

AUTM 2020 Licensing Activity Survey

A Survey of Technology Licensing and Related
Activity for US Academic and Nonprofit
Research Institutions



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The Navigator is an online directory of 750+ research facilities in Canadian universities, colleges, hospitals, and federal departments and agencies that are collaborating with industry, academia and government partners.



A Message from AUTM's Chair

The Right Innovation Model for Today and Tomorrow

The COVID-19 pandemic has impacted our lives and our work in ways we could not have imagined just a short while ago. It has changed the way we operate, but not the way we move forward.

Science and technology transfer have played a key role in responding to the pandemic. With the outbreak of the health crisis, the work of technology transfer offices quickly moved to the battle's front line. Leading science and research-based organizations led the creation of licensing guidelines that would ensure rapid and broad access for all humankind to the life-saving technologies — from ventilators to vaccines — that poured out of labs, hospitals and businesses.

This rapid response was due in part to the Bayh-Dole Act, which enables organizations to advance federally funded innovations for the public good through effective patenting and partnership activities. Since its passage more than 40 years ago, the Act has spurred nearly 300 new drugs and discoveries that have driven the innovation economy — contributing \$1.7 trillion to the US gross industrial output and adding more than 5.9 million jobs.¹

At the very time we need it most, this model demonstrates once again that it works. Patents and licenses remain a vital piece of the innovation economy that represents a successful partnership among scientists, investors, businesses, policymakers and the public we all aim to serve with effective vaccines and treatments. The AUTM survey data illustrates how this enduring system drives our innovation economy, creating better jobs and saving lives here and around the world.



Laura Savatski

Laura Savatski, MBA, CLP, RTTP
AUTM Chair

¹ AUTM and the Biotechnology Innovation Organization, *The Economic Contribution of University/Nonprofit Inventions in the United States, 1996-2017*, June 2019



Executive Summary

Tech Transfer Responds to Epic Challenges

University research and technology transfer played a key role in responding to COVID-19 — delivering protective equipment to front-line workers and life-saving treatments to patients. That seismic event accelerated existing trends — tech transfer staff are handling even more deals, broadening their reach, and driving the innovation economy through entrepreneurial ecosystems.

The health crisis also shaped business activities of tech transfer offices, including the gathering of survey data. The data for fiscal year 2019 was being gathered just as the world began pivoting to a dramatically different environment. This reduced that year's response rate. One year later, we've adjusted to the "new normal," and the number of responses for the 2020 fiscal year report has rebounded to a more typical 197 research institutions, 18 more than 2019. Wherever possible, we've framed the findings in the 2020 report within a long-term context.

STAFFS HANDLING MORE

While the number of licenses and options increased 26.5% since 2015, the number of licensing full-time staff equivalents grew just a modest 6.9% over the same period. As the number of deals handled by staff has expanded, so has their reach. In 2020, nearly 83% of agreements were non-exclusive, compared with just 66.1% five years earlier. Tech transfer offices are getting more creative, branching into areas like data, software and open source licenses.

DRIVING INNOVATION ECONOMY THROUGH SMALL BUSINESS

Universities are driving the innovation economy through small, entrepreneurial businesses. In 2020, over three-fourths of licenses and options were conducted through startups and small businesses. Academic discoveries led to the creation of a record 1,117 startups, directly impacting local economies with nearly 69% of the new businesses remaining in their institution's home state. Meanwhile, the trend for large businesses — those employing more than 500 workers — has gone in the opposite direction. Since 2015 the number of agreements with large businesses declined 23.8%.

We included just a few of the hundreds of stories available in the Better World Project that illustrate the impact that technology transfer offices have made on lives like yours. Those same tech transfer offices make this report possible by thoughtfully responding to the annual survey. Their data can also be found in the AUTM STATT Database.



John Miner
Chair, AUTM Metrics and Surveys Portfolio

Tech in Your Life

Artificial Pancreas Gives Hope

University of Virginia



The impossible became a reality after decades of effort from a team of mathematicians, engineers, physiologists, clinicians, alumni and a software startup company from the University of Virginia (UVA).

The research team attracted early funding from the National Institutes of Health, the Juvenile Diabetes Research Foundation and UVA's LaunchPad, supported by the Manning Family Foundation. This support enabled the development of a simulator that digitally replicated the human metabolic system in order to connect continuous glucose monitoring systems to insulin pumps. Preclinical trials began at UVA and expanded to ten other centers.

New iterations shrank the artificial pancreas from a bulky computer system to a wireless smartphone device, leading to stunning success in further trials. The UVA Licensing & Ventures Group (LVG) then licensed the technology to TypeZero Technologies Inc.

"This story is representative of what is possible when we harness the full capacity of this institution to support innovation," says Michael Straightiff, LVG Executive Director.

Living with Type 1 diabetes requires constant management. Due to a deficient pancreas, food and exercise must be manually balanced against blood sugar and regular insulin injections. Even for patients with insulin pumps and compact monitors, managing this life-threatening disease creates daily medical decisions that burden basic activities.

The concept of an artificial pancreas, based on a complex algorithmic combination of pumps and monitors into one closed-loop system, has for decades remained a far-flung hope given the reality that emulating organic pancreatic function presents impossibly complex problems.

2020 TECH TRANSFER BY THE NUMBERS



933

New Products Created

1,117
Startups Formed



\$83.1 BILLION

Research Expenditures

27,112

Invention Disclosures



8,706

US Patents Issued

6,567

Startups Still Operational



17,738

New US Patent Applications

10,050

Licenses and Options Executed



Research Expenditures

Fresher Ways to Fund Research

Funding the work of researchers and scientists at colleges, universities and other research institutions is the first step in developing technologies that eventually improve our world. Funding comes from the federal government, industrial sponsors and other sources.

The 2020 survey showed that the apparent dip in federal research support in 2019 was likely an artifact of the decreased number of respondents and that federal research support for US universities by the federal government has grown 15.9% since 2018. The weakest source of research support in 2020 was industry, which is growing by only 5% per year. The federal government supplies 58% of total research support and industry supplies 6.6%, while all other sources — including state and local government, philanthropic and institutional — account for 35.4% of total support.

