Defending the Freedom to Innovate: Faculty Intellectual Property Rights after *Stanford v. Roche*

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The report that follows, prepared by a subcommittee of the Association's Committee A on Academic Freedom and Tenure, was approved by Committee A and adopted by the Association's Council in November 2013.

Tensions over control of the fruits of faculty scholarship have been slowly building since the 1980s and have intensified over the last three years. There have long been differences of opinion over ownership of patentable inventions, but recently a number of universities have categorically asserted that they own the products of faculty research. And there is increasing institutional interest in declaring ownership of faculty intellectual property subject to copyright—most notably evident in demands that faculty members cede ownership of online courses and other instructional materials to their universities, a trend that began escalating in the 2012–13 academic year.

The AAUP is issuing this report in the midst of these fundamental changes in the character of faculty rights and academic freedom. Its purpose in doing so is to put the dialogue on intellectual property on a new path, one that leads to a principle-based restoration of faculty leadership in setting policy in this increasingly important area of university activity. Administrative efforts to control the fruits of faculty scholarship augur a sea change in faculty employment conditions, one too often imposed without negotiation or consent. Indeed, underlying these developments is an administrative conviction that faculty members are not independent scholars, teachers, and researchers but rather employees no different from those working in for-profit corporations that exist for the benefit of investors.

The topics addressed in this report are moving targets. New developments occur almost weekly. Thus, for example, in May 2013 the University of Pennsylvania issued a draft policy declaring that faculty members could not decide to design and offer an online course through an outside company without university permission. The draft policy makes it clear that Penn could refuse permission because it wants to curtail potential competition with its own online offerings. The same reasoning could be applied to a faculty member expecting to issue a potentially profitable book with a commercial press, since a university could insist that its own press publish the book instead or that it must negotiate the contract with the commercial press and take a share of the income for doing so. Penn's draft policy also makes it clear that it wouldn't matter if the faculty member designed the course on his or her own time. The mere fact of employment now apparently trumps the deeply rooted expectation of faculty independence.

This report begins with some basic definitions, then introduces the key issues at stake. A section summarizing the history of university policies on patentable and copyrightable intellectual property follows. Finally, the report offers eleven very specific principles that ought to be included in handbooks or collective bargaining agreements to clarify intellectual property policies.

Much of this report is adapted from *Recommended Principles to Guide Academy-Industry Relationships,*

a book-length study that the AAUP Foundation published in 2014.

I. Definitions

The management of inventions, patents, and other forms of intellectual property in a university setting warrants special guidance because it bears directly on the university's core values, including academic freedom, scholarship, research, shared governance, and the transmission of knowledge. These core values distinguish university activity from that of government and industry, and they provide a basis for the argument for public support of research and the role of the university as an independent contributor to both policy and commerce. The negotiation and management of faculty-generated intellectual property can be complex and can carry significant consequences for those directly involved in negotiations (faculty investigators, inventors, and authors as well as companies, university administrators, attorneys, and invention-management agents) and for others who may be less directly affected (competing companies, the public, patients, and the wider research community).

Intellectual property refers broadly to patents, copyrights, trademarks, and (according to some definitions) trade secrets.[1] In common usage the term also refers to the underlying subject matter that is controlled by the owner of these property rights (inventions, works of authorship, and identifiers that distinguish goods and services in the marketplace). Patents provide the owner with the right to exclude others from "practicing" (making, using, and selling) an invention. A patent, unlike a copyright, goes beyond the protection of written expression to accord an exclusive right to the operational principles that underlie the invention. Copyright prohibits unauthorized copying or modification of particular instances of expression; a patent permits the exclusion of work created independently, is not limited to the precise "expression," and has no "fair use" exception, even for nonprofit purposes. Thus, patents may have an additional and potentially substantial impact on university research, may affect the value and role of scholarly publication, and may influence collaborations and the transfer of technology developed or improved in other research settings. Recognizing the potential for harm, the faculty of a number of medical schools for years prohibited the patenting of inventions pertaining to public health.

Patents may cover new, useful, and nonobvious inventions, which are categorized by patent law as processes, machines, manufacture, and composition of matter. Patentable inventions thus may span a wide range of results of academic work, including devices, chemical compounds, biological materials, research methods and tools, production processes, and software. Design patents cover new designs of useful articles. Plant patents and related plant-variety protection laws cover reproducing, selling, or using patented plants. Patents are acquired by an application that is reviewed by a patent examiner; the process may take up to three years. A patent has a term of twenty years from the date of application.

Trademarks distinguish goods and services in the marketplace and are classed as trademarks, service marks, certification marks (showing testing by an independent laboratory, for instance), and collective marks (identifying membership in an organization, such as real estate agents). Trademarks may be common law—that is, acquired by use in commerce—or registered at the state or federal level. A trademark remains in existence as long as it is being used. In academic settings, names, logos, and tag lines for assets such as software programs, research laboratories, new techniques, services offered by departments, websites, and programs of research may all come to have trademark status.

Copyright encompasses original works of authorship fixed in any tangible medium of expression. Copyright vests in a work when it meets these requirements of the law; no application or registration process is now required. Classes of copyright-eligible subject matter include literature and other printed matter, architectural or engineering drawings, circuit diagrams, lectures and other instructional materials, musical or dramatic compositions, motion pictures, sound recordings, choreography, computer software and databases, and pictorial and sculptural works. Copyright now has a term of the life of the author plus seventy years, or, in the case of work made for hire, ninety-five years from the date of first publication or 120 years from the date of creation of the work, whichever is shorter.

These lists are not exhaustive. The scope of work subject to intellectual property claims has expanded considerably over the past thirty years as a result of both changes in law and changes in university policies.

1. Trade secrets, which have economic value that is not generally known to the public and is subject to reasonable controls on disclosure, are sometimes, but not always, included in discussions of intellectual property.

Additionally, the term of copyright has been extended and registration formalities removed. Thus, even where university intellectual property policies have not changed, the range of faculty-led work subject to these policies has expanded, complicating the landscape for discussions of the appropriate role for institutional controls on scholarship and the responsibilities to the public of faculty authors, inventors, and entrepreneurs.

II. Why Does Intellectual Property Matter?

Whether ownership of a particular invention resides with the inventor or is assigned by the inventor to a university technology-transfer office, a university-affiliated foundation, or an independent invention-management agency, all those involved need to recognize the distinctive role played by inventions emerging from scholarly research. Faculty investigators and inventors, together with university administrators, must shape policies that govern the development and deployment of patent rights accordingly.

One fundamental principle should be clear: inventions are owned initially by their inventors. That principle is established in both the US Constitution and federal patent law. As the US Supreme Court affirmed in its 2011 decision in *Board of Trustees of Leland Stanford Junior University v. Roche Molecular Systems, Inc. (Stanford v. Roche)*, federal funding of faculty-led research does not change this principle: inventors in a university setting using federal funds are also the initial owners of their inventions. Universities, as hosts of federally supported research, have neither an obligation nor a mandate under federal law to take ownership of faculty inventions made in such research. Ownership of patent rights attached to an invention, however, may be transferred to another party by a written instrument signed by the inventor. Control of patent rights can be distinguished from ownership. A patent owner may contract with (or transfer title to) another entity that manages those patent rights on the owner's behalf. Furthermore, a patent owner's invention may include elements that are subject to the patent claims of others, and therefore the owner and any of the owner's licensees may not be able to practice the invention without a license from other patent holders. A university may become the owner of patent rights through voluntary assignment by a faculty inventor, as was the case at most universities prior to the Bayh-Dole Act of 1980.

Some universities have sought to make their ownership of all faculty patent rights a general condition of employment, which implies that the university controls faculty scholarship as an employer and that faculty members are expressly hired to invent. Some cite use of university facilities as a justification for asserting their ownership or claim that participation in externally funded research requires that the university own the resulting intellectual property. Though these strategies are increasingly preferred by many universities, there is little to indicate that such ownership claims advance university interests, whether taken narrowly as the pursuit of income from patent licenses or broadly in terms of the social value of research and broad access to its results.

One fundamental problem with university ownership of patent rights to faculty inventions is that it creates institutional conflicts of interest between the university's governance role and its own financial and competitive interests in exploiting patented inventions. It is all too easy for universities to conflate royalty income from the use or manufacture of patented inventions with their public service mission to enhance economic growth while failing to perceive, or to acknowledge, the conflict that arises with respect to other institutional responsibilities and the university's long-standing commitment to the broad dissemination of knowledge.

