



DARTMOUTH
TECHNOLOGY
TRANSFER

2022-2026:
Five Years of Impact



DARTMOUTH TECHNOLOGY TRANSFER



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CMOS "burst mode" image sensor and camera board designed at Dartmouth, primarily by Xin Yue, during his PhD research in Eric Fossum's lab.
Photo: Katie Lenhart



**DARTMOUTH
TECHNOLOGY
TRANSFER**

CELEBRATING FIVE YEARS OF EXTRAORDINARY IMPACT

Bold ideas. Emerging innovations. New startups. The remarkable impact of the past five years demonstrates how TTO's partnership with Dartmouth innovators builds a foundation for a better world.

Geisel produced a pandemic vaccine and a breakthrough treatment for an orphan disease. Thayer improved ways to diagnose women's health and sense light particles in darkness. Arts and Sciences unleashed quantum and captured carbon. DHMC developed new imaging tools and care-extending digital monitoring apps. The TTO's multi-talented team partnered with faculty, researchers, and students across every discipline—life sciences, engineering, humanities, and the arts.

We worked closely with the Magnuson Center for Entrepreneurship on accelerators, pitch competitions, and programming—in an alliance we're excited to take to new levels. We deepened coordination across Dartmouth, extended

our DHMC IP-management agreement, and grew our network of alumni, advisors, and investors. We moved into new offices, launched a new brand, and expanded our media coverage, from LinkedIn to *The New York Times*.

The metrics speak for themselves—revenue generated the past five years will fund future innovation, further amplifying impact. But the stories behind the numbers reveal more. They show how curiosity-driven research and persistence powered world-changing breakthroughs: Jason McLellan's team turned a stubborn protein puzzle into a vaccine platform. Randy Noelle's lab commercialized promising autoimmune antibodies. Mike Sporn's work spawned new spin-offs after Reata. And creative dealmaking fueled success. Now new startups and emerging innovations promise more impact.

When Dartmouth innovations meet the TTO, the result is a blueprint for making the world better.



KIM ROSENFELD JD

Director, Technology Transfer

Kim has three decades of business, legal, and tech transfer experience. She worked at MIT's Technology Licensing Office and Partners Healthcare Innovations, and directed tech transfer for SUNY's 32 campuses and at UAB Medical Center. Kim traveled the startup journey with UAB spin-out BioHorizons, UVA spinout Stereotaxis, Xcellerex, and numerous entrepreneurs. She represented pharma and tech companies as a partner in law firms and in-house counsel, and chaired non-profit boards.

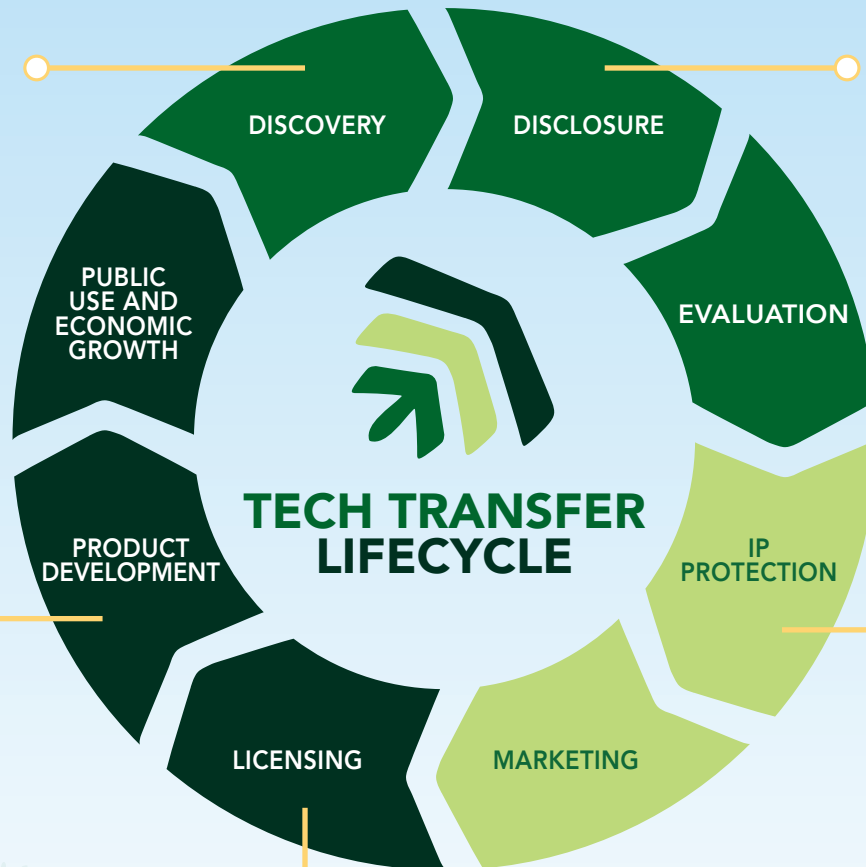
Since taking the helm in 2020, Kim built a high-performing tech transfer team, brokered the DHMC agreement, and steered the landmark COVID vaccine, ImmuNext, and Reata monetization deals. A University of Virginia Law graduate and cum laude Yale alumna—Dartmouth wasn't coed when she applied—Kim carries on the legacy of the Dartmouth alumni in her family.

BY THE NUMBERS

5 YEARS OF OUTCOMES

\$600+
MILLION IN
TOTAL LICENSING
& EQUITY REVENUE

\$934.3
MILLION IN
RESEARCH
EXPENDITURES



386
INVENTION
DISCLOSURES

305
NEW U.S.
PATENT
APPLICATIONS
FILED

237
U.S. PATENTS
ISSUED

1000+
ACTIVE PATENTS

11
NEW
STARTUPS
FORMED

22
STARTUPS IN
OPERATION

24
LICENSES
& OPTIONS

2500+
OTHER
AGREEMENTS

5 YEARS RUNNING : AMONG THE TOP 100
U.S. UNIVERSITIES
GRANTED PATENTS

4 YEARS RUNNING : AMONG THE TOP 100
WORLDWIDE UNIVERSITIES
GRANTED PATENTS

NATIONAL ACADEMY OF INVENTORS RANKINGS

HOW INNOVATION GROWS INTO SOCIETAL IMPACT



RESEARCH & DEVELOPMENT

Research across Dartmouth's labs creates fertile ground for technical and creative innovation by investigators.



INVENTION

A researcher breaks through with a discovery, invention, algorithm or creative work with potential for impact.



DISCLOSURE

The innovation is disclosed to TTO, planting the seed for strategic discussions about further development and potential commercialization.



EVALUATION

The TTO evaluates the disclosure for protectability, marketability, and competitive advantages, and works together to shape a commercialization strategy.



IP PROTECTION

TTO funds and manages IP strategy, and also handles MTAs and NDAs, rooting the innovation in the protection it needs as it is further developed and marketed.



MARKETING

We work with investigators to chart the path to impact, shining light on the technology's potential for collaborators, companies, and investors.

THE TECHNOLOGY TRANSFER LIFECYCLE



LICENSING

TTO negotiates licensing terms with a startup or established company—matching each innovation with the partner most likely to help it thrive.



PRODUCT DEVELOPMENT

The licensee develops and commercializes the technology. For startups, TTO makes connections with resources and other opportunities.



PUBLIC USE & ECONOMIC GROWTH

Impact grows as innovations yield products and services that improve lives and create companies, jobs, and opportunity.



REINVESTING

50% of proceeds goes to innovators and the other 50% returns to Dartmouth to fund future research and fuel the next generation of innovation.

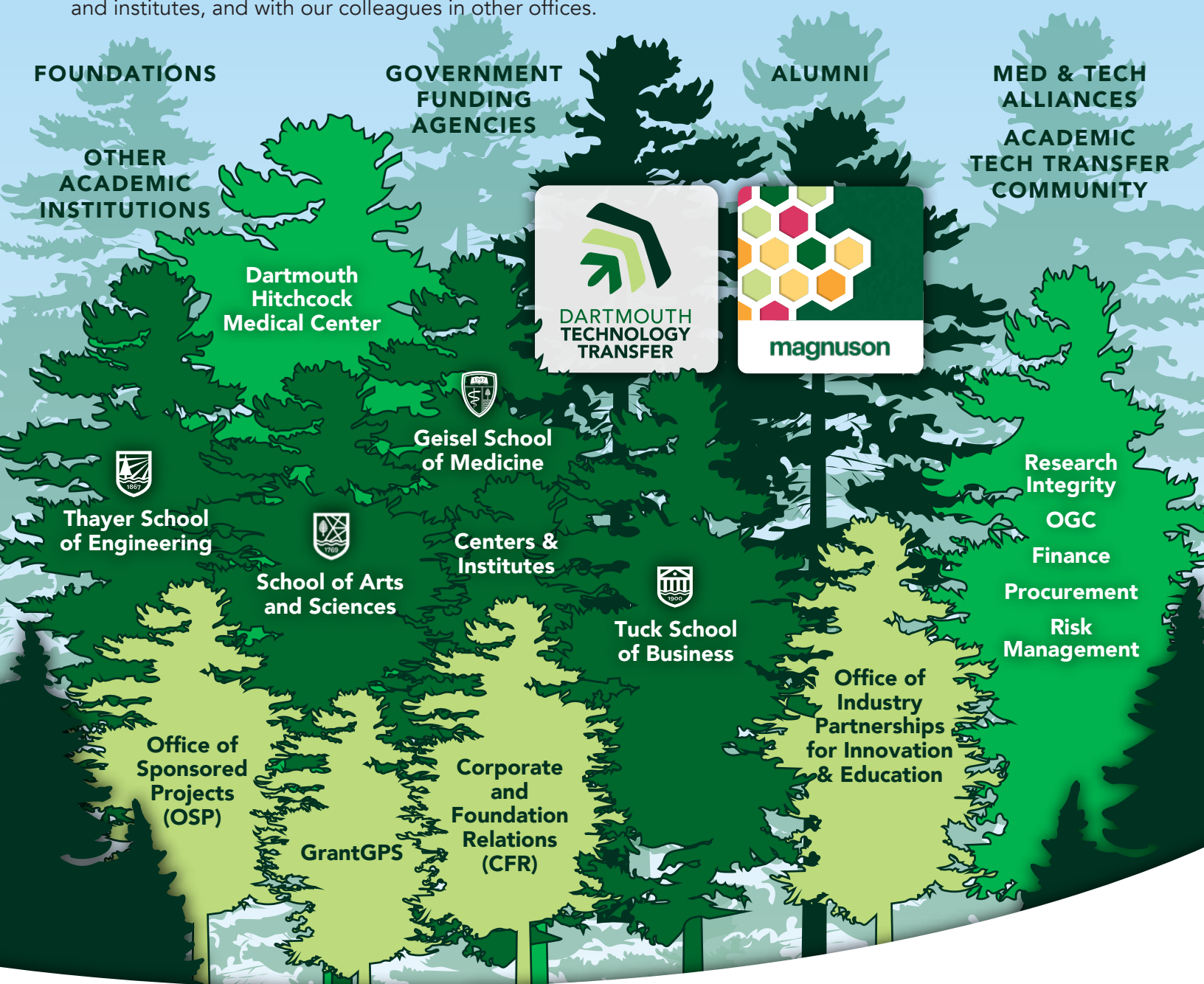
The TTO's Mission:

- 1 Advance Dartmouth innovations to benefit the world,
- 2 Attract and retain world-class innovators and creators, and
- 3 Generate and distribute the revenue that results from commercialization.

