Overview of Technology Transfer

by
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OVERVIEW OF TECHNOLOGY DEVELOPMENT

by Bruce Goldstein

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Abstract

All scientists at NIH, whether involved in laboratory or clinical research, need to be aware of the newly emerging field in Intellectual Property law that is broadly called "technology transfer." This chapter discusses a subset of the tools of technology transfer, called "technology development." Technology-development tools primarily involve a variety of agreements between private researchers and the Government designed to enable various forms of collaborative activity. A scientist who ignores the issues involved in technology development faces serious risks, including being sued, having reputations ruined, even possibly facing criminal penalties -- not to mention having research efforts ruined. Properly handled, these tools can protect the researcher, the Government, and the private facility, and by doing so, help make the research possible.

Introduction

The changes over the last twenty years in the dynamics of scientific progress generally, and in the biomedical arena in particular, have been as dramatic as the changes wrought upon a landscape by a river altering course, flooding some regions and carving others. Inexorably, the ground that had been solid crumbles, and new shores emerge. For those who have established the foundations of their research careers in the realm of pure academia, the new landscape lacks many of the familiar landmarks and paths. Though many people find such changes disturbing, confusing, or simply aggravating, the most successful researchers will have to learn to navigate

the new terrain.

As is discussed in more detail in another chapter, one of the major forces precipitating the changes in the manner of scientific development occurred in the law of patents. First, in 1980, the Supreme Court ruled that life forms created through recombinant-DNA technology could be protected by patents. Second, in 1982, Congress created a special appeals court, the Federal Circuit Court of Appeals, to hear specific kinds of cases, including patent law. This court has clarified much of patent law, and made enforcing patents far more practical than it had been. Third, and most relevant to this chapter, Congress passed a series of laws in the early 1980s (with important, subsequent amendments) that enabled the transfer of some of the Government's rights to inventions to non-Government parties. The combination of these events dramatically accelerated the development of the scientific field now called biotechnology, and started the legal field which today is broadly called "technology transfer," among other things.[2]

People are largely unaware of all the various tools used to accomplish the transfer of technology. Ask people who have heard about technology transfer, and many will reply that it involves lawyers arranging for big corporations to license Government-owned patents. Ask them how technology transfer impacts their research, and they are likely to say, "not at all." But the river is still carving new territories, and more sooner than later, most of the pure researchers will be forced to navigate the new terrain. Research agreements, inventions, patent licenses, material transfers, confidentiality, software, copyrights, trademarks, and many other, perhaps even more unfamiliar things loom -- and pitfalls, deep enough to swallow a career or two, hide in between. To add another layer of confusion, the perspectives of for-profit industries, nonprofit/university groups, and Government about technology development are significantly

different from each other.

In this chapter, to identify the new landmarks and map the terrain, a *purely fictional* scenario will be described, relating a series of hypothetical events. Then, using the scenario as a backdrop, some of the various tools will be examined in turn, with a focus on why, when, and how each is used appropriately. The causes of the more common snags will also be discussed, so that those problems caused by divergent perspectives may be avoided. Hopefully, at the conclusion, the features of the new landscape will appear as opportunities -- ways to enhance and enable research -- rather than as obstacles.

Scenario: Disasters Waiting To Happen

Meet Gillian Niher, M.D., Ph.D. She has developed a stellar reputation as an up-and-coming neuronal researcher. Her focus has been on therapies for neural injuries, primarily peripheral nerves. From a brief teaching position at Smallville Medical School, she found a tenure-track position at NIH, in a lab with facilities in the NIH Clinical Center. Unfortunately, she was stuck for ideas for her next blockbuster study; though generally interested in a variety of cutting-edge technologies, she had not yet settled on one. Then, her very close college friend, Alan Prophet, Ph.D., came to Bethesda on a business trip, and stopped by. Over lunch, Alan told Gillian about his gene-therapy research at Tate State University (a private institution in Maryland that does not rely on grants from NIH to support its bioscience research, but several projects are funded by industry).

Alan mentioned that Tate State sponsored “spin-off” companies for professors who invent new bioscience products. He also mentioned that he was named as a co-inventor on a

recently issued patent on the genetic sequence of a recently discovered neuronal growth factor. With support from Tate State, Alan and his colleagues created a small company called Neurion to develop this gene. They had found some support from a group of venture capitalists, who received a large share of corporate control in exchange for financing. The company had already succeeded using the gene in several *in vitro* models. They also had recently done some toxicity and efficacy tests in injured rats and rabbits, but the results were not yet public. Alan invited Gillian to visit Neurion's facilities, and Gillian excitedly agreed.

Two weeks later, she went to Neurion's small facilities near the Tate State campus. When she arrived, Alan told her that before he could give her a tour, she would have to sign a form the lawyers drafted to make sure trade secrets stayed secret, and Gillian agreed to comply. Then, Alan showed her preliminary data that demonstrated the growth factor was surprisingly effective in stimulating neuron regrowth, either when the growth factor protein was delivered directly to the site of neuronal injury, or when a plasmid incorporating the gene was applied to the extracellular matrix.

Impressed with these results, Gillian saw an opportunity to establish a collaboration: Neurion's growth factor entering clinical trials at NIH. She consulted her Scientific Director about the project, and was pleased that he was very interested. Alan -- and his partners in Neurion -- were equally excited when she made that suggestion to them. Alan and Gillian quickly drafted a protocol for human trials, which was favorably received by Gillian's Laboratory Chief and Scientific Director, as well as by the venture-capital group. Once Gillian signed some of Neurion's forms, Neurion sent large amounts of GMP-grade materials for Gillian to use at NIH. The process of establishing the study appeared on the fast track to success.

Shortly after, while reviewing the final animal-study data Alan had provided, Gillian noticed two things Neurion had missed. First, the rabbits in the "control" group (those given only blank plasmid) had no noticeable neuronal growth -- that is, the number of nerve endings was unchanged with the injection of the plasmid -- but they seemed improved in terms of muscle movement and strength. Upon closer examination of the rabbits, she found that the original injured nerve endings had in fact regrown. In contrast, those rabbits that received the gene all had completely new nerves growing in addition to the original ones, and those rabbits that received nothing all had no neuronal stimulation at all. Something in the plasmid itself appeared to have activity. Second, she noticed that those rabbits receiving the gene had exuberant growth of neurons -- even in regions where all the original neurons were dead.

Alan was naturally excited to hear about these observations, but told Gillian to keep them quiet just long enough so that Neurion could file a patent application. Reluctantly, Gillian agreed. However, she quietly sent samples of the plasmid, with and without the gene, to John Rogers, M.D., a colleague of hers still at Smallville, for careful analysis of the plasmid's sequence. The clinical trials began, and over the following weeks, the pair began collecting data.

Then the big problems began. Alan and Gillian continued to prepare the manuscript for the paper disclosing Gillian's discoveries, but Neurion insisted Alan delay his efforts, telling Gillian that the delay was needed because the patent application was not yet ready. This created a problem for Gillian, who was obligated to publish her results as soon as possible. Then, while on a visit to Alan's offices at Neurion, Gillian saw some documents indicating that a patent application had already been filed by Neurion describing her discoveries -- but she was not named as an inventor. Furious, Gillian quickly polished the rough draft, and submitted the

manuscript immediately. Upon learning of this act, Neurion demanded that Gillian retract the publication, return all remaining stores of the gene, and terminate the study, but Gillian refused.

To make matters worse, ten subjects in the clinical trial were experiencing something very strange. The regions of tissue receiving the gene were experiencing hypersensitivity, to the point of severe pain. Histological analysis of the tissue revealed that the neurons were growing far more exuberantly in humans than in either rats or rabbits. The stimulating factor was out of control. As if matters were not bad enough, John used Gillian's sample plasmids to generate a large quantity, of gene-bearing plasmid, which he had injected into ten undergraduate volunteers at Smallville College -- without securing IRB approval, acquiring informed consent, or even controlling the quality of the materials he had injected. Six of these students have experienced the neuronal hyperplasia.

Gillian is now being sued by Neurion for breaches of their contracts, misappropriation of trade secrets, and patent infringement. Although the injured patients and students are suing Neurion for making the dangerous materials, Neurion has asked the court to order Gillian to pay Neurion's legal bills and any judgment associated with that product-liability suit -- on the grounds that Gillian had agreed to do so in her various contracts. The media, having heard of the Smallville incident, has placed the whole story on national news. Congress has issued subpoenas to her entire lab, asking why the NIH is sponsoring secret clinical trials of unproven, dangerous genes in our nation's children. The Scientific Director personally has asked her to resign. Finally, Gillian's attorney has told her the Assistant U.S. Attorney is investigating whether to charge her with criminal sanctions.

What went wrong, and how could the tools of technology development helped avoid

these problems? By unraveling the complicated mess, and reviewing each piece, we will illuminate the traps and show the tools that would help avoid them.

I. The First And Biggest Mistake: *Signing The Agreements*

A. Contract Execution in General

By the time most people have reached adulthood, they have been scolded to read all contracts before signing them, no matter how long and confusing the fine print may be. Indeed, in many cases, the documents we are asked to sign are so complicated and hard to read that common sense demands hiring a lawyer. Nonetheless, because hiring lawyers is expensive and time-consuming, and because many of us are unaware of the *actual* risk of something going wrong, we ignore that risk and sign -- often without even reading -- happy to have saved the time and money. Only later, when we need the lawyer's equivalent of a root-canal, do we ruefully ask for help to clean up the mess.

Yet even if the document is simple and the person being asked to sign it has taken the time to read it, major pitfalls still lurk. For example, if something goes wrong, who is on the hook? As a general rule, a person who signs a contract is promising to fulfill the terms of the contract.[3] That means Gillian will likely be liable if the promises in the contracts she signed are not satisfied. This is especially dangerous if the agreement purports to make promises that the signer cannot keep, like a promise to keep something secret that must by law be disclosed.

A bigger problem here is "agency," or the power to act on someone else's behalf. If the signer purports to bind another party (such as a company or institution) to perform a promise, the signer must, in truth, have authority from that party to bind it in order for the party to be bound.[4]

Moreover, the authority must extend to the particular type of contract: if person A has limited authority to buy groceries for person B, A may not use B's money to buy investment bonds. Though these rules appear simple on their face, they are less simple in practice.

People who occupy key offices in a corporation (such as President or Chief Executive Officer) or a university (such as Provost or Dean), generally have formal, written authority to bind their employers to the contracts they sign on their behalf.[5] The formal authority typically appears in charters, articles of incorporation, bylaws, or employment contracts. Other times, authority is expressly delegated in a memo or other writing, such as through a power of attorney. This express grant of power is called "actual" authority. Generally, individual employees do not have actual authority to bind their employers. In the Government, analogous to the structure of many large institutions, the statutes passed by Congress specify which offices can bind a Federal Agency, and actual authority below that level must be formally delegated in writing.

Occasionally, authority to act as an agent reasonably can be inferred from the circumstances, even if no actual authority exists. If the General Counsel, Associate Dean, or Senior Vice President of a company or university signs a contract, others might be justified in relying on the signature, even if the individual has no written delegation to display.[6] This is a narrow exception, however, and one cannot reasonably assume that any randomly selected employee of a company has authority to bind that company. Because Gillian did not have any indicia she had authority to bind her Institute[7] (such as being the Institute's Director or Technology Development Coordinator), Neurion had a poor basis for assuming her signature alone would bind anyone at NIH other than herself, and so would have weak grounds at best for asserting that the Government breached any contracts.

