

Scofflaw Science: Avoiding the Anticommons Through Ignorance

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I. INTRODUCTION

An expansion of patent rights in upstream scientific research has led many commentators to posit that broad intellectual property (IP) rights actually deter innovation.¹ A recent empirical study, however,

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1. See Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698, 701 (1998) (“[T]he privatization of

suggests that such reports of the demise of innovation may be, like Mark Twain's death, "greatly exaggerated."² The study, published in *Science* magazine, explains that "IP on research tools . . . rarely precluded the pursuit of worthwhile projects" and "issues of access to IP rights to research tools" almost never stopped projects in their tracks.³

If that were the study's only conclusion, such a result would disappoint no one. The *Science* study, however, goes on to report that, in addition to challenging in the validity of patents in court or licensing upstream patents, researchers are going offshore or simply infringing patents without much fear of detection.⁴ This Article argues that the way in which "industrial researchers have adopted 'working solutions'"⁵ to the upstream patent problem should be cause for hesitation, as encouraging or supporting the intentional infringement of patents incentivizes a nation of scofflaw scientists.

Where the law and norms diverge is the subject of a veritable cornucopia of scholarly attention.⁶ This Article contributes to the literature not by reconceptualizing the theories of obedience to legal standards but rather by applying the existing literature to the apparent scientific norm of "disobedience." I proceed in Part II by accepting and describing the ways in which researchers are flouting the law. Parts III through V articulate the various responses society can take when legal standards and norms diverge. Part III recognizes the option of doing nothing and illustrates the problems of that approach, articulating some of the moral and utilitarian concerns of law-breaking. Contrary to the *Science* study's implicit encouragement of infringement, this Article

biomedical research . . . risks creating a tragedy of the anticommons through proliferation of fragmented and overlapping intellectual property rights. Policy-makers should seek to ensure coherent boundaries of upstream patents and to minimize restrictive licensing practices that interfere with downstream product development."); see also Robert P. Merges, *Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents*, 62 TENN. L. REV. 75, 84-91 (1994) (discussing examples of innovations that were delayed or deterred because of negotiation breakdowns). Upstream research consists of the "building blocks" of scientific knowledge, whereas downstream development refers to the actual application of that research.

2. THE OXFORD DICTIONARY OF QUOTATIONS 786 (Elizabeth Knowles ed., 1999).

3. John P. Walsh et al., *Working Through the Patent Problem*, 299 SCIENCE 1021 (2003).

4. *Id.*

5. *Id.* In reviewing the study, Arti Rai and Rebecca Eisenberg note that "[a]lthough the study characterizes this firm behavior as a 'working solution,' one might question the long-term viability of a solution that is based on pervasive law-breaking that may yet trigger costly litigation when it comes to light." Arti K. Rai & Rebecca S. Eisenberg, *Bayh-Dole Reform and the Progress of Biomedicine*, 66 LAW & CONTEMP. PROBS. 289, 298 n.49 (Winter/Spring 2003).

6. See, e.g., Eric Posner, *Law and Social Norms: The Case of Tax Compliance*, 86 VA. L. REV. 1781, 1781 (2000) ("Scholarship on the relationship between law and social norms, between legal and nonlegal sanctions, is flourishing, and there is no sign that it will abate any time soon.").

argues that this avenue—doing nothing—will actually harm society. I present the advantages and disadvantages of other policy alternatives in Parts IV and V. Part IV analyzes the possibility of tightening enforcement of IP rights and increasing discovery of IP violations. Finally, Part V offers a brief review of proposed reforms that would bring the law closer to what actually occurs and explains how the traditional slippery slope argument against such alternatives would apply in this context..

II. SOLVING THE PATENT PROBLEM

Empiricists have devoted substantial resources to determine how the patent landscape affects scientific research.⁷ The purpose of a patent system, after all, is traditionally assumed to encourage innovation.⁸ Responding to concerns that the patent landscape in fact deters innovation, analysts have sought to establish this deterrence by anecdote, or to rebut it through survey evidence. In this Part, I first illustrate this phenomenon by explaining the concerns commentators have articulated in the context of the biomedical and pharmaceutical industries. Subpart B provides the foundation for the rest of my argument by describing in detail the empirical studies done in response to those concerns. As I later argue, these studies do not illustrate a good “working solution” as the commentators seem to argue, but rather present a significant cause for concern.

A. *The Problem? A Biomedical Anticommons*

Numerous commentators have criticized broad patent rights in basic research tools, arguing that such a system may discourage innovation. Briefly, the concern is that because scientists making downstream products must license or work around so many upstream patents, those researchers—particularly in the biomedical industry—will be

7. For studies outside the scope of this Article, see, for example, Ian Cockburg & Rebecca Henderson, *Public-Private Interaction in Pharmaceutical Research*, 93 PROC. NAT'L ACAD. SCI. USA 12,726 (1996).

8. This purpose stems from constitutional command. See U.S. CONST. art. 1, § 8, cl. 8. Congress may grant monopolies “[t]o promote the Progress of Science and useful Arts.” *Id.* Outside of encouraging innovation, Edmund Kitch has argued the patent system functions as a prospect system because the scope of patents is larger than need be solely to encourage innovation. Kitch argues such a prospect system is socially useful because it allows upstream inventors to coordinate development. Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265 (1977).

discouraged from initiating the inventive process.⁹ Negotiating with numerous upstream patent holders entails significant transaction costs, leading to a fear that broad patent claims that are allowed on “relatively trivial upstream inventions” could lead to less downstream research.¹⁰

Professors Michael Heller and Rebecca Eisenberg dubbed this concern the “tragedy of the anticommons,” writing that “[a] proliferation of intellectual property rights upstream may be stifling life-saving innovations further downstream in the course of research and product development.”¹¹ Heller and Eisenberg argue that traditional private contracting will not alleviate this problem within the biomedical field because (1) the transaction costs of bundling rights in biomedical research are higher than in other fields because of difficult, divergent valuation; (2) conflicting agendas and social values of IP owners in biomedical research hinder effective licensing;¹² and (3) biotechnology business offices rely on researchers to self-identify the worth of their patents, which leads to exaggeration and rejection of “reasonable offers.”¹³

Calling Heller and Eisenberg’s theory “far from merely an academic construct,” Professor Janice Mueller cites anecdotal examples where projects were stifled because of “overly restrictive licensing terms and excessive licensing fees.”¹⁴ Another commentator suggests that the anticommons “appears to be a systemic problem and if it is, the solution might lie in an overhaul of the entire system rather than tinkering with it

9. See, e.g., ORG. FOR ECON. CO-OPERATION & DEV., GENETIC INVENTIONS, INTELLECTUAL PROPERTY RIGHTS AND LICENSING PRACTICES (2002), [hereinafter OECD REPORT] available at <http://www.oecd.org/dataoecd/42/21/2491084.pdf> (“[P]atents on early ‘foundational’ discoveries, if not widely licensed, may discourage or limit the use of these important innovations and slow the pace of R&D in a particular field.”); Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, 5 J. ECON. PERSP. 29, 32 (1991) (“[B]road protection can lead to deficient incentives to develop second generation products.”).

