel Green '20, of biomedical engineering and Tiffany Nicholas '20 (T5) of biomedical engineering are recipients of the University's Student Life Awards (also known as "Rockys").

"The Rockies represent the tremendous effort, talent, and commitment our students have to our University and its community," says Matthew Burns, the College's dean of students. "It's with an enormous sense of sadness and disappointment that we cannot have the gala event in person this year, however, it is as high an honor as ever to reach out to our remarkable Rockies recipients, thank them for all their hard work, and hope that this message finds them safe and well."

Daniel Green '20, BME, who also completed a minor in psychology, was the recipient of the Award for Outstanding Fraternity and Sorority Leadership. This award also recognized significant contributions to the greater campus community. Daniel volunteered at the Child/Adolescent Inpatient Psychiatry Unit at the Medical Center working with patients, as a tutor for a Sigma Phi Epsilon spelling bee competition for disadvantaged city school students, and as a student volunteer-in-training coordinator and teacher for a youth education program at Temple Beth El.

Tiffany Nicholas '20 (T5) of biomedical engineering, who also earned a minor in music, was the recipient of the Percy Dutton Prize, awarded to

a student of the graduating class who has excelled in “wholesome, unselfish, and helpful influence among fellow students.” Tiffany served as a campus tour guide, teaching assistant, orientation leader, communications and graphics assistant, admissions interviewer, peer advisor, tutor, and student alumni ambassador. Her Take 5 topic is Gender Hallmarks and Representation: Using Media to Examine Gender Perception in Society.

Three CMTI teams among winners of University’s Regulatory Science Competition

Three teams of CMTI (Center for Medical Technology & Innovation) master’s students placed well in the University’s annual “America’s Got Regulatory Science Talent” competition, a UR CTSO Regulatory Science Program. Teams proposed a wide range of novel solutions to address nine scientific priority areas outlined in the Food and Drug Administration’s (FDA) Strategic Plan for Advancing Regulatory Science.



Mia Fiacchi, Catherine Krawiec and Anna Olsen present their project at the “America’s Got Regulatory Science Talent” competition.

Second place: JEK Innovations John Lisi, Kale Friesen, Eric Cecco

To facilitate innovations in product manufacturing and quality, we propose developing a national award to incentivize competition between medical device companies, similar to the JD Power Award. The FDA Award for Excellence in Innovative Quality Practices would be presented annually to the top 20 percent of medical device companies based on their innovation and maintenance of high quality standards. The award would boost the reputation of companies that go above and beyond current good manufacturing practices (cGMPs) to prioritize patient care through advances in quality management.

Third place (tie): Food Cam

Mia Fiacchi, Catherine Krawiec, Anna Olsen

Understanding what’s in your food or nutritional supplements can be confusing. Ingredients can have long, complicated names that can confound or scare consumers. To clear up the confusion and help consumers make informed choices at the grocery store, we propose the Food Cam, a mobile app that translates food ingredients while users shop. The app pulls information from the FDA’s Food Additive Status List to present the user with the common name for the ingredient, its purpose and whether it is considered safe to consume. The app will also alert users when a product they have scanned is recalled. Armed with this information, the consumer can make more informed purchasing decisions.

Third place (tie): Inform Empower Labeling Shannon Keenan

According to data from 2013-2016 from the Centers for Disease Control and Prevention, nearly 50% of people in the U.S. had used at least one prescription drug – and 24% had used three or more – in the 30 days prior to polling. With all of that drug use, it could be easy to miss important drug interactions or changes in safety information. To keep patients better informed, I propose to develop a mobile app where users can log their daily prescriptions and get risk and benefit information about those drugs as well as real-time alerts from the FDA any time there is a change in their prescriptions’ safety information.

Alec Salminen takes first place in University Falling Walls Competition



Jessica Goodman, an integrated behavioral health clinician, and Alec Salminen, a PhD student in biomedical engineering, won first place at the Falling Walls Competition

Alec Salminen, who works in the lab of James McGrath, professor of biomedical engineering, took first place and a prize of \$500 at the University’s Falling Walls competition. He also represented the University in the final Falling Walls Lab competition in Berlin, against 99 other presenters from across the globe.

Salminen described how the blood-brain barrier, a strict regulator of transport into and out of the brain, is disrupted early in the onset of sepsis, leading to delirium or drastic changes in cognitive function. “Unfortunately, diagnosing sepsis-associated delirium is subjective and often not viable in many clinical settings,” he said.

He is working on a device that recreates the complex brain microenvironment on an inexpensive microfluidic chip. Combined with batch processing and high content imaging, this system would allow early sepsis detection with a simple blood draw at the bedside “permitting corrective patient intervention before the disease progresses into the devastating multiorgan failure associated with the disease,” Salminen said.

Salminen is the second member of the McGrath lab to win this competition. Kilean Lucas took first place two years ago.

Yara Izhiman receives Dance Citizen Award



Yara Izhiman was presented with the dance citizen award by The University of Rochester Program of Dance and Movement. This award is given to a senior in recognition of their consideration of social justice and social consciousness through coursework, creative endeavors and/or scholarship, and upholding this integrity in the Program of Dance and Movement.

Sofia Guarnieri receives Wells Award



Sofia Guarnieri

Congratulations to Sofia Guarnieri who is among this year’s recipients of the Hajim School Wells Award. This award is given to seniors who are not only majoring in an engineering discipline, but also pursuing majors or minors in the humanities.

“Studying the humanities provides our students with the skills to clearly communicate their ideas with diverse audiences, facilitating multidisciplinary collaborations and generating creative ideas,” says Lisa Norwood, assistant dean of the Hajim School.

“This helps make our graduates well-rounded and socially conscious individuals.”

The University’s open curriculum, with its unique cluster system, gives engineering students greater flexibility to pursue an interest in humanities than they would have otherwise. Guarnieri, for example, is majoring in biomedical engineering, but also earning a minor in Spanish.