Dartmouth's policies are designed to maximize impact: a generous innovator share to attract and keep top talent, and institutional shares that fund research to fuel new innovation.

One Dartmouth: Many Roots & Branches

A Lone Pine does not grow on its own. One Dartmouth creates fertile ground for new ideas to take root, and the TTO nurtures that growth by cultivating relationships. We collaborate closely with our closest partner, the Magnuson Center for Entrepreneurship, with DHMC, and with Dartmouth's schools, departments, centers, and institutes, and with our colleagues in other offices.



BEYOND CAMPUS

Rooted in One Dartmouth, we branch out beyond campus to advance Dartmouth innovation, powered by the TTO team's field-tested expertise and extensive networks. We help expand innovators' relationships with funders—government agencies, foundations, and industry. We link them with alumni, entrepreneurs, investors, and advisors.

We connect them into the wider innovation ecosystem, drawing on resources locally and nationally. We actively engage with the international technology transfer and innovation communities, staying ahead of emerging opportunities and shaping best practices. The TTO uses all these pathways to cultivate technologies and grow Dartmouth's impact.

ONE UPPER VALLEY TEAM

HOW TTO HELPS TRANSLATE MEDICAL INNOVATIONS INTO IMPACT

How could Dartmouth Hitchcock Medical Center encourage translation from its clinical research engine to meet unmet patient needs and increase the medical center's impact on healthcare? Rather than build a tech transfer function from scratch, DHMC partnered with the TTO's seasoned team. The agreement gave clinicians access to trusted experts ready to handle the IP and map out strategies to turn ideas shaped by clinical experience into innovations to improve patient care.

The face of the collaboration is Heather Brownell, PhD, Associate Director for Health Sciences, who reaches clinicians directly, presents at grand rounds and department meetings, and supports clinician-founders in the accelerators. She interfaces with SYNERGY, the Levy Health Care Delivery Incubator, the Cell Therapy program, and the VA. Heather works with DHMC's Office of Research Operations and manages patent filings and the IP database.

The agreement provided mechanisms for resolving issues that resulted from years of joint research, shared IP, and dual appointments with Dartmouth College. When clinicians and Dartmouth researchers work together, Heather and her TTO colleagues sort out the IP and align the interests of the innovators and both institutions, to move shared discoveries smoothly from the labs to companies that can provide resources needed to advance the innovations.

Last fiscal year, DHMC invention disclosures jumped over 70%, signaling an energized process moving discoveries from bench to bedside. Case in point: ViewsML licensed DHMC innovations and now works to virtualize biomarker staining for pathology.

The DHMC partnership with the TTO has stopped looking like an experiment and now operates as the standard for how a tech transfer office moves a medical center's innovations into impact.

“The TTO provides our clinicians with additional avenues to improve patient care. Our research, grounded in clinical experience and patient data, has the potential to make a real difference. The partnership with the TTO to translate that research expands DHMC's impact on healthcare.”

— SHEILA RYAN, PHD, JD, MPH, CCRP
*Vice President, Research Operations,
Dartmouth Health*



THE TEAM THAT FUELS INNOVATION



The TTO team reflects the rare blend of technical, scientific, business, and legal expertise the technology transfer lifecycle demands—collectively, over 180 years of experience.

Over the past five years, our licensing managers dramatically expanded support for innovators across every discipline, while our operations team collected and distributed record revenue, managed the growing patent docket, and steered through increasingly thorny regulatory terrain.

We crafted and negotiated thousands of licenses, options, collaborations, and agreements, supported multimillion-dollar grant applications, helped

startups land SBIRs and STTRs, and fielded a constant stream of IP questions.

Industry engagement is our stock in trade—commercial partners and investors provide resources essential to turn academic discovery into real-world impact. We met industry's requirements while fiercely protecting faculty freedom to publish, control their research, and receive fair credit.

We love teaching as much as deal-making. We presented to students, faculty, and staff, as well as community groups. Under-resourced compared to peer institutions, we rely on relationships: we don't just collaborate, we make collaboration happen. For a small office we have a big reputation—as recognized leaders in the entrepreneurship and tech transfer world.

“The TTO is responsive, reliable, and relentless in representing the interests of researchers.”

— GEOFFREY PARKER, PhD

Professor of Engineering Innovation

Faculty Director, Irving Institute for Energy & Society



**HEATHER
BROWNELL**

PhD

*Associate Director for
Health Sciences*



IMPACT:

Manages Dartmouth-Hitchcock Medical Center (DHMC) Intellectual Property & Licensing

Heather has 25+ years of tech transfer experience with academic and clinical inventors in life sciences. She has consulted for U.S. and Canadian universities, medical centers, and startups, worked in tech transfer at Harvard Medical School, and helped build proof-of-concept funding programs at the Ontario Genomics Institute. She has a PhD in Tumor Virology from Queen's University, a postdoc from Joslin Diabetes Center, and a sixth sense for Canadian connections.

After working with TTO as a consultant for six years, Heather joined Dartmouth in 2023. She has significantly increased DHMC's technology transfer operations through her outreach to DHMC investigators, and in FY 2026 increased disclosures by over 70 percent, helping launch startups, and generating new revenue. She also built TTO's professional development programs and advanced women entrepreneurs, working with Equalize Startups.

Tammy has over 20 years in tech transfer and commercialization across engineering, business, and medicine. She led IP monetization, startup creation, and research translation strategies at Mass General Hospital and Drexel University. With a BS in chemical engineering from RPI, MBA/MS in finance from Temple, and graduate-level coursework in molecular biology and anatomy at Harvard, Tammy is tri-lingual in engineering, finance, and life sciences.

Since joining in 2021, Tammy has orchestrated a complex pharmaceutical royalty stream monetization and auction that was unprecedented at Dartmouth, supported startup launches, built relationships with active spin-outs, and managed commercialization for medical device, quantum, and energy-related projects. She has guided dozens of innovators, coordinated trips to industry conferences such as CERAWeek, BIO, and MedTech, and built our marketing program.



**TAMMY
HEESAKKER**
MBA

*Senior Business
Development &
Licensing Manager*

IMPACT:

Chemistry, Physics, Materials
Science & Climate/Energy;
Monetization, Special Projects



**CHERYL
JUNKER JD**

*Senior Business Development
and Licensing Manager
Associate Director for
Compliance and Operations*



IMPACT:

Mechanical, Materials & Electrical
Engineering, Computer Science;
Copyrights; Compliance

Cheryl has 20 years of academic tech transfer experience, previously leading tech transfer for the University of Georgia College of Engineering and managing broad portfolios at Georgia Tech and NC State. Cheryl is an IP attorney, with a J.D. from UNH Law School and a BS in Ceramics Engineering from Alfred University, where competitive swimming prepared her to hold her breath in long negotiations and stay afloat in choppy compliance waters.

Since joining in 2020, Cheryl has supported more than 100 faculty investigators, mostly affiliated with Thayer School of Engineering, and two dozen startups. She has managed contracts for the Company PhD program and launched our legal residency and internship programs, mentoring 10 law students. She also assumed direction of TTO's compliance operations and the Technology Innovation Awards, and she has given dozens of lectures on tech transfer.

Kerry has 30 years of experience helping investigators commercialize early-stage technologies, including at MIT's Technology Licensing Office (with exchange work at Cambridge Enterprise) and UVM Innovations, where she led expansion of the nascent entrepreneurial ecosystem. She holds an MS in molecular microbiology from Tufts and a BS in biochemistry from UNH, and a love of the arts that fuels her talent for creatively making connections.

Since joining in 2024, Kerry has galvanized a 47% surge in invention disclosures from the Geisel School of Medicine and 40% surge from first-time inventors, reaching them by tripling the number of faculty presentations and center meetings. She has connected inventors with entrepreneurial support programs, advised in DIAC Accelerators, represented the TTO at MedTech and startup support events, and showcased 15+ Geisel technologies at BIO.



**KERRY
SWIFT MS**

*Senior Business
Development &
Licensing Manager*

IMPACT:

Life Sciences, Digital Health,
Medical Devices & Diagnostics

“ The TTO’s multi-faceted team is dedicated to doing what it takes to help Dartmouth’s innovators grow their ideas into solutions. They are strategists who chart the path, problem solvers who clear obstacles, advocates who protect faculty interests, and guides who walk innovators through unfamiliar terrain.”

— KIM ROSENFELD,
Director of TTO

Mike has 20+ years of experience in operations, budgeting, and database management. He joined Dartmouth in 2015 as administrative coordinator and budget analyst, moved to Tuck as advancement systems and operations manager, then joined TTO in 2020. Mike served 20 years in the U.S. Navy as an electronics technician and earned an AS in Accounting from SNHU, plus honorary TTO degrees in spreadsheets, processes, and building smarter systems.

Since joining TTO, Mike has stewarded more than \$600M in revenue, distributing over \$250M to inventors and \$350M to schools, departments, labs, and the Provost’s Office. Mike tracks and reports TTO metrics and has engineered 30 automations and streamlined processes, eliminating significant manual work. He has also processed over 5,000 vendor invoices and recovered \$1.2M in patent cost reimbursements from licensees.



**MIKE
CASS**

*Financial Manager
Patent &
Database Manager*

IMPACT:

Budgets, Finances, Invoices
& Distributions, Metrics
and Database Operation



**BETH
CULVER**

*Department Coordinator
Marketing Specialist*

IMPACT:

Administrative Support,
Communications, Marketing,
Social Media, and Events

With more than 20 years of experience in visual design, marketing, and communications, Beth has worked with organizations across manufacturing, higher education, human resources, retail, and tourism. She is also a talented graphic designer and detail-oriented administrator. Beth holds a bachelor’s degree in information technology from the Rochester Institute of Technology, and she speaks fluent “last-minute request.”

Since joining in the spring of 2025, Beth has led multiple initiatives that showcased the impact of Dartmouth investigators and TTO, strengthening communications and increasing the visibility of TTO and Dartmouth’s innovations and broad impact. She developed a new brand identity and logo, expanded TTO’s social media presence and audience, improved the office website, and co-led planning and execution of the Technology Innovation Awards.

Carla has 20+ years of broad experience in research administration and technology transfer operations. She led operations at Rice University's tech transfer office, and later served as a consultant for many universities (including Dartmouth). Carla was a vice president of customer success at Wellspring, TTO's database provider for tracking IP, agreements, and contacts, where she managed Dartmouth's account and earned a Wellspring black belt.

