

Technology Transfer: A Roadmap

The following feature article, written by [Bob Mullins](#) and [Jan Crowe](#), was published in the February 1999 issue of *College and University Auditor*, the magazine of the Association of College & University Auditors (ACUA). Technology transfer at colleges and universities is becoming an area of increasing importance for auditors. Key factors include:

- The rapidly increasing trend toward active involvement in the incubation of start-ups. This activity carries with it considerable risks for the institution.
- Stresses on systems that were originally intended to service smaller and simpler operations—systems that are responsible for tracking patent activity, monitoring revenue streams, collecting and distributing fees and royalties, and tracking expenses.
- Significantly increasing revenue streams and associated expenses, which may or may not result in increased profitability; and the need to protect the institutions interests through audits of licensees.
- Increasing exposure to disputes between licensees and the institution, and between & among institutions and inventors.

The impact that university technology transfer has on the economy at the national and local level makes it increasingly visible to the outside world. It is estimated that the overall economic impact of technology transfer includes the creation of approximately 250,000 jobs and over \$24.5 billion in product sales.

Introduction

The Cohen-Boyer gene-splicing patent, which expired in 1997, earned over \$250 million for UCSF and Stanford University over its lifetime. Amgen recently paid an initial license fee of \$20 million for rights to develop the discovery of a gene thought to regulate obesity—the so-called "fat gene." These are two extreme examples, but between 1980 and 1997, technology transfer, especially in the life sciences, has grown from a relatively obscure activity to one involving over 300 U.S. and Canadian universities, teaching hospitals, research institutes, and patent commercialization companies, according to the 1997 annual survey conducted by the Association of University Technology Managers (AUTM).¹

The purpose of this article is to provide university internal audit directors and their staffs with an overview of this increasingly important area, and help them develop an appreciation for the expanding role technology transfer is playing on campuses today, the risks and rewards of that activity, and the resources required to sustain it.

Technology transfer, or the migration of academic discoveries to useful application in the development of marketable products or processes, is an activity in which very few educational institutions engaged prior to World War II. Even after the benefits of applied university-based technology were demonstrated through the development of weapons, communications systems, and other war-related needs, it took another 35 years until 1980 for technology transfer to begin to really take off.

Until passage of the Bayh-Dole Act in 1980, the major restraining force on technology transfer was the federal government's retention of ownership of all technology developed in university laboratories with taxpayer funds. The government would agree to license these technologies only through non-exclusive licenses. This meant that a potential manufacturer would have a very limited

opportunity to recover its investment in an early stage technology. The inevitable result was that few companies were interested. As a result, prior to 1980 fewer than 250 patents were issued each year to U.S. universities.²

Bayh-Dole changed all that. It contained provisions that:

- established a uniform federal patent policy;
- encouraged universities to collaborate with companies;
- permitted universities to retain title to federally funded inventions, as long as patent applications were filed.

The days of non-exclusive licenses and inconsistent policies issued by different government agencies were over. Companies now had the incentive they needed to pursue university-based technologies. Under the new legislation, the government retained "march-in rights," or the right to take title to or develop the technology if the university failed to do so, and also retained a non-exclusive right to practice the invention.

Another factor in the rapid increase in technology transfer has been the explosion in biotechnology. A confluence of factors, including the Bayh-Dole legislation, productivity gains made possible by computer technology, and the rise of biotechnology, produced an explosion of new technology and companies. In many institutions, biotechnology inventions constitute half or more of the total technology transfer activity. According to the AUTM survey, over 70% of the 1997 active licenses/options and approximately 87% of the gross licensing income reported were in the life sciences. Other significant 1997 AUTM survey statistics are:

- 11,303 invention disclosures were reported, up 11% from the prior year;
- 4,267 new U.S. patent applications were filed; 2,645 new U.S. patents were issued;
- 333 start-up companies were formed, up 34% from the prior year;
- academic institutions received an equity interest in 251 transactions in fiscal 1997, and received \$22.4 million from liquidation of equity received as part of licensing transactions;
- 2,214 new companies have been formed since 1980 based on a license to an academic invention;
- gross income received from licenses and options was just under \$700 million.

It is clear that technology transfer has become a major activity at many institutions and will continue to expand. The AUTM statistics also show a clear trend, troubling to some in technology transfer, for universities to increasingly participate actively in the creation of start-up companies to promote technology licensing. This trend will be discussed in more detail later.

