Managing Technology Transfer at a Large State Institution: The University of California at Los Angeles

Andrew Neighbour, PhD

Since writing this article in early 2005, Andrew Neighbour, PhD, who was associate vice chancellor for research at the University of California at Los Angeles, has retired. Currently, he is living as an artist in Santa Fe, New Mexico.

Background: A Brief History of Technology Transfer at the University of California

The University of California (UC) comprises ten campuses situated throughout the state. Each is a comprehensive teaching and research university, with its Los Angeles campus (UCLA) as the largest in student enrollment and research activity. Over the past five years, UCLA has consistently ranked in the top five research universities in terms of research award dollars. As a public institution, with approximately $800 million of extra-mural research funding, a research faculty in all disciplines of more than 4,000, and more than 10,000 graduate students from all over the world, the University of California is a major contributor of innovation and economic development for the state and the nation. Collectively, each year, the campuses together file more U.S. patent applications than any other U.S. university.[1]

Traditionally, technology transfer has been centered at the Office of Technology Transfer (OTT) in the UC Office of the President (UCOP), now located in Oakland. The OTT served the entire university by providing disclosure review; patent evaluation, prosecution, and management; licensing; and accounting for all technology transfer activities. Almost fifteen years ago, recognizing the need for local campus involvement, UCLA obtained permission from UCOP to establish its own technology transfer unit, as an authorized licensing office (ALO). Successful implementation led to the establishing of ALOs at the Berkeley, San Francisco, San Diego, Davis, and Irvine campuses over the next few years. By 2000, each of these campuses was responsible for all or part of the portfolio arising from research at its own campus, with OTT providing additional case-management capacity

and centralized services such as patent prosecution coordination, accounting, and policy oversight. UC Santa Barbara, Riverside, and Merced (UC's newest campus) continue to rely almost completely on OTT's case-management services.[2]

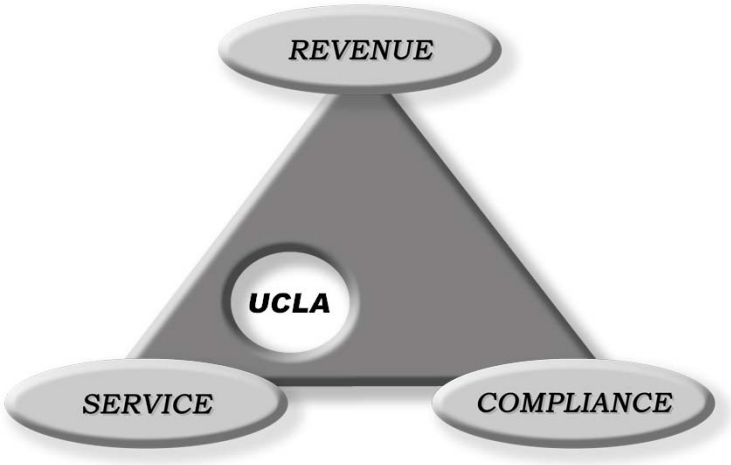
Thus, throughout these years, there has been a gradual decentralization of technology transfer, bringing case management to the campuses so that staff can interact more effectively with faculty on site. The university is presently accelerating this process and expects to complete decentralization of patent management and licensing to all ten campuses within two or three years. OTT will continue to provide policy support and oversight, accounting, central information, and database services, and a linkage to general counsel, who will provide policy and legal advice. All decisions concerning business terms will be delegated to the campuses, and authority to provide exceptions to certain policies will be granted.

Like many technology programs, UCLA has experienced the swinging pendulum of resources, organizational structure, mission, and successes. By the mid-90s, the UCLA technology transfer office, which became known as the Office of Intellectual Property Administration (OIPA), had reached a peak of almost twenty people and was establishing a competent and supportive reputation amongst faculty. However, during the second half of that decade, there was a rapid and, somewhat devastating, decline in resources and organizational support for OIPA, and much of the portfolio was returned to OTT for central management. This deterioration in the services provided to faculty created a legacy of animosity toward the administration that has been slow to mend. External partners were frustrated by the slow and, sometimes, lack of responsiveness; some faculty felt that the commercialization potential of their inventions was not realized; and a general aversion to risk prevailed among senior university administrators. Finally, under new leadership, the campus administration decided that a significant fix was required. The program described below outlines the changes that were made and their impact on reversing this trend.