Carla joined Dartmouth in January 2026. In her first six months, she updated the IP docket and invoicing processes, developed new operating procedures for IP management, the database, and federal compliance, decreased federal notifications of technically overdue reporting by 61%, and expanded the patent cost reimbursement project she led for Dartmouth while at Wellspring, increasing collections by 412% from FY24 to FY25.



CARLA GARIC

*Associate Director of
Intellectual Property and
Financial Operations*

IMPACT:

Patent Docket, Database,
and Financial Matters



KARIN RIVARD JD

*Senior Contracts
Manager and
Special Counsel for
Technology Transfer*



IMPACT:

MTAs, CDAs, Industry
Collaborations & Sponsorship
Contracts; In-house Legal Support

Karin is an attorney with 30+ years of experience crafting and negotiating deals that help science get to market. She spent 10 years at MIT's Technology Licensing Office and 20 years at Goulston & Storrs, guiding universities, medical centers, and companies through complex tech and life science alliances, licenses, and research agreements. Karin's signature technique is finding practical solutions, delivered without legal jargon.

Previously outside counsel, Karin joined TTO in April 2025. She has already provided legal support and connected with offices across campus on dozens of complex IP transactions, while keeping up with the steady stream of MTAs, NDAs, and Collaboration Agreements. She has begun simplifying, standardizing, and creating new TTO agreement templates, and is collaborating with other members of TTO to develop new licensing and compliance protocols.

Conrad was previously a legal extern at the TTO, supporting the business development and licensing managers. He holds a JD from UNH Law School with a specialty in IP law and a BS in biology and environmental studies from the University of Wisconsin-Madison. A competitive sailor, Conrad's skills in match racing—known for close-quarters maneuvering, contested calls, and gamesmanship—prepared him well for negotiating contracts.

As a former legal intern in 2025, Conrad's major achievement was compiling and organizing a long-needed comprehensive database of Dartmouth's unlicensed patents available for licensing. Since his return, after completing his JD in May 2026, he has sailed through his training and successfully negotiated and drafted several material transfer and non-disclosure agreements.

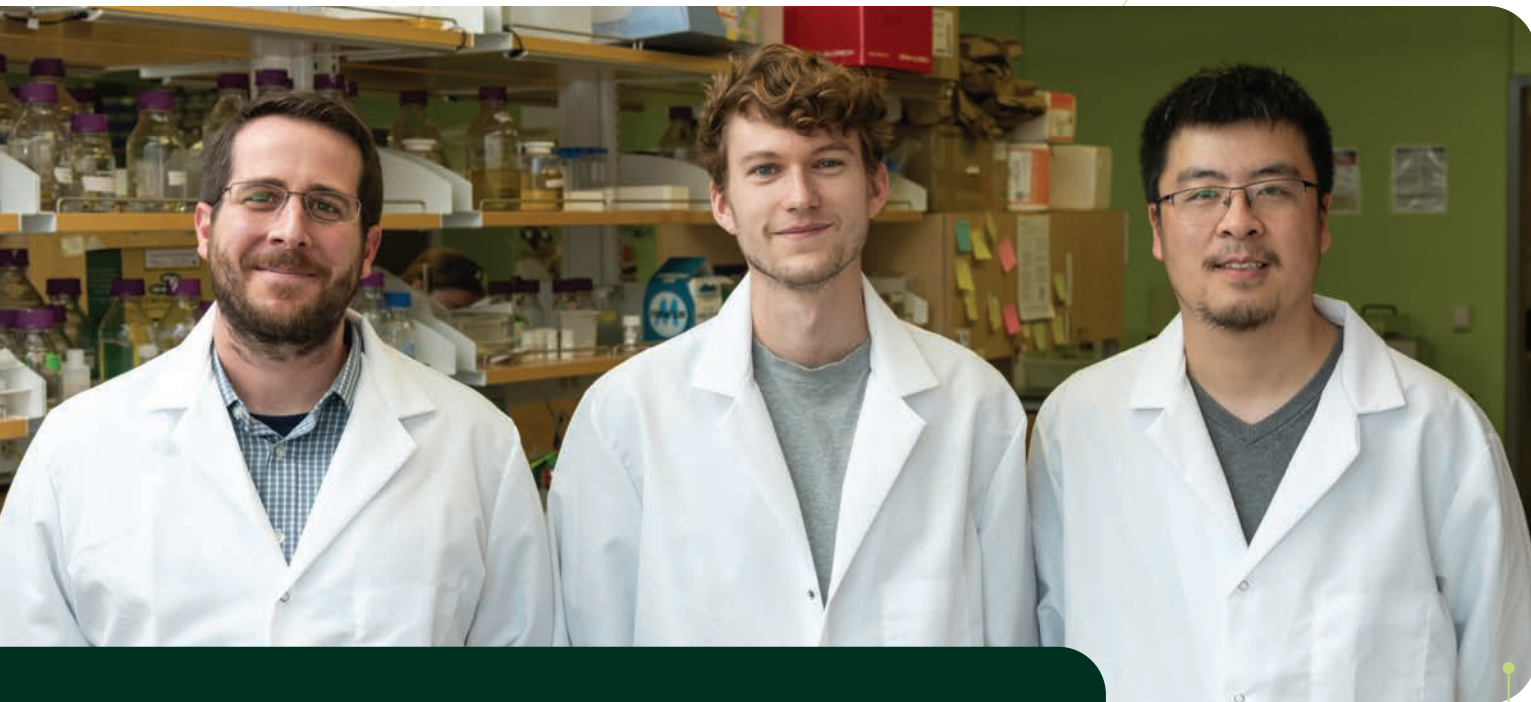


CONRAD VANDLIK JD

Contracts Specialist

IMPACT:

MTAs, NDAs and
Contract Support



HOW INNOVATION BECOMES IMPACT

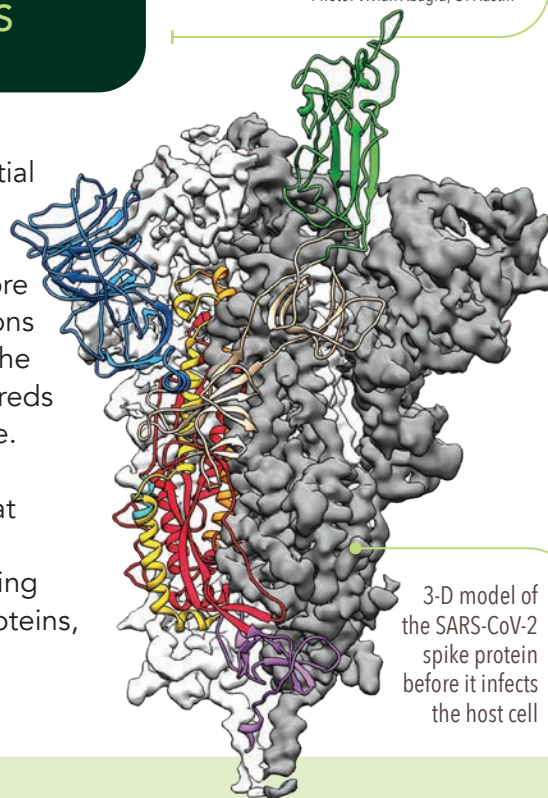
THE DARTMOUTH STORY BEHIND THE VACCINES

(Left to Right) Jason McLellan, Associate Professor of Molecular BioSciences, Daniel Wrapp, graduate student, and Nianshuang Wang, Research Associate, in the McLellan Lab at the UT Austin in 2020.

Photo: Vivian Abagiu, UT Austin

Six years later, it's easy to forget the terrifying early months of the COVID-19 pandemic: people were sick and dying, with hospitals overwhelmed and no effective treatment in sight. As vaccine developers raced for a solution, they faced a seemingly insurmountable barrier: how to stabilize the coronavirus's volatile spike protein. The key breakthrough—how to lock the protein's shape before it infected human cells—came from a Dartmouth lab.

The discovery proved essential to some of the most widely used vaccines in history, credited with preventing more than 18 million hospitalizations and three million deaths in the U.S. alone, and saving hundreds of millions of lives worldwide. Behind these numbers is a technology transfer story that began at Dartmouth, with a tenacious investigator studying structures of volatile viral proteins, including a little-known coronavirus spike protein.



3-D model of the SARS-CoV-2 spike protein before it infects the host cell

“Dartmouth saw the value in this research early on and provided funding and ongoing support that included license negotiations and IP management even after I’d moved to another institution. The Technology Transfer Office team brought incredible collaboration and expertise to designing agreements that helped the COVID-19 vaccines achieve lifesaving global impact.” —JASON MCLELLAN, PhD

PERSISTENCE AND TWO PROLINES

Structural biologist Jason McLellan started his lab at Dartmouth's Geisel School of Medicine in 2013, fresh off a postdoc at the NIH, determined to solve a problem that had stymied scientists: viral spike proteins change shape upon fusing with a human cell, and vaccines built around that post-fusion version don't stop disease. The challenge of locking the protein in its pre-fusion shape had slowed vaccine development for RSV, Ebola, MERS, and SARS—viruses long considered low priority. Federal reviewers even rejected McLellan's universal coronavirus vaccine grant proposal after rating it "outstanding."

In 2017, McLellan and postdoc Nianshuang Wang, working with NIAID and Scripps Research, cracked the code: adding rigid amino acids—two prolines—was enough to hold the protein in place. The solution was patented, though pharma still showed little interest.

FROM PATENTS TO PANDEMIC RESPONSE

COVID-19 changed everything. When the novel beta coronavirus was identified, NIAID knew who to call. McLellan and graduate student Daniel Wrapp had since moved to the University of Texas at Austin, but using the blueprint they developed at Dartmouth, determined the stabilized SARS-CoV-2 spike protein structure

in under two weeks. Dozens of companies, including Moderna, BioNTech, Janssen, and Novavax, applied for licenses. NIAID, as lead under agreements with Dartmouth, Scripps, and UT, entered into agreements to license the patents, and Dartmouth's TTO Director and Associate General Counsel worked with them on the complex agreements and patent strategy.

The story of transforming McLellan's team's innovations to worldwide impact is a blueprint for successful technology transfer: Research nurtured at Dartmouth reached billions, as persistence turned a protein challenge into a foundational vaccine solution. Collaboration among government, academia, and industry on a nonexclusive licensing strategy enabled worldwide distribution. Dartmouth received revenue it can now reinvest to fuel new research and innovation.

BUILDING ON THE BREAKTHROUGH

McLellan continues his research, critical to RSV vaccines and other lifesaving advances. Wrapp runs his own lab at the Duke Human Vaccine Institute, building on lessons learned as a Geisel graduate student. Wang applies his postdoc training to developing new solutions at a pharmaceutical company. And Dartmouth's Technology Transfer Office continues supporting investigators to further their impact as they seek to solve the unsolvable.