When faculty inventors and university administrators agree to use patents only for defensive purposes and to allow general access to technology platforms and make them readily available for adoption, there is generally minimal institutional conflict of interest. But when an invention is used to seek financial gain by exploiting monopoly marketplace positions—as necessary as this may be at times—faculty inventors and administrators alike find themselves in a far more conflicted position. In these situations, it may be beneficial for the university and the faculty inventor to use an external invention-management agent to promote development of the underlying invention while simultaneously protecting continued use of the invention in ongoing research and education.

Despite distinctions often drawn in university policy statements, inventions are a natural outgrowth of scholarly activities and have enjoyed a symbiotic role in faculty research for more than a century. As patent law has expanded what is patentable to include software, business methods, and biological materials, results of scholarly activity have become more exposed to ownership claims based on patents. The scholarly nature of university-based inventions does not disappear with the addition of a potential

patent or other intellectual property rights. A patent is simply a specialized way of transmitting knowledge to society, of sharing a new invention with the world in exchange for limited rights to exclude others from practice in order to promote investment, development, and exploitation of the invention. Thus, patented inventions and other discoveries subject to intellectual property protection should properly be viewed as extensions of scholarship subject to the principles of academic freedom and faculty rights, just as are copyrights in manuscripts prepared by faculty members. Patents are regularly used in industry to exclude others from using inventions. But faculty members should often be focused instead on creating conditions that give the public access to inventions, regardless of the possibility that a monopoly position might attract more payment to the university for granting an exclusive license. It is a rare university-hosted invention that absolutely must enjoy a monopoly in order to attract the investment necessary to be used and developed.

Commercial development of university knowledge to stimulate economic growth and bring public benefits is unquestionably good. But some administrative practices associated with patenting and licensing operations may negatively affect economic growth as well as scholarship, the public interest, and the university's educational mission.[2] These include narrow exclusive licensing, speculative reselling and relicensing of patent rights, "assert licensing" (in which an offer to license is preceded by a claim of possible infringement), trolling activities (in which litigation is considered the primary means to realize the value of a patent), and aggressive reach-through provisions (which claim an interest—ownership or license—in inventions and other developments made with the use of a licensed invention). Other activities associated with commercialization may be consistent with scholarship and academic norms, particularly when broad access to university inventions and research is protected through fair, reasonable, nonexclusive licensing and where practice of the invention does not require any product to be developed, as is the case with many inventions that are methods. The university or other licensing agent should make an explicit dedication of rights for research and experimental practice. Faculty investigators and inventors must have a strong voice in decisions involving patent management. A university administration and its faculty collectively also have an obligation to ensure that both institutional and individual interests in using patents to seek financial and logistic advantages are pursued within the context of (and remain subordinate to) the university's broader scholarly and public research missions.

Both contracting and licensing of intellectual property may be managed directly by the university or through one or more outside agents (such as a research foundation working under contract with the university or a private invention-management agency). Licensing is also regularly undertaken by inventors acting privately, as with open-source software. When negotiating sponsored research agreements, a university administration and its invention-management agents must address the management of intellectual property and proprietary matter that may be provided by the sponsor as well as the disposition of any inventions or discoveries that may arise in the course of the sponsored project (including intended deliverables, unexpected discoveries, or findings entirely unrelated to the sponsor's commercial goals).

University administrators and faculty members can also make research funded by the federal government and other sources available for public benefit. This might occur through broad dissemination of the research (as happened with the Cohen-Boyer gene-splicing technique, developed at Stanford University and the University of California, San Francisco, which launched the biotechnology revolution) or through more targeted exclusive licensing, which gives one firm—say, a pharmaceutical company—monopoly rights to a discovery provided that the company invests the substantial resources required to develop the discovery into a viable new drug.

Finally, a university's nonprofit status and its reliance on public funding mean that its management agents are responsible for upholding high academic, educational, and research standards. The obligations of nonprofit institutions necessarily shape the opportunities that may be considered by faculty members and administrators in choosing licensing models, invention-management agents, and acceptable licensing terms and practices.

The keys to proper intellectual property management are consultation, collaboration, and consent. Consultation does not guarantee that invention licensing and management negotiations will be easy, but it does promote a system of checks and balances that can potentially produce better overall results. Any of the parties to such negotiations can exercise bad

2. Mark A. Lemley, "Are Universities Patent Trolls?," *Fordham Intellectual Property, Media and Entertainment Law Journal* 18, no. 3 (2008).

judgment. Faculty members may have a sound understanding of the science and technology underlying their inventions but be unable to gauge their usefulness to industry or their marketability. University technology-transfer officers, by contrast, may understand the legal and technical aspects of an invention but not the underlying science with its uncertainties and thus may overstate an invention's commercial value and misjudge how to disseminate it most effectively. Each party in these negotiations (a university technology-transfer office and a sponsoring company or a faculty member) can be motivated by the narrower goal of maximizing profits and fail to consider the best interests of the public. That is one reason why faculty members collectively, through their governing bodies, need to be involved in setting policy.

The dangers in having institutions or their agents exercise unilateral authority over patenting and other intellectual property decisions are illustrated in a cautionary tale summarized by Siddhartha Mukherjee in his 2010 book *The Emperor of All Maladies: A Biography of Cancer.* In the late 1980s, Brian Drucker, a young faculty member at Boston's Harvard University–allied Dana-Farber Cancer Institute, was investigating chronic myelogenous leukemia (CML), a disease that affected only a few thousand people annually but was incurable, leaving those it did affect with a life expectancy after diagnosis of only three to five years. Drucker wanted to determine whether drugs might intervene in the cancer's genetics. Scientists at the pharmaceutical company Ciba-Geigy had synthesized a number of promising compounds, which were held in the firm's freezer in Basel, Switzerland. Drucker proposed a collaboration between Ciba-Geigy and the Dana-Farber Cancer Institute to test those compounds in patients, but, according to Mukherjee's account, "the agreement fell apart; the legal teams in Basel and Boston could not reach agreeable terms. . . . Scientists and lawyers could not partner with each other to bring these drugs to patients."[3] It was not until Drucker moved to Portland's Oregon Health and Science University in 1993 that he was able to get independent authority from an academic institution to move his research forward.

One of the Ciba-Geigy compounds had shown dramatic results in the lab, but because CML afflicts only a few thousand patients a year in the United States, the company questioned whether further research was worth the investment. Ciba-Geigy had meanwhile merged with Sandoz to form Novartis, and eventually the new company agreed to synthesize the experimental drug—Gleevac—for patient testing. The results were dramatic: Drucker witnessed dozens of deep remissions. Today the drug is so effective that the cumulative number of surviving patients is significant: "As of 2009, CML patients treated with Gleevac are expected to survive an average of thirty years after their diagnosis. . . . Within the next decade, 250,000 people will be living with CML in America."[4]

As this account reminds us, faculty members and administrators can fulfill an important shared governance role by collaboratively establishing the university-wide protocols for managing faculty inventions that will protect the best interests of the faculty, the university, and the national science and research communities while also promoting technological innovation, public health, economic development, and the public good. The AAUP recommends that faculty senates, together with their university administration, consider adoption of principles 11–21, delineated below in section V, to ensure that academic inventions and intellectual property management advance all these goals while protecting academic freedom.

III. The Struggle over Faculty Intellectual Property

Current disputes over faculty intellectual property have their roots in several trends and events. Declining state funding for higher education has led public universities to seek new revenue streams, including royalties from the licensing of faculty inventions. Unfortunately, many universities do not break even, and where there is licensing income, it is used not to offset costs in education but rather to supplement research budgets, which may actually create even more demands on administrative resources. More recently, the impulse to seek profits from faculty work has been extended to instructional materials. The long-term effects of landmark congressional legislation designed to stimulate campus-based research and development have also come to a head over the last two years, dramatically increasing administrative efforts to control faculty intellectual property. Legislation in this area began with a 1980 bill sponsored by Senators Birch Bayh and Robert Dole, known as the Bayh-Dole Act. Although it continued with a 1981 tax credit for

3. Siddhartha Mukherjee, *The Emperor of All Maladies: A Biography of Cancer* (New York: Scribner, 2010), 434.

4. Ibid., 400.

research and development (enhanced in 1986) and relaxed antitrust rules for joint research and development ventures passed in 1984, Bayh-Dole remains the key piece of legislation in current controversies.

