The Taking of Human Biological Products

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Despite the Supreme Court invalidating human gene patents in the recent past, thousands of patents on other human biological products can still arguably be enforced. Although such patents do not cover these products inside our body, the moment one isolates them from our body and extracts them, the patent holder has an exclusionary right to them. This raises complicated legal and ethical questions. Who owns the excised body parts? The person whose body they come from, or a third person who owns a patent on these materials? If a human being owns her excised body parts, does the State commit a taking by transferring property rights of these bodily materials to a third party through patents? While a number of scholars and courts have discussed whether patents are protected as “private property” under the Takings Clause, this paper argues that in some circumstances, patents themselves may constitute a taking. Patent law has traditionally considered patents on human biological products under a unitary doctrine covering all natural products. But this paper shows that patents on natural products isolated from the human body raise additional questions implicating the Takings Clause.

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INTRODUCTION

Though the earth, and all inferior creatures, be common to all men, yet every man has a property in his own person: this no body has any right to but himself.

Locke1

“You own my blood?” gasped a visibly shocked Simon.2 “I applied for a patent [on your DNA], and I got it, so, yes, I own it,” replied Doctor Fremont.3 It was a bizarre twist in the plot of “Tea and Sympathy,” an episode of Boston Legal.4 The episode began with a bumptious man, Simon, walking into a law firm seeking legal assistance to exploit his miraculous and unique ability.5 He had recently discovered that his body could spontaneously cure itself of AIDS, without any treatment.6 His blood serum was valuable, and he knew it.7 He wanted to make a deal with the pharmaceutical companies allowing them to conduct research on his blood serum.8 Any offers for book deals or television appearances were also welcome.9

3.  Id. at 7:43.
4.  See id.
5.  Id. at 1:01–2:22.
6.  Id. at 1:07–1:10.
7.  See id. at 1:10–1:12.
8.  See id. at 30:15.
9.  Id. at 1:55.
Unfortunately for Simon, his dreams of becoming rich and famous received a sudden jolt from his physician, Dr. Fremont. Dr. Fremont had patented Simon’s DNA, and was now claiming ownership over Simon’s blood serum. Putting aside the lack of legal precision, “Tea and Sympathy” raises an important issue regarding the patenting of human biological materials. The U.S. Supreme Court, in Association for Molecular Pathology v. Myriad Genetics, Inc., invalidated patents on human genes last year. At this stage, however, the scope of the Myriad decision remains unclear and whether it extends to all other human biological products is unsettled. The Court’s emphasis on the genetic information over the chemical structure of human genes, for instance, has led to uncertainty over the extension of the Myriad principle to nongenetic materials. Some commentators lamented Myriad’s

10. See id. at 7:37–7:43.
11. Id.
12. A student of patent law would balk at the assertion that a patent on DNA would also bestow ownership of the blood. Just like “a pound of flesh” bargained for in The Merchant of Venice allowed nothing more, not even a “jot of blood,” see WILLIAM SHAKESPEARE, THE MERCHANT OF VENICE act 4, sc. 1, a patent on isolated DNA only grants monopoly on the DNA, not on the blood. But then, when have television legal dramas ever been known for accurate depictions of law?
13. For the purpose of this Comment, “human biological materials” is synonymous with “human bodily products” or “human biological products.” It refers to both to replenishable substances such as blood, bone marrow, hair, urine, perspiration, saliva, semen, etc., and nonreplenishable substances such organs or oocytes. It also refers to molecules like proteins, vitamins, DNA, and RNA. Admittedly, not everything within the scope of this broad definition has been patented or is patentable, but many have been patented. A wide variety of human biological products, including human cells, tissues, DNA, proteins, and vitamins, have been frequent subjects of patents. See, e.g., U.S. Patent No. 8,309,352 B2 (filed Nov. 9, 2006) (patenting the use of isolated umbilical cord blood cells to provide neural cells for transplantation); U.S. Patent No. 6,200,806 (filed Jun. 26, 1998) (patenting human embryonic stem cells); U.S. Patent No. 5,843,780 (filed Jan. 18, 1996) (patenting primate (including human) embryonic stem cells); U.S. Patent 5,747,282 (filed June 7, 1995) (patenting breast and ovarian cancer gene and proteins); U.S. Patent No. 5,486,359 (filed Feb. 8, 1994) (patenting isolated human mesenchymal stem cells); U.S. Patent No. 5,370,037 (filed Sept. 11, 1993) (patenting Vitamin K1). A 2005 study estimated that some 20 percent of all human genes had already been patented, 63 percent of them by private firms. Kyle Jensen & Fiona Murray, Intellectual Property Landscape of the Human Genome, 310 SCIENCE 239 (2005). Regardless of whether all of these biological products have been patented, any patents on them present the same questions of property rights and takings violations.
15. See, e.g., Ryan Davis, High Court’s Myriad Ruling Will Spur Novel Patent Claims, LAW360 (June 13, 2013), http://www.law360.com/articles/449945/high-court-s-myriad-ruling-will-spur-novel-patent-claims (noting that Mark Janis, director of The Center for Intellectual Property Research at the Indiana University Maurer School of Law, described the opinion as a “mixed blessing,” and doing “virtually nothing to illuminate the broader questions about how to distinguish between an ineligible product of nature and eligible inventions derived from natural products”); Carmela DeLuca & Melanie Szweras, The Myriad Decision: What Is the Impact?, LEXOLOGY (June 20, 2013), http://www.lexology.com/library/detail.aspx?g=ed2570c9-bcac-44e0-8346-c815ae42e773 (“It also remains to be seen whether the Court’s reasoning about isolating DNA from its surrounding environment being insufficient to distinguish DNA from a product of nature, will be extended to other types of ‘isolated’ biomolecules, including proteins, cells, organisms and other natural products.”).
16. See DeLuca & Szweras, supra note 15 (noting that the opinion “may be [limited to] ‘isolated genes’ as indicated in the Court’s conclusion: ‘[W]e merely hold that genes and the
lack of guidance on patent eligibility of other human biological materials, like proteins and vitamins. As a result, thousands of patents on a number of purified human biological materials still remain enforceable until further elucidation of the Myriad doctrine by courts. Patents on these purified human biological materials do not cover the products while they are inside the human body. But, the moment one isolates the materials and extracts them from the body, the patent holder has an exclusionary right to the materials. This raises complicated legal and ethical questions. Who owns the excised biological materials? The person whose body they come from, or the person who owns the patent?

Assuming that a human being does own her excised body parts, patents on such isolated human biological materials also raise questions about eminent domain and takings. Does the state commit a taking by transferring property rights of these bodily materials to the patentee? Interestingly, while a number of scholars and courts have discussed whether patents are protected as “private property” under the Takings Clause, none has considered the fact that in some circumstances, patents themselves may constitute a taking. Of course, a

17. See id.; Dennis Crouch, Twenty Thoughts on the Importance of Myriad, PATENTLYO (June 14, 2013), http://www.patentlyo.com/patent/2013/06/myriad.html (noting that Timothy Holbrook of Emory Law explained that “the Court provided very little guidance as to future issues relevant to biotech, such as isolated/purified proteins or other organic chemicals”).


