

DRIVING INNOVATION TOWARD IMPACT

HARVARD'S OFFICE OF TECHNOLOGY DEVELOPMENT
IMPACT REPORT | FY2024



HARVARD
Office of Technology Development

The true measure of our success lies in our impact on society.

Whether through developing new treatments for diseases, creating sustainable technologies, or advancing our understanding of the world, Harvard has a profound responsibility to translate research from across the university to improve lives and shape our future.

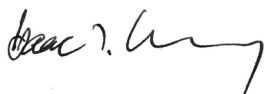
The Harvard Office of Technology Development (OTD) is driven by a sense of urgency to accelerate the translation of academic research into real-world solutions that can improve public health, address pressing global challenges, and drive economic growth. However, the journey from lab to market is fraught with challenges, including advancing early-stage research toward commercialization, successful startup formation, overcoming regulatory hurdles, and navigating the complex landscape of industry partnerships.

OTD provides researchers with the support and resources needed to realize the commercial impact of their ideas, creating an environment where academic research and real-world impact converge. This is achieved through intellectual property protection, strategic corporate partnerships, accelerator funding, and venture creation. We're fortunate to have the ability to tap into Harvard's extraordinary network of alumni and entrepreneurs who serve as mentors, investors, and industry partners.

To provide crucial early-stage support, OTD manages accelerator funds: the Blavatnik Biomedical Accelerator, the Grid Accelerator, and the newly established Climate and Sustainability Translational Fund. Additionally, we host networking events and annual boot camps for Harvard faculty, postdocs, and graduate students, further showcasing our commitment to fostering the growth and development of our research community.

Our mission is to advance innovation toward impactful solutions. This fiscal year, 14 startups launched based on Harvard innovations, each poised to make significant contributions and revolutionize their respective fields. We are committed to advancing Harvard's vision of tackling the world's most pressing challenges and creating a lasting impact on a global scale.

Sincerely,



Isaac T. Kohlberg
Senior Associate Provost and
Chief Technology Development Officer
Harvard University



TRANSLATING INNOVATION TO IMPACT

The Office of Technology Development (OTD) advances innovations made at Harvard University through corporate partnerships, accelerator funds, reinvesting in Harvard research, and startup formation.

TABLE OF CONTENTS

- 4 Advancing Research through Corporate Partnership**
- 8 Tapping into Innovation Across the University**
- 10 Advancing Early-Stage Technologies**
- 14 Reinvesting in Harvard Research**
- 14 Venture Creation**
- 20 Supporting Harvard Innovators**

Advancing Research through Corporate Partnership

Industry-sponsored research, collaborations, and long-term research alliances bring real-world problems directly into the lab to foster tangible solutions for society. Strategic alliances with corporate partners advance research in various disciplines across the university to address important unmet needs and make substantial progress in a wider field.

CORPORATE PARTNERSHIPS

Industry-sponsored research brings real-world problems into Harvard research labs and often provides access to data sets, reagents, and knowledge that are vital to advance research. Corporate partnerships strengthen faculty research initiatives and leverage the collective work of labs of several schools and research teams.

In FY24, OTD advanced faculty research through:

\$36.4M

in corporate research funding from strategic alliances and sponsored research agreements

Resulting in:

52

corporate research partnerships

402

new innovations reported by Harvard researchers

Over the last five years, OTD advanced faculty research through nearly:

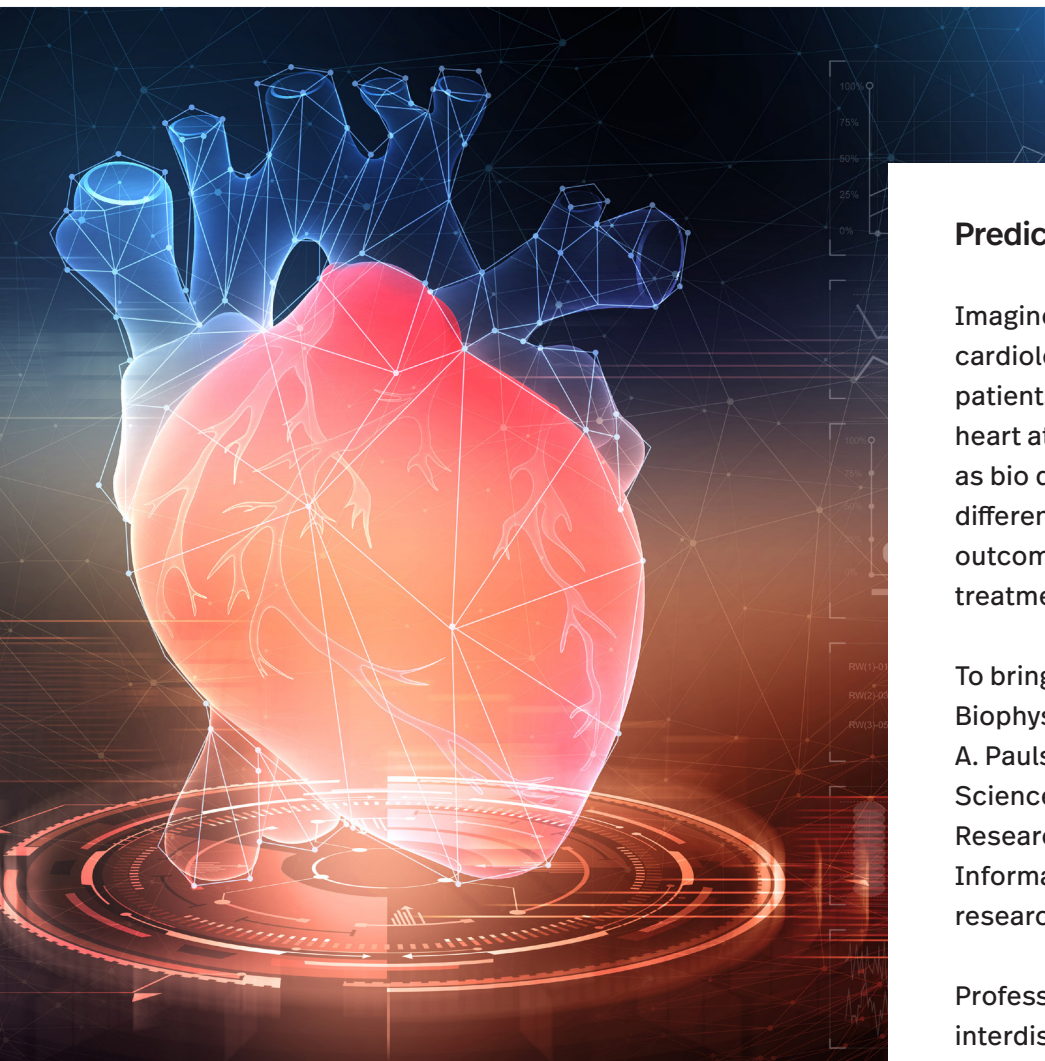
\$300M

in corporate research funding from strategic alliances and sponsored research agreements

Preserving Biodiversity

In FY24, **LVMH Recherche** and **Parfums Christian Dior** entered into a sponsored-research agreement with Harvard to support research in the lab of Professor Charles Davis at the Harvard University Herbaria to develop a digital collection and genomic library of nearly 2,000 medicinal and horticulturally important flowering plants. Insights from the project may identify opportunities to protect biodiversity amid changing climates and preserve knowledge of vitally important flowering species.





“Alan Gordon and the OTD office have done an excellent job translating our discoveries to market. In the spring of 2023, I had a day where I received an advertisement for a drug discovery assay we had invented that’s being marketed by a biotech company. Later that day, I found myself in the outdoor section of a department store, where the barbecue smoker we had invented was for sale. That evening, I took my daughter to a restaurant serving the alt protein we had invented in my laboratory. In one day, three of the many translation stories that OTD has told with our inventions were witnessed. It was a good day to be an inventor. It was a good day to be an inventor at Harvard.”



Prof. Kevin Kit Parker
Harvard School of Engineering
and Applied Sciences
Wyss Institute for Biologically
Inspired Engineering

Predicting Heart Attacks

Imagine a not-too-distant future where cardiologists use virtual representations of patients’ cardiovascular systems to predict heart attacks. These software models, known as bio digital twins, also allow physicians to test different therapies to see which offers the best outcome, facilitating personalized, preventive treatment.

To bring this vision into reality, the Disease Biophysics Group (DBG) at the Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS) is partnering with NTT Research, Inc., through its Medical & Health Informatics (MEI) Lab, via a three-year joint research agreement that began in July 2022.

Professor Kevin Kit Parker leads an interdisciplinary team with experience building micro-physiological systems, or “organs on chips.” These devices, about the size of a computer memory stick, use human cells to mimic organs and physiologic responses to various drugs. In collaboration with the MEI Lab, which has developed bioelectrodes that interface with cells and tissues, the DBG team intends to engineer a virtual replica of the human heart.

This collaboration expands NTT’s research relationship with Harvard. Earlier in 2022, NTT Research’s Physics & Informatics (PHI) Lab announced a joint research agreement with Harvard University scientists to study animal neuro-responses with the hope of informing future artificial intelligence systems.

Advancing Research through Corporate Partnership

/ CORPORATE ALLIANCES

Over the last 5 years, corporate alliance efforts resulted in:

\$130.2M

in corporate research funding from strategic alliances

84

funded projects

14

alliance partners

“It’s exciting to see discoveries made in my lab being propelled into therapeutic development [...] The resources at Harvard to support translational biomedical innovation were really instrumental in helping us advance this work to a jumping-off point, and I’m hopeful that further development and clinical testing of the results could make a significant and lasting difference in the lives of patients.”



