FALL 2025 BIOMEDICAL ENGINEERING

Creating a Culture that Encourages Tech Transfer

University programs guide students on the path toward commercialization.

FULL STORY, p. 12

CASE WESTERN RESERVE UNIVERSITY | *Biomedical Engineering Alliance* | Cleveland Clinic

FALL 2025

IN THIS ISSUE

The Biomedical Engineering Alliance

at Case Western Reserve University and Cleveland Clinic

FROM THE CHAIRS

Researchers in the Biomedical Engineering Alliance between Case Western Reserve University and Cleveland Clinic work tirelessly every day on projects related to biomaterials, biomedical imaging, neural engineering and rehabilitation, immunoengineering, biomechanics, artificial intelligence and more. You can read about several studies that have landed grants this year to move the needle on groundbreaking projects in our Faculty Highlights on page 4. No matter the focus, the end goal of a lot of the research we conduct is to help clinicians better serve patients and make a difference in the lives of people through technology translation.

The BME Alliance is committed to tech transfer. In this issue, we cover several Case Western Reserve University programs that guide students and researchers on the path toward commercialization. The article on page 12 discusses the Three Minute Thesis competition, the Translational Fellows Program and the I-Corps@NCATS program.

These programs have sparked an interest in entrepreneurship and paved the way for startups and product commercialization. Brecken Blackburn, a former Translational Fellow and current research professor in biomedical engineering, co-founded two companies that are developing biomedical optics devices – Lighthanded Enterprises and North Coast Photonics. She understands the value of translational programs and support.

"It's very likely that by having more trainees get experience thinking about, finding and communicating with commercial partners, a lot more of the wonderful research that happens through the BME Alliance will result in collaborations to bring technology out into the real world," says Blackburn.

As chair of Case Western Reserve University's Department of Biomedical Engineering for nearly 14 years, I've witnessed firsthand the remarkable accomplishments of our students and faculty at both the university and Cleveland Clinic. In January, I will step down as chair. (You can read more about that on page 8.) But my colleague and co-author of this message, Geoff Vince, along with my successor as chair will continue to lead the BME Alliance as it makes strides in biomedical engineering research, training and education. And I will remain active as a professor and researcher at the university. I'm proud to have helped launch this newsletter nearly a decade ago, and it will continue to shed light on our achievements.

Robert F. Kirsch

Allen H. and Constance T. Ford Professor and Chair of Biomedical Engineering

Case Western Reserve University

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Geoffrey Vince

The Virginia Lois Kennedy Endowed Chair in Biomedical Engineering and Applied Therapeutics

Lerner Research Institute
Cleveland Clinic

@DGeoffreyVince

GRADUATE AND RESEARCH UPDATES

Doctoral Candidate Wins Epilepsy Research Award

Nrupen Pakalapati, a doctoral candidate in biomedical engineering at Case Western Reserve University and researcher in the Neural Engineering Center (NEC), won the American Epilepsy Society's 2025 Grass Foundation Young Investigator Award. Pakalapati's abstract, entitled "Single White Matter Electrode for Bilateral Epileptic Activity Detection and Monitoring," was one of eight selected for the award from a pool of more than 1,500 submissions. The groundbreaking research, conducted under the supervision of Dominique Durand, director of the NEC and the Elmer Lincoln Lindseth Professor in Biomedical Engineering, pioneers a more efficient and less invasive method for monitoring epileptic seizures.

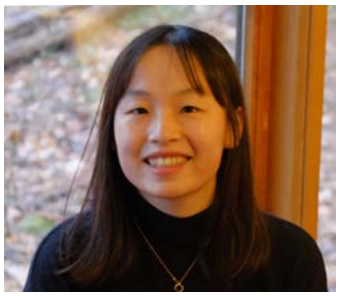
PhD Student Wins Trainee Professional Development Award

Jonah Mudge, a doctoral candidate in biomedical engineering at Case Western Reserve University, won the Society for Neuroscience's 2025 Trainee Professional Development Award. The award is given to applicants who have demonstrated commitment to rigorous scientific inquiry and dedication to local advocacy and outreach efforts in neuroscience. Mudge is a student in Assistant Professor Emily Graczyk's lab, where he characterizes proprioceptive percepts in people with upper limb loss who have been implanted with composite flat interface nerve electrodes (C-FINEs). "Jonah is excited to make connections and broaden his understanding of proprioception with the support of this award," says Graczyk.

Grad Student Lands on "20 in Their 20s" List

Thomas DeSilvio, a doctoral candidate in biomedical engineering at Case Western Reserve University, was included in the *Crain's Cleveland Business* 2025 list of "20 in Their 20s" for his commitment to advancing the frontiers of medical imaging and computer vision by developing state-of-the-art deep learning tools for computer-aided diagnosis and detection, disease characterization and treatment evaluation. DeSilvio is a member of several labs and centers, including the Imaging Informatics for Interventions (INVent) Lab and the Center for AI Enabling Discovery in Disease Biology (AID2B). He was recently awarded the National Cancer Institute's Ruth L. Kirschstein National Research Service Award (NRSA) for Individual Predoctoral Fellows (F31) for his project entitled, "Pathologically Interpretable Computational Imaging Predictor for Response to Total Neoadjuvant Treatment in Rectal Cancers."