The Bayh-Dole Act addresses inventions and associated patent rights, not other forms of intellectual property. It established a uniform policy across all government agencies with regard to the use of inventions by federal agencies in federally supported research at universities, nonprofit organizations, and small businesses. The act did not mandate that universities own or that they have a first right to own inventions made with federal support, nor did it require that they commercialize such inventions. It did require universities to honor the conditions of a standard patent-rights clause to be developed by the Department of Commerce for use in all federal funding agreements. That standard rights clause instructs universities to require their research personnel to make a written agreement to protect the government's interest in any inventions they may make.

The written agreement—under the standard patent-rights clause, to be required by universities of their research personnel—provides (1) that faculty members notify their university when they have made an invention with federal support; (2) that faculty members (as initial owners of their inventions) sign documents allowing patent applications to be filed when the owner of the invention, which may be the government or an invention-management agent, desires such an application to proceed; and (3) that the inventors sign documents that establish the government's rights in their inventions, which may include assignment of ownership or a grant to the government of a nonexclusive right to use an invention developed with federal funds. The latter requirement assures federal agencies that they have access to federally funded inventions for government purposes.

These requirements were spelled out in a patent-rights clause that Bayh-Dole authorized the Department of Commerce to create. Universities—including the entire University of California system—have tried to claim that the only way they can guarantee that faculty members will honor these responsibilities is by taking ownership of all faculty inventions, but obviously there are contractual alternatives to what amounts to a wholesale institutional grab of significant developments of faculty scholarship. Indeed, faculty members have long been able to honor these requirements without assigning their intellectual property rights to the university. Bayh-Dole also carefully avoided dictating to universities and faculty members alike what patent rights they might be interested in or how these rights might be used—whether dedicated to the public, licensed nonexclusively, licensed exclusively, or held so the university could develop an invention directly.

Nowhere does the act mandate university ownership of faculty inventions. Indeed, until a university intervenes—except for the requirement of the written agreement, which confirms the delegation of personal responsibility to potential inventors—the operative relationship is between the government and the inventor. It is only when a faculty member chooses to assign rights to another agent, such as the university, that Bayh-Dole's complexities come into play.

Nevertheless, over the course of thirty years, US university patent managers came to interpret the Bayh-Dole Act as granting them automatic ownership rights to all federally supported inventions generated on campus, including the right to license this intellectual property to industry and others in exchange for royalties, equity, and other fees. The US Supreme Court, however, in its landmark 2011 decision in *Stanford v. Roche*, offered a different interpretation of the Bayh-Dole Act. The court firmly rejected the claims by Stanford and other institutions favoring federally sanctioned, compulsory university ownership of faculty research inventions.[5]

Stanford had sued Roche in 2005, alleging that Roche's kits for detecting the human immunodeficiency virus infringed university patents. After years of litigation, Stanford pushed its case to the highest court, with support from other universities, including many major research universities, who saw the case as an opportunity to secure court endorsement for their interpretation of Bayh-Dole.[6] In an amicus brief filed on behalf of Stanford, the Association of University Technology Managers (a professional organization representing university licensing staff) and the

5. The complete US Supreme Court decision in *Board of Trustees of Leland Stanford Junior University v. Roche Molecular Systems, Inc.* (2011) is available at http://www.supremecourt.gov/opinions/10pdf/09-1159.pdf.

6. Maddy F. Baer, Stephanie Lollo Donahue, and Rebecca J. Cantor, "*Stanford v. Roche*: Confirming the Basic Patent Law Principle That Inventors Ultimately Have Rights in Their Inventions," *les Nouvelles* (March 2012): 12–23, http://www.lesi.org/les-nouvelles/les-nouvelles-online/march-2012/2012/02/29/stanford-v.-roche-confirming-the-basic-patent-law-principle-that-inventors-ultimately-have-rights-in-their-inventions.

Association of American Universities (an association of sixty-two top research universities), joined by six other research associations and five dozen universities, argued that Bayh-Dole had been "incredibly successful in stimulating innovation by giving universities certainty regarding their ownership of federally funded inventions." The brief went on to argue that Bayh-Dole vested ownership of inventions made with federal funds in the university that contracted to do the research: "Where, as here, a university elects to exercise its right under Bayh-Dole to retain title to an invention, the individual inventor cannot assign that invention to a third party because the invention is assigned, by operation of law, to the university."[7]

But the Supreme Court in its ruling refuted this interpretation of the law. For while Bayh-Dole requires universities to secure faculty agreement to protect and honor *the US government's interest* in federally funded inventions, the Court concluded that there was nothing in the act that automatically vested title to faculty members' own inventions in their university employers. Nor does the act require faculty members to assign their inventions to their universities or any other agent for management.

In its own successful amicus brief, the AAUP elaborated on this very point, arguing that Bayh-Dole does not alter the basic ownership rights granted to inventors by law. Rather, it helps bring inventions forward to benefit the public by clarifying that government agencies are to allow certain assignees of federally funded inventions to retain ownership, if and when they come to accept ownership, provided they meet various requirements to protect the government's interest and the public interest.[8] The high court agreed, ruling that US patent law has always favored, and should continue to favor, the rights of individual inventors and that universities need a written assignment from researchers to establish ownership of their inventions.

The AAUP considers *Stanford v. Roche* an important victory for faculty rights. The Supreme Court decision demonstrates once again that academic researchers and inventors remain, as they have traditionally been, much more than mere employees of their institutions, a conclusion underscored by the respect afforded them by the federal government in its contracting with universities. Arguments underlying the compulsory assignment of faculty intellectual property to university employers (which continue to be advanced by Stanford, the Association of University Technology Managers, the Association of American Universities, and many university administrations) begin with the assumption that faculty members are no different from corporate employees who owe their employers the fruits of their labor. But the AAUP's 1915 *Declaration of Principles on Academic Freedom and Academic Tenure* anticipated and firmly disputed that claim. The declaration observed that faculty members could not maintain academic freedom and the ability to serve the interests of society as truly independent experts and academic scholars unless they were recognized as "appointees," not corporate employees.

Few academic administrators would now disagree that academic freedom firmly secures faculty members' rights to direct and control their own scholarly research and classroom instruction. By attempting to assign ownership of faculty research inventions (and, more broadly, intangible assets in any form) to institutions, university administrations are effectively arguing that faculty members lose academic freedom the moment they become inventors, at which point their scholarly autonomy disappears and they become mere employees. The argument amounts to an assertion of employer control over faculty research, including the dissemination and possible future uses of academic research discoveries and results. Such a claim is as objectionable for faculty research as it is for classroom instruction. It is also objectionable to postdoctoral fellows and students, who should never be expected to give away their rights as inventors to their universities.

Of course, professors (and other kinds of academic investigators) may choose to negotiate separate contractual agreements with their universities outside of their normal teaching, research, and scholarly responsibilities. These agreements typically involve the performance of optional tasks that may be expressly identified in advance as "works for hire," in which university ownership claims to resulting intellectual property may be reasonably included by mutual agreement. Such a situation might arise, for example, if a professor voluntarily consents to signing a discrete work-for-hire contract to develop a new online course. This kind of arrangement—which permits a university to own and distribute a course through

7. Lisa Lapin, "Stanford 'Disappointed' in Supreme Court Ruling in Roche Case," Stanford University Press Release, June 7, 2011, http://news.stanford.edu/news/2011/june/court-roche-ruling-060711.html.

8. Kathi Westcott, "Faculty Ownership of Research Affirmed," *Academe*, September–October 2011, 7–8, http://www.aaup.org/AAUP/pubsres/academe/2011/SO/nb/patentlaw.htm.

its online education division—is altogether different from university claims to automatic, broad ownership of all intellectual property developed in the course of ordinary and continuing faculty research, scholarship, and teaching. Such claims pose a direct challenge to academic freedom because they undermine faculty members' ability to control and direct the dissemination of their research.

That said, it is altogether inappropriate to *require* a faculty member to cede ownership of a course to the university merely because the course is prepared in a format suitable to online presentation. Faculty members who do so should realize they may be signing away to the university their right to modify the course or control its performance. The university may modify the course, assign it to someone else to teach, or change the attribution of authorship. The major national outlets for massive open online courses (MOOCs) are so far apparently not demanding ownership of university-based courses. Nor do they require universities to assert ownership. University administrators are simply exploiting the situation as an opportunity to take ownership of instructional intellectual property, when all that is needed is for a faculty member to grant permission to the university to host a course in an online program.