10. Arti K. Rai, *Engaging Facts and Policy: A Multi-Institutional Approach to Patent System Reform*, 103 COLUM. L. REV. 1035, 1070-71 (2003) (“If the PTO were to have granted patents—particularly broad patents—on large numbers of these relatively trivial upstream inventions, there is reason to fear that downstream research might have been delayed or perhaps even blocked. The transaction costs [of] negotiating with various upstream claimants would likely have been prohibitive.”).

11. Heller & Eisenberg, *supra* note 1, at 698.

12. *Id.*; see also Charlotte H. Harrison, *Neither Moore Nor the Market: Alternative Models for Compensating Contributors of Human Tissue*, 28 AM. J.L. & MED. 77, 86-87 (2002) (“The time-consuming nature of academic/industrial negotiations is often due, in part, to the substantive social values expressed in public technology policy. . . . The conflict is rooted in a difference between public and private objectives rather than in mere inefficiency.”).

13. Heller & Eisenberg, *supra* note 1, at 698.

14. Janice M. Mueller, *No “Dilettante Affair”: Rethinking the Experimental Use Exception to Patent Infringement for Biomedical Research Tools*, 76 WASH. L. REV. 1, 7-8 (2001).

at the margins.”¹⁵ Conversely, others have refuted the anticommons claim by asserting that the patent system is “getting it right.”¹⁶

B. The Solution? License, Infringe, or Go Offshore

Despite this tale of an anticommons, empirical evidence suggests that researchers have been able to avoid the transaction costs of licensing or buying numerous upstream and basic research patents. Some patent holders, for example, allow university researchers “to conduct unlicensed research on their patented genes, or, at least, charge[] just a handling fee.”¹⁷ The most important evidence that upstream patents are not currently creating problems for downstream research comes from a study by Professors John Walsh, Ashish Arora, and Wesley Cohen. The study was initially published in *Science* magazine¹⁸ and expanded in a later paper.¹⁹ It concludes that researchers have, through a variety of methods, “limited the negative effects of research tool patents on innovation.”²⁰ Although respondents in the study recognized that the patent landscape has become significantly more complex, most downstream researchers had adopted “working solutions” to handle the large number of patented upstream products.²¹ Similarly, a study of research organizations in Germany concluded that “problems could be handled flexibly and, while some problems have not been solved or negotiations have failed, working solutions have been found in most cases.”²²

The nature of these “working solutions” warrants discussion. A key component of researchers’ solution to the patent problem is simple infringement. Often by using what has been dubbed “an informal research exemption,” many researchers simply flout the IP laws.²³ Professors Walsh, Arora, and Cohen report that “[a] third of the industrial respondents (and all nine university or government lab

15. Kojo Yelapaala, *Owning the Secret of Life: Biotechnology and Property Rights Revisited*, 32 MCGEORGE L. REV. 111, 185 (2000).

16. F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697, 753 (2000) (arguing that patents, even for research tools, provide incentives for the commercialization of goods and services).

17. May Mowzoon, Comment, *Access Versus Incentive: Balancing Policies in Genetic Patents*, 35 ARIZ. ST. L.J. 1077, 1090 (2003).

18. Walsh et al., *supra* note 3, at 1021.

19. John P. Walsh et al., *Effects of Research Tool Patents and Licensing on Biomedical Innovation*, in PATENTS IN THE KNOWLEDGE BASED ECONOMY 285 (Wesley M. Cohen & Stephen A. Merrill eds., 2003).

20. *Id.* at 289.

21. *Id.* at 314.

22. OECD REPORT, *supra* note 9, at 47.

23. Walsh et al., *supra* note 19, at 324.

respondents) acknowledged occasionally using patented research tools without a license.²⁴ The authors note that “[u]niversity researchers have a reputation for routinely ignoring IP rights in the course of their research.”²⁵ Further, much patented material proves unuseful to scientists conducting research; only if the firm or organization actually develops a product using a patented research tool will it typically seek to license or buy the patent.²⁶

Another “solution” to the upstream patent problem is to take research outside of the United States. The *Science* study does not offer hard data on how many organizations use offshore research to avoid licensing patented research tools, but concludes:

Respondents also pointed out that patents are national but the research community is global. . . . Although similar to the solution of ignoring the patent, in that it involves using patented technologies without securing the rights, this case differs in that firms are not violating the legal rights of the patent owner, at least not until there is a product developed and the firm tries to import the product.²⁷

The patent laws hold liable for infringement anyone who, without authorization, imports a product made with a patented process.²⁸ But again, researchers only need to license what works—leaving the research tools tried unsuccessfully without protection.

These solutions—intentional infringement and offshore research—combined with traditional private ordering, court challenges and invent-around, lead Walsh, Arora, and Cohen to conclude that patents on upstream inventions have not led to any discernable decrease in innovation in the biomedical field; there is “a free space in the patent landscape that allows research projects to proceed relatively unencumbered.”²⁹ Similarly, the author of the German study reports that

24. *Id.* at 327.

25. *Id.* at 324 (citing Rochelle K. Seide & Janet M. MacLeod, *Comment on Heller & Eisenberg*, at <http://www.sciencemag.org/feature/data/980465/seide.shl> (last visited Jan. 20, 2005) (“Finally, it has been our experience that the average institutional researcher, in designing biomedical research projects and soliciting and allocating research funds, generally does not consider the patent positions of others in the field (with the exception of a few well-known patents).”).

26. *See id.* at 327 n.58 (“Once you identify the promising candidate, then you look into licensing the research tools or sequences you used.” (quoting a study respondent)).

27. *Id.* at 328.

28. *See* 35 U.S.C. § 271(g) (2000) (“Whoever without authority imports into the United States . . . a product which is made by a process patented in the United States shall be liable as an infringer, if the importation . . . of the product occurs during the term of such process patent.”).