Prof. David Ginty

Harvard School of Medicine
Howard Hughes Medical Institute

Developing Data-Driven Solutions

To spur advances in quantum networking, the transmission of information in quantum bits, and support the development of data-driven solutions to complex social problems, OTD executed two strategic research alliances with Amazon Web Services (AWS), establishing more than \$26 million in research funding.

Building a Quantum Internet

Harvard and AWS launched a three-year research alliance, announced in September 2022, focusing on driving rapid progress toward research aims at the Harvard Quantum Initiative (HQI) to develop foundational methods and technologies for building a quantum internet, a network of quantum computers that will transmit information to solve specific types of problems. Research supported by the AWS alliance has led to a key milestone in quantum computing. A research team, led by Professor Mikhail Lukin has created the first programmable, logical quantum processor. The work was recently published in *Nature* and conducted in collaboration with Professor Markus Greiner, colleagues from MIT, and QuEra Computing, a Boston company founded on technology from Harvard labs.

Harnessing Data for Social Impact

A second research alliance agreement allows researchers, through the Harvard Data Science Initiative (HDSI), to partner with AWS in applying the power of cloud computing technology to problems facing humanity. The AWS Impact Computing Project seeks to advance research in social impact computing and enable faculty, students, and researchers to think differently about ways data can assist in the structuring and building of human-centric solutions to complex challenges like the climate crisis. The alliance will bring together researchers from across the university, representing multiple disciplines and areas of focus.

Advancing Drug Discovery to Address Multiple Disease Areas

In March 2024, Harvard and Ono Pharmaceutical launched a university-wide research alliance to advance therapeutic research in oncology, immunology, neurology, and specialty areas. This five-year strategic alliance, spearheaded by OTD's Alliance Management Team, will involve various labs across the university, including those at Harvard Medical School, Faculty of Arts and Sciences, Harvard Chan School of Public Health, Wyss Institute, and more. OTD and Ono will collaboratively select projects, with the Harvard Medical School Therapeutics Translator playing a crucial role in advancing later-stage projects.

Partnerships such as this bridge the development gap, ensure the continuity of resources, and are instrumental in discovering new drugs and treatments for complex diseases.



OTD hosted the Ono Pharma Day Luncheon to launch the Harvard and Ono Pharmaceutical alliance. Faculty from across the university met with Ono leadership and therapeutic area heads to learn about the company's areas of interest relevant to the alliance.

“With industry support, we are developing next-generation, “off-the-shelf” therapeutic approaches that can be applied to a broad range of human diseases. Our goal is to streamline treatment approaches so patients do not have to undergo complicated cell transplantation processes, accelerating treatment and avoiding serious side effects associated with transplantation.”



Prof. Amy Wagers
Harvard Dept. of Stem Cell
and Regenerative Biology

Rethinking Gene Therapy

The Resilience research alliance with Harvard expanded efforts with a new project led by Professor Amy Wagers to develop next-generation gene therapy. The Wagers Lab studies the mechanisms that regulate the function of blood- and muscle-forming stem cells so their potential can be optimally exploited for treating diseases such as cancer, anemia, muscular dystrophy, and diabetes. The Resilience-funded project aims to establish a system for robust, selective, in situ gene delivery and genome modification. The overarching goal is to develop therapies for treating diseases of the blood and immune systems.

Tapping into Innovation across the University

OTD continues to focus on advancing our strategy of engagement with schools, departments, and institutes across the university. We do this through sponsored research agreements, strategic industry alliances, and unique collaborations that pull from labs across the university with the unified goal of advancing research.

FEATURE FOCUS

Transforming Lives, Human Mobility, and Work: The Impact of Robotics Research

As advances in robotics technology usher in a new era of automation and extend human capabilities, Harvard University scientists, engineers, and computer scientists are at the forefront of creating technologies that solve real-world problems.

Through industry-sponsored research and alliances, intellectual

property management, licensing agreements and accelerator programs, OTD paves the way for innovations in robotics to move from labs into homes, hospitals, workplaces, and other settings, easing suffering, solving intractable problems, and improving safety and efficiency.

As robotics and artificial intelligence rapidly change the way we move, work, communicate, and heal, there is a need to translate research quickly and effectively into marketable products and services.

Startup Spotlight

OTD recently supported the launch of three robotics startups emerging from Harvard labs:

Project 1985 is leveraging a manufacturing process pioneered by Professor Robert Wood and inspired by children's pop-up books to augment the medical robotics field.

