

Administrative Activities Review UA Office of Technology Transfer (OTT) August 2018

I. Basic Facts and Description of Unit

a. Mission and goals

The mission and goals of UA's Office of Technology Transfer (OTT) include assisting the university to achieve its visions and objectives through identification, protection and commercialization of its research results and capabilities that are relevant both regionally and globally, and achieve the institution's connectivity, entrepreneurial, and innovation objectives as well as meeting the goals of the Board of Regents.

b. Services

University technology transfer operations typically provide services that primarily include identification, evaluation, protection and commercialization of technology derived from its research, OTT, as part of the Office of Research, has broader perspectives, and we consider our goals to include assistance in maximizing UA's research effectiveness as well as regional and state economic development. We believe we continue to achieve our specific technology transfer goals of improving services to the faculty, staff, and students in connection with the foregoing tasks, e.g., easier for them to make disclosures, better data retrieval mechanisms, more cost effective protection adequate for faculty, student, and University needs, and continued growth and success in making our technologies available for commercialization. The number of invention disclosures and resulting patent applications continues to be robust (and a national leader), augmenting our pipeline of impressive IP for future licensing opportunities. Notably, we continue a program of in-house filing of provisional patent applications that saves an estimated \$120,000 - \$150,000 in annual patent costs. In addition, OTT now provides Federal reporting of inventions and discoveries resulting from UA research activities in compliance with Bayh-Dole requirements.

Critical partners:

Figure 1 shows a diagram of relations between OTT and significant partners. OTT works closely Office of Research Administration (ORA) and University of Akron Research Foundation (UARF) in management of the university's research activities (colored blue). OTT works with other university organizations (orange), and external organizations (green). OTT works with the Office of General Counsel (OGC) in managing outside counsel activities including patent filing decisions and budget control. OTT collaborates with the Office of Research Administration (ORA) and the OGC to facilitate research-related contracts. OTT's participation in resolving research contract-related matters involving conflicts, confidentiality, liability, publication, and IP rights as well as MTAs, CDAs, and international training programs also help achieve growth in the University's overall research programs, minimize research management problem resolution, and assist and promote faculty and graduate student success..

Pursuant to UA Trustees Resolution 01-24-05, OTT collaborates with the UA Research Foundation (UARF) particularly in connection with development and commercialization of UA’s technologies. Regional wealth creation and the Governor's objectives in State economic development have been closely tied to new business creation. Our ongoing assistance (a) to faculty in fostering and establishing startup companies, (b) in facilitating existing small business in their efforts to generate funding and commercial applications for new technologies through SBIRs, STTRs, technology options, and business counseling, and (c) promoting collaborations and sharing of business assets among established companies, help achieve our goals of local and regional economic development while enhancing the stature of and returning economic benefit to the University. For example, OTT and UARF engage with almost two hundred large regional and multinational corporations for research sponsorship and/or licensing opportunities.