29. Walsh et al., *supra* note 19, at 324.

“the freedom to operate is not unduly impeded” because of upstream patents.³⁰

Before proceeding to explain why these “working solutions” come with a price too costly to pay, it is important to delineate the different risks of infringement faced by downstream researchers. Each risk entails a different analysis of whether to infringe, and presents different costs and challenges to the status quo.

1. Risk of Detection

Use of patented research tools and upstream inventions is difficult to detect, particularly when such use does not lead to a successful product. The classic cases of intentional infringement are easy to detect: a maker of a patented product sees the infringing product on the market. In the biomedical field, in contrast, there is no widget that is easily detectable as an infringer. Even if it is possible to know that an end-product necessarily uses a certain patented research tool, that knowledge is limited to the tools used to make the end product. The tools used in unsuccessful projects are therefore even more difficult to detect.

The authors of the *Science* study recognize this phenomenon, concluding that “if research tool patents have created a minefield, they are mines with fairly insensitive triggers.”³¹ A respondent to the *Science* study explained: “You [a downstream researcher] can infringe, and take the risk of getting sued. They [the upstream patent owner] would have to know your practices. . . . Some research tool owners are very aggressive. If they get a hint you are using their tool, they sue. You take all this into account.”³² Because the use of most research tools takes place behind “laboratory doors,” such hints are rarely available to owners of upstream patents.³³

2. Risk of Prosecution

Even if infringing uses are detected, many researchers do not fear that the patent holder will actually bring a lawsuit. Because the risk of bad publicity typically outweighs any damages a patent holder could extract from a university or research institution, the risk of prosecution is fairly low, especially within the academic community and among repeat

30. OECD REPORT, *supra* note 9, at 79.

31. Walsh et al., *supra* note 19, at 324.

32. *Id.* at 327 n.58.

33. OECD REPORT, *supra* note 9, at 47.

players. The authors of the *Science* study quote a person working in a university technology transfer office:

Asserting [patent rights] against a university doesn't make sense. First, there are no damages. You cannot get injunctive relief and/or damages. What have you gained? You've just made people mad. Also, these firms are consumers of technology as well. No one will talk to you if you sue. We all scratch each others' backs. You will become an instant pariah if you sue a university.³⁴

Repeat players here enforce scientific norms by punishing only "overly aggressive behavior."³⁵ Patent infringers, however, face a larger risk of prosecution when the patent holder is a one-shot player.³⁶

3. Risk of Liability

Finally, a patent infringer faces the risk of liability. Even if the infringing use is detected, and the patent holder brings suit, the infringer may still win in court, if the patent is held invalid or the use is deemed part of a research exception. It is at this liability phase that courts have the only opportunity to control or influence the patent landscape.³⁷ A strong presumption of patent validity and infringement would make the liability risk very high, perhaps compensating for the market factors that make the risk of detection and prosecution so low.

However, in practice, researchers tend to believe their risk of liability is actually very low. The authors of the *Science* study explain:

[A]t least a few industry respondents argued strongly that using a gene patent as a research tool did not infringe or that infringement was limited to that experiment per se and did not extend to the product discovered (in part) by using the research tool, i.e., that the scope of research tool patent claims is quite limited. In addition, because many of these patents are of debatable validity, they felt that if a license were not available, they could challenge the patent in court. Finally, not only is use of a patented research

34. Walsh et al., *supra* note 19, at 325.

35. *Id.* (citing Arti K. Rai, *Regulating Scientific Research: Intellectual Property Rights and the Norms of Science*, 94 NW. U. L. REV. 77 (1999)). It is important to distinguish the norm discussed here—that researchers are violating existing patent rights—with the norms Rai discusses. In her article, she establishes that most actors follow the norm of generally not seeking property or patent rights in very basic research. She then argues that the government should "reinforce and protect these norms," but not rely exclusively on legal change to prevent over-patenting that discourages research. Rai, *supra*, at 152.

36. See Walsh et al., *supra* note 19, at 317-19 (discussing examples).

37. See also *infra* notes 90-93 and accompanying text.

tool hard to detect, but because of the long drug development process, the 6-year statute of limitations may expire before infringement is detected.³⁸

Without the availability of equitable tolling, courts are not in a position to impose liability after the six-year statute of limitation expires.³⁹

Courts could, however, use clear, bright-line liability rules so that companies can assess their risks of liability easily (and, conversely, so that patent holders can assess their chances of victory).⁴⁰ Ironically, the one area of law that courts have settled, the scope of the research exemption, seems ignored or contradicted in practice.⁴¹ For example, a respondent to the *Science* study wrote:

I know this is a murky legal issue, and you should talk to patent lawyers, but in everyday practice, it is not murky. There is a concept of “academic use” I don’t know if it is solidly defensible in the law, but it is the practice. When I have a patented technology, academic colleagues would not even think of paying to use it.⁴²

The *Science* study was, however, conducted before the United States Court of Appeals for the Federal Circuit’s decision in *Madey v. Duke University*, the seminal case that severely restricted the scope of the research exception.⁴³ The area of law that seemed to many scientists to allow for the use of patented technologies now severely restricts such opportunities. *Madey* and other decisions are moving this country toward a status quo of scofflaw science.

38. Walsh et al., *supra* note 19, at 327-28.

39. See 35 U.S.C. § 286 (2000) (“Except as otherwise provided by law, no recovery shall be had for any infringement committed more than six years prior to the filing of the complaint or counterclaim for infringement in the action.”).

40. See *infra* notes 94-95 and accompanying text.

41. See *infra* note 43 and accompanying text.

42. Walsh et al., *supra* note 19, at 327.

43. 307 F.3d 1351 (Fed. Cir. 2002), *cert. denied*, 539 U.S. 958 (2003). According to the Federal Circuit, “so long as the act is in furtherance of the alleged infringer’s legitimate business . . . [it] does not qualify for the very narrow and strictly limited experimental use defense.” *Id.* at 1362. The Supreme Court did ask for the views of the Solicitor General, 538 U.S. 959 (2003), who argued the petition should be denied because concerns stemming from the decision “may be better suited for legislative rather than judicial consideration.” Brief for the United States as Amicus Curiae, *Duke University v. Madey*, No. 02-1007, available at <http://www.usdoj.gov/osg/briefs/2002/2pet/6invit/2002-1007.pet.ami.inv.pdf>. Even before *Madey*, however, the Federal Circuit had taken a narrow view of the experimental use exception. See *Roche Prods., Inc. v. Bolar Pharms. Co.*, 733 F.2d 858, 862-63 (1984) (holding the experimental use defense does not permit “unlicensed experiments conducted with a view to the adaptation of the patented invention to the experimenter’s business,” as opposed to experiments conducted “for amusement, to satisfy idle curiosity, or for strictly philosophical inquiry”).