Spring Graduate Honored as Finalist for ISMRM Young Investigator Award



Yuran Zhu, who earned her PhD in biomedical engineering at Case Western Reserve University in June, was one of eight finalists selected by the International Society for Magnetic Resonance in Medicine for its 2025 Young Investigator Award. Her recognized work, "3D MR Fingerprinting for Dynamic Contrast-Enhanced Imaging of Whole Mouse Brain", enables quantitative assessment of solute transport and clearance across the entire mouse brain. The research was conducted as part of her dissertation project in the lab of Xin Yu, the F. Alex Nason Professor II of Biomedical Engineering. In July, Zhu joined Nudge as a research scientist, where she is developing technologies for MRI-guided brain interfacing.

Dual-Degree Student Awarded NHLBI Training Fellowship

Prerna Singh, an MD/PhD candidate in biomedical engineering at Case Western Reserve University, was awarded the Ruth L. Kirschstein National Research Service Award (NRSA) Individual Fellowship for Predoctoral Dual-Degree Training Programs (F30) Fellowship from the National Heart, Lung, and Blood Institute (NHLBI). Singh's research aims to improve early detection of heart disease using deep learning to automatically detect small, low-density coronary artery calcifications below the current detection thresholds in CT calcium exam scores.

"These tiny calcifications are linked to vulnerable plaques, which can cause heart attacks, especially in younger individuals," says Singh, who works in the lab of Dave Wilson, the Robert J. Herbold Professor of Biomedical Engineering and Radiology. "Identifying these small calcifications can improve early heart disease detection and guide precision preventative therapies, with the ultimate goal of reducing deaths from heart disease."

Post-Doctoral Researcher Attends Microneurography Workshop

Rohit Bose, a post-doctoral researcher in the Department of Biomedical Engineering at Case Western Reserve University, won an award from Linkoping University in Sweden to attend its microneurography workshop. Bose conducts research in Assistant Professor Emily Graczyk's laboratory, where his main focus is developing innovative invasive and noninvasive technologies to deliver meaningful sensory feedback to individuals with prostheses. During the workshop, Bose learned how to implement a new technique recording from nerves with tiny electrodes.

PhD Student Wins Poster Competition

Cedric Levi, a doctoral candidate in biomedical engineering at Case Western Reserve University, won the outstanding poster award at the university's third annual Graduate and Medical Student Research Day in October. The poster, entitled "Suppressing Electric-Field Coupled Epileptiform Activity," presented research on medial-temporal lobe epilepsy conducted by Levi at the Neural Engineering Center (NEC). Building upon prior studies that show epileptic activity can propagate non-synaptically across tissue cuts via electric field (EF) coupling, Levi used a "Faraday cage" concept using perforated, 20um thick conductive metal films to short-circuit this field and block EF-coupled propagation in hippocampal mouse slices. Levi is mentored by Dominique Durand, director of the NEC and the Elmer Lincoln Lindseth Professor in Biomedical Engineering.

FACULTY & STAFF HIGHLIGHTS

Jay L. Alberts

Jay L. Alberts, the Edward F. and Barbara A. Bell Family Endowed Chair, Lerner Research Institute, Department of Biomedical Engineering, received the Parkinson's Foundation 2025 Trailblazer Award for his project utilizing artificial intelligence to realize the value of skin biopsy phosphorylated alpha-synuclein in early diagnosis of Parkinson's disease. "The project will, for the first time, combine explainable AI models developed from the electronic health record to identify and evaluate a scalable approach to screening for Parkinson's disease," says Alberts. He also was awarded $665,118 in funding from the National Institutes of Health to study neural mechanisms underlying the benefits of aerobic exercise in advanced Parkinson's disease.

Suneel Apte

Suneel Apte, staff, Lerner Research Institute, Department of Biomedical Engineering, received a $2.2 million, five-year award from the National Institute of Arthritis and Musculoskeletal and Skin Disease for his project, "Degradomics of proteolytic mechanisms in post-traumatic osteoarthritis."

James Basilion

Visano Theranostics Inc. received an award from the Ohio Third Frontier Technology Validation and Start-up Fund to commercialize a new imaging approach to guide prostate biopsies. The approach uses gas-filled nanobubbles that attach to a protein found on prostate cancer cells to mark dubious tissue during ultrasounds, enabling providers to see tumors more clearly in real time and increase biopsy accuracy. The company's leadership team includes James Basilion, professor of biomedical engineering at Case Western Reserve University and a member of the CWRU Center for Imaging Research (CCIR), and Agata Exner, professor of biomedical engineering and CCIR director.