The Goal

At any university, the goal of technology transfer can be thought of as lying somewhere within an isosceles triangle bounded by three drivers: service, revenue, and compliance. For some institutions, the expectation of revenues from technology licensing is a major

goal. For others, serving the faculty and research enterprise is the most important. Few institutions do technology transfer solely because of federal mandate, but complying with external and internal regulations does often influence the scope and approach taken by most universities. Usually, the goal of any particular institution lies somewhere in the middle of the triangle, with a skew toward one or other of these three drivers. UCLA's overall intentions for its technology transfer program lean toward a service-oriented approach.



UCLA's service mission has been adopted in response to several environmental factors. One of this university's major continuing challenges is attracting and retaining research faculty in a highly competitive market in California. Cost of living, decaying infrastructure, population density, commuting congestion, and schooling are major factors influencing a potential researcher who may consider moving to the greater Los Angeles area. The university frequently faces direct competition from private universities and even from campuses within the UC system that may be able to offer more attractive incentives. Consequently, it is imperative that research administration and assistance with the commercialization of faculty innovations be both value-added and efficient. In addition, because of the legacy of less-than-ideal service in the recent past, as discussed above, providing excellent service to meet faculty needs is a significant expectation of university leadership.

It is also clear from many years of experience within UC that, in relation to the amount of extramural funding received for supporting research activities, revenues from commercialization represent a modest, almost insignificant, source of additional discretionary money to support the enterprise. Currently, UCLA receives approximately $12 million from its technology transfer activities. After deduction of the inventors' shares (35 percent of gross income less unreimbursed patent costs) and portions to cover out-of-pocket costs (operational costs of OTT and the local technology transfer office), patent costs, and a state refund, less than $3 million is available for the schools to reinvest into research. While these are extremely useful dollars, they are minimal in relation to the financial needs of the institution that can be more easily met through state allocation, retained indirect costs from sponsored research, tuition fees, and philanthropy.

With respect to compliance, it is clear that providing good service requires that policies, regulations, guidelines associated with the university's nonprofit structure, and the terms and conditions attached to extramural funds be met. An effective service organization must achieve a balance between acting within the plethora of rules while at the same time not being completely risk-averse. Good service, thus, includes providing creative options and approaches to achieving complex business relationships with full knowledge of the rules and the liabilities that may accrue if the envelope is pushed too far. To be effective, technology transfer should adopt an approach of risk management rather than aversion.

While UCLA's current approach is one of putting service ahead of revenue, this strategy is under constant re-examination and is often adapted to meet the needs of individual circumstances. For example, while there are times that the TTO will actively manage cases with minimal commercial value to build trusting relationships, budgetary constraints and common sense often lead to an aggressive triage of new inventions to maximize the efficient use of university resources. As stewards of state assets, the TTO is obligated to use university resources wisely and cost effectively. A highly commercial invention may tend, therefore, to receive more attention from the office.

Finally, one of the fundamental missions of UC is to support the economic development of the state by creating jobs and industries for the future of California. While the TTO does not seek nor focus solely on those inventions that will lead to new companies, this

mission does impact some of the decision making regarding the mode of commercialization of particular discoveries. The service goal is then frequently met in two ways, by supporting the entrepreneurial interests of certain faculty members and creating new business ventures within the state that, if successful, may enhance the economy. Since revenue to UC is not the main goal, this allows us occasionally to support the creation of a new venture even when the technology could be licensed and effectively developed by an existing out-of-state, mid- or large-cap corporation. (Note: The creation of startups will be dealt with in greater detail later in this chapter.)

