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I. INTRODUCTION TO THE TECHNOLOGY TRANSFER OFFICE

1. Mission

The Technology Transfer Office directly contributes to the three-pronged mission of Dartmouth College: teaching, research and public service.

The Technology Transfer Office contributes to the research mission of the College by commercializing inventions generated at the College and its professional schools, assisting in obtaining research dollars from private sources, and ensuring compliance with Government technology transfer regulations.

The teaching mission of the College receives direct benefit from the Technology Transfer Office through its presentations at various workshops for faculty, staff and graduate and undergraduate students on intellectual property and university licensing. By transferring academic research to the private sector, the Technology Transfer Office provides graduate students and research fellows with an opportunity to apply their research skills in an industrial setting.

The Technology Transfer Office provides public service by transferring technologies to industry and participating in both state and federal business assistance and economic development programs, such as Small Business Innovation Research (SBIR), Small Business Technology Transfer program (STTR), and New Hampshire Industrial Research Center (IRC). As demonstrated by an Association of University Technology Managers (AUTM) study, research transferred from academic institutions to companies not only provides valuable technologies for the public good, but also leads to the creation of high-wage, high-skill jobs.

2. Federal Laws

The passage of Public Law 96-517, the Bayh-Dole Act, in 1980 (and subsequent guidelines and executive orders, issued during the 1980s) was the major milestone in the development of technology transfer activity for academic institutions in the United States. Under this Act, title to inventions arising from Federal Government sponsorship resides with the university; however, the university is obliged to transfer the inventions to the private sector for the benefit of the general public. If the university cannot demonstrate that it is actively transferring academic inventions to industry, the U.S. Government can exercise so-called "march-in rights" and take away the title to the inventions.

Any invention funded by Government grants and contracts is to be promptly and fully reported by the inventor to the university and the university in turn must report all disclosures to the Federal Government.

The Bayh-Dole Act also requires that universities have written agreements with all employees involved in research in which they agree to assign to the university any inventions made with Federal funding.

3. Dartmouth College Patent Policy

According to the Dartmouth College Patent Policy as voted by the General Faculty and ratified by the Faculty of Arts and Sciences on April 24, 1978, when an individual's effort in conceiving an invention is significantly assisted by the use of College facilities, resources or personnel, the invention is assigned to Dartmouth College. The College and the inventor will share in the net income generated from licensing of such invention.

Rights to inventions developed through individual initiative, not in response to a specific College assignment and with only incidental use of College facilities or resources, belong to the inventor. Any license income accrues to the inventor alone.

Dartmouth College Patent Policy is available as a separate document. Implementation of this Policy comes under the Technology Transfer Office's purview.

II. PATENT LAW BASICS

1. What is a Patent?

A patent is an agreement between an inventor and the government, granting the inventor the right, for a limited period, to exclude others from making, using, or selling the described invention. As stated in the United States Constitution, the main purpose of patents is “*to promote the progress of science and the useful arts...*” While an inventor may financially benefit from a patented invention, the public also benefits from it by buying and using it. The full patent disclosure in turn allows the public to take unrestrictive advantage of the invention when the patent expires (20 years from the filing date). While providing an inventor with a monopoly on the practice of the invention for a limited period of time, the patent system encourages further development of the technology, as well as inventions in the same field by others.

2. What can be Patented?

The U.S. patent law postulates that patents may be granted on:

1. A process, such as a method of applying a vapor barrier to silicon materials;
2. A machine, such as a new instrument to detect volatile gases;
3. An article of manufacture, which is any product or thing made by human effort, such as a table or a key ring, or a genetically engineered protein;
4. A composition of matter, such as a new chemical compound, or a new microorganism;

5. New and useful improvements of the above, even if the prior process, machine or composition of matter on which the improvement is based has been patented;
6. Any distinct and new variety of plant which is asexually reproduced;
7. Any new, original, and ornamental design for an article of manufacture.

Things that are not patentable include theories, non-demonstrable ideas, plans of action, methods of business, discoveries of laws of nature, and anything repugnant to morals or leading to injury.

3. Major Requirements for a Patentable Invention

Under United States Patent Law, all patent applications are examined for novelty, usefulness, and non-obviousness.

Novelty: the invention must be demonstrably different from any existing prior art; this means that it cannot be described in prior “public disclosure”, such as publication or previous patent, or available to the public, either as a commercial product or by being within the public domain.

