Northwestern | RESEARCH

IMPACT REPORT 2025

This past year has tested research universities across the country, including Northwestern. But our community has responded with creativity and resilience, pursuing discoveries that deliver real societal value, sustaining excellence in teaching and scholarship, and advancing bold ideas even in uncertain times. Challenges remain, but so do opportunities. With determination and collaboration, Northwestern is turning today's challenges into tomorrow's opportunities.

Our momentum is fueled by strong support, including competitive grants from federal agencies, commitments from foundations and private philanthropy, and our Board of Trustees. I value that trust and am dedicated to earning it every day.

Research has the greatest impact when it reaches the people it aims to serve. Communicating openly and clearly about our progress is part of our duty to inform and benefit the public. That's why we improved our research coverage on Northwestern's homepage, supported faculty op-eds and media appearances, and expanded training to help researchers explain complex work to general audiences. Our students and faculty are sharing their stories more effectively and responsibly, connecting with communities across Illinois and beyond.

This impact report offers a snapshot of our progress. It features a select few projects, from basic research to real-world applications, and shows how we support investigators in conducting and communicating the purpose and significance of their work. You'll also see how collaboration among our teams, research institutes, centers, and external partners is accelerating discovery.

We have more to do, and we're raising our sights. Northwestern's research enterprise thrives because it is rooted in connection—between scholars and students, across disciplines, and with the communities we serve. Together we are turning ideas into action, from the humanities to the sciences, extending the limits of our knowledge and developing solutions to challenges that matter locally and globally. As we look ahead, we will deepen these partnerships and continue building a research culture that amplifies impact through collaboration.

Eric Perreault
Vice President for Research
Northwestern University

On the cover, clockwise from top left

Northwestern Medicine scientists have developed an AI tool that matches doctors' accuracy in outlining lung tumors on CT scans and even flags areas some may miss. On the cover, **Troy Teo** (radiation oncology), who coauthored a study on this AI tool, points to a lung tumor on a CT scan. The breakthrough aligns with the mission of the **Northwestern Network for Collaborative Intelligence** (NNCI), which connects AI and data efforts across campus and beyond. Led by **V.S. Subrahmanian** (computer science) and **Abel Kho** (preventive medicine), NNCI drives cross-disciplinary collaborations that **augment human intelligence and improve society.** Its campus-wide curriculum provides tools, training, and resources for research projects and teaches responsible use of AI. NNCI also links Northwestern with the corporate, government, and nonprofit sectors. Photo by Ben Schamisso

Rod Passman (cardiology) leads **REACT-AF**, a seven-year, 85-site clinical trial testing whether an approach guided by a customized Apple Watch can safely replace the use of daily blood thinners for people with atrial fibrillation. Continuous anticoagulation prevents stroke but raises the risk of bleeding, including gastrointestinal and brain hemorrhages. The watch detects episodes of A-fib and prompts short-term anticoagulation therapy when stroke risk peaks. The study could result in **scalable, personalized stroke prevention with fewer side effects**. Photo by Northwestern Medicine

Northwestern leads the $20 million **AI Institute for the Sky (SkAI)**, funded by the National Science Foundation and the Simons Foundation. Directed by **Vicky Kalogera** (physics and astronomy) and **Aggelos Katsaggelos** (electrical and computer engineering), **SkAI uses AI tools to analyze vast datasets, speed up computer simulations, and improve instruments and surveys**. With more than 100 team members across 25 national labs, colleges, and businesses, SkAI unites astronomers, AI experts, and others to advance research, develop software, and train an AI-literate workforce. Photo by NSF/NSF NRAO/AUI/B.Foott

Elizabeth Gerber (mechanical engineering, communication) explores **how new technologies can support "collective innovation,"** which taps into underused human, social, and economic resources to discover, assess, and implement ideas. Through the **Center for Human-Computer Interaction + Design, Delta Lab,** and **Design for America**, her team develops collaborative networks that address complex issues—from healthcare access to climate resilience—promoting entrepreneurship and strengthening the link between engineering and society. Photo by Lisa Beth Anderson