Institutional Trademark Licensing

In some cases, the same office that administers technology transfer will also be responsible for the licensing of sportswear and other logo products.³ This can be a major income producing activity for many schools. While the suggested audit steps at the end of this article are directed toward technology transfer activities, they may be applicable to trademark licensing as well.

Core Activities

Technology transfer may be the responsibility of an office within the institution, or may be performed by a separate entity. These entities may be either for-profit or not-for-profit, and may or may not be wholly-owned by the institution.

The core activities of a technology transfer office that is not actively engaged in the creation of start-up companies will typically include most or all of the following activities:

- monitor the activities of investigators and maintain awareness of new technologies,
- maintain industry contacts and awareness of potential product applications,
- evaluate new technologies for patentability and commercial potential,
- evaluate the need for patents, both foreign and domestic,
- prepare, or facilitate preparation of, patent applications,
- market inventions,
- negotiate the sale or licensing of inventions,
- administer licensing agreements,
- monitor and collect revenue,
- calculate and remit the inventors' and institution's shares, and
- track invention progress and maintain a record of the entire process.

Audit issues related to these activities will be discussed in greater detail later in this article, but you can begin to see here the areas in which your audit of this activity might have value for your institution. The most obvious areas for review would include the office's activities in the recording of invention disclosures, monitoring and collection of revenue, proper tracking of revenues and expenses, and remitting the inventors' and institution's shares.

There are important benefits to be gained by looking beyond the basic accounting and bookkeeping, however. Technology transfer offices are subject to many of the same budget pressures and constraints as other university offices. Licensing professionals are bright, energetic and enthusiastic about their work. Sometimes overworked, their first priority is the licensing of technology, not building and operating robust administrative systems. As a result, you have a unique opportunity to help ensure that the systems and processes they use serve their needs, and are efficient and cost effective.

Philosophical Differences vs Practical Considerations

Visit the web site of the Harvard Office of Technology and Trademark Licensing (OTTL) ⁴ and you will see that their stated policy regarding patents and licensing encourages *"the notion that ideas or creative works produced at the University should be used for the greatest possible public benefit. This would normally mean the widest possible dissemination and use of such ideas or materials. Thus, every reasonable incentive should be provided for the dissemination into use of ideas, and the production and introduction into use of creative works or educational materials generated within the Harvard community. While this policy places benefit to the public before financial gain, it recognizes that it is also appropriate and desirable for the University and individual inventors or authors to benefit financially from the sale of products based on their inventions or other creative works. In deciding how to proceed in regard to a particular invention or creative work, the University will consider the benefits and consequences for the public and the University, as well as the individual inventors or authors."*

The mission statements of other offices may place more or less emphasis on financial benefit to the institution versus promoting the "greatest possible public benefit." The different philosophical approaches that institutions can take are, however, subject to certain realities of the marketplace. With the exception of a few highly profitable patents, most licensing revenue is realized through large numbers of relatively modest licenses. This forces a certain degree of conformity in the way technology transfer offices approach the evaluation and licensing of emerging technologies.

Tech Transfer Marketing

Not all institutions make money at technology transfer, and many lose money.⁵ Most tech transfer activity generates relatively modest returns, and many patents show no payoff at all. Approximately one half of the income-producing technologies generated less than \$10,000 during FY 1997 and fewer than 10% generated more than \$100,000.⁶ There are, however, the occasional blockbusters. Among the largest is the enormously successful Cohen-Boyer patent whose revenues are shared by Stanford University and UCSF. As mentioned earlier, this single patent, which covers a fundamental gene splicing technique, has generated over \$250 million for those institutions.

Those statistics demonstrate that a very limited number of inventions are high income producers, and are reflective of the challenges faced by licensing professionals when weighing the costs of patent protection against potential licensing income.

In most institutions, technology transfer occurs through the traditional approach described above, in which licensing professionals market their technologies principally through contacts in existing companies. The AUTM survey shows that some institutions, however, are adopting a much more aggressive posture that places more emphasis on the creation of start-up companies. The presumption is that the financial returns from start-up companies taking into consideration the potential future value of equities will exceed the financial benefits gained through more traditional licensing approaches. The incubation of start-ups may also have important benefits for local economic development and job creation efforts.

This active involvement in the creation of start-ups is not universally embraced within the tech transfer community. Some believe that it will adversely affect the traditional mission of universities to educate and perform basic research, and that it creates potential conflicts of interest that can be extremely troublesome for the institution. Others are concerned about the potential implications for an institution's tax-exempt status.