KEY FINDINGS

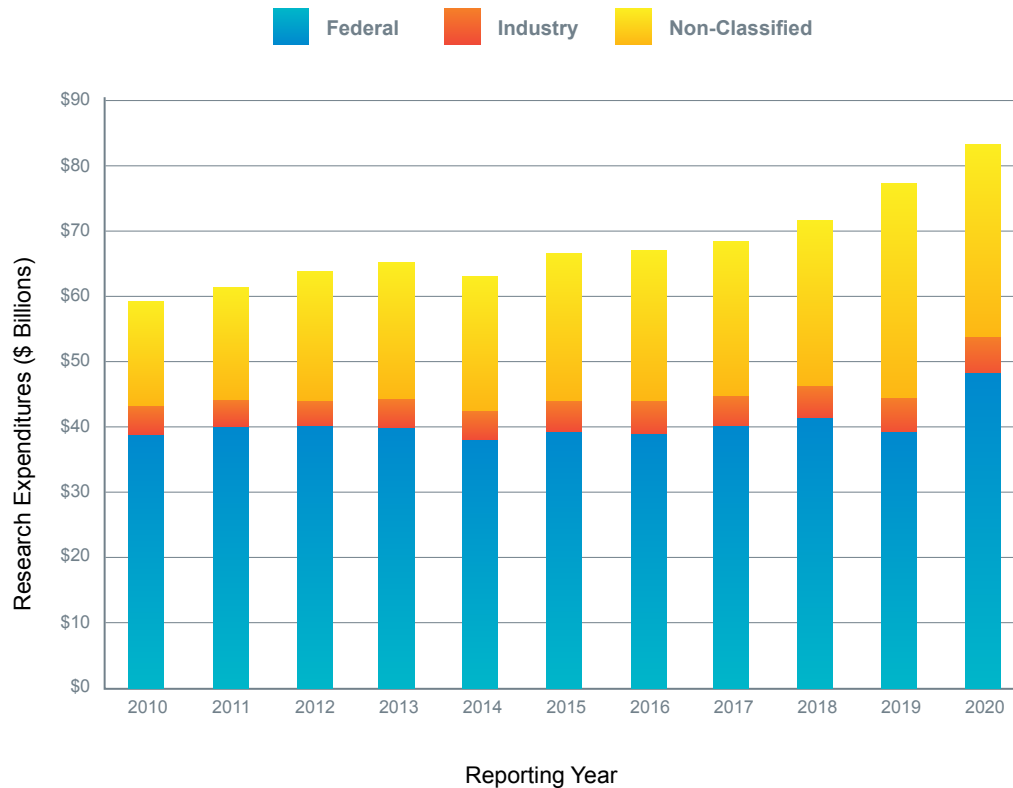
- Research funding in 2020 is back on the growth trajectory of 2018.
- Total research expenditures increased \$11.4 billion over 2018 to \$83.1 billion, a two-year increase of 15.9%.
- Federal research expenditures grew by \$6.9 billion over 2018 to \$48.1 billion, a two-year increase of 16.7%.
- Industrial research expenditures rose \$0.5 billion over 2018 to \$5.5 billion, a two-year increase of 9.9%, or 5% per year.
- Relative distribution of sources of income is back in line with 2018 and earlier ratios — 58.0% federal, 6.6% industrial, 35.4% all other.

Research Expenditures (\$ Billions)

	2015	2016	2017	2018	2019	2020
Federal	\$39.2	\$38.9	\$39.8	\$41.2	\$39.1	\$48.1
Industrial	\$4.9	\$4.9	\$4.8	\$5.0	\$5.2	\$5.5
Non-Classified	\$22.5	\$23.0	\$23.6	\$25.4	\$32.9	\$29.4
Total	\$66.6	\$66.9	\$68.2	\$71.7	\$77.2	\$83.1

% Federal	58.9%	58.2%	58.3%	57.6%	50.7%	58.0%
% Industrial	7.3%	7.4%	7.1%	7.0%	6.7%	6.6%
% Non-Classified	33.8%	34.4%	34.6%	35.5%	42.6%	35.4%

Research Funding Sources



Invention Disclosures

Overall Disclosures Rising, but...

The disclosure is the launching pad for evaluating new inventions, analyzing market potential, and developing strategies for protecting the intellectual property.

Overall, the number of disclosures continued its upward trend from 2018, but the number of disclosures reported per institution has remained relatively flat for the past few years. One of the bellwethers of the Licensing Survey has been the rate of disclosures per staff (full-time equivalents or FTEs) and per research funding (\$10 million in research expenditures). These benchmarks have held steady at about ten disclosures per FTE and three per \$10 million in research expenditures for the past five years. While overall disclosures have steadily increased since AUTM began tracking the data, more research may be required to identify specific challenges to increasing the rate of disclosures.



KEY FINDINGS

- Overall disclosures grew to 27,112, a modest 3.4% increase from 2018.
- Over the past five years, disclosures have risen 7.1%.



Invention
Disclosures

Disclosures

	2015	2016	2017	2018	2019	2020
Invention Disclosures Received	25,313	25,825	24,998	26,217	25,392	27,112

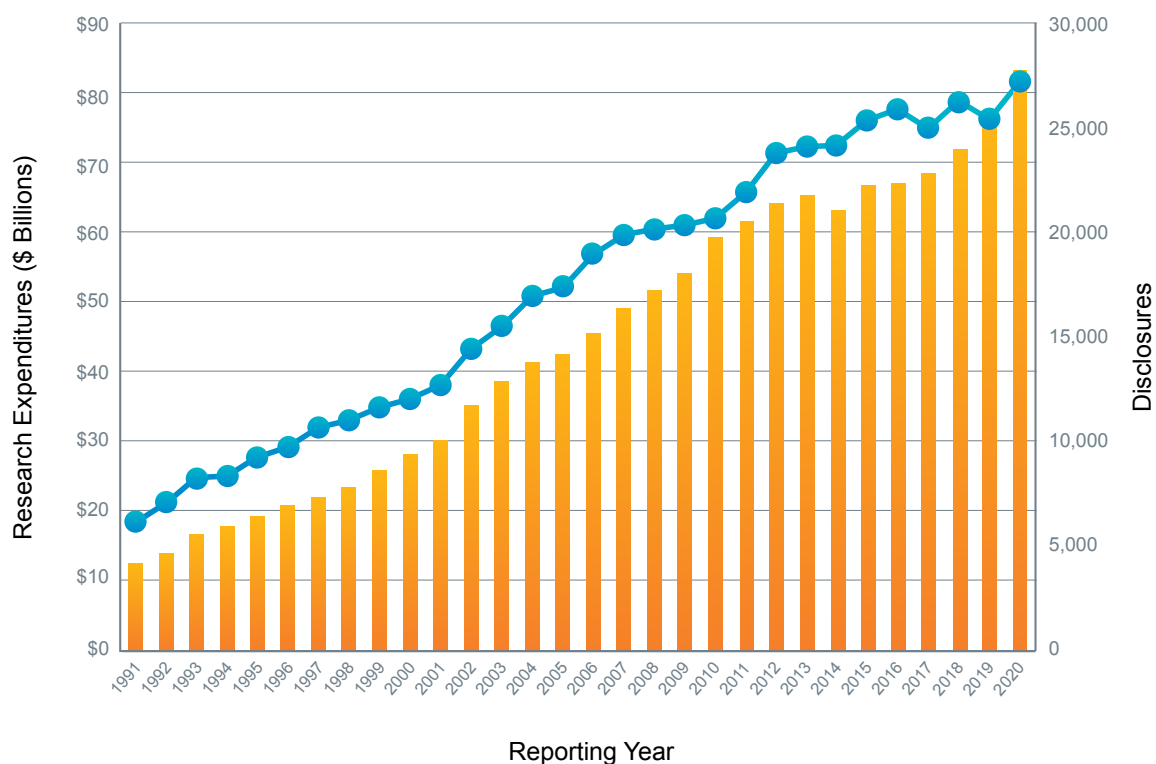
Number of Responses	200	194	187	196	179	197
Average Disclosures per Respondent	127	133	134	134	142	138