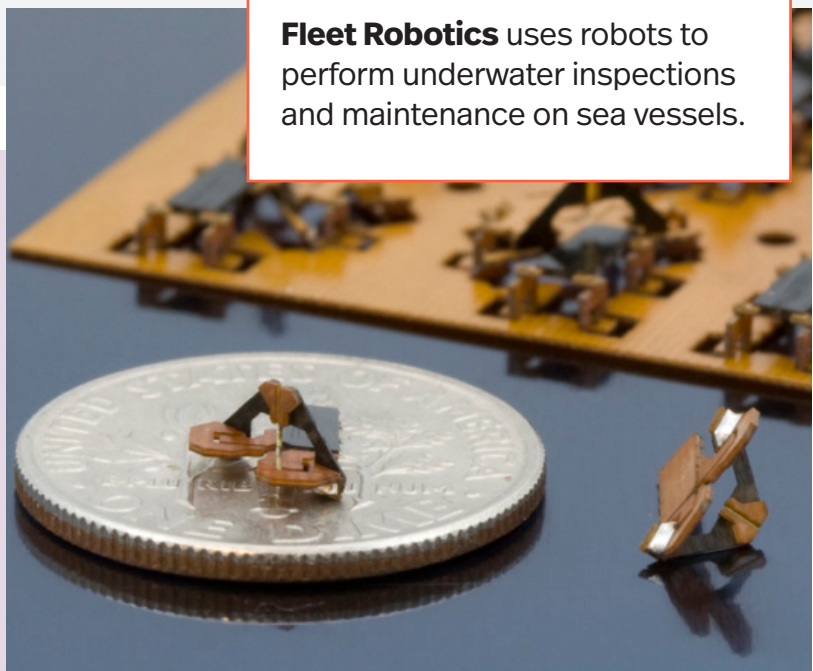
WurQ, a startup based on discoveries from the lab of Professor Conor Walsh, develops wearable devices for strength training.

Fleet Robotics uses robots to perform underwater inspections and maintenance on sea vessels.

“Engineering is all about solving real-world problems. My lab recently launched two robotics startups. This would not have been possible without the translational programs at Harvard, combined with the extraordinary startup ecosystem of the greater Boston area.”



Prof. Robert Wood
Harvard School of Engineering and Applied Sciences
Harvard Microrobotics Lab



An example of mass production of a microrobotic mechanism (Photo: Pratheev Sreetharan, Peter Whitney, Wood Lab)

Impactful Solutions from the Wyss Institute

OTD works with the Wyss Institute for Biologically Inspired Engineering at Harvard University to advance research through industry collaboration and strategic alliances and enables the commercialization of research out of the Wyss, focusing on startup formation. Together with the Wyss leadership, such commercialization efforts are advancing Wyss research with meaningful applications and impact.

OTD recently executed a research alliance agreement in close coordination with the Collaborative Fund and the Wyss Institute, establishing a long-term strategic partnership to foster solution-focused discovery efforts in the lab that will bolster the pursuit and growth of Wyss projects that have the potential to solve important unmet environmental problems in the world – particularly projects within the areas of synthetic biology, biomanufacturing, and clean air and water.

Collaborative Fund, a New York-based venture fund, committed \$15 million to create a Laboratory for Sustainable Materials Research and Innovation at the Wyss Institute to launch a research and innovation alliance focused on new, sustainable materials to fight climate change.

Startup Spotlight

Breaking

Breaking, a plastic degradation and synthetic biology company, is making significant strides in addressing the global plastics crisis with its core technology, X-32. This innovative solution, discovered at the Wyss Institute and incubated at Colossal Biosciences, can break down multiple types of plastic—polyesters such as PET bottles, polyolefins like packaging materials, and polyamides such as nylon—in less than 22 months. The process leaves behind only carbon dioxide, water, and biomass, with no known negative environmental ramifications, offering hope for a cleaner future. (Photo: Breaking)



In 2020, the Wyss Institute, Northpond Labs (the research-and-development affiliate of Northpond Ventures), and other collaborating institutions launched the Laboratory for Bioengineering Research and Innovation at the Wyss Institute as part of a research collaboration. The collaboration, enabled by OTD, established a \$12 million, five-year commitment from Northpond Labs to advance impactful research with a strong translational potential for commercialization. The collaboration has funded four projects at the Wyss, including eRNA (currently being commercialized by EnPlusOne Biosciences), SomaCode, Lab-on-a-Molecule, and most recently, AminoX.

The AminoX team, out of Professors George Church and Jim Collins's labs, is developing a platform for differentiated protein-based therapeutics. Using machine learning approaches, the research team is developing a platform for easier and faster integration of non-standard amino acids (nsAAs) into new protein-based drugs. This is the fourth Wyss project to which Northpond Labs has provided funding and in-kind support to ensure a pathway toward rapid technology commercialization.

Advancing Early-Stage Technologies

OTD-managed accelerators combine translational funding, technical support, mentorship, and industry connections to enable research teams to commercialize their discoveries and realize real-world impact.

/ ACCELERATORS

Blavatnik Biomedical Accelerator

The Blavatnik Biomedical Accelerator (BBA) at Harvard University provides essential gap funding, development support, and business expertise to help faculty investigators in life sciences achieve the full potential of their work.

The accelerator awarded **\$2.05M** to **11** Harvard biomedical projects in the past year in the areas of cell and gene therapy, inflammation and immune diseases, oncology, neuroscience, and drug discovery platforms. The projects are led by faculty in Harvard Medical School, Faculty of Arts and Sciences, School of Engineering and Applied Sciences, and Chan School of Public Health.

