Technology Licensing Office

MIT Libraries

Commercialization of MIT Technology
Innovation, Technology Transfer, and Licensing

Lauren Foster, Associate Director, Licensing
Deirdre Zammit, Associate Director, Licensing

January 17, 2024

- **Overview of university technology transfer**
- Intellectual Property (IP) policy and management
- Commercialization through licensing

MIT Technology Licensing Office (TLO) Mission

In the spirit of MIT's mission to advance knowledge, the TLO moves innovations and discoveries from the lab to the marketplace for the benefit of the public and to amplify MIT's global impact.

We cultivate an inclusive environment of scientific and entrepreneurial excellence and bridge connections from MIT's research community to industry and startups by ***strategically evaluating, protecting, and licensing technology***.

FY2023

TECHNOLOGY TRANSFER LIFECYCLE

MIT | TLO Technology Licensing Office

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.

$1.98B
FY22 Research Expenditures

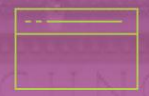
593
Invention Disclosures

23
Startups Formed

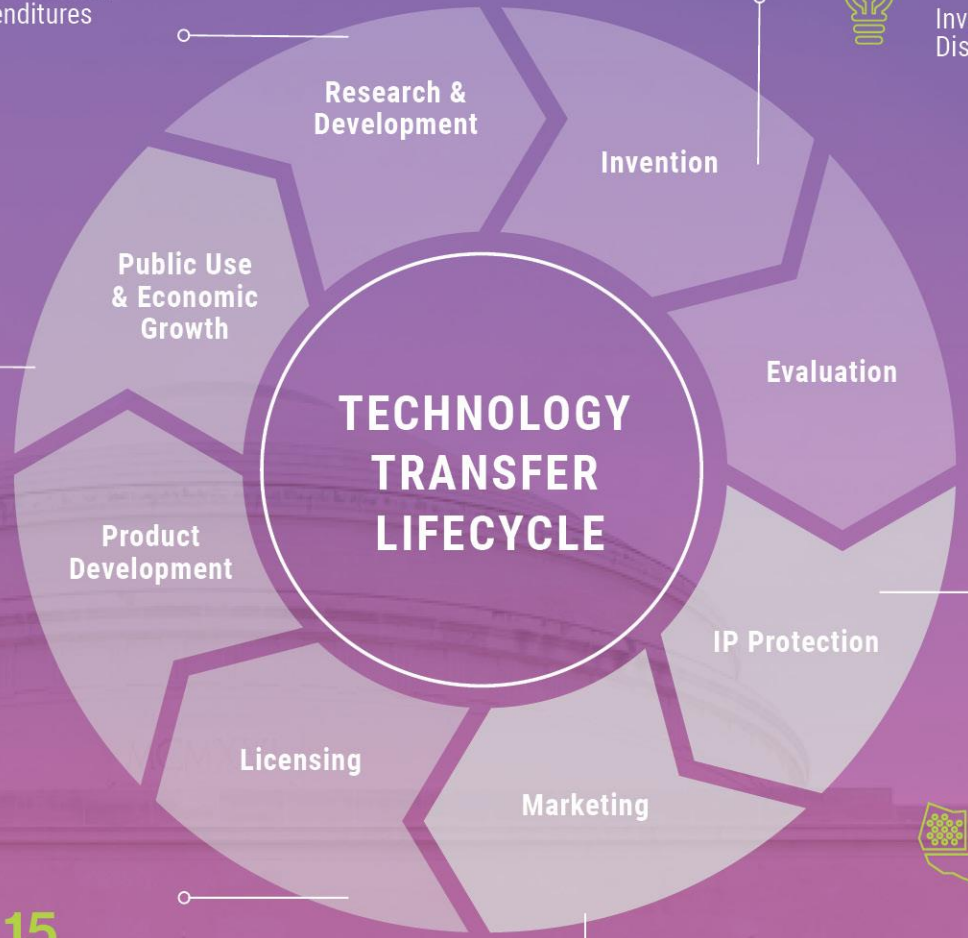
592
New U.S. Patent Applications Filed

362
U.S. Patents Issued

115
Licenses & Options Executed



688
Total Technology Briefs on Website



FY2023

FACT SHEET

MIT | TLO Technology Licensing Office

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

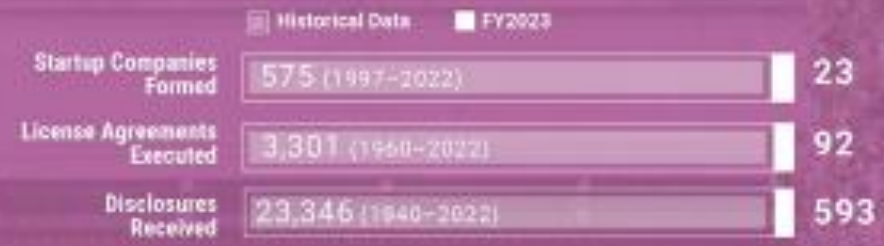
$499K
Trademark Licensing

3,844
Active U.S. Patents

$40.2 MILLION
Total Licensing Revenue

Sector of MIT Startup Companies

GROWTH THROUGH FY2023



- Overview of university technology transfer
- **Intellectual Property (IP) policy and management**
- Commercialization through licensing

MIT IP Policy – IP Ownership
Section 13.1 of MIT Policies

- MIT owns Intellectual Property (IP) generated by one or more of the following:
  - Using MIT Funds;
  - In the performance of a Required IPIA Signatory's MIT employment;
  - In the performance of an MIT collaboration, research or other sponsored agreement;
  - For Required IPIA Signatories who are no employees, faculty, graduate students, postdoctoral associates or fellows, as a result of research or educational opportunities made available by or at MIT (collectively, an "MIT Opportunity").

MIT IP Policy – Royalty Sharing

- MIT owns Intellectual Property (IP) generated by one or more of the following:
  - Inventors / Authors / Contributors receive one-third of net revenue (a*fter recovery of patent and licensing costs and a 15% administrative fee, as well as any payments due to any third parties such as joint owners)*
  - The remainder is shared between DLCs and the MIT General Fund after adjustments made to recover any remaining unreimbursed patent costs