Contrary to the emerging pattern of coopting the faculty's instructional intellectual property, an April 2013 memorandum from the California State University, Long Beach, administration established an interim agreement for faculty members applying for 2013 internal grants to support development of online courses, using a very different approach to define a principle that could be widely adopted:

> the faculty member shall retain ownership of all works he or she produces for . . . online instruction. Thus, in the absence of a separate, written "work-for-hire agreement" which may supersede this agreement, the undersigned faculty member shall be deemed to be the sole owner of all intellectual property rights in his or her course materials, even though the faculty member is receiving a financial stipend to support the creation of online lectures, electronic presentations, podcasts, quizzes, tests, readings, simulations, including development of software, and other teaching and learning activities or material. The fact that the faculty member might use common campus resources (e.g., computers, library books, library databases, software licensed to CSULB for faculty and staff use, consultations with reference librarians, assistance from the Faculty Center for Professional Development and Instructional Technology Support Services staff) shall not alter faculty ownership of the works produced by the faculty member.

Faculty handbooks or collective bargaining agreements could embody the principle at stake—rejecting any institutional claim of ownership based on the use of university resources in course development—with the following language:

> The university shall make no claim of ownership or financial interest in course materials prepared under the direction of a faculty member unless the university and faculty member have so agreed in a separate, voluntary agreement. Payment of a financial stipend, use of university resources, or release time to develop course materials shall not be construed by the university as creating a basis for a claim of institutional ownership of such materials, nor shall it be assumed that a work-for-hire relationship exists between the university and the faculty member with regard to the preparation of any such materials.

A provision like this would be especially relevant to the creation of MOOCs, where the use of university resources—especially assistance from staff—tends to be greater. One might note, however, that universities do not typically ask for an actual accounting of resources used.

The *Stanford v. Roche* decision challenges a number of practices university administrators have imposed on faculty members since Bayh-Dole, practices that lack legal standing. Soon after the Supreme Court's ruling, intellectual property experts predicted that US universities would respond defensively by incorporating new clauses in faculty employment contracts that assign ownership of faculty inventions to the institutions automatically.[9] The University of

9. See Matt Jones, "Supreme Court Rules for Roche, Clarifies Bayh-Dole," *GenomeWeb Daily News*, June 6, 2011: "The most likely effect of the ruling will be that universities will begin making sure that their employees sign assignation agreements that make it clear if they expect to own the rights to the patents their employees generate, Steve Chang, an attorney with the IP firm Banner and Witcoff, told *GenomeWeb Daily News* Monday." For an example of a comprehensive claim of intellectual property ownership by a university, see the University of Washington's "Patent and Invention Policy" at http://www.washington.edu/admin/rules/policies/PO/E36.html.

California is acting comprehensively with a different strategy: at the end of 2011 it began demanding that current faculty members sign a letter assigning ownership to all their future inventions to the university.[10] Such an arrangement is called an assignment of expectant interests, or a "present assignment." The claim made for such assignments is that they become effective the moment an invention is made, without the need for notice to the university, review of circumstances, or a determination of the university's proper interest in the invention as provided by policy.

The AAUP has in its files copies of letters from senior UC administrators informing UC faculty members that the university will refuse to approve their grant applications if they have not signed the new patent/invention assignment form. Indeed, the university is withdrawing already-submitted applications if faculty members refuse to comply.

In requiring present assignment of all future patent rights from current faculty members, the UC system is effectively violating the agreements faculty members made when they were appointed, for it had long followed a policy of evaluating inventions on a case-by-case basis. If that long-standing policy had contractual status, then the new requirement effectively modifies a contract without negotiation or consent. At the same time, institutions like the University of Illinois that have responded to *Stanford v. Roche* simply by posting a universal claim to institutional patent ownership on the university website are no better observers of academic freedom and faculty rights. They are imposing an objectionable condition of employment without a contract at all.

These deliberate strategies represent a disturbing, ongoing trend. Most of the developments in university research and invention policies over the past thirty years have significantly limited or even ended opportunities for faculty investigators and inventors to control the disposition of their research results and instructional materials, whether prepared for their colleagues, for a research sponsor, for industry, or for the classroom. Some universities, such as the University of Washington, invoke state ethics laws to exclude faculty investigators from participating in intellectual property and invention-management transactions involving the state because, the universities argue, the faculty members might receive pay and other financial benefits from such negotiations (such as summer salary, which would not otherwise be allocated) and might therefore have a personal interest in the research agreement.

Universities also now sometimes insert automatic institutional ownership clauses into standard sponsored research agreements with industry and private foundations, claiming title and management rights to all faculty inventions created under the agreement even when the sponsor does not require such institutional interest. Faculty members with little bargaining power, including PhDs in their first tenure-track jobs, are particularly vulnerable to pressure to sign away their invention rights, possibly for their entire careers.

Many current university policies distinguish between faculty intellectual property that can be protected by copyright and intellectual property that is patentable, with universities commonly asserting automatic institutional ownership claims only on patentable intellectual property. This distinction is fundamentally flawed and should not be used in determination of ownership rights: it is not based on any rational analysis of the nature of faculty research and productivity, and it violates academic freedom. Indeed, the possibility arises that universities will expand their intellectual property ownership claims to copyrightable faculty work as well, given that the distinction in this context is arbitrary.

Since 2007 the National Association of College and University Attorneys (NACUA) has promoted university ownership of both patentable and copyrightable intellectual property. That year, four attorneys delivered a paper, "Creating Intellectual Property Policies and Current Issues in Administering Online Courses," at NACUA's annual meeting, and NACUA posted the paper on the members-only section of its website. The AAUP obtained a copy in 2012, and *Inside Higher Ed* subsequently obtained permission from NACUA to make it public.[11] The authors call for comprehensive

10. The University of California's letter of assignment that all faculty members are required to sign reads, in part, "[in] consideration of my employment, and of wages and/or salary to be paid to me during any period of my employment, by University, and/or my utilization of University research facilities and/or my receipt of gift, grant, or contract research funds through the University . . . I acknowledge my obligation to assign, and do hereby assign, inventions and patents that I conceive or develop 1) within the course and scope of my University employment while employed by the University, 2) during the course of my utilization of any University research facilities, or 3) through any connection with my use of gift, grant, or contract research funds received through the University."

11. Beth Cate, David Drooz, Pierre Hohenberg, and Kathy Schulz, "Creating Intellectual Property Policies and Current Issues in Administering Online Courses" (paper presentation, NACUA meeting,

university ownership of faculty intellectual property whenever its creation has involved substantial use of university resources. "Substantial resources," they argue, "might include specialized computer resources or other equipment and significant use of student or research support." A large number of income-producing activities, including textbook authorship, would readily fall under this broad definitional umbrella.

The NACUA paper also stipulates that institutions may claim a share of faculty consulting income if "the faculty member is involved with university research in the same area as the consulting" or if the consulting is in the same general area in which the faculty member teaches. Both conditions are widely applicable to faculty members consulting across numerous academic disciplines. Indeed, it is improbable that faculty members would be consulting in areas for which they have no demonstrated expertise as scholars and teachers. The NACUA paper further recommends that faculty members' right to make any software they have created freely available through open-source licensing should be subject to review to determine whether "the goals of the institution would be better served through commercialization." Such positions are serious challenges to academic freedom; from the perspective of universities' long-standing commitments to broad public dissemination of new knowledge, they are all the more troubling. If a professor judges that his or her research would be more broadly used in continuing research or commercial applications if it were freely disseminated through "open sourcing," why should that professor be compelled to adhere to the dictates of the university's technology-transfer officers, who typically have far less insight into the technology in question and its possible applications? Why, furthermore, should faculty members lose the right to provide open access to their research if the technology-transfer office's preference for control—and the imposition of licensing fees—stems principally from a desire to maximize revenue for the university rather than a desire to maximize public use of the invention? Such preferences for profit seeking undermine claims that institutional ownership is the best route to serving the public good.

The recommendations contained in the 2007 NACUA paper violate the fundamental principle that faculty members should control their own research, and they further encourage universities to assert control over all potentially profitable faculty research products, regardless of whether those products are subject to copyright or are patentable. Indeed, one attitudinal survey of university technology-transfer officers, conducted by researchers Jerry Thursby, Richard Jensen, and Marie Thursby, found that most such individuals assume that comprehensive institutional ownership of faculty inventions is already the norm.[12] In response to the question "Who owns inventions and materials made or developed by faculty members or other personnel in your university?" all but one technology-transfer officer in the sample asserted that the university owns patentable inventions and materials. For copyrightable inventions, 66 percent stated that the university was also the owner.