19. See Christopher M. Holman, Debunking the Myth that Whole-Genome Sequencing Infringes Thousands of Gene Patents, 30 NATURE BIOTECHNOLOGY 240, 240 (2012), available at http://www.nature.com/nbt/journal/v30/n3/pdf/nbt.2146.pdf (noting that the claim language defines the exclusionary scope of the patentee and that “the law is quite clear that genes, as they occur naturally, for example, in the human body, cannot be patented”). However, “the doctrine of isolation and purification” has allowed patentees to claim patents on many products that existed naturally by claiming them in their purified state. See DAVID B. RESNIK, OWNING THE GENOME: A MORAL ANALYSIS OF DNA PATENTING 54 (2004). In Amgen, Inc. v. Chugai Pharmaceutical Co., Ltd., 927 F.2d 1200, 1203–04 (Fed. Cir. 1991), for example, the Federal Circuit upheld claims directed to “[a] purified and isolated DNA sequence.” Of course, Myriad casts a cloud on the continued vitality of this doctrine.

thorough legal analysis of the issue is quite challenging because it implicates questions covering a wide range of laws—including patent law, property law, and constitutional law—and the doctrinal answer is far from clear. But with the recent debate over patenting human genes, the issue of patenting human biological products has gained much urgency.21

Patent law has traditionally addressed the patenting of human biological products under a generic “product of nature” doctrine, which essentially holds that naturally occurring products cannot be patented.22 However, courts and the U.S. Patent and Trademark Office have allowed purified and isolated natural products to be patented on the premise that they are distinct from their native form, and have great therapeutic and commercial value.23 Although some commentators have challenged this principle of permitting patents on isolated natural products,24 the commentary has mostly ignored the distinction between isolated products derived from human beings and those derived from other natural sources, instead grouping them into one general category: “products of nature.”25 But patents on human biological products present additional concerns that go beyond the traditionally recognized concerns surrounding patents on natural products. For example, patenting human DNA may have different implications than patenting bacterial DNA. At the very least, a human being has certain intuitive possessory rights to her DNA that we do not typically recognize for bacteria.


21. See Crouch, supra note 17; Davis, supra note 15.

22. See, e.g., Ass’n for Molecular Pathology v. Myriad Genetics, Inc., 133 S. Ct. 2107, 2111 (2013) (holding that “a naturally occurring DNA segment is a product of nature and not patent eligible merely because it has been isolated, but that cDNA is patent eligible because it is not naturally occurring”); Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127 (1948) (holding that a mixture of naturally occurring bacteria was not patent eligible).

23. See, e.g., Merck & Co., Inc. v. Olin Mathieson Chem. Corp., 253 F.2d 156, 164 (4th Cir. 1958) (holding purified Vitamin B12 patentable because in the isolated form the products were “of great therapeutic and commercial worth”); Parke-Davis, 189 F. at 103 (S.D.N.Y. 1911) (holding purified adrenaline patentable because it was “a new thing commercially and therapeutically”). The recent Supreme Court ruling on gene patents, however, casts doubt on the validity of these patents. See Myriad Genetics, 133 S. Ct. at 2111 (2013).

24. See, e.g., Linda J. Demaine & Aaron Xavier Fellmeth, Reinventing the Double Helix: A Novel and Nonobvious Reconceptualization of the Biotechnology Patent, 55 STAN. L. REV. 303, 310–12 (2002) (challenging the “isolated and purified” test for patent eligibility of natural products and proposing an alternative test called “substantial transformation test” (internal quotation marks omitted)); Samantak Ghosh, Gene Patents: Balancing the Myriad Issues Concerning the Balancing of Natural Products, 27 BERKELEY TECH L.J. 241, 241–42 (2012) (noting that the “doctrine on the patentability of products of nature is far from coherent” and arguing that isolated products of nature should not be patent eligible unless they are structurally or functionally different); Eileen M. Kane, Splitting the Gene: DNA Patents and the Genetic Code, 71 TENN. L. REV. 707, 707 (2004) (concluding that “the patenting of genes results in constructive preemption of the genetic code, a result that is contrary to the Supreme Court’s dictate that the laws of nature are not patentable”).

25. See, e.g., Kane, supra note 24, at 732–33.
One does not need to possess Simon’s unusually valuable and unique biology to be affected by patents on human biological products. Due to the high degree of homology, or similarity of biological products, between human beings, patents on these biological products in effect monopolize them in almost all human beings. For instance, any two human beings have 99.9 percent genetic homology or identity.\(^\text{26}\) When it comes to small molecules like vitamins, the identity is 100 percent.\(^\text{27}\) This essentially means that patents on these products can be enforced against any individual who decides to isolate them from his or her body. For instance, if an individual’s proteins need to be isolated to test for a disease, a patent owner may legally prevent that individual from getting them isolated. In fact, as the *Myriad* case shows, patent owners have not hesitated in exercising these rights against patients’ interests.\(^\text{28}\) This Comment looks into some of the concerns raised by patenting human biological products and explores the argument that such patenting may be a violation of the Takings Clause.

The Fifth Amendment states that private property shall not “be taken for public use, without just compensation.”\(^\text{29}\) Since the Takings Clause only applies to private property, Part I studies the common law doctrine on the property rights associated with human biological products. It notes that courts are increasingly receptive to recognizing a person’s rights in her excised bodily material, but fall short of acknowledging full-fledged property rights. This Comment argues that the possessory, usage, and excludability rights that a person enjoys with respect to her body parts satisfy the common law definition of property. Moreover, current technological advances and societal demands have substantially diluted the philosophical underpinnings of the early common law prohibition against granting property rights to human body parts. Human body parts now have commercial and therapeutic value, not just sentimental or dignitary value. Instead of remaining ossified in a bygone era, the law should adapt to the needs of a modern civilization and recognize property rights in excised human bodily material.

As this Comment notes, the ultimate question is not whether there should be property rights associated with human biological materials, but rather who owns those property rights. These are tangible nonpublic goods that are increasingly acquiring economic value. Wherever there is a valuable resource, disputes over its ownership will inevitably follow, and the law will have to take


\(^{27}\) Small molecules typically have the same structure regardless of their source.

\(^{28}\) See Ass’n for Molecular Pathology v. U.S.P.T.O., 653 F.3d 1329, 1344 n.3 (Fed. Cir. 2011). In this case, some patients alleged injury based on their inability to get affordable access to breast cancer genetic tests because the patent owner, Myriad, enforced the gene patents against labs that were willing to perform the test. Id. at 1339–40.

\(^{29}\) U.S. CONST. amend. V (emphasis added).
That is precisely what property law entails. It is paradoxical to argue, as courts have done, that patents on isolated human biological products are “property interests,” while also asserting that no private property rights exist with respect to excised human bodily materials.30

Assuming that human bodily products are private property belonging to the individual from whom they are obtained, Part II of this Comment examines the contention that the U.S. government’s granting of patents on such products to third parties constitutes a taking under the Fifth Amendment. Although no court has addressed the question so far, this Comment posits that a takings claim can very reasonably be made. Patents on human biological products substantially interfere with a person’s possessory rights by granting the patent owner the exclusive authority to prevent a person from using, making, or selling these products. Even if these patents meet the threshold requirement of public use, the finding of a taking would force the government to stop granting such patents because providing just compensation would prove financially impractical.31

As this Comment dives into the doctrinal intricacies of Fifth Amendment jurisprudence to study the takings implications of these patents, it almost becomes a journey to Ithaca,32 the voyage being more edifying than the destination. Along the way, it questions traditional notions of property rights, and how we view our body and body parts in this rapidly evolving world. It delves into fundamental questions of our political life: What resources are central to our identity and well-being? What can be subject to collective redistribution? How do we draw that line? Suffice it to say, the answers are not always clear. Regardless of where we come out on these issues, the very fact that these patents raise legitimate takings concerns should cause us to pause and reconsider them. It should push us to consider alternative measures that may promote technological innovation without substantial invasions of private property rights. After all, the underlying goals of the Fifth Amendment are best served by finding the right balance between public purpose and private interests.