“I was in a dual language program in elementary school, taking Spanish since I was five. I wanted to make sure I didn’t lose that once I got to college,” says Guarnieri. She spent a month living with a host family in Ecuador through a Spanish language immersion program offered through the Department of Modern Languages and Cultures, which gave her the opportunity to use her Spanish on a daily basis. Guarnieri, a member of the varsity swim team, also spent a semester studying abroad in Christchurch, New Zealand. In addition to taking a course that counted towards her biomedical engineering major, she also completed “Land Journeys and Ethics.” The final exam consisted of a three-day hike through scenic mountains. “We had to deliver our presentation on top of a mountain. It was amazing,” she says.

As part of her work in the lab of Amy Lerner, she collaborates with engineers and radiologists at the Hospital for Special Surgery in New York City. One focus of the research is to better understand the impact when part of the meniscus is removed, in terms of affecting the contact mechanics of the knee and the risk of developing osteoar-

Steven Spirakis Named to Allstate AFCA Good Works Team



Steven Spirakis, junior placekicker for the Yellowjackets

Football player and BME student Steven Spirakis has been named one of 22 players on the Allstate AFCA Good Works Team which stretches across all NCAA and NAIA Divisions. Spirakis is a junior

HAJIM SCHOOL OF ENGINEERING & BME DEPARTMENT AWARDS

EDWARD PECK CURTIS AWARD FOR EXCELLENCE IN TEACHING BY A GRADUATE STUDENT
Antonio Ladron de Guevara Ruiz, BME 211

G. HAROLD HOOK PRIZE
Tresa Elias

DONALD M. AND JANET C. BARNARD FELLOWSHIP
Christine Massie

MARYLOU INGRAM FELLOWSHIP
Emmanuella Adjei-Sowah
Tresa Elias

DONALD M. BARNARD PRIZE
Arjun Ashok
Jake Gilman
Charles Patterson

NATIONAL ACADEMY OF ENGINEERING GRAND CHALLENGES SCHOLARS PROGRAM
Sara Anis – Provide Access to Clean Water
Ananya Goyal – Engineering Better Medicines
Alistair Kirk – Engineering Better Medicines

BME GRADUATE STUDENT TA AWARD
Raquel Ajalik

BME GRADUATE STUDENT SERVICE AWARD
Raquel Ajalik
Rahul Alenchery

OUTSTANDING BME THESIS AWARD
Alexander Kotelsky

BME FACULTY AWARD FOR UNDERGRADUATE SERVICE
Ananya Goyal

BME FACULTY AWARD FOR EXCELLENCE IN UNDERGRADUATE RESEARCH
Tresa Elias

BME FACULTY AWARD FOR TEACHING ASSISTANT
Robert Breidenstein
Edward Chen

BME OUTSTANDING SENIOR
Gabriel Sarch

BME OUTSTANDING JUNIOR
Sofia Guarnieri

GRADUATE STUDENT AWARDS AND FELLOWSHIPS

NATIONAL SCIENCE FOUNDATION (NSF) GRADUATE RESEARCH FELLOWSHIPS

Raquel Ajalik
Human Tendon-on-Chip Platform for Quantifiable Sensing of Secreted Cytokines in Fibrosis Disease Model
Jeffrey Beard
HIV Viral Loading and CD4 T Cell Counting for Resource-Limited Communities

NATIONAL INSTITUTES OF HEALTH F31

Clyde Overby
Development of Anti-Fouling Peptide Nanoparticle Conjugates for the Delivery of siRNA to Fractures
Lindsay Piraino
Salivary gland tissue chip designed to screen preventative drugs for radiation-induced xerostomia

NATIONAL INSTITUTES OF HEALTH F30

Aditi Misra
Defining the Unique Role of Fibroblasts in Neonatal Cardiac Regeneration

ORTHOPAEDIC RESEARCH SOCIETY ANNUAL MEETING TENDON SECTION PODIUM AWARD

Keshia Mora
Multiaxial and Multiscale Strain Assessment Across the Mouse Achilles Tendon During Passive Dorsiflexion

SOCIETY FOR REPRODUCTIVE INVESTIGATION PRESIDENT'S PRESENTATION AWARD

Stephanie Hollenbach
Fetal Rh Antigen is Present Consistently Throughout Cells in the Maternal Circulation in Early Pregnancy

SOCIETY FOR MATERNAL FETAL MEDICINE BEST POSTER AWARD

Stephanie Hollenbach
Modern Echoes of Historic Institutionalized Racism: Association Between Previously "Redlined" Districts and Current Obstetric Outcomes

BEST STUDENT PAPER AWARD, ACOUSTICAL SOCIETY OF AMERICA

Melinda Vander Horst
Therapeutic effects of ultrasound on dermal wound healing in diabetic mice

CHEMISTRY-BIOLOGY INTERFACE T32 TRAINING GRANT

Alyson March

PULMONARY RESEARCH T32 TRAINING GRANT

Alec Salminen

MICROBIOLOGY & IMMUNOLOGY T32 TRAINING GRANT

Alan Finkelstein

DATA SCIENCE GRADUATE TUITION SCHOLARSHIP

Siladitya Khan

INSIGHT DATA SCIENCE FELLOWSHIP

Manuel Ramirez-Garcia

DEAN'S FELLOWSHIP

Sandra Castillo Aguirre

HOPEMAN FELLOWSHIPS

Andre Palacios Duran

Marlyn Torres

GEM FELLOWSHIP

Andre Palacios Duran

placekicker for the Yellowjackets.

Spirakis, a resident of Garden City, NY, worked with hospitalized pediatric patients and their families at home on Long Island. The major event is a Swim-A-Thon. It has raised nearly half a million dollars since 2005. He and his brother discovered the Child Life Program at Winthrop Hospital and created the Teen Project to provide gifts for hospitalized teenagers who are often overlooked at holiday time. Last year (2019), he worked with the UR Medicine Golisano Children's Hospital on the University of Rochester campus holding a holiday fundraiser.