“Our goal is to improve patient lives, to take years of research and propel it out of the lab, into clinical studies, and to patient care. Accelerator funding, combined with expert guidance and a robust network, provides essential support to ensure early-stage technologies can ultimately make a significant impact.”



Prof. David Scadden
Harvard Dept. of Stem Cell and Regenerative Biology
Massachusetts General Hospital

Startup Spotlight



A Harvard startup, with BBA-supported technology and co-founded by Professors Andrew Kruse and Timothy Springer, Tectonic Therapeutic recently entered into clinical trials for its lead program addressing a Cardio-Pulmonary Disease (Group 2 Pulmonary Hypertension in Heart Failure with preserved Ejection Fraction). Its second program is in preclinical stages for a genetic bleeding disorder called HHT. There are no approved medicines for either disease. The company also announced a reverse merger with AVROBIO and entered the public market. Tectonic Therapeutic (TECX) is a biotech company developing G-Protein Coupled Receptor (GPCR)-targeting therapeutic proteins and antibodies for a broad range of diseases.

As of 2024, support from the Blavatnik Biomedical Accelerator has resulted in:

\$29.5M
in grants awarded

162
projects funded

26
startup companies with
foundational IP supported
by the BBA

\$2.9B
in financing raised by
BBA-supported startup
companies

\$166M
in licensing revenue and corporate research
funding generated to support continued
innovation at Harvard

Harvard Grid Accelerator

The Harvard Grid Accelerator is designed to support Harvard's physical science research teams to de-risk promising ideas and bring those ideas to market. The accelerator supports research teams to establish a solid proof of concept, scale up a product or process, and generate intellectual property positions. The Grid Accelerator builds upon the success of the OTD Physical Sciences and Engineering Accelerator, which has advanced research since 2013.

As part of the Harvard Grid, the Grid Accelerator, along with targeted programming, mentorship, and resources, advances the commercialization of Harvard innovations in engineering and the physical sciences.

As of July 2024, support from the Grid Accelerator and its predecessor has resulted in:

\$3.4M
in grants awarded

37
projects funded

17
Grid Accelerator-
supported startup
companies

\$176M
in financing raised

"Through the Grid Accelerator, we've been able to get new resources into the group and transform our three-dimensional printing platform into a truly multifunctional, multi-material platform for manufacturing."



Prof. Jennifer Lewis
Harvard School of Engineering
and Applied Sciences
Wyss Institute at Harvard

FEATURE  FOCUS

Grid Accelerator Awardees

In 2024, the Grid Accelerator announced awards to 6 interdisciplinary research projects, led by Harvard faculty members Patrick Slade, David Weitz, Joost Vlasik, Shriya Srinivasan, Daniel Jacob, and Jia Liu, to support their work to de-risk promising technologies and eventually form startups. The projects include advanced drug delivery and encapsulation technology; AI-driven flexible bioelectronics for treating neurological disorders, cancers, and diabetes; and a navigation aid for the visually impaired, among other technologies.

Startup Spotlight

MicroAvionics

A Harvard startup with Grid Accelerator-supported technology, MicroAvionics, launched in FY24. MicroAvionics is commercializing research from Professor Joost Vlassak's lab to access the near-space atmosphere for crucial climate, telecommunications, and defense knowledge. Their ultra-light products levitate in Earth and Mars' atmospheres without the need for fuel or batteries, being powered by energy from the sun.



Climate and Sustainability Translational Fund

The urgency and magnitude of the climate crisis necessitate new pathways through which researchers and scientists can efficiently translate discoveries in the lab into products that can contribute to mitigating the impact of climate change. That's why OTD, in collaboration with the Salata Institute for Climate and Sustainability at Harvard University, launched the Climate and Sustainability Translational

Fund and related programs, with the inaugural awardees being announced in FY25.

Aiming to increase the global impact of Harvard research on climate and sustainability, the fund supports university-based projects and helps prepare researchers and technologies for startup formation. Project teams that receive support through the fund will also gain valuable input from experienced mentors as they progress toward the commercialization of their research.

This initiative will spur the real-world application of research-based technology solutions and advances in sustainability, helping create environmentally minded leaders and ready technologies for commercialization that directly impact the long-term health of our world.

To kick off the Climate and Sustainability Translational Fund, OTD co-hosted the **Climatech Boot Camp** along with the Harvard Grid and the Salata Institute for Climate and Sustainability. OTD staff and faculty from the Harvard Business School led the full-day workshop on commercializing climate and sustainability-related innovations for start-up formation.



WATCH THIS on OTD's YouTube channel

HouseZero, Harvard's Center for Green Buildings and Cities headquarters, is a research project turned laboratory highlighting the synergy of research across the university. As a data-driven living laboratory, HouseZero also acts as a test bed for other research teams developing new technologies.