KEY TAKEAWAYS:

Long-term R&D investment can pay off.

Foundational research may not always follow a predictable timeline and may go in unexpected directions on the way to global impact.

"Lower-priority" discoveries are still worth patenting.

Research considered less urgent in 2017 became foundational to some of the most widely used vaccines in history.

Collaboration among academia, government, and industry is a game changer.

No single institution working alone can move discoveries from lab to manufacture to global distribution.

Non-exclusive licensing can be the right strategy.

Broad access enabled multiple vaccine developers to move at once during a global emergency and compete to improve the technology.

Graduate student and postdoc participation can accelerate the research and advance their careers.

Wrapp and Nianshuang were early-career researchers when they co-invented this technology.

Technology transfer runs on a virtuous cycle. Early investment led to lifesaving impact, and the resulting revenue funds future research.

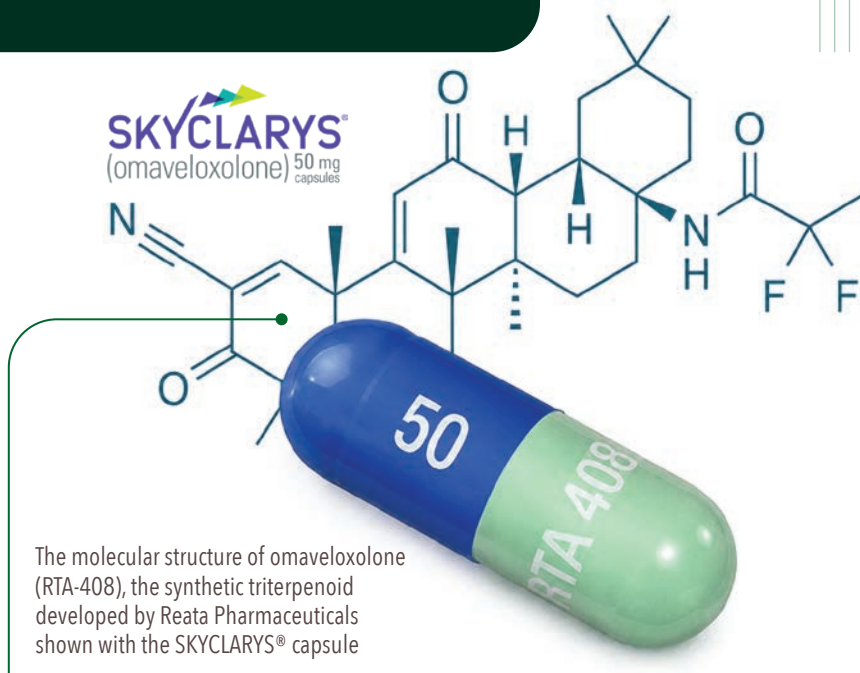
A RARE-DISEASE BREAKTHROUGH

DARTMOUTH RESEARCH & CREATIVE DEAL-MAKING

When the FDA approved the first and only treatment for Friedrich's ataxia, a rare neurological disorder affecting roughly 15,000 people worldwide, patients finally had a therapy that could impact the disease's relentless progression. The story behind that success unfolded over more than two decades—a saga of pioneering research by Dartmouth scientists and creative dealmaking by the TTO.

FROM SETBACK TO SUCCESS

It began with foundational intellectual property from the Geisel School of Medicine and the Dartmouth chemistry department, born from research collaborations with the University of Texas MD Anderson Cancer Center and exclusively licensed to startup Reata Pharmaceuticals. Reata developed a compound that showed promise for chronic kidney disease—but the FDA rejected it. Reata persisted. A second compound, omaveloxolone, known as SKYCLARYS®, won approval. While not a cure, it slows a disease that steadily strips away patients' ability to walk, speak, and live independently.

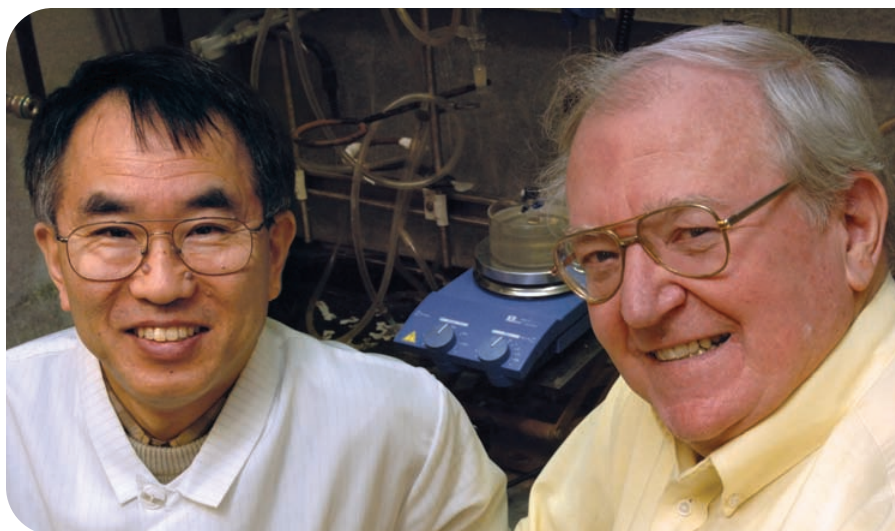


CRAFTING THE RIGHT DEAL

Dartmouth's stake traces back to 2012, when TTO negotiated a creative arrangement with Reata under which the parties agreed to share future royalties on product sales resulting from related Reata research that was not covered specifically by the Dartmouth patents licensed to Reata. That bet paid off twice in 2023—first when SKYCLARYS® reached the market, then when Biogen acquired Reata for \$7.3 billion.

TURNING REVENUE INTO RESEARCH

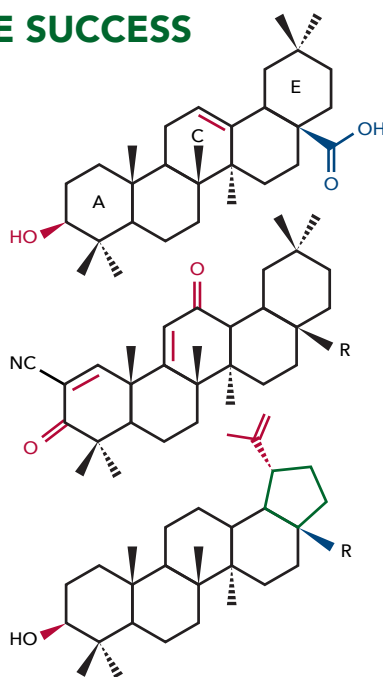
Another strategic choice shaped Dartmouth's next move. Instead of waiting to receive periodic royalty checks, Dartmouth ran a competitive auction that drew multiple bidders interested in buying the future royalty stream. TTO led the complex transaction, involving several Dartmouth departments and outside advisors. Dartmouth sold most of the future royalties, generating present revenue to invest in research that will fuel future innovations and further impact—on conditions ranging from rare diseases affecting thousands to global health challenges affecting millions.



Tadashi Honda, PhD and Gordon Gribble, PhD

THE SCIENCE BEHIND THE SUCCESS

Mike Sporn, MD, assembled the team that pioneered the design and development of synthetic triterpenoid drugs for the treatment of cancer and other chronic diseases, including the compounds developed through collaboration with the University of Texas MD Anderson Cancer Center and licensed to Reata. Organic chemists Gordon Gribble, PhD, and Tadashi Honda, PhD, redesigned naturally occurring triterpenoids, synthesizing increasingly potent compounds. Karen Liby, PhD, worked with Sporn to reveal their remarkable biological activity. And TTO prosecuted and licensed the resulting patents.



Researchers modified key regions of naturally occurring oleanolic acid to develop increasingly potent synthetic triterpenoids, including CDDO.

Dr. Sporn with his postdoctoral fellow Karen Liby



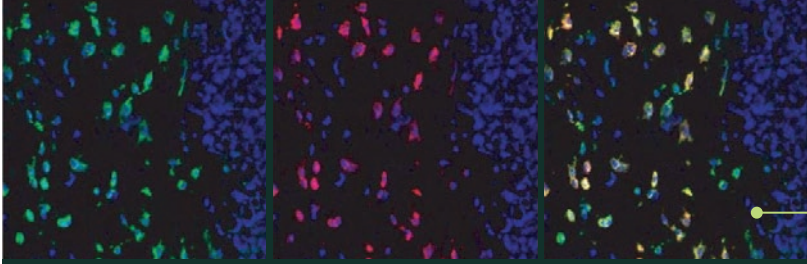
“I think that the need for prevention is intuitively obvious.”

— MICHAEL B. SPORN



MIKE SPORN'S LEGACY EXTENDS BEYOND REATA

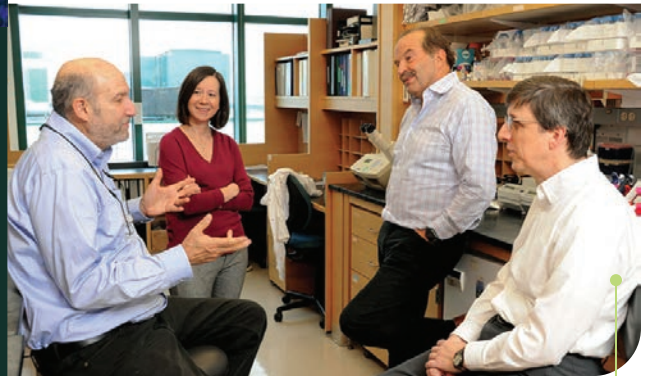
Mike Sporn's legacy extends beyond Reata. He's the father of chemoprevention—a term he created—and his research and advocacy had a major impact on cancer prevention. Already an inventor on 20+ U.S. patents cited in thousands of other patents, Sporn founded Triterpenoid Therapeutics (TTX) at age 85 to develop and commercialize new compounds discovered in his Dartmouth lab. Under a license from the TTO, he actively worked to advance the technology until his death in 2022. Sporn's son Paul now leads TTX, continuing the legacy of developing and commercializing Dartmouth-discovered triterpenoids to treat cancer and a wide range of other diseases.



Fluorescent imaging shows VISTA (red) on immune cells (green) within a melanoma tumor, illustrating its role in regulating the immune response to cancer.

THE MASTER SWITCH OF IMMUNITY

PERSISTENCE & REINVENTION IN A DARTMOUTH LAB AND STARTUP



Steve Firing, Mary Jo Turk, Randy Noelle, and Charles Sentman, photographed in Turk's lab at the Norris Cotton Cancer Center. Photo credit: Jon Gilbert Fox

Professor Randolph Noelle, in Geisel's department of microbiology and immunology, was on a quest: how does the immune system decide when to attack and when to stand down? The regulators of immune responses that prevent the body from attacking itself can also limit the ability to attack cancerous tumors. Noelle believed that understanding these mechanisms could help treat not only autoimmune diseases such as multiple sclerosis and lupus but also cancer.