III. A STATUS QUO OF SCOFFLAW SCIENCE

As demonstrated in Part II, scientists often ignore the law, choosing instead to use patented products without a license or legal process to get around the patent. This phenomenon could be seen as positive, as researchers avoid the tragedy of the anticommons to pursue knowledge and greater good. It could also be seen as a private matter, one for patent holders to pursue much like a party holding a contract enforces it against a party who has broken a promise. This Article, however, argues that the trend of infringement is a social harm, not just a private one. First, I show how the infringement norm is not efficient by summarizing the costs of consistent violation of the law and applying these costs to the biomedical industry. I next explain why scientists have a duty to obey the patent laws and not infringe.

A. *The Costs of Disobedience*

Most people have broken one law or another, violating some type of legal standard. The most common example is speeding; drivers routinely exceed the posted limit. A culture of excessive speeding brings costs on those who follow the limit, unfair advantages to those who know how to avoid speed traps, and selective or discriminatory enforcement.⁴⁴ Additionally, there is the classic slippery slope argument: once a person breaks one law without punishment, he is more likely to break another, more costly law. This section applies these classic arguments to IP rights in the biotechnology industry.

1. Costs Imposed on Law-Abiders

This argument is fairly intuitive: when a law is widely ignored, only law-abiders face the costs of compliance. This effect creates disincentives to follow the law, and penalizes people for “doing the right thing.” In the biomedical field, for example, the companies that do not infringe patents are penalized through the costs of licensing the patents or using more expensive products. Infringers, in contrast, face lower transaction costs, such as an unlicensed vendor selling Taq polymerase.⁴⁵

44. See generally Margaret Raymond, *Penumbra Crimes*, 39 AM. CRIM. L. REV. 1395 (2002) (discussing the consequences of the consistent violation of speeding laws).

45. See Walsh et al., *supra* note 19, at 300, 306 (discussing high royalty rates for Taq polymerase). The company Promega, who is often in litigation with Roche Diagnostics (the company that makes Taq polymerase), sells Taq “for about half of what many licensed vendors charge.” *Id.* at 325; see also Mueller, *supra* note 14, at 3-5 (discussing the Roche/Promega dispute).

In addition, a company may invent around the patent, an expensive endeavor that infringers do not face.

When the norm is to violate laws, only those complying with it face substantial costs. Professor Larry Lessig explains:

At some point, when everyone else is violating a norm—when everyone else is evading their taxes—obeying the norm makes one a “chump.” It is no longer the case that the pressure to obey the norm has been lessened solely because of the decreasing odds of being caught for violating the norm. Now there is an affirmative cost to obeying the norm as well.⁴⁶

In some cases, compliance with a law also offers additional benefits beyond mere compliance. For example, drivers who obey speed limits may avoid car crashes more frequently than speeders.⁴⁷ In the biomedical field, however, the compliant firm receives no benefit other than risk avoidance.

2. Advantages to Those “In the Know”

The system of scofflaw science also gives unfair advantages to those researchers who are more keenly aware of which patent holders tolerate infringement. In essence, the system favors incumbents because research firms new to the industry will likely seek to avoid infringement. Without knowledge of the persistent infringement common to the industry, a newcomer may run extensive patent searches or attempt to license various research tools. These extra costs act as a barrier to entry, and may even deter the inventor from proceeding. Heller and Eisenberg’s fear of an anticommons thus holds true for those individuals and firms unaware of the norm of infringement.

Adding another barrier to entry in the pharmaceutical field may not appear to be a huge problem. After all, the costs of starting a drug company or university research center from scratch pale in comparison to the small barrier to entry the scofflaw culture creates. What this particular barrier to entry does, however, is add costs to existing firms or hospitals looking to expand into the biomedical field. Some of these firms may already be aware of the infringement norm, but empirically we do not know how far that norm extends. The authors of the *Science* study interviewed seventy people for their study, from all aspects of the

46. Lawrence Lessig, *Social Meaning and Social Norms*, 144 U. PA. L. REV. 2181, 2185 (1996).

47. See, e.g., Cass R. Sunstein, *Social Norms and Social Roles*, 96 COLUM. L. REV. 903, 961 (1996) (“[N]orms that encourage people to carry guns, use dangerous drugs, drive well over the speed limit, engage in unsafe sex, and so forth may properly be an object of governmental attack, because of their potentially pernicious effects on people’s lives.”).

industry.⁴⁸ Whether scientists at smaller or less famous institutions know of this norm is an unanswered question. Licensing research tools and running patent searches impose tremendous costs on those unaware of the infringement culture.

Patent law has created other advantages for those firms that are aware of typical practices. For example, if a patent is willfully infringed, the infringer may be liable for treble damages.⁴⁹ An actor aware of what Professors Mark Lemley and Ragesh Tangri dubbed the “willfulness game” will avoid reading patents or seek biased legal advice to prevent a willfulness finding.⁵⁰ Lemley and Tangri explain how companies that “know how to play the game” request favorable opinion letters, whereas the “uninitiated might get a traditional form of legal advice: an honest opinion that acknowledges a risk of infringement.”⁵¹ Further, Lemley and Tangri argue that the “game” creates a “trap for the unwary:”

[E]xperienced patent lawyers often advise their clients to avoid reading patents in order to avoid liability for willfulness. However, not all clients will get—or follow—such advice. Companies without patent counsel or with little exposure to the patent system might naively assume that it is a good idea to read patents to see what is out there before inventing, or even while bringing to market a product they already have invented but which could be improved.⁵²

Although the Federal Circuit recently curbed some of the problems resulting from the “willfulness game,”⁵³ both the willfulness game and the “infringement game” benefit those in the know.

Additionally, an experienced downstream researcher may avoid using tools from companies that are more likely to work to detect infringement or prosecute infringement claims. Thus, the first two risks—detection and prosecution—are minimized for downstream

48. Walsh et al., *supra* note 19, at 292.

49. See 35 U.S.C. § 284 (2000) (“[T]he court may increase the damages up to three times the amount found or assessed.”). The Federal Circuit requires willfulness before it will award treble damages. See, e.g., *Jurgens v. CBK, Ltd.*, 80 F.3d 1566, 1570 (Fed. Cir. 1996) (“Because increased damages are punitive, the requisite conduct for imposing them must include some degree of culpability.”).