Richard Burgess

Richard Burgess, MD, adjunct professor of biomedical engineering at Case Western Reserve University, received the 2025 Legacy Award from the American Clinical Magnetoencephalography Society. The award recognizes clinicians and researchers who have shaped the field of clinical magnetoencephalography (MEG). Dr. Burgess, who specializes in epilepsy neurology at Cleveland Clinic, was responsible for bringing the first MEG system for assessing normal and abnormal brain function to the healthcare system in 2008. He now conducts assessments of more patients with complicated epilepsy than at any other center.

Margot Damaser

Margot Damaser, staff, Lerner Research Institute, Department of Biomedical Engineering, received a five-year grant from the National Institutes of Health. The project, "Matrix regenerative nanotherapeutic platform for pelvic organ prolapse," will receive $688,436 in funding. The goal of the research is to slow pelvic organ prolapse (POP) progression by treating early-stage POP with the lab's novel elastogenic functionalized nanomaterial drug complexes.

Emily Graczyk

Emily Graczyk, assistant professor in the Department of Biomedical Engineering at Case Western Reserve University, was awarded $9.9 million in funding from the Congressionally Directed Medical Research Program (CDMRP) Peer Reviewed Medical Research Program (PRMRP). The study will feature a randomized controlled trial of 12 people with upper limb loss using an implanted neuroprosthesis to restore intuitive control and sensation to advanced hand prostheses. "Participants will use the neuroprosthesis at home for up to 12 months, and we will track functional, psychosocial and pain outcomes," says Graczyk.

Graczyk's lab also performed the first implant of the Bionic Breast neuroprosthesis in May. The aim of the Bionic Breast is to restore sensation and mitigate pain for women who have undergone mastectomies due to breast cancer.

Will Grissom

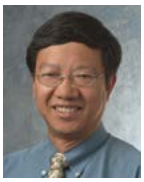
Will Grissom, Medtronic Professor of Biomedical Discovery and Innovation in the Case School of Medicine and professor in the Department of Biomedical Engineering, gave the Lopez Lecture at the September Council Meeting of the National Institute of Biomedical Imaging and Bioengineering (NIBIB). The lecture is presented annually by a distinguished scientist who exhibits the same high level of professional performance as its namesake, a former director of NIBIB's ultrasound imaging program who died in 2014. Grissom, who was chosen for his extensive background in developing novel MRI and focused ultrasound technologies, discussed his group's research, unsolved technical challenges in the field and how MRI and ultrasound may evolve over the next decade.

Umut Gurkan

Umut Gurkan, the Wilbert J. Austin Professor of Engineering at Case Western Reserve University, has received accolades for his groundbreaking contributions to the field of biomechanics and bioengineering. The American Society of Mechanical Engineers awarded Gurkan the 2025 Savio L-Y. Woo Translational Biomechanics Award for his work translating scientific discoveries into practical, life-saving diagnostic tools for underserved populations. Gurkan developed an easy-to-use screening device that revolutionizes diagnosis of sickle cell disease, which is now commercially available as Gazelle by Hemex Health.

The Association for Clinical and Translational Science also named Gurkan one of its Translational Science Award recipients earlier this year for development of the diagnostic tool, which has been deployed in more than 44 countries, screening over 1.5 million babies and children for sickle cell disease and other hemoglobin disorders.

Gurkan also has published several articles recently, including an article in *Nature Communications* on monitoring cellular adhesion in blood samples. The article presents work on motion blur microscopy and machine learning-based image analysis to study cell interactions in microfluidic channels during whole blood flow. In addition, Gurkan co-authored a publication by the National Academies of Sciences, Engineering, and Medicine exploring strategies for fostering ethical and effective scientific leadership in research environments, as well as an opinion piece in *The Scientist* urging academia to measure success by societal contributions, translation to practice and partnerships with industry and policymakers.



Zheng-Rong Lu

Zheng-Rong Lu, faculty director in the Case School of Engineering and M. Frank and Margaret Domiter Rudy Professor of Biomedical Engineering, was elected as a fellow of the International Society for Magnetic Resonance in Medicine (ISMRM) for his outstanding and pioneering work in small targeted MRI contrast agents that enable clinical translatable high-resolution molecular MRI of cancer. In addition, the PET tracer developed in Lu's lab received Investigational New Drug approval for clinical trials from the U.S. Food and Drug Administration.

Luke Osborn

Luke Osborn, assistant professor in the Department of Biomedical Engineering at Case Western Reserve University, was part of a team that was granted a patent in June for a prosthetic arm that includes thermotactile stimulation devices to provide sensations of temperature and touch back to the user. The patent stems from development of a thin film thermoelectric device that can rapidly provide thermal stimulation to the skin of an individual with arm amputation, which is perceived as a cooling sensation in the missing hand. (An article on the device entitled, "Evoking natural thermal perceptions using a thin-film thermoelectric device with high cooling power density and speed" was published in the August 2024 issue of *Nature Biomedical Engineering*.) Other patent authors include colleagues at the Johns Hopkins University Applied Physics Laboratory, where Osborn worked as a senior researcher prior to joining Case Western Reserve University.