SWITCHING IMMUNITY ON AND OFF

In the 1990s, Noelle's lab identified a novel protein, the ligand for CD40, known as CD40L or CD154. Noelle described it as a kind of kingpin of adaptive immunity—a molecule capable of switching on the immune response that protects us from disease, but that can also turn against us in autoimmune disorders. Years later, his lab

found another key player: the checkpoint regulator VISTA, which helps keep that system in check.

SCIENTIST TURNED ENTREPRENEUR

Determined to get his discoveries to patients, Noelle added "entrepreneur" to his skill set, co-founding ImmuNext, LLC. Dartmouth patented Noelle's discoveries and licensed them exclusively to the company, taking a small share of equity from the startup. Clinical development of anti-CD40L antibodies had stalled because of safety problems with a competing antibody developed in a different lab, but undeterred, Noelle's lab and ImmuNext worked for decades to determine what went wrong and overcome safety concerns. They licensed anti-CD40L antibody, Frexalimab, to Sanofi. Trials showed the drug's promise in suppressing Multiple Sclerosis inflammation without depleting the immune cells needed to protect the body, and Sanofi has described it as a "pipeline-in-a-product."

SUCCESS FUELS THE NEXT DISCOVERY

Seeing Frexalimab's potential, Royalty Pharma acquired the drug's royalty and milestone rights by merging ImmuNext into a subsidiary, with ImmuNext as the operating company to continue its research and development. As a shareholder in ImmuNext, Dartmouth received proceeds and distributed them to the inventors on the IP that led to the company's formation as well as to the school and department that had nurtured Noelle's research, for investment in new discoveries.

VISTA's story continues, too. Noelle and his ImmuNext colleagues realized VISTA biology made it useful as a delivery vehicle, and spun off another startup, Liford Immunotherapeutics, to pursue the discovery. Noelle's boldness and persistence as an investigator and an entrepreneur continue to create important health and economic impact.

HUMANITIES AND THE ARTS

ADVANCING THE IMPACT OF CREATIVE WORKS

Innovation isn't only an engineering and life science story, and not every creation is patentable. Innovators in the humanities and arts at Dartmouth benefit society profoundly, and the TTO works to expand that impact with the School of Arts and Sciences, the Hopkins Center for the Arts, and other centers and institutes across Dartmouth.

Cases in point: Dr. Mark Williams, Associate Professor of Film and Media Studies, launched the Media Ecology Project, striking agreements with collections worldwide to unlock film metadata and history.

John Bell as Program Director of DREAM (Dartmouth Resources for Emerging Arts and Media) used motion-capture technology to trace how dance and movement have shifted on film across decades.

Dr. Monica Ndounou's *Create Ensemble* project gives creators of color a digital stage, and she worked on digital techniques to tackle bias in avatars.

Through programs like Coursera, faculty reach learners worldwide while keeping their copyrights.

In computer science, too, innovation rarely waits for patents. The TTO works with software platform and app creators, leading the way on the IP challenges and opportunities presented by new media, AI, machine learning, and open-source tools in development across Dartmouth.



John Bell attaching the reflective sensors which enable detection in the motion capture system.
Photo: Katie Lenhart

A new art form. Novel ways of compiling archives or examining history. An algorithm, app, or code. Each demands its own playbook. The TTO champions innovation and creativity in every form, across every discipline.

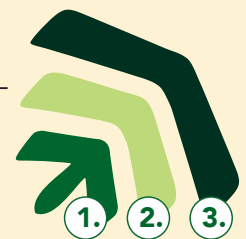
A New Brand of TTO



The TTO sits at a critical intersection where ideas move out of Dartmouth and into the world. The new logo design visually expresses that momentum, reflecting entrepreneurial spirit and outward-facing mission.

The logo draws from the top of Dartmouth's iconic lone pine, preserving a strong link to Dartmouth's heritage and values through a modern interpretation that reflects innovation.

Together, the three arrows show a continuous progression—innovation emerging from Dartmouth, carried forward by TTO, and delivering lasting impact in the wider world.



- 1. DARTMOUTH GREEN** represents the faculty, researchers, and other innovators within Dartmouth where their ideas originate.
- 2. SPRING GREEN** represents Technology Transfer itself, where innovation is evaluated, protected, marketed, and strategically positioned for translation to real-world use.
- 3. FOREST GREEN** represents impact beyond Dartmouth: industry partners and communities where the beneficial economic and societal impact of Dartmouth innovations are realized.

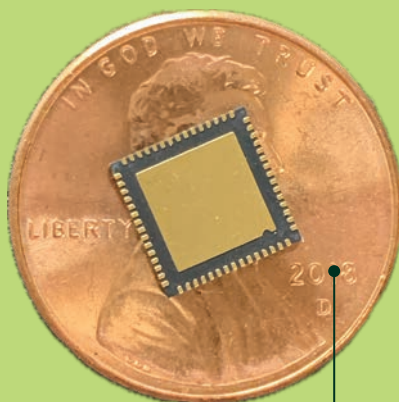
STARTUP COMPANIES

Most Dartmouth innovations are licensed first into start-ups, for the development and proof of concept needed to de-risk the technology and attract investment or industry partners. Dartmouth's policies encourage faculty founders—no one understands or cares more about moving their work into the world than they do. The TTO backs them with favorable license terms and connects them to resources along the long, winding, and often rocky road to success.

Non-Von

Non-Von.com

Your brain runs enormously parallel computation on a power budget a laptop can't touch. Non-Von, founded in 2020 by Dartmouth's Dr. Richard Granger, is building computer hardware that works the same way. Rather than bolting AI software onto conventional chips, Non-Von designs custom algorithms and neuromorphic hardware together—"non-von Neumann machines" modeled on brain circuitry—to run vast numbers of independent processing streams without the memory bottlenecks that slow traditional architectures. The payoff is an order-of-magnitude improvement in cost and power efficiency for AI and sensor-processing applications, particularly at the network edge and in data centers where every watt counts.



Non-Von's novo chip, shown on a penny for scale, packs 3,200 compute cores into a chip measuring just 3×4 mm.

InSight Surgical Technologies

InsightSurgicalTechnologies.com

Brain tumors are notoriously difficult to separate from healthy tissue. Neurosurgeons like Dr. Dave Roberts, former Chief of the DHMC Neurosurgery Section, rely on pre-operative scans to guide removal of cancerous tissue as completely as possible without damaging healthy brain cells. But brains move during procedures, and surgeons can't stop for intraoperative imaging. Roberts joined forces with Thayer Engineering Professor Keith Paulsen, renowned for his expertise in medical imaging methodologies. Their research collaboration focused on intraoperative and fluorescence guidance to identify cancerous tumors and update imaging during surgery.

TTO helped protect the results by carefully crafting agreements with industry partners who loaned equipment and patenting the broad portfolio of inventions. Roberts and Paulsen co-founded InSight Surgical Technologies (IST), licensed the IP portfolio, set up shop in the Dartmouth Regional Technology Center, and hired a veteran medical device CEO (who'd helped previous Dartmouth/DHMCC spin-out, Cairn Surgical). With development well underway, IST is raising funds to move continuous intra-operative fluorescence-guided imaging from the lab bench to the operating table.



Wide-Field Fluorescence (using an institutional IRB-approved prototype system and not qF-Image™)

“ The best, most efficient way for us to bring Dartmouth’s biomedical discoveries to cancer patients around the world is through entrepreneurship. ”

—STEVEN D. LEACH, MD

Former Director of Dartmouth Cancer Center and the Preston T. and Virginia R. Kelsey Distinguished Chair in Cancer at the Geisel School of Medicine.

Cairn Surgical

CairnSurgical.com

One in four breast-conserving cancer surgeries fails to clear the tumor margin the first time—meaning a second surgery, a harder recovery, and real emotional toll. CairnSurgical, spun out of Dartmouth and Dartmouth-Hitchcock by Drs. Keith Paulsen, Richard Barth, and Venkat Krishnaswamy, built a fix: the Breast Cancer Locator System, which 3D-prints patient-specific surgical guides from imaging data to show surgeons exactly where the tumor is—and isn’t. Its “Visualizer” maps tumor size, shape, and margins in real time. Already commercially available in Europe, the system just hit its primary endpoint in a pivotal U.S. trial, compared to conventional wire localization on positive margin rates. The company became a model for other Geisel, Thayer, and DHMC collaborations that de-risked promising clinical solutions in a startup, based on a TTO equity-only license arrangement designed to conserve company cash for the development work.



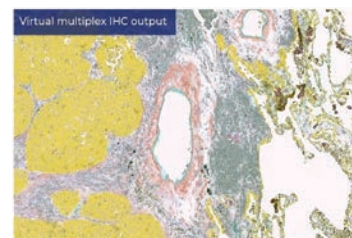
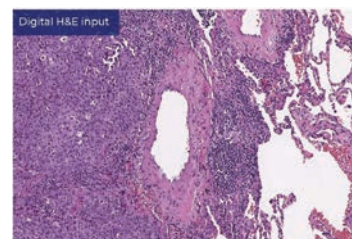
The Visualizer offers 3D visualization of the tumor and quantification of the closest distance from the tumor to the skin and chest wall.

ViewsML

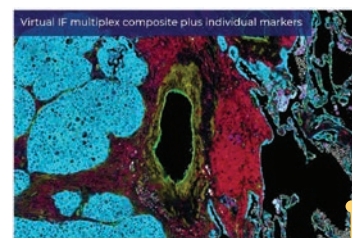
ViewsML.com

How long should a patient have to wait for biopsy results? Traditional biomarker testing involves physically staining tissue with antibodies, consuming scarce samples, and delaying treatment decisions.

The process can take days. ViewsML, Inc. a Vancouver-based techbio company, is building an AI platform that predicts the same results directly from a standard pathology slide in minutes—no additional staining required.



CD31
CD45
CD8
SMA
CK



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Using a single H&E stained sample slide, the ViewsML platform provides spatial and quantitative insights into biomarker expression, enabling detailed per-cell analysis for multiplex biomarker studies.

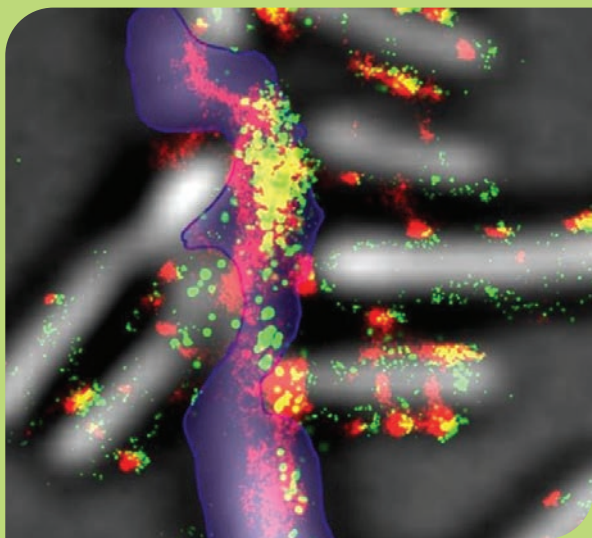
Through negotiations with the TTO, ViewsML Inc. entered into a license agreement with DH for the platform technology. This partnership is making progress toward virtual biomarker panels that could improve patient selection for clinical trials and sharpen cancer risk stratification. This year, ViewsML Inc. has raised over \$3M US in follow-on funding from multiple investors.