This is cold comfort for Gillian. Normally, if an agent acts within the scope of the authority delegated by the principal, the agent will not be liable if the principal later breaks the contract.[8] This immunity, however, rests on whether the agent acted within the scope of the authority. Because Gillian's signature was not authorized by NIH, she will not be protected by the fact that she signed the agreements, even if she did it in an attempt to carry out her official duties.

Finally, even if a scientist who signs an agreement clearly lacked authority to bind the employer, the employer may still be placed in the position of facing an irate company. Two recent cases highlight the problem.

According to an article recently published in *The Scientist*,[9] Dr. David Kern, a medical professor at Brown University, was asked by a local fabric company called Microfibers to consult on two cases involving a rare syndrome called interstitial lung disease. He discovered it was due to conditions in Microfiber's factories, and also discovered cases in other employees of Microfibers working at two specific facilities. Immediately, he began the process of publishing his results. Microfibers, however, threatened to sue both Kern and his employer, on the basis of certain nondisclosure agreements signed by *students in Kern's department*, who had come to Microfibers for a visit two years before on an unrelated matter. Apparently, neither Kern nor his employer had ever ratified the agreements, and it is unclear whether either was even aware of the agreements' existence. Even so, Kern's employer, placed in the highly awkward position of having to face litigation or restraining Kern, elected the latter.

Another recent example of an attempt to suppress research, reported in major newspapers,[10] occurred between the former Boots Pharmaceuticals[11] and the University of

California at San Francisco. In 1987, Dr. Betty Dong, a scientist at UCSF, signed Boots's research-funding agreement personally, in order to conduct a study on whether Synthroid (a synthetic drug for the treatment of hyperthyroidism) was superior to generic equivalents. The study was completed in 1990, which indicated that the generics were bioequivalent to Synthroid; Dr. Dong handed copies of the data to Boots. By 1995, Boots had not released any of the information, so Dr. Dong submitted a manuscript to JAMA. Boots asserted the study was flawed, and refused permission to publish -- and the original research agreement said that permission was required before the results could be made public. Despite the fact that the provision violated UCSF policy, UCSF's attorney told Dr. Dong that UCSF would honor the term, and if she wanted to publish on her own, she would have to defend herself against Boots's threatened litigation without UCSF support. Faced with this threat, Dr. Dong asked JAMA to halt the article. Only after intervention by Dr. Louis Sullivan, then the Secretary of the U.S. Department of Health & Human Services, did Boots relent, and allow publication,[12] but not before Boots had published a scathing critique, reinterpreting the data in a manner that cast a more favorable light on Synthroid.[13]

B. Scope of Actual Authority of Government Laboratories

In the context of Government laboratories, there is an additional twist. For most people, laws are *dis*abling: In other words, you can do whatever you want *unless* it is prohibited by law. For the Government as an acting entity, with few exceptions, laws are *en*abling: An Agency (and its authorized representative) can do *only* what the law has expressly authorized. In the establishment of relationships between Government agencies and non-Government parties, this

divergence of point-of-view is often a major cause of problems. In particular, companies and universities, accustomed to crafting essentially whatever terms their internal institutional policies will allow, simply do not understand why the Government Agency says, "no, we cannot do that."

The enabling character of law as it applies to Government action stems from the Constitution, the very foundation of the Government, which lists those specific things Congress *can* do. Ultimately, the written authority for an Agency to take a given action must be directly traceable from a provision in the Constitution, to a law passed by Congress (or occasionally, an order issued by the President), through regulations promulgated by the Secretary of the Agency, and a written trail of delegations down the chain of command within that Agency. At each delegation, the authority to act may be restricted further. The scope and meaning of these documents may be illuminated by opinions of courts, the U.S. Attorney General, and the General Counsel of the Agency. Finally, each Agency may establish its own policies of implementation, which generally stem from the original mission set out by Congress. As a consequence, even if a given person has the raw potential to receive authority to act on behalf of the Agency, the scope of authority actually delegated may be severely circumscribed by these various layers of Government. In certain circumstances, a particular office in an Agency may want to take an action that is still within the law, but exceeds existing delegations of authority. Unfortunately, circumventing a given authority may require so much review at so many levels, and may precipitate so much political fallout, that only the most dire case would justify the attempt.

Occasionally, the law also acts on Agencies in a disabling way. For example, Agencies of the Government are directly forbidden to take an action that would incur upon the Agency a debt that exceeds its appropriated budget, without express statutory authorization to do so.[14]

Thus, in the Neurion scenario, the NIH could not agree to protect Neurion from the product-liability lawsuits brought by the injured students, as the possible judgments against Neurion (not to mention Neurion's legal fees) might well exceed the agency's appropriated budget. At best, Neurion may feel cheated, having entered an agreement in good faith, and will be reluctant to enter future agreements with anyone at NIH. At worst, if any Government employee purports to incur such a liability on behalf of the Government -- as Gillian did in the agreements she signed -- the employee risks, in theory at least, going to jail.[15]

II. Agreements Not To Disclose: Trade-Secrets and the "CDA"

One political extreme holds the view that the Government is engaged in the systematic suppression of information that the public has a need to know. The other extreme asserts that the Government is not capable of keeping information secret without being forced to do so, even if the life of every American depended on it. Reality lies somewhere between these extremes. Ever since the passage of the Freedom of Information Act (FOIA), a lively debate has ensued over the proper balance between these two opposing positions. Sometimes, the Government must reveal the information on which its actions and policies are based; other times, release of information in Government possession would injure private parties without providing any public benefit.

In the arena of scientific research, the debate is as strong as anywhere. From time to time, Government scientists need access to confidential information in the hands of private parties to do their jobs. By the same token, these same Government scientists must publish their research results. The challenge is to find a way to accommodate the legitimate needs of industry

to protect trade secrets and of individuals to protect their privacy, without giving a private party the power to restrict the Government scientist's prerogative to publish or the public's right to know.

In 1997, Congress extended the reach of FOIA to *non-governmental* researchers receiving federal funds.[16] Specifically, Congress ordered the Office of Management & Budget to amend Circular A-110 "to require Federal awarding agencies to ensure that all data produced under an award will be made available to the public through the procedures established under the Freedom of Information Act." Although this provision has not yet been implemented, anyone receiving federal funding should be aware of the implications of FOIA, as that law may soon apply to them.

A. Background: Trade Secrets

As a general principle of trade-secret law, a trade secret can be any piece of information that (1) is exclusively known by the party claiming it (*i.e.,* it is truly a secret), (2) is protected by measures that are reasonable under the circumstances, and (3) is of some economic value -- either because owner of the secret experiences a direct and tangible economic benefit (say, a cheaper way of making a formulation) or because the competitors of the owner would have to expend considerable resources to discover the secret through lawful means (say, by reverse-engineering).[17] Classic trade secrets include methods of mass-manufacture, detailed contact and pricing lists for each customer, recipes, and inventions that are the subject of pending patent applications. But a trade secret *could* be anything.

If the basic criteria are met, the owner of a trade secret has grounds to ask a court to

protect that secret against "misappropriation," by assessing money damages and sometimes by imposing an injunction.[18] A trade-secret lawsuit does not depend on the existence of a contract to be successful; "misappropriation" encompasses both the wrongful acquisition of a trade secret, and the wrongful use or disclosure of a rightfully held trade secret.[19] Moreover, for as long as the information actually remains a secret, the legal right to protect the secrecy of that information continues.

The difficulty in trade-secret litigation, typically, lies in proving that all the initial criteria are met. For example, assuming your confidante wrongly disclosed your secret, how do you prove that your information was actually a secret before it was disclosed to the confidante? Were the steps you took to keep your information secret "reasonable" (and will a randomly selected jury agree)? Was it still a secret at the moment when the confidante publicly disclosed your information? These are difficult facts to prove, even in the best of conditions. Moreover, as a purely practical matter, the likelihood is low that an injured party will recover through the legal process the value of what was lost when the secret was revealed, even if misappropriation has been proved.

Nevertheless, using some form of confidential disclosure agreement is a good idea for all concerned, for several reasons. First, a signed agreement often has the psychological effect of making those involved treat the terms of the written agreement more seriously than they would a mere handshake. Second, clear terms can help avoid disagreements and ill-will by putting each other on notice about which information should be treated as confidential, as well as what acts are or are not appropriate. Third, a written agreement reduces the risk that a patent office will deem a pre-filing disclosure of an invention to be a bar against patenting. Finally, even if there

is a breaching disclosure, if it is a minor disclosure, the party owning the trade secret still has a chance of getting legal protection for the information in the future, because the party can point to the agreement as evidence that the party took every reasonable step under the circumstances.

B. Secrets and the Government

Under FOIA,[20] all Government records must be disclosed upon request, unless the Government can demonstrate that the information in the record falls into a specific, narrow exception on a short list set out by Congress -- and even then, the Government must disclose a redacted version if feasible. Of the exceptions on that list, five are routinely relevant to the Government's biological and medical research. They are exceptions for trade secrets,[21] internal decision-making,[22] personal information of a private nature,[23] unfiled patent applications in which the Government owns an interest,[24] and certain research information generated under a "Cooperative Research And Development Agreement," or "CRADA"[25] (a topic discussed in more detail below). This arrangement presents a dilemma for the NIH.

On the one hand, from a scientific perspective, data should be meticulously collected, organized, and carefully analyzed before drawing bold conclusions; it is potentially irresponsible to release such conclusions that have not been grounded in properly collected data, particularly if the conclusions have not undergone some substantive review. This is especially true where the premature release of unsifted information would be misleading. Further, NIH acknowledges that private research facilities have a legitimate need to protect their trade secrets and individuals have the right to privacy; NIH understands that these parties will not cooperate with NIH if the confidentiality of their information will not be protected.

On the other hand, even apart from the commands of FOIA, NIH has strong reasons to support disclosure of all research results as quickly as possible. For example, because the most talented scientists cannot advance their careers if impediments block their ability to publish important results in a timely manner, they will instead work in a more publication-friendly environment. More importantly, the bedrock mission of the NIH is to uncover new knowledge that will lead to better health for everyone. NIH depends on the rapid communication of research results to advance that mission. As a policy, NIH is strongly committed to the principle that scientific advancement relies on the unfettered and rapid dissemination of information. NIH will never approve any agreement in which a private entity has substantive control or veto power over the research publication of one of its scientists, lest valuable information which was developed by taxpayer funds be stifled to further private interests. On this point NIH will not negotiate.

As a compromise, NIH strives to draw a line between the information provided to NIH, and the research results derived from that information. NIH will work with collaborators to protect legitimate trade secrets from inadvertently being disclosed in publications. Specifically, NIH will delay disclosures enough to give collaborators a reasonable opportunity to file patent applications on discoveries. Also, NIH will seriously consider any requests by collaborators to redact or edit manuscripts and other disclosures before they are made public. Nonetheless, NIH must retain final authority to decide whether to go ahead with a given disclosure.