Antonio Ladron de Guevara Ruiz receives Edward Peck Curtis Award



Antonio Ladro de Guevara Ruiz

Congratulations to graduate student Antonio Ladron de Guevara Ruiz who was awarded the prestigious Edward Peck Curtis Award for Excellence in Teaching by a Graduate Student. Jacob was nominated by Professor Ian Dickerson for his service as a Teaching Assistant for his course, BME211, Cell and Molecular Biology, in the Fall of 2019.

"Antonio was the finest TA I have worked with in 30 years," says Ian Dickerson, associate professor of neuroscience. "He came up with a

unique format for an in-class quiz based on the Quizizz app. Antonio also came up with a weekly cell biology-based meme competition. Antonio encouraged the students to send him memes that reflected the current week's content, and then chose the best to send out in an all-class email. This was a fantastic idea, as the students began trolling cell biology-based websites for clever memes, and 'accidentally' learned a bit of the course material in the process!"

Jacob Kallenbach awarded Wilmot Cancer Institute predoctoral fellowship



Jacob Kallenbach

Congratulations to PhD Candidate Jacob Kallenbach (Chakkalalab), who was awarded a Wilmot Cancer Institute predoctoral fellowship to support his proposal on "Targeting CCR2 to Mitigate the Late Effects of Juvenile Radiation-Induced Skeletal Muscle Decline."

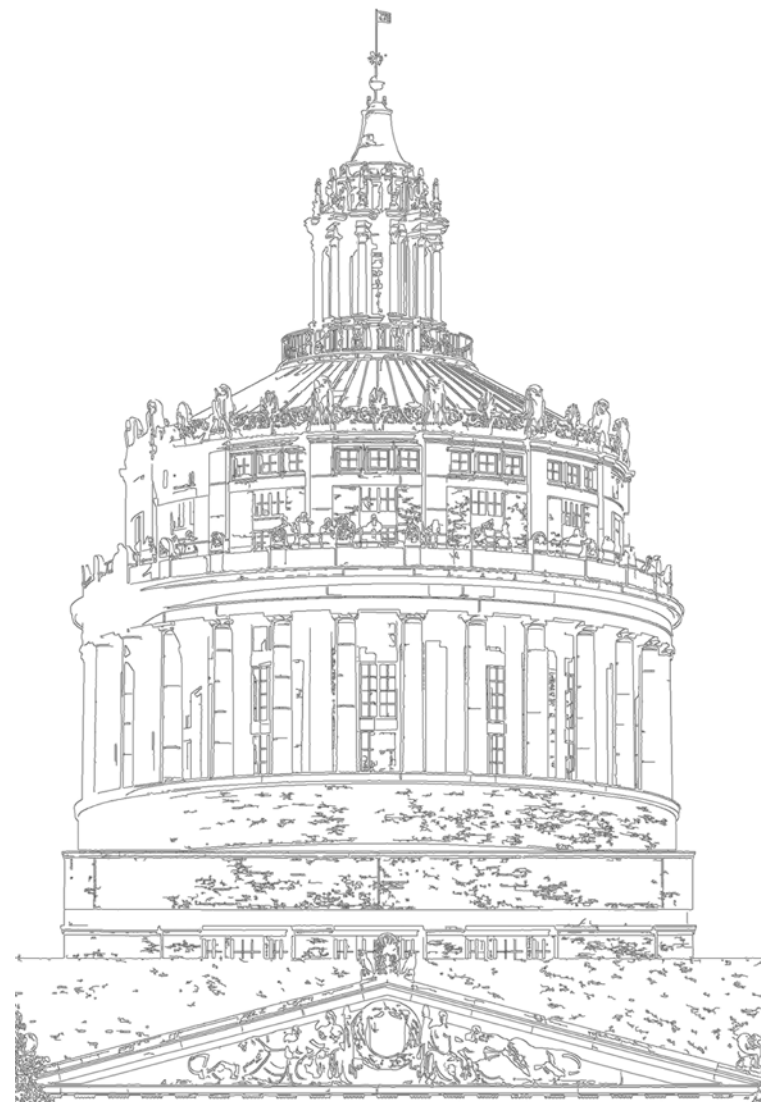
He will investigate how adult survivors of childhood cancers are at an increased risk of diminished physiological musculoskeletal function, which is intricately connected to a survivor's quality of life. The Wilmot Predoctoral Cancer Research Fellowship provides two years of support for Ph.D. or M.D./Ph.D. candidates under the mentorship of a Wilmot Cancer Institute member. The goal of the program is to enable emerging scientists to build an independent career in the investigation of the causes, diagnosis, treatment, prevention, or management of cancer or its side effects.

Help shape the future of UR BME

Thank you for considering giving a gift to the Department of Biomedical Engineering. Your support of the department can create academic and research opportunities for students and faculty and have a profound effect on human health and well-being.

Your contribution to one of the following BME funds will have immediate impact on the mission of the BME department. You may also want to consider becoming a member of the George Eastman Circle and directing your contribution to one of the BME department funds.

To learn more about opportunities for impact on the University of Rochester Department of Biomedical Engineering, please contact Department Chair Diane Dalecki at dalecki@bme.rochester.edu or Associate Director of Advancement Derek Swanson at derek.swanson@rochester.edu (585-273-1341).



BME DEPARTMENT FUNDS

BME Undergraduate Program Fund ([Rochester.edu/giving/bmeundergrad](https://rochester.edu/giving/bmeundergrad))



Supports undergraduate student awards and scholarships, undergraduate student research, travel for undergraduate students to attend scientific conferences, senior design projects, the UR BMES Student Chapter, undergraduate teaching laboratories, undergraduate curriculum development, broadening participation in BME, and new initiatives in undergraduate education.