STARTUPS

Terragia Biofuel

Terragia.com

Making transport fuel from abundant, available non-food plant materials like agricultural residues and perennial grasses is an enticing solution to climate and energy issues, but doing it efficiently has stumped the industry for decades. Terragia Biofuel, built on nearly a four-decade body of research by Dr. Lee Lynd, has attacked the problem with “consolidated bioprocessing”—an innovative one-step method that converts cellulosic biomass into ethanol without added enzymes or thermochemical pretreatment. The process slashes capital costs and energy inputs compared to conventional approaches. Dartmouth invested in early versions of Lynd’s work, and TTO has worked with Lynd for two decades, supporting IP, collaboration agreements with global partners, and the spin-off of a new startup in 2022. Fundraising and development have accelerated under a new name and a dynamic new management team.



Heat-loving bacteria break down and ferment plant material in a single step, the biological process at the heart of Terragia’s approach to producing low-carbon fuels.

National Renewable Energy Laboratory/U.S. Department of Energy

AssurTek Surgical

AssurtekSurgical.com

Nerve damage is one of the most feared complications in dental implant surgery, and it’s often invisible until it’s too late. AssurTek Surgical is a spin-off founded in 2023 by Dr. Ryan Halter, Dr. Alicia Everitt, and oral surgeon Dr. Michael Salin, based on research at Thayer and DHMC. Its flagship product, OsteoSmartSense™, is the world’s first smart-sensing digital drill, designed to detect nerves, sinuses, and other vital structures in real time—and stop drilling before injury occurs. Designed to slot into existing clinical workflows with minimal retraining, AssurTek is making a routine but high-stakes procedure safer and better for patients and practitioners.



OsteoSmartSense™ transforms a standard dental drill into a smart-sensing tool, providing real-time feedback to help clinicians avoid nerves, sinuses, and other critical structures during implant surgery.

“Many Dartmouth startups participate in the accelerators, getting early feedback from people who have built companies before, and a chance to pressure-test the science against what it takes to succeed commercially. Those are essential to turning a promising discovery into a company with real staying power.”

—BARRY SCHWEITZER, PHD

Interim Director, Magnuson Center for Entrepreneurship and director of accelerator programs.

“ The PhD Innovation Program gave us the tools and the TTO laid the foundation: their support for early protection and licensing of Nanopath’s core technology proved critical for investors, especially for a woman-led team tackling a historically underserved disease space. ”

—AMOGHA TADIMETY

Co-founder and Co-CEO, Nanopath, Inc.

Resonant Link

RLMedical.com

Charging an implanted medical device and charging an industrial forklift may sound like entirely different challenges, but both grew from the same wireless-power foundation.

Founded in 2017 on research from Dr. Charles Sullivan’s lab at Dartmouth, Resonant Link applied its innovations in coils, magnetics, and power electronics across medical and industrial applications. Today, Resonant Link Medical focuses exclusively on implantable medical devices. Its Aurion WPT™ platform delivers wireless power at up to 10 times the speed and over twice the range of conventional systems. In early 2025, the industrial charging business was acquired by Advanced Charging Technologies. In 2026, Resonant Link Medical received the MedTech Magnet Award, recognizing its impact within the medical-device industry.



Small enough to fit between two fingers, Aurion WPT™ delivers wireless power to implantable medical devices, enabling smaller, longer-lasting designs.

Nanopath

NanoPath.com

For many women, common infections can mean waiting days for lab results—or starting treatment before knowing what’s wrong. Amogha Tadimety and Alison Burklund, graduate students in Professor John Zhang’s lab at Thayer, shared a commitment to using their research to solve real human health problems. They realized that combining their separate work on rare biomarker capture and ultra-sensitive biosensing could form the foundation for a new diagnostic platform to address women’s health issues that were too often ignored. Eric Fossum’s PhD Innovation Program empowered them to start a company, NanoPath, to move their ideas beyond the bench. Taking advantage of Dartmouth’s entrepreneurial ecosystem, they entered and won a pitch competition, joined the NSF i-Corps program, and filed patents through the TTO, which licensed the IP to the company. Nanopath’s technology can identify pathogens and antibiotic resistance markers in as little as 15–20 minutes, without delays caused by traditional methods using nucleic acid amplification. Enabling diagnosis of UTI’s, vaginitis, sexually transmitted infections, or HPV during a single office visit can improve accuracy, reduce unnecessary antibiotic use, and enhance patient care. Nanopath has raised over \$22 million, and in 2025 the FDA granted its UTI test Breakthrough Device designation, rare for a women’s health diagnostic- demonstrating the company’s impact on neglected women’s health issues.



NanoPath’s compact molecular diagnostic platform brings lab-quality testing to the point of care, enabling rapid detection of multiple pathogens from a single patient sample.

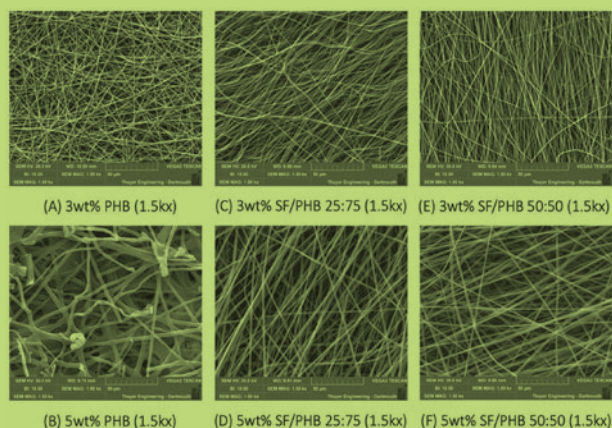
STARTUPS

Tensara Medical

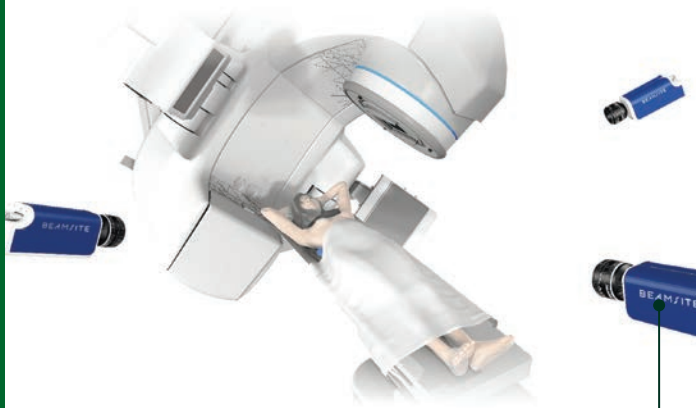
NovaGyn.org

As a doctoral student in Dartmouth's PhD Innovation Program, Becca Thomson developed a bioresorbable, tissue-engineered scaffold as an alternative to synthetic surgical mesh. The scaffold, which dissolves over time, encourages the body's own tissue to grow in and provide permanent support. The TTO supported her work and assisted her in launching NovaGyn, a company targeting stress urinary incontinence, a condition affecting millions of women with few good surgical options. Her research earned a \$50,000 NSF seed grant that funded the first prototypes, followed by a \$300,000 NIH award.

Through the Dartmouth Innovation Accelerator for Engineering, Thomson connected with an experienced entrepreneur who joined as co-founder. The company re-cast the scaffold as a platform for tissue repair generally, rebranded as Tensara Medical, and recently won \$100,000 to fund full proof-of-concept animal studies.



SEM images of all scaffolds fabricated, demonstrating fiber diameter and alignment differences between concentrations and ratios of polymers.



BeamSite cameras surround a radiation therapy system, capturing real-time images of the radiation beam as it reaches the patient and giving clinicians an added view of treatment delivery.

Dose Optics

DoseOptics.com

In radiotherapy, the moment of highest risk is also the hardest to see: the actual delivery of the dose. DoseOptics, co-founded in 2015 by Dr. Brian Pogue, solved that blind spot with an invention that would become BeamSite—the world's first system to capture a direct, real-time view of radiation dose delivery by imaging the Cherenkov light it produces in tissue. Built for clinical guidance in safe radiotherapy, BeamSite lets care teams visualize and verify treatment as it happens, not after. Now FDA-cleared and in worldwide sales, it turns a normally invisible step in cancer care into something clinicians can finally see in real time.

“The startup journey is as intense as anything I've faced in the lab. But there's no greater satisfaction than guiding your own discovery from bench to bedside. Dartmouth's policies facilitate the path for faculty founders, and the TTO's support clears the way, so we can focus on the science and the mission.”

—BRIAN POGUE, PHD

Professor of Biomedical Engineering, founder, DoseOptics, QUEL Imaging, and Hypoxia Surgical

“Dartmouth gave me the intellectual toolbox and community of mentors and support from the TTO that made it possible to turn ideas into companies. These have been critical assets in every startup I’ve launched.”

—JACK O'TOOLE

CEO & Co-founder: DSEC; Co-founder: FreshAir Sensor, LLC; Merum Wine, LLC; Lutum, LLC; Founder: SDI, LLC

FreshAir Sensor

FreshAirSensor.com

Joe BelBruno, a Dartmouth Chemistry professor, was worried about cigarette smoke. He knew from decades of research that he could produce polymer sensors precise enough to detect nicotine molecules in secondhand smoke. What if they could also detect signature components of marijuana smoke? BelBruno co-founded FreshAir Sensor LLC, working with students at Tuck as he explored the market for smoking sensors.

Then, vaping grew in popularity, slipping past every detector on the market. So the company pivoted, receiving a grant from the NIH to develop the technology to meet the need. Hotels, casinos, and public housing providers now use FreshAir to monitor air quality, automate cleaning, and cut costs. Its latest innovation, FreshAir Certified™, lets hotels sell guests on verified pristine rooms, turning clean air into an amenity guests pay for. Smoking in hotels and public housing used to be nearly impossible to prove.

FreshAir's molecular sensor detects tobacco and marijuana smoke by targeting specific molecules in the air, helping eliminate the false alarms common with particle-based detectors.



DeepSense Electromagnetics and Consulting

DeepSenseEM.com

Some of the most dangerous things buried underground are also the hardest to find. DeepSense, founded by Thayer engineering professor Fridon Shubitidze, Dartmouth graduate student Max Orman-Kollmar, postdoctoral researcher Dr. Irma Shamatava, and retired Marine Raider Jack O'Toole, builds ultra-light electromagnetic sensor arrays that locate and identify buried metal objects, from landmines and unexploded ordnance to aging water infrastructure.