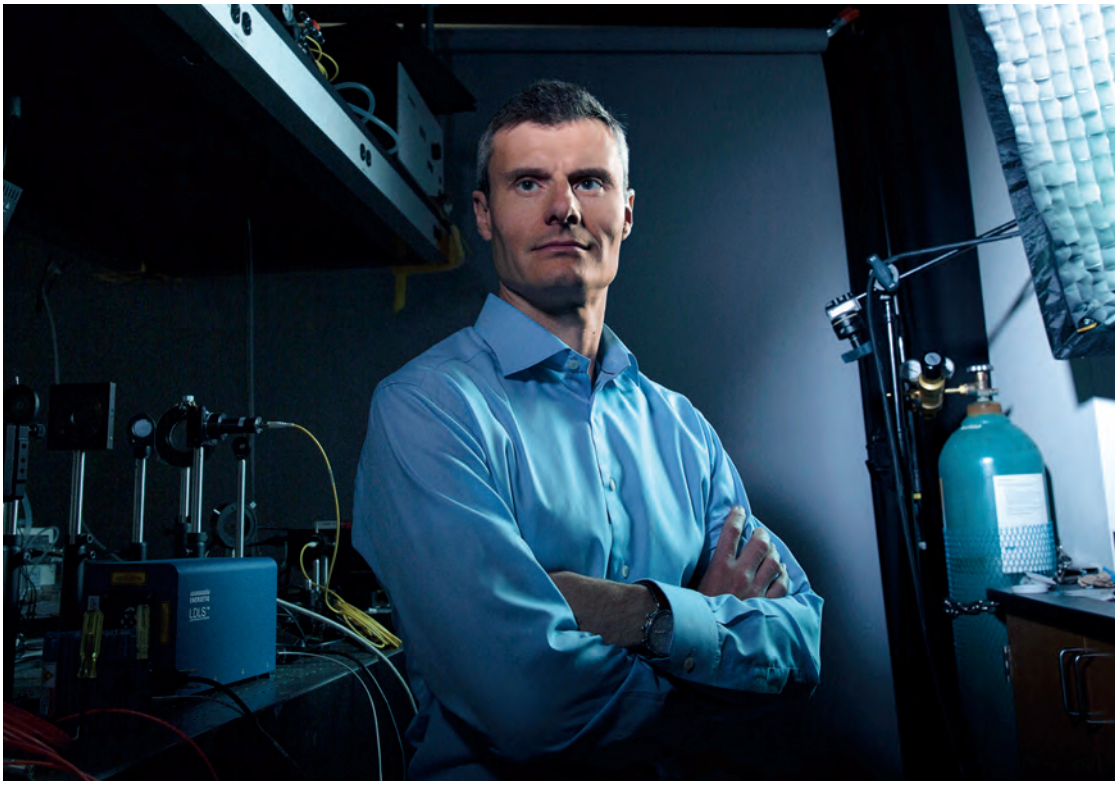
John Rogers (materials science and engineering, biomedical engineering) and **Igor Efimov** (cardiology) created a tiny, bioresorbable pacemaker—just 1.8 by 3.5 millimeters—which is injectable by syringe and paired with a soft, wearable patch that uses infrared light. **The patch automatically senses low heart rates and triggers normal pacing via an LED.** Matching full-sized devices' performance, the system avoids extraction surgery, reducing the risk of trauma and infection for newborns with congenital heart defects and patients needing temporary pacing after surgery. John A. Rogers/ Northwestern University

Northwestern | RESEARCH

Office for Research
Eric Perreault
Vice President for Research
Matt Golosinski
Director of Research Communications