BME Graduate Programs Fund ([Rochester.edu/giving/bmegrad](https://rochester.edu/giving/bmegrad))



Supports graduate student awards and scholarships, support for student research projects, graduate student professional development activities, travel for graduate students to attend scientific conferences, graduate curriculum development, broadening participation in BME, and new initiatives in graduate education.

BME Research & Innovation Fund ([Rochester.edu/giving/bmeresearch](https://rochester.edu/giving/bmeresearch))



Supports activities associated with advancing BME research and innovation, including pilot funds for new research initiatives, shared instrumentation and core research labs, industry engagement with BME research, and support for innovative design projects and clinical translation.

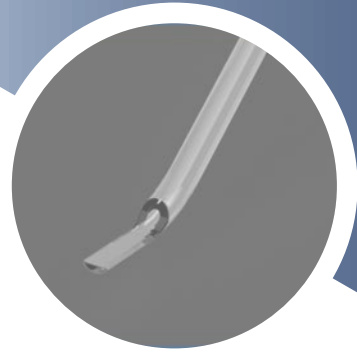
Looking for other ways to give back?

Visit hajim.rochester.edu/bme/alumni/stay-engaged.html to explore various opportunities to stay connected with UR BME!

DESIGN DAY 2020

Each year, biomedical engineering students partner with companies and institutions to solve real-world engineering problems through developing prototype medical devices and research instruments.

We are grateful to our industry partners and collaborators for the opportunity to address their challenges. Their dedication to improving health care has inspired our students to apply, develop and demonstrate their creative talents and engineering expertise.



Meramec Suction-Elevator

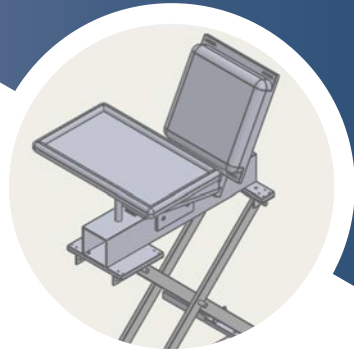
Student Team

Mia Fiacchi
Catherine Krawiec

Supervisors

Dr. Amy Lerner
Dr. Greg Gdowski
Mr. Martin Gira

For spinal surgeons who face difficulty visualizing the nerve root during spinal decompressions, the Meramec suction/elevator is a surgical instrument that combines multiple instrument functions to free surgeons' hands and increase OR efficiency. It combines the functionality and familiarity of existing suction tips and manual elevators with end effector geometry specific to the lumbar nerve roots, reducing the need to switch instruments. This improves OR workflow and increases patient safety.



Spica Chair

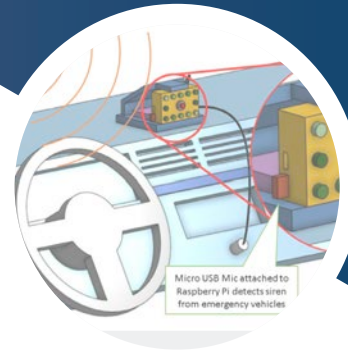
Student Team

Nina Stash
Victoria Bebbler
Cristian Baltier
Orianna Olson

Supervisor

Dr. Catherine Kuo

A chair specifically designed to safely and comfortably sit infants and young children that are immobilized by a cast that spans from the mid abdomen to the ankle, all while allowing proper social and cognitive development. The chair incorporates extra space for the casted torso and legs, as well as multiple aspects of adjustability to fit the wide range of children sizes and to fit under tables of varying heights.



Emergency Vehicle Alert (E.V.A.)

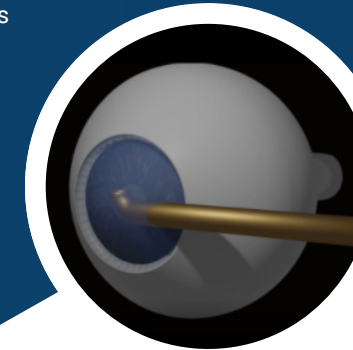
Student Team

Sylvester Benson-Sesay
Phuc Do
Gabriel Sarch

Supervisor

Dr. Ross Maddox

People that are hard of hearing or deaf are three times as likely to be involved in a motor vehicle accident and up to nine times as likely to be seriously injured in the accident (National Academy of Forensic Engineer, 2016). In this project, we developed a device for use in the car that detects emergency vehicles and notifies the driver of their presence in real-time. We trained a convolutional neural network to detect sirens in noisy environments.



Cataract Surgery Device for the Developing World

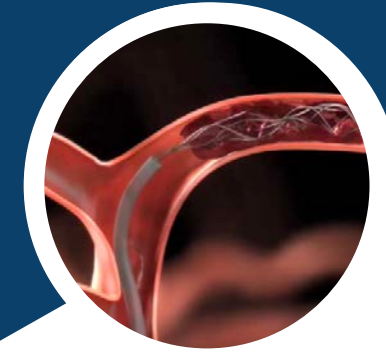
Student Team

Beth Ghyzel
Alistair Kirk
Abdo Sharaf

Supervisor

Dr. Mark Buckley

Cataracts, a hardness and opacifying of the lens, is the leading cause of curable blindness worldwide, with the majority of cases occurring in developing countries where trained ophthalmologists are scarce. Our project is to develop a device to be used for a simplified cataract surgery that will insert a cylindrical intraocular lens into the cataract. By simplifying the procedure, more healthcare providers can be trained to perform the procedure, increasing the accessibility of cataract treatment in developing countries.



BrainFreeze

Student Team

Arjun Ashok
Edward Chen
Bahie Ezzat
Daniel Green
Mathew Izard

Supervisors

Dr. Whasil Lee
Kale Friesen

Current methods of monitoring brain temperature are impractical for use assisting selective brain hypothermia. Direct methods involve the invasion of medical equipment into brain tissue, which adds increased surgical complexity and medical risk to the intervention procedure. Indirect methods avoid invasivity but do not provide the accuracy or precision required for the temperature readout to be of significant use to interventionists. The design goal of BrainFreeze is to, therefore, provide a solution by designing a non-invasive, accurate, and precise brain thermometer to provide key and up-to-date information to the stroke interventionist in the operating room.