Andrew Rollins

Lighthanded Enterprises, a startup company that developed a laser otoscope to diagnose middle ear infections more accurately, was awarded a Small Business Innovation Research (SBIR) grant from the National Institutes of Health to further develop the technology. Researchers from Case Western Reserve University's Department of Biomedical Engineering who contributed to the project include Andrew Rollins, the Leonard Case Jr. Professor of Engineering and a member of the CWRU Center for Imaging Research (CCIR); Brecken Blackburn, research assistant professor and a CCIR member; and Matthew Mcpheeters, post-doctoral scholar. Cleveland Clinic will lead a pilot study on the laser otoscope conducted by Brandon Hopkins, MD, a pediatric otolaryngologist.

Andrew Shoffstall

Andrew Shoffstall, Nord Distinguished Associate Professor in the Department of Biomedical Engineering at Case Western Reserve University, published an article in a September issue of *Nature Communications*. The article, entitled "Dexamethasone-loaded platelet-inspired nanoparticles improve intracortical microelectrode recording performance," discusses the impact of new platelet-inspired therapy to improve the long-term recording performance of implanted brain-machine interface intracortical microelectrodes. The work was funded by the Department of Veterans Affairs and performed in partnership with Haima Therapeutics, a startup company founded by Anirban Sen Gupta, the Wallace A. Persons Professor in Case's Department of Biomedical Engineering. Jeff Capadona, the Donnell Institute Professor of Biomedical Engineering and vice provost of innovation at Case Western Reserve University, was also a co-investigator.

Nicholas Ziats

Nicholas Ziats, associate professor in the Department of Biomedical Engineering at Case Western Reserve University and professor of pathology and anatomy in the School of Medicine, won the Society For Biomaterials' 2025 Founders Award. The award, which is the highest honor bestowed by the society, recognizes landmark contributions to the discipline of biomaterials and significant service to the Society For Biomaterials (SFB). A member of SFB since 1988, Ziats has conducted fundamental studies in biomaterials research that have impacted the use and analysis of clinically used biomaterials for more than 30 years.

"It is important to recognize the breadth of Nick's work covering many disciplines, including cell biology, immunology, cancer, heart disease, neural disease and wound healing, and how his studies – along with his many colleagues and collaborators – have impacted the field of biomaterials at the local, regional, national and international levels," says James M. Anderson, MD, Distinguished University Professor of Pathology, Macromolecular Science and Biomedical Engineering at Case Western Reserve University.

Robert Kirsch receives the Paul B. Magnuson Award from Steven Lieberman, Acting Undersecretary for Health for VHA; Carolyn Clancy, Assistant Undersecretary for Health for Discovery, Education and Affiliate Networks for VHA; and Grant Huang, Acting Chief Research and Development Officer for VHA.

Photo courtesy of Cleveland FES Center

Robert Kirsch

Robert Kirsch, the Allen H. and Constance T. Ford Professor and Chair of Biomedical Engineering at Case Western Reserve University, received the Paul B. Magnuson Award for Outstanding Achievement in Rehabilitation Research and Development. The award, which is the Department of Veterans Affairs' highest honor for rehabilitation investigators, was presented at VA headquarters as part of the 2025 National VA Research Week in May.

Kirsch, who also serves as Executive Director of the Cleveland Functional Electrical Stimulation (FES) Center, was honored for his work on restoration of arm movements using FES to veterans and individuals with complete paralysis due to spinal cord injury and other neurological disorders, as well as high-performance user command interfaces and advanced prosthetics user interfaces. "Our veterans and all research participants are the true pioneers," says Kirsch. "Their selflessness makes all this work possible."

Longtime Leader of BME Department to Step Down

Robert Kirsch will retire as chair but remain active within the department and university