The company builds on more than 26 years of Shubitidze's electromagnetic sensing work, spanning fundamental physics, sensor design, system development and demonstration, as well as advanced signal-processing, inversion, and classification methods developed at Thayer. DeepSense is now piloting a noninvasive method to specifically identify buried lead, copper, and galvanized pipes with the EPA, with funding to explore whether the same technology can safely detect landmines. Formed in February 2026, DeepSense credits Dartmouth's DIAEn accelerator with sharpening its pitch and business strategy early.



DeepSense's ultralight electromagnetic sensor array uses advanced sensing and signal processing to locate and identify buried metal objects.

EMERGING TECHNOLOGIES

Innovation comes from many directions—a hunch, a long-unanswered question, an ambitious vision, a serendipitous find. The TTO's work is to identify and evaluate the innovations at the earliest stage.



**Mattias
Fitzpatrick**

Engineering/Physics

Fixing atomic-scale defects to unlock next-generation quantum computing

In a lab humming with cryostats, Mattias Fitzpatrick chases coherence in fragile qubits. At Thayer School of Engineering, he bridges hardware and theory—engineering superconducting circuits that whisper quantum information without losing it to noise. Now, as part of the NSF-funded MARQUIS institute, he's reimagining the Josephson junction itself, hunting atomic-scale defects that limit next-generation quantum hardware. Each pulse of microwave light is a careful negotiation between fragility and control. For Fitzpatrick, every breakthrough—whether in his lab or this national collaboration—is a step toward quantum computers solving problems classical machines never could.



**Hui
Fang**

Engineering

Designing brain implants built to last and neural probes that sense and record at once

A brain implant is only as good as its weakest interface—the microscopic boundary where electronics meet living tissue. Hui Fang's lab at Thayer studies exactly that boundary, engineering the materials and mechanics that determine whether a neural probe keeps working for years or fails within weeks. His group co-leads NeuroCROWN, a \$2.8M NIH-funded initiative to develop next-generation CMOS implantable neurotechnology, and separately secured \$2.6M to develop a microelectrode array that can simultaneously sense neurochemicals and record electrical activity—a probe design with applications in deep brain stimulation and epilepsy monitoring, and another step toward commercial-scale manufacturing.

INNOVATION ON THE RISE

The TTO strategizes with innovators at the outset on how best to realize the potential health, environmental, artistic, or other societal benefit of their new discoveries or creations.



**Katherine
Hixon**

Engineering/Orthopaedics

An electronic implant that helps skull and brain heal together

Getting long-term access to the brain requires cutting through the skull—and somehow leaving it able to heal around whatever's implanted. Katherine Hixon, who studies tissue engineering and bone regeneration at Thayer and Geisel, teamed up with bioelectronics researcher Alexander Boys to solve both halves of that problem at once: a skull-healing electronic implant that regrows bone around a functioning neural device, published on the cover of *Advanced Materials Technologies*. Hixon's broader work spans craniofacial reconstruction and fracture healing, including a keratin-based biomaterial shown to improve how skin integrates around prosthetic implants—a small fix with outsized impact for amputees.



**Claudia
Jakubzick**

Microbiology & Immunology

Repurposing an approved HIV drug, to fight cancer

Macrophages are supposed to be cancer's foot soldiers, but some quietly switch sides. Claudia Jakubzick, an immunologist at Geisel School of Medicine, discovered that even closely related macrophage populations contain both "accelerators" that fight tumors and "brakes" that help them grow—a finding published in *Nature Immunology* using single-cell sequencing and spatial imaging. In a cancer vaccine model, her team showed that blocking those suppressive brakes with maraviroc, a drug already FDA-approved for HIV, significantly boosted anti-tumor immunity. Because the drug is already approved, the discovery—so far shown in lung cancer—could reach patients faster than a therapy built from scratch.

WHERE IMPACT BEGINS

How can we advance early-stage ideas most effectively? Through industry collaboration? License to an existing company? Forming a new startup? Is the idea best transferred via publication or open source?



**Esteban
Orellana**

Molecular & Systems Biology

Blocking a tRNA modification that pushes healthy cells toward cancer

For decades, tRNAs—the molecules that translate genetic messages into proteins—were dismissed as housekeeping machinery, too basic to matter in disease. Orellana's research at Geisel says otherwise. His lab discovered that an enzyme called METTL1 chemically modifies a specific tRNA, Arg-TCT, in ways that can drive healthy cells to turn cancerous. In a recent study, blocking that modification was enough to suppress tumor growth and cancer cell proliferation in preclinical models—pointing to a new class of cancer targets hiding in the basic machinery of protein synthesis. The work, building on a 2023 *Nature* paper detailing the enzyme's structure, earned him the Damon Runyon-Dale F. Frey Award for Breakthrough Scientists.



**Adithya
Pediredla**

Computer Science

Steering light with sound, and testing imaging systems before they're built

Most cameras are limited not by their sensors but by their optics—mirrors and lenses simply cannot move fast enough. Adithya Pediredla, a computer scientist at Dartmouth, uses sound to steer light instead. Acousto-optic devices built in his Rendering and Imaging Science Lab redirect laser beams millions of times per second, roughly a thousand times faster than conventional scanners, enabling high-speed projection, LiDAR, 3D scanning, and underwater optical communication. His group also adapts physics-based rendering, the simulation technology behind photorealistic graphics, to design and test new imaging systems entirely in software before any hardware is built.

TECHNOLOGIES TAKE SHAPE

The TTO removes the friction and greases the wheels to progress early-stage innovations, freeing the investigators to focus on research, publication, and teaching.



**Kim
Samkoe**

Engineering/Physics

Real-time color maps that guide surgeons and protect critical nerves

What if surgeons could see anatomy in different colors, live, mid-operation? That's the premise behind Kim Samkoe's fluorescence imaging work at Dartmouth's Thayer School. Using the same physics that makes a white shirt glow under a black light, Samkoe tags critical structures like nerves and blood vessels with light-activated molecules, producing real-time "color maps" that show surgeons exactly what to cut and what to spare. The approach won up to \$31.3M through an ARPA-H Precision Surgical Interventions award to fund the collaborative program with Dartmouth colleagues Keith Paulsen, Ryan Halter and Scott Davis, with an aim to reduce nerve damage in prostate surgery by 90%.



**Mukul
Sharma**

Earth & Planetary Sciences

Carbon-capturing clay that could slow climate change

Why is fracking wastewater toxic? Dartmouth geochemist Mukul Sharma's research into that question not only reshaped understanding of fracking, pointing to safer treatment methods—it led to unexpected carbon sequestration discoveries. Sharma earned a Guggenheim for finding that clay put in seawater attaches to microalgae-derived carbon, producing fast-settling flocs. The clay also spurs bacteria to form large flocs zooplanktons eat, making heavier fecal pellets that sink captured carbon deep in the ocean faster, before it escapes. On land, Sharma is trying to lock carbon into farm soil by fortifying biochar with lava-derived nutrients—improving soil fertility while tackling climate change.

RESEARCH IN PROGRESS

The TTO meets innovators where they are, matching each early-stage idea to the path—grant, mentorship, or protection—that gives it room to grow.



**Charles
Sentman**

Microbiology & Immunology

Pioneering CAR T-cell therapy taking aim at neurodegenerative disease

When Charles Sentman started studying CAR T-cell therapy in the early 2000s, the entire field's researchers could fit in a conference room. Sentman's work on natural killer cells helped lay the groundwork for several first-generation CAR T-cell therapies—treatment that turns a patient's own immune cells into a living, self-renewing drug against cancer. That research helped establish Dartmouth as one of the field's pioneers, ahead of CAR T-cell therapy's FDA approval and rapid expansion into mainstream oncology. Sentman's lab is now pushing the same cell-engineering approach beyond cancer, into neurological diseases including Alzheimer's, Parkinson's, and ALS.



**Sladjana
Skopelja-Gardner**

Molecular & Systems Biology

Hope for targeted, self-applied therapy to treat cutaneous lupus skin lesions

Up to 80% of lupus patients develop cutaneous lupus. With no FDA-approved targeted topical treatment, steroids and systemic immunosuppression are their only options. Dr. Sladjana Skopelja-Gardner, an expert in innate immunity and disease mechanisms in lupus, has a potential solution. Her team in Microbiology & Immunology at Geisel found applying a MAIT antigen, 5-OP-RU, directly to skin activates protective immunity, expanding MAIT cells and regulatory T cells. Therapy cleared lesions in preclinical models, prevented UV light-triggered flares, and worked in human skin explants—offering hope of stable, self-applied home treatment for the roughly 3.5 million people living with cutaneous lupus.

SOLUTIONS UNDERWAY

Not every early idea needs a patent lawyer. Sometimes it needs an introduction, a program like iCorps, a grant lead, a collaborator. The TTO makes connections and provides support in many forms.



**Mary Jo
Turk**

Microbiology & Immunology

Training the immune system to remember cancer and keep it in check

Most cancer treatments have to kill every last malignant cell to work—miss one, and the disease returns. Mary Jo Turk's research asks a different question: what if the immune system could simply remember cancer cells and keep watch for good? As co-director of Dartmouth Cancer Center's Immunology and Cancer Immunotherapy Program, Turk studies how to generate durable, long-lived T-cell memory that continues patrolling the body long after treatment ends. Her lab is now extending CAR T-cell approaches to solid tumors—cancers that make up the majority of diagnoses but have historically resisted this kind of immune-based therapy.



**Vikrant
Vaze**

Engineering

Turning messy real-world dilemmas into solvable math problems

Airlines, hospitals, and coastal towns don't look like they have much in common—until you frame each as an optimization problem. Thayer Professor Vikrant Vaze applies optimization, game theory and machine learning across all three: streamlining aviation schedules to cut delays, modeling healthcare systems to improve patient care, and analyzing how early planning could help coastal communities manage retreat from rising seas. Vaze's data-driven approach has earned him recognition as "The Optimizer" for turning messy real-world systems into solvable math—and a Woodhouse Excellence in Teaching Award for bringing students along for the ride.

DARTMOUTH TECHNOLOGY INNOVATION AWARDS



2026 AWARD RECIPIENTS

(Left to Right) Dr. Nicholas Jacobson, Kim Rosenfield, Dr. Eric Fossum, and Dr. Brian Pogue at the 2026 Awards.

DR. BRIAN POGUE

Robert A. Pritzker Professor of Biomedical Engineering

The *Technology Innovation and Commercialization Award* and *Rising Star Innovator Award* recognize up to 3 faculty and researchers whose inventive and entrepreneurial work creates meaningful societal and economic impact.

The *Technology Innovation and Commercialization Award* honors individuals whose innovation and entrepreneurial achievements have made significant contributions to Dartmouth and society.

The *Rising Star Innovator Award* recognizes early-career faculty, including Assistant and Associate Professors, who demonstrate exceptional research, innovation, and entrepreneurial thinking.