Sponsorship – US Government Sponsorship Basics

- Patentable Inventions
    - MIT notifies Government sponsor of invention disclosure and MIT must decide if it will file a patent application within two years
        - If MIT retains title and files a patent application, Government has Government Use Rights, consideration free.
        - If MIT does not retain title, MIT waivers its ownership in the invention to the Government agency that sponsored the research; the Government agency may decide to file a patent application on behalf of the Government.
- Copyrighted Works: US Government typically has Government Use Rights or even Unlimited Rights which allows the Government to reproduce, prepare derivatives, and distribute copies to the public, and perform publicly and have or permits others to do so.

Sponsorship – Non-US Government Sponsorship Basics

- If Industry Sponsored, sponsor(s) has the right to request a commercial license:
  - Non-exclusive license
  - Exclusive license
- Other types of sponsorship, e.g. foundations may also have IP terms including:
  - MIT sharing MIT's commercial licensing revenue with the foundation.
  - Diligent development of technology to ensure foundation interests are addressed.

MIT TLO Evaluation of Disclosures
Research@MIT App

- Types of Disclosures
  - Inventions: Patentable Subject Matter: 1) processes, 2) machines, 3) manufactures and compositions of matter – *need to pursue patents on subject matter for IP protection.*
  - Copyrights - *copyright protection exists automatically once it is fixed in a tangible medium.*
  - Tangible Property – *Property rights established in physical materials (e.g. prototype devices, chemical samples, cell lines, genetically modified organisms).*
- Initial Steps taken by TLO:
  - Identify relevant inventors / authors/ contributors and whether they are required to assign ownership to MIT or other parties.
  - Understand funding sources used to create subject matter and IP obligations associated with the funding
  - Understand why investigators are disclosing to TLO (now)

MIT TLO Evaluation of Invention Disclosures

- Intellectual property considerations:
  - Patentability (utility, novelty, non-obviousness)
    - Patentable Subject Matter: 1) processes, 2) machines, 3) manufactures and compositions of matter
    - Non-Patentable Subject Matter: laws of nature, natural phenomena, and abstract ideas
  - If we pursue a patent application, are we likely to get broad claims?
  - Is it possible to detect use of the technology in the final product?
  - Is patenting the right route for maximizing access to the technology?