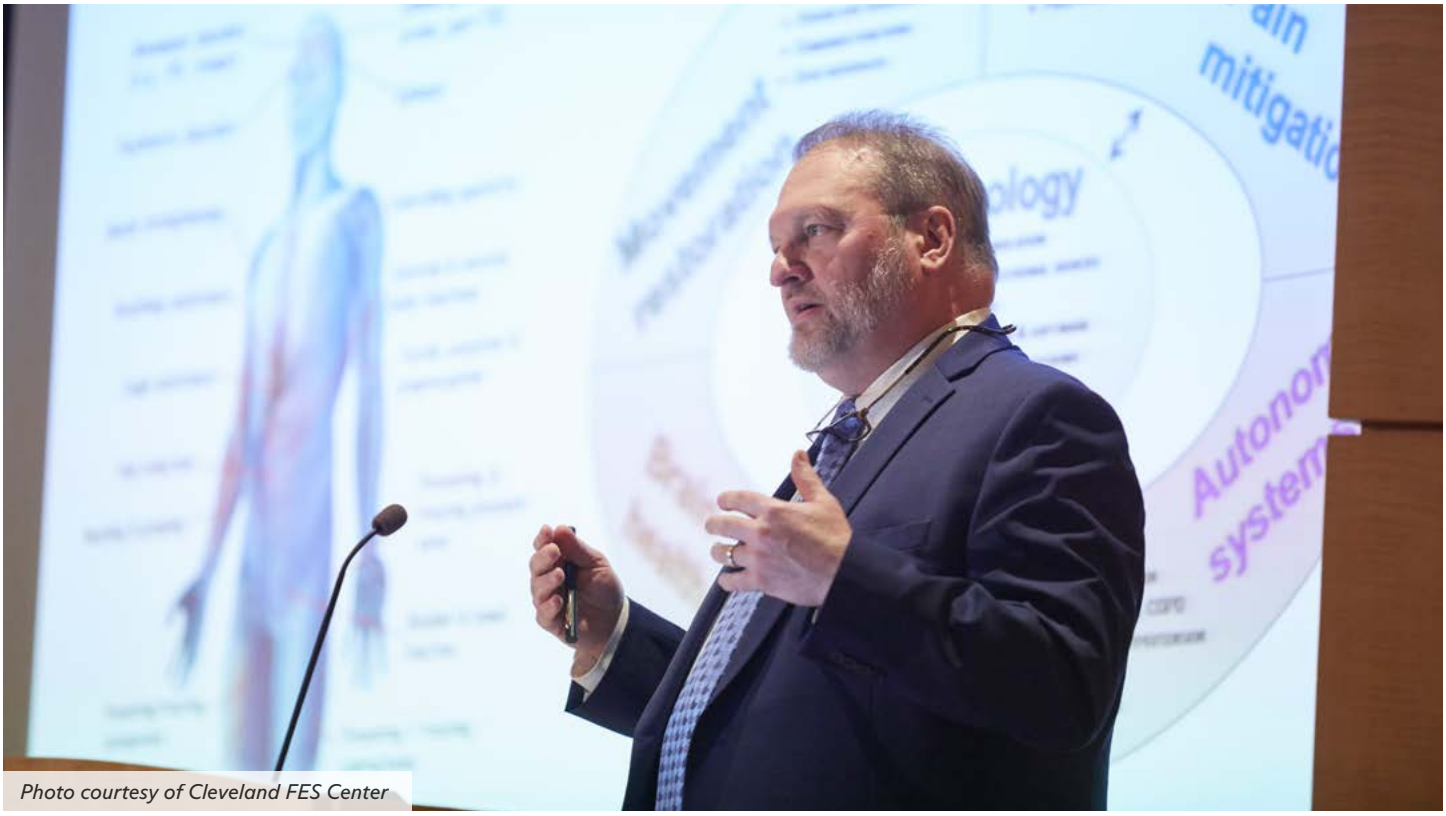


Photo courtesy of Cleveland FES Center

Robert Kirsch will step down as chair of Case Western Reserve University's Department of Biomedical Engineering on Jan. 1, 2026, after 14 years of leadership.

"That's an unprecedented length of time as chair – the longest in biomedical engineering history at Case," says Kirsch, who will continue as the Allen H. and Constance T. Ford Professor. "I joked with one of the deans that I feel a bit like Queen Elizabeth."

While Kirsch's reign doesn't begin to approach Queen Elizabeth's 70-plus year monarchy, 60% of the department faculty were hired during his tenure as chair and the faculty has grown to 36 members. But more important than the increase in numbers is the camaraderie and cohesiveness he's instilled in the department.

"With no hyperbole, Bob cares about the well-being and success of every member of the department," says A. Bolu Ajiboye, the Robert and Brenda Aiken Professor of Biomedical Engineering and one of Kirsch's research collaborators. "He has furthered a culture where others feel ownership of the department and hence invest in the department's overall successes and not just that of their own labs."

> I am honored to have been chair of the department. We have amazing faculty, a strong student population and nationally prominent research labs and translational research programs."
>
> **- Robert Kirsch**
>
> *Allen H. and Constance T. Ford Professor of Biomedical Engineering*

Leading a Nationally Renowned BME Program

Kirsch joined Case as a research faculty member in 1996 after completing post-doctoral research at McGill University. He was appointed to the primary faculty in 1999, then became interim chair of the Department of Biomedical Engineering in 2012 when his predecessor, Jeffrey Duerk, was named dean of the Case School of Engineering. In 2013, Kirsch accepted the position of permanent chair.

"I am honored to have been chair of the department," says Kirsch. "We have amazing faculty, a strong student population and nationally prominent research labs and translational research programs."