I.

PROPERTY RIGHTS IN HUMAN BIOLOGICAL MATERIAL?

Even before addressing the tricky issue of ownership as between the patentee and the person from whom the human biological material was obtained, we need to first determine whether there is any property right associated with excised bodily materials. Traditionally, common law has been

30. See infra Part I.
31. See infra Part II.
reluctant to find property rights in body parts. Courts, however, have not applied this principle consistently. Additionally, some recent case law highlights the increasing recognition of property rights in body parts. While courts have balked at granting full property rights in excised body parts, “it appears that the modern view adopted by a majority of courts that have considered the matter recognize[s] that there is a property right of some nature, sometimes referred to as a quasi-property right.”

A. Body as Property, Then and Now

The common law’s reluctance to recognize property rights in the human body dates back to Sir Edward Coke’s 1644 proclamation that a cadaver was *nullius in bonis*, or that it could not be considered property. English courts subsequently adopted this principle in cases such as *Regina v. Sharpe* and *Williams v. Williams*. In *Regina v. Sharpe*, for instance, the court convicted a man for digging up his mother’s dead body and moving it to be buried with his father in a different burial ground. Rejecting the defendant’s defense that he had a right to his mother’s corpse, the court held, “Our law recognises [sic] no property in a corpse.”

Although this principle continued to be a part of American common law, courts gradually started recognizing some kind of legal right to corpses. Courts started upholding a surviving relative’s right to the possession of the deceased’s body for burial purposes. These rights subsequently formed the basis for recognizing a quasi-property interest in the human body. Thus, in *Ritter v. Couch*, the court held that, “while a dead body is not property in the strict sense of the common law, it is a quasi property, over which the relatives of the deceased have rights which our courts of equity will protect.”

While common law also permitted fully informed live donors to donate nonvital organs for transplantation, there was “no irrevocable procedure for donating cadavers.” In the late 1960s, the adoption of the Uniform

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36. Id.
37. Id. at 707 (citation omitted) (internal quotation marks omitted).
38. See e.g., Larson v. Chase, 50 N.W. 238 (Minn. 1891) (recognizing a surviving wife’s right to the possession of her husband’s dead body); Foley v. Phelps, 37 N.Y.S. 471, 473–74 (N.Y. App. Div. 1896) (holding that the surviving wife is entitled to the possession of her deceased husband’s body for proper care and burial); Pettigrew v. Pettigrew, 56 A. 878 (Pa. 1904) (holding that the right to control the burial is first in the surviving spouse and then in the next of kin, in the order of relation).
41. Id. at 1184.
Anatomical Gift Act ("UAGA") by most American jurisdictions resolved this issue. Under the Act, individuals could donate all or part of their cadavers to hospitals or medical schools for education, research, therapy, or transplantation. Responding to the growing need for human tissues and body parts for transplantation and education, states promptly adopted the Act. However, concerned with the possibility of exploitation of destitute donors, Congress passed the National Organ Transplant Act ("NOTA") in 1984, which prohibited the sale of human organs.

These Acts, regulating the sale or disposal of organs, nevertheless failed to clearly delineate property rights in human body parts. The prohibition against selling excised body parts did not appear to apply to sperm, hair, and blood, which continued to be sold legally and in which people possess rights traditionally associated with personal property. For instance, in State v. Truesdale, the court convicted a person for stealing "property," which included "one human hair fall." In another case, the Utah Supreme Court interpreted the state’s Anatomical Gift Act as conferring property rights to a person in her body so that she can dispose of her organs. While the statutes defined the extent of control in specific situations, they did not establish any general principle.

Courts, meanwhile, struggled to outline the limits of the property or quasi-property status of human body parts. United States v. Garber, which involved taxing sales of blood serum, exemplified this uncertainty. In this case, the Fifth Circuit grappled with whether to categorize the sale as a service or a sale of property. Dorothy Garber, the defendant, was one of only two or three known persons in the world whose blood contained a rare antibody useful in the production of blood-group-typing serum. She sold her blood to laboratories, receiving payment in relation to the strength of the antibody

42. See id. at 1186–88.
43. Id. at 1186.
44. See id. at 1185–86, 1188.
48. Estate of Moyer, 577 P.2d 108, 110 n.4 (Utah 1978) (noting “[t]hat our legislature has recognized that a person has property rights in his body and can so dispose of his organs”) (citing Utah’s Anatomical Gift Act).
49. See United States v. Garber, 607 F.2d 92, 97 (5th Cir. 1979).
50. See id.
51. Id. at 94.
collected in each unit. The district court convicted Garber of willfully evading income taxes on these transactions. Sitting en banc, the Fifth Circuit reversed, noting that a controversy existed as to the taxability of such funds, and that the defendant’s reasonable misconception regarding the tax law negated the inference of her willfulness.

The court, however, could not decide whether the sale of blood plasma constituted a service or property sale. This distinction was important for taxation purposes, because if Garber’s acts constituted a sale of a product, then they may not have generated a taxable gain. Since it was impossible to compute the original cost of Garber’s bodily fluids, the blood plasma’s value could be deemed equal to the open market price, thus eliminating any taxable gain. The court noted that the efforts of production—including the ordeal of plasmapheresis and the possibility of nausea, blackout, and dizziness—made it appear like a service. “On the other hand, blood plasma, like a chicken’s eggs, a sheep’s wool, or like any salable part of the human body, is tangible property which in this case commanded a selling price dependent on its value.” The court ultimately abstained from “undertak[ing] the complex task of resolving what the law should be,” and simply reversed the district court because this uncertainty negated the necessary intent for the crime.

Moore v. Regents of the University of California also confronted but failed to affirmatively delineate individuals’ interest in their bodies and body parts. The plaintiff, John Moore, was diagnosed with hairy cell leukemia, and as part of his treatment his doctors removed his spleen. Unbeknownst to Moore, the doctors, realizing that Moore’s cells were unique, genetically engineered them to produce a therapeutically valuable cell line. The patented cell line had an estimated value of three billion dollars. When Moore learned about this development, he sued the doctors on multiple theories, including the conversion

52. Id.
53. Id. at 93.
54. Id. at 92.
55. Id. at 95, 97. Since Garber, some states made this important distinction clearer by characterizing blood sale transactions as services. For example, California “laws usually characterize these paid transfers as the provision of services rather than the sale of a commodity,” Moore v. Regents of the Univ. of Cal., 793 P.2d 479, 518 (Cal. 1990) (en banc) (Mosk, J., dissenting). Apparently, “[t]he primary legal reason for characterizing these transactions as involving services rather than goods is to avoid liability for contaminated blood products under either general product liability principles or the [Uniform Commercial Code’s] implied warranty provisions.” Id.
56. Garber, 607 F.2d at 97.
57. Id.
58. Id. (emphasis added).
59. Id.
60. 793 P.2d 479.
61. Id. at 481.
62. Id. at 481–82.
63. Id. at 482.
of his spleen, lack of informed consent, and breach of fiduciary duties. The Court of Appeal “concluded that the plaintiff’s allegation of a property right in his own tissue is sufficient as a matter of law” and found that Moore had made sufficient allegations for a cause of conversion.