research@northwestern.edu
research.northwestern.edu

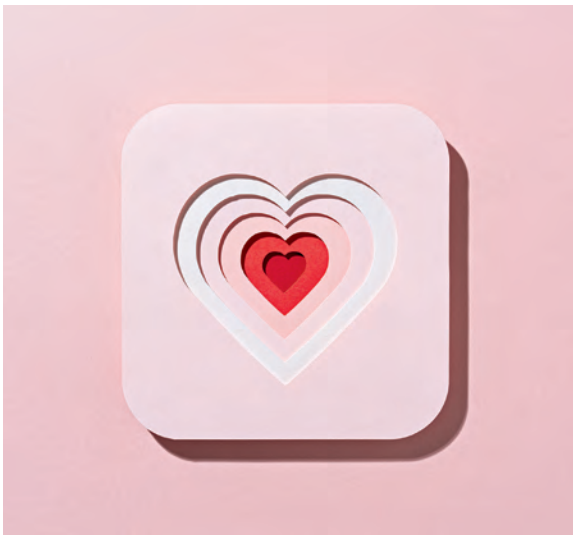
Perreault: Eileen Molony



DISRUPTING CANCER'S ABILITY TO ADAPT

Tumors often rebound even after harsh treatments. Chromatin—the tightly packed mix of DNA, RNA, and proteins that control which genes turn on and off—lets cancer cells survive, grow, and develop rapid resistance to treatments. By changing the structure of chromatin, **Vadim Backman** (biomedical engineering, medicine) and his team prevented tumors from switching into drug-resistant states, **doubling chemotherapy's effectiveness** in animal models and nearly eliminating disease in cell studies. Rather than killing cells directly, this strategic approach disables adaptability, helping existing drugs work longer. "We wanted to take away cancer cells' superpower," says Backman, director of the Center for Physical Genomics and Engineering, "removing their inherent abilities to adapt, to change, and to evade."

THINK ON WHAT IS GOOD: IRIS MURDOCH'S MORAL PHILOSOPHY



Kyla Ebels-Duggan (philosophy) explains and develops the ethical insights of the novelist-philosopher Iris Murdoch. Drawing on Murdoch's writings, Ebels-Duggan contends that ethical thinking begins with the stories that we tell and accept —stories that make certain ethically significant concepts available while occluding others. Murdoch regards love as the most central moral concept. Love of others, rather than merely choosing and acting well, is the most important moral task. Ebels-Duggan's research demonstrates how love, understood as recognizing the full reality of others, can guide us in interpersonal relationships and public life. By **making complex ideas accessible** to broader audiences, her work supports Northwestern's priorities in the humanities, creative arts, and interdisciplinary innovation.

Illustration: Getty Images; Backman: Kyle Monk

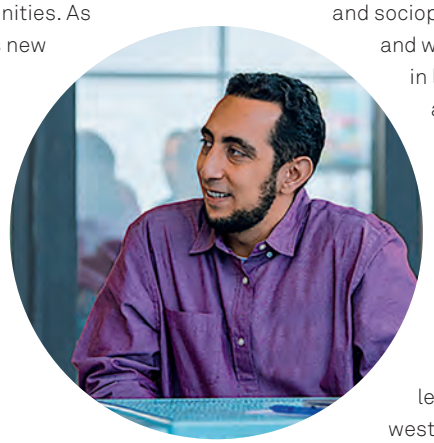
BIOMATERIAL BREAKTHROUGHS REGROW, REPAIR, AND RENEW

At the **Querrey Simpson Institute for Regenerative Engineering** (QSI RENU), Northwestern engineers and physicians are inventing materials and devices that help the body heal itself. Led by biomaterials pioneer **Guillermo Ameer** (biomedical engineering, surgery), QSI RENU combines materials science, stem-cell and developmental biology, physical sciences, and clinical translation to create scalable therapies—biofabricated tissues, smart hydrogels, and 3D-bioprinted constructs—to restore, augment, and preserve tissue function. Teams of engineers and clinicians work on translating cardiovascular, musculoskeletal, nervous system, dermatology, ophthalmology, and transplant care research, **accelerating lab-to-clinic impact**. QSI RENU advances University priorities in biosciences and the interface between engineering and medicine, training the next generation and partnering with industry to bring regenerative technologies closer to patients.

COMMUNICATING RESEARCH WITH CLARITY

At the Medill School of Journalism, Media, Integrated Marketing Communications, **Patti Wolter** (journalism) equips scientists in training and journalism students to **translate innovative research into powerful public stories**. Through seminars cotaught with STEM faculty, newsroom-style workshops, and one-on-one editorial coaching, Wolter works with students to turn complex methods and uncertain results into clear, accurate, engaging narratives using plain language and responsible framing. Her courses emphasize interviewing researchers, verifying evidence, and ethically communicating risk and uncertainty. In partnership with Northwestern's Graduate School, Wolter leads the Medill media and science communication program, which offers a five-course certificate in top-tier journalism training to STEM PhD students in the Weinberg College of Arts and Sciences, the McCormick School of Engineering, and the Feinberg School of Medicine.