A compulsory ownership claim changes the relationship between the faculty and the administration from one of administrative governance and support to one of an employer with authority over the disposition of work of employees. However routine in companies, such a relationship is neither routine nor acceptable for university faculty members.

Interestingly, the history of intellectual property management at universities makes it clear that some institutions once strongly respected faculty intellectual property rights.[13] Whereas Stanford, the Massachusetts Institute of Technology, and the University of Illinois sought comprehensive control over faculty intellectual property as early as the 1930s or 1940s, the University of California's 1943 policy went a different route: "Assignment to the Regents of whatever rights the inventor or discoverer may possess in the patent or appointment of the Board as the agent of the inventor or discoverer shall be optional on the part of the faculty member or employee." Rutgers was

San Diego, CA, November 7–9, 2007). See also Cary Nelson, "Whose Intellectual Property?," *Inside Higher Ed*, June 21, 2012, http://www.insidehighered.com/views/2012/06/21/essay-faculty-members-and-intellectual-property-rights. The paper is posted on NACUA's members-only website, but NACUA permitted *Inside Higher Ed* to link to it, noting that while the paper reflected the authors' views at the time, some of the issues may have changed since then.

12. Kerry G. Thursby, Richard Jensen, and Marie C. Thursby, "Objectives, Characteristics and Outcomes of University Licensing: A Survey of Major US Universities," *The Journal of Technology Transfer* 26, no. 1/2 (2001): 59–72.

13. Thirty-seven university patent policies were reprinted in the appendix to Archie M. Palmer, *Survey of University Patent Policies: Preliminary Report* (Washington, DC: National Research Council, 1948). Also see Archie M. Palmer, *University Research and Patent Policies, Practices, and Procedures* (Washington, DC: National Academy of Science–National Research Council, 1962), for a more extensive list of patent policies.

even more concise in 1946: "the University claims no interest in any invention by members of its staff." That same year the University of Cincinnati affirmed "the right of absolute ownership by a faculty member or student or other person connected with the teaching or research staff of the University of his own inventions, discoveries, writings, creations, and/or developments, whether or not made while using the regular facility of the University." Columbia included an exception typical of a number of institutions: "While it is the policy of the Faculty of Medicine to discourage the patenting of any medical discovery or invention[,] . . . the right of staff members in other divisions of the University to secure patents on their own inventions is well recognized."

The policy for the University of Texas, adopted in 1945, similarly asserted that "the title to a patent for any discovery or invention made by an employee of the University of Texas belongs to the said employee and he is free to develop or handle it in any manner he sees fit." The University of Arizona in 1939 also declared that "no inventor shall be compelled to submit an invention to the Patent Committee." Princeton adopted its policy in 1938: "If a member of the University desires to obtain a patent on his own responsibility he may do so." All three institutions did mandate modest profit sharing, which remains an appropriate and reasonable practice today. These university policies demonstrate that faculty research ownership and intellectual property rights do not have to be invented; they merely need to be revived, publicized, and reinforced.

The *Stanford v. Roche* decision opens the door for faculty members and their governing bodies to press for a return to the far stronger faculty inventor rights that led the development of new technology in the decades prior to the passage of the Bayh-Dole Act, and it highlights the need for more visionary shared governance systems around intellectual property and invention management. The Supreme Court's ruling strongly bolsters the AAUP's position that faculty members should be free to control the disposition of their scholarship without interference by university intellectual property administrators. It logically follows that faculty members should be free to choose how their inventions are managed, including how best to disseminate, license, or develop their discoveries, as well as which management agent is best equipped to work with them to handle the patenting and license negotiations. As a university makes disposition of these rights a condition of employment, these rights could be secured for faculty members in collective bargaining agreements.

Under such a system, professors might very well choose to grant invention rights to their own institutions. But those institutions would have to compete for faculty business on a level playing field; they could not simply claim automatic monopoly control over faculty research. Instead, they would have to offer services consistent with faculty investigator objectives and be held accountable for the commitments made to support licensing of the invention. The institutions would also, then, have to show how their program of invention deployment better served the public than comparable services offered by private invention-management agents. Faculty members could choose instead to work with an outside intellectual property expert or management agency (unless they had previously agreed otherwise).

Allowing faculty members to retain title to their inventive scholarship protects academic freedom and inventors' rights. It also requires universities to work much more collaboratively with faculty members, both in negotiations over individual faculty inventions and in the development of shared protocols to guide invention-management practices university-wide. The establishment of such shared governing protocols for the management of university intellectual property is critically important. In its 2011 report *Managing University Intellectual Property in the Public Interest*, the National Research Council and the National Academies called on faculty members, administrators, and other constituencies with an interest in campus-based inventions and intellectual property management practices to develop such protocols. As the authors of the report explained, "It is essential that universities give a clear policy mandate to their technology transfer offices and acknowledge the tensions among frequently stated goals: knowledge dissemination, regional economic development, service to faculty members, generation of revenue for the institution, and, more recently, addressing humanitarian needs."[14]

Most universities currently operate without clear shared governance protocols to guide their invention-management and technology-transfer operations. The result is the widespread complaint—from faculty members, industry, private foundations, legal experts,

14. National Research Council, *Managing University Intellectual Property in the Public Interest* (Washington, DC: The National Academies Press, 2010), http://www.nap.edu/catalog.php?record_id=13001. See recommendations 1 and 2, quoted on pages 4 and 66.

government agencies, and public interest groups—that universities are unaccountable, overly focused on maximizing profits, and ineffective in managing inventions in the public interest. In 2007, officials from the Ewing Marion Kauffman Foundation, the leading US foundation dedicated to entrepreneurship research, wrote that university-based technology-transfer offices "were envisioned as gateways to facilitate the flow of innovation but have instead become gatekeepers that often constrain the flow of inventions and frustrate faculty, entrepreneurs, and industry."[15] Many in industry are quite vocal about the poor university management of research inventions, the lack of sufficient expertise in university technology-transfer offices, and the imposition of excessive licensing restrictions and fees that impede industry use.[16]

The AAUP agrees with the US Supreme Court that universities have a legal obligation to honor faculty inventor rights and to respect the central role of faculty members in the disposition of intellectual property deriving from their own research. The strongest opposition to this position is likely to emanate from the technology-transfer offices themselves, which have a vested interest in the status quo. In a written public comment submitted to the AAUP on July 17, 2012—after the Supreme Court's *Stanford v. Roche* ruling—AUTM's board of directors continued to proclaim that as "employees of a university, faculty members are subject to employment contracts like any other profession" and should not be granted "free agency" when it comes to the ownership and management of their research discoveries and inventions.

According to AUTM's letter, compulsory assignment of invention rights is justified because technology-transfer offices are best equipped to fulfill the public objectives of technology transfer, which AUTM defines as follows: "1. to give taxpayers a return on their invested research dollars, and 2. to benefit the public by transferring new technologies for public use expeditiously and effectively." In AUTM's view, university technology-transfer offices (also known as technology-licensing offices, or TLOs) are the most experienced managers of these inventions and also the least biased: "University TLOs, experienced in dealing with multiple inventors and multiple institutions, are in the best position to be neutral, objective, and unbiased advocates of federally funded inventions. Further, the benefit of this expertise extends to the transfer of technologies that have other sources of funding."

AUTM provided no evidence to support its assertions, but most data on the management of campus-based research and inventions would counter the claim that technology-transfer offices are neutral and unbiased guardians of the public interest. Most universities expect these offices to be financially self-sustaining, which, given their operating costs, creates a strong incentive for their officers to put institutional revenue generation ahead of competing public interest goals. The survey cited above found that university technology-transfer officers rank revenue generation (from licensing royalties and fees) as their top priority, valuing it over widespread use of faculty inventions and even effective commercialization.