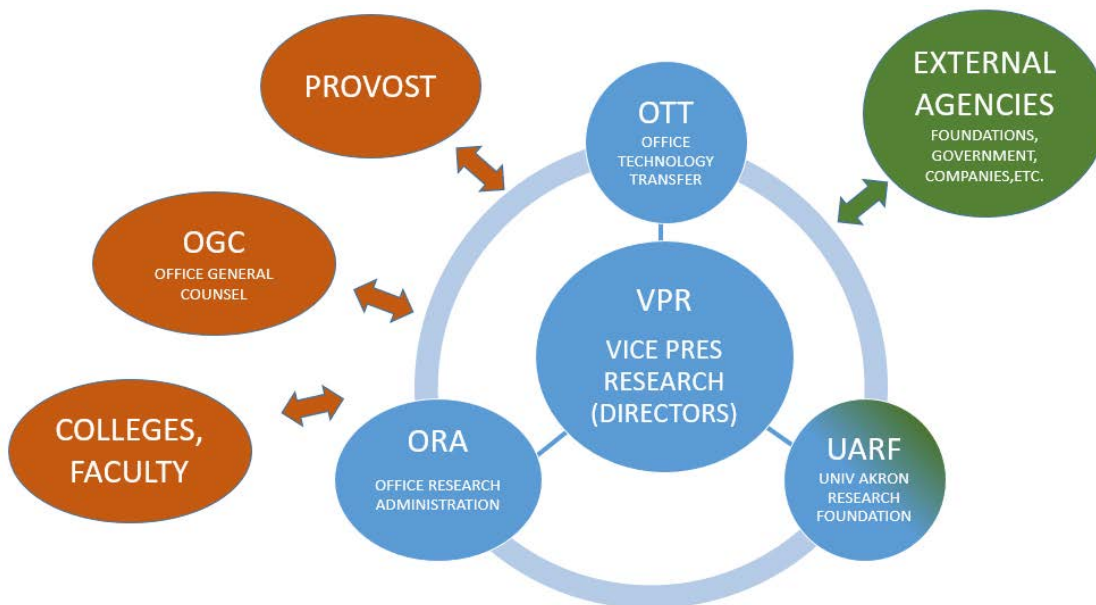


Figure 1. Relations and critical partners of OTT. OTT is one of the three major units on campus that manage research and intellectual property activities for the UA campus.

In addition to meeting our strategies for revenue enhancement through increased research and commercialization of results, OTT’s efforts directed through combinations of the University, UARF and the numerous outgrowth organizations both for-profit and non-profit companies, activities, and volunteers provide an unprecedented opportunity for a coordinated approach to economic development and wealth creation

Furthering our outreach endeavors and in support of the UARF’s extension of services to sister institutions in the region, OTT has directly assisted CSU and YSU, and made our services available to assist LCCC, KSU and NeoMed with IP management and research services. In addition, OTT participates

as a member of the university tech transfer officers from across the state, along with representatives from the BOR, 3rd Frontier, and ODOD in advancing the State's interests in research commercialization.

Customers:

Within UA, the OTT supports and enhances the university technology transfer function by working with faculty and inventors to protect inventions and discoveries, obtain intellectual property, and market technologies to potential licensees. For example, OTT forges internal partnerships with faculty and student inventors, supports faculty with patent advice and protection, provides educational and recognition opportunities for faculty and students to enhance visibility, and encourages collaborations with business and promotes student success.

Outside the university, OTT assists faculty with identifying end users for inventions and making connections to industry partners for research and licensing opportunities, and promote the research, discoveries, inventions, patents and know-how of UA faculty and staff. In addition, OTT collaborates with the college deans to enhance the university research activities through corporate outreach, industry-sponsored research, technology marketing, intellectual property development, licensing, and new business startups. OTT maintains strong technical and business connections to the chemical and polymer industry with the objective to increase student enrollment and promote UA research excellence. An additional objective is to increase UA's reputation as a national leader in research and innovation to benefit university and faculty recognition.

Performance analysis:

University Invention Disclosures and Patents Granted over 5 years

In recent years The University of Akron has received approximately 60 invention disclosures submitted by faculty and students annually although, historically, the numbers have been higher. Likely the downward trend (shown in Figure 1) reflects the retirements/departures of a number of prolific inventors e.g., Isayev, Cakmak, Newkome, and Cheng. Patents typically issue 4 – 6 years after filing, thus the large number of issued patents in 2018 resulted from the disclosures during the 2012-2014 years. In view of the down-trend of disclosures and cost-cutting by OTT, we expect the number of issued patents to decline as well.