Regardless of the approach taken, certain activities are fundamental. An essential element in this process is the evaluation of potential income versus the expense required to pursue a patent and locate a licensee. Weighing the potential benefit versus the costs of seeking patent protection and other costs is complicated by the fact that the costs of foreign patent protection can be significantly greater than a domestic U.S. patent, and the benefits are sometimes less clear. Some institutions limit their exposure by not investing a great deal of time and expense in patenting, especially foreign, until a licensee is found.

Tech transfer professionals are often allowed a relatively high degree of autonomy in evaluating the patentability and potential commercial application of reported inventions, and in negotiating licenses. These individuals may also have the authority to decide when an invention is to be abandoned.

These judgements should be made within the context of a uniform framework that represents the institutions overall philosophy. Each office should have mechanisms in place to promote the exchange of ideas regarding licensing strategies and to promote consistency in their approaches. Although an element of risk is always present in decision-making processes, the structures in place should help reduce the risk of bad judgements. The auditor is not expected to challenge their professional judgements. He or she should, however, try to determine that structures exist to ensure that such decisions are made in the context of, and are consistent with, the stated policies and practices in effect in that office and the institution.

Encouragement for Early Stage Technologies

To provide a commercialization path for very early stage technologies, some institutions including those that have chosen not to actively engage in creating start-ups have established various "ripening" mechanisms. Harvard, for example, has established a program targeted to the needs of new technologies, including financing and business planning expertise.

A Technology Advancement Fund was recently created at Harvard University to support research and development of a limited number of emerging technologies. Funding for feasibility studies and testing of new technologies under that program is derived from the presidents share of royalty income, and is also awarded to faculty members on a competitive basis.

To complement the Technology Advancement Fund, Harvard also recently created the Harvard Entrepreneurial Teams (HEAT) program, in which interdisciplinary teams of graduate students and their faculty advisors work directly with the inventor and Harvards technology transfer office to address business and legal issues associated with commercializing a new technology. Activities performed by HEAT teams during the one-year project may include performing market assessments, evaluating business models, writing business plans and securing venture capital.

Start-ups

Those offices that are involved in commercialization through start-ups may perform a number of very important functions on behalf of the company, including providing space, recruiting talent, developing business plans, providing managerial expertise for their start-ups, even taking seats on the board. These activities may be performed either directly by the technology transfer office or through another entity. At Baylor College of Medicine, BCM Technologies was established as a for-profit wholly-owned entity to conduct this activity. At the University of Chicago, ARCH Development was established as a not-for-profit affiliate corporation of the University. Other institutions that aggressively pursue commercialization through start-ups include Yale University, University of Washington, University of Wisconsin, and Columbia University.

Equity in Start-ups

Whether or not an institution is actively involved in the creation of start-ups, sometimes it makes sense to accept an equity position in a cash-poor company as compensation for services provided or in lieu of fees. When this is the case, it is important that the value of that equity is reported fairly, and that any relevant assumptions are adequately disclosed to management and the board.

There should be a consistent approach to valuation of equities that are held by the institution. In some cases, market quotes will be available. In most cases, however, the start-up will not be publicly traded, and market quotations will not be available. In these cases, another basis for valuation must be determined. The valuation may be arbitrarily set at the institution's "investment" in the start-up (e.g., fees foregone or value of services rendered), or it may be a more subjective judgement. The use of a fair valuation methodology and disclosure of the basis for valuation are therefore key.

Some institutions, primarily those that are not actively involved in the creation of start-ups, have policies that require that their equity holding be divested as soon as practical, often when the start-up goes public. Each institution should have and should follow a consistent policy.

Abandonment

Not all inventions get developed and marketed. The disposition of costs related to failed inventions is governed by institutional policy, but they generally are offset against revenues generated by other inventions. These costs may be partially recovered from co-owners of the technology or may be written off in the year in which the determination to abandon is made. There should be a mechanism for ensuring that costs related to the processing of each invention are carefully tracked so that timely decisions can be made and financial exposure limited.