Dr. Brian Pogue, recipient of the 2026 Dartmouth *Technology Innovation and Commercialization Award*, is a leader in biomedical optics and imaging, whose pioneering work has advanced cancer detection and treatment through fluorescence-guided surgery, image-guided therapy, and technologies that help surgeons visualize tumors in real time. His translational research moves discoveries from the laboratory into clinical practice through collaboration with physicians and industry. A prolific inventor, he helped lead DoseOptics to commercialization and FDA clearance and is advancing the new venture Hypoxia Surgical, LLC—exemplifying the potential of innovation to transform cancer care and improve human health.

DR. NICHOLAS JACOBSON

Associate Professor of Biomedical Data Science and Psychiatry

Dr. Nicholas Jacobson, recipient of the 2026 Dartmouth *Rising Star Award*, is an emerging leader at the intersection of mental health, technology, and data science. His pioneering work uses smartphones, wearable devices, machine learning, and generative AI to improve how mental health conditions are monitored and treated. A pioneer in digital phenotyping, he combines psychiatry and data science to develop scalable, personalized approaches to mental healthcare. He also founded Therabot Labs, LLC, advancing his research toward commercialization. His work exemplifies the potential of next-generation technologies to expand access to care and improve mental health outcomes.



2025 AWARD RECIPIENTS

DR. PAUL GUYRE

Emeritus Professor of Microbiology and Immunology

Dr. Paul Guyre, recipient of the 2025 Dartmouth Technology Innovation and Commercialization Award, pioneered work in bispecific monoclonal antibodies that helped lay the foundation for a global market now exceeding \$10 billion annually. With Dr. Mike Fanger, he co-founded Medarex, one of Dartmouth's first spin-offs. The company went public in 1991 and was acquired by Bristol-Myers Squibb in 2009 for \$2.1 billion. Medarex's intellectual property has contributed to more than 40 FDA-approved therapies used to treat cancer and other serious diseases and saved over a million lives. Dr. Guyre's research also advanced checkpoint inhibition therapies, now a \$50 billion market. With a portfolio of over 45 patents, his legacy exemplifies the power of innovation to transform medicine and human health.

DR. KATHERINE MIRICA

Associate Professor, Chemistry

Dr. Katherine Mirica, inaugural recipient of the 2025 Dartmouth Rising Star Award, is advancing possibilities in materials chemistry through groundbreaking research in accessible electronic sensing devices. Her work combines fundamental and applied science to design materials for low-power, portable, and easy-to-use sensors, with applications spanning microelectronics, energy, healthcare, and environmental monitoring. A dedicated mentor, Dr. Mirica has guided PhD Innovation Program students and postdoctoral fellows from discovery to commercialization, fostering entrepreneurial thinking at Dartmouth. With 11 invention disclosures, 12 U.S. patent filings, and five issued patents generating over 900 citations, her innovations are advancing fields from microelectronics to healthcare and environmental stewardship.

PREVIOUS AWARD RECIPIENTS

Technology Innovation and Commercialization

2023: Dr. Randolph Noelle

Leading immunologist and co-founder of ImmuNext whose discoveries in immune regulation have advanced new therapies for cancer and autoimmune disease.

2020: Dr. Tillman Gerngross

Biotechnology innovator and serial entrepreneur whose research and companies have advanced antibody engineering and the development of new therapies.

2020: Dr. Michael Sporn

Pioneering cancer researcher and entrepreneur whose work advanced new approaches to cancer prevention and treatment and inspired decades of therapeutic innovation.

2019: Dr. Laura Ray

Engineering innovator and entrepreneur whose work spans robotics, intelligent systems, and medical technologies, translating research into practical real-world applications.

2019: Dr. B. Stuart Trembly

Biomedical engineering inventor and entrepreneur whose patented technologies and startups advanced innovative approaches to treating disease, including cancer and vision disorders.

ERIC R FOSSUM PhD

VICE PROVOST FOR INDUSTRY PARTNERSHIPS
FOR INNOVATION AND EDUCATION

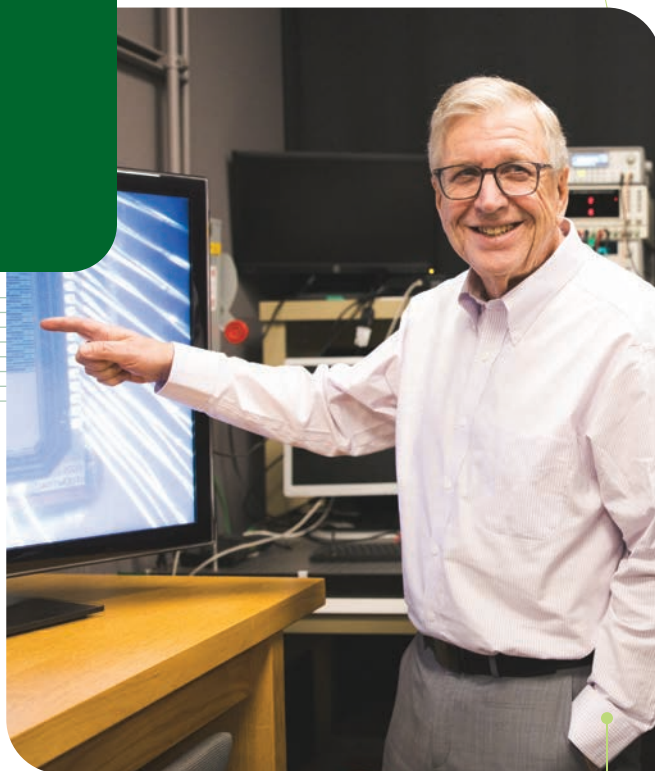
DIRECTOR, PHD INNOVATION PROGRAM

Eric R. Fossum, PhD, is the John H. Krehbiel Sr. Professor for Emerging Technologies in the Thayer School of Engineering. Before joining Dartmouth, he spent years in industry and was an expert consultant and witness in roughly a dozen patent litigation cases. He arrived at Dartmouth in 2010, served as Vice Provost for Entrepreneurship and Technology Transfer from 2017 through 2026, and in 2026 moved into the newly created role of Vice Provost for Industry Partnerships for Innovation and Education.

Under Eric's leadership, Dartmouth's Technology Transfer Office established itself as the nation's second-highest generator of licensing revenues, and The Magnuson Center for Entrepreneurship was established and grew into an internationally recognized hub for campus entrepreneurship. As director, Eric has also led significant expansion of Dartmouth's PhD Innovation Program, the nation's leading graduate-level innovation curriculum. He continues to teach and mentor students, helping graduate students develop the entrepreneurial, leadership, and industry engagement skills needed to move discoveries from the laboratory to the marketplace.

Eric holds 185 U.S. patents and is well-known for co-inventing the CMOS active-pixel image sensor—the “camera-on-a-chip”—initially commercialized through the startup Photobit Corporation out of JPL/Caltech, which powers cameras in an estimated seven billion devices each year, ranging from smartphones to medical instruments to spacecraft.

Eric also continues his research and development of new technologies at Dartmouth. With two of his Thayer PhD students, Eric co-founded Gigajot Technology, which commercialized the Quanta Image Sensor (QIS), a third-generation imaging technology sensitive enough to detect a single photon of light at room temperature without avalanche multiplication. He is now working on technology re-framed around edge AI and machine perception—continuing to reshape how the world captures, and increasingly, interprets light.



Professor Eric Fossum in his lab. Photo by Katie Lenhart

Eric received NAE's prestigious Charles Stark Draper Prize for Engineering, the Queen Elizabeth Prize for Engineering, and the National Medal of Technology and Innovation, and in 2026 he received the Bayh-Dole Coalition's American Innovator Award and was listed by *Forbes* as one of America's greatest living 250 innovators. He is a member of the National Academy of Engineering, the National Academy of Inventors, and the National Inventors Hall of Fame. A pioneering inventor, entrepreneur, and educator, and proud sponsor of the NIHF Camp Invention Program for young people, Eric's career exemplifies successful research translation for societal impact.

DELIVERING ON A PROMISE

When I accepted the role of Vice Provost for Entrepreneurship and Technology Transfer in 2017, I inherited a bold IP policy deliberately crafted to encourage faculty retention and recruitment via entrepreneurship. My goal was to build a Technology Transfer Office (TTO) and culture of entrepreneurship at Dartmouth that would sharpen that edge and deliver towards that goal. This was accomplished by creating, organizing, and funding The Magnuson Center for Entrepreneurship in a coordinated way with the already existing TTO.

A COMPACT FOR SOCIETAL BENEFIT

Every federal research award comes with a compact: in exchange for taxpayer funding, universities promise to convert that investment into societal benefit. That means we have the obligation to turn discoveries into technical advances, medical treatments, and solutions to the world's problems, while also working to enhance the human condition and drive economic progress. Universities can deliver on that promise by attracting and retaining faculty innovators who want to see their ideas move quickly from the lab to the marketplace, and have the entrepreneurial thinking and competencies needed to commercialize new technologies—which differ from expertise in research and discovery. I've lived that

truth from the entrepreneurial inventor's side of the table, and I brought to Dartmouth that firsthand understanding of what faculty-founders need.

POLICY TO PRACTICE

During my tenure, TTO leaned further into licensing to faculty startups, offering express, equity-only licenses and flexible use-of-space programs. We expanded our licensing and business development team, adding seasoned dealmakers with technical backgrounds. We reduced administrative friction by bringing on a finance and business team committed to consistent and clear practices in the management and tracking of intellectual property, company data, expenses, and distributions. We grew the share of TTO's deals that originated in faculty-founded startups and provided recognition to entrepreneurial faculty.

During the same period, some of Dartmouth's startups generated significant revenue through exits, and Dartmouth-owned IP was licensed to established industry in extraordinary deals, bringing over half a billion dollars of revenue to Dartmouth. I brought on a TTO director experienced in technology transfer and in negotiating complex transactions, which improved Dartmouth's position and brokered complex agreements that span life-saving vaccines, cancer therapeutics, advanced sensors, and consumer electronics.

CULTURE BUILT TO LAST

But revenue tells only part of the story. Culture is the multiplier. That's why I expanded the PhD Innovation Program to fuel a pipeline of graduate-founders who are comfortable both in the boardroom and at the bench. Graduates of that program have started companies that licensed Dartmouth innovations through the TTO, which continues to provide them with advice and support. Experimental technology commercialization accelerators created under Magnuson serve faculty, graduate students, and postdocs alike.

The TTO remains steadfast in its mission to commercialize Dartmouth innovations to greatest societal benefit, through startups and through win-win deals with industry. As I move into the new role of Vice Provost for Industry Partnerships for Innovation and Education, charged with expanding Dartmouth's engagement with industry, I look forward to continuing to work with the TTO team. I am proud of the impact Dartmouth has had in the past five years through the Office of Entrepreneurship and Technology Transfer and expect that the next five years will deepen the impact we can deliver together.

—ERIC R. FOSSUM

Vice Provost for Entrepreneurship
and Technology Transfer,
2017–2026



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