A virtual Design Day

Typically, our senior capstone projects are presented during an event that we call Design Day. Due to the pandemic, this year's Design Day was held virtually. Although it was a challenge for students and faculty alike to pivot to remote learning in the midst of these projects, the virtual platform also created opportunities to share these ideas more widely. Visit the Design Day website at www.hajim.rochester.edu/senior-design-day to find the full list of biomedical engineering projects. For more information on a specific project, please contact Amy Lerner at amy.lerner@rochester.edu.

funding news

For information on how to support the research of our BME faculty, please contact Derek Swanson at derek.swanson@rochester.edu or 585.273.1341



Professor Danielle Benoit
Engineered salivary gland tissue chips
Sponsor: National Institutes of Health (NIH)



Professor Jim McGrath
SEA-PUR: A new platform for improved microplastic contamination surveillance
Sponsor: National Science Foundation (NSF)



Professor Anne Luebke
NeuroDataRR. Collaborative Research: Testing the relationship between musical training and enhanced neural coding and perception in noise – Supplement
Sponsor: National Science Foundation (NSF)



Professor Laurel Carney
Auditory processing of complex sounds – Supplement
Sponsor: National Institutes of Health (NIH)



Professor Mark Buckley
Development and validation of high fidelity, patient specific, kidney phantoms for surgical rehearsals
Sponsor: National Institutes of Health (NIH)



Professor Anne Luebke
Effects of music training on auditory processing and high-frequency hearing abilities in adolescent musicians
Sponsor: National Institutes of Health (NIH)



Professor Ed Lalor
Perception and language in autism spectrum disorder: Assessing the role of predictive processing in ASD using electrophysiological modeling of neural responses to natural speech
Sponsor: Simons Foundation



Professor Jim McGrath
Commercializing the μ SIM: A modular platform for the development and analysis of barrier tissue models
Sponsor: SiMPore, Inc.



Professor Danielle Benoit
hiPSC-derived tissue mimetics of the retina blood barrier
Sponsor: National Institutes of Health (NIH)



Professor Jim McGrath
RAPID: Nanomembranes for the rapid detection of SARS-CoV-2 in biofluids
Sponsor: National Science Foundation (NSF)

funding news cont.



Professor Jim McGrath

Manufacturing and validating the commercial μ SiM: An imaging platform for barrier tissue models

Sponsor: Jeff Lawrence Manufacturing Innovation Grant



Professor Mark Buckley

Development of novel endothelial cell assessment

Sponsor: Alcon Laboratories



Professor Jim McGrath

The uSiM-hNVU-a human BBB platform for the study of brain injury mechanisms during systemic infection

Sponsor: National Institutes of Health (NIH)



Professor Anne Luebke

Administrative supplement to CGRP's effect on hearing and balance in a mouse model of migraine

Sponsor: National Institutes of Health (NIH)



Dean Johnson

Novel sheet-membrane dialyzer for wearable hemodialysis

Sponsor: National Institutes of Health (NIH)



Professor Mark Buckley

Diversity supplement to modulation of insertional Achilles tendinopathy by multiaxial mechanical strains

Sponsor: National Institutes of Health (NIH)



Professor Danielle Benoit

Tissue engineering strategies to revitalize allografts

Sponsor: National Institutes of Health (NIH)



Professors Hani Awad & Jim McGrath

A microphysiological system of tendon inflammation and fibrosis for drug screening and efficacy testing

Sponsor: National Institutes of Health (NIH)



alumni corner



"If you think your grades or background is not at par with others applying for the same summer research fellowships, co-ops, internships, jobs, and graduate program as you, still try. You never know what part of your application will resonate with the hiring manager/company or fellowship/academic committee."

Anurag Gupta, Ph.D.

Hometown: Hamburg, New York
Current location: Tewksbury, Massachusetts
Degrees: University of Rochester, B.S. BME, 2007
Roswell Park Cancer Institute / University at Buffalo, Ph.D.,
Molecular and Cellular Biophysics and Biochemistry, 2012
Current position & company: Principal Clinical Scientist, Clinical Development, Samyang Biopharm USA
What you enjoy most about your career? I am able to combine my passion for bringing new innovative medicines/medical devices to the market. I have had the great fortune of contributing translational/clinical and medical imaging data towards FDA approvals and patents in the oncology space.
Why did you pick University of Rochester? I picked the University of Rochester because of the BME program's strong emphasis on instrumentation & medical imaging. Additionally, the moment, I visited the campus, I knew that this is where I was meant to be. It felt like home, even though home was a

mere 85 miles away.
Favorite memory of UR: My favorite academic memory was being selected for a National Science Foundation Fellowship at the University of California, Irvine with the help of my advisor, Dr. Gdowski. On the personal side, my favorite memory is filming a spoof of 24 with my fellow BME classmates in the Robert B. Goergen Hall for Biomedical Engineering and Optics for ADITI's MELA.
Advice for current/future students: My advice is to never say 'No.' If you think your grades or background is not at par with others applying for the same summer research fellowships, co-ops, internships, jobs, and graduate program as you, still try. You never know what part of your application will resonate with the hiring manager/company or fellowship/academic committee. In addition, network with your faculty, peers, alumni, and leaders in the industry you want to join as this will allow you to gauge the types of jobs available and/or help land the type of job you desire. It will also help to define what you want to do after college whether it is graduate school, medical school, business school, law school or working in academia or industry.

Effuah Alleyne



"Utilize your resources! Take the time to understand what the campus offers both academically and socially, on and off campus - meet with your TA's, participate in clubs, visit Eastman School of Music, investigate internships. Engage fully in this experience."