Office Staff (Full-Time Equivalents)	2,502	2,484	2,590	2,578	2,653	2,799
Disclosures per Office Staff	10.12	10.39	9.65	10.17	9.57	9.69

Total Research Expenditures (\$10 Millions)	\$6,657	\$6,687	\$6,820	\$7,166	\$7,718	\$8,307
Disclosures per \$10M Research Expenditures	3.80	3.86	3.67	3.66	3.29	3.26

Disclosures vs. Total Research Expenditures

■ Total Research Expenditures (\$ Billions)
 ● Disclosures



Tech in Your Life

Harnessing the Power of Plants



Calyxt, a University of Minnesota startup based in Roseville, Minnesota, uses TALEN®, a gene-editing technology to develop healthier and more sustainable crops.

The process is different from genetic modification since the final product does not contain foreign DNA. Instead, the process is similar to the natural mutations that happen to plants in the wild and mimics the effects of traditional plant breeding methods — only with greater precision and over a much shorter period.

Calyxt's first product, and the first gene-edited food product on the market, was sold under the Calyxt brand Calyno®. Calyno is a heart-healthy, high oleic soybean oil with zero grams of trans fat per serving and reduced saturated fat, and it delivers many functional benefits to chefs and consumers. Calyxt created an end-to-end partner-based supply chain to bring the product to market. The company is now selling its high oleic soybean seed to processors.

Building on this early success, Calyxt is focusing on licensing TALEN so companies can use the precision plant breeding technology to develop and market their own products. Calyxt will continue licensing the traits it develops directly to other companies as well as partnering with companies to co-develop traits. In addition to soybeans, the company is developing alfalfa with improved digestibility; high-fiber wheat; hemp for the protein, nutraceutical fiber and advanced materials markets; and winter oats.

Using TALEN as a set of “molecular scissors,” Calyxt makes pinpoint changes to specific genes that lead to more desirable traits in plants.

The Technology Commercialization office at the University of Minnesota licensed the TALEN technology to Calyxt's majority shareholder. UMN Technology Commercialization has licensed additional UMN intellectual property to Calyxt to provide it with additional tools and resources to bring products to the market.



Patents

Again Showing Steady Growth

A key step in the transfer of technology is the protection of new inventions. Patent protection provides both economic opportunities for sponsoring research institutions and an incentive for entrepreneurs and companies to invest in new technologies.

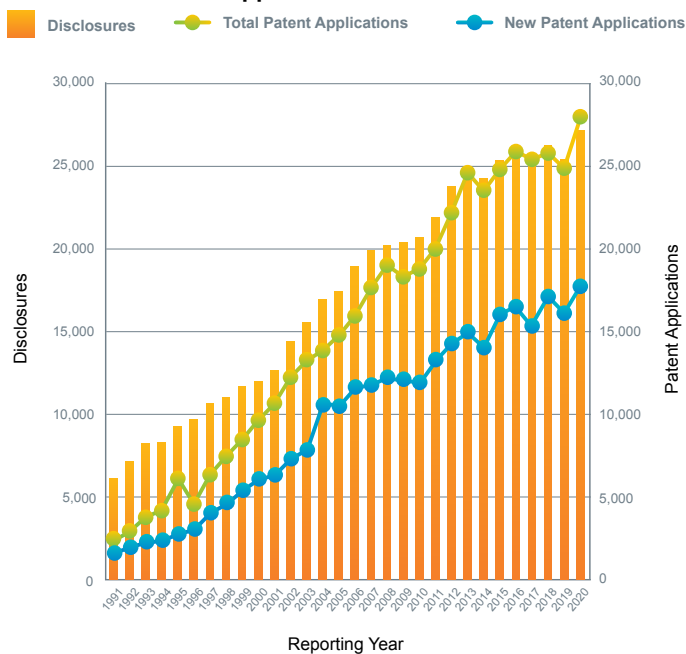
Overall, 2020 appeared to be a good year for patenting activities at responding institutions, with some particularly high points along the way. New patent applications, total US patent applications, and new US provisional patent applications all saw relatively modest annualized increases — less than 5% per year — when compared with 2018. New non-US patent application filings were up considerably in 2020, rising 16.3% since 2018 or 8.2% per year. We added a new data point this year, filings of Patent Cooperation Treaty (PCT) applications, and found that nearly 5,200 PCT applications were filed in 2020. Issued patents strongly recovered this year, with an annualized increase of 7.9% per year since 2018. Finally, nearly 60% of re-

KEY FINDINGS

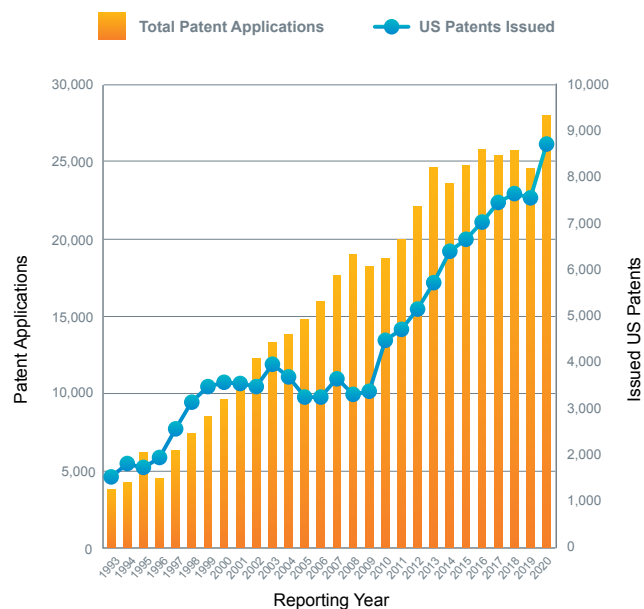
- Most patent-related metrics are up considerably this year compared with 2018 and 2019.
- New patent applications and total US patent applications are up 3.8% and 8.9%, respectively, from 2018.
- Filings of new non-US patent applications are up 16.3% from 2018, and 5,198 PCT applications were filed in 2020.
- 2020 saw a large increase in issued US patents, rising 14.2% from 2018.
- Considering only new patent applications where gender data was reported, 37.6% of new patent filings included at least one woman inventor.

sponding institutions provided gender data on new patent applications, and of those 7,542 new patent applications filed, 2,839 or 37.6% had at least one woman listed as an inventor.