Revenue Types

Because each technology is unique, the types of revenue from technology transfer activities may vary depending on the terms of the specific license agreement. Examples of revenues that are commonly negotiated as part of a licensing arrangement include:²

- Licensing fees, which are payments for the use of the technology, typically to cover administrative costs, and are usually assessed up front.
- Lump-sum or paid-up royalties. These are lump sum payments by licensees that may be made prior to commercialization or product sales. While the actual formula may vary, lump-sum payments may be determined by calculating the net present value of royalties based on projected product sales.
- Minimum payments, which are guaranteed amounts that are generally paid annually by licensees and may be applied against earned royalties.
- Running royalties, which are ongoing fees based on sales. Royalties are generally due on a regular schedule and the basis for calculating those amounts may vary, depending on the terms negotiated with the licensees. For example, royalties may be expressed as a

percentage of gross or net sales, or adjusted rates after designated levels of sales are reached.

As mentioned earlier, equity shares may also be accepted in lieu of or in addition to cash consideration as part of a licensing agreement.

The licensee's obligation to pay certain fees and royalties may be tied to specific events in the life of an invention, such as completion of prototype testing, achieving a specified phase in clinical trials, or final approval by FDA or other agency. These milestones should all be clearly enumerated in the license agreement, and the licensee's obligation should be well-defined, including the formula for calculating amounts due and definition of the elements to be used in the calculation. The tech transfer office database should have the ability to maintain and track this information, and provide alerts when possible to the staff regarding these milestones.

Payments are made on a regular schedule, and according to well established institutional policies to inventors, the institution, and third parties who are co-owner or may have provided funding for the research. Formulas for calculating the institution's and inventor's shares are applied according to this policy.

If the patent is the result of a collaboration between faculty at two or more institutions, inter-institutional agreements should exist to address these and other issues.

Expenses

Outside counsel is often engaged to evaluate the patentability of the reported inventions and to facilitate patent prosecution. In many cases, legal fees associated with patent filings are reimbursable by the licensees, sponsors, or co-owners of the inventions. To facilitate timely and accurate cost recovery, a reliable system should be maintained for monitoring on a case by case basis who is financially responsible for those expenses, what legal expenses have been paid, and what amounts have been reimbursed. Depending on the arrangement, legal expenses may be directly reimbursed by licensees, sponsors, or co-owners, or may be deducted from subsequent royalty distributions.

The formula that is used for legal expense recovery will vary depending on the terms of the agreements negotiated with licensees, institutional policies, and inter-institutional agreements with sponsors or co-owners of the technology. In some cases, legal expenses may not be reimbursable if efforts to commercialize a technology are unsuccessful. In such cases, the expenses may be written off to a legal reserve account.

Depending on the accounting system(s) in place within each institution, a separate ledger of expenses reimbursable by outside parties may be maintained within the technology transfer office. In those cases, care should be taken to ensure that the balances recorded in those supplemental ledgers are consistent with the institutions general ledger.

Systems

In addition to meeting internal needs, tech transfer offices must have reliable systems for recording and disseminating appropriate information to third parties funding research. Because the primary objective of these offices is the successful commercialization of technologies, their efforts to

ensure proper reporting of inventions and related financial activity may fall short to varying degrees. As mentioned earlier, this is an important area in which you, the auditor, might provide meaningful assistance to your tech transfer office.

Some systems for administering technology transfer activities are commercially available, including AIMS Pro, D.E.A.L.S. Db, and Info Office®. Harvard and Stanford each use their own custom-developed systems using the Mac-based 4th Dimension (4D) database. Both systems are available for licensing to other institutions.

These systems may be used by the administrative staff to record and monitor invention, patent, and licensing activity and to automate certain processes, including the generation of billings to licensees and standard correspondence. The database will also serve as a reference source and historical record.

Material Transfer Agreements (MTAs)

In the life sciences, institutions are increasingly requiring documentation to establish parentage and ownership of biological materials, and to communicate the institution's restrictions on the use of those materials to a potential recipient organization. When materials are transferred outside a laboratory, institutional policies typically require that standard material transfer agreements be completed.

The terms of material transfer agreements may vary depending on whether materials are being sent to for-profit or non-profit entities. In some cases, institutions may use different forms for transfers to non-profit institutions. Because the material is not to be used in the development of an end process or product for sale, these agreements are relatively simple and often are not required to be signed in advance of the material being shipped. For transfers to commercial entities, which can be expected to use the material in the development of a marketable product or process, the agreements typically contain explicit language, including how the materials may be used, and are more likely to require signature prior to the shipment of material.

Many institutions have not developed a reliable means of ensuring that rights and responsibilities enumerated in MTAs and licensing agreements are consistent, and that rights granted by one are not violated by the other.