50. Mark A. Lemley & Ragesh K. Tangri, *Ending Patent Law’s Willfulness Game*, 18 BERKELEY TECH. L.J. 1085, 1089-94 (2003).

51. *Id.* at 1092.

52. *Id.* at 1102.

53. See *Knorr-Bremse Systeme Fuer Nutzfahrzeuge GmbH v. Dana Corp.*, 383 F.3d 1337, 1344 (Fed. Cir. 2004) (overruling precedent and holding that “no adverse inference shall arise from the invocation of the attorney-client and/or work product privilege” in determining willfulness).

researchers aware of the practices of various upstream groups. A newcomer faces a much higher risk.

3. Selective Enforcement

Another common argument against intentional law-breaking is that those enforcing the law can then single out individuals for breaking the law in a discriminatory fashion. This argument has played out in the civil rights context in numerous ways, probably the most famous of which is the “driving while black” phenomenon.⁵⁴ Another example comes from critics of the “tax gap,” the difference between what Americans actually owe in taxes and what they pay,⁵⁵ who note the capriciousness of enforcement against tax cheats.⁵⁶ However, the patent infringement norm does not implicate these concerns, as selective licensing is permitted and perhaps even encouraged in the patent arena. That is, a patent holder is not liable for patent misuse for engaging in price discrimination.⁵⁷

Patent holders can and do discriminate when licensing their patents or forming patent pools. For example, in the early twentieth century Henry Ford and other auto manufacturers were denied access to a patent pool that controlled licenses for various engine patents.⁵⁸ Today, patent holders routinely refuse to sue universities, while prosecuting claims more frequently against for-profit firms.⁵⁹ Similarly, patent holders have refused to allow use of a patent for certain purposes that implicate the patent holder’s moral concerns, such as objections to abortion or stem cell research.⁶⁰ Even if a patent holder refused to deal with another firm for more insidious reasons such as personal biases or hatred toward a

54. See generally Kathryn K. Russell, “Driving While Black”: Corollary Phenomena and Collateral Consequences, 40 B.C. L. REV. 717 (1999).

55. The tax gap is estimated at more than \$166 billion annually. Stephen W. Mazza, *Taxpayer Privacy and Tax Compliance*, 51 U. KAN. L. REV. 1065, 1065 (2003).

56. See Pamela H. Bucy, *Criminal Tax Fraud: The Downfall of Murderers, Madams, and Thieves*, 29 ARIZ. ST. L.J. 639, 641 (1997) (“[B]ecause only a small fraction of tax cheats are actually prosecuted, selection of defendants too often conveys a sense of arbitrariness.”).

57. *USM Corp. v. SPS Techs., Inc.*, 694 F.2d 505, 510-11 (7th Cir. 1982); see *Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 708 (Fed. Cir. 1992). See generally Kieff, *supra* note 16, at 736-37; Note, *Is the Patent Misuse Doctrine Obsolete?*, 110 HARV. L. REV. 1922, 1933 (1997).

58. Rai, *supra* note 35, at 131.

59. See *supra* notes 34-36 and accompanying text.

60. See John R. Thomas, *The Future of Patent Law: Liberty and Property in the Patent Law*, 39 HOUS. L. REV. 569, 581-83 (2002) (discussing how the patent on abortion drug RU-486 could have restricted its use).

specific group, that refusal would likely not fall under the rubric of patent misuse.⁶¹

Thus, in the patent context, selective enforcement cannot provide an argument against the infringement norm, as the “costs” of selective enforcement apply even without any enforcement. To the extent that selective enforcement does present a problem, we would need to change far more than just the infringement norm.

4. Broken Windows and the Slippery Slope

Another classic argument against consistent law-breaking is that encouraging or permitting a scofflaw culture leads to bigger crimes. Dubbed the “broken windows theory,” this argument urges communities to fix broken windows and detect small crimes to show that people care.⁶² If people do not care, the theory goes, the community will suffer from property damage, more violent crime, and a “downward spiral to urban decay.”⁶³ This argument is essentially premised on the idea of a slippery slope. Professor Dan Kahan explains a modified version of this theory:

[I]ndividuals are much more likely to commit crimes when they perceive that criminal activity is widespread. In that circumstance, they are likely to infer that the risk of being caught for a crime is low. They might also conclude that relatively little stigma or reputational cost attaches to being a criminal; indeed, if criminal behavior is common among their peers, they may even view such activity as status enhancing. Finally, in a community in which crime is perceived to be rampant, individuals are less likely to form moral aversions to criminality.⁶⁴

This theory extends beyond urban neighborhoods and into white-collar crime. Once a person cheats on his taxes and gets away with it, he is more likely to break another law.⁶⁵ Other commentators wonder if behavioral traits can harken back even earlier: “We might guess that those who learn to cheat on multiple-choice examinations in school are more likely than others to violate traffic laws and evade taxes later in life.

61. See generally 6 DONALD S. CHISUM, PATENTS: A TREATISE ON THE LAW OF PATENTABILITY, VALIDITY AND INFRINGEMENT § 19.01 (1996) (defining patent misuse).

62. James Q. Wilson & George L. Kelling, *Broken Windows: The Police and Neighborhood Safety*, ATL. MONTHLY, Mar. 1982, at 29.

63. *Id.*

64. Dan M. Kahan, *Social Influence, Social Meaning, and Deterrence*, 83 VA. L. REV. 349, 350 (1997).

65. A variation of this argument is that people who cheat on their taxes are less likely to be “good citizens” in general. See Bucy, *supra* note 56, at 641 (“[T]ax cheats easily become apathetic citizens. Since they are not contributing to society’s coffers, they have less reason to be concerned how those coffers are spent.”).

This guess might be entirely wrong, but the question is worth considering.”⁶⁶

Similarly, it is worth speculating whether the infringement norm will lead to an increase in cases of scientists stealing trade secrets, cheating on taxes, infringing downstream patents, or worse. The probability here may be low, but this slippery slope is one of the many side effects of the infringement norm. These side effects create a system where infringing upstream patents is not socially efficient or desirable.