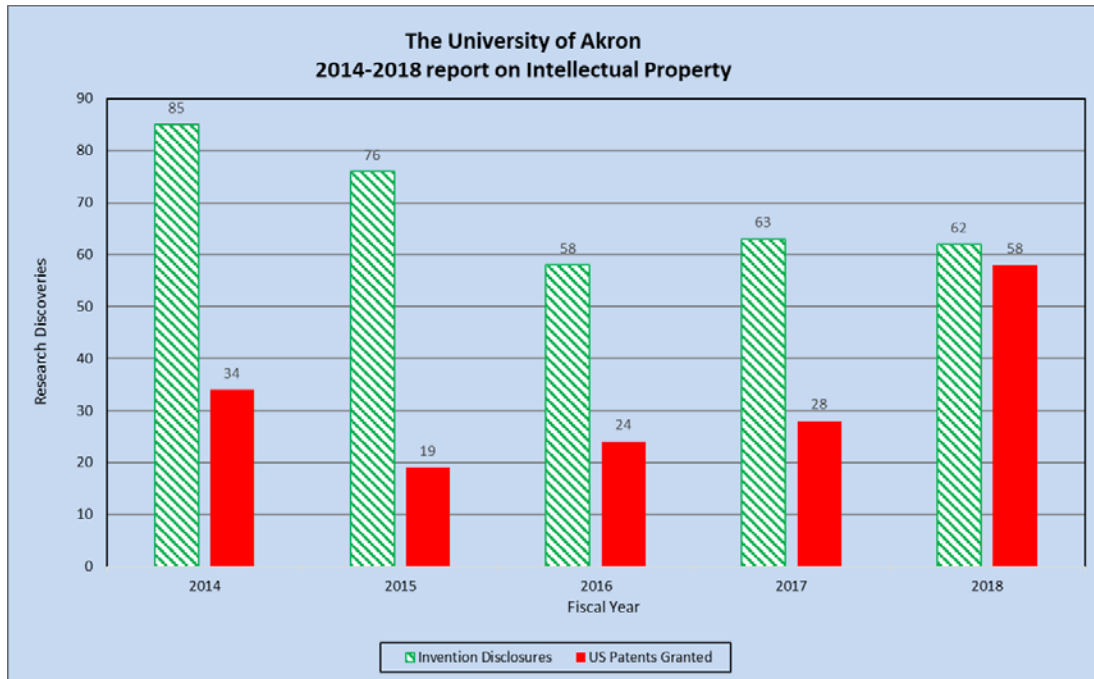


Figure 1. Yearly research disclosures and granted patents for UA from 2014 to 2018.

Tech Transfer Stats in comparison to Ohio research institutions

Among Ohio universities reporting to the Association of University Technology Managers (AUTM) for the decade up to 2010, UA ranked 1st (Table 1) in invention disclosures and total start-ups/million dollars research investment; 2nd in the number of issued patents/\$MM research (behind KSU); and 3rd in licensing income/\$MM research (behind OU and CWRU).

Table 1. Comparison of Ohio universities for 2001-2010 of licensing income and numbers of disclosures, patents, and startups per million dollars research investment.

Institution	Licensing Income/\$MM	Invention Disclosures/\$MM	US Patents/\$MM	No. Startups/\$MM
Univ. of Akron	\$26,248	1.03	0.23	0.06
Kent State Univ.	\$22,258	0.73	0.29	0.04
Univ. of Toledo	\$10,016	0.91	0.11	0.04
Ohio Univ.	\$85,461	0.84	0.15	0.02
Univ. of Cincinnati	\$12,813	0.60	0.08	0.01
Univ. of Dayton	\$3,309	0.31	0.08	0.01
Case Western Reserve Univ.	\$32,615	0.45	0.06	0.01
Ohio State Univ.	\$2,348	0.27	0.05	0.01

Research productivity comparison to US research universities

According to an analysis of AUTM data, author and tech transfer expert, Melba Kurman*, reports that UA ranks high in both number of research papers (y-axis) and inventions (x-axis)/\$MM research expenditures (Figure 2). Of particular note is that among the hundreds of research universities in the US, the performance by Akron is significant enough to appear in these research reports and the author commented, quote *“The University of Akron appears to be a well-rounded university as it ranks in the top twenty according to publishing per federal dollar, and also dominates its peers according to new inventions and industry funding.”*

* Melby Kurman, Tech Transfer 2.0: How universities can unlock their patent portfolios and create more startups, Triple Helix Press, 2013, <http://melbakurman.com/tech-transfer-2-0-book-contents/>

In Kurman’s analysis the two biggest universities (University of Texas and University of California) are not depicted in the charts because their performance is so large that they are off of the chart scale. UA’s position in this chart shows it produces a lot of papers and a lot of inventions per million dollars compared with many of the other universities making it a good value to the nation. The intent of the analysis was to assess performances over the completed decade. The last complete decade ended in 2010 hence the data is the latest available such report. The next comparable report should be written for the decade ending in 2020.