Harvard Grid Supports Emerging ‘Tough Tech’ Startups

Emerging technologies that push the frontiers of science and engineering to solve the world’s most pressing challenges require specialized support to reach the market.

To incubate “tough tech” projects, OTD and the Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS) officially launched the Harvard Grid, a comprehensive set of programs supporting commercially viable engineering and physical sciences innovations.

The Harvard Grid offers accelerator funding, physical workspace, mentorship, and onsite

advisors to foster the commercialization of innovations from Harvard engineers and applied scientists. Through strategic guidance and educational events throughout the year, Harvard Grid builds a community of entrepreneurs interested in bringing their innovations to market. The goal is to advance promising technologies to the stage where they can be the basis of a startup.

In 2024, Harvard Grid launched the **Grid Postdoc Fellowship**, an educational experience designed to give fellows translation experience in tough-tech startup formation. The 12-month program surrounds fellows with a broad and deep community of experts, mentors, investors, entrepreneurs, and more—that creates an ecosystem to help fellows launch successful tough tech ventures.

“The Harvard Grid is dedicated to bridging the gap between research and real-world applications. Our mission is to empower Harvard’s innovators by providing the necessary tools, mentorship, and resources to transform their visionary ideas into impactful startups.”



Paul Hayre
Executive Director
Harvard Grid

Hosted by the Harvard Grid and led by Harvard Business School faculty, the **Tough Tech Boot Camp** was held in the fall of 2023.

Postdocs and graduate students gathered for hands-on workshops on commercializing their tough tech innovations. Industry leaders and entrepreneurs shared their journeys and insights into launching tough tech startups.



Reinvesting in Harvard Research

Commercialization revenue is reinvested into Harvard research to enable additional discoveries to progress toward startup formation and products.

In FY24, technologies emerging from Harvard labs generated:

\$107M
in commercialization
revenue

Over the last 5 years, technologies emerging from Harvard labs generated:

\$483M
in commercialization
revenue

\$4B+
in equity financing
collectively raised by
Harvard startups

Venture Creation

OTD develops effective strategies to commercialize Harvard IP, matches technologies with licensees and investors, and establishes licensing agreements with partners.

In FY24, commercialization of Harvard's translational research resulted in:

14
startup companies

36
major license
agreements

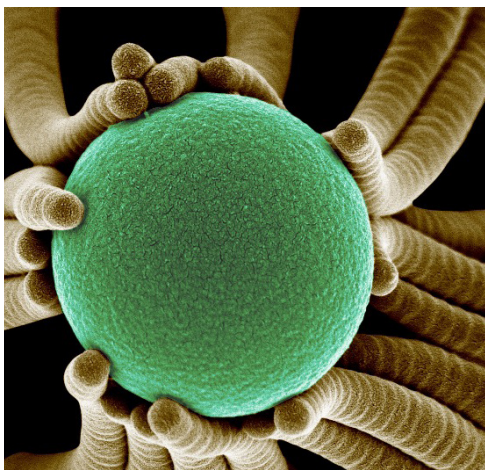
155
US patents
issued

Over the last 5 years, commercialization of Harvard's translational research resulted in:

96
startup companies

217
major license
agreements

897
US patents
issued





Transforming the HVAC Industry

Almost 25% of the energy produced worldwide is used to heat and cool our spaces. Even when turned off, heating and cooling devices significantly impact climate through gaseous refrigerant leakage. With a warming world, we need efficient solutions now.

A Harvard startup with Grid Accelerator-supported technology out of Professor Jared Mason's lab at Harvard's department of Chemistry & Chemical Biology, Pascal aims to transform the HVAC industry by creating a new class of solid-state refrigerants that could enable energy-efficient and emission-free cooling. The solid refrigerants undergo large changes in temperature when they are pressurized and depressurized. This temperature change allows them to transport heat from one location to another, enabling a refrigeration cycle. Pascal's technology allows solid refrigerants to operate in the same pressure range as gaseous refrigerants for the first time. This technology unlocks substantial advantages in efficiency, cost, and safety.



The First to Bring Metasurface Technology to Real-World Devices

Face ID has made unlocking our phones and passwords quick and convenient. However, current technology has limitations and comes with a hefty price tag.

Using licensed technology supported by the Harvard Grid Accelerator from Professor Federico Capasso's lab at Harvard School of Engineering and Applied Sciences, Metalenz recently launched Polar ID, the world's smallest and most affordable secure face unlock for smartphones. Metalenz is the first company in the world to design and build a complete imaging sensor solution around the unique capability of metasurface optics to harness polarized light information to reveal new insights and details about a scene. Metalenz also announced collaborations with Qualcomm and Samsung to bring Polar ID to the Android ecosystem, beginning with mobile. In FY24, Metalenz partnered with top semiconductor foundry UMC to mass produce its first-generation product, the "Orion" dot projector for smart lock and payment kiosk applications for customer Dilusense. Metalenz is rapidly commercializing metasurface technology out of Harvard with applications including face authentication for smartphones, contactless access control, security, gesture recognition, obstacle avoidance, and automotive in-cabin monitoring.