Office Size and Staffing

Like internal audit departments, the size and composition of the staff of the technology transfer office will vary greatly from one institution to another. Staffing can range from a single part-time manager to a highly specialized staff of twenty or more, including computer specialists and administrative and accounting support personnel.

Licensing professionals may have widely divergent backgrounds. Often they will have an undergraduate degree in a technical/scientific discipline that may be coupled with a graduate business degree or MBA, a law degree, or an advanced scientific degree. In addition, institutions that are more entrepreneurial seem to be more likely to have bonus plans for the licensing staff that are tied to the performance of the office.

Web Sites

Many technology transfer offices maintain web sites that provide valuable information and services to inventors and the university community. These web sites often include a description of the organizational structure of the office and professional qualifications of its staff, policies relating to intellectual property and related processes, the office's approach to technology transfer, the range of services that it provides, the office's annual report, including financial and other data on the commercialization of technology, and links to other resources relating to technology transfer.

Many sites also include downloadable forms and standard agreements used in the technology transfer process, and may provide the capability for inventors to submit their invention disclosures online. To provide a quick, abbreviated source of information to inventors, responses to frequently asked questions may also be provided. Your tech transfer office's web site will in many cases be a valuable source of needed basic information for auditing this activity.

To expand their reach, many institutions list non-enabling descriptions of the most promising technologies on their web site, providing interested companies the ability to search on-line. In addition, independent on-line services have been created to help promote these technologies, including Knowledge Express, the Venture Capital Resources Library, and one developed by Yale University called Technology Exchange.

Yale's Technology Exchange, for example, currently lists 106 universities and research institutions with technologies to offer, and 270 interested companies. In addition, Community of Science maintains a searchable database of journal articles, technical reports, and abstracts covering a wide range of disciplines.

The URLs for several technology transfer offices, the above on-line services, and a number of other useful and interesting sites are listed at the end of this article.

Institutional Oversight

The structure of institutional oversight can vary widely. Both the OTTL (university-wide) and OTL (Medical School only) at Harvard are broadly governed by policies established by the Committee on Patents and Copyrights. The Stanford Office of Technology Licensing (OTL) reports directly to the Dean of Research, and there is no oversight by a separate committee. At Baylor, BCM Technologies (BCMT) is a wholly-owned subsidiary of Baylor College of Medicine. BCMT reports to the Baylor Vice President for Finance. A Patent Committee represented by faculty members is responsible for recommending policies, arbitrating disputes among inventors, consideration of requests for invention releases, and interpreting patent policy.

Auditing Your Tech Transfer Office

As noted above, various factors, including whether an institution is actively involved in start-ups, need to be considered when defining your audit scope and the specific audit procedures that are to be performed. Below is a summary of basic audit procedures that may be performed to:

- develop an understanding of the technology transfer function;
- ensure that a sound process for evaluating and marketing reported technology exists;

- assess the adequacy of systems to ensure that intellectual property and related activities are properly reported;
- ensure that royalty and other payments are made by licensees in accordance with existing agreements;
- ensure that expenses are appropriate and are properly recovered in a timely manner; and
- ensure timely and accurate reporting to regulatory agencies and other research sponsors.

The following is not intended to represent a comprehensive audit program or complete list of detailed audit procedures, but rather to provide a general framework for developing an audit program appropriate for your institution and your audit objectives.

Organizational Structure - General

- Determine the organizational structure of the institutions technology transfer office, including the reporting hierarchy and the educational/professional qualifications of the staff. Obtain an overall understanding of each staff members roles and responsibilities.
- Determine the nature and degree of oversight over the technology transfer office, such as a Committee on Patents and Copyrights, and the responsibilities of the oversight group or person.
- Evaluate the adequacy of reporting of the technology transfer offices activities and licensing statistics to the universitys administration and/or oversight committee.
- Determine if the technology transfer office has implemented a performance-based bonus program and, if applicable, test the calculation of bonuses paid to staff for conformity with the established policy.
- Determine the extent of outreach initiatives to the inventor community to promote the services of the technology transfer office and an understanding of legal and institutional requirements relating to intellectual property (such as the timing and extent of public disclosures relating to an invention).

Institutional Policies

- Determine if standard policies relating to intellectual property and technology transfer (such as conflict of interest, patent and licensing, copyright, royalty distribution, and equity policies) have been established and documented, and how those policies are disseminated to the institutions employees.
- Determine who is responsible for approving new and revised policies, and whether standard policies are periodically reviewed and updated to reflect the current business environment.