Usefulness: the invention must be useful in ways which represent improvements over existing products and/or techniques.

Non-obviousness: the invention cannot be obvious to a person of “ordinary skill” in the art; non-obviousness is usually demonstrated by showing that the use of the invention yields surprising, unexpected results.

Each of these three criteria is open to interpretation. Establishing novelty and/or usefulness often relies on arbitrary value judgments. For example, it may not be clear that a new gene-sequencing instrument is “demonstrably different” from other existing models, or that the use of a new hybridoma for narrow research purposes is sufficiently significant to be called a “useful” improvement over existing techniques.

Despite the possible variety of definitions of novelty and usefulness, the concept of “non-obviousness” is the most complex of these three patentability requirements. Mere simplicity of an invention does not necessarily imply that it is an obvious invention. Judging what is obvious to one of “ordinary skill” in an art is rarely straightforward, especially in technologically complex and rapidly changing fields. “Obviousness” is most frequently cited by patent examiners as the reason for deeming an invention not patentable.

Finally, patent law states that inventions may be patented if they have been reduced to practice, either actually or constructively.

Actual reduction to practice means actual making of the patented object, carrying out the method, etc., and demonstrating the operability of the patented concept. Constructive reduction

to practice is merely teaching the public how to practice an invention, therefore limited extrapolation of the inventive concept can be included in a patent application.

III. OTHER FORMS OF INTELLECTUAL PROPERTY PROTECTION

1. Copyrights

Dartmouth students, professors and staff routinely create new written scholarship, literary works, computer software, artistic works and other items of copyrightable work. Copyright is a narrow form of intellectual property protection. It protects only the fixed expression of an idea, not the idea itself. The Federal Copyright Law provides that most original works of authorship are protected by copyright automatically when they are fixed in tangible form. However, it is advisable to provide a notice to the public that the copyright holder does not wish the material copied. This is best done by placing a copyright notice at the beginning of the work, as follows:

Copyright © , [date]
[name]

The [date] is the year in which the work was created; the [name] is the name of the author(s) for works not owned by an employer and the name of the employer when the employer asserts rights in the copyrightable works. The holder of copyright to a work has the exclusive right to copy or perform the work or to publish derivative works based on the original.

The Dartmouth College Copyright Policy governs copyright ownership of the works created by Dartmouth faculty and other classes of employees. The Dartmouth College Copyright Policy is available as a separate document.

2. Trade Secrets

A trade secret is any invention, or other valuable business information which is not protected by a patent and is not known or accessible to others. The inventor receives no monopoly in the form of a patent, and thus has no protection against someone who independently comes up with the same development. The advantage to the trade secrets however, is their unlimited lifespan (as long as the secret is maintained). A classic example of a trade secret is the formula for Coca Cola. To be protected as a trade secret, the information or invention must be used in a business, and positive measures must be employed to keep it secret. Since a university's task is exactly the opposite - the dissemination of technical information - universities are seldom involved with trade secrets.

3. Trademarks

Trademarks are defined in the Lanham Act (Title 15 United States Code) as "any word, name, symbol, or device or any combination thereof adopted and used by a manufacturer or merchant to identify his goods and distinguish them from those manufactured or sold by others". A trademark can also be protected, and the procedure is relatively simple. Unlike as in the case of patents, no utility, novelty or non-obviousness need be shown. It is only necessary that the trademark be easily distinguishable from other trademarks in the same class of products. Dartmouth trademarks are managed by the Legal Affairs department.

IV. PATENTING AND LICENSING

The major thrust of the Technology Transfer Office's activity is directed towards patenting and licensing of the inventions originated at Dartmouth College and its professional schools.

1. Invention Disclosure Form

It is a duty of each employee, who believes that he or she may have created an invention, to promptly report it to the Technology Transfer Office by filing a Dartmouth College Invention Disclosure form. This form is intended to provide necessary information to start evaluations of patentability and commercial potential of the invention, as well as to ensure compliance with Federal regulations, in case the invention has resulted from the sponsorship by the Federal Government and to determine whether any rights to the invention belong to a private sponsor.

An Invention Disclosure should be witnessed by a person who is capable of understanding the invention.

Inventors also should keep accurate records (such as signed and dated laboratory notebooks) of the invention, from the time of the invention's conception and throughout the course of its development. Fulfillment of these requirements is very important in determining precisely who the inventors are and when the invention was made.