C. Anatomy of a CDA

A normal CDA always addresses four major points,[26] in one form or another. First, it

identifies the information. Second, it names the parties. Third, it states how the confidential information itself will be handled. Fourth and finally, it specifies the term. Occasionally, some agreements discuss rights to intellectual property -- both that which exists prior to any disclosure under the agreement, and that which is discovered because of the disclosure, should any arise -- but this is not a legally necessary term.

The information to be disclosed defines scope and reach of the agreement. Consequently, this is the single most important part, and a well crafted CDA will clearly identify the information to be disclosed. Unfortunately, there is a tension between the Provider of the information, who typically wants the definition to be as broad as possible, and the Recipient, who wants it as specific as possible. Also, the Provider will not want the CDA's description of the information to incorporate the confidential information itself.

Nevertheless, some description should be fashioned that will make clear to the Recipient exactly what the Provider expects the Recipient to keep confidential. Also, as a matter of reasonableness, the agreement should specify those situations where information ostensibly provided under the agreement will not be deemed confidential, such as: (a) information which is or becomes public through no misdeed by Recipient; (b) information which Recipient lawfully receives from a third party, which Recipient already knows, or which Recipient independently creates; and (c) information which must be disclosed by force of law.

Next, identifying the parties is simple, yet surprisingly often it is botched by making the *individual* receiving the information sign as the party, rather than the individual's employer. One reason this is a mistake is the question of agency -- Providers have essentially no protection if they ask individuals to sign agreements on behalf of their Recipient-employers, unless the

individuals' authority to do so is apparent. Even if agency is not an issue, another problem lies in the hidden trap which caught Gillian Niher when she signed Neurion's CDA in her personal capacity: She breached her CDA merely by telling her Scientific Director and Lab Chief about Neurion's information -- not to mention by telling John Rogers at Smallville -- and any measures in breach specified in the CDA could be invoked against her.

How the confidential information will be handled by the parties is usually where the meatiest negotiations occur, because the possibilities are virtually endless. For example, though parties typically agree that written materials claimed to be confidential will be marked as such, how will oral disclosures be treated? What measures will be taken to control who at Recipient's lab will have access to documents? When the agreement ends, what will be done with the documents, and for how long will Provider's rights survive? If the Recipient wants to publish, what steps will Recipient have to take to ensure the publication does not contain Provider's confidential information? What will Provider's rights be if Recipient is ordered by a court to disclose the confidential information? Each of these issues could be negotiated, within the policies of the parties.

Finally, the agreement should have a clear, specified ending point. Some Providers ask for (and receive) promises to keep information confidential indefinitely. However, as Ben Franklin once wrote in Poor Richard's Almanac, "three can keep a secret, if two are dead" -- in other words, the more who know a secret, the shorter its secret status will live. In addition, the dizzying pace at which biomedical technology is advancing strongly implies that the commercial value to a piece of confidential information depreciates rapidly, even if competitors never learn the secret. Consequently, a reasonable term to keep a secret should reflect the true life of the

secret, little more. This is particularly important in the academic world, where the act of dissemination is the source of value for information. The NIH policy is that it will keep information given to it confidential for three years, which can be extended for an additional two years upon request -- subject, of course, to the limitations imposed by the Freedom of Information Act. Even for non-Government parties, only in the most unusual circumstances is it even meaningful to promise to maintain a secret for more than five years.

Intellectual property is only occasionally a true issue. Most parties appreciate the unlikelihood that the Recipient will invent something immediately and directly upon seeing the Provider's confidential information. Others, comfortable of the strength of their background patent position, do not concern themselves with what might happen if someone improves on the technology. In both of these cases, the agreement will state at most that ownership of patentable discoveries will be governed by patent law, and no licenses are promised.

Still, some Providers (usually small companies having a single core technology in a competitive market) will insist that they be promised certain rights in anything invented by the Recipient as a direct consequence of learning the confidential information. Companies and universities may, under the circumstances of the moment, decide that the benefit is worth the risk, and agree to such a term. The Government can never do so under a CDA. With the singular exception of a CRADA (discussed below), any term in an agreement that purports to promise rights in future Government inventions -- including even the option to negotiate a license -- utterly lacks authority under the law.

III. Agreements to Transfer Materials

A. The Basic "Material Transfer Agreement," or "MTA"

1. *Background*

A widely acknowledged axiom of academia is that the widest possible circulation of research materials is crucial to maintaining the pace of research. For years, and even today, little more than packing receipts, cover letters, or bills of lading document many transfers of materials. The NIH is searching for constructive methods of transferring materials without any kind of documentation, or at least to minimize the amount of paperwork required.[27] However, companies, and even a few universities, have begun to see the possible profits to be reaped by controlling the flow of the unique and useful things they have made. Others, moreover, have realized their vulnerability to product-liability lawsuits (not to mention accusations of theft of trade secrets and patent rights, in addition to theft of the material itself). Accordingly, agreements to document the transfer of materials have begun to proliferate tremendously. For the foreseeable future, the MTA is here to stay.

Fundamentally, a Material Transfer Agreement should be a simple, routine, and innocuous agreement not to do anything unethical or stupid with the transferred material. Occasionally, the unique nature of the material to be transferred genuinely demands special treatment. Other times, the value of the material to the provider will justify added consideration. Nonetheless, the MTA should be an easy agreement to establish, even taking care to avoid the major pitfalls and accommodate the needs of an unusual case.

In principle, each pending MTA represents a set of experiments that are not being done because of paperwork. In practice, MTAs can get bogged down by posturing, or by unrealistic expectations of one of the parties, or perhaps by the inaction of a provider who is cooperating

only out of courtesy and cannot be bothered to hurry. Still, no matter how tempting cutting corners or bypassing procedure may seem, a failure to take care can create problems such as those suffered by Gillian.

2. *Anatomy of the MTA*

A normal MTA will address the following separate topics: (i) Identifying the provider and recipient; (ii) identifying the material; (iii) how the material will (or will not) be used; (iv) how confidential information regarding the material, passed to the recipient incidental to the material transfer, will be maintained; (v) recipient's rights with respect the material itself; (vi) the term of the agreement; (vii) indemnification and warranties; and (viii) inventions derived from the use of the material. The MTAs now in circulation have particular terms that range from the truly innocuous to the truly outrageous. Each has its pitfalls for the unwary.

(i) *Parties.* As with every agreement the MTA should identify everyone involved -- namely, the provider, provider's scientist, the recipient, and the recipient's scientist -- but clarify that the scientists are not the actual parties to the agreement. Again, this serves the very clear purpose of specifying who has agreed to be bound by the agreement, and who is responsible if it is not carried out. So, when Dr. Niher signed Neurion's MTA in her personal capacity, she was personally bound by whatever terms Neurion had demanded, reasonable or unreasonable.

More and more, providers of material are demanding that all people who will handle the provided materials must actually sign an agreement in their personal capacities. To be sure, there is some wisdom in requiring that the recipient scientist acknowledge, in writing, having

received the MTA, having read it, and having understood the terms under which the materials were transferred. Even so, in the overwhelming majority of cases, forcing the recipient scientist to be bound personally is pointless overkill, because the recipient scientists are already bound by employment agreements, because other tort-based remedies exist regardless of whether the recipient scientist signed the MTA, and because the maximum damages for the breach of a contract such as this rarely will rise anywhere near a lawyer's litigation fee.

(ii) *Materials*. The MTA must also specify the materials to be transferred. Though this also is obvious, not all descriptions of materials are created equal. For example, some MTAs define the "Materials" to include all "derivatives," regardless of whether the derivative incorporates any part of the original material. If the original material is a plasmid and the derivative is the plasmid incorporating an inserted oligonucleotide, this term may be understandable, but what if the original material is a cell line to be used to screen candidate drugs? Arguably, any drugs discovered or designed using the screening cell line could be construed as a "derivative." Although everyone should watch for this subtle attempt to reach into future inventions (*i.e.*, defining the "material" as including anything invented with it), Government labs must be particularly careful here: Because rights to future inventions cannot be promised under the MTA, such a "back-door" transfer of invention rights would be unlawful.

One issue of particular concern to the NIH is the status of the materials -- are they for sale? The MTA is authorized for the purpose of enabling research, and no other purpose. So, if the materials could be purchased in a catalog, the MTA is not an appropriate mechanism. If a private-party recipient can buy a particular material, the recipient should pay for it; the NIH is not a manufacturer or retailer, let alone a free supplier of commercial materials. Likewise, if

NIH scientists can buy materials from competitive retailers, the use of the MTA to circumvent the procurement laws and regulations would be inappropriate, and possibly illegal.

(iii) *Uses*. The MTA should include a brief research plan, and clearly state prohibited activities -- *in particular,* that the research materials should not be used in humans. Essentially, these provisions serve two purposes, namely, they put the provider on notice of the nature of experiments the recipient plans to do, and they instruct the recipient not to do anything else. If Gillian had sent the plasmid to John Rogers under a formal MTA (assuming she was not prohibited from doing so by a prior MTA with Neurion), then she would have had a clear, easy answer to the Congressional inquiry: John agreed in writing not to test the plasmid in humans; if he broke the agreement by doing just that, Congress should be asking *him* why he did it.

(iv) *Confidentiality*. Confidentiality should be addressed, but rarely does this present a problem. If documents containing trade secrets about the material are transferred with the material, and to the extent the material itself constitutes a trade secret, confidentiality should be preserved; if the provider is still worried, the provider simply should not send those documents. Occasionally, however, companies will insist that certain limitations be placed on the recipient's ability to publish results. These limitations vary, from a mere 30-day delay (but only to permit the filing of patent applications on discoveries) at one end of the spectrum, to the right to review and redact in the middle of the spectrum, to the absolute right to prohibit any disclosures of any kind in perpetuity on the far end. Although private parties may negotiate whatever terms match their policies, the NIH has a strict, essentially non-negotiable policy never to permit any private party to control the NIH scientist's prerogative to publish. Because NIH wants to collaborate, however, NIH will seriously consider any comments collaborators have,

and will accommodate any reasonable request to redact confidential information not absolutely necessary to publish.

(v) *Rights in the Materials*. As a general principle, the standard Material Transfer Agreement creates, in legal terms, a "bailment." In other words, the relationship between the parties, the scientists, and the materials is analogous to the relationship between a restaurant, the restaurant's coat-check host, a guest, and the guest's coat. If the guest, five minutes later, demands the coat back, the host cannot refuse to deliver it. The host may not do with the guest's coat as the host sees fit, even if the host's actions are for the guest's personal benefit, and even if the guest has paid for the coat-check service. Likewise, the recipient of research materials under an MTA may hold the materials, must return or destroy the materials upon demand, and may use the materials only as the provider says the recipient may. The recipient under an MTA does not have *any* ownership rights in the physical material transferred, even after the provider has asked the recipient to destroy the material.

The bailment relationship should be (and normally is) detailed in a term in the MTA. This term usually states that the recipient will have a limited license to use the materials, but that the provider retains title. The MTA often will state that the recipient will keep control over the materials, and will not permit anyone to handle or use the materials other than those under the recipient's direct supervision. The MTA should state that the recipient will not transfer the materials to any third party without the written consent of the provider. All of this is routine, and even recommended.