Administration of Intellectual Property General

- Obtain a thorough understanding of the processes relating to the initial disclosure of inventions, patent filing, marketing of technology, negotiation of license agreements, monitoring and distribution of royalties and other related revenue, and tracking/allocating invention-related expenses (including legal and administrative fees).
- Obtain an understanding of the differing types of patents (such as divisional, continuation-in-part, continuation, and provisional) and licenses (such as exclusive, co-exclusive, non-exclusive).

- Evaluate the extent to which web-based technology is used to facilitate internal reporting of inventions, apprise research personnel of institutional policies and procedures, disseminate other useful information relating to the intellectual property and the institutions technology transfer function, and market available technologies.
- Determine if a process exists for verifying the existence of licensing commitments based on material transfer agreements (MTAs), collaborations, or sponsored research agreements when inventions are disclosed (e.g., to ensure that conflicting rights in the same research are not granted and that the rights of companies that have supplied materials are recognized).

Evaluation of Inventions

- Determine that a sound, consistent process exists for evaluating the patentability and commercial potential of reported technologies. Factors that may be considered when evaluating inventions include stage of development, commercial applicability, potential market, the likelihood of patent protection, the cost of seeking patent protection, and the revenue potential.
- Inquire about the existence of programs to promote further development of early-stage technology.
- Determine whether a standard review process has been implemented before abandoning or releasing rights to a technology to inventors and if that process includes communicating to the applicable sponsors the intent to release those rights.
- Determine if a process exists for informing inventors of their rights and responsibilities when inventions are abandoned by the technology transfer (for example, an inventors responsibility to notify licensees if a sponsoring agency or other funding source retains a non-exclusive, irrevocable license to use an invention for non-commercial purposes).

Negotiation of License Agreements

- Determine that a reasonable methodology is used for estimating the value of a technology. This may or may not include estimations of potential licensing and royalty revenues.

NOTE: Factors to be considered in the valuation of a technology include the size of the market, the cost of potential products, the significance of the invention to the product, the cost of developing the product, and industry licensing standards. ⁸

- Inquire about the extent of the review and approval requirements of license agreements prior to execution.
- Determine whether standard license agreements have been developed by the technology transfer office and, at a minimum, that certain terms are included in executed agreements, including right to audit and indemnification clauses.

License Administration

- Determine what system is used to record information relating to reported technologies (including the title of the invention, a unique invention or case number, the names of inventors and their percentages of contribution, applicable sponsors of the research, the status of the invention, and the disclosure date) and related technology transfer activity (such as detailed information about patent filings and license agreements). Review the system and determine the principal functions that it performs.
- Determine if a standard checklist or other mechanism is utilized to ensure that internal documentation requirements relating to new license agreements are met.
- Determine if standard billings are sent to licensees on a regular basis to promote compliance with reporting and payment requirements.
- Evaluate the adequacy and effectiveness of methods used to monitor licensees compliance with reporting and payment requirements established within license agreements (such as system-generated accounts receivable aging reports). Examples of items to monitor include: annual maintenance fees, royalty reports, progress reports, royalty payments, milestone events and dates, and equity shares.
- Inquire about the methods used to assess the accuracy and reasonableness of royalty and other payments by licensees.
- On a test basis, verify the calculation of royalty and other payments to the institution based on rates and milestones achieved as defined in the license agreement. For some technologies, notably drug development, milestone payments can be tied to predictable events such as the completion of specific phases of clinical trials and FDA approval.
- Verify that royalty distributions to inventors, institutional departments, and sponsors are consistently calculated and paid in accordance with established policies or other mutually agreed upon formulas.
- Determine that processes have been implemented for recording, monitoring, and recovering legal and administrative expenses, including the consistent application of formulas for calculating expense allocations, and the generation of timely expense billings. Ensure that this process includes a timely review of legal expenses by a case manager or licensing professional.

NOTE: To facilitate proper cost recovery, the information that should be documented in internal systems includes a detailed record of legal expenses, including the name of the law firm, invoice number, an internal tracking number, invoice date, payment date, payment amount, and who is responsible for the payment or reimbursement of those expenses. In some cases, law firms may bill research sponsors directly for their pro rata share of expenses.

- Determine whether royalty distributions are withheld for estimated future expenses and, if applicable, that a reasonable basis for calculating such reserves exists.
- Determine whether the office conducts periodic internal case reviews/audits of license agreements to ensure the integrity of recorded data and licensees compliance with negotiated terms.
- Determine whether the office performs periodic royalty examinations of licensees records, and assess the frequency, scope, and the results of such examinations. Your tech transfer office may perform these

internally, or may use an independent firm to conduct some or all of their royalty audits. There are a number of firms that can perform this function.