2. Patentability Determination

After the invention is reported to the Technology Transfer Office, public disclosure dates are verified to determine whether foreign and domestic patent protection is possible and whether accelerated patent work is necessary.

At present, U.S. and Canadian patent laws allow for a patent application to be filed within 12 months of publication or other public disclosure. *Foreign patent laws do not allow this grace period*, and in the rest of the world public disclosure before a patent application is filed renders the invention unpatentable. However, by treaties with most industrial countries, public disclosure does not cause loss of foreign patent rights if a U.S. patent application is filed prior to disclosure.

Investigators are strongly encouraged to submit invention disclosures to the Technology Transfer Office at least four months in advance of pending publication, poster presentation, oral presentation at a conference or a seminar or other public disclosure. Investigators should also be aware that while certain seminars may be closed and under confidential settings (such as Gordon Conferences) many university seminars and conferences are open to the general community.

After it is determined that patent rights were not forfeited as a result of public disclosure, the Invention Disclosure is forwarded to an outside patent counsel for further patentability evaluation.

3. Commercial Potential Determination

If the invention was determined patentable from the legal perspective, the Technology Transfer Office evaluates its commercial potential. Since patent filing and prosecution is costly, the decision to pursue an application has to take into account financial considerations. Who will use the invention, where will it be used, is it a significant improvement or a minor one, is it a market of hundreds or thousands of customers or a few dedicated dozens - in other words - what is the commercial value of the invention? Information provided by the inventor is very important in this process, as the inventor is best aware of potential applications and existing markets for an invention.

With the inventor's help the Technology Transfer Office compiles a non-confidential description of the invention and sends it for review to selected companies in the pertinent field; the mailing list could be as large as 200. To evaluate the commercial potential of an invention, the Technology Transfer Office also posts the description of the invention on appropriate Internet sites, including its own Web page. The help of outside consultants might sometimes be utilized. If the technology appears patentable and the feedback from the marketplace positive, the Technology Transfer Office takes necessary steps to obtain patent protection and find a commercial partner.

If it is determined that it is not feasible to invest Dartmouth resources into patenting and commercialization of a particular invention, the Technology Transfer Office offers to reassign the title to such invention to the inventor if he or she so desires. If such an invention has been conceived under Government sponsorship, the Technology Transfer Office requests the Government's permission to reassign the invention to the inventor.

4. Marketing

Once the decision to proceed with an invention's patenting and commercialization is made, the Technology Transfer Office launches an extensive marketing campaign, including: mass mailings, advertising in appropriate databases and technology transfer newsletters, creative collaboration with various business assistance programs, networking, and participation in relevant trade shows. The descriptions of Dartmouth's licensable technologies are sometimes

disseminated to participants of conferences in a pertinent technical area. In some instances a technology transfer broker might be engaged to market a technology.

After an interested commercial partner has been identified, the Technology Transfer Office prepares a Confidentiality Agreement in order to disclose proprietary information to such entity. If after review of the proprietary data a company wishes to pursue the invention's commercialization, the negotiation process begins. Once both parties agree upon license terms, the Technology Transfer Office prepares a written agreement which becomes a legal document obliging the parties to abide by the agreed upon conditions.

5. Licenses

The most common avenue for commercialization of a new technology is a license to an established company with an appropriate market. A license is a contract whereby Dartmouth College retains ownership of the patent, and the private company obtains the right to use the patent to make and sell products or processes. By making and selling these products or processes, companies create jobs, build factories, invest into new equipment -- in other words, contribute to the economic development of their region and the nation. Because licensed technology provides a financial benefit to private companies, Dartmouth College asks to share in that benefit.

The sharing usually takes place in the form of various license fees ("license issue fee", "license maintenance fee", "patent claim issue fee", etc.) and an ongoing payment linked to actual sales of products or services -- "running royalties". Inventors share in license revenues according to the Dartmouth College Patent Policy.

Two other important aspects of licenses are "Due Diligence" and "Indemnification". As a beneficiary of public research funds, Dartmouth College must require concrete proof that the technology it licenses is actually being successfully brought to the marketplace. Specific milestones and performance guarantees are included in license agreements in a so-called Due Diligence provision to ensure that technology is not lying dormant or the license to a Dartmouth patent is not simply used to block the competition.