The Current UCLA Technology Program

Resources

Perhaps the greatest determinant of success in any technology transfer office is the level of resources committed to the program. Adequate staffing levels as well as sufficient patent and marketing budgets tend to track closely with the success of any individual program. [3]

A simple analysis of the *AUTM Licensing Survey*™ data[4] shows that universities with well-regarded technology transfer programs have approximately 4 to 6.5 full-time equivalents (FTEs) per $100 million of extramural research awards. In addition, the higher the staffing levels, the more disclosures are reported. This, perhaps, reflects the ability of larger offices to be more proactive amongst their faculty in supporting the identification of potentially commercial inventions.

At UCLA, when I arrived in early 2001, OIPA had dwindled to five staff. Presently, the organization has been increased to seventeen FTEs, and, through an organizational merger with the Office of Research Administration, has benefited from the ability to share certain additional core services (information technology, reception, general office administration, etc.), thereby adding additional leverage in a budget-constrained environment.

UCLA, in common with most UC campuses, does not have a defined and separately budgeted fund to support its filing, prosecution, and maintenance of patents and copyrights. As a matter of practice, we endeavor to transfer the responsibility of patent costs to our

licensees at the earliest opportunity. Typically, we recover approximately 70 percent of our out-of-pocket intellectual property costs from our commercialization partners. The remaining unreimbursed, or so-called at-risk portion, is recovered from the portion of income allocated to the campus before the final net revenue is passed on to the school whose inventions generated the income.[5]

In addition, we recently introduced a fast-track patent program[6] to expedite rapid last-minute filings necessary to protect rights from public disclosure and as a way to control initial costs. Working with a select group of local IP law firms, we negotiated a flat fee for filing provisional applications. Once filed, we spend the next nine to eleven months evaluating commercial potential before deciding whether or not to convert to a utility application. The decision to use the fast-track approach with any particular invention is made carefully because of the known limitations and occasional dangers of provisional-patent filings resulting from incomplete support of desired claims.

Merging the Offices of Sponsored Programs and Intellectual Property

In a very large university such as UCLA, faculty can be overwhelmed by the separate administrative units whose activities frequently overlap. The faculty need is to get the deal done. They may not appreciate that different skills are required to negotiate a federal contract, approve a state award proposal, negotiate a clinical-trial agreement, or license an invention. Furthermore, it is common for research administration to evolve into a number of quite separate groups having exclusive responsibility for just one component of the process. Unfortunately, these silos obfuscate smooth processing of sponsored research or technology transfer.

In the past three years, specific efforts have been made at UCLA to encourage the separate functions to collaborate, especially on the more complex projects. Since commitments made in research contracts often involve the disposition of downstream IP rights, it is imperative that the contracts officer understand the implication of setting option terms and that licensing staff be aware of commitments that are made as part of the funding agreement. In addition, both federal and state agencies, and even some nonprofit foundations, are requiring specific intellectual property management plans as part of otherwise

standard extramural grants. Traditionally, grants officers have minimal experience with intellectual property issues, thus, the intellectual property team can provide necessary and immediate support during the funding negotiation.

Some practitioners feel that there is an inherent conflict of interest between sponsored programs and licensing. I believe otherwise and favor the streamlining of process to simplify faculty service by providing a one-stop-shop approach. At UCLA, this merger was absolutely necessary to reduce the gaps between pre- and post-award groups and OIPA. Since these offices were already co-located in one building, it made sense to combine them to create an Office of Research Administration reporting to the vice chancellor for research. This also had the added benefit of sharing common services and avoiding unnecessary budgetary costs. Thus, for example, one receptionist could represent all groups; the information technology group could manage computers and databases for everyone; and general office functions such as filing, photocopying, mail services, etc., could be shared.

Some might question the need to connect the nonprofit pre-award group with technology transfer. However, it is becoming increasingly necessary for the pre-award grants and contracts negotiators to be aware of and understand the implications of the disposition of intellectual property rights under these awards. Many agencies now require intellectual property sharing plans as part of all new proposals. Also, with a closer connection, it is more likely that the sources of funding and any associated conditions will be evident to the technology transfer staff when managing a new invention.