Hometown: Port of Spain, Trinidad and Tobago
Current location: Fort Worth, Texas
Degree: University of Rochester, 2005, BSc. Biomedical Engineering
Current position & company: Senior Analyst, GlobalData
What you enjoy most about your career: I am highly project driven and motivated and love to see the cycle of projects from inception to completion. It gives me joy to go through the steps of interacting with stakeholders, figuring out their requirements and translating it into a tangible product that satisfies their needs. I also enjoy rolling up my sleeves and troubleshooting, finding creative, out of the box solutions with my team.
Why Biomedical Engineering? This degree intertwined my interests at the time in biology and chemistry with the added incentive of learning engineering principles which has made me extremely adaptable in my career paths. I was able to work in construction as a professional electrical engineer working on designs for hospitals, industry spaces and commercial properties in my hometown, before switching gears in the US working in the oil and gas research space. This program gave me solid and transferable knowledge.
Favorite memory of UR: There are so many of them. I really enjoyed my

part-time job on campus working at the coffee cart at Clark. I met so many fellow students across all majors, years, undergraduate, graduate, members of different cultural clubs, sport teams, Greek life. I got to see and experience a large cross-section of campus. Special mention also to the U of R track team that I was also a part of, where we got to travel throughout the division competing.
Advice for current/future students: Utilize your resources! Take the time to understand what the campus offers both academically and socially, on and off campus - meet with your TA's, participate in clubs, visit Eastman School of Music, investigate internships. Engage fully in this experience.



Natalie Mitchell

Hometown: Portland, Maine
Current location: Atlanta, Georgia
Degrees: University of Rochester, BS, Biomedical Engineering, 2013
Georgia Institute of Technology, Master of Biomedical Innovation & Development, 2014
Current position & company: Senior Director of Program & Product Life Cycle Management, Vero Biotech
What you enjoy most about your career: What I love the most is being able to serve

in so many different roles, and to work with a cross functional team on a daily basis. I now interface between the Commercial and R&D teams to drive new product improvements to better serve the end user. This has allowed me to get into the field, interact with the customers, and better understand the unmet needs in our space. I am grateful for the breadth of exposure I've had in my career so far, and am excited to continue exploring. I also enjoy adjunct teaching program management for Georgia Tech's BME masters program. I always enjoyed teaching (TA'd BME 210!) and I am grateful I've been able to stay connected to students and mentoring as my career has progressed.
Favorite memory of UR: Too hard to pick just one! A major favorite was TA'ing for Professor Carney in BME 210 with several other great classmates. During their prep for the lab final, we would set up weekend lab sessions with Beyoncé music videos playing on the projector, and we would teach circuits! This experience really gave me the bug for teaching which drove me to the adjunct work I do with GA Tech now.
Advice for current/future students: Get exposed to as much as possible while you have the resources available to you. Don't ever feel worried about pigeonholing yourself too soon, you're young and a career pivot is not as bad as it sounds!
Hobbies: I love to cook and bake. My favorite cookbooks are from Yotam Ottolenghi (Italian & Mediterranean style). Another big hobby of mine is hiking. I grew up hiking in the Adirondack Mountains, and now spend many weekends in the Appalachian foothills of North GA. Best hiking experience to date however, was during my Honeymoon in Switzerland last fall.
Family: I am married to another U of R BME class of 2013 alumnus, John Nicosia. We got married in September, 2019 and live in Atlanta, GA with our dog Zuko.

Bre Padasak

Hometown: Erie, Pennsylvania
Current location: Salt Lake City, Utah
Degrees: University of Rochester, BS, 2014
Current position & company: Cold Chain Packaging Engineer II, DiscGenics, Inc.
What you enjoy most about your career: As a packaging engineer I get to be creative, interface with end users, and have hands on laboratory and design testing experience. I enjoy the diversity in the types of problems I solve in my career.
Why Biomedical Engineering? Biomedical Engineering has opened doors into the Medical Device and Pharmaceutical tech industries that I didn't know were possible (i.e. packaging).
A Biomedical Engineering education set me up as a desirable candidate who is a team player that can solve problems technically.
Advice for current/future students: Don't be afraid to act/fail. Action will force you to prioritize your options and if you pick the wrong option/fail, you'll learn something in the process. I find brainstorming my goals and thoughts by writing them down helps me think deeper about my options in order to act.
Hobbies: You'll find me outside with another U of R graduate, Jared Hilton, skiing, climbing, bike commuting, backpacking, and exploring the west.



alumni corner cont.

The Department of Biomedical Engineering at the University of Rochester was formally established in July 2000. Since its inception, UR BME has become a premier biomedical engineering department, internationally-recognized for excellence in research, education, and innovation. At our 20-year point, we celebrate the talents of our undergraduate and graduate students, the growth and accomplishments of our faculty, the dedication of our administrative and technical support teams, and the vibrant achievements of our diverse BME alumni! Although the pandemic disrupted our plans for in-person celebrations, we enjoyed engaging with many of our alums virtually! This year, we launched the Alumni Insight Seminar Series which was a tremendous success! We also invited several of our alums who were previously BME 101 TAs to record inspirational videos for our incoming first-year students. These uplifting messages bolstered the spirits of our new BME students embarking on a new school year amid the challenges of COVID-19. We are so grateful for the influence of our wonderful alumni!



UR BME
20years

words of wisdom from UR BME alums to first-year students

TYLER VASQUEZ-DORN

TECHNICAL OPERATIONS SPECIALIST, MEDTRONIC

*"One of the best things that you can take from this BME 101 course is you really get to learn about all of the concentrations, which trust me, you have time to choose which one you want to do, but as you continue to learn about them, you have the opportunity to be able to figure out what sparks your interest. What makes you passionate about BME and how can you make your own impact and your own mark? I think during this first year of your experience, **first and foremost, find your people.** Find those people who are going to be there with you through all of this-your friends that you're really going to lean on when classes are tough, when things are going on in your life. It makes a huge difference and makes the experience so much more enjoyable."*

BREANNA O'REILLY

PHD CANDIDATE AT BOSTON UNIVERSITY

"Believe in yourself. You were admitted to this program for a reason. You are all very smart and very able to do this. There were definitely times in my college experience when I thought maybe I wasn't made out for this or maybe I couldn't do it. But here I am getting my PhD in biomedical engineering and if I can do it, you can do it, even in these crazy times."