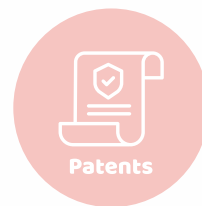
Patent Applications vs. Disclosures



Issued Patents vs. Total Applications



Patents



	2015	2016	2017	2018	2019	2020
New Patent Applications	15,953	16,487	15,335	17,087	15,972	17,738
Total US Patent Applications	24,723	25,797	25,351	25,678	24,824	27,957
New US Provisional Patent Applications	11,516	12,114	11,418	11,670	11,191	12,446
New US Utility Patent Applications	1,672	1,391	1,381	1,991	2,152	1,991
New Non-US Patent Applications	1,876	2,507	2,546	3,221	3,315	3,747
US Patents Issued	6,680	7,021	7,459	7,625	7,528	8,706
Number of Responses to Survey	200	194	187	196	179	197
New Patent Applications per Respondent	80	85	82	87	89	90
Office Staff (Full-Time Equivalents)	2,502	2,484	2,590	2,578	2,653	2,799
New Patent Applications per Office Staff	6.38	6.64	5.92	6.63	6.02	6.34
Total Research Expenditures (\$10 Millions)	\$6,657	\$6,687	\$6,820	\$7,166	\$7,718	\$8,307
New Patent Applications per \$10M Research Expenditures	2.40	2.47	2.25	2.38	2.07	2.14



COVID-19

Innovation Ecosystem Delivers Life-Saving Products

When future historians study how the COVID-19 pandemic was overcome, the role of university research and technology transfer will be key. From ventilators to vaccines, life-saving products began pouring out of labs, hospitals and other facilities within days of the declaration of a global health crisis.

Spurring this staggering activity were new licensing guidelines from AUTM that prioritized speed and access in getting innovation into the marketplace. The guidelines, issued in April 2020, recommended offering time-limited, non-exclusive, royalty-free licenses in exchange for a rapid and broad distribution of products and services addressing the pandemic. More than 95 universities and related stakeholders have signed on, with many sharing their ongoing research.

“COVID put technology transfer in the spotlight like never before,” says AUTM CEO Stephen Susalka. “And it forced us to do things differently.”

The guidelines altered the tech transfer paradigm. “We gave them professional cover from the traditional worrying about risk factors” and striving for perfection before marketing a product, says Marc Sedam, Vice President, Technology Opportunities and Ventures, NYU Langone Health. Instead, “the message was ‘Don’t worry about the market, get the solutions out there.’”

This new willingness to collaborate and accept some risk unleashed creativity and accelerated the transfer process.

The University of Kentucky’s technology commercialization office saw a 25% increase in disclosures from July through December 2020. The office created a COVID tech web page and implemented an expedited discovery evaluation. If a disclosure was COVID-related, “it went to the top of the pile,” says Ian McClure, Associate Vice President for Research, Innovation and Economic Impact.



That posed a different challenge. “We still had lots of technologies not related to the pandemic coming in,” says McClure. “And it wasn’t as if we had more or new resources. We focused mainly on the COVID-related ones, raising the question ‘How much time is too much time to spend on the pandemic?’”

“COVID broke the culture that we have to meet in person. People are more willing now to say, ‘Let’s click on Zoom and get it done.’”

— Marc Sedam, Vice President, Technology Opportunities and Ventures, NYU Langone Health

Darren Fast, Director of Technology Transfer at the University of Manitoba, says the COVID-spawned focus has heightened awareness of the value of university research, with more interest in new startups and collaborations.

Other post-pandemic positives include increased acceptance of risk, awareness of the importance of being adaptable, productivity gains from fewer face-to-face meetings and more online communication, and recognition that TT success is possible in a remote environment.

“A healthy, well-funded, predictable, innovative ecosystem helped us address this pandemic,” says Susalka. “We have to make sure we’re prepared for the next one. This is not going to be the last pandemic.”

Licenses and Options

Doing More with Less

The next step in the commercialization process for protected intellectual property is licensing. The number of exclusive licenses executed is a leading indicator of licensing revenue and the commercial development of new products and services five to ten years later.

Tech transfer offices are doing more with less. The number of licenses and options has grown 26.5% since 2015. During that same period, licensing full-time staff equivalents (FTEs) grew only 6.9% — suggesting fewer people are available to perform core tech transfer tasks.

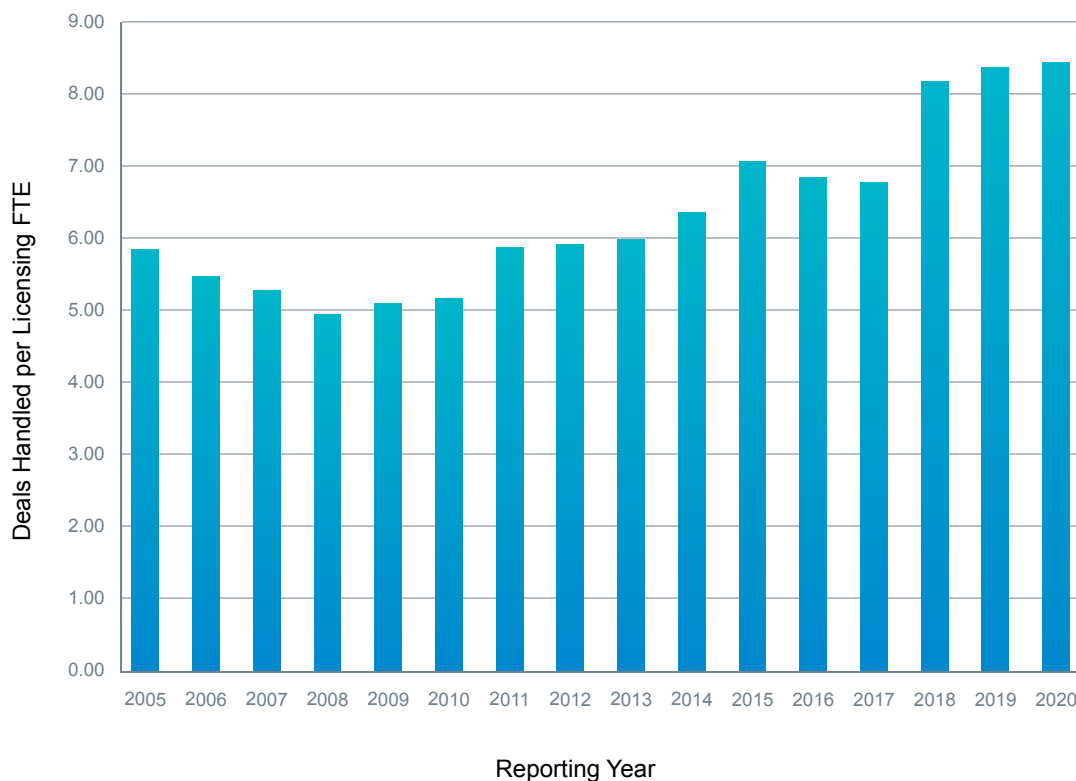
This year we asked about open source licenses and inter-institutional agreements (IIAs), two of the many types of agreements tech transfer offices handle. Not surprisingly, these two new metrics showed strong initial reporting levels: 197 open source licenses and 1,211 IIAs. In 2020, over \$383 million was paid to other institutions, and when coupled with the amount of IIAs being done, baseline data points toward strong inter-university collaboration.