The Supreme Court of California reversed, however, holding that Moore could not sustain a cause of action for conversion, though his complaint did allege a cause of action for the breach of the fiduciary duty of disclosure. While the court did “not purport to hold that excised cells can never be property for any purpose whatsoever,” it declined to extend tort liability, because it was concerned about the impact on biomedical research, and felt that the legislature was best suited to resolve important policy questions. Besides, the court noted that Moore had not expected to retain the possession of his cells following their removal. The court concluded that California statutes limited the patient’s control over excised body parts so drastically that what remained could not be called property for purposes of conversion law. Moreover, in light of the fiduciary duties of disclosure, the tort of conversion was not necessary to protect the patient’s rights.

A number of commentators have “appropriately criticized” Moore’s logic. Indeed, the California Supreme Court’s assurance that fiduciary duties would sufficiently protect tissue donors’ interests proved mistaken when a number of other state courts dismissed such causes of action on very similar sets of facts. Regardless of whether doctors’ fiduciary duties can sufficiently

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64. See id. at 483.
66. Moore, 793 P.2d at 480.
67. Id. at 493.
68. Id. at 488–89.
69. See id. at 489.
70. See id. at 496–97.
72. See, e.g., Greenberg v. Miami Children’s Hosp. Research Inst., 264 F. Supp. 2d 1064 (S.D. Fla. 2003). In Greenberg, a researcher patented the gene implicated in Canavan disease after studying the blood and tissue samples of several donors. Id. at 1067. The donors were under the impression that the resultant research would remain in the public domain and facilitate research on preventing and treating the disease. Id. When they found out that the researcher had patented the genetic sequence, they sued the researcher for lack of informed consent and breach of fiduciary duty, among other causes of action. Id. at 1067–68. The district court, however, declined to extend the duty of informed consent to cover the researcher’s economic interests. Id. at 1070–71. It also dismissed the claims for violation of fiduciary duty, asserting that unlike a doctor-patient relationship, “no automatic fiduciary relationship . . . attaches when a researcher accepts medical donations.” Id. at 1072; see also, D.A.B. v. Brown, 570 N.W.2d 168, 171 (Minn. Ct. App. 1997) (declining to recognize “a new tort based on breach of fiduciary duty to cover the wrong perpetrated by a physician who receives kickbacks for prescribing a manufacturer’s and distributor’s products”).
protect patients’ rights, Moore’s circular reasoning for denying property rights needs further examination. According to Moore, government regulation limiting personal rights in excised body parts militates against finding property rights in them. But if property rights were dictated by government regulations alone, then the takings jurisprudence would be made wholly irrelevant. The circularity of Moore’s reasoning is obvious: since the government regulates the sale and disposal of body parts, they are not private property; and since they are not private property, the government can subject them to additional regulatory regimes such as the patent system. But “‘[p]roperty’ cannot be defined by the procedures provided for its deprivation.”

Fortunately, subsequent California cases have refused to interpret Moore as completely denying ownership rights in body parts. The California Court of Appeal noted in Hecht v. Superior Court that Moore had failed to “resolve the debate over the existence or extent of a property interest in one’s body.” The court held that a decedent who had frozen his sperm “had an interest [in his sperm], in the nature of ownership . . . sufficient to constitute ‘property’ within the meaning of Probate Code section 62.” Similarly, the court in In re Estate of Kievernagel held that the depositor of sperm in cryopreservation storage “had at his death an interest, in the nature of ownership, to the extent that he had decisionmaking authority as to the use of the gametic material for reproduction.”

In 2007, the Eighth Circuit moved closer toward recognizing property rights in biological materials in Washington University v. Catalona. The court defined the donation of biological materials to Washington University as an inter vivos gift—“a voluntary transfer of property by the owner to another,

73. Moore, 793 P.2d at 489.
75. See, e.g., Hecht v. Superior Court, 20 Cal. Rptr. 2d 275, 281 (Cal. Ct. App. 1993). The court further noted that even existing statutory schemes did not resolve the issue. See id.
76. Id.
77. Id. at 283.
78. In re Estate of Kievernagel, 83 Cal. Rptr. 3d 311, 316 (Cal. Ct. App. 2008). However, in agreeing with Hecht, the court held that “gametic material, with its potential to produce life, is a unique type of property and thus not governed by the general laws relating to gifts or personal property.” Id. This hesitation to grant full property status to gametes arose from a notion that gametes “occup[ied] an interim category that entitle[d] them to special respect because of their potential for human life.” Davis v. Davis, 842 S.W.2d 588, 597 (Tenn. 1992). Not all courts, however, recognize this principle. For instance, in York v. Jones, the court found that a cryopreservation agreement between a couple and a medical college, which retained the couple’s frozen pre-zygote, created a bailor-bailee relationship. York v. Jones, 717 F. Supp. 421, 425 (E.D. Va. 1989). When the medical college refused the couple’s request for an interinstitutional transfer, the couple sued. Id. at 422–23. The court sustained the plaintiff’s cause of action in detinue, which required proving, among other elements, that the “plaintiff must have a property interest in the thing sought to be recovered” and “the right to immediate possession.” Id. at 427 (emphasis added).
79. 490 F.3d 667 (8th. Cir. 2007).
without any consideration."\(^80\) In *Catalona*, a surgeon at Washington University ("WU") had collected samples of his patients’ blood and tissue in a biorepository owned by WU.\(^81\) When he left WU for Northwestern University, he obtained release forms from some of his patients so that he could take the samples with him.\(^82\) WU sought a declaratory judgment against him, seeking to establish WU’s ownership of the biological samples.\(^83\) The court ultimately found for WU, noting that the attachment of certain conditions did not void the donation.\(^84\) As a result, WU “retained absolute possession of the biological materials.”\(^85\) It is apparent that the court could not have reached this conclusion without recognizing property rights in human biological materials.