Through the years, Kirsch has attained numerous professional achievements. He was named a Fellow of the American Institute for Medical and Biological Engineering (AIMBE) in 2009. Kirsch served as chair of the national BMES Council of Chairs (CoC) in 2017 and hosted the CoC's Education Summit at Case Western Reserve University in 2019. He contributed to 90 publications and advised 19 doctoral students.

Eric Perreault, vice president for research at Northwestern University and professor of biomedical engineering and physical medicine and rehabilitation, was the first PhD student Kirsch mentored.

"Bob was terrific at creating opportunities for me and other students, helping us grow throughout our time in his lab. This included encouraging us to participate in conferences, introducing us to colleagues and sharing information about the inner workings of universities and scientific communities outside of the laboratory," says Perreault. "This broad exposure to many people and the different aspects of science and academia had a substantial impact on my future opportunities and career choices."

Noteworthy Departmental Achievements

While Kirsch is proud of his personal accomplishments, he would rather be remembered for the departmental achievements that occurred during his time as chair with the help of faculty, staff, university partners and other supporters. They include:

- **$20 million gift from Robert and Brenda Aiken**

In 2017, the couple bestowed the generous gift to support biomedical engineering at the university. "It enhanced our PhD program and incubated several faculty research programs," says Kirsch. It also supports an endowed chair, currently held by Ajiboye, and provides partial funding for other initiatives, such as the 186,000-square-foot Interdisciplinary Science and Engineering Building (ISEB) slated to open in the fall of 2026 and the Case-Coulter Translational Research Partnership (CCTRP).

- **Creation of the Biomedical Engineering Alliance**

In 2018, Case Western Reserve University and Cleveland Clinic Lerner Research Institute formed the alliance to advance research and education in biomedical engineering. "We worked very hard to make the alliance a reality," says Kirsch. "When two distinguished institutions join forces, the sum is always greater than its individual parts. That certainly is true with the Biomedical Engineering Alliance."

- **Growth of the CCTRP**

Launched at Case in 2006, the program promotes translational research and supports collaborative translational research projects to address unmet or poorly met clinical needs. Since its inception, hundreds of projects and dozens of start-up companies have been funded. "The CCTRP has become a leader in the community in translational research, and it's one of the top Coulter programs in the country," says Kirsch. "I nurtured it along, but Steve Fening, managing director of the CCTRP, has done the lion's share of the work."

- **Faculty leadership appointments**

"Biomedical engineering faculty have been selected for many upper administration positions at Case, which shows that we have great people who have been afforded excellent career development opportunities," says Kirsch. "We are recognized as strong leaders."

Among those who have landed university leadership roles are Ajiboye, faculty director of postdoctoral affairs; Fening, associate vice president for research; and Jeff Capadona, vice provost for innovation and the Donnell Institute Professor of Biomedical Engineering.

Cleveland FES Center

Continuing Role in Pioneering Research

Though Kirsch is relinquishing his duties as chair of the Biomedical Engineering Department, he will remain active as a professor and researcher. He will continue as executive director of the Cleveland Functional Electrical Stimulation Center, an interdisciplinary alliance that studies the use of neuromodulation to improve, treat or reverse neurological conditions. Kirsch also is a co-principal investigator of the ReHAB study, which is advancing a platform to allow reanimation of paralyzed limbs under direct control of the brain.

In addition, Michael Oakes, senior vice president of research and technology management at Case Western Reserve University, has charged Kirsch with developing a neural technology cluster for the ISEB.

"We have one of the best neural engineering groups in the world, but we are scattered around campus and local hospitals," says Kirsch. "The idea is to bring the group together and provide support for the next generation of research." He envisions three primary hubs within the neural technology cluster: devices, computation and industry relations.

"Hundreds of our graduates work in the neural device field, and we need to take better advantage of that and provide services to industry," says Kirsch.

One of those graduates is Christopher Pulliam, who joined Kirsch's lab as a graduate student. He spent nearly a decade in industry, working at Great Lakes NeuroTechnologies and later Medtronic. He returned to Case's Biomedical Engineering Department as an assistant professor in 2022.

Pulliam cites qualities that make Kirsch an ideal leader for the neural engineering cluster. "While Bob's strategic vision is well known, I would emphasize his genuine talent for connecting with people," says Pulliam. "Over time, I have seen firsthand – and through the eyes of others in our field – the authentic value he places on those around him."

A Commitment to People and Community

Perhaps no moment in Kirch's tenure as BME chair highlights his commitment to people – and connecting people – than the start of the COVID pandemic. Approximately two weeks after the university shut down and moved to online instruction, Wickenden Hall, home of the Biomedical Engineering Department and many research labs, flooded. Kirsch drove to campus on a Sunday morning to assess the damage, took videos of all the labs affected and sent them to his colleagues. He lobbied for renovations of the damaged parts of the building ahead of the campus reopening.