(vi) *Termination*. Every contract should have a clear terminating event. That event could be mutual consent, or unilateral request by provider, or the delivery/consumption of

goods, or the creation of a joint work-product, or a simple expiration date. This is purely a matter of practicality. It addresses, for example, how long information must be kept confidential, how long the recipient has to track the MTA, which rights, if any, continue after the material has been consumed, and if some do, for how long. Although parties certainly can agree to make an MTA last indefinitely, the absence of a formal termination event could cause bad feelings if each party's understanding is inconsistent with the other's. This is especially important where materials may sit in storage for years, long after the original recipient scientist (who understood the limitations imposed on the provider's materials by the MTA) has moved on to another position elsewhere. The most recent version of the PHS Model MTA states simply that the recipient of materials will protect confidential information relating to the materials for a term of three years, which may be extended by another two years upon written request by the party providing the materials.

(vii) *Warranties and Indemnification*. Routinely, private parties to contracts make certain promises to each other that are beyond such matters as quantity, delivery date, price, etc. Promises such as these often amount to warranties and indemnification. These terms should be approached with great caution, and under the advice of an attorney. This is because such terms can create liability beyond the "four corners" of the agreement itself.

A warranty is a special promise, above the promises normally included in a contract, that a certain relevant fact is true.[28] In the ordinary sale of retail products, for instance, the merchant provides the consumer with the promise that the product in the box is what the label on the box says it is (called a "warranty of merchantability") and does what the merchant claims it will do (a "warranty of fitness for a particular purpose"). The warranty may be expressly stated, implied

by the context, or imposed by law. If not forbidden by a law, parties may agree to waive certain warranties that ordinarily would apply automatically. In the absence of a warranty, if the merchant breaches a contract, the other party gets the dollar-value of the contract as damages -- you get your money back -- and no more. If a warranty is provided, and the promised fact turns out not to be true, the warrantor may be held liable for *all* foreseeable, consequential damages above the dollar-value of the contract, provided the damages can be shown to have been caused by the breach of warranty.[29]

Research-related contracts often disclaim any warranty of merchantability and fitness for any particular purpose. These warranties were created to protect consumers against shady merchants selling shoddy goods. Such warranties, however, are rarely necessary to protect researchers handling materials of unknown properties and hazards -- researchers are normally expected to be careful with such items. Also, agreements in the research arena routinely disclaim any warranty that materials being transferred do not infringe some third-party's intellectual property rights. Sometimes, however, a provider of material will insist that the recipient warrant such things as that the NIH's investigator will comply with the laws of a certain country (other than the U.S.), or that the terms of the MTA do not conflict with any other agreement entered by the U.S. Government. Facts such as these would be impossible for the NIH to ascertain, and so a warranty regarding these facts could be disastrous.

Indemnification essentially is a promise in the other direction: The customer promises the merchant that, if the customer does something stupid with the product that injures someone, and this third-party sues the *merchant*, the customer will "step into the shoes" of the merchant for the purposes of defending the litigation, including paying lawyer's fees, as well as paying any

judgments against the merchant if the merchant loses. Suppose in Gillian's case, for example, when she signed Neurion's agreements, she agreed to indemnify Neurion against any third-party law suit concerning the materials she got from Neurion or arising from her use of them. If so, then even though she did not manufacture the materials, and even though she did not tell anyone that the materials were safe or would work properly, she could be forced to pay any judgments imposed on Neurion for making an unsafe product.

Indemnification creates a particular problem. Companies and universities routinely acquire liability insurance specifically to cover litigation expenses, and though individuals often do not do so, they can -- but Agencies of the U.S. Government cannot indemnify anyone unless Congress expressly says otherwise. Under the Adequacy of Appropriations Act[30] and the Antideficiency Act,[31] a Government Agency may not incur a debt or liability greater than the amount of money Congress has appropriated to that Agency. Indemnification is an open-ended promise to pay whatever is assessed, even if that assessment exceeds the Agency's budget. In the worst case, any Government employee purporting to incur such a liability on behalf of the Government could be subject to criminal sanctions.[32] At best, when a company which thought it had secured indemnification from the Government learns the truth, the company may believe that the scientist and the Government negotiated in bad faith.

(viii) *Inventions -- "Reach-Through" Rights*. The terms in MTAs relating to intellectual property are often the most nettlesome of all, because they directly address the diverging views regarding how research material should be treated. Generally, a consensus has arisen that the clinical -- *i.e.*, purely diagnostic, prognostic, or therapeutic -- uses of materials are uses that may be restricted by those who invented them to enable the inventor to recoup its

investment, and perhaps make a profit. For example, if a new, patented chemical is found to treat a disease, the inventor/patent-owner should be able to control who can sell this new drug. The question is the extent to which pure-research uses should be similarly restricted. In other words, if the new drug were being used to explore the mechanism of action of a cellular process unrelated to the condition the drug was invented to treat, should the inventor/patent-owner be entitled to extract large royalties for each experiment -- or perhaps claim rights in discoveries made out of those experiments?

Industry traditionally views all of its creations as things that required a capital investment and which can provide a source of revenue. Some even believe that all discoveries made using the creation, which could only have been made using the creation, are really part and parcel to the original creation. In various forms, some in industry now ask for so-called "reach-through" rights. Specifically, in exchange for the use of the materials, the provider would get some kind of rights in anything the recipient invents. Sometimes the provider asks merely for an "option" to a license, to be negotiated later; other times, the provider asks for a pre-negotiated license, often royalty-free, occasionally exclusive (*i.e.*, no one can develop the invention but provider); a few ask for total assignment of any inventions.

Academia views inventions as the practical consequence of theoretical discoveries, and that the former should serve the latter, not the other way around. Otherwise stated, any use of an invention that serves purely to investigate facts should be free and unfettered. Exorbitant fees or powerful reach-through rights, therefore, create barriers to research and learning, to the free flow of ideas. If a particular road to the development of a technology contains too many toll booths, the researcher will be forced to search for other, probably less efficient routes.

Additionally, at least from academia's point of view, the mere fact that someone has asked for reach-through does not necessarily mean granting it would be fair or reasonable. If person A sells person B a screwdriver, should A be allowed to claim ownership of every piece of equipment, and perhaps every building, B builds with it? Aggressive reach-through by industry creates an even larger barrier for Government researchers, because the Government is extremely limited in its authority to grant license rights, even when the grant is appropriate. In fact, the only mechanism now existing for a Government laboratory to promise a private party present rights to the laboratory's future inventions is through a CRADA, discussed below.

B. The "Uniform Biological Material Transfer Agreement," or "UBMTA"

In the early 1990s, various non-profit research organizations, universities, and the NIH together realized that the MTA was an annoying, bureaucratic nuisance. All agreed on the major principles governing the transfer of materials among each other; all agreed not to do anything unethical or stupid with each other's research materials. So, they wondered, why must every MTA be re-negotiated? To avoid the unnecessary extra paperwork, the academic community created the UBMTA[33] -- a "treaty," for lack of a better description -- to which any non-profit organization or university could become a member. Under the UBMTA, any signatory could transfer materials to any other signatory, using a pre-negotiated form which could be signed directly by the scientists doing the transfer, rather than an administrator. The UBMTA is not mandatory, so that if the provider has a special interest in the transferred materials (say, because the technology is exclusively licensed to a company), the provider could revert to the standard MTA process.

To the extent it has been utilized, the UBMTA process has dramatically streamlined the process and decreased the time needed to arrange for the transfer of materials among members. Unfortunately, the UBMTA has not been used as much as it might be. Part of the reason appears to be a lack of awareness that the mechanism exists, and another part seems to be that the UBMTA is a confusingly written document. The largest part, however, appears to be the fact that universities and non-profit organizations are marketing their technologies more aggressively, signing exclusive arrangements with companies more often, and thus finding that the UBMTA is not adequate. Still, it remains a valuable tool.

C. The "Clinical Trial Agreement," or "CTA"

Obviously, Gillian Niher could not have brought Neurion's materials to NIH under the MTA, because MTAs expressly prohibit using transferred materials in humans. To address this limitation in the MTA, some of the Institutes have developed a variant, which would permit them to use received materials for clinical purposes. The Clinical Trial Agreement is, at its heart, an expanded MTA. In addition to all the topics arising under the MTA, the CTA addresses other issues specific to clinical trials. A well crafted CTA should reflect, at a minimum, special consideration relating to protocol drafting, regulatory filings, interactions with regulatory agencies, use of data, and how the agreement might be terminated in the middle of the clinical trial without endangering the patients enrolled in the trial.

Because the provider does not have to participate in the research under a CTA, the CTA should make clear the provider's role. Some providers are pleased to be passive, particularly those who have little or no experience in running clinical trials or interacting with the US Food

& Drug Administration ("FDA"); other providers want at least an equal role as the NIH in drafting, reviewing, and approving any protocols, and in analyzing the data. NIH is flexible, provided that no outside party has the authority to command NIH personnel, restrict NIH research, or veto NIH publications.

Additionally, the CTA must clearly state who will be responsible for filing any regulatory documents with the FDA, such as an Investigational New Drug application ("IND"), necessary to enable the research to begin. Because INDs are expensive and complicated, companies often are happy to let NIH bear responsibility for filing the IND if the NIH is so inclined. If NIH is going to accept that responsibility, however, the provider should agree to send NIH the necessary formulation data -- or, at least, the provider must give NIH access to a Drug Master File.

As a matter of law, the holder of the IND is responsible for reporting adverse events,[34] and for participating in any direct interactions with the FDA.[35] When NIH holds the IND, some providers want to participate in this process, and some do not; the term is negotiable. If the provider holds the IND, however, the NIH must have the right to file its own adverse event reports, and must be permitted to participate in any meetings with the FDA. This is to ensure that information negatively affecting the product being tested will be timely disclosed to the FDA. Almost all companies would never suppress such data, but the temptation for a company, which may be depending on the success of the product, to put a misleading spin on damaging information can be enormous. Physicians who are participating in the trial have a legal duty to report adverse events; the failure to do so could lead to administrative, or even criminal, penalties.[36] Consequently, NIH would rather risk insulting a company, and insist on retaining this right.

Normally, a CTA will state that each party will share with the other all raw data generated under the clinical trial, provided the confidentiality of the patients in the study is adequately protected. Further, each party normally has the right to use the data for its own purposes (reserving to each party, of course, the right to file patents on the inventions of its own employees). The parties may, if they like, agree to publish jointly; however, the NIH will always reserve the right to publish independently if the provider declines to join in a particular publication.

Finally, some term should address what happens if one or both of the parties determines that the agreement should be terminated before the protocol has been fully carried out. As a matter of medical ethics, a doctor should not be forced to abandon a viable course of therapy already being administered to a patient due solely to a provider's refusal to continue providing the therapeutic agent. On the other hand, providers do not want to be forced to continue squandering significant resources on a project they have determined will not be profitable. Fortunately, there are several mechanisms to protect both parties' needs. For example, the provider could agree to provide enough agent at the beginning of the trial to supply the entire protocol. Alternatively, the provider could give NIH a license, plus information on the manufacture of the materials, to hire a contractor to make enough agent to complete the trial (if NIH cannot make the materials itself). The mechanism is negotiable, even if the principle is not.