A recent settlement between the Havasupai Indian tribe and Arizona State University is another example where an individual’s property right in donated blood samples was vindicated. The tribe received a $700,000 settlement award from Arizona State after the university allegedly used the tribe’s members’ blood samples for unconsented purposes.\(^86\) Members of the Havasupai tribe had donated blood samples to the university researchers hoping to obtain some genetic clues as to the prevalence of diabetes in their community.\(^87\) They sued the university upon learning that genetic researchers were using their DNA samples for many other studies relating to mental illness, inbreeding, and theories of the tribe’s migration that contradicted their traditional stories.\(^88\) In an apparent recognition of the sample donors’ rights, the university returned the controversial blood samples to the tribe along with the data from the studies.\(^89\)

In addition to these cases, the U.S. Department of Health and Human Services has issued regulations that also show recognition of potential property interests in bodily materials. The Code of Federal Regulations warns against using exculpatory language in informed consent agreements “through which the subject or the representative is made to waive or appear to waive any of the

80. Id. at 673–74 (emphasis added); see also Laura B. Lowe, *You Don’t Own Me: Recommendations to Protect Human Contributors of Biological Materials After Washington University v. Catalona*, 84 CHI.-KENT. L. REV. 227, 241 (2009) (“The Eighth Circuit correctly concluded that human biological material is property, and that it should be governed by property law.”).
82. Id. at 672.
83. Id.
84. Id. at 676–77.
85. Id. at 675.
87. Harmon, supra note 86.
89. See Harmon, supra note 86; Rubin, supra note 88.
subject’s legal rights.”\textsuperscript{90} As an example of \textit{impermissible} exculpatory language that may improperly interfere with a donor’s property interests, the Code provides, “By consent to participate in this research, \textit{I give up any property rights} I may have in bodily fluids or tissue samples obtained in the course of the research.”\textsuperscript{91}

It is true that courts are struggling to adapt the common law contours of property rights associated with the human body to the modern technological advances and societal demands. But the trend is, rightfully, toward a greater recognition of property rights in human bodily material. The philosophical underpinnings of the traditional restrictions against recognizing full property rights appear to trace back to the religious and cultural perspectives of early English common law, which was heavily influenced by principles inherited from its predecessor ecclesiastical courts.\textsuperscript{92} However, rapid advances in medical science and biotechnology continue to redefine the various ways the human body (and parts thereof) can be perceived and valued. While the sanctity of the human body continues to be cherished even today, and there may be valid concerns against its commodification, we cannot continue to rely on seventeenth-century definitions to solve twenty-first century problems. Given the recent appreciation of the economic, therapeutic, and diagnostic value of human biological materials, courts need to rethink the question of property rights in the human body. As Justice Black eloquently noted, “When precedent and precedent alone is all the argument that can be made to support a court-fashioned rule, it is time for the rule’s creator to destroy it.”\textsuperscript{93}

B. Arguments in Favor of Property Rights in Human Biological Materials

Although there are a number of arguments that favor recognizing property rights in human biological material, the best place to start reevaluating our notions of property rights is the definition of property itself. “The legal definition of property most often refers not to a particular physical object, but rather to the legal bundle of rights recognized in that object, which bundle of rights includes the rights to possess, use, and dispose of a particular article.”\textsuperscript{94}

\begin{itemize}
  \item \textsuperscript{90} 45 C.F.R. § 46.116 (2012).
  \item \textsuperscript{92} Boulier, supra note 34, at 695 n.15 (observing that Edward Coke had traced the prohibition against recognizing property rights in human body to ecclesiastical rules).
  \item \textsuperscript{93} Francis v. S. Pac. Co., 333 U.S. 445, 471 (1948) (Black, J., dissenting).
  \item \textsuperscript{94} AMERICAN JURISPRUDENCE ON PROPERTY § 1 (2d ed. 2009). Although commentators have criticized the appropriateness of the metaphor, it remains the dominant model. \textit{See, e.g.,} Myrl L. Duncan, Reconceiving the Bundle of Sticks: Land as a Community-Based Resource, 32 ENVTL. L. 773, 774–76 (2002) (noting that the “bundle of sticks” metaphor has long been used in describing property rights but calling for a reorientation of this paradigm); J.E. Penner, The “Bundle of Rights” Picture of Property, 43 UCLA L. REV. 711, 713–14 (1996) (critiquing the “bundle of rights” metaphor while acknowledging its prevalence).
\end{itemize}
The right to exclude is considered the most essential stick in the bundle, and traditionally has been considered a fundamental element of the property right. The reasonable expectation that a human body is under the exclusive control of the human being forms the basis for calling it a person's property. Similarly, the usage rights vested in the human body are exemplified by the fact that we can use our body with minimal government restrictions. Additionally, cremation rights recognize the right to dispose of our body. Any restrictions on the disposal of the body or body parts arises more out of public health concerns than a restrictive notion of property rights on the human body.

It is ironic, therefore, that this pervasive recognition of individual property rights in one's own body does not extend to excised bodily materials. This approach is analogous to the warped logic that one's house is his property, but a brick isolated from that very house is not. For the law to hold such a counterintuitive position there must be strong policy reasons. The following Sections discuss the main arguments articulated in favor of this illogical position: (1) the law imposes certain restrictions on the use of these materials, thereby eviscerating private property rights in them, and (2) recognizing private property rights may lead to unwarranted commodification of the human body and exploitation of the poor.

I. Legal Restrictions on the Use of Human Biological Materials Do Not Dissolve Individuals' Property Rights in Those Materials

Among the laws restricting the use of human biological materials, the National Organ Transplant Act ("NOTA"), which prohibits the sale of human organs, is perhaps the most prominent. But the scope of NOTA’s restrictions is more limited than it appears superficially. Although the law limits the right to sell human body parts, this prohibition is restricted to organs as “[n]o State or Federal statute prohibits the sale of blood, plasma, semen, or other replenishing tissues if taken in nonvital amounts.” For instance, the Ninth Circuit in Flynn v. Holder held that NOTA did not prohibit compensation for bone marrow stem cells obtained from donors’ blood because once stem cells were in the

95. See, e.g., Dolan v. City of Tigard, 512 U.S. 374, 384 (1994) (noting that the right to exclude is “one of the most essential sticks in the bundle of rights that are commonly characterized as property” (quoting Kaiser Aetna v. United States, 444 U.S. 164, 176 (1979)) (internal quotation marks omitted)).
96. Notable restrictions on the freedom to use one’s body or body parts include laws restricting abortions, such as the Partial-Birth Abortion Ban Act. See 18 U.S.C. § 1531 (2012).
97. See, e.g., TEX. HEALTH & SAFETY CODE ANN. § 711 (West 2013) (describing the rights of kin to cremate along with obligations to follow appropriate procedures).
98. This is exemplified by the California Supreme Court’s approach in Moore. See supra text accompanying note 73.
99. See, e.g., Boulier, supra note 34, at 723 (“O]ne of the chief criticisms against the recognition of property rights in human body parts is that it would result in commercialization.”).
100. Moore v. Regents of the Univ. of Cal., 793 P.2d 479, 518 (Cal. 1990) (en banc) (Mosk, J., dissenting).
bloodstream, they were a “subpart” of blood, not bone marrow. The ruling allowed a nonprofit organization to compensate donors by providing “$3,000 in scholarships, housing allowances, or gifts to charities.” Interestingly, although the court upheld the constitutionality of NOTA under rational basis review, it appeared unpersuaded by the rationale underlying NOTA. The court noted that the reasons behind the law were “in some respects vague, in some speculative, and in some arguably misplaced,” and recognized “strong arguments for contrary views.” Choosing not to seek Supreme Court review of the Flynn decision, the federal government implicitly acknowledged the validity of the limits that the Ninth Circuit placed on NOTA’s scope.