B. *A Duty to Obey*

Outside efficiency-related concerns, another argument against the scofflaw culture centers on the duty to obey the law.⁶⁷ The philosophical debate around the outer boundaries of such a duty need not be repeated here; it is sufficient to note that many philosophers and legal theorists believe that such a duty exists. Even concerns that humans need not obey an “unjust” law are largely irrelevant in the IP context.⁶⁸ A person violating a patent gets a discernable benefit from his action, while a scofflaw who refuses to enforce a discriminatory covenant or reveal the location of a fugitive slave receives no benefit other than taking the moral high ground. Further, because patent infringers violate the law in secrecy, they cannot claim to do so in civil disobedience.⁶⁹

Many scholars define such a duty to obey along the lines of William Blackstone’s *malum in se* and *mala prohibita* arguments.⁷⁰ Which category violating IP rights fits into is debatable. A “thief” of IP steals the hard work of the rights holder, but such rights only exist by virtue of the state’s conferral of them. Based on the state’s creation of the violated right, infringing an IP right is wrong “because forbidden”⁷¹ and thus would be a *mala prohibita* offense. Regardless of the moral obligation

66. Stewart Macauley, *Popular Legal Culture: An Introduction*, 98 YALE L.J. 1545, 1554 (1989).

67. See generally J.C. SMITH, LEGAL OBLIGATION (1976) (discussing the philosophy behind legal obligations); Kent Greenawalt, *The Natural Duty to Obey the Law*, 84 MICH. L. REV. 1 (1985) (same).

68. For an overview of the philosophy surrounding the duty to obey laws, both just and unjust, see Leo P. Martinez, *Taxes, Morals, and Legitimacy*, 1994 B.Y.U. L. REV. 521.

69. Conversely, some people using copyrighted material may in fact be properly labeled as civil disobedients, as they utilize the material solely for the purpose of illustrating the “wrongness” of IP laws and to expand the definition of fair use. Music group Negativland, for example, parodies famous IP as part of a larger effort to bring publicity to its cause of a larger public domain. See Negativland, *Negativland’s Tenets of Free Appropriation*, at <http://www.negativland.com/riaa/tenets.html> (last visited Apr. 27, 2004).

70. 1 WILLIAM BLACKSTONE, COMMENTARIES *54.

71. *Id.*

surrounding them, Blackstone articulates a general duty to obey even those laws proscribing *mala prohibita* offenses:

As to offences merely against the laws of society, which are only mala prohibita, and not mala in se; the temporal magistrate is also empowered to inflict coercive penalties for such transgressions; and this by the consent of individuals; who, in forming societies, did either tacitly or expressly invest the sovereign power with a right of making laws, and of enforcing obedience to them when made, by exercising, upon their nonobservance, severities adequate to the evil. . . . [I]t is a part of the original contract into which they entered, when first they engaged in society; it was calculated for, and has long contributed to, their own security.⁷²

This social contract applies particularly in the context of IP, as many users of IP are also owners of IP. Downstream researchers gain the benefit of the IP reward system when patenting their end use products. By virtue of their contract with society, and especially the security and benefits they receive from the patent system, scientists must obey the rest of the patent laws. If they dislike those laws, part of the democratic contract is the ability to persuade lawmakers to change the system.

Finally, it is important to distinguish one common counterargument to this general duty to obey the law. Some scholars posit that widely ignored laws still serve a useful signaling function.⁷³ For example, antismoking laws, even if rarely enforced, gave nonsmokers power and started to change people's perceptions of the norm of smoking.⁷⁴ Laws that change behavior do so by giving power to those people harmed or affected by the existing norm to put external pressure on followers of the socially bad norm. Nonsmokers who dislike secondhand smoke could use the antismoking law to signal their dislike of others' smoking.⁷⁵ This theory fails in the IP context, as only stakeholders—patent owners—have an interest in changing the norm. Instead of the nonsmoker, the patent owners are more like a manufacturer of smokeless tobacco. Both, as stakeholders, lack credibility when using the widely ignored law as a signaling device.

72. 4 *id.* at *8-*9.

73. See, e.g., Thomas B. Stoddard, *Bleeding Heart: Reflections on Using Law to Make Social Change*, 72 N.Y.U. L. REV. 967, 979-81 (1997); Cass R. Sunstein, *Law, Economics & Norms: On the Expressive Function of Law*, 144 U. PA. L. REV. 2021, 2035 (1996). See generally ERIC A. POSNER, *LAW AND SOCIAL NORMS* (2000).

74. See generally SMOKING POLICY: LAW, POLITICS, AND CULTURE (Robert L. Rabin & Stephen D. Sugarman eds., 1993).

75. Ad campaigns to persuade smokers to stop are more effective when emphasizing the dangers of second hand smoke, rather than harm to the smoker. See Lisa K. Goldman & Stanton A. Glantz, *Evaluation of Antismoking Advertising Campaigns*, 279 JAMA 772 (1998).

IV. ENFORCING EXISTING PATENT PROTECTION

One typical response to a norm of lawlessness is to enforce the law more consistently or harshly. This Part examines the various ways in which patent law, through changes in statutory or decisional law, could enforce and strengthen existing patent protection. That is, this Part analyzes the ways in which the law could more effectively deter infringement. Effective enforcement of patent infringement, however, presents a number of problems, which I explain in the last section of this Part.

A. *Enforcement Ideas*

Patent law already attempts to deter infringement through the availability of treble damages for willful infringement.⁷⁶ Professor Michael Abramowicz provides a thoughtful analysis of this option to conclude that “damages multipliers may help deter infringing activity and reduce the incidence of suit.”⁷⁷ Abramowicz pulls from earlier scholars to discuss theories of enhanced damages and how they relate to patent infringement. First, he discusses the notion that enhanced damages prevent a property rule from turning into a liability rule.⁷⁸ Although patent law already provides damages that mimic a property rule—a reasonable royalty⁷⁹—Abramowicz concludes that even greater damages may be necessary to protect against the chance that adverse selection will create “some danger that courts will misestimate the amount of the reasonable royalty” on the low side.⁸⁰

Next, Abramowicz draws from work on punitive damages in tort law.⁸¹ Although recognizing substantial differences between the “decision” to commit a tort (whether intentional or negligent) and the “decision” to infringe a patent, Abramowicz explains the basic premise of this theory:

If patentees will not consistently enforce their rights, then potential infringers will recognize that there is only some probability less than one

76. 35 U.S.C. § 284 (2000); *see also* Knorr-Bremse Systeme Fuer Nutzfahrzeuge GmbH v. Dana Corp., 383 F.3d 1337, 1342 (Fed. Cir. 2004) (noting that willful infringement must be determined on a totality of circumstances approach).