D. Other Specialized Material Transfer Agreements

1. *Materials In Repositories*

The point of a repository is to enable researchers to access samples of research materials,

typically biological materials, from a centralized source. Some of the Institutes at the NIH maintain repositories of biological materials, including transgenic animals, cDNA clones, and viruses. The NCI maintains a special repository of natural products collected from around the world. Private entities, such as American Type Culture Collection and the Jackson Laboratories, maintain repositories for public access.

Use of repositories raises one common issue relating to MTAs, specifically, relating to "background rights." When the creator of the materials places a supply in the custody of a repository, the creator may have filed patent applications on the materials, and may demand that the repository put restrictions on the further distribution of the materials. Normally, these restrictions are similar to those that would appear in a standard MTA (*i.e.*, don't do anything stupid or unethical with the materials). Occasionally, the creator demands that the repository extract "reach-through" rights from any recipient for the benefit of the creator. Those who would access a private repository should be vigilant for such terms.

The NCI natural-products repository has a unique twist, which is serving as a model for transnational research in other arenas. NCI's authority under the law to control what happens to materials it sends out of a repository is severely limited. Because most of the materials were collected from developing countries, the NCI negotiated agreements with these countries, trying to find ways within U.S. law to ensure that a significant portion of any economic benefits derived from materials collected would flow back to the country of origin. Ultimately, the NCI established a Memorandum of Understanding with each source country, which has resulted in the favorable cooperation of -- and even collaboration with -- the local scientists and universities in these countries.

2. *Software Transfer Agreements*

Suppose a scientist at NIH wants to work on software now under development. If the software was written by a potential collaborator, can a *Material* Transfer Agreement be used to allow the collaborator to transfer the software? Alternatively, what about transferring the software out? The answer to both is a qualified "yes."

On a superficial level, the use of an MTA should be legally sufficient to permit the transfer of the physical floppy disk or CD containing the code. On a deeper, more theoretical level, the issue is somewhat more complicated. Specifically, it is not clear whether the NIH's authority to transfer biological materials[37] includes the intangible essence of software code (separated from the physical media on which it is written).

Regardless, an agreement to transfer software must always conform to all laws and NIH policies, such as that the software is not commercially available, and that the provider does not demand reach-through to NIH inventions. The NIH Office of the General Counsel has approved use of a software transfer agreement by some of the Institutes; hopefully the PHS Technology Transfer Policy Board soon will adopt a version as the PHS Model Software Transfer Agreement.

IV. Collaboration and Inventions: The "CRADA"

A. Background

Uncounted collaborations occur every year that are never formally documented, that are never embodied in any kind of contract. When the collaboration becomes complicated, or when the nature of the research requires the employers of the collaborating scientists to commit significant materials, or when one or both parties is worried about how rights to inventions will be handled, some kind of written agreement is obviously required. For private parties, the possible terms are essentially limited only by each party's policies and available resources. For the Government, matters are not so simple.

When a Government employee invents something, the employee must assign ownership rights to the Government.[38] Yet, the core mission of the NIH is to conduct research to improve the public health, not to sell products and make profit. Therefore, when someone at the NIH discovers a new prognostic/diagnostic tool or a new therapy, the NIH is unable to commercialize products embodying the invention -- *i.e.*, engineer mass production, tap distribution channels, market, and sell -- only private parties can do that. The law requires the Government to offer the opportunity to license Government inventions to all interested parties in open competition -- in a sense, the public owns each Government invention, so everyone (the public) should have fair access to every opportunity to acquire rights in each invention.

This arrangement is appropriate for NIH inventions made purely by NIH personnel, but what about inventions through a collaboration? Indeed, these laws made companies nervous about collaborating with Government labs, as the companies had no assurance that they would have rights in inventions their work enabled. For example, a company probably would be reluctant to collaborate with the government on an improved analog to the company's main drug, if they feared the government would license the analog to another company to increase

competition. In particular, small companies worried that larger companies could out-bid them, even though the small companies' collaborative contributions made the invention possible.

So, in 1987,[39] and through updates in the ensuing years,[40] Congress further authorized Government laboratories to enter a "Cooperative Research And Development Agreement," or "CRADA," which provided the laboratories a measure of flexibility in arranging such collaborations. For this purpose, each Institute of the NIH constitutes a "laboratory." As of now, the CRADA is the only legal mechanism by which a Government laboratory can, in the present, promise a collaborator certain rights in inventions yet to be created by the Government as a consequence of the collaboration. The CRADA discussed in this chapter, therefore, is unique to Government/private collaborations (though the principles involved may have applicability beyond this particular scope).

B. CRADA Basics

Foremost, the keystone of a CRADA is collaboration. Each party must contribute some intellectual effort towards a specific research project. That collaboration drives the process of developing the agreement, and, in turn, that process is designed to authorize the negotiation of terms in the agreement suitable to enable the project.

Under a CRADA, the Government laboratory may:

- contribute physical resources to a collaborator;
- dedicate staff time to a project;
- permit a collaborator's staff to work in Government facilities without requiring that staff member to assign all inventions to the Government (as is usually required[41]); and
- promise the collaborator an exclusive option to elect an exclusive or nonexclusive license (collaborator's choice) in any Government rights in any invention that will be conceived or first reduced to practice in the conduct of research under the

CRADA.

The CRADA is not a grant, procurement contract, or other "funding mechanism;"[42] in other words, the Government laboratory is prohibited from transferring Congressionally appropriated funds to a CRADA collaborator, under any circumstances.

Under a CRADA, the collaborator may:

- contribute resources to the Government laboratory;
- dedicate staff time to a project;
- permit Government researchers to perform their CRADA-related research in the collaborator's facilities; and
- transfer funds to the Government for the laboratory's use in carrying out the CRADA.

In addition, essentially all the issues pertinent to CDAs, MTAs, and CTAs can arise in the negotiation of a CRADA. Finally, the CRADA has some additional, administrative twists unique to the nature of the agreement, which will be discussed in more detail below.

As is obvious, the CRADA involves resolution of a wide variety of important issues. Consequently, an understanding of what a CRADA comprises can smooth the process greatly. The fastest NIH can establish a CRADA is about a month, though complicated cases have required a year of negotiations, and even more. A rough estimate for the time needed to establish a new CRADA is between four and eight months, depending in large measure on how fast and flexible the *collaborator's* review process is. For the NIH, the major stages include selecting a collaborator, negotiating the agreement, institutional review of the agreement, and finally, execution by the parties -- each of which will be discussed in turn.

1. *Selecting the Collaborator*

In the vast majority of cases, the selection of a CRADA collaborator is one of the

simplest of the four main phases. Occasionally, however, this process presents a serious hurdle. These hurdles can be grouped as either fair-access or conflict-of-interest.

By law, a Federal laboratory must provide every possible collaborator "fair access" to any opportunity to enter a CRADA.[43] In the vaguely related context of selecting contractors to perform a service or selecting merchants to sell goods to the Government, the Federal Acquisition Regulations thoroughly specify the procedure for ensuring that any interested party can apply for the opportunity. For CRADAs, in contrast, this process is not so well defined, with good reason. In the overwhelming majority of cases, a given research collaboration can *only* be done with a single collaborator. For instance, a CRADA to develop the collaborator's patented new drug cannot be done by anyone but the owner (or licensee) of the patent. In such cases, no purpose would be served by opening the selection process to a competitive bid. Still, the Government is not permitted pick collaborators in an arbitrary or capricious way -- the selection must always be reasonable under the circumstances.

As a general rule, if research under a CRADA genuinely depends on access by the Government to a prospective collaborator's proprietary technology, unique expertise, or unique facilities, "fair access" is deemed satisfied without any effort having been made to find someone else (because no one else would suffice). This is not as beneficial for collaborators as it might appear at first blush, however, because the CRADA research would be circumscribed by that uniqueness. The laboratory would be free to initiate CRADAs on similar themes utilizing other technologies -- provided, of course, that the laboratory can satisfy all the requirements of each CRADA, and that the research plan of each CRADA does not overlap any other. For instance, a laboratory having a new cDNA library may initiate one CRADA with a gene-array maker using

their propriety chip technology, and another CRADA with a company with unique protein-analysis technology to create an expression profile for this cDNA library. Indeed, in principle, if the research plans were written specifically enough and the research carefully segregated, the laboratory could engage in more than one CRADA to analyze different proteonomic aspects of the library, limiting each CRADA to research utilizing that collaborator's unique technology.

For those cases where access to a particular technology is not a necessary prerequisite, the laboratory may announce to the world that a CRADA opportunity exists, and permit anyone interested to submit a research proposal. Again, unlike the Federal Acquisition Regulations, the law governing CRADAs provides no formal guidance or specific mechanism for making such announcements. At a minimum, publication in the Federal Register should suffice, but there is no limit to the venues that may be used for announcing. Thereafter, if one collaborator is selected on the basis of a proposal submitted under that announcement, others would have little grounds for complaining on the basis of "fair access."

A question often arises in the selection of collaborators, namely, whether a Federal laboratory can enter a CRADA with either a non-profit entity or a company based outside the United States. The answer to this question is yes for both kinds of collaborators, with certain caveats. For example, in a collaboration with a non-profit entity, particularly universities, the parties must consider how the products that might be developed under the CRADA will be commercialized. Also, unlike private parties, the Federal laboratory has limited authority to control the flow of money, which makes sharing royalties a tricky endeavor. These are issues the non-profit entity should consider before embarking on the negotiation for a CRADA, as the terms will have to be carefully crafted. For a foreign company, the law governing CRADAs

requires only two things: (1) if two parties apply for the same opportunity, and if one is a U.S. company and the other is a foreign company, the Federal laboratory must give preference to the U.S. company;[44] and (2) for any U.S. rights in inventions licensed to any collaborator, the collaborator must manufacture in the U.S. any products it sells in the U.S.[45]

Assuming the collaborator is appropriately selected under "fair access" principles, the other hurdle to cross before negotiations can begin is to confirm that the NIH's Principal Investigator (PI) will not have a conflict of interest. For example, if the PI owns stock in the prospective collaborator, or is in the process of negotiating employment with the prospective collaborator, the PI's independence could be questioned, even if not actually compromised.[46] To avoid such problems, the NIH has designed a "Conflict Of Interest and Fair Access" questionnaire for its PIs to complete and submit to their Ethics Officers for review. This process protects the PIs from accusations of unfairly steering opportunities to favored companies. Further, the review uncovers subtle problems in the selection process before the negotiations become too involved, usually in time to address them to the satisfaction of everyone.

2. *Negotiating the Agreement*

Once the collaborator has been appropriately selected, the negotiations may begin. A complete CRADA should have at least three parts: (A) the Research Plan, which includes specific commitments of particular actions by each party; (B) the commitment of specific resources by each party; and (C) the terms provisions that make the agreement operational under the law. Other items can be included, if the parties see fit. At NIH, in order to make the review process more efficient, these three parts are written as separate documents that are attached to the

back of a copy of the unmodified PHS Model CRADA (called the "boilerplate") as appendices, rather than integrating them into a single document.