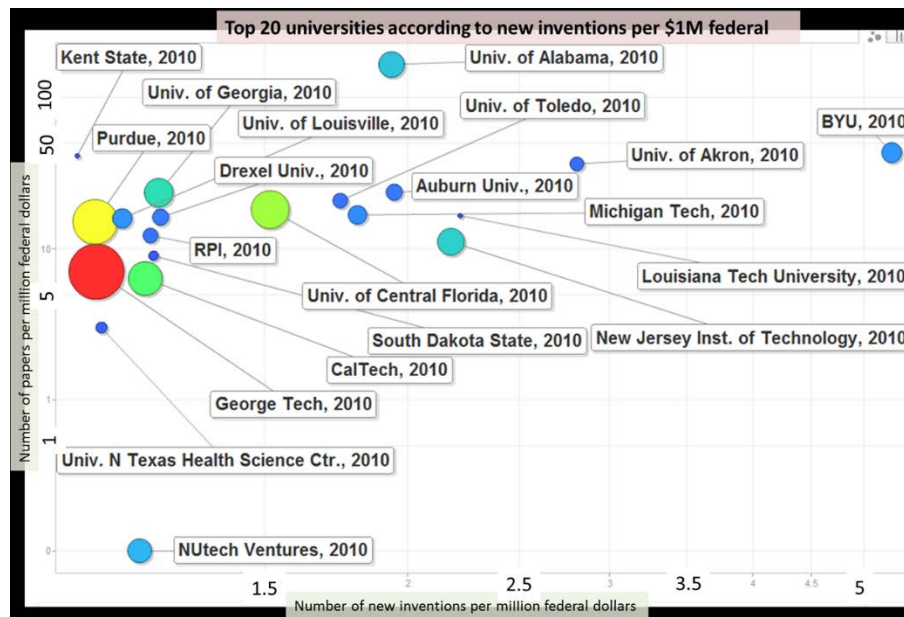


Figure 2. AUTM report comparison of numbers of papers and new inventions per million federal dollars of research. The size of the bubbles represent relative measure of research funding.

Milken Institute 2017 Report on Concept 2 Commercialization

The Milken Institute’s Center for Jobs and Human Capital has released its 2017 Report (attached) on the effectiveness of university technology transfer and commercialization. The report finds *“American research universities are among the nation's most powerful engines for domestic economic growth, and funding to sustain their research brings strong returns in the form of new industries, businesses and jobs. Creating human capital and conducting research, along with its efficiency as measured by output (patents, licenses executed, licensing income, and startups) relative to input (research expenditures), depict the production of good universities delivering on their mission.”* The report draws data from the nationwide AUTM report. In this list, Akron is ranked 61st, just above Princeton. The remainder of the Ohio universities are ranked as listed in Table 2.

Table 2. Milken Report rankings of Ohio universities.

Institution	Ranking
Cleveland Clinic	24
OSU	55
U Akron	61
U Toledo	66
Cincinnati	112
Ohio U	113
CWRU	192
U Dayton	200
Miami U	213
KSU	225

2017 Worldwide University Patent Ranking

Among worldwide universities, the National Academy of Inventors(NAI)/Intellectual Property Owners(IPO) Association 2017 Patent report indicates UA is second only to CWRU among Ohio universities in patents issued in the US, and 60th among universities in the world (Figure 3).



Figure 3. Image from cover of NAI/IPO report.

National Academy of Inventors Fellow Recognitions

The University of Akron was one of the charter member institutions of the National Academy of Inventors (NAI), which was founded in 2010. Akron has over 50 faculty members who are members of this organization, by virtue of having at least one US Patent.