77. Michael Abramowicz, *A Unified Economic Theory of Noninfringement Opinions*, 14 FED. CIR. BAR J. 241, 243 (2004).

78. *Id.* at 244 (citing David D. Haddock et al., *An Ordinary Rationale for Extraordinary Legal Sanctions*, 78 CAL. L. REV. 1, 13 (1990)).

79. 35 U.S.C. § 284.

80. Abramowicz, *supra* note 77, at 246.

81. *Id.* at 249-50 (citing A. Mitchell Polinsky & Steven Shavell, *Punitive Damages: An Economic Analysis*, 111 HARV. L. REV. 869, 879, 882, 889 (1998)).

that infringement will be punished. To compensate for that probability, courts can order supercompensatory damages—that is, damages that not only compensate the patentee for lost profits, but also add enough extra so that the potential infringers' incentives are aligned with social welfare.⁸²

Scholars have disagreed with the purpose and necessity of punitive or enhanced damages in various contexts, and they may not be appropriate in the patent infringement context.⁸³ What is important here is that harsher sanctions may deter the scofflaw norm effectively by increasing the cost of infringement.

Before proceeding to describe some risk-specific enforcement ideas, there is another option outside mere enforcement, but closely related: changing the norm in the research community to fit the law through a public relations campaign. For example, college towns with laws against public intoxication have been known to devote resources to programs that explain the harmful effects of alcohol as a drug. Such a campaign is not used to enforce the law per se, but rather to modify the norm of underage public drinking.⁸⁴ In the copyright arena, the film industry created commercials to persuade computer users not to download movies and foster a norm against file swapping.⁸⁵ In the patent arena, such a campaign would likely be futile. Scientists already routinely ignore the advice of patent lawyers by playing the “willfulness game” and refusing to run patent searches.⁸⁶ Further, who would undertake such a campaign and how would it work?

The rest of this section provides ideas to increase the various risks infringers face, which will result in less scofflaw science.

1. Risk of Detection

By itself, the risk of detection is perhaps the hardest to increase, as it is inherently difficult to identify when someone has used a research tool or upstream patent that does not lead to a commercially viable product. Some ideas to increase the risk of detection include providing incentives to researchers who report infringement, similar to a whistleblower law, and requiring extensive historical records of research

82. *Id.* at 250.

83. See Thomas E. Cotter, *An Economic Analysis of Enhanced Damages and Attorney's Fees for Willful Patent Infringement*, 14 FED. CIR. BAR J. 291, 315 (2004) (arguing that enhanced damages should be imposed in only limited circumstances).

84. See Raymond, *supra* note 44, at 1412-15.

85. See Lance Ulanoff, *The RIAA Is Full of Hot Air: What Can the Big Five Record Labels Learn from the Motion Picture Industry That Could Help Save Their Business?*, PC MAG., Sept. 17, 2003, ¶ 10-11, available at 2003 WL 5730184.

86. See Lemley & Tangri, *supra* note 50, at 1089-94.

undertaken and upstream inventions used, when a downstream product maker applies for a patent.

Mandatory reporting has proved vital to the stability of the securities industry,⁸⁷ but outside that context, the picture is grim. In the environmental context, for example, Professor Wendy Wagner has argued that actors have no incentives to report noncompliance with laws, because “environmental enforcement regimes provide only sticks not carrots.”⁸⁸ Wagner offers numerous proposals to incentivize information production, but recognizes that “[g]iven the powerful incentives actors have to remain ignorant about any adverse consequences associated with their products and activities, it is not realistic to expect them to ignore these interests.”⁸⁹ Additionally, the burdens of mandatory reporting may sufficiently disincentivize innovation, and thus be more detrimental than helpful.

2. Risk of Prosecution

A patent holder may choose not to sue an infringer for two reasons: first, patent holders face expensive litigation and the risk that patents may be declared invalid in court; second, patent holders may justifiably fear bad press.⁹⁰ To avoid the infringement norm, it would be far better for a company who wishes to give universities or nonprofits free or inexpensive licenses. The result is the same—the university uses the product at no cost—but the university does not contribute to the infringement norm. Free licensing to universities may be in a patent holder’s best interest, as encouraging the infringement norm among universities may easily lead to widespread infringement in for-profit entities that compete with the patent holder.

As for the other reason a patent holder may refrain from suing, the legal system could easily reduce the costs of litigation by shifting the risk to the putative infringer. Enhanced damages or a modified “loser pays”

87. See Louis Lowenstein, *Financial Transparency and Corporate Governance: You Manage What You Measure*, 96 COLUM. L. REV. 1335, 1335 (1996) (explaining why “corporate financial reporting in the United States . . . is much better than that elsewhere, [and] why it contributes so much to the fairness and efficiency of our financial markets, and most particularly why it has contributed so much to effective corporate governance and oversight”); Joseph E. Stiglitz, *The Contributions of the Economics of Information to Twentieth Century Economics*, 115 Q.J. ECON. 1441, 1467-68 (2000) (“Legal institutions—from reporting requirements to strong fraud laws to laws to protect minority shareholders from the majority—are all essential parts of a broad system of corporate governance.”).

88. Wendy Wagner, *Commons Ignorance: The Failure of Environmental Law to Produce Needed Information on Health and the Environment*, 53 DUKE L.J. 1619, 1688 (2004).

89. *Id.*

90. See *supra* notes 34-36 and accompanying text.

attorney fee system would defray some of the costs of bringing suit.⁹¹ More importantly, however, the legal system could establish bright-line rules so patent holders could more accurately predict the likelihood of victory at trial.⁹² Even if these rules establish that patents are infringed far less frequently, a patent holder will know *when* to pursue an infringement case, thus decreasing the cost of litigating marginal cases. Further, limiting the scope of an invalidity determination to the instant case would reduce the asymmetrical cost of litigating an infringement suit.⁹³

3. Risk of Liability

Related to the argument that clearer standards decrease the cost of litigation for a patent holder is the notion that courts should actually find in favor of the patent holder more frequently, thus increasing an infringer's risk of liability. Under this theory, when the risk of detection and/or prosecution is low, the risk of liability should be high to serve as a deterrent, similar to the threat of punitive damages.