(i) *Appendix A: The Research Plan*. The Research Plan ("RP") should serve three functions. First and foremost, it should lay out exactly what each party will do. The more specific these allocations of work are, the less likely confusion over responsibilities will be. Second, it should circumscribe the activities, so that activities "outside" and "inside" the scope of the RP can be readily distinguished -- which, in turn, defines which inventions are governed by the agreement and which are not. For example, if the RP contemplates incorporating an antigen into a vaccine, the inadvertent discovery that the purified antigen makes a wonderful shoe-polish would not be a subject invention. Third, if the NIH invents something and the collaborator elects the option to a license, the collaborator is entitled under the law[47] to a *pre-negotiated* field of use; the NIH's normal pre-negotiated field of use is "the scope of the RP."

Although not absolutely required, a Research Plan may also incorporate additional information to serve other functions. For example, the RP presents a useful opportunity to explain the background of the technology, to highlight the experience and interests of the NIH PI, and to explain in detail why the selected collaborator is particularly suited to the project. Also, the RP can contain an agreed abstract for public release, which each party understands up front may be freely disclosed to the public at any time by the other. Having such an abstract is especially important for NIH, which must often answer regular FOIA requests for routine data relating to CRADAs. Companies also appreciate the reduced risk offered by such an abstract, as they no longer have to worry about reviewing every proposed disclosure for these routine FOIA requests. Finally, the RP can include such other useful information as the parties deem

appropriate, like a list of the most relevant publications, background patents owned by each party, and any prior agreements between the parties.

(ii) *Appendix B: Financial And Material Contributions*. In NIH CRADAs, "Appendix B" contains the commitment of physical and financial resources. Specifically, this part of the CRADA spells out exactly what materials, facilities, equipment, and staff will be committed by each party, and the funds (if any) that the collaborator will provide to the NIH. Each Appendix B is unique; there is no requirement that every CRADA involve the commitment by either party of any particular one of these items. Ultimately, the resources to be committed by each party will depend on the research that each party wants to perform. If, for example, the collaborator wants the NIH to perform an experiment using a particular piece of equipment neither party owns, the collaborator may choose to buy the equipment and loan it to NIH, to hire a contractor to run the experiment, or to give the NIH lab money to buy one -- or, the NIH lab will have to decide whether to purchase the equipment directly. If neither the collaborator nor the NIH laboratory can afford it, or if each could pay but is unwilling to bear the expense for other reasons, the research plan would have to be modified or scaled back.

The funding aspect of CRADAs offers a particularly useful source of opportunities to Government laboratories. First, funds transferred by the collaborator to the Government may be used to hire personnel -- who will not be subject to the hiring ceilings otherwise imposed by law. Second, unlike appropriated money, funds transferred to the Government under a CRADA may be kept by the laboratory for the duration of the CRADA, and it will never revert to the U.S. Treasury. Third, subject to routine ethics-review, the funds can be used for the travel-related expenses of Government researchers in carrying out the CRADA. Further, receipt of CRADA

funds and materials allows the PI to explore additional, perhaps costly experiments that would not otherwise be supported by the lab's budget. Of course, the laboratory must regularly account to the collaborator how the funds are spent, the funds must be used to pay for CRADA-related materials or activities, and any unobligated funds at the end of the CRADA must be returned to the collaborator.

The funding aspect of the CRADA also benefits companies. For example, it presents a way for a company to support particular Government research that is of interest to the company, without running afoul of the ethical concerns implicated in the gift process. Also, companies that do not have large budgets may be able to fund CRADA research with money received under a Federal grant, such as the Small Business Innovative Research program. As long as the research project of the CRADA is distinct from the research project under the grant, such grant money can be used in this manner. In exchange, the company receives a wealth of expertise not available from any other source in the world -- not just in a particular scientific field, but also in regulatory filings.

With respect to this funding aspect of the CRADA in particular, one point should be clearly re-emphasized: The foundation of every CRADA is intellectual collaboration. Although the CRADA mechanism offers NIH labs the opportunity to supplement the resources they receive through routine channels, this aspect should not dominate the CRADA. If the only reason a lab has for entering a CRADA is the material support, the use of the CRADA mechanism is inappropriate. Reciprocally, if the CRADA collaborator is only interested in acquiring a "pair of hands" for the collaborator's benefit, and has no interest in the intellectual contributions of the NIH scientists, there is no collaboration and the CRADA is not appropriate,

even if the laboratory is willing to assist the collaborator.

(iii) *Appendix C: Modifications To The CRADA Language*. Appendix C contains changes to the CRADA boilerplate language. Some of the language in the boilerplate is little more than a restatement of existing law. For example, the mandatory Government licenses to collaborator's subject inventions derives from a specific Congressional command;[48] these cannot be removed. Others reflect NIH Policy, and can only be modified in consultation with the appropriate NIH offices. An example of this is the mechanism for licensing NIH inventions: Because all NIH patents are licensed through the centralized NIH Office of Technology Transfer ("OTT"), individual Institutes may not significantly change the process of licensing without confirming with OTT that it is willing and able to abide by those new terms. The remainder of the terms can be, and often are, negotiated to accommodate the unique needs of each collaborator.

Appendix C also contains terms relating to clinical trials, if applicable. As with the CTA, a Clinical-CRADA would reflect, at a minimum, special consideration relating to protocol drafting, regulatory filings, interactions with regulatory agencies, use of data, and how the agreement might be terminated in the middle of the clinical trial without endangering the patients enrolled in the trial. Unlike the CTA, however, the collaborator will always participate in a Clinical-CRADA, contributing intellectual effort to portions of the research, if not to all of it.

3. *NIH Review of the Agreement*

Once the conflict of interest and fair access questions have been resolved, the scope of the research clearly identified in the RP, resources have been promised, and legal language

hashed out, the complete agreement must be reviewed by NIH. Overall, this process requires nine separate approvals: four within the Institute, four at the level of the National Institutes of Health, and after all these have been secured, final execution by the Director of the Institute.

First and foremost, the NIH Principal Investigator ("PI") must review the agreement as a whole, as that individual will be ultimately responsible for doing what the CRADA promises. In addition, the PI's Laboratory Chief must approve, not only because the CRADA represents a commitment of lab resources, but also as a first substantive review of the science behind the research plan. Next, the Technology Development Coordinator for the Institute must review the agreement, to determine whether it complies with the Institute's policies. Then, the Scientific Director must review the agreement, to determine the merits of the project both on its own and in relation to the mission of the Institute as a whole.

Once the Institute has approved the package, it moves up to NIH-wide review. Formally, the specific Institute is the Governmental party to the agreement, not the National Institutes of Health as a whole (let alone the Public Health Service[49] or the whole Department of Health & Human Services). Even so, the law provides that NIH may disavow CRADAs within thirty days of execution, rendering them void.[50] To avoid this event, NIH requires review at four levels.

The first level of review is the NIH Office of Technology Transfer ("OTT"). OTT has been delegated the exclusive authority to prosecute patent applications and negotiate patent licenses for all the Institutes of the National Institutes of Health. OTT reviews the CRADA for issues relating to the handling of intellectual property, such as modifications to the procedure by which any inventions under the CRADA will be licensed, or the pre-negotiated field of use for those inventions. Next, the NIH Office of the General Counsel ("OGC") reviews the CRADA

for legal sufficiency. Any modifications to the boilerplate, and any legally binding terms appearing anywhere else, will be scrutinized for whether they conform to, and are authorized by, the laws. Thereafter, the "PHS CRADA Subcommittee" looks at it for policy issues spanning the PHS, and in particular, it reviews the CRADA for compliance with NIH policies and for conflicts with other CRADAs by other Institutes.[51] Although the Subcommittee does not review the merits of a particular scientific project, and does not consider whether the commitment of particular resources by each party is "fair" or "wise," it does consider the precedential impact of an Institute's decision to accept particular terms. Finally, the agreement is reviewed by the Office of the Director of NIH. If this final review reveals no problems, the clearance of the CRADA by the NIH Office of the Director constitutes an assurance that the CRADA will not be disavowed after execution.

4. *Execution by the Parties and the Effective Date*

By its terms, the CRADA becomes effective on the day when the last signature is inked. Could the parties agree that the agreement will be effective on a date *after* final signature? Certainly. How about making the agreement retroactively effective -- in other words, setting the effective date to a point *before* the final signature? By itself, this is apparently not authorized by the law; NIH cannot promise intellectual property rights without anything having been signed by the collaborator and the Institute. Unfortunately, this inability to make CRADAs retroactive put prospective collaborators and the NIH in a quandary: As CRADA negotiations take months, and as the NIH-approval process itself takes weeks (sometimes more than a month), either the scientists must remain idle, or the collaborator must risk losing rights to any NIH inventions that

are invented just before the CRADA is signed. Several CRADA opportunities were lost because of this problem.

To solve it, the NIH developed the "Letter of Intent," or "LOI." The LOI is a simple promise that, if a CRADA is signed, its effective date will be retroactive to the effective date of the LOI. Unfortunately, the mechanism has certain limitations. First, because the LOI is not a promise that a CRADA will ever be signed, some collaborators are unwilling to begin a project under an LOI. Also, some projects depend on the transfer of funds to begin; however, no funds may pass to NIH under an LOI because it is not a promise that the full CRADA will be signed. Further, because the LOI was originally intended solely to allow research to begin while the paperwork is completed, it is limited to a short, six-month life, which may be extended for cause. Nonetheless, many collaborators are satisfied with this mechanism, and the Letter of Intent has proven to be a valuable mechanism for facilitating collaborations.

C. Possibilities

CRADAs have enabled a large, and growing, number of exciting projects. NIH labs and companies have been able to study therapies for rare diseases, new (perhaps high-risk) uses of existing drugs for new indications, and therapies and vaccines for diseases primarily occurring in poor countries -- technologies most companies would consider too high a financial risk to invest resources developing -- by pooling their resources and expertise. Even beyond this, NIH labs have been able to access manufacturing channels and unique research materials, often which would be prohibitively expensive to procure without the CRADA -- especially for the smaller institutes. Companies, in turn, have found they can access a unique source of expertise, and can

tap a research entity whose bedrock interest is to help successful products reach the bedside, without having to rely on the assistance of a competitor. In one specific and successful example, when the NCI needed a tool to perform microdissection of cells for clinical pathology of cancerous tissue, NCI and Arcturus Engineering agreed to enter a CRADA to develop one. Laser capture microdissection was created, and is now on the market.

In the case of Gillian Niher, a Clinical-CRADA would have enabled her project and protected her interests in publishing, receiving material and financial support, and handling regulatory filings. It would also have guaranteed the NIH's interest in protecting the patients enrolled in the clinical trial; additionally, it would have protected Neurion's interest in ensuring compliance by Gillian with the terms of their agreement, and perhaps secured rights in Gillian's invention involving the bare plasmid. In short, a Clinical-CRADA would have established the ground rules by which the parties would act, ensured no one operated on a misconception, and authorized them to do what they wanted to do.

V. Proprietary Materials: The "Materials-CRADA"

Assume that Gillian had not proceeded on her own, and wanted to acquire Neurion's gene legally to run *in vitro* and *in vivo* tests of her own, though she did not want to collaborate. Assume further that the company has a supply and is willing to provide some to the NIH for free, though no one at Neurion is interested in collaborating with Gillian, either. The gene is protected by patents and pending applications, but the company is worried about improved formulations, or some other discovery that in combination might make the original technology even more valuable. Accordingly, the company refuses to release the gene or permit NIH to

work with it, unless NIH promises the company rights in any related inventions Gillian creates during the project. Unfortunately, as previously noted, the keystone of a CRADA (the only mechanism by which such rights could be promised) is collaboration, of which there is none. What can be done to get the materials to the NIH?