GUIDING RESPONSIBLE AI, EDUCATION, AND POLICY



The School of Education and Social Policy's **Sepehr Vakil** (learning sciences) helps chart the ways AI can serve students and communities. As faculty director of Northwestern's new **Center for Responsible Tech, Policy, and Public Dialogue** and the master of science in technology, people, and policy program, he bridges classrooms, computer science, and public policy to prepare practice-ready leaders. His recent Spencer Foundation report, "Towards New Horizons of AI, Learning, and Equity in Education," outlines a research agenda for **trustworthy, community-centered uses of AI in education**. It investigates the ethics and sociopolitical contexts of computing and what AI may—and may not—enable in learning and creativity. Vakil also serves as senior adviser to Spencer's AI initiative. He was appointed to the National Academies committee defining K–12 competencies in data and computing—work that will shape future standards for AI usage. By convening cross-campus dialogues on AI and learning, Vakil exemplifies Northwestern's interdisciplinary impact.

Vakil: School of Education and Social Policy; Illustration: Henry McGill; Ameer: Kristin Samuelson

3,306
TOTAL AWARDS

$1.04 BILLION
TOTAL SPONSORED AWARDS

#7
NATIONAL UNIVERSITY RANKING

US News & World Report
Best College Rankings

222
PATENTS ISSUED

Innovation and New Ventures, Northwestern

30
HIGHLY CITED RESEARCHERS

Clarivate

#11
GLOBAL INTERDISCIPLINARY SCIENCE RANKING

Times Higher Education and Schmidt Science Fellows

324
INVENTION DISCLOSURES

Innovation and New Ventures, Northwestern

398K+
ENROLLEES IN CLINICAL TRIALS

Feinberg School of Medicine, Northwestern

8
NORTHWESTERN STARTUPS LAUNCHED

Innovation and New Ventures, Northwestern

#29
RESEARCH AND DEVELOPMENT EXPENDITURES

*Higher Education Research and Development Survey, National Center for Science and Engineering Statistics, 2023**

