UNIVERSITY OF FLORIDA
Research & Graduate Programs

OTL TECH NOTES

PUBLISHED BY THE UNIVERSITY OF FLORIDA OFFICE OF TECHNOLOGY LICENSING

Fall 2002

Startup Companies Lead the Way as University Tech Transfer Grows Nationwide

According to the latest published findings by the Association of University Technology Managers (AUTM), the University of Florida continued its impressive growth in FY 2000, executing twenty-eight license agreements and filing 134 patent applications, more than any other academic institution in the southeast. Perhaps more significantly, UF was also responsible for spearheading the creation of six start-up companies, placing it near the forefront of AUTM's survey results.

AUTM states that the creation of new companies is one of the most important methods for an academic institution to develop innovative technologies, as existing companies are often hesitant to invest in ideas with unsure outcomes. Not surprisingly, AUTM's data evidences a growing number of start-up companies among its member institutions. FY2000 saw the formation of at least 454 start-ups, compared to 344 in 1999. UF's start-up companies directly impact the state economy: AUTM reports that 80% of start-ups have their primary place of business in the academic institution's home state. UF's start-up company formation also speaks to its continued commitment to research.

Out of the 190 AUTM member institutions responding to the survey, UF ranks an impressive twenty-fourth in "Total Sponsored Research Expenditures," with $294.7 million invested in research.

This increase in research expenditures, coupled with the influx of start-up companies, has created a favorable climate for the growth of university technology transfer not only at UF, but at academic institutions nationwide. According to AUTM, before 1980, universities had secured less than 250 patents and rarely commercialized faculty inventions.

In contrast FY2000 saw universities account for 6,375 of the new patent applications filed with the United States Patent and Trademark Office, a 15% increase from FY 1999. ◆

Clues to Industry Dependence on Public Research

Observers have long said that U.S. industrial science relies heavily on publicly funded research and now a new report purports to provide proof. The National Science Foundation study, "The Increasing Linkage Between U.S. Technology and Public Science," conducted by CHI Research, looked at the relationship between industrial patents and the citation of government-funded research in those patents in 1987-1988 and 1993-1994. It found that 73 percent of the papers cited are based on publicly supported science, authored at academic, governmental, and other public institutions. The study also found that references to U.S.-authored research papers tripled over a six-year period, and that the strongest relationship is in the medical and biological sciences. This close relationship implies that "U.S. industry is far from self-sufficient in science," the paper says.

Admirable and welcome as its conclusions are to the fans of public science, the study (which received major publicity in *The New York Times*) has nevertheless drawn fire from critics of its techniques of analysis:

1. Citations to non-patent literature in U.S. patents are so rare that a large increase may not be statistically significant;
2. Citations are placed by the examiner (with some reference to the patent applicant's supporting documentation), and do not necessarily imply the sort of causal relationship implied by the study.

Well over 80 percent of all published papers, and as high as 90 percent of papers in some fields reported on, are "public science," since companies tend not to publish their research. So a citation rate of 73 percent actually reveals a *weaker* linkage than might exist from a random assignment of papers to patents. ◆

In This Issue

Co-Inventors: Who They Are, and Who They Aren't

Determining who should be named as an inventor on a patent application is a difficult, often subjective task--and not at all the same as deciding who should be listed as authors of a publication. It's a matter of law—not protocol, status, or generous credit- or royalty-sharing, or the lack thereof. If the names on a patent don't match up with the legally defined inventors, it can be invalidated, with disastrous consequences for any product or company dependent on it.

Again, just because people are co-authors of a peer-reviewed article, or students, co-workers, supervisors, or employees, doesn't make or entitle them to be co-inventors. For instance, sometimes students or technicians are included as co-authors on a publication to recognize their contribution for having carried out the inventor's instructions. Or a department chair or thesis adviser may be honored or shown deference in the same way. However, unless they contribute in a legally defined way, they cannot be considered co-inventors. Conversely, if they did contribute, even accidentally or in minor proportion, then they must be considered co-inventors.

Under the law, conception and reduction to practice are the two elements of inventorship. Conception, according to Melvin Blecher, Ph.D., attorney and former professor at Georgetown University Medical Center, is the completion of the mental part of the invention. When an inventor has a definite and permanent idea of the invention that would require only ordinary skill to reduce to practice, conception is complete. The key is that the idea must be a specific solution to a problem, not merely a general research goal.