MIT TLO Evaluation of Invention Disclosures

- Technology and market considerations:
  - What problem does the technology solve?
  - Is it disruptive technology or an incremental improvement?
  - Has proof of principle been demonstrated?
  - How does it distinguish itself from current ways of addressing the problem/need?
  - Are companies in the field investing in new and/or externally developed technologies?
  - Will the market support the cost of the solution?
- Licensing considerations:
  - Is the technology jointly owned?
  - Do we have obligations to third parties, e.g., sponsors of the research?

MIT TLO Evaluation of Software & Other Copyright Disclosures

- Copyrighted works may be commercially licensed or licensed to research institutions for research use
- Authors of copyrighted works often seek TLO support on licensing to make works available to many with minimal restrictions
  - Software – released through relatively permissive open-source licenses
    - BSD License & MIT License: MIT retains ownership and placement of software on internet.
    - GPLv2: like BSD & MIT but requires redistribution of derivatives under the same license
  - Other Copyrighted Works (e.g. data sets) – Open Access through Creative Commons licenses
    - BY – Attribution
    - SA – Share Alike
    - NC – Non-commercial
    - ND – Non-derivatives

MIT TLO Evaluation of Tangible Property Disclosures

- Most often disclosed in connection with a request to transfer materials to a collaborator, or based upon requests for requests for materials following publication.

- For convenience, certain materials that can be replicated can be deposited in a repository (e.g. Addgene, Jackson Laboratory)

Patenting Process at MIT

- Invention report (Technology Disclosure Form)
  - Describes invention in detail with supporting data
  - Documents date of invention, inventors, sponsors, anticipated public disclosure
  - Provides no protection
- Literature and patent (prior art) search to assess patentability
- Patent application prepared and filed by external law firms
  - Patent Office examines the claims and issues an "Office Action“
  - Patent attorneys reply to Patent Office
    - ≥ 3 years from filing to patent issuance

Patenting Process at MIT

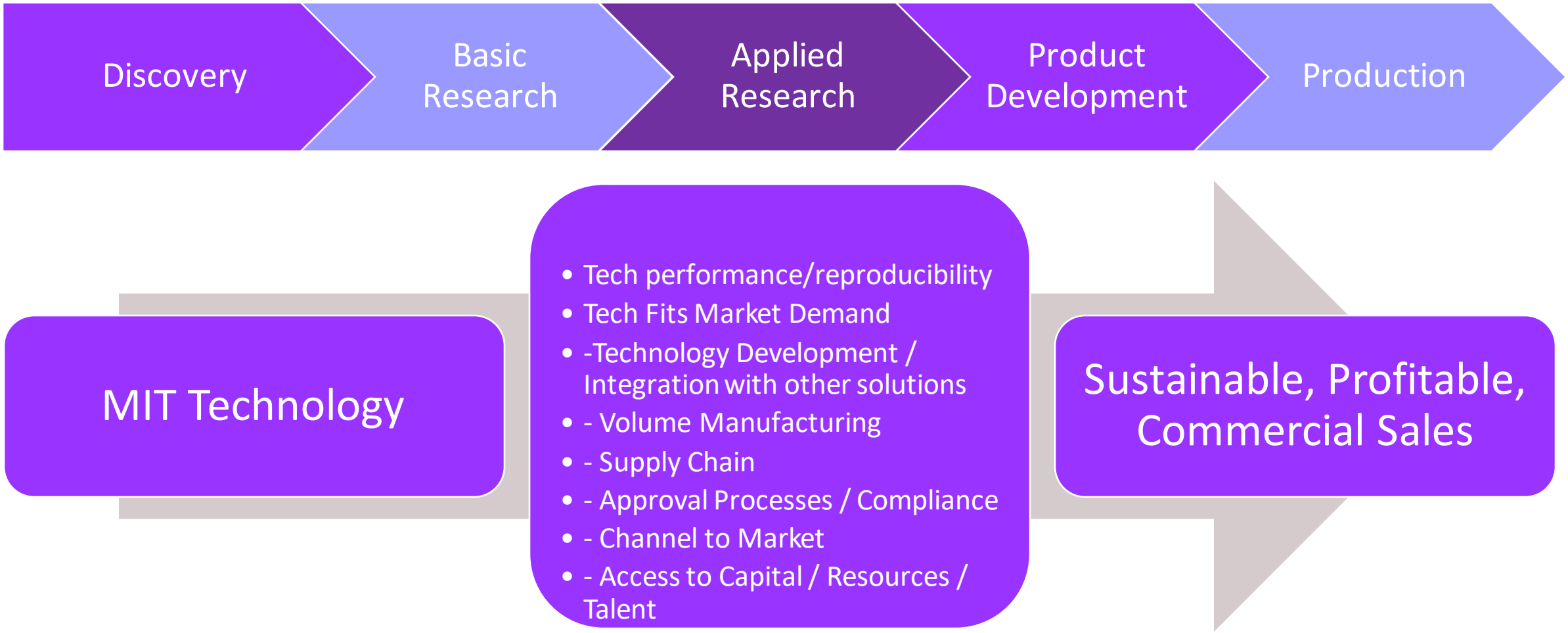
- Lead inventors will be asked to participate in patent preparation and prosecution
  - Review of prior art searches and cited art to help understand how the invention is different from the prior art
  - Review of the claims to make sure that the key features of the invention are being described accurately