- Verify that financial records maintained by the technology transfer office are periodically reconciled to the institutions general ledger and that discrepancies are resolved in a timely manner.

Business Start-Ups

- Determine what the institutional philosophy is regarding start-ups and the extent of the services provided by the technology transfer office (such as the development of business plans, hiring of management teams, negotiation of office space, and representation on boards of directors).

NOTE: In developing an audit program for those offices that are actively involved in the creation of start-ups, auditors should consider potential operational and financial issues, such as the basis of decisions to invest significant resources toward the creation of start-ups, procedures to manage and disclose potential conflicts of interest, and the risks involved in holding equity shares.

Equities

- Determine whether a policy exists for determining when stock may be accepted in connection with licensing arrangements, and whether it is consistently applied.
- Determine whether a sound and consistent approach exists for valuing equities that are held by the institution (particularly non-publicly traded shares), whether the basis for valuing equity is adequately disclosed to management, and who is responsible for performing valuations. For equity interests received in lieu of cash, determine who is responsible for managing such shares and whether an institutional policy exists governing when equity shares should be sold. Determine the extent of compliance with this equity policy.
- In the event that stock certificates are issued, determine who maintains custody of such certificates and if they are adequately safeguarded.

Government and Inter-Institutional Reporting

- Determine what process exists for ensuring compliance with reporting requirements relating to research funded by the government, foundations, and other sponsors, including timely disclosure of inventions and periodic reporting of licensing activity.
- Determine how the terms/requirements of inter-institutional agreements are documented and monitored for compliance, including timely and accurate reporting of invention disclosures, patent prosecution, cost and revenue sharing, and other terms.

The world of technology transfer uses certain terms that you will need to clearly understand. We were unable to locate a comprehensive glossary, but a short listing of commonly used terms is included here.

Application, Patent

A *patent application* is the document submitted to the U.S. Patent and Trademark Office requesting a patent. It contains all of the specifications and information relevant to the invention, including line drawings, if applicable.

Application Provisional

A *provisional application* is essentially a patent application for which detailed claims are not required. It is a less formal and less costly method of filing that will preserve the original filing date as long as the full filing is submitted within one year. As a practical matter, a sufficient level of detail should be provided in a provisional application to substantiate an inventor's claim(s) when a full filing is submitted.

Continuations, Continuations In Part (CIPs), and Divisionals

The terms "continuation", "continuation in part" and "divisional" each refer to the lineage of a patent application. They mean different things that may determine how costs and revenues are tracked and allocated.

A *continuation* patent application is one that claims priority based on a previously filed application. A continuation is usually filed when the Patent Office has rejected claims in the parent application, but the applicant wishes to revise the claims again. A continuation application receives the priority date of the parent application.⁹

The owner of a pending application may file a "*continuation-in-part*" (CIP) application. A CIP application contains some matter in common with a previous patent application (called the "parent" application), that also contains new matter, and that was filed while the parent application was pending.¹⁰

A *divisional* patent application claims priority from a previously filed patent application (called a "parent application") in which, based on evaluation by the patent office, more than one invention was disclosed. The applicant may elect to pursue one or more of the inventions in the parent application by submitting a divisional application.¹¹

Disclosure (of an invention)

Under ideal circumstances, an invention is initially "disclosed" when a standard invention disclosure form is submitted to the technology transfer office. The disclosure form typically includes a description of the invention, the inventors, and the chronology of events leading to the invention, and is signed by the inventors. This form of disclosure should be distinguished from *public disclosure*, which occurs when an invention is made readily available to the public (such as through a journal paper, a conference presentation, a publication on the World Wide Web, or a dissertation indexed at the library) in enough detail that someone else would be able to make and use the invention. Under patent law, showing or telling such new ideas and selling or offering to sell a prototype of an invention may also constitute public disclosure.

The dates of disclosure are important because in the U.S. an inventor has one year from the date of public disclosure in which to file a patent application. Once that one-year period has passed, the invention cannot be patented. In addition, foreign patent rights are lost once an invention has been publicly disclosed. For these reasons, inventors are encouraged to disclose their inventions to technology transfer offices before public disclosures are made so that appropriate actions can be initiated.¹²

First to file vs first to invent

Most countries award patents based on a "first to file" criteria. In essence, it does not matter which inventor first made the invention, the first person to file is considered the inventor. The United States generally follows a "first to invent" policy. That is, when two

inventors file for the same or similar patents, the award of a patent is based on when the inventor can prove the invention was created, as indicated by contemporaneous documentation such as laboratory notebooks.