The second element, reduction to practice, must be carried out personally by the inventor or through someone under the inventor's direction. Reduction to practice can be actual or constructive. (Don't be confused: physical "construction" of an invention is considered actual reduction to practice.) According to Blecher's description of constructive reduction to practice, when an inventor files a patent application that "describes prophetically . . .how to reduce the invention to practice," that application is considered the legal equivalent of actual reduction to practice.

"Naming co-inventors is a gray area that comes up often", says Deanna Shirley, a patent attorney for the firm of Rivkin, Radler & Kremer. "Co-inventors can even change over time, as an invention is developed and as claims are allowed or disallowed," she said. (A claim is a legal term for the very precise explanations of the scope of an invention.) A co-inventor must have some role in the final conception of an invention as it is patented. "Who conceived is the critical question," Shirley said.

William H. Needle, of Needle & Rosenberg, Atlanta, GA, suggests applying the following test to help determine inventorship: ask of a potential co-inventor's contribution, "If this idea had *not* been contributed, would the claimed invention exist?" If the answer is no, then that person is probably a co-inventor. When faced with a situation that may lead to an invention, Needle divides co-workers into three groups: 1) Those who contribute ideas that result in the development of an invention as claimed. Members of this group should be considered inventors; 2) Those who contribute labor, supervision or routine techniques and other non-mental contributions. Members of this group should not be considered inventors; and 3) Those who contribute ideas while an invention is being developed, but whose ideas don't contribute directly to the claimed invention. This group also should not be considered as inventors.

The claims of the patent are the standard for determining inventorship, according to attorney David V. Radack of Eckert Seamans Cherin & Mellott in Pittsburgh. All inventorship questions must be analyzed against the specific steps that make the invention perform differently from any prior art. To put it simply, a sole inventor must have conceived the ideas in *all* of the patent's claims; a co-inventor must have conceived the idea in at least one of the patent's claims.

To help avoid inventorship disputes, it's a good idea to become familiar with OTL's invention disclosure procedures. Giving clear information about your research to the licensing professionals in OTL and keeping good records of everyone involved in the inventive process—students, engineers and technicians—can help simplify the inventorship question. ◆

Material Transfer Agreements Prevent Disputes

In the course of conducting experimental work, a researcher may require research materials. *Research materials* include chemical compounds and such biological materials as antibodies, genes, cell lines, and microorganisms. Obtaining these research materials requires the *transfer* of the materials between the provider and the recipient. Providers and recipients can be individuals or the institutions that employ them. Another situation that would require the transfer of research materials is when a provider of research materials needs a researcher to validate the capabilities or properties of the material.

In addition to the materials, privileged information may be transferred. "Privileged information" means knowledge about an actual or potential product or process that requires the permission of the owner before use. This potential as a contributor to the innovation process is shared by research material, which may be both a source and carrier of privileged information.

When research material and privileged information are transferred, the intellectual property rights of both parties must be protected. This affects the actions of the parties. For example, can the recipient share the results of his or her research on the material with third parties? While

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the recipient may be entitled to intellectual property rights arising from use of the material, such rights could be subject to certain background rights held by the provider. The rights of the parties may be based on patent law or they may be the result of an agreement between the parties.

To prevent disputes arising from the transfer of the research material, the provider and recipient must come to an understanding on issues relating to actual and potential intellectual property rights. Research materials agreements (MTAs) are the best way to define the intellectual property rights of the parties before the potentialities of the material become realized in the hands of the recipient.

A typical MTA begins with an introduction of the parties and a definition of the material requested. The material is identified as experimental, with stipulations requiring prior approval for use with human subjects. Usually, use of the material is restricted to noncommercial, in-house research, and there are provisions that address issues relating to publication and transfer of the material to third parties. The agreement specifically states that any commercial use must be separately negotiated. However, the commercial party in the arrangement is usually granted rights to commercialize resulting inventions. At this stage, payment for the material is nominal. Liability issues are addressed as well in the MTA, and upon expiration the recipient is asked to either destroy the material or return it to the provider.

To facilitate the development of an understanding between the parties, The National Institutes of Health have developed a standard Uniform Biological Material Transfer Agreement (UBMTA) for the exchange of research materials between scientists in public and nonprofit organizations, and the use of this agreement is strongly encouraged.

If you have questions about MTAs, please call your tech transfer office.

—From State University of New York Research Foundation

How Do You Know You've Invented Something?

If your focus is the progress of your research, it's very natural that you may not be thinking about potential spin-offs from your work. Yet, even if the aim of your research is far removed from the commercial world, it's possible that a tool or method you had to develop to solve a problem in the context of a particular project, may have applicability outside your lab or even outside your field. How do you know when you've invented something?