- Overview of university technology transfer
- Intellectual Property (IP) policy and management
- **Commercialization through licensing**

MIT's Technology Licensing Philosophy

- Primary objective is to transfer technology
  - Achieve commercial reality for invention or to enable R&D within companies & other research institutions
  - If commercial licensee is successful, MIT will share in the success financially
- Seek patent protection (for inventions)
  - Typically, necessary for successful commercial licensing
  - Companies often don't want to be first to market with un-protected, innovative solution
- Fair and flexible licensing structures
  - Immature technology is high risk
  - Exclusivity often makes it easier to attract required resources for commercialization
  - Fee based licenses and/or Equity licenses depending on technology

Transitions from MIT to Commercialization May Have Challenges



What TLO Looks for in a Licensee

- Proposed Solution addresses Market Need
- Business model
- Potential for sustainable profitability
- Channel/Access to Market

- Capital
- Production Capability
- Supply Chain
- Intellectual Property
- Certifications

- Business
- Technical
- Experience
- Realism

Licensing to Startups & Established Companies

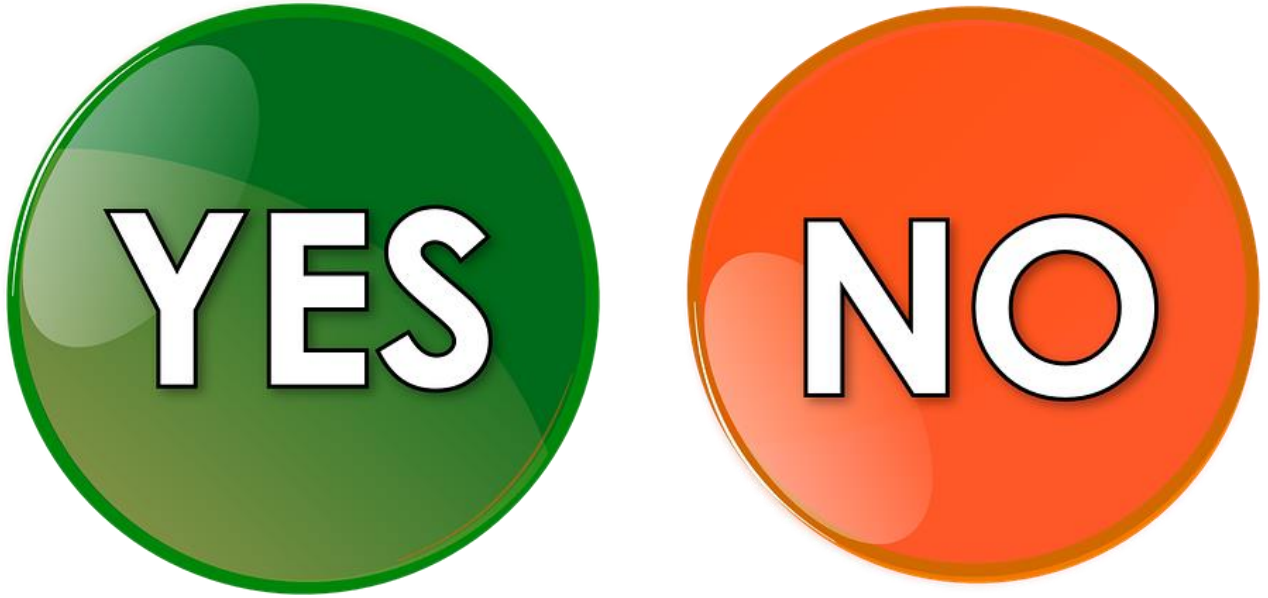
Startups are often a good fit for a technology when:

- Technology platform
- Inventor(s) support transfer to startup
- Some startup advantages:
  - Focus/commitment
  - Flexibility of small organization
  - Often more tolerant of risks associated with early-stage technology

Established companies often a good fit for technology when:

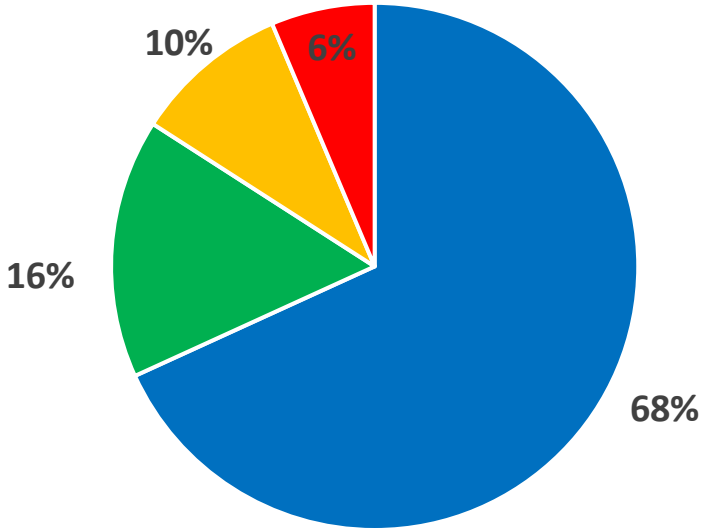
- Technology is improvement to company product /service or fulfills a strategic need
- Some established company advantages:
  - Product development experience, resources and capacity
  - Established access to supply chain
  - Established manufacturing capability
  - Established access to customers
  - Experience within market, including understanding of regulations

Test Your Knowledge on MIT Commercial Licensing
Are the Majority of MIT commercial licenses to startup companies?

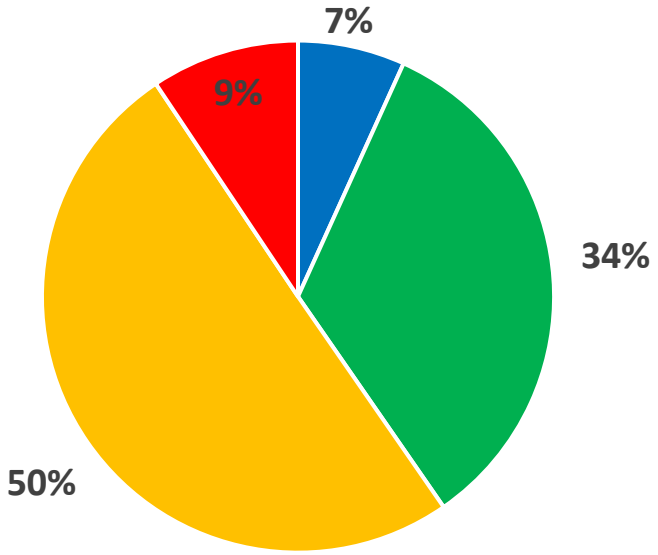


Exclusive and Non-Exclusive Licenses (2013 – 2023)

Exclusive Licenses (220)



Non-Exclusive Licenses (407)