A possible solution appears upon realizing that the intellectual property underlying the unique materials can be treated as the intellectual contribution of a collaboration. If this is sufficient, the CRADA can be modified to reflect that situation. Many standard CRADA provisions would no longer have meaning, such as those that govern sole inventions by the collaborator, and the role of the collaborator's PI; these now can be removed, and the agreement streamlined. In this way, NCI developed the "Materials-CRADA," which the PHS has adopted as an officially approved mechanism.

Because there are limited situations in which the Materials-CRADA would be appropriate, the Materials-CRADA may be used only to transfer into NIH patented materials, or unpatented proprietary materials that are not available commercially.[52] No other materials or physical resources may be committed by either party. A collaborator may contribute up to $20,000 towards the project, but that money may not be used to hire personnel. Finally, unless the agreement is unmodified or the modifications are essentially trivial, it will be treated like a normal CRADA for the purposes of NIH-review.

The greatest challenge to the Materials-CRADA arises where the likely invention, if any, would be a "research tool." Although it is difficult to define exactly what constitutes a research tool, a good start is to say that a research tool is something that has a primary utility of enabling or enhancing scientific research, as opposed to utilities focused on diagnostic, prognostic, or

therapeutic embodiments. Suppose the material to be transferred is a compound that dramatically improves the chances of success in making transgenic animals having whatever trait is desired. Transgenic animals have virtually no possible direct use in a clinical setting; rather, they are useful as tools to study other things, such as biological mechanisms and pharmacological activity.

A bedrock policy of the NIH is that research tools should be made as widely available as possible. If the collaborator provides the materials under a Materials-CRADA, the collaborator would be entitled to elect an exclusive license -- and, through it, could have the power to determine who would have access to any research tools. If the collaborator issues an ultimatum, demanding exclusive rights to research-tool inventions in exchange for its material, should NIH hold ground and deny its researchers access to this exciting and scientifically rewarding opportunity, or compromise its policy and risk allowing the collaborator to restrict research? Though many people have strong opinions -- especially the scientists, who need access to opportunities such as these to develop their careers -- no easy answer exists.[53]

VI. Trademarks and Copyrights for the Government Scientist

Occasionally, a research scientist encounters one of the two other main forms of intellectual property rights, copyright and trademark. Each form rarely has any direct impact on the scientist's ability to perform the responsibilities of employment, but whenever one becomes applicable, a minimal understanding of how they work can help the scientist figure out what needs to be done.

A. Copyright

A copyright is the exclusive right to control the "copying" of a "work of authorship" that has been "fixed in a tangible medium."[54] "Works of authorship" include such traditional things as books, articles, television shows, plays, music, photographs, sculpture, and computer software. It also applies to things that people normally do not think about, such as e-mail, cartoons, clip-art, flyers, and other advertisements, as well as the selection and arrangement of data, such as the telephone yellow pages,[55] the statistics on a baseball card,[56] and the pagination of a compiled work.[57] "Fixed in a tangible medium" refers to any physical embodiment. So, a videotape of a performance could be the subject of a copyright, but the live performance itself is not. Copyright exists the moment the work has been fixed -- the moment the ink has dried, or the software has been saved on a medium like a floppy disk or hard drive.

Formal registration is not a prerequisite to acquiring, licensing, or transferring a copyright, though it does provide additional rights, such as the right to sue in Federal courts for damages and injunctive relief. Also, infringing acts that occur prior to registration nevertheless violate the copyright, and can be stopped once the work has been registered. Regardless of registration, every work should bear the symbol "©", the name of the copyright-owner, and the year in which it was created. This puts people on notice of the claim of ownership, and deters unauthorized copying.

Under U.S. law,[58] the owner of a copyright has the right to stop others from (1) directly copying the work, (2) creating a derivative work, (3) distributing the work,[59] (4) putting the work on public display, (5) performing the work, and (6) importing copies of the work into the United States. These rights are circumscribed by the "fair use" exception, which allows limited copying

and use of copyrighted materials under specific circumstances (such as academic research, legitimate commentary and criticism, education, parody, etc.).[60] Even so, the "fair use" exception is neither broad nor particularly well defined, so particular questions should be brought to the attention of the Institute's Technology Development Coordinator or the NIH Office of the General Counsel before they become problems.

Although this collection of rights may seem straightforward, it becomes complicated when applied to the arena of digital information. There is no doubt that copyright applies to software, e-mail, web pages, digitized music, and articles posted on the Internet. The question is, what can the recipient do with such electronic works? First, the wise course is to assume that *everything* is protected by copyright, unless it is expressly dedicated to the public domain. Second, it is reasonable to assume that trivial copies (such as loading a web page into a computer's temporary memory, or saving a copy on the hard drive) are either tacitly licensed by the person who put the work on the Internet, or else at least a "fair use." Further distribution, however, should be done only with permission or great caution. For example, the NIH Office of the General Counsel believes that a news-clipping service -- which scans for relevant articles in major news sites that do not charge access fees, and distributes the articles to a restricted group -- probably is fair or, if it is not fair, chances are remote that anyone will be injured enough to care. However, a service that re-posts fee-based articles on Internet bulletin-boards, which can be accessed by an unlimited number of people for free, probably would not be fair.

Certain works of authorship -- specifically, those that were created by employees of the U.S. Government as a part of their official duties -- are not entitled to copyright protection.[61] So, articles written by NIH scientists may be freely copied by anyone. The journal in which the

article was published may have some minimal rights to stop photocopying of the article, particularly if the journal contributed some original layout, used a creative typeface, or placed its own artwork on the same pages as the article, but if the journal did not contribute substantively, it has no right to stop someone from transcribing the original article word-for-word.

Almost all scientific journals are aware of the exception for works by Government employees, but occasionally, upon approving a manuscript for publication, the journal will send the NIH author a request to "assign" the copyright. Obviously, the author has nothing to assign, and the journal probably did not notice the affiliation. If an NIH scientist receives something like this, the scientist should simply call the journal and remind them of the author's affiliation; the journal will usually send a modified request that does not require assignment. If any confusion remains, the author should contact the Technology Development Coordinator for the author's Institute, or the NIH Office of the General Counsel.

One copyright-related issue has begun to arise more and more: collaborations to write software. As a rule, when two authors create a single, integral work jointly, each owns a 50% share of the entire work, and when two authors contribute discrete parts that are linked but which can be easily distinguished (such as chapters in a book), the copyright to each discrete portion vests 100% with the author of that portion. If one of the authors is a Government employee and the contribution is within the employee's official duties, ownership of copyright is apparent only if the contributions of each author are clearly distinguishable. Unfortunately, the law relating to joint works that are integral is not clear. So what about collaborative research projects that involve writing software?

The Federal Circuit Court of Appeals has recently ruled that software can be the subject

of a patent, if the inventive idea behind the software otherwise meets the requirements for obtaining a patent.[62] Consequently, the collaborator would be well advised to enter a CRADA, if only to protect against the possibility of an invention arising from the project. As for copyright, the law authorizing CRADAs clearly permits each party to transfer property -- including intellectual property -- to each other. Accordingly, a copyright in a work created under a CRADA could be transferred to the Government by the collaborator and licensed back, or else the copyright could be licensed to the Government, or the Government could take no license. The term should be broadly negotiable. To avoid the conundrum of the existence of copyright in a jointly made, integral work, the CRADA RP should clearly identify who will write each portion.

One other issue occasionally arises relating to copyright, namely royalties. The Government has no statutory authority to receive royalties for copyrights assigned to it. Consequently, the only significant reason the Government might want to own the copyright in a work is to control the integrity of the work as it is distributed and recast. As for the author, if the author created the work as a part of the author's official Government duties, receipt of royalties would be an actual conflict of interest (not to mention odd, given that there is no copyright). If the author created a work outside of official duties,[63] and if the author's Ethics Counselor has reviewed the situation, the author could receive royalties.

B. Trademarks

Occasionally, a research program finds itself in the position of offering a service to the public, perhaps even providing specific, tangible materials containing health-related information.

In order to help the public become aware of the program, the program develops a name for the service or materials. As the program grows and becomes well known, the program eventually will become concerned that other groups might try to piggy-back on the reputation of the program, perhaps by falsely claiming endorsement by the program, or claiming false information came from the program, or otherwise pawning off its materials as if they came from the program. How can the program protect itself? By registering the name of the materials as a mark in the U.S. Patent & Trademark Office.

A mark is any word, phrase, logo, graphical design, number, letter, scent, sound, or combination of these, that serves to identify the source of goods/services, and to distinguish the goods/services of the mark-owner from similar offerings by other parties. A mark can fall into four categories. A "trade mark" identifies goods, such as IVORY® soap and FORBES® magazine. A "service mark" identifies services, such as UNITED® airlines and BELLSOUTH® telephone. A "collective mark" identifies the provider as being a member of a select group, such as the SUNKIST® fruit growers. A "certification mark" certifies that the goods or services of a provider have met the minimum requirements of quality or included features, such as the UL® mark, which appears on electronic products that have been tested as safe by Underwriter Laboratories. In some limited circumstances, a mark can appropriately be registered in more than one of these categories (such as the AAA® mark, which is both a collective mark and a service mark) or for an entire family of products (such as the wide range of PROCTOR & GAMBLE® products that fill retail pharmacy shelves).

As with copyrights, registration of a mark is technically not a prerequisite to having rights in the mark, but registration provides important additional rights, and the sooner it is

registered the better. Marks that are registered should be identified with the "®" symbol; unregistered marks may be claimed by the "™" or "_"symbol, for goods or services, respectively. Merely claiming and using a mark, however, is not always enough to earn the right to stop others from using it -- the mark must, in fact, be distinctive from all other marks in use for related goods/services, in order to fulfill its function. Thus, proposed marks that are confusingly similar to existing, registered Marks will not be entitled to protection.[64] Also, marks that are generic references to the product or service (*e.g.*, FRUIT STAND, for a roadside fruit vendor)[65] or that are purely descriptive of the product/service (*e.g.*, BED&BREAKFAST REGISTRY for a lodging-registration service)[66] will not be given any force by the courts or the U.S. Patent & Trademark Office.[67] To be reasonably assured of finding a successful mark, the owner should try to be as creative as possible, perhaps by creating a coined term (*e.g.*, KODAK®), or using an arbitrary association of a word with the product (*e.g.*, APPLE® computers), or a fanciful term that has no descriptive quality whatsoever (*e.g.*, GUESS?® jeans).

Although the Government may own a trademark, license its use, and seek injunctions to stop misuse, the Government unfortunately has no authority to receive royalties on the use of a trademark by another. Nonetheless, the protection to the reputation of a Government-sponsored program remains a viable reason to acquire registration of a mark. Indeed, the NIH already has several registered marks. These include the NCI COMPREHENSIVE CANCER CENTER®, 5 A DAY - FOR BETTER HEALTH®, and PDQ®. Queries about existing or new marks should be sent to the NCI Technology Development & Commercialization Branch, or the NIH Office of the General Counsel.