The purpose of the Indemnification clauses is to shift financial risk for liability arising from the use of licensed products or processes produced by the licensee from Dartmouth College (and the inventor) to the licensee.

Complete texts of Dartmouth's standard license agreements can be found at the Technology Transfer Office Web Site (<http://www.dartmouth.edu/admin/tto>) or obtained from the Technology Transfer Office directly.

V. INDUSTRIAL RELATIONS

1. Agreements with Industry

Licenses, and the revenue they generate, are but a small fraction of the entire spectrum of academic collaborations with industry. Academia and industry are governed by different cultures but are increasingly drawn together by each other's ability to complement the resources needed for commercialization of research findings. Companies report increased productivity and an improved competitive position as a result of collaborations with university scientists, and universities receive much needed research support as well as valuable practical experience for students.

The Technology Transfer Office oversees numerous forms of collaborations with industry on Dartmouth's campus. Office staff negotiates and monitors industrially sponsored research, testing and material transfer agreements. Templates of these agreements can be found at the Technology Transfer Web Site (<http://www.dartmouth.edu/admin/tto>) or obtained from the Technology Transfer Office directly.

The office also assists in establishing industrial collaborations via Government business assistance mechanisms, such as Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs¹.

2. Compliance with Government Regulations and Obligations to Sponsors

One of the Technology Transfer Office responsibilities is to ensure Dartmouth's compliance with Government regulations pertaining to technology transfer, and the Bayh-Dole Act requirements in particular. The Technology Transfer Office provides necessary reports on inventions to the sponsoring agency, informs the sponsoring agency about invention title election, issues confirmatory licenses to the U.S. Government, and keeps the agency apprised of resulting patenting and licensing activity. The Technology Transfer Office staff ensures that obligations to the private sponsors of the research are fulfilled as well.

The Technology Transfer Office maintains a campus wide database of Invention Agreements that each employee involved in research needs to sign according to the Bayh-Dole Act.

¹ One avenue of Federal Government in fostering of industry-university collaborations to enhance national competitiveness and economic development, is through Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) grants. Both programs were launched by Small Business Administration (SBA), the former in 1982, the latter in 1993. Both programs are funded through various Federal Agencies (NIH, NSF, NASA, DOD, DOE, etc.) by setting aside a certain percentage of extramural R&D budget.

These grants are designated solely for small businesses conducting research. Although agreements governing SBIR and STTR collaborations follow special formats, their basic philosophy in dealing with inventions agrees with the Bayh-Dole Act and follows universities' standard approach to sponsored research. The Technology Transfer Office negotiates and prepares these agreements for Dartmouth faculty, who are becoming increasingly involved in SBIR and STTR projects.

3. Public Relations

The Technology Transfer Office is heavily involved in the promotion of Dartmouth's scientific and technological potential. The Office is a major focal point of interaction between academic research on campus and industry. Through its participation in the activity of various Government sponsored business assistance programs and their networks, the Technology Transfer Office is able to utilize various mechanisms for academia-industry linkages to the benefit of both entities.

The Technology Transfer Office is the home of the Dartmouth Satellite of the New Hampshire Industrial Research Center (NHIRC), a cooperative project of the New Hampshire Department of Resources and Economic Development (DRED), the University of New Hampshire (UNH), and Dartmouth College. The NHIRC links the research capabilities of the State's foremost academic institutions -- Dartmouth and UNH -- with small and mid-size manufacturers in the state. The NHIRC matches the first \$25,000 in industrial contributions for projects proposed by the company, taking advantage of research capabilities of Dartmouth or UNH. The Technology Transfer Office helps identify campus experts for IRC industrial clients who will then work jointly with the company on a proposal for the matching grant.

The Technology Transfer Office frequently arranges or co-hosts campus visits of corporate executives and arranges their one-on-one meetings with Dartmouth scientists.

To further enhance Dartmouth's image as a fine research institution, the Technology Transfer Office staff maintains a high profile in the technology transfer field via hosting conferences, participating in high technology trade shows, and by making presentations and conducting workshops at various professional gatherings.

Parts of this document are based on materials adapted from the Intellectual Property Guide of the Harvard Medical School Office of Technology Licensing and Industry-Sponsored Research, A Guide to the Law of Patents for Scholars from the University of Colorado, and Inventions and Technology Transfer from Technology Transfer Office of the University of Utah.