ZACK MILSTONE

MD/PHD CANDIDATE, UMASS MEDICAL SCHOOL

*"The most important piece of advice that I can give is **try to learn from everything and everyone that you're going to meet and experience and be a part of over the next few years.** And that doesn't mean that all of your experiences are going to be good. In fact, some of the most important learning experiences that I had were bad experiences. So take the time to reflect on everything you go through...don't be afraid to ask for help and to reach out to the people who are doing the work that you find interesting. And while much of your experience will be virtual, try to connect with everyone in your class and use them as your best resource moving forward."*

KELLY TIGHE

APPLICATIONS ENGINEER AT CURTISS-WRIGHT

*"Some of the best advice I've received and have since been able to use in my own work is: **ask questions and be flexible.** You never know the answer to a question until you ask, and I've gotten a lot of cool opportunities just by saying "yes" when asked to be part of a project. And even though this year is not one that anyone expected it to be, you are going to learn more from your professors, TAs and classmates than you ever thought possible. There is no doubt that you are all going to come out of this experience with unique perspectives that can turn into real problem solving assets later in your careers."*

A special THANK YOU to the following alums who participated in the BME 101 alumni video project!

Tyler Vasquez-Dorn

Chantelle Lim

Dominique James

Anisha Khosla

Spencer Klubben

Zack Milstone

Tiffany Nicholas

John Nicosia

Breanna O'Reilly

Kelly Tighe

Chandler Woo

bme alumni insight series fall 2020



CARL BROWN

SHERLOCK BIOSCIENCE

Engineering DNA: The next revolution in molecular diagnostics



RHIMA COLEMAN

UNIVERSITY OF MICHIGAN

Regulation of stem cell phenotype on both sides of the cell membrane



MATT VESSA

PALISADE HEART

Engineering is a great career choice. Is Psychology better? The power of soft and hard skills in a successful career



DELALI ATTIQBE ATTIPOE

54GENE

Leveraging education, experience, and energy to be a leader of impact



MICHELLE GABRIELE SANDRIAN

FOOD & DRUG ADMINISTRATION

How did I get here? UR BME to FDA CDRH

stay engaged with the BME department

Our BME students' educational experiences and our departmental research and innovation are uniquely enhanced through participation of alumni, industry, and community partners. Please consider one of the following opportunities for alumni engagement and contact Department Chair Diane Dalecki (dalecki@bme.rochester.edu) for more information.

STUDENT PROJECT CUSTOMER

Could your company, laboratory, or clinical practice use a fresh perspective on an engineering problem? Each year, our students partner with companies, researchers, and clinicians to solve problems through developing medical devices and research instruments. Consider being a customer for a student design project.

RESEARCH COLLABORATOR

Collaborate with our world-class faculty in state-of-the-art laboratories to advance research in biomedical engineering. Whether you are in industry, academia, or a healthcare profession, our faculty and students welcome new collaborative opportunities to advance novel research initiatives.

MENTOR A STUDENT AS A "REAL READER"

BME alumni can mentor current engineering students as they develop resumes and cover letters, practice spoken communication skills, and reflect on their career goals. Volunteering as a "Real Reader" for a required course called Communicating Your Professional Identity is a meaningful way to give back without a large time commitment.

INDUSTRY PARTNER

Consider a partnership between your company and our BME department. Industry partnerships can include joint research initiatives, design projects, student internships, and other opportunities of mutual benefit.

TEACHER

Contribute your expertise to our BME courses and educational programs. Your knowledge and perspective can offer new dimensions to our courses, student experiences, projects, and academic programs.

CAREER ADVISOR

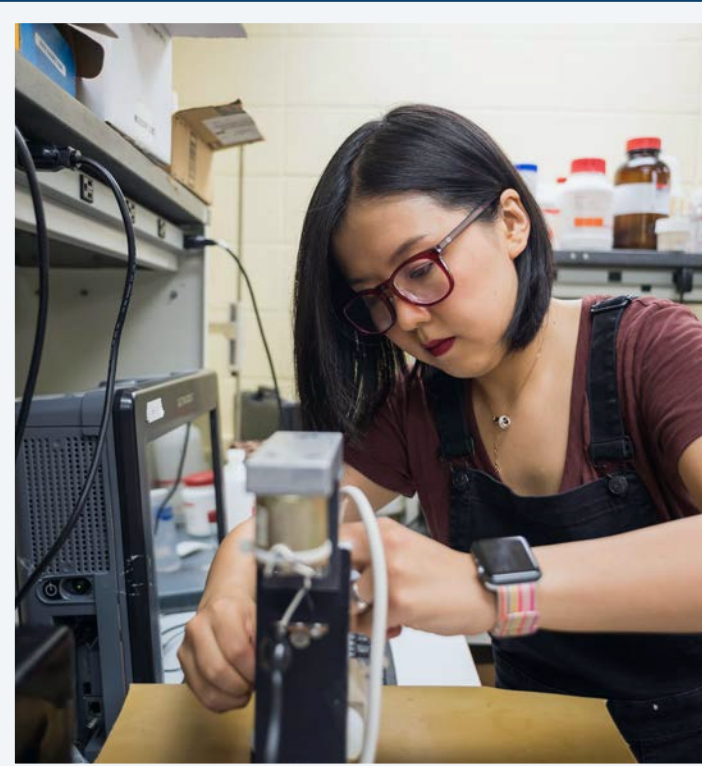
Interested in sharing your experience with the next generation of biomedical engineers? Help BME students navigate the next steps of their careers through one-on-one conversations or participating in a BME Career Conversations session.

