

FISCAL YEAR 2023
TECHNOLOGY LICENSING OFFICE

ANNUAL REPORT



MASSACHUSETTS INSTITUTE OF TECHNOLOGY

HELLO, FROM CAMBRIDGE.



Lesley Millar-Nicholson
Executive Director
OSATT-TLO

We consider it a privilege to work with outstanding faculty, researchers, entrepreneurs, funders, academic, and corporate partners. This year was no different, and in the process, we sent hundreds of new technologies into the hands of startups, medium-sized companies, and large corporations.

MIT is driven by its mission to make a better world, through education, research and innovation. The TLO contributes to that mission through its work protecting and commercializing new technologies and innovations. The innovations the TLO receives from faculty and researchers reflect the broad range of research that is undertaken at MIT.



In helping address the world's climate crisis, we have licensed Intellectual Property (IP) related to high voltage rechargeable batteries, energy efficient windows, improved materials for water desalination, recycling of lithium-ion batteries using novel membranes, and development of self-healing concrete.



We are contributing to more efficient manufacturing through licensing improved equipment for optical measurements, software tools for efficiency in manufacturing processes, flexible substrates, and 3D printed new alloys for additive manufacturing.



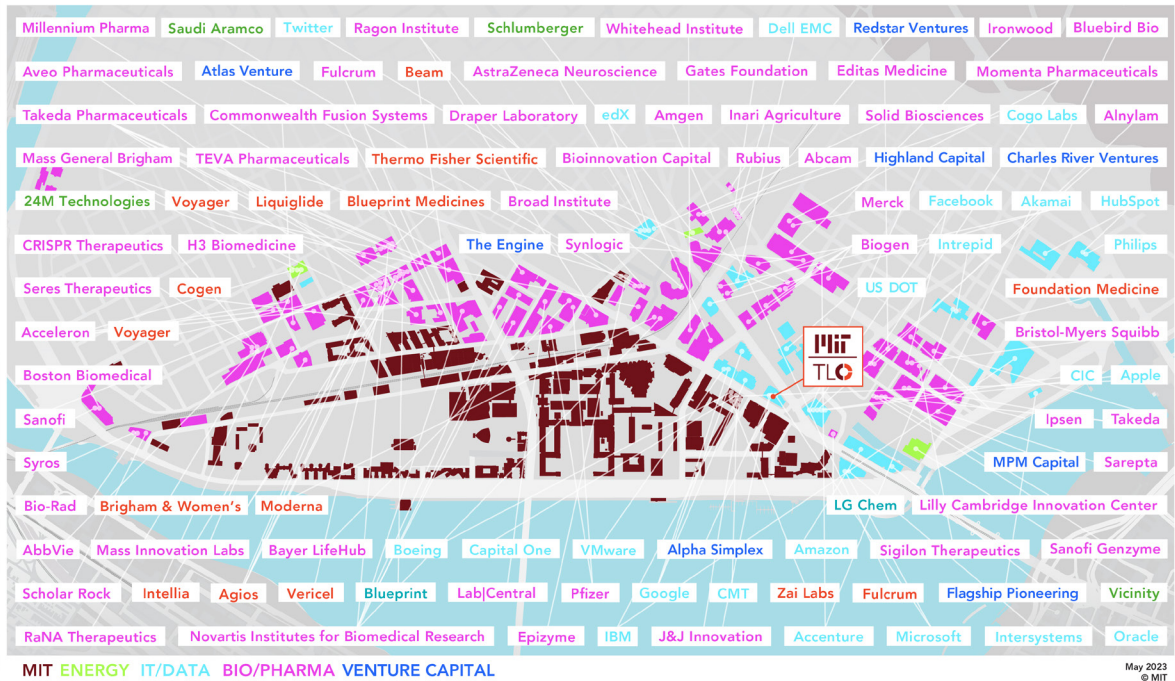
In the field of drug discovery, gene therapy, and disease treatment we have licensed screening tools, optogenetics for eye diseases, synthetic biology techniques for cell therapy platforms, magnetic resonance for disease screening, new biomaterial for surgical adhesives, protein sequencing for developing new therapeutics and diagnostics.



In support of improved security, communications and transport, there have been technologies licensed related to haptics for computer simulations, high frequency sensing apps, advanced optics for LIDAR, Augmented Reality (AR) and Virtual Reality (VR), sensors for autonomous vehicles, mitigation software for electromagnetic interference, high-speed transmission and reception of radar signals for improved air traffic safety.

This is just a small sample of how we strive to make the world a better place. We look forward to the year ahead supporting our MIT community.