$12.3M
IN FUNDS RECEIVED FROM INNOVATION LICENSING

Innovation and New Ventures, Northwestern

201
TOTAL ACADEMY MEMBERSHIPS

116
AMERICAN ACADEMY OF ARTS AND SCIENCES MEMBERS

19
NATIONAL ACADEMY OF EDUCATION MEMBERS

21
NATIONAL ACADEMY OF ENGINEERING MEMBERS

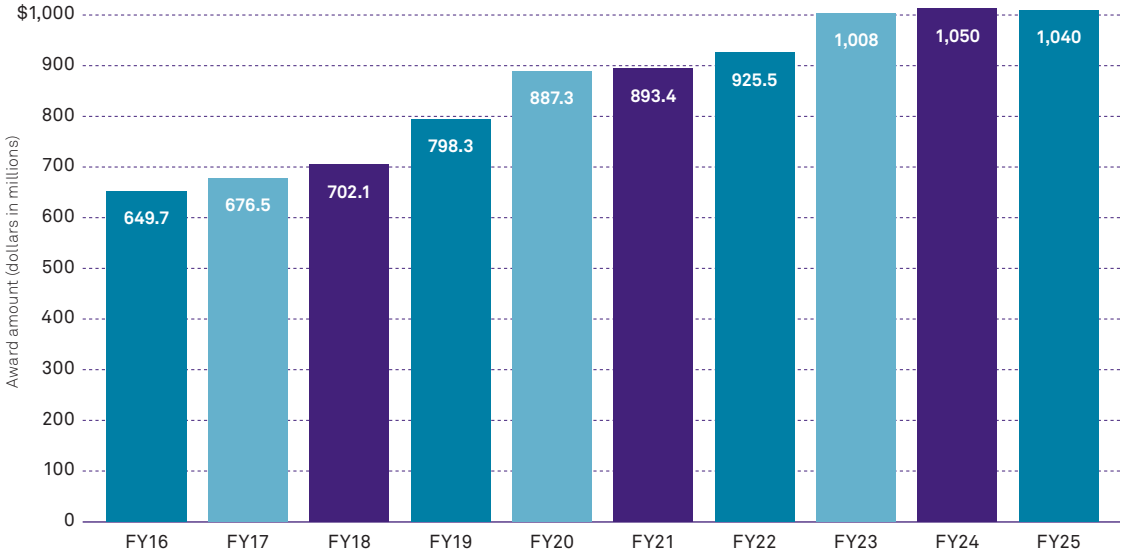
14
NATIONAL ACADEMY OF MEDICINE MEMBERS

31
NATIONAL ACADEMY OF SCIENCES MEMBERS

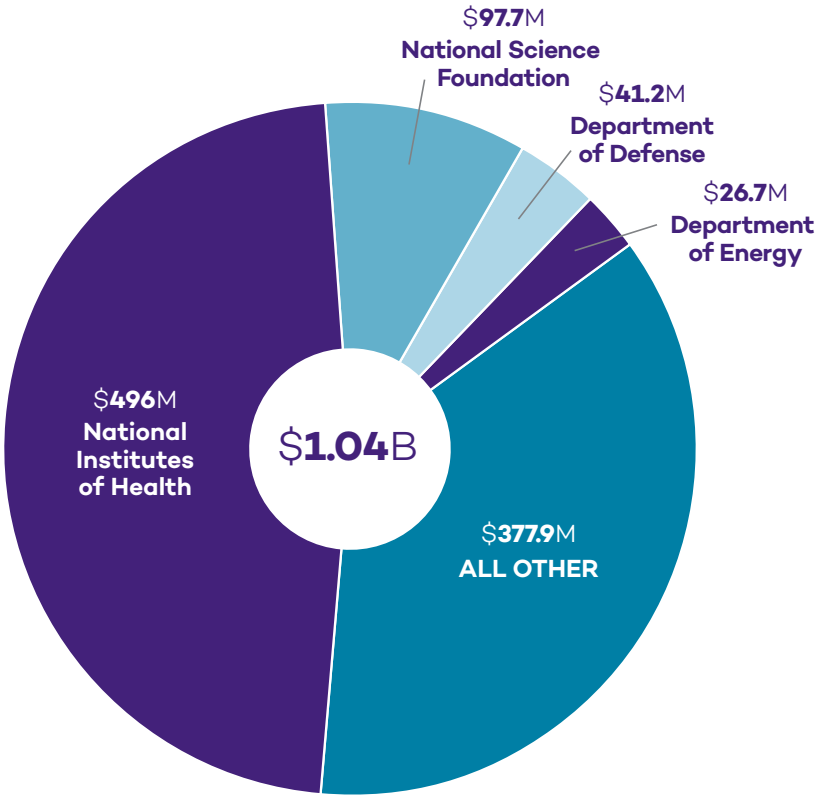
**The most recent survey collected R&D expenditure data from 914 US colleges and universities that spent at least $150,000 on R&D in the prior fiscal year.*

RESEARCH AWARD GROWTH, 2016–25

60% growth over 10 years



AWARDS BY SPONSOR, FY25



COMBINATION THERAPY THAT BLOCKS MYC PATHWAYS MAY IMPROVE CANCER TREATMENTS

Northwestern researchers led by **Sarki Abdulkadir** (urology) discovered a way to enhance the effectiveness of MYCi975, a new MYC-blocking drug, against difficult-to-treat prostate and lung cancers. MYC (pronounced "mick") is a gene that acts like a master switch for cell growth in many cancers. When MYC is constantly switched on, these cancers grow more quickly. Using a CRISPR gene-editing screen, the team demonstrated that cancer cells depend on mitochondria—tiny power plants—for energy backup when MYC is blocked. If doctors also inhibit that backup system (called complex I), the cells lose energy and die more easily. This two-step approach could lead to **better treatments for aggressive, drug-resistant cancers**.

EXPLORING NEW METHODS TO TREAT SEVERE FOOD ALLERGIES

A Northwestern team led by researchers **Stephanie Eisenbarth** (allergy and immunology) and **Adam Williams** (allergy and immunology) discovered a new pathway that controls severe allergic reactions. In mice, the gene DPEP1 regulates anaphylaxis by modulating leukotrienes in the gut. After a yearslong forward genetic screen, the team repurposed the FDA-approved asthma drug Zileuton to block this pathway. In peanut-challenge tests, Zileuton nearly eliminated life-threatening reactions, changing outcomes from about 95 percent susceptible to about 95 percent protected. The research team's study, published in *Science*, describes a **practical safety strategy for the more than 33 million Americans with food allergies**, who still have limited FDA-approved options to prevent and treat serious allergic reactions.