Inventor

The inventor is the person or persons who had significant creative input in the development of an invention. Not included are individuals who may have contributed to or worked on the development of the invention but had no creative input to the process.

Licenses Exclusive, Non Exclusive, Co-Exclusive

An exclusive license is the right, obtained by contract with the owner, for one company to exclusively develop a product or process using the patented invention. This provides the maximum protection for a company concerned about recovering its investment in developing a product or process. A non-exclusive license is one in which an unlimited number of entities may be granted the right to use the invention. In a co-exclusive license, this right is granted to a limited number of companies.

Patent

A *patent* is the exclusive right, granted by the government, to benefit from an invention. Technically, it is the right to exclude others from "making, using, offering for sale, or selling the invention in the United States or importing the invention into the United States." ¹⁴ Patents are granted by individual countries, and although treaties exist that attempt to harmonize patent law among countries, in order to obtain patent protection an inventor must file in each country in which protection is desired. The term for a patent in the U.S. is 20 years from the date the patent application was filed.

Patent Corporation Treaty (PCT)

PCTs are international patent applications administered by the World Intellectual Property Organization. A PCT does not, however, lead to an "international patent." It merely leads to the ability to file patent applications in designated countries over a wider range of permissible times than if no international patent applications were filed.

Notes and References

1. AUTM 1997 Survey. Statistics quoted from this document are based on responses by 175 of the 306 entities surveyed. Those responding included 90% of the top 100 research universities.
2. AUTM Basic Licensing Course Manual, Q&A
3. We have no information about the extent to which technology transfer offices also handle logo sportswear and other trademark licensing, though we are aware that some do. The AUTM survey statistics mentioned in this article do not include income from this source.
4. Harvard University has two offices that work cooperatively. The OTTL is a university-wide office that serves all departments except the medical school. The medical school is served by the Office of Technology Licensing and Industry Sponsored Research (OTL).

Both are guided by policies of the Committee on Patents and Copyrights, to which the report together annually on their activities.

5. *Signals Magazine*, Go Team Go!. 6/23/98
6. AUTM 1997 Survey
7. AUTM Technology Transfer Practice Manual, Vol. II, VII-3.
8. Stanford University OTL Home Page (FAQ)
9. Based on Oppedahl & Larson, "General Information About Patents."
<http://www.patents.com/patents.sht#>
10. Oppedahl & Larson
11. Oppedahl & Larson
12. Stanford University OTL Home Page (FAQ)
13. U.S. Patent Office, "General Information Concerning Patents." <http://www.uspto.gov>

Useful / Interesting Web Sites

Ass'n of University Technology Managers	www.crpc.rice.edu/autm
Stanford U. Office of Technology Licensing	www.stanford.edu/group/OTL/
Yale U. Office of Cooperative Research	www.yale.edu/ocr/
MIT Technology Licensing Office	web.mit.edu/afs/athena.mit.edu/org/t/tlo/www/
Yale U. Technology Exchange	www.techex.com
Harvard University tech transfer	www.techtransfer.harvard.edu/
BCM Technologies (Baylor College of Medicine)	www.bcm.tmc.edu/bcmt/
The UC System Office of Technology Transfer	www.ucop.edu/ott/
U.S. Patent and Trademark Office	www.uspto.gov/
The World Intellectual Property Organization	www.wipo.org/
The Software Patent Institute	www.spi.org/
The IBM Intellectual Property Network	www.patents.ibm.com/
Intellectual Property (IP) Mall/An IP Resource	www.ipmall.fplc.edu/
Washington Technical Center	www.watechcenter.org/
Venture Capital Resource Library	www.vfinance.com/
The Franklin Pierce Law Center	www.fplc.edu/tfield/PLFIP.htm
The law firm of Oppedahl & Larson, LLP	www.patents.com/
Friedman Eisenstein Raemer and Schwartz Accountants and Business Advisors	www.fersroyaltyaudit.com/
Signals. An online biotechnology publication	www.signalsmag.com/
IDEA The Journal of Law and Technology Technology Access Report	www.idea.fplc.edu/
Technology Access Report	techaccess.com/
The Community of Science	www.cos.com/