In addition, the NAI Fellows Program was established to highlight academic inventors who have demonstrated a prolific spirit of innovation in creating or facilitating outstanding inventions that have made a tangible impact on quality of life, economic development and the welfare of society. Election to NAI Fellow status is the highest professional distinction accorded solely to academic inventors. Of the 912 Fellows worldwide, Akron has 6 recipients, including Stephen Z.D. Cheng; Alan N. Gent; Frank N. Harris; Joseph P. Kennedy; George R. Newkome; and Darrell H. Reneker. OTT believes this recognition is useful in both promoting UA technologies and stimulating inter-institutional collaborations

Brief assessment:

Indicated in the line chart in Figure4 the OTT comprises three persons (2.2 FTE) with extensive research, legal, patent, industry, federal compliance, and academic experience. In collaboration with UARF, the protection, development and commercialization of UA technology along with education, economic outreach, enrollment and job creation activities have been highly acclaimed and widely successful.

One person (1.0 FTE) manages all disclosures, applications, and patents. This person is the only person trained to access patent software tools through the US Patent Office to prepare reports, analysis, and to monitor progression of patents through the application process including coordination with external patent counsel. This person also provides patent information to companies and external agencies that express interests in patent portfolios and prepares reports required for Federal IP compliance. The remaining two people (combined 1.2 FET) are responsible for a wide range of activities in regards to management and promotion of commercialization of intellectual property and licensing. One of these two people is a registered patent attorney which permits the OTT to file Provisional Patent applications in house at a substantial cost savings (savings in the range of \$120,000 to \$150,000 is equivalent to about ½ of OTT's total annual salary budget). To our knowledge, no other university in the state system has this cost-saving advantage.

The OTT is operating lean and lacks depth in personnel. If personnel need to take leave of absence for any reason, certain activities must be placed on hold. This is of great concern should a person's absence occur during a critical time period.

c. Resources

Highlights:

Strengths: Current operations have been optimized for efficient operations. Over the past years the OTT has been effective in processing patent applications in support of highly productive faculty/inventors, as indicated in previous discussions on ranking of UA among other universities.

Weaknesses: As indicated above, the OTT operation is lean. An extended absence by any person would be disruptive. Furthermore, resources (personnel) are not available to innovate in terms of applying new ideas for interacting with industry to promote UA's IP. There is concern with recent personnel changes on campus that there will be a decline in new inventions in coming years until younger faculty gain experience and become established.

Opportunities: UA has a strong reputation and a strong patent portfolio. Opportunities exist to reach out to companies for licensing or support of research efforts.

Personnel:

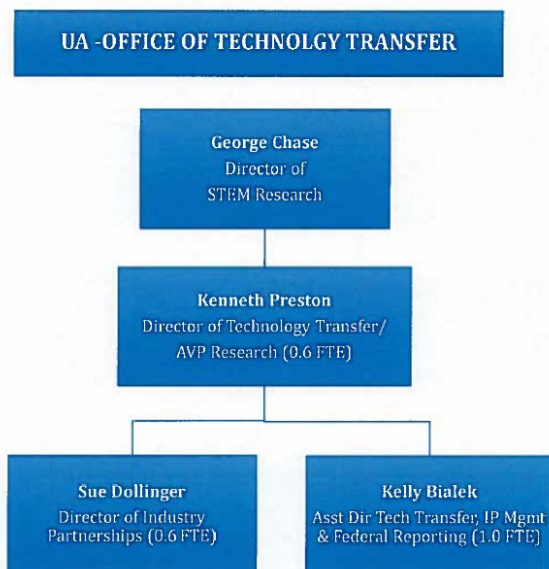


Figure 4. Line chart.