KEY FINDINGS

- Tech transfer staff may be growing, but so are expectations of the individual, with each licensing staff (FTE) responsible for 8.3 deals, up from 7 deals only five years ago.
- Offices managed three more new licenses per year compared with 2018, and 11 more than five years ago.
- Licensing to small companies has swelled to 59% of total agreements, outperforming large companies and startups.
- Licenses to large companies have declined 23.4% over the past five years, and 10.2% since 2018.

Deals Handled per Licensing Staff

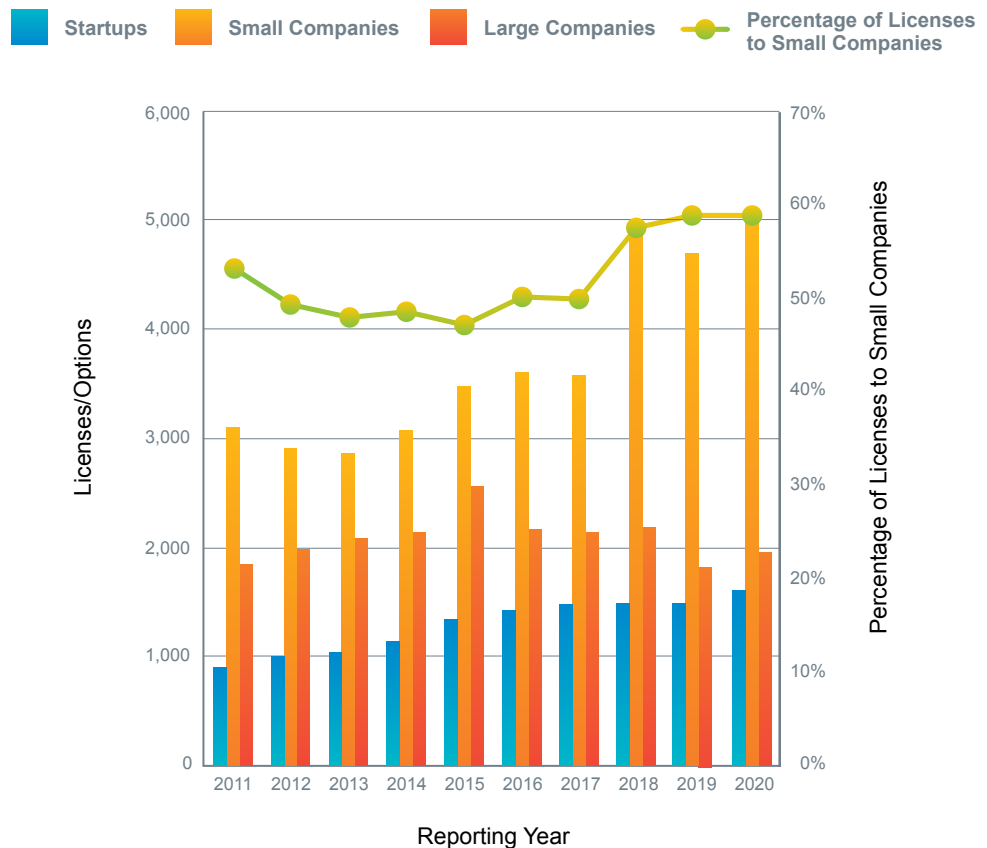




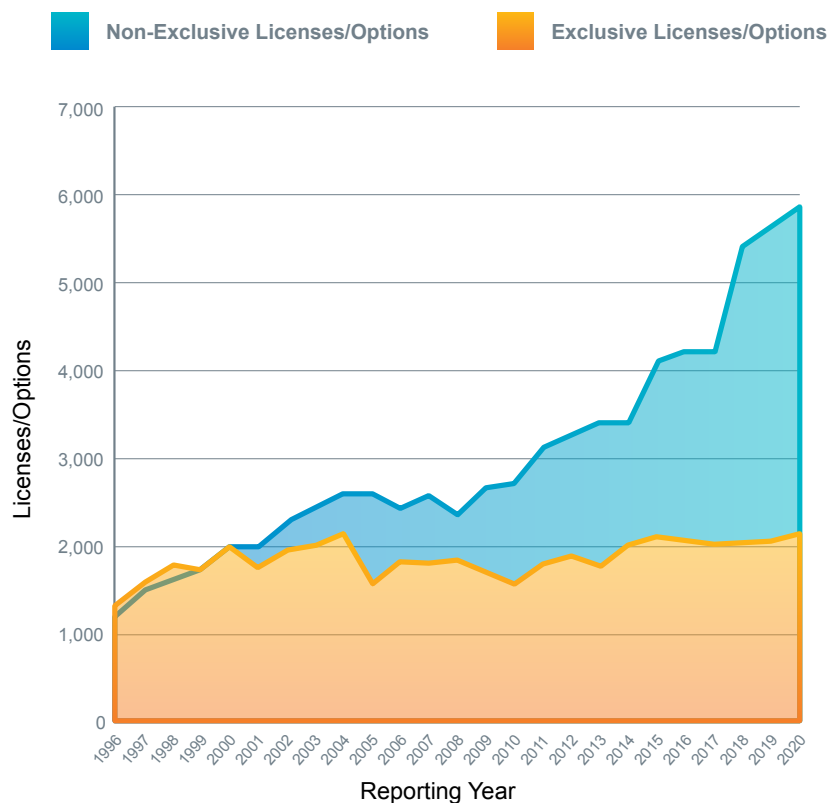
Licenses and Options

	2015	2016	2017	2018	2019	2020
Total Licenses and Options	7,942	7,730	7,849	9,350	9,751	10,050
Number of Responses to Survey	200	194	187	196	179	197
Average Licenses and Options per Respondent	40	40	42	48	54	51
Licensing Staff (Full-Time Equivalents)	1,130	1,130	1,160	1,142	1,167	1,209
Average Licenses and Options per Licensing Staff	7.03	6.84	6.76	8.19	8.35	8.31
Total Research Expenditures (\$10 Millions)	\$6,657	\$6,687	\$6,820	\$7,166	\$7,718	\$8,307
Licenses and Options per \$10M Research Expenditures	1.19	1.16	1.15	1.30	1.26	1.21