Even assuming for argument’s sake that NOTA’s prohibitions applied to all bodily materials, not just organs, these restrictions do not completely eliminate the alienation rights associated with property. Prohibition on sale is not the same as prohibition on alienation. After all, one can still donate organs. Furthermore, the right to sell is not such an essential attribute of property rights that, in its absence, all other property rights dissolve. It is not necessary that the same bundle of rights attach to all property. For policy reasons, the law may limit the exercise of certain rights, but that does not make the object of those limitations nonproperty. There are many examples of state regulation of the right to dispose or alienate personal property, but none has been considered to wipe out personal property’s character as property. For instance, public health and safety laws restrict the ways that items such as food, drugs, and explosives are manufactured, distributed, and sold. These limitations on the right to use and dispose of personal property at a certain time and space and in a certain manner, however, are not inconsistent with the notion of their being property. Another example of a sale restriction is found in state codes like the California Fish and Game Code, which prohibits a sportsman from selling caught fish but

101. Flynn v. Holder, 684 F.3d 852, 863 (9th Cir. 2011). The case arose when parents, doctors, and a nonprofit organization representing children suffering from leukemia challenged the constitutionality of NOTA on equal protection grounds. See id. at 855–56, 858. Minority and mixed-race patients have a very rare type of marrow cells, which makes it hard to find matching bone marrow donors. See id. at 856–57. Applying rational basis review, the court upheld the constitutionality of NOTA but allowed compensation for stem cells obtained by peripheral blood stem cell apheresis. See id. at 862–65.

102. Id. at 858.

103. See id. at 861–62. Although the court saw strong contrary arguments, it observed that “these policy and philosophical choices are for Congress to make, not us. The distinctions made by Congress must have a rational basis, but do not need to fit perfectly with that rational basis, and the basis need merely be rational, not persuasive to all.” Id.

104. Id. at 861.

105. See Alice Park, Should People Be Able to Sell Their Organs?, TIME.COM (July 3, 2012), http://www.cnn.com/2012/07/03/health/allowed-sell-organs-time/index.html (“U.S. Attorney General Eric Holder decided not to ask the Supreme Court to review the appellate court’s decision, which would have been the next step in overturning it. That means the ruling stands—and that people can now be paid up to $3,000 for their marrow, as long as it is collected by apheresis.”).

106. The FDA, for instance, regulates the manufacture and distribution of food and drugs.
HUMAN BIOLOGICAL PRODUCTS

not from donating it. 107 No one, however, would argue that the fish caught by
the sportsman is not his property. Similarly, prescription drugs possessed by the
person to whom they are prescribed can neither be sold nor given away. 108
These alienation restrictions do not undermine the proposition that these
articles are property. Likewise, human biological materials are no less property
merely because their disposal and alienation are restricted.

2. An Unregulated Market for Human Biological Products May Encourage
   Commodification More than a System That Recognizes Property Rights in
   These Products

   An increasing body of evidence suggests that the policy prohibiting the
sale of organs should be revisited. There is a great shortage of organ donors in
the United States. In 2012, it was estimated that more than one hundred
thousand patients were on the transplant waitlist, and that each year seven
thousand of them die because of organ shortage. 109 The prohibition on organ
sales may have aggravated the situation. This crisis is so severe that it has
forced doctors to increasingly use expanded-criteria organs from donors whose
medical conditions may not make them ideal donors. 110 While doctors and
patients are struggling to deal with organ shortage, the ban has done nothing to
stop the international black market for human organs, which is growing with
demand. 111

   In order to encourage organ donation, seventeen states provide tax
incentives to donors, but a recent study has found that these measures are not
working. 112 Other proposed measures such as presumed-consent laws 113 and

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107. See CAL. FISH & GAME CODE §§ 3039, 7121 (West 2013); see also Moore v. Regents of
       the Univ. of Cal., 793 P.2d 479, 510 n.10 (Cal. 1990) (en banc) (Mosk, J., dissenting).
108. See Moore, 793 P.2d at 510 n.11.
109. Pauline W. Chen, Using a D.M.V. Wait to Enroll Organ Donors, N.Y. TIMES (May 17,
110. Expanded Criteria Donors in Kidney Transplantation: A Treadmill or Bandwagon
demographics, excessive waiting times, and the increasing disparity between organ supply and
demand, the use of kidneys from expanded criteria donors (ECDs) has become generally (albeit
gradually) accepted and increasingly common.”).
111. See Denis Campbell & Nicola Davison, Illegal Kidney Trade Booms as New Organ Is
       “Sold Every Hour,” THE GUARDIAN (May 27, 2012), http://www.guardian.co.uk/world/2012/may/27
/kidney-trade-illegal-operations-who (The underground organ “trade may well be increasing again.
There have been recent signs that that may well be the case.”) (quoting World Health Organization
official Luc Noel).
112. Richard Knox, Tax Breaks for Organ Donors Aren’t Boosting Transplant Supply, NPR
-organ-donors-arent-boosting-transplant-supply.
113. There is a debate over the effectiveness of presumed-consent laws. There is some
       indication that they may be effective in increasing deceased donor rates. For instance, Spain, which has
a presumed-consent law, has the highest rate of deceased organ donation in the world. See John Fabre,
et al., Presumed Consent: A Distraction in the Quest for Increasing Rates of Organ Donation, 341
“no give, no take” laws do not appear to have a demonstrable effect in countries that have adopted them. Only Iran has eliminated its organ donation shortage, and it did so by developing a “working and legal payment system for organ donation.” This suggests that allowing a regulated market of organ donation may be one proven way to solve this crisis. Indeed, a recent empirical study on kidney donation confirmed the intuitive notion that “participants’ willingness to donate increased significantly as their risk for kidney failure decreased, [and] as the payment offered increased.” More interestingly, “the possibility of payment did not alter their willingness to donate for altruistic reasons.” Recognizing this reality, the American Medical Association’s Council for Ethical and Judicial Affairs observed that “financial incentives to encourage organ donation were not intrinsically unethical and warranted further study.”

Commodification is always a concern when there is a possibility of using the human body for a nontraditional purpose in return for economic benefits. Surrogacy critics, for example, raised the specter “of a ‘breeder class’ of poor women who will be regularly employed to bear children for the economically advantaged.” But this concern has not led to an outright ban on surrogacy in most states. If commodification and exploitation of the human body is a
concern, there is no reason to believe that an unregulated market is a better substitute. Rather, there should be a fair, transparent system that permits noncoercive exchanges to the satisfaction of both parties. It also provides an opportunity to ensure that people donating nonvital organs or tissues receive adequate post-operative care. Some regulatory oversight of the upper and lower limits on compensation may also assuage concerns of extreme commodification.

It should be emphasized that this Comment neither proposes an open market for organs nor outlines the structure of any regulated market. Such a proposal would need a much more thorough study that is beyond the scope of this Comment. In fact, as discussed earlier, some courts have interpreted NOTA as prohibiting only organ sales, and not sales of other human biological products. The main purpose of the foregoing discussion is to question the policy judgments behind NOTA and courts’ and commentators’ reliance on it to deny full-fledged property rights to human biological products.

3. Further Support for Recognizing Property Rights in Human Biological Materials

Indeed, the economic value of human biological materials also suggests that they may fall under another definition of property accepted by the California Supreme Court. Under this definition, property “extends to every species of right and interest capable of being enjoyed as such upon which it is practicable to place a money value.” While not conceivable in the past, it is now arguable that there is a practical way to value human biological products. One recent estimate valued the human body (including body parts) at around $45 million based on price estimates from hospitals and insurance companies. Surveying the market for human body parts, a Wired Magazine study reported that bone marrow is worth $23,000 per gram, DNA can fetch up to $9.7 million, and the antibodies our body produces are worth around $7.3 million.