Advancing Imaging Capabilities

From mining and natural resource exploration to semiconductor manufacturing and the analysis of forensic evidence, electron microscopy has made many world-altering innovations and discoveries possible.

One longstanding challenge that has held back advances in the field is the low temperature at which many of the most important materials in applications, such as semiconductors, superconductors, and quantum computing, must be kept for proper study.

Ismail El Baggari, a fellow at the Rowland Institute at Harvard, set out to address this issue by developing the technology that now underlies h-Bar Instruments, a startup developing “cold finger” sample-holder devices for high-resolution microscopy techniques. h-bar’s devices position the sample in the microscope and draw heat away to cool the sample while simultaneously insulating both the sample and microscope from any resulting vibrations. This technology can simultaneously cool objects to liquid helium temperature (-452 F) and magnify up to 2 million times, enough to see the atoms that make up materials. The findings may one day help scientists design new electronic devices for applications in quantum computing, efficient memory, and renewable energy.



Carbon-Negative Manufacturing

Greenhouse gases, a major contributor to climate change, are emitted when producing food, materials, and fuel. What if there was a solution to remove greenhouse gases from the equation?

Circe is building a manufacturing platform that can make products from carbon dioxide, water, and electricity, starting with triglycerides. Triglycerides are fats, butters, and oils that are key components in foods, chemicals, & fuels. Out of Professor Pam Silver’s lab at the Wyss Institute at Harvard and Harvard Medical School, Circe lowers costs with advanced gas fermentation technology and makes high-quality, tailored products with synthetic biology. At scale, the platform can compete with industrial agriculture and petrochemicals on cost and decarbonize in the process. Circe quantifies sustainability as resource efficiency—how to efficiently turn ubiquitous raw materials into the most products with the smallest environmental footprint—a response to the urgent need to continue to support a growing and flourishing world while removing, not just reducing, greenhouse gasses. For the same volume of oil, the process uses 99% less water and land and 101% less CO₂ than conventional approaches. This all-female founding team is changing how we think about the future of manufacturing, and if their carbon-negative chocolate is any indication, it’s going to be good.

Startup Spotlight



Grab Your Steak Knives

Using animals for meat causes about twice as much air pollution as plant-based food production. Developing affordable alternative proteins is one way to reduce these food-related emissions while improving global health and diversifying our food supply.

A research team out of the labs of Professor Jennifer Lewis and Professor David Weitz at Harvard School of Engineering and Applied Sciences created a sustainable food source by developing whole cuts of plant-based meat. Startup Mooji Meats mimics muscle fibers using plant fibers to produce single cuts of plant-based protein that mimic the structure and texture of steak.

Startup Spotlight



A Sustainable Alternative to Animal Agriculture

The animal agricultural industry is a major contributor to climate change and environmental concerns. The market for alternative meat products is well established but has not offered alternatives that match meat in taste and texture—until now.

Out of Professor Kit Parker's lab at Harvard School of Engineering and Applied Sciences, Tender Food is changing the alternative meat industry with a technology that shapes plant ingredients into muscle fibers, creating the look and texture of real meat. This provides a superior product for not only burgers and sausages but also plant-based pulled pork, steak, and chicken. And the industry is taking notice. In FY24, Tender Food closed a Series A funding round, adding \$11M to their funding and almost doubling their total amount raised. Tender also added 11 Clover Food Lab, a vegetarian fast-food chain, locations to their list of restaurants offering their products, and has a growing list of restaurant and corporate customers that it plans to supply with this new funding.

RevivBio

Designing Biology with Accuracy and Speed

Protein design is the complex process of manipulating the sequence of amino acids to create new proteins with specific properties. The field of protein engineering is rapidly advancing as researchers look to machine learning to accelerate the design process. These advancements have the potential for multiple applications, including new medicines and industrial and agricultural uses.

Out of Professor David Weitz's lab at Harvard School of Engineering and Applied Sciences, RevivBio uses Generative AI and Ultrahigh-Throughput experimentation to advance protein design. The technology accelerates and improves the design process of proteins, leading to better and more targeted applications. Using protein-design deep learning methods, RevivBio aims to create the next generation of biotechnologies that solve society's problems in drug discovery, food security, and climate change.



Breathing Better and Safer

In the US alone, 16 million patients (about the population of greater New York) have been diagnosed with chronic obstructive pulmonary disease (COPD). People with COPD are at a high risk for hypoxia, low levels of oxygen in body tissues. Erythropoietin, a hormone that causes your body to make red blood cells, counteracts tissue hypoxia by increasing the systemic oxygen-carrying capacity. However, erythropoietin also promotes blood clotting, and high levels of natural erythropoietin can be a health risk and increase the chances of a heart attack or stroke.