MIT INNOVATION ECOSYSTEM



Original innovation map created by MIT IMCo. Used with permission.

MIT is fortunate to be surrounded by leaders in biotech, healthcare, venture capital and other leading academic research institutions.

At the heart of the MIT innovation ecosystem lies the Technology Licensing Office (TLO), which plays a pivotal role in translating cutting-edge research and inventions into real-world applications. The TLO acts as a bridge between academia and industry, facilitating the seamless transfer of technology and knowledge from MIT labs to the market.

MIT's Technology Licensing Office (TLO) stands out among all US universities in terms of the sheer number of new inventions received from its faculty. However, not all of these inventions are immediately ready for licensing. Many require additional resources and investment to mature the ideas or mitigate risks to make them more attractive for licensing. Recognizing this need, the Deshpande Center for Technological Innovation was established in 2002 through the generosity of Gururaj "Desh" Deshpande and his wife, Jaishree. The center provides crucial research grants, mentorship, and education to MIT faculty and researchers. This year, the Deshpande Center has supported exceptional projects aimed at driving innovation in both a carbon-free world and human health.

DESHPANDE CENTER

deshpande.mit.edu



Antione Allanore
Professor, Materials Science
& Engineering

Selective conversion of oxides to sulfides for carbon free metal production. **Impact:** reduction in carbon intensive mineral and metal processing methods.

TLO Case #: 21958



Ariel Furst
Professor, Chemical
Engineering

Improving electrochemical carbon dioxide reduction. **Impact:** reduced CO2 emissions and converting CO2 into feedstock for use in industrial applications.

TLO Case #: 24712



Betar Gallant
Professor, Mechanical
Engineering

Development of a new hybrid solid-liquid cathode. **Impact:** increased energy of lithium batteries.

TLO Case #: 24100



Brandon Dekosky
Professor, Chemical
Engineering

More efficient antibody discovery against viruses and membrane protein targets. **Impact:** New membrane protein targets and creation of new medicines.

TLO Case #: 23890



Laurie Boyer
Professor, Biological
Engineering

Developing a high throughput platform for high resolution imaging and quantification of drug uptake within target cells. **Impact:** More effective drugs that get to the right place inside human cells.

TLO Case #: 22339, 16900



Paulo Lozano
Professor, AeroAstro

New space propellants to fit smaller spacecraft. **Impact:** More usable payload for small spacecraft.

TLO Case #: 22282, 21144



Rafael Gomez-Bombarelli
Professor, Materials Science
& Engineering

Improved catalysts using artificial intelligence-based platform. **Impact:** discovery of new catalysts, reducing costs in industry and improving development of lifecycle.

TLO Case #: 22905

PROGRESS & POTENTIAL

FACULTY FOUNDER INITIATIVE



Dr. Sangeeta Bhatia
Founder, Faculty Founder Initiative & MIT Professor



Kit Hickey
Executive Director, Faculty Founder Initiative

The gender gap in entrepreneurship and innovation has long been recognized. The United States Patent and Trademark Office (USPTO) has released study¹ upon study demonstrating the slow pace of progress in engagement by women and underrepresented communities in the patenting process. While positive changes are being seen, it takes intentional action to continue to move the dial.

MIT's Faculty Founder Initiative aims to help close that gap.

Research undertaken in 2019 by Prof. Sangeeta Bhatia, Susan Hockfield and Nancy Hopkins revealed that women had founded less than 10% of the 250 biotechnology startups created by MIT professors, even though 22% of MIT faculty are women. From this data, the study estimated that if female faculty had been founding startups at the rate of male faculty, there would be forty additional biotechnology firms today. In response to this study, the inaugural MIT Faculty Founder Prize Competition, supported by Northpond Labs was launched in 2021 to encourage engagement of female faculty members in the MIT innovation ecosystem.

While the program aims to increase the number of female faculty members at MIT who start biotechnology companies, the actual impact is increased solutions to help solve the world's problems. The first cohort of nine projects includes the following faculty.

1. U.S. Patent and Trademark Office. "Progress and Potential in Intellectual Property." USPTO. Accessed July 25, 2023. <https://www.uspto.gov/ip-policy/economic-research/publications/reports/progress-potential>.

FACULTY FOUNDER INITIATIVE PROJECTS



Ariel Furst
Professor, Chemical
Engineering



SUSTAINABLE FOOD PRODUCTION

Protects biofertilizers from stressors, enabling widespread distribution for regenerative agriculture and sustainable food production.