Yet there is one general caveat that applies to all invention-management negotiations: no party to a contract is inherently immune to disabling motivations and biases. Faculty inventors and administrators alike may be biased by the apparent opportunity for substantial profit when negotiating intellectual property and research contracts. The reality of such influences strengthens the argument for collectively defined university intellectual property protocols, such as the ones we recommend. These protocols could benefit the public by clarifying institutional support for procedures by which creative workers hosted by a university may transfer academic knowledge to society. When universities assume monopoly ownership over research inventions (and therefore do not negotiate with faculty inventors or face competition from independent intellectual property management agencies and professionals), they have a powerful incentive to pursue more restrictive licensing arrangements, which they believe are more profitable. In actual practice, such behaviors tend to rely on a very few licensing deals generating a disproportionate amount of licensing income, while the vast majority of inventions claimed by a university languish: the extra licensing income serves to file patents—that is, to claim formal institutional ownership of inventions—but is not used to transfer these inventions to the public. In fact, the institutionally created patents become barriers to access and serve

15. Robert E. Litan, Lesa Mitchell, and E. J. Reedy, "Commercializing University Innovations: A Better Way" (working paper), http://regulation2point0.org/wp-content/uploads/downloads/2010/04/RP07-16_topost.pdf.

16. *Bayh-Dole—The Next 25 Years, Testimony Before Comm. on Science and Technology, Subcomm. On Technology and Innovation*, 110th Cong. (July 17, 2007) (Statement of Wayne Johnson, vice president of university relations, Hewlett-Packard); David Kramer, "Universities and Industry Find Roadblocks to R&D Partnering," *Physics Today* 61, no. 5 (2008): 20–22.

to undermine the value of the research that led to the discoveries and inventions in the first place.

In its written comments, AUTM argued that in order to foster successful technology transfer, it was necessary to give universities the power to patent government-funded inventions and license them exclusively to private companies. Otherwise, it stated, those companies would be unwilling to invest the capital required to bring embryonic academic inventions into commercial development. This more aggressive university focus on patents and exclusive licensing may aid in the development of some inventions, but—as recent cases involving stem cells, breast cancer genes, disease patents, and software demonstrate—it by no means helps with all university discoveries, and it is often not in the public interest.

AUTM and the university technology-licensing community routinely disparage all alternatives to their adopted policy model. Viable alternatives include using specialized invention-management agents, allowing investigators and inventors to work with the intellectual property attorneys and management agents of their choice, using nonexclusive licensing to promote competition and free enterprise, dedicating inventions to the public domain, using open innovation strategies, and licensing for quality control without requiring payment. Studies show that such alternative methods of technology transfer remain the most common channels by which industry gains access to academic knowledge and inventions. One survey of firms in the manufacturing sector reported that the four highest-ranked avenues for accessing university knowledge were traditional, open academic channels: publications, conferences, informal information exchange, and consulting.[17] Patents and licensing ranked far lower on the list. Even in pharmaceuticals, where patents and licenses are considered important to facilitate commercialization, firms still rely heavily on traditional open channels.[18]

The notion that stronger intellectual property control accelerates commercialization of federally funded research runs contrary to important economic principles. When publicly funded knowledge is "nonrivalrous," as academic science frequently is, its use in additional applications poses no real economic cost. By contrast, when any one party is denied access to a discovery, it can stifle the potential for continuing research and other commercial applications.[19]

Ironically, most academic inventions reach the attention of strategically located people in industry through existing contacts with faculty inventors. When Thursby and colleagues asked technology-transfer officers to describe the procedures used to market scholarly work, the role of faculty inventors was paramount. Fifty-eight percent of the respondents listed faculty inventor contacts as useful for marketing academic technology to industry. "It is also likely," noted the survey's authors, "that some of the 75% of [the technology-transfer officers] who listed personal contacts as important were referring to the personal contacts of faculty." A companion survey of businesses that license university technologies generated similar results: 46 percent of industry respondents said that personal contacts between their research and development staff and university faculty members were extremely important in identifying new technologies to license.[20] These results accord with a 1999 study finding that 56 percent of the primary leads for university license adoptions, in the 1,100 licenses examined, originated from faculty members.[21] Technology-transfer offices, these surveys suggest, could not operate effectively without help from faculty inventors, through their contacts in industry and their deep knowledge of invention technologies and applications. According to the authors of the survey on technology-transfer officers, "[t]he importance of the faculty in finding licensees follows . . . from the generally early stage of university technologies since, for such technologies, it is the faculty who are able best to articulate the value and nature of such technologies."

It thus seems particularly shortsighted for AUTM and university administrations to insist on the compulsory assignment of faculty research inventions to the

17. Wesley M. Cohen, Richard R. Nelson, and John P. Walsh, "Links and Impacts: The Influence of Public Research on Industrial R&D," *Management Science* 48, no. 1 (2002): 1–23; Ajay Agrawal and Rebecca Henderson, "Putting Patents in Context: Exploring Knowledge Transfer from MIT," *Management Science* 48, no. 1 (2002): 44–60.

18. Alfonso Gambardella, *Science and Innovation* (Cambridge: Cambridge University Press, 1995).

19. Kenneth J. Arrow, "Economic Welfare and the Allocation of Resources for Invention," in *Science Bought and Sold: Essays in the Economics of Science*, ed. Philip Mirowski and Esther-Mirjam Sent (1962; repr., Chicago: University of Chicago Press, 2002), 165–81; Richard R. Nelson, "The Simple Economics of Basic Research," in *Science Bought and Sold* (1959; repr.), 151–64.

20. Jerry G. Thursby and Marie C. Thursby, "Industry Perspectives on Licensing University Technologies: Sources and Problems," *Industry and Higher Education* 15, no. 4 (2001): 289–94.

21. Christina Jansen and Harrison F. Dillon, "Where Do the Leads for Licenses Come From? Source Data from Six Institutions," *The Journal of the Association of University Technology Managers* 11 (1999).

university—a process that necessarily distances faculty members from the management and marketing of their own inventions. Given that faculty inventors have the deepest knowledge of their own inventions and sometimes are sole sources of the expertise that surrounds their scholarly work (which is often experiential and cannot be patented), it is simply sound policy for faculty members to control the dissemination of their own scholarship and research.

In seeking to strengthen these rights, faculty members will likely face considerable opposition from university technology-licensing officers and universities' legal counsel, who have grown accustomed to asserting monopoly positions on faculty scholarship and have a powerful interest in maintaining the status quo that funds their salaries. Propelled by Bayh-Dole and other legislative reforms, universities have invested heavily in their technology ownership and licensing operations over the last three decades, expending large sums on licensing staff, legal experts, patenting and licensing fees, and intellectual property–related litigation.

This expenditure has certainly brought some returns for a handful of institutions, but it has also generated substantial infrastructure overhead and expense. From 1983 to 2003, the number of patents issued directly to American universities grew from 434 to 3,259.[22] The overwhelming majority of these patents were concentrated in biomedicine, but patents also came from engineering, computer science, agriculture, and numerous other fields. Universities, however, refuse to disclose how many of these patents have not been licensed and, of those that have, which of these licenses have resulted in new products made available to the public at a reasonable cost. Total annual revenues from the licensing of university inventions increased from roughly $200 million in 1991 to $1.85 billion in 2006.[23] In 2007, AUTM reported a total of 3,148 cumulative, operational start-up firms associated with US university patenting and licensing activities. But it does not report how many of these firms are still in business or which of them has ever produced a new product offered for sale.[24]

The figures are intended to look impressive. But they are not. Contrary to widespread assumptions, most universities have not actually generated substantial income from their patenting and licensing activities, nor has their licensing activity resulted in a significant number of new products coming into commercial use. Only roughly two dozen US universities with "blockbuster" inventions generate sizable revenue from their licensing activities.[25] A 2006 econometric analysis found that, after subtracting the costs of patent management, universities netted "on average, quite modest" revenues from 1998 until 2002, two decades after Bayh-Dole took effect. The study concluded: "[U]niversities should form a more realistic perspective of the possible economic returns from patenting and licensing activities."[26] Lita Nelsen, director of the technology-licensing office at MIT, made similar observations: "[T]he direct economic impact of technology licensing on the universities themselves has been relatively small (a surprise to many who believed that royalties could compensate for declining federal support of research) . . . [M]ost university licensing offices barely break even."[27] Licensing offices less than twenty years old and institutions with annual research budgets of less than $100 million have particular difficulty breaking even. Those universities, especially, should adopt policies that restore faculty control of their inventive scholarship, for financial reasons and to protect academic freedom and support innovation. The

22. Wesley M. Cohen and John P. Walsh, "Real Impediments to Academic Biomedical Research," *Innovation Policy and the Economy* 8 (2008): 1–30, http://www.nber.org/~marschke/mice/Papers/cohenwalsh.pdf.