General Biologics, Inc., out of Professor Pam Silver's lab at the Wyss Institute at Harvard and Harvard Medical School, seeks to develop a product for the treatment of hypoxia, which could be used to treat COPD, cystic fibrosis, and patients on ventilators. The Silver Lab has established a general platform for improving the safety of protein-based hormone drugs. General Biologics is using this approach to develop a unique engineered form of erythropoietin that induces red blood cell formation but does not induce thrombosis. The product is an engineered fusion protein that directs the activity of erythropoietin to red blood cell precursors and to tissues that may die upon hypoxic exposure but away from cells that promote blood clotting, which is the major, dose-limiting side effect of erythropoietin itself.

Startup Spotlight



A Lymphatic-System-on-a-Chip

Our lymphatic system plays a critical role in various diseases. It moves fluids throughout the body and regulates our inflammatory response. It is also critical for healthy immune responses. However, very little has been accomplished to leverage the complex system for therapeutics.

Ropirio, a startup recently spun out of the Wyss Institute at Harvard and Boston University, is the first company to develop therapeutics targeting and activating the lymphatic system. A research team from the lab of Wyss Core Faculty member and Boston University Professor Chris Chen developed a lymphatic system-on-a-chip that models human lymphatic vessels. For the first time, the research team demonstrated that lymphatic vessels respond to external factors, shutting down in the face of inflammation. Ropirio will be the first to develop therapeutics that target and activate the lymphatic system, with the potential to address multiple serious diseases.

Startup Spotlight



Silencing Chronic Cough

Chronic cough, lasting more than eight weeks, affects an estimated 26 million adults in the US. Of these, 8 million adults have unexplained coughs for which no treatment is available.

A Harvard startup with technology supported by BBA and co-founded by Professors Clifford Woolf, Bruce Bean, and Bruce Levy at Harvard Medical School, Nocion Therapeutics is developing therapeutics targeting neurons to mediate cough, itch, pain, and inflammation. In March 2024, Nocion announced \$62M Series B financing to advance its lead drug into a Phase 2b clinical trial in chronic cough patients and to prepare for a Phase 3 trial. This recent financing raised the company's total funding to \$122M. The company's lead compound is targeting chronic cough, but their platform technology may be applied to a broad range of therapeutic applications.

Supporting Harvard Innovators

OTD supports faculty, postdocs, and graduate students interested in entrepreneurship by hosting networking events, speaker series, boot camps, and workshops. In partnership with schools and institutes, OTD creates programs and initiatives to bring industry leaders, investors, entrepreneurs, and researchers together to expand awareness of startup formation and translation.

Biomedical Informatics Entrepreneurs Salon

Co-hosted with the Biomedical Informatics Department, these monthly fireside chats discuss professional journeys with established, well-known entrepreneurs.

OTD's Guppy Tank: Elevate Your Pitch Series

Co-hosted with LabCentral, the Guppy Tank events provide an opportunity for Harvard life-science research teams to pitch their early-stage venture opportunities to a panel of industry leaders and entrepreneurs for constructive feedback.

OTD's Business Development Fellowship

OTD's Business Development Fellowship provides current Harvard graduate students and postdoctoral researchers mentorship and training in the various stages of technology development. Over the course of a year, fellows gain a valuable introduction to the fields of tech transfer, IP, and business development.

OTD's Bench-to-Business Boot Camp

OTD's annual Bench-to-Business Boot Camp is a full-day educational event for Harvard graduate students and postdoctoral researchers on technology transfer. The boot camp includes info sessions, a case study workshop, and faculty and industry speakers.



"I feel like my research can potentially make someone in the big pharmaceutical companies get interested in this, but I also feel like to make the ultimate impact—to make something into a drug—I need to leverage the business side."



Lian Chang
Former OTD Senior Fellow
Harvard Graduate School of Arts and Sciences



“Harvard spurs innovation and progress through the dedicated work of its faculty and researchers. Their ingenuity and passion are palpable, as is their desire to engage with industry partners who are similarly motivated to improve the world. Strong relationships expand our contributions to discovery and build our reputation. OTD, which is central to our efforts to connect people and ideas, helps make our success possible.”

Alan M. Garber, MD, PhD
President
Harvard University

MEET THE TEAM



As part of the Office of the Provost and serving faculty and researchers across the university, the OTD team is in Harvard Square in Cambridge, at Harvard Medical School in Longwood, at the Science Engineering Complex in Allston, and at the Wyss Institute for Biologically Inspired Engineering in Boston.

Our team includes leaders in business development, alliance management, IP policy, and technology transactions. Reach out to connect at OTD@harvard.edu.



OTD in Cambridge, Harvard Square

Richard A. and Susan F. Smith Campus Center, Suite 727E
1350 Massachusetts Avenue
Cambridge, MA 02138
(617) 495-3067
otd@harvard.edu

OTD in Boston, Longwood Medical Center

Harvard Medical School
Gordon Hall, Suite 210
25 Shattuck Street
Boston, MA 02115
(617) 432-0920
hms_otd@harvard.edu



HARVARD
Office of Technology Development