122. For an example of such a proposal see, e.g., HIPPEN, supra note 116.
125. Carney, supra note 124; see also What Is Your Body Worth?, supra note 124 (estimating that the value of a human body broken down into chemical elements is $160).
Not only do human bodily materials fit the traditional definition of property,\(^\text{126}\) it is also illogical to assert that patents confer a property right in excised biological products, while simultaneously claiming that there is no private property right in these materials. It is largely accepted that patents are property.\(^\text{127}\) In fact, one of the main factors influencing the Federal Circuit ruling on gene patents, which the Supreme Court reversed in *Myriad*, was its reluctance to disturb the settled expectations of the biotechnology industry, which invested substantial time and money “to obtain property rights related to DNA sequences.”\(^\text{128}\) By accepting the proposition that patents grant property rights in biological materials, courts and commentators have acknowledged that individuals and companies may acquire property rights in such materials.\(^\text{129}\)

Thus, in the end, the question is not whether there can be property rights associated with isolated bodily materials, but rather who owns them. As Professor James Stern rightly points out: “Property law affixes a sort of invisible tag to every object in the world, naming the person authorized to decide how to use the object.”\(^\text{130}\) There may be more than one name on the tag and the permutations may be complicated. But as long as the “thing” exists, property law tells us who gets to use that “thing” and in what manner.\(^\text{131}\) Human bodily material is a tangible “thing.” Also, it is certainly not a public good because it is both excludable and rivalrous.\(^\text{132}\) Ultimately, the issue is who has a better claim to human bodily material: the individual whose body it is derived from or the person who discovers its composition (the patentee)? This Comment posits that the individual from whom the material is obtained has a better claim on isolated bodily materials than a patentee.

The definition of property is a major point of contention in property law, and it continues to intrigue scholars.\(^\text{133}\) It is a constantly evolving concept

\(^{126}\) See supra Part I.B.

\(^{127}\) See, e.g., Hartford-Empire Co. v. United States, 323 U.S. 386, 415 (1945) (“That a patent is property, protected against appropriation both by individuals and by government, has long been settled.”); see also Mossoff, supra note 20, at 690 (“Patents are property. The question that haunts scholars and courts today is whether patents also are constitutional private property, falling within the ambit of protections afforded to ‘private property’ under the Takings Clause.”).


\(^{129}\) *Myriad*’s reversal of the lower court’s ruling did not undermine the notion that patents grant the patentee proprietary rights on the subject of the invention; it merely invalidated such interests in natural DNA sequences. Indeed, the Court directed any concerns regarding disturbing the “reliance interests” of gene patentees to Congress. See Ass’n for Molecular Pathology v. Myriad Genetics, Inc., 133 S. Ct. 2107, 2119 n.7 (2013).


\(^{131}\) See id.


shaped by the moral, political, and practical understandings of the time. Thus, when this country appreciated the moral repugnance of slavery, it was abolished, thereby redefining traditional notions of property. Similarly, one hopes that there is a greater recognition of the fact that there is something morally and intuitively wrong when a person’s body parts are essentially owned by a third party through patents. Regardless of whether body parts can be sold, this Comment argues that a person should have substantial possessory, usage, and excludability rights in their excised body parts to comport with the common law definition of property rights. The increased recognition of property rights in human bodily material is supported by both evolving doctrinal trends and significant policy considerations.

II. DO PATENTS ON HUMAN BIOLOGICAL MATERIALS CONSTITUTE A TAKING?

Assuming that one’s interest in his excised biological materials constitutes property rights, this Part examines the regulatory takings doctrine involving personal property to understand whether patents on these materials constitute a taking. Since patents are temporary monopolies, this Comment attempts to address the takings argument under the doctrinal rubric of temporary regulations. It concludes that a reasonable argument can be made that patents on human biological products violate the Takings Clause.

A. Character of the Property

To begin with, let us determine whether the human biological materials are a type of property protected under the Takings Clause. The Fifth Amendment provides, “nor shall private property be taken for public use, without just compensation.” In other words, the Takings Clause only protects “private property.” There is no doubt that the human body and body parts are “private” to the person who owns them. In fact, it is difficult to imagine a property more private than the human body. Hence, human bodily material satisfies the requirement that property protected under the Fifth Amendment must be “private.”

Nevertheless, opponents of a takings claim may argue that courts have traditionally afforded personal property less protection than real property under the Takings Clause. But this distinction is based on Supreme Court dictum in

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135. U.S. CONST. amend. V.
Lucas v. South Carolina Coastal Council, and has been strongly contested. In Lucas, Justice Scalia merely observed that in the case of personal property, by reason of the State’s traditionally high degree of control over commercial dealings, [a person] ought to be aware of the possibility that new regulation might even render his property economically worthless (at least if the property’s only economically productive use is sale or manufacture for sale). As discussed below, this distinction between real and personal property—if it exists at all—speaks to the extent of state regulation, not whether the Takings Clause applies. Besides, the pervasiveness of zoning and environmental land-use regulations belies the assertion that personal property is more stringently regulated than real property.

It is well established that personal property, both tangible and intangible, is protected under the Fifth Amendment. Courts have recognized that interests on principal, most contract rights, patents, trade secrets, avian artifacts, and even causes of action once reduced to final unreviewable judgment are property interests under the Takings Clause. In Maritrans, Inc. v. United States, the Federal Circuit categorically rejected the argument “that personal property is not subject to Fifth Amendment protection.”

In addition, unlike most other personal property, human bodily materials have some distinctive similarities to land. These similarities may support a
claim for greater constitutional protection. Just as they attach greater subjective value to land, people are likely to attach greater subjective value to their excised body parts. In many instances, isolated bodily materials could be considered more unique than land.\footnote{While small molecules are the same across all human beings, the larger the molecule or the more complex the biological material, the greater the chances of differences between human beings.} Examples include sperm, ovaries, and certain unique proteins. Furthermore, human bodily material tends to be more personal in nature than other private personal property. Professor Margaret Radin notes, “a few objects may be so close to the personal end of the continuum that no compensation could be ‘just.’”\footnote{Margaret Jane Radin, \textit{Property and Personhood}, 34 STAN. L. REV. 957, 1005 (1982).} Indeed, it is hard to imagine objects closer to the personal end of the spectrum than human biological materials. In short, excised human biological products are not only “private property” protectable under the Fifth Amendment, but their close association with the human body also provides greater reasons for constitutional protection.

\textbf{B. The Public Use of Patents on Human Biological Materials}

Regardless of whether compensation is paid for private property, a taking \textit{must be for public use}.\footnote{See U.S. CONST. amend. V.} Without a finding of public use, the taking is unconstitutional. Thus, a lack of public use stops the inquiry and enjoins the taking.\footnote{Andrea L. Peterson, \textit{The Takings Clause: In Search of Underlying Principles: Part I—A Critique of Current Takings Clause Doctrine}, 77 CALIF. L. REV. 1299, 1357 n.316 (1989) (“[I]f the government was not acting to promote the common good, the claimant could seek an injunction on the ground that the government's action did not satisfy the public use requirement of the takings clause.”).} This Section examines whether patents on human biological products meet the “public use” requirement of the Fifth Amendment.