TLO Case #: 23587



Canan Dagdeviren
Professor, Media Lab



BREAST CANCER SCREENING

Transformative approach to breast cancer screening, detection, and diagnosis, revolutionizing accessibility, affordability, and early detection, thereby enhancing survival rates by enabling home-based ultrasound usage and empowering less skilled operators.

TLO Case #: 25168, 20934



Ellen Roche
Professor, IMES &
Mechanical Engineering



CUSTOMIZED IMPLANTS

Combines minimally-invasive procedures with patient-specific additive manufacturing, allowing same-day, customized intracardiac implants that reduce complications and address patient variability.

TLO Case #: 22338



Elly Nedivi
Professor, Brain &
Cognitive Sciences



MORE ACCURATE BIPOLAR DISORDER DIAGNOSIS

Aiming to develop genomic assays for accurate bipolar disorder diagnosis and personalized treatment selection based on genetic sequencing.

TLO Case #: 23591



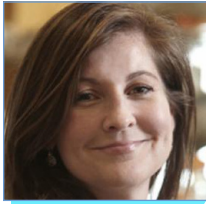
Kristin Knouse
Assistant Professor,
Biology



GENETIC RESEARCH

Paving the way for new discoveries and accelerated advancements in diverse phenotypes, disease models, and other CRISPR applications.

FACULTY FOUNDER INITIATIVE PROJECTS



Laurie Boyer
Professor, Biology &
Biological Engineering



ACCELERATED DRUG SCREENING

Accelerates drug screening and discovery, enabling visualization of nanodrugs and their effects across thousands of cells, expediting the development of safer medicines for patients.

TLO Case #: 22339, 16900



Natalie Artzi
Professor, IMES



DRUG DELIVERY FOR CANCER THERAPY

Revolutionizes cancer therapy by delivering drugs directly to tumors, enhancing treatment outcomes, eliminating side effects associated with systemic delivery, and overcoming biological barriers that hinder drug effectiveness.

TLO Case #: 13843



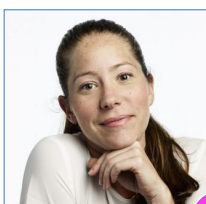
Polina Anikeeva
Professor, Material
Science & Engineering
& Brain and Cognitive
Sciences



IMPLANTS FOR DRUG DELIVERY

Redefines the human-machine interface with soft, minimally invasive implants—flexible fibers delivering drugs, sensing, and stimulating the body—for versatile therapeutic, diagnostic, and monitoring applications, validated through extensive pre-clinical testing.

TLO Case #: 25058, 25260, 24866, 24351, 24178, 23751



Tal Cohen
Professor, Civil
Environmental
Engineering and
Mechanical Engineering



RAPID TISSUE DIAGNOSIS FOR THYROID CANCER

Offers rapid and objective tissue characterization, revolutionizing pre-operative diagnosis of thyroid nodules, reducing unnecessary surgeries, and minimizing complications, with the potential to combat the increasing prevalence of thyroid cancer in women.

TLO Case #: 25109

CONNECTING WITH THE MIT COMMUNITY

APPS.MIT.EDU/RESEARCH



Research@MIT is an app-based interface for research administration, collaboration, compliance, and innovation management. Designed for MIT principal investigators (PIs) and their administrative teams, the app brings together data from multiple MIT enterprise systems to serve as a one-stop shop for PIs' research administration and related needs.

TLO has also been enhancing its IP management tools to improve ease of engagement by faculty and researchers. In 2023, a new disclosure portal will be added to the Research@MIT app allowing all inventors to efficiently submit their inventions and discoveries for evaluation and potential commercialization. Over time, more features will be added to help inform researchers about important activity related to their IP portfolios.

[Download Now!](#) 

FY2023

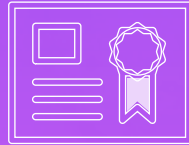
FACT SHEET



Moving innovations and discoveries from the lab to the marketplace for the benefit of the public and to amplify MIT's global impact.

592

All U.S. Patents Filed



362

U.S. Patents Issued

349

International Patents Issued



\$499K

Trademark Licensing



3,844

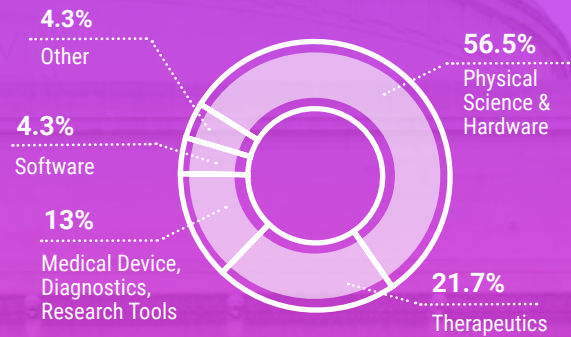
Active U.S. Patents



\$40.2 MILLION

Total Licensing Revenue

Sector of MIT Startup Companies



GROWTH THROUGH FY2023

■ Historical Data ■ FY2023

Startup Companies Formed

575 (1997-2022)