Kirsch led weekly videoconference meetings with faculty to keep them updated during the pandemic and supported a Virtual Summer Internship in 2020 that attracted more than 500 students from 50-plus universities around the world.

"During COVID, it was hard to retain a sense of community, but everyone in our department rose to the occasion," says Kirsch. "We emerged stronger than ever."

After 14 years of Kirsch's leadership, the Biomedical Engineering Department is thriving and well-prepared for the future as a new chair steps in.

Lee Miller (visiting), Robert Kirsch and Bill Memberg with a subject in the ReHAB study.

A Model of Professionalism

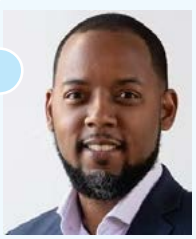
Robert Kirsch is widely regarded as a model of professionalism as he prepares to leave his role as chair of Case Western Reserve University's Biomedical Engineering Department in January. Colleagues shared their thoughts:

"He has always supported and promoted me to ensure that my contributions in our research collaborations are recognized. He has been an excellent model of academic leadership who has influenced my approach to leadership."

A. Bolu Ajiboye
Robert and Brenda Aiken Professor of Biomedical Engineering at Case Western Reserve University

"He has encouraged me to seek leadership opportunities, been a scientific collaborator and has been available as a sounding board whenever needed. Probably most importantly, he has been a model for how I've tried to mentor my own students, who I hope have also benefitted indirectly from Bob's mentorship."

Eric Perreault
Vice president for research at Northwestern University and professor of biomedical engineering and physical medicine and rehabilitation



"Bob has played a significant role in my career, directly or indirectly influencing some of my key transitions. His people-focused leadership inspired my own style, and observing him balance various roles in life offered an implicit model for how I aim to approach my career."

Christopher Pulliam
Assistant professor of biomedical engineering at Case Western Reserve University

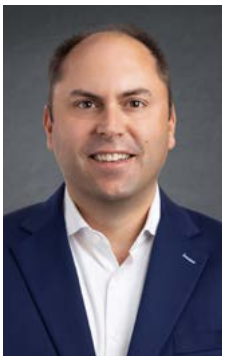
Creating a Culture that Encourages Tech Transfer

University programs guide students on the path toward commercialization

While working on her doctorate degree in biomedical engineering at Case Western Reserve University (CWRU), Brecken Blackburn conducted research on optical coherence tomography (OCT) elastography. She gained invaluable insight into moving her project from the lab to the marketplace as a CWRU Translational Fellow.

"The Translational Fellows Program helped me explore and deepen the translational push on our imaging technology, which we are now working on with commercial partners," says Blackburn, now a research assistant professor in the Department of Biomedical Engineering. "More broadly, it gave me the encouragement and background knowledge to help me co-found two medical device start-up companies."

The fellowship program is one of several translational initiatives spearheaded by the university to develop and inspire the pursuit of commercial opportunities in the biomedical field.



"It's so important to drive the culture of translation and to feed the pipeline of strong projects," says Stephen Fening, an associate vice president for research at Case Western Reserve University, professor of biomedical engineering and managing director of the Case-Coulter Translational Research Partnership (CCTRP).

The CCTRP is a high-profile platform on campus that promotes translational research and supports collaborative translational research projects to address unmet or poorly met clinical needs. However, the university offers other programs for undergraduates, graduate students and postdoctoral researchers with an entrepreneurial itch. These include the Three Minute Thesis competition, the Translational Fellows Program and I-Corps@NCATS training.

Three Minute Thesis (3MT™) – Case Western Reserve University will hold its fifth annual 3MT competition in February. Developed by the University of Queensland and held at over 900 institutions across more than 80 countries, the competition cultivates students' presentation and research communication skills. Participants present short pitches about their research using only one accompanying slide.

"For people in deeply technical areas, like most researchers, it's hard to communicate with people outside their specialty. But a lot of the magic in translational research and innovation happens when you connect with people from other disciplines," says Fening. "So, it's a great skill to be able to communicate the impact of your work to a more general population." Fening started the 3MT competition at CWRU with Rachel Begley, director of professional development in the School of Graduate Studies. The school hosts the annual competition, which includes a virtual round followed by an in-person event, where approximately 24 graduate students participate. Noa Nuzov, a doctoral student in biomedical engineering, won last year's competition for her presentation, "Mapping the Vagus Nerve to Improve Stimulation."

PhD candidate Noa Nuzov presents at the 2025 3MT competition.

Translational Fellows, friends and family participate in an axe throwing outing.

Translational Fellows Program – Launched in 2020, the one-year Translational Fellows Program (TFP) aims to train individuals in entrepreneurship and the translation of innovation into commercial ventures. Approximately one day a week is carved out for participants to work on the process of evaluating and preparing a technology for commercialization. Curriculum includes several components, including the 3MT competition, a business plan competition and connection with an alumni mentor through the CWRU Venture Mentor Program.