The only real challenge in implementing this merger was to bring about the partnership of individuals and groups that were used to working in defined and somewhat cloistered areas. Change management in a large institution can be challenging, since changes unsettles and threatens stability and security, moving staff into unfamiliar territory. There is always the concern that an individual will be expected to be an expert in areas outside of his or her career experience. Special effort is needed, therefore, to facilitate communication and team building. We did not experience any of the conflict-of-purpose concerns that others have expressed when combining the technology licensing activity with sponsored

research. This is largely because the administration was not forcing an agenda that was aimed at encouraging one activity at the expense of the other. In fact, we invited and followed their wishes with regard to priorities of research versus commercialization in their laboratories. The business development managers serving as faculty liaison helped significantly in establishing the desired balance.

OIPA Organization

In addition to the executive director, OIPA consists of six distinct, but integrated, groups of specialist individuals.

- *Licensing* (four licensing officers, one of whom serves as director of licensing): Each has either extensive prior licensing experience or a combination of a science education with intellectual legal experience.
- *Business development* (three business development managers): Each has extensive industrial experience in building new businesses and acquiring technologies in industry segments directly relevant to the university research portfolio. In addition, one was a partner in a local venture fund, thus providing specific expertise to support new venture creation.
- *Patent management:* An attorney and a paralegal provide patent and copyright oversight in collaboration with the patent prosecution group at OTT.
- *Marketing:* Three marketing staff with science backgrounds and communications experience provide internal promotional activities and support the technology marketing activities of the licensing and business development officers.
- *Materials transfer:* Two experienced staff with science and legal backgrounds manage all material transfer agreements and tangible material bailments.
- *Administration:* Two administrative staff support document, data, and financial management activities.

The business development managers work closely on campus within the schools establishing knowledge of and relationships with key faculty working in areas that may yield potential solutions to market needs. Through their industry contacts, they can link professors with key industry leaders to understand markets and the requirements of the commercial environment for new technologies. They may find new inventions and/or opportunities

for encouraging industry-sponsored research. As such, they form an active bridge between the intellectual property and sponsored projects offices. Having identified an opportunity, they team with a licensing or research contract officer who will negotiate and finalize the legal agreements.

Licensing officers typically are first to review new inventions that flow into the office and serve as the case manager responsible for oversight of each docketed invention. They will tap into the knowledge of the business development staff in formulating a decision regarding the technology. Similarly, they may use this expertise to assist in defining appropriate commercial partners for a focused marketing campaign.

If there is a decision to file, the licensing officer will work with the patent management team to select an appropriate intellectual property attorney and establish the necessary files and documents.

The marketing team will develop a nonconfidential summary of the invention for posting on the OIPA Web site and written promotional materials for distributing to targeted companies. This process is highly focused. Through a major campaign, the marketing group maintains a dynamic and detailed database of industry contacts who have specifically indicated to UCLA their interests in specific technology areas.

Case management, therefore, draws on the specific expertise of individuals drawn from the group according to their technology/industry knowledge to interact as a team through the life of the case. Although one individual—the case manager—is responsible for each case, collaboration within the office with others who can extend the capabilities of each licensing officer is employed as a business practice. This extends the more typical cradle-to-grave model followed by most TTOs.

Proactive Technology Transfer

A very specific and somewhat understandable consequence of the prior benign neglect afforded to faculty at UCLA was their reluctance to disclose their inventions to OIPA. Many chose instead to publish believing that building their resumes would have greater

benefit to them than commercialization through university channels. For a comprehensive university receiving $700 million to $800 million in extramural research support, an annual disclosure rate leading up to the year 2000 was well below competing institutions, averaging less than 120 inventions.[7] Therefore, a deliberate effort was to shift, where possible, to a more proactive method of invention mining. Several approaches were adopted: Holding seminars to provide information on the process of disclosure and how inventions would be handled by OIPA, increased presence on campus (OIPA is situated in an off-campus building approximately ten minutes away by foot), attendance at lab meetings and research reviews, and direct interaction with selected faculty working in fields matched with known market needs.