The OTT Director is responsible for all aspects of intellectual property management including acquisition, protection and commercialization. (one person @ 0.6 FTE)

The Director of Industry Partnerships and Technology Marketing provides scientific and business support to the Office of Technology Transfer, with the primary objective to promote university research inventions, obtain valuable intellectual property and commercialize research discoveries through collaboration and licensing deals with the private sector. (one person @ 0.6 FTE)

The Asst Director Tech Transfer, IP Mgmt and Federal Reporting manages the OTT Intellectual Property data collection and analytics, and is the interface among and between outside counsel, inventors, and licensees regarding IP matters as well as assuring Federal IP compliance. (one person @ 1.0 FTE)

Financials:

A summary of OTT operational budget speedtypes is shown in Figure 5. Summation of the budgets for the years 2014 through 2018 show the total operation budgets to be respectively \$1.049M, \$1.012M, \$1.284M, \$0.647M and \$0.639M. This shows OTT's budget was reduced by approximately 40% from 2016 to 2017.

Office of Technology Transfer

Figure 5. Summary of budget speed types used in the operation of OTT.

Speed Type: 202697					
Budgeted Amount					
Budget Period	2014	2015	2016	2017	2018
Wage/ Administration	\$ -	\$ -	\$ 187,476	\$ 103,141	\$ 106,220
Fringe Benefits	720	600	54,868	39,651	36,390
Supplies & Services	19,556	20,006	15,000	15,000	15,000
Communications	5,500	5,959	5,500	5,500	5,500
Travel & Hospitality	9,251	9,409	6,000	6,000	6,000
	<u>\$ 35,027</u>	<u>\$ 35,974</u>	<u>\$ 268,844</u>	<u>\$ 169,292</u>	<u>\$ 169,110</u>

Speed Type: 202697					
Actual Amount					
Budget Period	2014	2015	2016	2017	2018
Wage/ Administration	\$ -	\$ -	\$ 187,476	\$ 103,141	\$ 104,540
Fringe Benefits	720	600	54,868	39,651	39,560
Supplies & Services	14,549	15,493	15,655	13,747	17,450
Communications	5,041	5,036	4,533	4,533	-
Travel & Hospitality	5,843	6,822	7,351	5,890	220
	<u>\$ 26,153</u>	<u>\$ 27,951</u>	<u>\$ 269,882</u>	<u>\$ 166,962</u>	<u>\$ 161,780</u>

Speed Type: 202699					
Budgeted Amount					
Budget Period	2014	2015	2016	2017	2018
Wage/ Administration	\$ 376,062	\$ 355,910	\$ 277,109	\$ 112,460	\$ 113,460
Full Time Staff	368	-	-	-	-
Fringe Benefits	117,725	118,234	95,392	42,960	38,617
	<u>\$ 494,155</u>	<u>\$ 474,145</u>	<u>\$ 372,501</u>	<u>\$ 155,420</u>	<u>\$ 152,077</u>

Speed Type: 202699					
Actual Amount					
Budget Period	2014	2015	2016	2017	2018
Wage/ Administration	\$ 376,062	\$ 355,910	\$ 277,108	\$ 112,460	\$ 113,460
Full Time Staff	377	-	-	-	-
Fringe Benefits	117,725	118,234	95,392	42,960	42,094
	<u>\$ 494,164</u>	<u>\$ 474,145</u>	<u>\$ 372,500</u>	<u>\$ 155,420</u>	<u>\$ 155,554</u>

Equipment and technology:

Usual and standard Office facilities and equipment.

Space:

Current offices in Suite 312 GDYR and at 411 Wolf ledges.

II. Future Plans

a. Potential Changes

The best way to address the weaknesses described previously is to hire a new person (1 FTE) that can be cross trained in critical tasks to provide the necessary depth.

In current fiscal climate we recognize hiring a new person in OTT will be a strain on the UA budget. We are looking into other courses of action but none so far appear satisfactory.

b. Trends

In the next few years the numbers of disclosures may decline because of reduction in research faculty. This is expected to have a minor effect on workload because of the time it takes for disclosures to become issued patents. Furthermore, the bulk of the effort by OTT is in managing the current patent portfolio which will only continue to grow. If worst case occurs we will have to delay or eliminate some services. This will have negative impact on the growth of the patent portfolio and IP productivity at UA.