23

License Agreements Executed

3,301 (1960-2022)

92

Disclosures Received

23,346 (1940-2022)

593

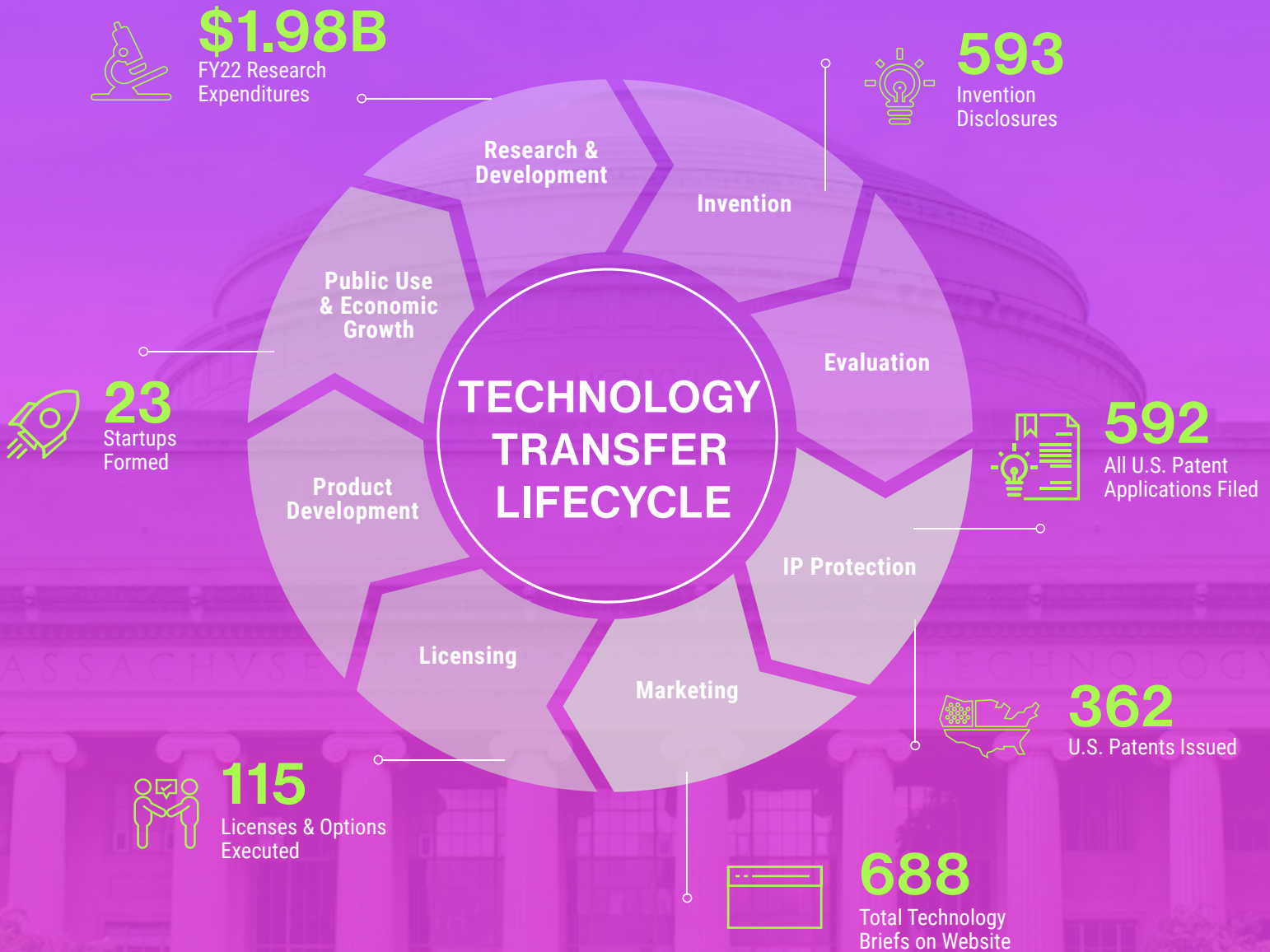
FY2023

TECHNOLOGY TRANSFER LIFECYCLE

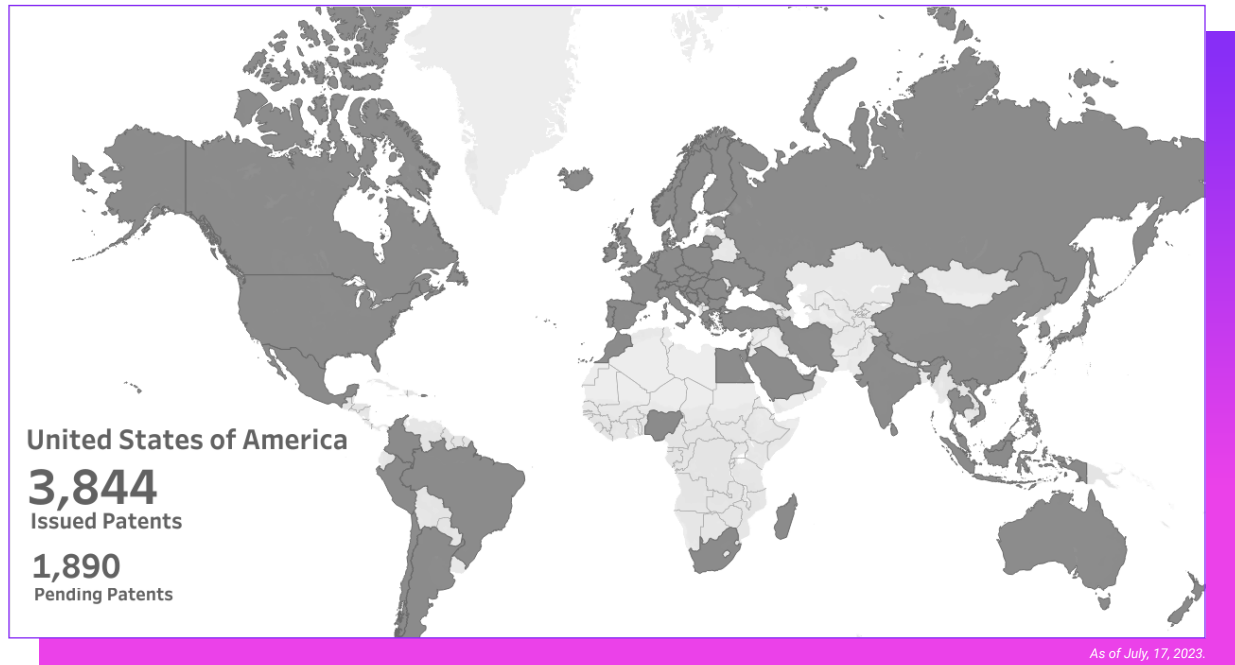


BENEFITING SOCIETY AND THE ECONOMY.

Every year university research yields discoveries with commercial potential. Technology transfer professionals manage the complex process of shepherding ideas from the lab to the marketplace—from evaluating and protecting discoveries to commercializing the inventions through new and existing companies.



MIT U.S. PATENTS



MIT has an IP portfolio of nearly 12,000 U.S. and foreign patents, all of which have arisen out of the cutting-edge research undertaken on the MIT Campus and at Lincoln Laboratories. Nearly 60% of these patents are licensed to third parties, demonstrating the strength of the portfolio and success of the mission of the TLO, which is to get inventions into the marketplace to have global impact.

We recognize the importance of protecting MIT's intellectual assets through the patent process. With nearly 50% of research funding on MIT campus from federal sources, government regulations such as the Bayh-Dole Act and new initiatives such as the CHIPS and Science Act also influence our licensing, commercialization and patent portfolio management strategies.

TLO STRATEGIC INITIATIVES



During the year, the Senior Management Team (SMT) has been working to create a clear vision, in support of our well-established mission to have global impact through technology transfer. We are pleased to formally roll out that vision and acknowledge the tremendous work of the SMT, as well as the support of all TLO staff as we continue to work on related strategic initiatives.

“The MIT TLO will be an equitable, inclusive organization recognized as a global leader in technology transfer dedicated to advancing MIT technologies for societal impact, having:

- **People** with deep expertise and thought leadership in all aspects of technology transfer
- **Partnerships** both inside and outside of MIT that facilitate ease of engagement with stakeholders and process excellence through the entire technology transfer value chain
- **Stakeholder Focused Teams** that provide innovative solutions to challenges that arise which enable high quality work products delivering outstanding value
- **Optimized processes** that support each stage of the technology transfer lifecycle”

CONTACT US

bit.ly/TLOFY23

UPCOMING EVENTS

tlo.mit.edu/resources/news-events

January 2024

Intellectual Property Speaker Series at MIT
Independent Activities Period (IAP)



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