23. All original statistics on university and hospital patenting and licensing come from licensing activity surveys coordinated by AUTM. However, these figures were extracted from Cohen and Walsh, "Real Impediments to Academic Biomedical Research" and from Anthony D. So, Bhaven N. Sampat, Arti K. Rai, Robert Cook-Deegan, Jerome H. Reichman, Robert Weissman, and Amy Kapczynski, "Is Bayh-Dole Good for Developing Countries? Lessons from the US Experience," *PLoS Biology* 6, no. 10 (2008): e262, http://www.plosbiology.org/article/info:doi/10.1371/journal.pbio.0060262.

24. Association of University Technology Managers, *FY 2007 Licensing Activity Survey Full Report*, ed. Robert Tieckelmann, Richard Kordal, Sean Flanigan, Tanya Glavicic-Théberge, and Dana Bostrom (2007).

25. So et al., "Is Bayh-Dole Good for Developing Countries?" Original sources: Association of University Technology Managers, *FY 2006 US Licensing Activity Survey* (2006) and David C. Mowery, Richard R. Nelson, Bhaven N. Sampat, and Arvids A. Ziedonis, "The Growth of Patenting and Licensing by US Universities: An Assessment of the Effects of the Bayh-Dole Act of 1980," *Research Policy* 30, no. 1 (2001): 99–119.

26. Harun Bulut and Giancarlo Moschini, "US Universities' Net Returns from Patenting and Licensing: A Quantile Regression Analysis," Center for Agricultural and Rural Development at Iowa State University Working Paper 06-WP 432 (2006), http://www.card.iastate.edu/publications/dbs/pdffiles/06wp432.pdf.

27. Lita Nelsen, "The Rise of Intellectual Property Protection in the American University," *Science* 279, no. 5356 (1998): 1460–61.

blockbuster invention that a faculty member might make is more likely to benefit the institution when the relationship between the faculty inventor and the university is one of voluntary collaboration than when it is governed by a compulsory ownership policy.

Supporters of Bayh-Dole may have hoped the legislation would create opportunities for universities to manage academic inventions made with federal support and thus speed the pace of technological innovation in the United States. But here too the legislation's economic legacy has been mixed. Though university patents soared after Bayh-Dole, studies have found that academic patenting does not correlate well with increased industrial use or commercial development of academic discoveries.[28] A 2002 study of the patent portfolios of Stanford and Columbia found that, of eleven major inventions, seven would have been commercialized without any assertion of patent rights or technology-transfer office licensing, because "strategically located people in industry were well aware of the university research projects even before the universities' [technology-transfer offices] began to market the inventions."

IV. AAUP Policy Statements on Copyright and Patent Rights

The academic freedom principles undergirding principle 11 (below) have been guiding the AAUP since its founding. To our knowledge, this principle has not been endorsed previously by other professional academic groups; however, it builds on several recent policy statements issued by the AAUP relating to faculty-generated intellectual property. It is also consistent with long-standing principles of academic freedom and with US patent and copyright laws pertaining to the ownership rights of inventors.

As the AAUP's 1999 *Statement on Copyright* observed regarding faculty research and inventions subject to copyright, "the faculty member rather than the institution determines the subject matter, the intellectual approach and direction, and the conclusions"; for the institution to control the "dissemination of the work" would be "deeply inconsistent with fundamental principles of academic freedom." The statement goes on to note that "it has been the prevailing academic practice to treat the faculty member as the copyright owner of works that are created independently and at the faculty member's own initiative for traditional academic purposes." And it adds, "It is unlikely that the institution will be regarded as having contributed the kind of 'authorship' that is necessary for a 'joint work' that automatically entitles it to a share in the copyright ownership."

In 1998, the AAUP established a Special Committee on Distance Education and Intellectual Property Issues, which released several documents the following year, including one recommending language for campus policies regarding intellectual property rights and management, *Sample Intellectual Property Policy and Contract Language*. This document begins, "The copyright statement takes as its guiding assumption that the faculty member (or members) who create the intellectual property own the intellectual property," adding that "that assumption applies to the patent area as well." It goes on to recommend the following language for campus adoption: "Intellectual property created, made, or originated by a faculty member shall be the sole and exclusive property of the faculty, author, or inventor, except as he or she may voluntarily choose to transfer such property, in full or in part." Drawing on a detailed discussion of "work made for hire" in the *Statement on Copyright*, the special committee endorsed the following: "A work should not be treated as 'made for hire' merely because it is created with the use of university resources, facilities, or materials of the sort traditionally and commonly made available to faculty members." It went on to note: "Funds received by the faculty member from the sale of intellectual property owned by the faculty author or inventor shall be allocated and expended as determined solely by the faculty author or inventor." Recognizing the current trend for universities to assign intellectual property rights to institutions involuntarily, the AAUP further warned in its *Statement on Copyright*: "If the faculty member is indeed the initial owner of copyright, then a unilateral institutional declaration cannot effect a transfer, nor is it likely that a valid transfer can be effected by the issuance of appointment letters to new faculty members requiring, as a condition of employment, that they abide by a faculty handbook that purports to vest in the institution the ownership of all works created by the faculty member for an indefinite future."

The AAUP's *Statement on Distance Education and Intellectual Property* is prefaced by a warning that the "vital intersection of emergent technologies and

28. David C. Mowery, Richard R. Nelson, Bhaven N. Sampat, and Arvids A. Ziedonis, *Ivory Tower and Industrial Innovation: University-Industry Technology Transfer before and after the Bayh-Dole Act* (Stanford, CA: Stanford Business Books, 2004): 5.

the traditional interests of faculty members in their own intellectual products requires scrutiny and the formulation of policies that address the former while preserving the latter." The statement itself emphasizes that "the faculty should have primary responsibility for determining the policies and practices of the institution in regard to distance education." That includes authority for determining whether particular courses should receive credit at a college and how much credit they should receive. The statement does not anticipate the phenomenon of a MOOC enrolling one hundred thousand students, but it takes a firm stand on principles that should govern online courses no matter what their size: "Provision should also be made for the original teacher-creator, the teacher-adapter, or an appropriate faculty body to exercise control over the future use and distribution of recorded instructional material and to determine whether the material should be revised or withdrawn from use."

Even when a faculty member willingly creates a distance education course on a work-for-hire basis, the statement clarifies a key condition: "the faculty member should, at a minimum, retain the right to take credit for creative contributions, to reproduce the work for his or her instructional purposes, and to incorporate the work in future scholarly works authored by the faculty member."

Principle 11 was additionally informed by recent evidence of university technology-transfer offices abrogating the academic freedom rights of faculty in intellectual property decisions pertaining to their research (some of these cases are discussed above or in *Recommended Principles to Guide Academy-Industry Relations*) and by a 2010 faculty advisory board ruling in an academic freedom case involving a dispute between Stanford University and a Stanford professor (also discussed in *Recommended Principles*).

Principle 12 grows directly out of earlier AAUP policy statements on intellectual property–related issues. The AAUP has already recommended that a campus intellectual property committee "play a role in policy development." The AAUP's 2004 *Statement on Corporate Funding of Academic Research* further observes, "Consistent with principles of sound academic governance, the faculty should have a major role not only in formulating the institution's policy with respect to research undertaken in collaboration with industry, but also in developing the institution's plan for assessing the effectiveness of the policy." The AAUP has long asserted the faculty's primary responsibility for the "subject matter and methods" of research, a principle reaffirmed in the 1966 *Statement on Government of Colleges and Universities*. With regard to principle 13, one should note that the AAUP's Statement on Graduate Students points out that "graduate students are entitled to the protection of their intellectual property rights." More broadly, the AAUP's 1999 *Sample Intellectual Property Policy and Contract Language* takes a parallel approach to the one offered here:

> In light of the changing legislative environment, and in view of the evolution of contracts and policies in the intellectual property area, AAUP believes that the establishment of an on-going Intellectual Property Committee representing both faculty and administration would serve a useful purpose in both collective bargaining and non-collective bargaining environments. Such a committee could serve a variety of purposes, including keeping faculty and administration apprised of technological changes that will affect the legislative, contract, and policy contexts. Such a committee would play a role in policy development, as well as perform a dispute resolution function. In the absence of such an overall policy committee, a dispute resolution committee with both administrative and faculty representation is essential.

Principle 14 flows logically from the recommendations contained in principle 11, which were drawn from earlier AAUP statements relating to the rights of faculty members to own and control their intellectual property. The purpose of principle 14 is to extend these faculty rights to both traditional and larger-scale corporate sponsored research agreements.