"The goal of the program is not necessarily to have participants go out and start companies. It's scratching their itch to see if they want to have a translational element to their careers, either in industry or as a faculty member at a university," says Fening. The TFP is sponsored by the university's Clinical and Translational Science Collaborative (CTSC) and co-directed by Fening and Umut Gurkan, professor of mechanical and aerospace engineering and biomedical engineering.

"The skills needed to find the right connections and present your technology are not commonly taught in classes, and many trainees would never get direct experience doing this," says Blackburn. "The Translational Fellows Program helps fill this gap."

I-Corps@NCATS – The CTSC also serves as a regional hub for this six-week program developed by the National Center for Advancing Translational Science (NCATS). "The mission for I-Corps is to vet technologies for commercialization and to teach investigators the skill of customer discovery," says Fening.

I-Corps participants work in teams including principal investigators, entrepreneurial leads and entrepreneurial mentors. The curriculum provides hands-on, immersive experiences, including interviews with potential customers to help teams understand how their technologies might solve client problems. The program at Case also features three teaching days, led by an external instructor at the beginning, midpoint and end, as well as team presentations.

Blackburn participated in I-Corps during her year as a Translational Fellow.

"It's a great program for pushing those of us coming out of purely academic training to think of the real-world stakeholders and the value our technology presents," she says. "Participating in I-Corps improved my ability to discuss our project with potential commercial partners and also made me evaluate new potential research projects with an eye toward the practicalities of translation."

Fening, who leads the I-Corps program in collaboration with Ofer Reizes, the Laura J. Fogarty Endowed Chair for Uterine Cancer Research at Cleveland Clinic, says that Case Western Reserve University is dedicated to providing translational programs designed to facilitate commercialization.

"Sometimes we overlook the value and importance of education in culture change," he says. "These programs can fundamentally change how investigators look at research." And that could lead to significant progress in developing innovative technologies.

Blackburn says, "I think it's very likely that by having more trainees get experience thinking about, finding and communicating with commercial partners, then a lot more of the wonderful research that happens through the BME Alliance will result in collaborations to bring technology out into the real world."

CCIR Hosts Imaging Symposium

The Case Western Reserve University Center for Imaging Research (CCIR) hosted a symposium in April celebrating its 20th anniversary. More than 200 attendees reflected on CCIR's history and accomplishments and looked forward to imaging research on the horizon. Highlights of the symposium included:

- A keynote lecture by CCIR Founding Director Jeff Duerk
- A presentation on the center's Imaging Research Core, which provides a comprehensive suite of preclinical and clinical imaging instrumentation and techniques
- A session on artificial intelligence co-hosted by the Center for AI Enabling Discovery in Disease Biology (AID2B)
- A panel discussion providing insights from industry and startup companies

In addition, the symposium featured five research presentations, 55 scientific posters and eight research power pitches by trainees.

[Right] Trainee power pitch presenters with CCIR leadership: Agata Exner, Ananya Subramaniam, N. Reid Bolding, Kacey Pagano, Lifang Zhang, Madison Albert, Zhiqing Yin and Katherine Gullett (not pictured: Jack Xia, Shruti Kumari)

[Left] Jim Basilion, Katherine Gullett, Jon Lewin, Agata Exner, Jeff Sunshine, Jeff Duerk and Mark Griswold

[Right] CCIR retrospective panel discussion: Jeff Sunshine (moderator), Ray Muzic, Zhenghong Lee, Jon Lewin, Marty Pagel, Dave Wilson and Mark Griswold

IN THE NEWS

FUTURISM

Scientists Discover a Whole New Way Neurons Communicate — and It Could Rewrite Neuroscience

For more than a century, scientists believed they had a solid understanding of how the brain's billions of neurons talk to each other. Messages flowed through synapses, where chemical messengers leapt microscopic gaps, or through electrical junctions that directly linked cells. But a team of researchers at Case Western Reserve University may have just found an entirely new kind of connection — one that could reshape how we think about brain activity and consciousness itself.

FOX 8 WJW · CLEVELAND

Ground-breaking Imaging Research

Fox 8 Cleveland: Dan Ma, assistant professor of biomedical engineering; Mark Griswold, the Pavey Family Designated Professor of Innovative Imaging-Revolutionizing the Worlds of Education; and Chris Flask, professor of radiology, shared their work alongside physicians and scientists from University Hospitals developing a transformative magnetic resonance fingerprinting technology that was recently approved by the FDA.

cleveland.com

How a Cleveland team is revolutionizing prosthetics with a hand that can actually feel

Technology developed at Case Western Reserve University can restore a sense of touch that makes a prosthetic hand feel like a part of one's own body. In a new clinical trial, 12 people with upper limb amputation will be recruited to compare standard prosthetic arms and hands to the sensory-enabled neural-controlled prostheses developed at the university since 2015.

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