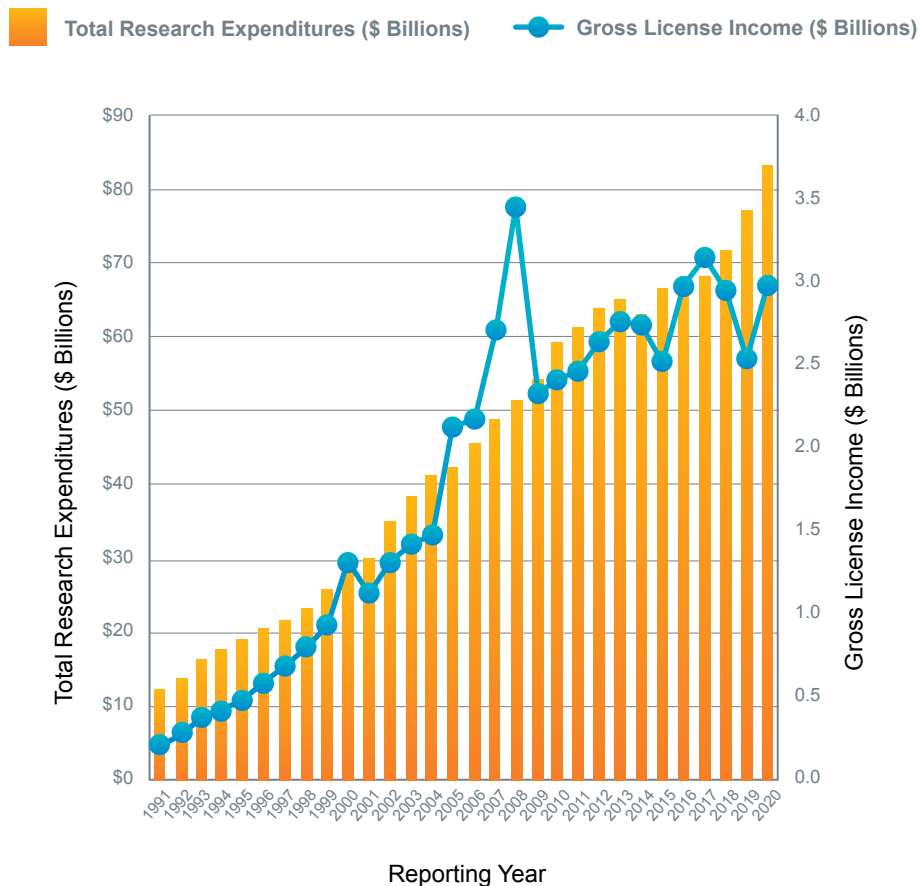
Licensing More to Small Companies



Non-Exclusive vs. Exclusive Licenses/Options



Gross License Income vs. Total Research Expenditures



Small Offices

Small but Mighty

At his first AUTM meeting, Rodney Ridley encountered the “big boys” of technology transfer. “I must have looked like a deer in the headlights,” he recalls. Now, after successful tech transfer launches at two Pennsylvania universities, he co-chairs AUTM’s committee on successful practices in small TTOs. “I’ve learned how to build and run a highly successful and efficient small TTO at a small university,” says Ridley, Alvernia University’s Vice President and head of the O’Pake Institute for Economic Development and Entrepreneurship.

Yatin Karpe, Director of Technology Commercialization at Rowan University in New Jersey, says a creative and innovative approach is key, while keeping in mind the operation’s limitations: “It’s important to know your innovation ecosystem,” including educational, technological, governmental and financial resources. Karpe has had great success with the National Science Foundation’s Innovation Corps program, a startup accelerator. Rowan’s I-Corps teams have won ten awards in the last three years.

Smaller schools also are more likely to utilize students. Lakehead University boosts its five-person

“Here’s the magic: We pair students with community leaders who volunteer their time. ... And they form a lifelong mentor-mentee relationship that grows really fast.”

— Rodney Ridley, Vice President, COO of O’Pake Institute, Alvernia University

TTO staff with business-subsidized internships and co-op arrangements with other departments. Alvernia recruited and trained more than 30 students as O’Pake Fellows last year.

“Smaller offices cope with smaller budgets,” says Ellen MacKay, Director of Innovation Development at Canada’s Lakehead University. Her budget is “shoestring, compared with some, but I’m not having to spend my time doing invention disclosure triage with hundreds of applications. ... We can move things forward more quickly. Also, we really get to know our faculty. And since we understand their research, it’s easier to pitch it to industry.”

And that’s no small matter.

Small Offices – Lakehead University

An annual competition “to promote what we’re doing, to get eyes on us,” is one way Ellen MacKay explains and enhances the role her TT office plays at Ontario’s Lakehead University, where MacKay is Director of Innovation Development.

Faculty apply to be featured in a short video about their work. “Who doesn’t want a professionally produced commercial about their product or research?” she asks rhetorically. Twenty applied this year, resulting in four videos for the university’s Research and Innovation Week celebration, now in its 16th year.

Recognizing that the publicity can spur more innovation, MacKay has commissioned four additional videos for use this year.

It’s just one tool her office utilizes to extend its reach. Three years ago, Lakehead established its first business incubator, Ingenuity, which MacKay oversees along with numerous other entrepreneurial efforts at the university’s two main campuses. “There are a lot of regional clusters we have to engage,” she says.

To enhance its effectiveness, Lakehead is undergoing a lengthy assessment of the strengths, shortcomings and impact of its economic engagement, in hopes of completing the Innovation and Economic Prosperity (IEP) Universities program. If successful, Lakehead will become only the second IEP-designated institution in Canada.



Products

Where It All Comes Together

The arrival of new products in the marketplace is the culmination of successful tech transfer, from idea, research and development to intellectual property protection and licensing — a strategic, collaborative and often complicated process led by tech transfer professionals.

KEY FINDINGS

- The number of new products increased to 933, up 12.7% from 2018 and approaching the historic high of 965 in 2014.
- The number of new products per respondent is down 6.9% from 2018 levels and down considerably from the historic high of 7.5 new products per respondent in 2014.
- As research expenditures have increased dramatically, the number of new products normalized to research expenditures has fallen slightly from 2018 levels.

New Products

	2015	2016	2017	2018	2019	2020
New Products	879	798	755	828	711	933

Number of Responses to Survey Question	129	133	125	139	152	168
Average New Products per Respondent	6.81	6.00	6.04	5.96	4.68	5.55

Office Staff (Full-Time Equivalents)	2,502	2,484	2,590	2,578	2,653	2,799
New Products per Office Staff	0.35	0.32	0.29	0.32	0.27	0.33

Total Research Expenditures (\$10 Millions)	\$6,657	\$6,687	\$6,820	\$7,166	\$7,718	\$8,307
New Products per \$10M Research Expenditures	0.13	0.12	0.11	0.12	0.09	0.11



Tech in Your Life

Realizing a Vision
University of Arizona



Imagine having cataracts, then finding a way to see — at all ranges — without contacts or glasses. In the past, cataract surgeries offered clarity for only two distances: near and far. What about the intermediate range?