Recommended Principles to Guide Academy-Industry Relations offers detailed citation of consensus statements by other academic and professional groups that support principles 15–21. Finally, the statement *Academic Freedom and Electronic Communications* reminds us that "teachers are entitled to freedom in the classroom in discussing their subject" and adds that "*a classroom is not simply a physical space, but any location, real or virtual, in which instruction occurs.*"

V. Intellectual Property Principles Designed for Incorporation into Faculty Handbooks and Collective Bargaining Agreements

These principles are reproduced (with the original numbering retained) from *Recommended Principles to Guide Academy-Industry Relations*.

HANDBOOK PRINCIPLE 11: Faculty Inventor Rights and Intellectual Property (IP) Management: Faculty members' fundamental rights to direct and control their own research do not terminate when they make a new invention or other research discovery; these rights extend to decisions about their intellectual property—involving invention management, IP licensing, commercialization, dissemination, and public use. Faculty assignment of an invention to a management agent, including the university that hosted the underlying research, will be voluntary and negotiated, rather than mandatory, unless federal statutes or previous sponsored research agreements dictate otherwise. Faculty inventors retain a vital interest in the disposition of their research inventions and discoveries and will, therefore, retain rights to negotiate the terms of their disposition. Neither the university nor its management agents will undertake IP decisions or legal actions directly or indirectly affecting a faculty member's research, inventions, instruction, or public service without the faculty member's and the inventor's express consent. Of course, faculty members, like other campus researchers, may voluntarily undertake specific projects as "work-for-hire" contracts. When such work-for-hire agreements are truly voluntary and uncoerced, their contracted terms may legitimately narrow faculty IP rights.

HANDBOOK PRINCIPLE 12: Shared Governance and the Management of University Inventions: The faculty senate or an equivalent body will play a primary role in defining the policies and public-interest commitments that will guide university-wide management of inventions and other knowledge assets stemming from campus-based research. University protocols that set the norms, standards, and expectations under which faculty discoveries and inventions will be controlled, distributed, licensed, and commercialized are subject to approval by the faculty senate or an equivalent governance body, as are the policies and public-interest commitments that will guide university-wide management of inventions and other knowledge assets stemming from campus-based research. A standing faculty committee will regularly review the university's invention-management practices, ensure compliance with these principles, represent the interests of faculty investigators and inventors to the campus, and make recommendations for reform when necessary.

HANDBOOK PRINCIPLE 13: Adjudicating Disputes Involving Inventor Rights: Just as the right to control research and instruction is integral to academic freedom, so too are faculty members' rights to control the disposition of their research inventions. Inventions made in the context of university work are the results of scholarship. Invention-management agents are directed to represent and protect the expressed interests of faculty inventors, along with the interests of the institution and the broader public, to the maximum extent possible. Where the interests diverge insurmountably, the faculty senate or an equivalent body will adjudicate the dispute with the aim of recommending a course of action to promote the greatest benefit for the research in question, the broader academic community, and the public good. Student and other academic professional inventors have access to grievance procedures if they believe their inventor or other IP rights have been violated. Students will not be urged or required to surrender their IP rights to the university as a condition of participating in a degree program.

HANDBOOK PRINCIPLE 14: IP Management and Sponsored Research Agreements: In negotiating outside sponsored research agreements, university administrators will make every effort to inform potentially affected faculty researchers and to involve them meaningfully in early-stage negotiations concerning invention management and IP. In the case of large-scale corporate sponsored research agreements like strategic corporate alliances (SCAs), which can have an impact on large numbers of faculty members, not all of whom may be identifiable in advance, a special faculty committee will be convened to participate in early-stage negotiations, represent collective faculty interests, and ensure compliance with relevant university protocols. Faculty participation in all institutionally negotiated sponsored research agreements will always be voluntary.

HANDBOOK PRINCIPLE 15: Humanitarian Licensing, Access to Medicines: When lifesaving drugs and other critical public-health technologies are developed in academic laboratories with public funding support, the university will make a strong effort to license such inventions in a manner that will ensure broad public access in both the developing and the industrialized world. When issuing an exclusive license to a company for the development of a promising new drug—or any other critical agricultural, health, or environmental safety invention—the university will always seek to include provisions to facilitate distribution of these inventions in developing countries at affordable prices.

HANDBOOK PRINCIPLE 16: Securing Broad Research Use and Distribution Rights: All contracts

and agreements relating to university-generated inventions will include an express reservation of rights—often known as a "research exemption"—to allow for academic, nonprofit, and governmental use of academic inventions and associated intellectual property for noncommercial research purposes. Research exemptions will be reserved and well publicized prior to assignment or licensing so that faculty members and other academic researchers can share protected inventions and research results (including related data, reagents, and research tools) with colleagues located at this university or at any other nonprofit or governmental institution. The freedom to share and practice academic discoveries, for educational and research purposes, whether legally protected or not, is vitally important for the advancement of research and scientific inquiry. It also enables investigators to replicate and verify published results, a practice essential to scientific integrity.

HANDBOOK PRINCIPLE 17: Exclusive and Nonexclusive Licensing: The university, its contracted management agents, and faculty will always work to avoid exclusive licensing of patentable inventions, unless such licenses are absolutely necessary to foster follow-on use or to develop an invention that would otherwise languish. Exclusive and other restrictive licensing arrangements will be used sparingly, rather than as a presumptive default. When exclusive licenses are granted, they will have limited terms (preferably less than eight years); include requirements that the inventions be developed; and prohibit "assert licensing," sometimes referred to as "trolling" (aggressively enforcing patents against an alleged infringer, often with no intention of manufacturing or marketing the product yourself). Exclusive licenses made with the intention of permitting broad access through reasonable and nondiscriminatory sublicensing, cross-licensing, and dedication of patents to an open standard should meet public-access expectations. However, the preferred methods for disseminating university research are nonexclusive licensing and open dissemination, to protect the university's public-interest mission, open-research culture, and commitment to advancing research and inquiry through broad knowledge sharing. To enhance compliance and public accountability, the university requires all invention-management agents to report publicly and promptly any exclusive licenses issued together with written statements detailing why an exclusive license was necessary and why a nonexclusive one would not suffice. The faculty senate, or another designated governance body, has the authority to review periodically any exclusive licenses and corresponding statements for consistency with the principle.

HANDBOOK PRINCIPLE 18: Upfront Exclusive Licensing Rights for Research Sponsors: The university will refrain from signing sponsored research agreements, especially multiyear, large-scale SCA agreements, granting sponsors broad title, or exclusive commercial rights, to future sponsored research inventions and discoveries unless such arrangements are narrowly defined and agreed to by all faculty members participating in, or foreseeably affected by, the alliance. If this arrangement is not feasible, as in the case of larger SCAs, the faculty senate (or another designated governance body) will review and approve the agreement and confirm its consistency with principles of academic freedom and faculty independence and with the university's public-interest missions. Special consideration will be given to the impact exclusive licenses could have on future, as-yet-unimagined uses of technologies. When granted, exclusive rights will be defined as narrowly as possible and restricted to targeted fields of use only, and every effort will be made to safeguard against abuse of the exclusive position.

HANDBOOK PRINCIPLE 19: Research Tools and Upstream Platform Research: The university and its contracted management agents will undertake every effort to make available and broadly disseminate research tools and other upstream platform inventions in which they have acquired an ownership interest. They will avoid assessing fees, beyond those necessary to cover the costs of maintaining the tools and disseminating them, and avoid imposing other constraints that could hamper downstream research and development. No sponsored research agreement will include any contractual obligations that prevent outside investigators from accessing data, tools, inventions, and reports relating to scholarly review of published research, matters of public health and safety, environmental safety, and urgent public policy decisions.

HANDBOOK PRINCIPLE 20: Diverse Licensing Models for Diverse University Inventions: Faculty investigators and inventors and their management agents will work cooperatively to identify effective licensing or distribution models for each invention with the goal of enhancing public availability and use.

HANDBOOK PRINCIPLE 21: Rights to "Background Intellectual Property" (BIP): University administrators and their agents will not act unilaterally when granting sponsors rights to university-managed background intellectual property related to a sponsor's

proposed research area but developed without the sponsor's funding support. The university will be mindful of how BIP rights will affect faculty inventors and other investigators who are not party to the sponsored research agreement. University administrators and managers will not obligate the BIP of one set of investigators to another's sponsored research project, unless that BIP is already being made available under nonexclusive licensing terms or the affected faculty inventors and investigators have consented. ■

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