Startups **Small Company**

Large Company **Sponsor**

License Often Preceded by an Option Agreement

- Provides rights solely in connection to evaluation of MIT IP; no rights to support commercial activity
- Provides right to negotiate a commercial license contingent upon diligence
- Provides optionee time to:
  - Hire management and technical teams
  - Raise capital
  - Fortify business plan including:
    - Specifying capital required to support development & commercialization milestones
    - Timeline for fundraising, product development, team development, strategic milestones including first commercial sales

Key Elements of a License Agreement

- Grant of Rights
  - Make, have made, use, sell, lease, import
  - Sublicense (if exclusive)
- Exclusivity
  - Specific to a field of use
  - Limited Term
  - Geographic
- Retained Rights
  - Research, teaching, education for non-profits
  - US Government Rights
  - Sponsor rights/terms, as applicable
- Diligence
  - Execution on business plan
  - Development milestones by certain date
  - First commercial sale by certain date
  - Cumulative sales / annual sales
- Consideration
  - Fees: issue & maintenance & commercial milestones & change of control
  - Royalties on sales
  - Equity
  - Patent Cost Reimbursements
  - Sublicense Income Sharing

License Factors

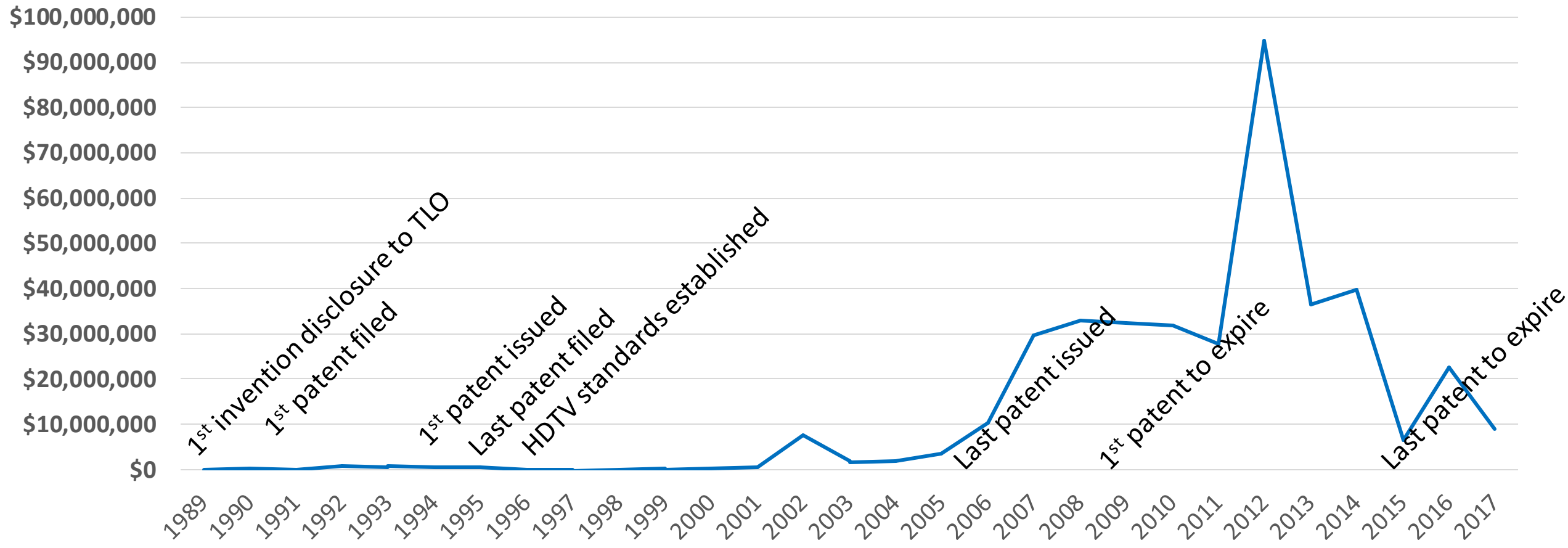
- Tailor terms to fit technology and licensee business plan
    - Shared risk
    - Low initial fees; back end loaded
    - Equity in partial-lieu of up-front fees
    - Reasonable royalty rates
    - Diligence provisions
        - Investment, personnel, milestones (development and sales), sublicensing requirements
- Flexibility : Potential to renegotiate as nature of the business evolves

Impacts of MIT Technology Licensing

- Convert inventions to solutions that benefit society
- Supply of commercially available solutions to US Government
- Support local economy (and beyond); job creation
- Support entrepreneurship/training future business leaders
- Encourage industry collaborations
- Enhance MIT educational experience/attract faculty and student talent
- Revenue from options/licenses shared among MIT DLCs, inventors

Test Your Knowledge on MIT Commercial Licensing
Is there a quick return on investment from technology licensing?