Internal Marketing and Education

It will come as no surprise to any technology transfer practitioner that many faculty and graduate students are frequently ignorant of their rights and obligations as employees of the university and as recipients of extramural funds. At many institutions, including UCLA, all permanent and temporary employees (i.e., faculty, graduate students, and staff, including visiting appointments) are required to sign a patent acknowledgement agreement. Typical language usually requires that "all employees be required to disclose and assign all inventions that are made within the scope of their employment, and conceived or reduced to practice using university resources, facilities and managed funds." These agreements, by their very nature, can often be interpreted in a number of ways causing ambiguity and confusion among both researchers and administrators. The impact of the employees' permissible external business activities (e.g., consulting) can further complicate the situation, often because these activities are personal to the individual, may not be disclosed to the university, and may require a level of confidentiality that may impede such disclosure.

It is essential, therefore, that all staff responsible for interacting with faculty on issues relating to research administration be fully conversant with all relevant university policies and practices. In addition, this information must be made easily available to researchers, together with training modules to explain the nuances of interpreting these complex requirements. UCLA achieves this through the publication (on the Web and in printed

copy) of tailored brochures and FAQs and by offering explanatory seminars to individual laboratories, divisions, and departments. Depending on the relative roles of the central office and local departmental administration, it may also be advisable to train those who serve as conduits between faculty and the central administration.

One of the significant advantages of being part of a large university system is that each campus can share experiences with their peers throughout the system. The directors of each technology transfer office meet quarterly in person to discuss issues, trends, new policies, etc., and staff at all levels meet regularly at one campus on a rotating basis several times during the year. Listservs and e-mails are also used frequently to share knowledge and experiences between officers.

The UCLA Pre-Seed Fund

On arrival at UCLA, I was confronted with a long line of venture capitalists (VC) from the local and state community wishing to improve their access to university inventions. Because of the low number of disclosures, it occurred to me that perhaps I could use the VC community to provide some help and encouragement to faculty to reawaken their interest in technology transfer. Being a public university, state laws prohibited our entering into privileged agreements with selected commercial entities that would ascribe them preferential access to intellectual property rights. However, in return for funds provided to support research, it was, in fact, feasible to at least grant a first look. Consequently, we created the *UCLA Lab2Market Fund* that would be used internally to support the enablement or acceleration of early-stage inventions that required additional proof of principle or prototyping to establish commercial potential. The university itself has no internal discretionary funds to organize such a funding vehicle. We approached most of the first-tier venture funds in the state (centered around Los Angeles and the San Francisco Bay area) to solicit their participation. Thus far, a small number of these funds have provided $100,000 investments each to a pool that is used to fund certain projects that OIPA believes could benefit from this funding. The money is provided the faculty in the form of zero-overhead grants of up to $25,000. Clear milestones must be negotiated with OIPA, and the money should be used to address a key question that may facilitate commercialization. Examples of projects funded so far include: the collection of animal

data for a novel osteoporosis therapy, programming a user friendly graphical user interface for an antenna design software, and prototyping a new stent. Meetings are held regularly with representatives from the consortium of participating funds to discuss proposed projects and to describe new disclosures received by OIPA that might be of interest to the funds or their portfolio companies. The VC firms gain facilitated access to faculty aided by OIPA, invitations to on-campus technical reviews and seminars, and a modest return on their investment derived from future license revenues or founder's equity if a startup venture is formed. In addition, the funds may each participate in seed or first-round financing of the startup. The partnership is not exclusive and OIPA will not exclude other VC funds from participating in venture generation around university technologies.

Creation of Startups

Because of the keen desire of many of UCLA's faculty to engage in their own entrepreneurial companies, we have agreed to support these interests by allowing them to license inventions they have made—provided there is no other prior claim of rights from a commercial sponsor and following conflict-of-interest and commitment review and approval. OIPA provides introductions when necessary to outside venture funds and angels, as well as advice and broad assistance in creating a commercial venture. Most commonly, we execute a letter of intent, followed quickly thereafter with an option to a future exclusive license. Occasionally, we have granted the license in place of an option when circumstances warrant it. In all cases, whatever the nature of the agreement, we require that (1) the negotiation be with an officer of the new venture (or an attorney acting on his or her behalf) and not the faculty member and (2) the agreement contain clear, drop-dead milestones to enforce diligent development of the technology toward commercialization. For example, if the new venture cannot raise predefined levels of funding within a certain time period, the agreement is terminated and all rights return to the university. The venture must operate exclusively off campus, and the inventors cannot serve as officers in the company unless they take a leave of absence. UC does allow these companies to sponsor ongoing research in the inventors' laboratories subject to review by our independent conflict-of-interest committee. Licensing terms include fees, milestones, royalties, and, in most cases, equity. Our policy allows the university to acquire up to 10 percent equity at issuance. All equity decisions require additional review and approval by general