A University of Arizona optical scientist has realized this vision by designing implantable cataract replacement lenses that allow for midrange sight. The lenses were developed by Jim Schwiegerling, a professor in the Department of Ophthalmology and Vision Science in the James C. Wyant College of Optical Sciences.

As we age, the precisely structured proteins that create the eye's naturally transparent lens begin to clump, causing cataracts that cloud vision. The routine solution to this problem has been surgery to replace our natural lenses with artificial intraocular lenses. But today's bifocal intraocular lenses offer clarity for only close up and far away.

"With the prevalence of screens in the modern day, people want that extra intermediate distance," Schwiegerling says.

With support from Tech Launch Arizona (TLA), the UArizona office that commercializes inventions created from research, patents were filed and granted to the Arizona Board of Regents. TLA then partnered with Alcon, one of the world's largest producers of intraocular lenses, providing the company a license to use the UArizona technology in its products.

Besides offering better eyesight through a third focal distance, the lenses can also let more light into the eye, which creates sharper, higher contrast images.

Half a million people around the world have now received the trifocal Alcon lenses.

Schwiegerling (pictured at right) discovered he had cataract in one eye before receiving an implant.

"I'm a user and not just a maker," he says. "I am thrilled with being able to do my outdoor activities, work at the computer and read without being encumbered by glasses. I see like I am young again."

Equity, Diversity & Inclusion

Creating More Opportunities for Everyone



Jennifer Shockro and Megan Aanstoos want to put an end to “Lost Einsteins.” That’s the term researchers coined for people from underrepresented groups who would have had impactful inventions had they become inventors.

“If you’re only talking to a small proportion of inventors at your school, of course you’re missing out,” says Shockro, who heads AUTM’s Women Inventors Special Interest Group and is Assistant Director for Technology Transfer at the California Institute of Technology.

“Opportunity is the overarching word for why we should have more inclusion. Hearing [new] voices means more opportunity for economic growth, leading to a more productive, happier society.”

— Megan Aanstoos, Licensing and New Ventures Manager, Kentucky Commercialization Ventures

“We’ve made more strides in the last few years than in the previous 100, but we’re not doing a good-enough job,” adds Aanstoos, chair of AUTM’S EDI Committee and Licensing and New Ventures Manager with Kentucky Commercialization Ventures.

At the current pace, researchers estimate it will take more than a century to reach gender parity in innovation. And with Whites three times more likely than Blacks to become inventors, that’s another uphill climb.

The biggest challenge is education.

“If you don’t see someone like yourself in technology transfer, you’re less likely to participate,” AUTM CEO Stephen Susalka says.

AUTM now has the most diverse board in its history. And this summer the association initiated a two-year pilot program called “Emerging Members.” Aimed at improving technology transfer outcomes, the program pairs mentors with participants from Minority-Serving Institutions to provide education and connectivity.

“We’re targeting groups historically left out of the conversation and providing a safe space to communicate and grow together,” says Aanstoos. “It’s important for those voices to play a role in the future of tech transfer and of AUTM.”

Noting that his school is implementing an institutional inclusion action plan, J.P. Heale, Managing Director of the University-Industry Liaison Office at the University of British Columbia, also emphasized the role of individuals. “We all have implicit biases and need to be mindful of that” when hiring and working with innovators, he says.

Shockro says that having diverse role models and mentors in STEM — and technology transfer — is important. “It makes the dream seem that much more achievable,” she says.

Heale highlights the importance of this: “To only develop products with one segment of the population doesn’t serve the community as a whole. And we’re trying to lift up society as a whole.”

HBCUs

Mentoring Emerging Research Institutions



It's a new era for the AUTM Board of Directors. Not only is it the most diverse in the Association's history, but it also has its first member from an HBCU.

Almesha Campbell is Assistant Vice President for Research and Economic Development at Jackson State University. After 12 years there, she knows firsthand the research and technology challenges facing Historically Black Colleges and Universities and other institutions serving underrepresented populations.

When AUTM announced a two-year pilot program for mentoring emerging research institutions, Jackson State was quick to sign up.

Fewer than ten of the more than 100 HBCUs have technology transfer offices, Campbell says, fueling her commitment to diversity in this area. Campbell hopes to use the pilot program to

"All program participants benefit from expanded access to a more inclusive, diverse tech transfer community."

— Almesha Campbell, Assistant VP for Research and Economic Development, Jackson State University

learn more about licensing and university-industry partnerships.

Reis Alsberry, Director of Technology Transfer at Florida A&M University, another pilot school, says that because HBCUs lack the resources and networking opportunities of other universities, they've been less successful. "We're behind in playing the technology transfer game," he says, "and we're trying to close the gap."

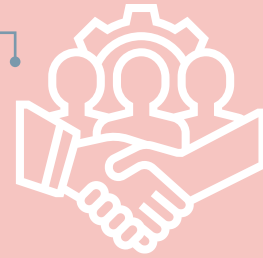
Startups

Continued Growth

Startups continue to be a core focus of university technology transfer offices, but after a decade of steady growth, there are signs that investors and TTOs may be becoming more selective.

The 2020 Survey showed that the pandemic took a toll on both startup formation and survival. The number of newly formed startups resumed its upward trend after plateauing in 2017 and 2018 and declining in 2019, which was probably an artifact of the low response rate; however, the growth since 2015 is only 10.4% or just over 2% per year.

Startups went out of business at a high rate in 2020. The number operational at the end of 2020 decreased by 158 from the end of 2019, which was probably artificially low. With 1,117 new startups formed in 2020, this means at least 1,275 earlier startups went out of business in 2020, double the average rate of the previous four years.

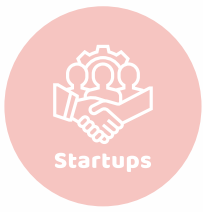


KEY FINDINGS

- Startups formed grew by 37 over 2018, a two-year increase of 3.4% or 1.7% per year.
- 68.9% of the startups formed were located in their home state, continuing the preference for staying close to their originating institution.
- Startups still in operation increased by 49 from 2018, a two-year increase of 0.8%.
- On average, each respondent formed 5.67 startups in 2020, one startup for every \$83 million in total research expenditures.