DONOR

Support our BME students, research, educational programs through philanthropy.

WE LOVE TO HEAR FROM OUR ALUMS! VISIT [HAJIM. ROCHESTER.EDU/BME/ALUMNI/INDEX.HTML](https://www.rochester.edu/bme/alumni/index.html) TO FIND OPPORTUNITIES TO CONNECT WITH US AND OUR BME STUDENTS!





The Rochester Center for Biomedical Ultrasound (RCBU) was created at the University of Rochester to unite professionals in engineering, medical, and applied science communities at the University of Rochester, Rochester General Hospital, and the Rochester Institute of Technology. Since its founding in 1986, the RCBU has grown over the years to nearly 100 members, with several visiting scientists from locations around the world. The Center provides a unique collaborative environment where researchers can join together to investigate the use of high frequency sound waves in medical diagnosis and therapy. Its mission encompasses research, education and innovation.

research

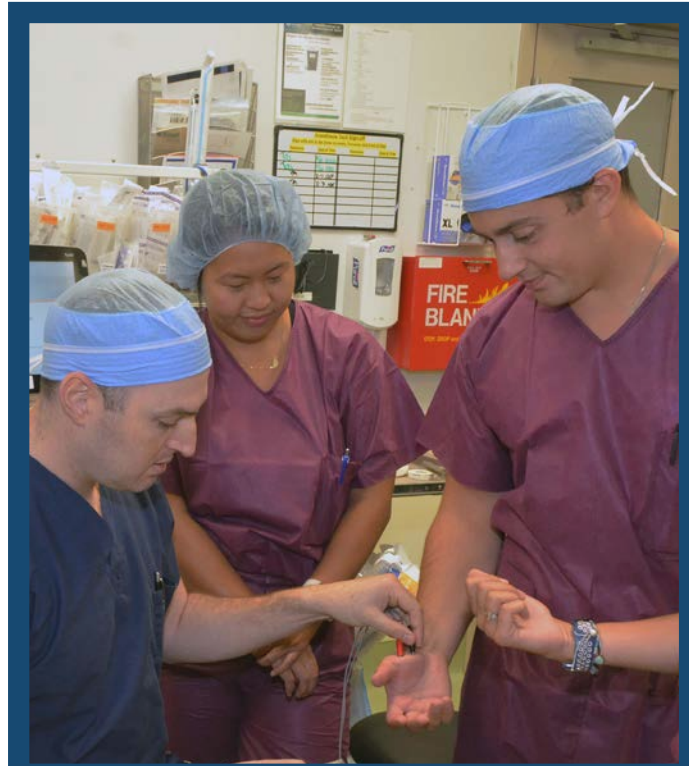
education

innovation



Interested in the RCBU?

Contact RCBU Director Diane Dalecki at dalecki@bme.rochester.edu or visit rochester.edu/rcbu to learn more and request a copy of the RCBU Annual Report.



The Center for Medical Technology & Innovation offers a one-year masters degree in biomedical engineering specializing in medical device design. The program involves a 2-semester guided process in medical technology innovation and an 8-week clinical immersion program in clinical and surgical settings. One of the program's strengths is its close proximity to Strong Memorial Hospital, the largest hospital in Upstate New York. The CMTI is less than a 5 minute walk from the medical center, making it easy to interact with our clinician colleagues.

What you'll learn

- Identify and evaluate unmet clinical needs
- Work with surgeons for concept design
- Market and intellectual property assessment
- FDA regulatory processes and quality systems
- Design and execute prototype tests
- Prototype clinical needs into scientifically proven concepts

Ready to learn more?

Visit cmti.rochester.edu for more information or to apply. Scholarships are available! Contact our team at cmti@ur.rochester.edu



Degrees Awarded

Dear BME Alumni,
Whether it's been a long time since BME 101 or just a few short years, I would be delighted to hear from you. Please keep me posted on all your successes!

Best,

Diane Dalecki,
Chair of BME
dalecki@bme.rochester.edu

For more information on applying to one of our graduate programs, please contact us at 585.275.3891. To learn more about biomedical engineering at the University of Rochester, visit www.bme.rochester.edu and follow us on Facebook.

MS

December 2019

Syed Danial Ahmad
Farhin Ahmed
Jeffrey Beard
Vincent Ralph Ching-Roa
Kosha Dholakia
Holly Eyrich
Antonio Ladron de Guevara Ruiz
Eleni Patelaki
Shafaqat Rahman
Edgar Rodriguez
Tong Shan
Baixue Xiao
Ming Yan
Thomas Stoll

May 2020

Siladitya Khan
Molly McCloskey

August 2020

Zhimo Li
Julia Waltermire

Center for Medical Technology and Innovation (CMTI) MS

August 2019

Nancy Bansbach
Jennifer Beahan
Eric Cecco
Samuel Charpentier
Molly Ferris
Mia Fiacchi
Kale Friesen
Jacques Kouevi
Shannon Keenan

Catherine Krawiec
John Lisi
Luke McConnaghy
Erin Minervini
Huy Nam Nguyen
Manikanta (Datta) Nori
Anna Olsen
Kimberly Richards

PhD

March 2020

Alexander Kotelsky

"Elucidating the Factors that Govern Vulnerability of In situ Articular Chondrocytes to Mechanical Loading"

May 2020

Langchen (Elsie) Fan

"Physiological Studies of Binaural Tone-in-Noise"

Manuel Alejandro Ramirez Garcia

"Engineering Approaches to Elucidate the Causes of Endothelial and Stromal Corneal Conditions"

Talat Jabeen

"Investigating Modulation of Organ of Corti Micromechanics by Outer Hair Cell Electromotility"

CONNECT WITH US

Any questions or comments about this publication or our programs? Interested in getting involved with UR BME? A former student just wanting to say hi? We would love to hear from you.



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