The first step is to stop and reflect on your work every so often. Perhaps you hold a weekly progress meeting with other members of your lab. (We hope you have "notebook corroboration day" each week, when everyone switches notebooks to read and sign. This is just one step in the good record-keeping procedures that support your case for a patent.) If you regularly make the time, then you might build up the habit of asking, have we invented something?

But is it an invention? You might look for guidance in the regulations governing the grant you're working under. Federal agency rules usually refer to the U.S. Code, which in one place (35 USC 201(d)) says, "The term 'invention' means any invention [okay, so our laws are a little circular—stay with us] or discovery which is or may be patentable or otherwise protectable."

In brief, a patent may be obtained for any method, machine, manufactured article, compound or "composition of matter," or new use, or improvement to one of the above, which can include genes and gene products, and software. To qualify, the invention must also be new, useful, and non-obvious to a person skilled in the art. (It may be obvious in retrospect, along the lines of "Why didn't I think of that?" but if no one else did think of doing it, it probably qualifies.)

Actually, determining whether your research finding fulfills the requirements of a patent is a legal question to be addressed at a later stage. It's more important to "disclose" your idea or finding to the tech transfer office early, so the process of determining whether it is an invention, and then what to do about it, can begin.

A simpler first question to ask yourself every so often is, how else could this be used? Even more important for determining its commercial potential: is it better, faster, cheaper than alternatives? Clues: do other researchers keep dropping by to borrow your device, or do you notice an inordinate interest in the details from (industry) attendees at your conference presentations?

Of course, not everything you may develop is suitable for patenting. A multi-media presentation might be protectable by copyright, and be of considerable commercial interest to CD-ROM or Internet publishers. Or a method you've worked out could be valuable as a trade secret, like the formula for Coca-Cola.

As always, if you're not sure, ask your friendly licensing office. ◆

1. Know your technology transfer office contact—and call any time!
2. Understand that the university owns your inventions (in your line of inquiry)…even if you conceived it in your shower at home.
3. Think about what you want out of a relationship with industry (funding? publications? etc.) and tell your contact.
4. Keep good lab records: contemporary, in ink, in a bound notebook, pages consecutively numbered, signed, witnessed and dated.
5. Obtain material transfer agreements for anything you send out, and understand who controls what rights in the ones you sign.
6. Make sure you're in compliance with the IP terms of all grants—including both federal and private funding sources.
7. Read the shrink-wrap agreement on any software tools you use. Most require that you show their trademark—at the very least.
8. Know the difference between inventorship—a legal question—and authorship. Your institution's policy may allow participants to share in any returns, regardless of whether they are legally inventors.
9. For best results: learn about the process, if possible bring an interested company name along with the disclosure, champion the development of your invention, and stay involved.
10. Did we mention this? Call your technology transfer department—first!

Internet Publication Can Kill Patent Rights and Royalties

More and more journals are enhancing their print editions with Internet versions that provide quick access and wide distribution to abstracts or entire papers months before the print edition appears. Unfortunately, if an invention is described online in this way, the patent offices of the world consider it to be published, and that can have a big effect on your pocketbook.

In the United States, the consequences may not be too severe. The U.S. allows a one-year grace period after the date you publicly disclose an invention, during which you must start the formal patent application process. Of course, if you or your licensing office schedules your work with the patent attorneys thinking you have until the formal journal publication date six months' hence, but the clock actually started ticking when the abstract went up on the journal's web site, you may inadvertently lose the right to patent in the U.S.

In the rest of the world, publication anywhere, in any form, is an immediate disqualifier for obtaining patent protection. Now, while the U.S. represents the largest single market for most products, it is still only a third of the worldwide market. Are you ready to allow unknown companies to manufacture and sell products based on your work in two-thirds of the world, without any recognition of you as the inventor—much less any royalty payments? And that's not all. In our increasingly global economy, many U.S. manufacturers are much less interested in inventions that don't include foreign rights.

A quick call to your tech transfer office before you send off an abstract or a preprint can save many headaches—and quite possibly the opportunity for research support from a company, or royalties on your invention. ◆

The Office of Technology Licensing

David Day, Director

Jane Muir, Associate Director

Assistant Directors:

Kevin Boggs

Bruce Clary

Alan Marder

Anthony Palmieri

Bin Yan

UNIVERSITY OF FLORIDA

For more information contact our office or visit our website:

The Office of Technology Licensing

www.otl.ufl.edu

a division of the

Office of Research & Graduate Programs
Dr. Winfred M. Phillips
Vice President and Dean
PO Box 115500
Gainesville, FL 32611-5500

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