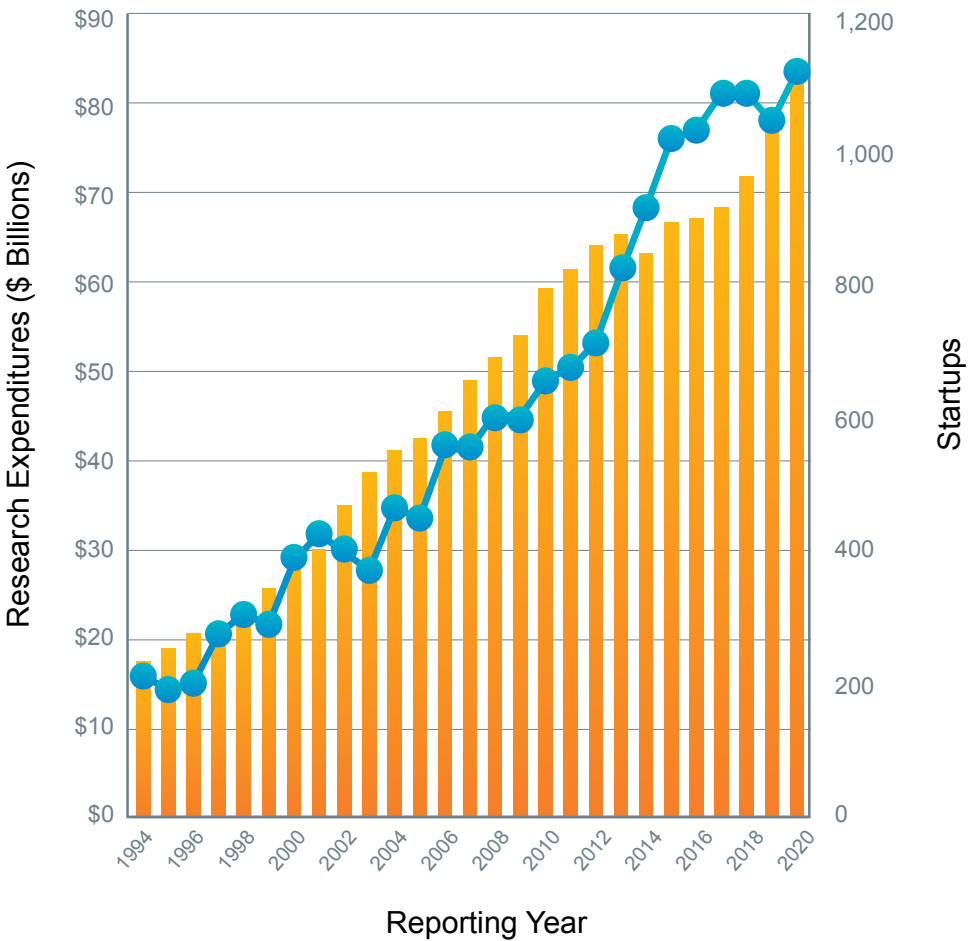
Startups

	2015	2016	2017	2018	2019	2020
Startups Formed	1,012	1,024	1,080	1,080	1,040	1,117
Startups in Home State	735	752	782	749	763	770
Startups Still Operational at End of Year	5,057	5,237	6,050	6,518	6,725	6,567
Number of Responses to Survey	200	194	187	196	179	197
Average Startups Formed per Respondent	5.06	5.28	5.78	5.51	5.81	5.67
Office Staff (Full-Time Equivalents)	2,502	2,484	2,590	2,578	2,653	2,799
Startups Formed per Office Staff	0.40	0.41	0.42	0.42	0.39	0.40
Total Research Expenditures (\$10 Millions)	\$6,657	\$6,687	\$6,820	\$7,166	\$7,718	\$8,307
Startups Formed per \$10M Research Expenditures	0.15	0.15	0.16	0.15	0.13	0.13



Startups vs. Total Research Expenditures

 Total Research Expenditures (\$ Billions)  Startups



Benchmarking

How Does Your Institution Measure Up?

We know that survey contributors already use the historical data to see how their institutions stack up. So, using research expenditures to level the playing field, we're taking a closer look at how tech transfer operations tick for different peer groups.

WHAT TO MEASURE

For the benchmarking report, we selected five of the most common measurements that broadly capture the overall performance of tech transfer offices. A sixth key measurement, research expenditures, was used to organize the data into peer groups.

- Invention Disclosures
- New Patent Applications
- Licenses and Options

- Gross Licensing Income
- Startups Formed

SELECTING PEER GROUPS

Another important consideration in cross-institution benchmarking is identifying appropriate peers. We use the HERD report to divide the population into categories based on research funding. Each year the National Science Foundation (NSF) conducts the comprehensive Higher Education Research and Development (HERD) Survey. This annual census collects information on R&D expenditures from more than 900 degree-granting institutions that spent at least \$150,000 in R&D during the fiscal year. These institutions accounted for more than 99% of the total R&D expenditures reported.

Peer Group Comparison

Peer Groups			Invention Disclosures		New Patent Applications		Licenses and Options		Gross Licensing Income		Startups Formed	
HERD Rank	Total Research Expenditures	Group Size	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median
1	More than \$469,682,000	57	319.9	250	221.1	123	101.4	83	\$40,448,421	\$13,919,427	12.8	10
2	\$212,823,000 to \$469,682,000	43	112.4	112	61.0	49	32.6	23	\$9,678,221	\$2,480,057	3.9	3
3	\$102,823,000 to \$212,823,000	30	55.4	54	45.5	32	22.8	12	\$5,301,075	\$1,568,218	3.2	3
4	\$46,253,000 to \$102,823,000	22	30.8	29	15.3	8	57.8	5	\$1,277,813	\$195,931	1.4	1
5	\$24,194,000 to \$46,253,000	19	17.5	12	14.0	8	5.5	3	\$654,114	\$25,844	1.4	1
6	\$8,011,000 to \$24,194,000	7	16.0	6	7.7	5	2.0	2	\$163,989	\$15,000	0.6	0
Overall		178	145.2	78	96.9	44	52.0	22	\$16,418,223	\$2,283,067	5.9	3



About the Survey

AUTM invited 312 US institutions —universities and colleges, hospitals and research institutions, national laboratories and third-party technology investment firms — to participate in the AUTM 2020 US Licensing Activity Survey. AUTM received 197 completed surveys, for a response rate of 63%. The numbers from these institutions reflect the significant role played by technology transfer in today's innovation economy.

Most of the data collected in this survey is also available in AUTM's Statistics Access for Technology Transfer (STATT) Database. To access this searchable database of 30 years of academic licensing data, visit www.autm.net/stattdb.

Suggested Citation

AUTM report titled *AUTM US Licensing Activity Survey: 2020, A Survey Report of Technology Licensing (and Related) Activity for US Academic and Nonprofit Institutions and Technology Investment Firms* can also be referenced by its abbreviated title, *AUTM US Licensing Activity Survey: 2020*, editors Grant Allard, John Miner, Dustin Ritter, Paul Stark and Ashley Stevens.

About AUTM

AUTM is the nonprofit leader in efforts to educate, promote and inspire professionals to support the development of academic research that changes the world and drives innovation forward. Our community comprises more than 3,000 members who work in more than 800 universities, research centers, hospitals, businesses and government organizations around the globe.

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