counsel, and any shares are held and sold by the treasurer of the UCOP using a defined protocol without input or influence from the campus administration or inventors.

Conclusions and Final Comments

There Is no Best Practice

In rebuilding technology transfer offices, I am frequently asked, Who has the best program? or Which university's program are you going to emulate? My response is that one of the mistakes many make in this business is to assume that what worked at a major Massachusetts institution could necessarily be exported to one in the Midwest or Southern California. An effective program must adjust to the local campus culture and needs. Clearly, one should be aware of, and may even introduce, specific initiatives that have succeeded at, for example, Columbia, MIT, or Stanford. However, it is imperative that (1) any expectation that it will work at your institution needs to be carefully managed and (2) it must be tweaked or significantly customized when implemented at your campus to work effectively. Even within one university system such as UC, each technology transfer program is structured, funded, sized, and motivated differently. The directors of each program share their experiences and seek advice from each other, but each brings his or her approach and solutions to common problems.

Perhaps the best example of this is the often-believed misconception that "if we could only create an organization like San Diego's Connect, we could transform this state into the next biotech capital of the world!" Consequently, my caveat to this chapter is that, just because the programs described here are producing results at UCLA, they may not work well at your university. Perhaps the best advice when creating or modifying an organization is to visit several TTOs at institutions similar in structure and size to your own and learn from their successes and failures. I find that TTO directors are, by and large, extremely willing to share their experiences and advice.

Interesting Times

It is important to make the point that the world of technology transfer continues to evolve. Currently, our federal and state congressmen, funding agency leaders, faculty, and our university presidents are becoming more engaged in discussing and influencing the academic technology transfer enterprise. Our industry of professionals has become

smarter and more experienced, and we have seen excellent results and accomplishments throughout most, if not all, research universities. This success, unfortunately, has caught the attention of those who criticize this progress. It is imperative, therefore, that all technology transfer professionals become familiar with these viewpoints and work collectively through organizations such as AUTM, the Council on Governmental Relations, the Association of American Universities, and others to bring knowledge, understanding, and perspective to those who seek to influence our efforts at bringing innovative solutions to those in society who will benefit from them. A critical part of this is that each TTO must maintain its organizational and policy flexibility to serve its constituents well as regulations and the environment in which we work undergo inevitable change.

Notes

1. U.S. Patent and Trademark Office Press Release, #04-04, February 9, 2004.
2. University of California, Office of Technology Transfer Web site: http://www.ucop.edu/ott/.
3. It should be noted here, that by success, I mean the favorable achievement of the overall goal at each institution—not some arbitrarily selected metric, such as the number of inventions disclosed, patents filed or issued, or revenues received. Clearly these measurements can be used, provided this is done carefully and that they reflect the specific goal of the organization.
4. *AUTM Licensing Survey, 2003.*
5. Within the UC system, each campus manages the distribution of income according to its own internal procedures, which may differ slightly from each other. After deducting any unreimbursed patent and legal costs, the UC patent policy defines that 35 percent of the net income be allocated to the inventors (http://www.ucop.edu/ott/patentpolicy/pat-pol.html). OTT then deducts a calculated share of OTT's operating costs prorated to each campus, a portion is returned to the state general fund, and the rest sent to the campus. Once there, UCLA, for example, a portion is retained by the chancellor to cover the cost of its internal technology transfer staff, and, then, any remaining balance is distributed to the school from which the invention was derived.
6. http://www.research.ucla.edu/oipa/fasttrack/
7. *University of California Annual Technology Transfer Report,* FY00: http://www.ucop.edu/ott/ars/ann00/ar00.pdf.