Licensing Revenue for HDTV Patent Portfolio



Technology Licensing Office

MIT Libraries

THANK YOU!

Visit Us At: tlo.mit.edu

Lauren Foster, Associate Director, Licensing
Deirdre Zammit, Associate Director, Licensing

January 17, 2024

Technology Licensing Office

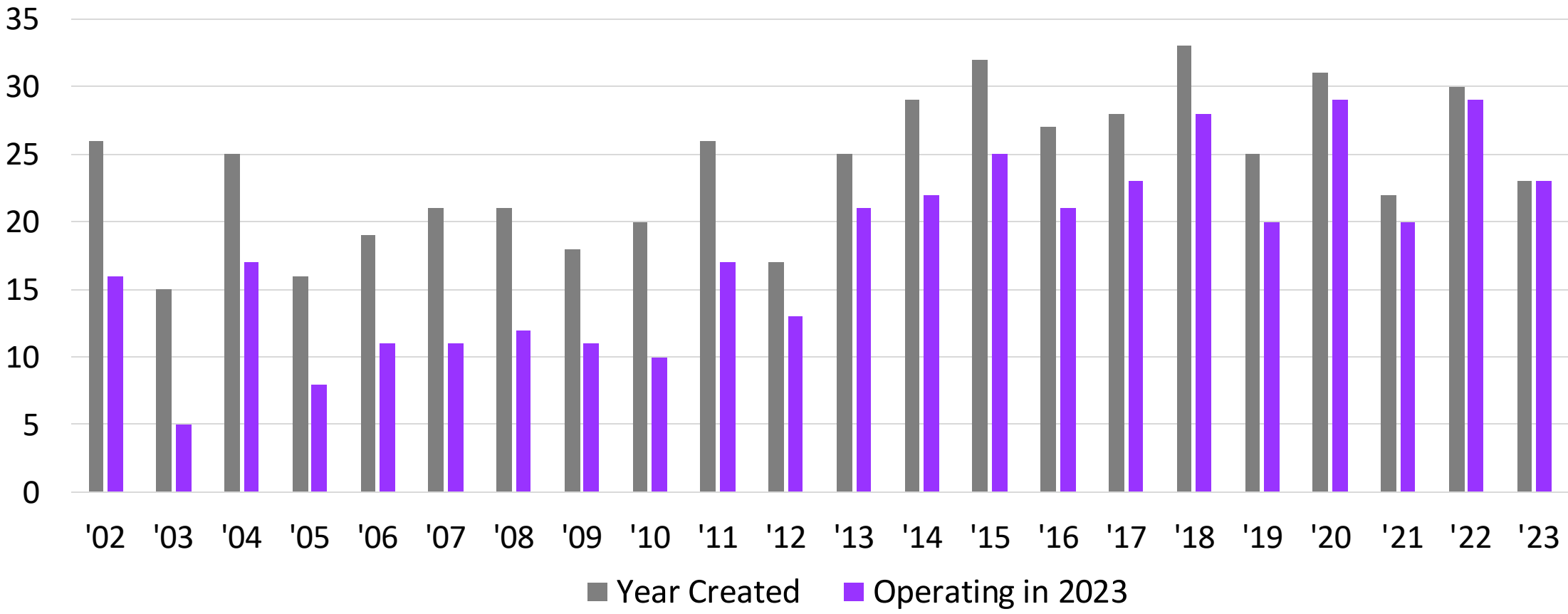
MIT Libraries

Backup slides

Lauren Foster, Associate Director, Licensing
Deirdre Zammit, Associate Director, Licensing

January 17, 2024

Startups from MIT Licensing by Fiscal Year



Total Research Expenditures v. Licensing Revenue of ~ 200 US universities