PERSUASIVE STORYTELLING ROOTED IN FACTS

Nathan Walter (communication studies) is founder and codirector of Northwestern's Center for Media Psychology and Social Influence, where he investigates **how strategic storytelling, emotional framing, and timely corrections shape beliefs and behavior**. Working across health, politics, and science, Walter concentrates on a simple guiding question: How do we amplify good information and dampen bad information? NIH- and FDA-supported projects validate interventions that debunk tobacco-related and broader health falsehoods. By pairing experiments with real-world message design in digital and community settings, Walter equips agencies and nonprofits with evidence-based strategies that resonate emotionally and cognitively.

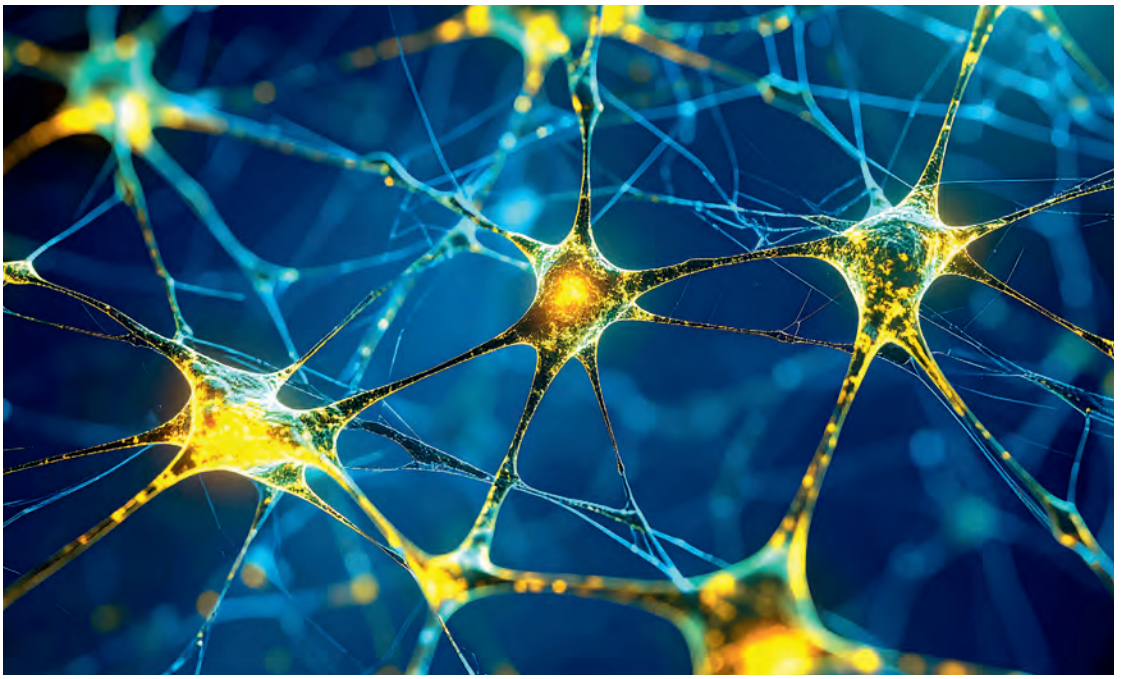
Walter: School of Communication; Eisenbarth/Williams: Northwestern Medicine; Abdulkadir: Feinberg School of Medicine

Northwestern University

Office for Research
Rebecca Crown Center, 2-574
633 Clark Street
Evanston, Illinois 60208-1108

A CANDIDATE FOR NEURODEGENERATIVE DISEASE THERAPY

Richard Silverman (chemistry) initially developed a molecule called NU-9 to treat amyotrophic lateral sclerosis. In recent studies, he collaborated with **William Klein** (neurobiology) and **Hande Ozdinler** (neurology) to explore the molecule's broader potential. The molecule—now renamed AKV9 by Akava Therapeutics, a startup founded by Silverman—showed promising results in Alzheimer's research. It restored neuron health by reducing inflammation and preventing the buildup of toxic proteins in both cell and animal models. The scientists believe AKV9 works by stopping harmful amyloid-beta clumps in the brain and activating lysosomes—cells' recycling centers—to break them down. By targeting common pathways of protein misfolding and mitochondrial stress, AKV9 represents a potential **single therapy for various neurodegenerative diseases**. After extensive preclinical testing, AKV9 received FDA approval to begin ALS clinical trials; Alzheimer's studies are progressing preclinically. This project exemplifies Northwestern's collaboration among chemistry, neurobiology, and medical researchers, demonstrating a commitment to turning laboratory discoveries into therapies.



Neurodegeneration: Adobe Stock