Alternatively, courts could use clear standards to make the risk of liability as close to 100% as possible. Under this theory, these standards need not be pro-patentee, but rather just explain unambiguously when liability for infringement would attach. An actual infringing use, however defined, should be adjudged an infringing use as a matter of law. Lower courts do make mistakes of law, especially under balancing tests, "mushy" standards, or unclear areas of the law. Bright-line rules reduce the chance of error, and thus increase the risk of liability. Professor Cass Sunstein, although not a proponent of bright-line rules, explains their advantages:

[R]ules are an admirable device for obtaining agreement on the content of law, and also for reducing discretion at the point of application. . . . Frequently a lawmaker adopts rules because rules narrow or even eliminate the range of disagreement and uncertainty faced by people attempting to follow or to interpret the law. This step has enormous virtues in terms of

91. See F. Scott Kieff, *The Case for Registering Patents and the Law and Economics of Present Patent-Obtaining Rules*, 45 B.C. L. REV. 55, 118-22 (1993) (arguing in favor of fee shifting in patent cases). Fee shifting has also spawned extensive commentary. For a representative sample, see Thomas D. Rowe, Jr., *Shift Happens: Pressure on Foreign Attorney-Fee Paradigms from Class Actions*, 13 DUKE J. COMP. & INT'L L. 125, 127-34 (2003).

92. See *infra* notes 94-95 and accompanying text.

93. See Kimberly A. Moore, *Judges, Juries and Patent Cases—An Empirical Peek Inside the Black Box*, 99 MICH. L. REV. 365, 378 (2000) (discussing the "asymmetrical stakes").

promoting predictability and planning and reducing both costs and risks of official abuse.⁹⁴

Regardless of the merits of the democratic value of clear standards,⁹⁵ it is fairly clear that such rules reduce the transaction costs among potential litigants.

B. Enforcement Complications

Enforcing the law as written avoids remedying the problem of the anticommons, and it also may increase infringement by alerting people that infringement actually occurs. One of the reasons why people break the law, cheat on taxes, speed or infringe others' patents, is that they believe others are doing the same. Conversely, if the norm is to obey, people generally comply.⁹⁶ Professor Margaret Raymond explains how this concept works in the context of tax enforcement:

An individual is much more likely not to comply with the tax laws if the people with whom he discusses taxes seem to tolerate or approve of noncompliance, or to engage in noncompliance themselves. . . . Ironically, therefore, increased tax enforcement may have perverse effects; since people's tax behaviors are not publicly observed, taxpayers who learn that tax enforcement will increase become less, not more, likely to comply with tax laws; threats that enforcement will be stepped up tend to signal that such increased enforcement is necessary because noncompliance is widespread.⁹⁷

Within the context of the infringement norm, widespread prosecutions may do more than deter—they may give researchers the idea to infringe patents, as such an infringement may be difficult to detect.

V. REFORMING THE LAWS TO FIT THE NORM

A final option is to reform the laws to fit the norm, proposals for which are in no short supply.⁹⁸ Commentators have proposed reinvigorating the research exemption,⁹⁹ mandating cheap compulsory licensing,¹⁰⁰

94. Cass R. Sunstein, *Problems with Rules*, 83 CAL. L. REV. 953, 1021-22 (1995).

95. See Justice Antonin Scalia, *The Rule of Law as a Law of Rules*, 56 U. CHI. L. REV. 1175, 1176 (1989).

96. See Raymond, *supra* note 44, at 1417-20.

97. *Id.* at 1421 (footnotes omitted).

98. See generally Rai, *supra* note 35, at 137-44.

99. See Mueller, *supra* note 14, at 39.

100. See Colleen Chien, *Cheap Drugs at What Price to Innovation: Does the Compulsory Licensing of Pharmaceuticals Hurt Innovation?*, 18 BERKELEY TECH. L.J. 853, 857 (2003) (“[T]he blanket assertion that licensing categorically harms innovation is probably wrong.”).

offering patent prizes,¹⁰¹ utilizing a reverse doctrine of equivalents,¹⁰² and limiting the subject matter and scope of patents.¹⁰³

In many situations, reforming laws to fit norms leads society down a path of greater undesirable behavior. Raise the speed limit, the argument goes, and people will just drive faster.¹⁰⁴ That is, if government changes the law to reflect the norm, people will just create a new norm of infringement. This argument fails within the context of IP, as infringement is an on or off switch; there's no highway on which to drive faster and faster. To be sure, it could be argued that if courts allowed expanded use of a research exemption, scientists would use the exemption not only for upstream patents, but also downstream patents in direct competition with their products. Yet such a scenario seems implausible.

The infringement norm responds to a potential problem, the biomedical anticommons. Massive legal reforms to respond to the infringement norm necessarily implicate the debate over the anticommons.¹⁰⁵ The answer to whether changing or enforcing the law is the proper solution depends on how large of a problem we think the anticommons is in relation to incentives for innovation. To borrow from two vastly different United States Supreme Court Justices, we must be careful not to use a "sledgehammer to kill a gnat"¹⁰⁶ or "launch a missile to kill a mouse."¹⁰⁷

VI. CONCLUSION

Proponents of greater restrictions on IP may view the infringement norm as a good thing, but in this Article I have argued that this norm should not be encouraged. First, it produces inefficiencies and

101. See, e.g., Michael Abramowicz, *Perfecting Patent Prizes*, 56 VAND. L. REV. 115, 118-19 (2003).

102. See Merges, *supra* note 1, at 97.

103. This reform takes any number of forms, from, for example, strengthening the requirement of utility, see 35 U.S.C. § 101 (2000), to forbidding the patenting of living things, see John J. Doll, *The Patenting of DNA*, 280 SCIENCE 689, 690 (1998) ("Without the incentive of patents, there would be less investment in DNA research. . . . A strong U.S. patent system is critical for the continued development and dissemination to the public of information on DNA sequence elements.").

104. See Raymond, *supra* note 44, at 1434-35.

105. Cf. Yelapaala, *supra* note 15, at 113 ("The question of whether biotechnological discoveries or inventions should be protected as property brings to the forefront some of the eternal policy issues that have eluded philosophers, jurists, and theologians for hundreds, if not thousands, of years.").

106. Raymond B. Yates, M.D., P.C. Profit Sharing Plan v. Hendon, 541 U.S. 1, 16 (2004) (Scalia, J., concurring).

107. Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1036 (1992) (Blackmun, J., dissenting).

unfairness, and second, it contradicts a general duty to obey the law. How to “fix” this infringement norm ultimately depends on how serious the problem of the biomedical anticommons is. Rather than argue for increased enforcement of the existing regime or legal changes that reform it, I have analyzed these possible solutions under the traditional theories of law and social norms. Ultimately, my Article does not present a final solution, because that solution must include consideration of the economic efficiencies of the patent system. What should not be done, however, is the continued encouragement of scofflaw science.