Conclusion

Decades and centuries ago, the intrepid trailblazers mapped rivers, built monuments, and explored new terrain, using tools such as a compass, sextant, and telescope. Today, they map genes, build new devices, and explore new ideas, using, among other things, the tools of technology development. Properly utilized, these tools help avoid the dangers and reveal the best that the new landscape has to offer. Vast opportunities await those who have the vision to seize the tools along with the moment.

Figures

Fig. 1: NCI's famous mark, 5 A DAY - FOR BETTER HEALTH.

END NOTES

1. Mailing Address:
NCI TDCB
6120 Executive Blvd., Suite 450
Rockville, MD 20852

2. "Technology Transfer," as the term is normally used, usually encompasses issues focused on acquiring and licensing patents, which are discussed in another chapter, in addition to the various research-related transactional agreements that are discussed in this chapter. Accordingly, to avoid confusion between the two topics, the tools discussed in this chapter will be grouped in subcategory, called "technology development."

3. *See, e.g.*, RESTATEMENT (2D) AGENCY, § 322 (an agent who fails to disclose existence of agency or identity of the principal is personally liable) and § 329 (an individual lacking agency authority may be liable for breach of warranty of agency).

4. *See, e.g., id.* § 1 (definition of agency, principal, and agent), § 26 (creation of actual agency), § 140 (principal liability for the acts of an authorized agent) and § 159 (principal liable for acts of agent with apparent authority).

5. *See, e.g., id.* § 1 comment c (attorney at law) and § 14C (although individual members of the Board of Directors are not agents of the corporation, officers hired to conduct the company's business are). In theory, actual authority does not have to be written, *see id.* § 26 (creation of agency relationship may be oral) and § 27 (creation of agency by apparent authority may be by oral statements of principal), but as a matter of practical reality, agency relationships based on oral statements are difficult to prove.

6. *Id.* § 27.

7. The National Institutes of Health has twenty subdivisions under its aegis, each of which is either an "Institute" or a "Center." The Institutes and Centers of the NIH, together with the Food & Drug Association and the Centers for Disease Control (*see infra*, n. 47), will be all referred to as "Institutes" for simplicity's sake only.

8. *Id.* § 320.

9. Peter Gwynne, "Corporate Collaborations: Scientists Can Face Publishing Restraints," *The Scientist*, 24 May 1999, p.1 (and continuing on p.6).

10. "Thyroid Drug Study Reveals Tug of War Over Privately Financed Research," by Rick Weiss, *Washington Post*, A03 (Apr. 16, 1997); "Bitter Pill: How a Drug Firm Paid For University Study, Then Undermined It," by Ralph King, Jr., *Wall St. Journal*, A01 (Apr. 15, 1997); Rennie, D., "Thyroid Storm," *JAMA* (editorial), 277(15):1238-1243 (Apr. 16, 1997).

11. Boots Pharmaceuticals was purchased by BASF AG in April 1995.

12. Dong, B.J., et al., "Bioequivalence of Generic and Brand-name Levothyroxine Products in the Treatment of Hypothyroidism," *JAMA*, 277:1205-1213 (Apr. 16, 1997).

13. Mayor, G.H., et al.., "Limitations of levothyroxine bioequivalence evaluation: analysis of an attempted study," Amer. J. Ther. 2:417-432 (May 1995). Dr. Mayor was also an associate editor of this journal at the time.

14. The Adequacy of Appropriations Act, 41 U.S.C. § 11, and the Antideficiency Act, 31 U.S.C. § 1341.

15. 31 U.S.C. § 1350 (" An officer or employee of the United States Government or of the District of Columbia government knowingly and willfully violating section 1341(a) or 1342 of this title shall be fined not more than $5,000, imprisoned for not more than 2 years, or both. "). Based on the fact that the author is unaware of any case in which the U.S. Department of Justice has even attempted to prosecute anyone for this crime on the basis of an unauthorized indemnification clause appearing in a research-related agreement, jail appears to be an extraordinarily remote possibility.

16. Omnibus Budget Reconciliation Act, Public Law 105-277 (1997).

17. *See, e.g.,* RESTATEMENT (2D) TORTS § 757 comment b; Roger Milgrim, Milgrim on Trade Secrets § 101 (discussing the Uniform Trade Secret Act); *cf.* Economic Espionage Act of 1996, 18 U.S.C. § 1839(4) (1997) (definitions). Each State in the United States has its own trade-secret law. In addition, the Federal Government recently enacted the Economic Espionage Act, which is intended to complement existing State laws without preempting them. As a result, there are many overlapping definitions and rules concerning trade secrets. Specific matters should be addressed by attorneys who have particular familiarity with the laws of the jurisdiction in question.

18. Milgrim, § 16.01[7].

19. Economic Espionage Act, 18 U.S.C. §§ 1831-32; Milgrim, § 13.03.

20. 5 U.S.C. § 552.

21. *Id.*, § 552(b)(4). Information generated by a Government scientist under a CRADA is also exempt, provide the information is such that it would be deemed a trade secret if it had been given to the Government by the collaborator. 15 U.S.C. § 3710a(c)(7).

22. *Id.*, § 552(b)(5).

23. *Id.*, § 552(b)(6). *See also*, Privacy Act of 1974, 5 U.S.C. § 552a.

24. 35 U.S.C. § 205. This exemption only applies for a "reasonable time in order for a patent application to be filed."

25. 15 U.S.C. § 3710a(c)(7). Of particular note, subparagraph (7)(B) extends the "trade secret" exemption of the Freedom of Information Act to cover data generated by Government scientists under a CRADA, provided that the data so generated would qualify as a trade secret if it had been provided by the CRADA collaborator. However, this extra exemption only lasts five years from the development of that data.

26. Depending upon the parties negotiating the agreement, it often, but not always, contains some additional terms. Examples of such provisions may include provisions that specify the law of the agreement (*e.g.*, "Federal law shall govern"), certification provisions (*e.g.*, certification by signer of authority to bind the party), indemnification provisions, and disclaimers of warranties. An attorney should be consulted before any of these provisions are accepted. Although these terms may be common, they do not necessarily have to appear in an agreement to make the agreement valid and binding.

27. Federal Register Notice published on Tuesday, May 25, 1999 (64 FR 28205).

28. Black's Law Dictionary, pp 1586-89 (6th ed. 1990). *See also*, Arthur Corbin, Corbin On Contracts § 14 (single-volume edition).

29. Samuel Williston, Williston On Contracts 3d § 1364C (buyer's consequential damages under the Uniform Commercial Code), § 1394 (general consequential damages for breach of warranty).

30. 41 U.S.C. § 11.

31. 31 U.S.C. § 1341.

32. 31 U.S.C. § 1350.

33. See the web page of the Association of University Technology Managers, at <http://www.autm.net>.

34. 21 C.F.R. § 310.305 and § 312.32.

35. *See, e.g.*, 21 C.F.R. § 312.47(meetings with FDA), § 312 50 (general duties of sponsor), § 312.58 (FDA inspection of sponsor's records), and § 312.68 (FDA inspection of records of sponsor's clinical investigator).

36. 21 U.S.C. §§ 335a, 335b.

37. 42 U.S.C. § 282(c) ("substances and living organisms").

38. See Executive Order No. 10096 (1952), as amended.

39. The Federal Technology Transfer Act, P.L. 99-502 (1986) (amending 15 U.S.C. § 3710a).

40. The National Technology Transfer and Advancement Act, P.L. 104-113 (1995) (amending 15 U.S.C. § 3710a)

41. *See, e.g.*, NIH Policy Manual No. 2300-320-03 (the NIH Visiting Program).

42. Some confusion occasionally arises between a "Cooperative Agreement" (15 U.S.C. § 3706), which is a mechanism analogous to a grant by which federal funds can be legally transferred to a private party, and a "Cooperative Research And Development Agreement," which is ***not*** a funding mechanism.

43. 15 U.S.C. § 3710a(c)(4).

44. *Id.* § 3710a(c)(4)(B).

45. *Id*; *see also* 35 U.S.C. § 204.

46. Though rarely exercised, in instances where there is an appearance (but not actual) conflict of interest, the NIH Institute has the power to elect to waive that conflict if the research is of overriding importance to the Institute and no other PI could carry out the research.

47. 15 U.S.C. § 3710a(b)(1).

48. 15 U.S.C. § 3710a(b)(1, 2).

49. Although the Public Health Service no longer functions as a discrete sub-unit of the Department of Health & Human Services, the name still serves to identify the National Institutes of Health, the Centers for Disease Control, and the Food & Drug Administration as a group.

50. 15 U.S.C. § 3710a(c)(5).

51. Because OTT and OGC have representatives on the Subcommittee, issues that OTT and OGC have about a CRADA are typically raised as an integral part of the Subcommittee's review, which increases the efficiency of resolving those issues by airing them all in a single forum.

52. On a case-by-case basis, the Subcommittee will consider Materials-CRADAs for materials which are commercially available, but which are so exorbitant that they are effectively unavailable without the promise of intellectual property rights. Such requests are not reviewed favorably, but some have been approved.

53. A draft NIH Policy on research tools appeared in the Federal Register on Tuesday, May 25, 1999 (64 FR 28205), but it does not entirely answer this conundrum.

54. 17 U.S.C. § 101 (definitions), § 102 (subject matter of copyright), § 103 (compilations & derivative works), and § 106 (core rights of copyright owner).

55. *BellSouth Advertising & Publ. Corp. v. Donnelley Information Publ., Inc*., 999 F.2d 1436 (11th Cir., 1993), *cert. denied*, 501 U.S. 1101 (1994).

56. *Kregos v. Assoc. Press*, 937 F.2d 700 (2d Cir., 1991); *Eckes v. Card Prices Update*, 736 F.2d 859 (2d Cir., 1984).

57. *West Publishing Co. v. Mead Data Corp*., 799 F.2d 1219 (8th Cir., 1986).

58. 17 U.S.C. § 106 (core rights of copyright owner), § 106A (rights of attribution and integrity), and §§ 601-603 (importation).

59. A major exception to this right is the "first sale" doctrine. In essence, if I buy a book from a store, I can do whatever I want with *that* book -- including sell it to someone else. However, assuming I have a license from the copyright owner to make copies of the book, that license does not automatically include the right to distribute the duplicates. 17 U.S.C. § 109.

60. 17 U.S.C. § 107.

61. 17 U.S.C. § 105. The only twist to this rule is that the Government may accept assignment of a copyright *from* a private party, but this is rarely done.

62. *State Street Bank & Trust Co. v. Signature Financial Gp., Inc.*, 149 F.3d 1368 (Fed. Cir., 1998), *cert. denied*, 119 S.Ct. 851 (1999).

63. For example, a chapter in a medical textbook that broadly teaches about a region of health might be a legitimate outside activity for an NIH physician, but a chapter on the particular research in which the physician is engaged probably would not be. The Ethics Counselor for each Institute must review such projects.

64. *See id.*; TMEP § 1207.

65. Trademark Manual of Examining Procedure § 1209.01(c) ("TMEP").

66. TMEP § § 1209.01(b).

67. See 15 U.S.C. § 1052. Other marks that cannot be protected include marks that are deceptively

misdescriptive, are purely geographical references, are a mere use of a surname, are official government insignia or flags, or are offensive and scandalous. *Id.*