The Supreme Court has interpreted the public use requirement broadly, holding that a taking is for public use if it is taken for a “public purpose.”\footnote{Haw. Hous. Auth. v. Midkiff, 467 U.S. 229, 241 (1984).} As a result, the public use hurdle is low. Considering the expansive modern view of the public use requirement, it is hard to imagine that patents on human biological products would fail this threshold inquiry.\footnote{See James Geoffrey Durham, \textit{Efficient Just Compensation as a Limit on Eminent Domain}, 69 MINN. L. REV. 1277, 1278 (1985) (observing that “'[p]ublic use’ has . . . been defined so broadly that little if anything will not fall within the meaning of the term”) (footnote omitted).} The strongest public purpose argument in favor of granting patents on human biological products is that they stimulate the discovery of these objects and promote scientific progress. The promotion of scientific advance should easily meet the public use requirement for these patents.

147. While small molecules are the same across all human beings, the larger the molecule or the more complex the biological material, the greater the chances of differences between human beings.


149. See U.S. CONST. amend. V.

150. Andrea L. Peterson, \textit{The Takings Clause: In Search of Underlying Principles: Part I—A Critique of Current Takings Clause Doctrine}, 77 CALIF. L. REV. 1299, 1357 n.316 (1989) (“[I]f the government was not acting to promote the common good, the claimant could seek an injunction on the ground that the government's action did not satisfy the public use requirement of the takings clause.”).


152. See James Geoffrey Durham, \textit{Efficient Just Compensation as a Limit on Eminent Domain}, 69 MINN. L. REV. 1277, 1278 (1985) (observing that “'[p]ublic use’ has . . . been defined so broadly that little if anything will not fall within the meaning of the term”) (footnote omitted).
C. Regulatory Takings and the Penn Central Inquiry

However, even if the courts were to find a rational public purpose for patents on human biological products, finding a constitutionally valid taking may itself be enough to effectively nullify these patents. Consider how much the government would have to pay if every person whose biological products were patented requested compensation. Since it would be financially impossible for the government to compensate everyone for every patent issued on human biological products, the government would be forced to abandon issuing such patents. Hence, this Section analyzes the nature and scope of interference with private property rights resulting from the issuance of these patents in order to determine whether the government action qualifies as a compensable taking.

To begin with, the fact that patents are temporary monopolies does not make them any less of a taking. The Supreme Court has emphatically held that “temporary regulatory takings” are “not different in kind from permanent takings for which the Constitution clearly requires compensation.”[^153] As early as 1922, Justice Holmes dismissed the argument that property remaining in the owner’s possession could not be considered appropriated or used by the public.[^154] Since then, the Court has consistently held that “while property may be regulated to a certain extent, if regulation goes too far it will be recognized as a taking.”[^155] Nor does it matter that patents are typically enforced by third parties and not by the government. This is because when the government authorizes the encroaching conduct of a third party, a takings liability can be imputed to the government.[^156]

Courts decide whether a temporary governmental regulation constitutes a taking under the Fifth Amendment by applying a multi-factor test outlined in *Penn Central Transportation Co. v. New York City*.[^157] The relevant factors are the economic impact of the regulation on the claimant, the extent to which the regulation has interfered with the claimant’s investment-backed expectations, and the character of the government regulation.[^158] The regulatory taking determinations involve a factual inquiry into the nature and extent of


[^156]: See, e.g., Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419 (1982) (holding state liable for a taking when state-authorized activity was carried out by a private company).


[^158]: *Penn Central*, 438 U.S. at 124.
interference with the claimant’s property rights, weighing all of the relevant circumstances.\footnote{159}{Id. at 130–31.}

The \textit{Penn Central} inquiry “turns in large part, albeit not exclusively, upon the magnitude of a regulation’s economic impact.”\footnote{160}{Lingle v. Chevron U.S.A. Inc., 544 U.S. 528, 540 (2005).} Some courts have measured the impact of regulations by looking at the affected property’s remaining economic value.\footnote{161}{See, e.g., Coast Range Conifers, LLC v. State, 117 P.3d 990 (Or. 2005).} Other courts, like the Federal Circuit, have measured the impact by looking at how much the regulations changed the property’s fair market value.\footnote{162}{See, e.g., Fla. Rock Indus., Inc. v. United States, 18 F.3d 1560, 1567 (Fed. Cir. 1994).} Whatever approach courts take, the fact that patents prohibit all uses of isolated bodily products means that the patentee appropriates all economic value of these products. Even if courts require demonstrating the depreciation in monetary terms, advances in medical science and the existence of a giant global market—both legal and illegal—will facilitate those computations.\footnote{163}{See supra note 125.}

It can be argued, however, that unlike the investment in personal property such as chattels, people do not have any investment-backed expectations in their excised biological products. But this argument unravels under scrutiny. First, a lack of investment-backed expectations does not necessarily preclude finding a taking.\footnote{164}{See id.} People who acquire property by gift or inheritance may still make a valid takings claim.\footnote{165}{See Palazzolo v. Rhode Island, 533 U.S. 606, 634–35 (2001) (O’Connor, J., concurring) (“We . . . have never held that a takings claim is defeated simply on account of the lack of a personal financial investment.”).} Second, the argument that people do not invest in their body and do not expect to retain property rights in their excised body parts is baffling. A human being continues to invest in her body by continuously nourishing it and protecting it from injury. Human blood, tissues, and proteins would not automatically regenerate if people stopped feeding themselves. While it is true that most people do not nurture their bodies with the intention of making money by selling their body parts, some do sell or donate body parts like blood, hair, semen, tissues, and organs. We never argue that a person who invests in her home without the intention of selling it does not have investment-backed expectations of possessing the house. Similarly, a human being need not intend to sell her body parts in order to have the reasonable expectation of owning them when they are excised from the body.\footnote{166}{Courts have generally applied an objective “reasonable” standard in determining the expectations of the claimant. See Ruckelshaus v. Monsanto Co., 467 U.S. 986, 1005 (1984) (“A ‘reasonable investment-backed expectation’ must be more than a ‘unilateral expectation or an abstract need.’”); Cienega Gardens v. United States, 331 F.3d 1319, 1346 (Fed. Cir. 2003) (“This factor also incorporates an objective test—to support a claim for a regulatory taking, an investment-backed expectation must be ‘reasonable.’”).}
Hence, when a person decides to alienate, devise, or donate her body parts, she has a reasonable expectation of doing so without interference from a third party who has patented her biological products.

The character of the government regulation is another criterion that determines whether a compensable taking has occurred. Courts analyze the extent of governmental interference in private interests to determine whether it weighs in favor of finding a taking. “[D]estruction of one ‘strand’ of the bundle” of property rights may not necessarily constitute a taking. On the other hand, there have been a number of instances in which courts have found a taking for the abrogation of a single right, despite the plaintiff’s retention of other rights in the same property. Particularly, when the government regulation destroys certain “essential sticks in the bundle of [property] rights”—such as the right to exclude or the right to pass on property to heirs—the Supreme Court has found that a compensable taking has occurred. Since patents on isolated human biological products grant patentees the exclusive right to prevent others from making, using, selling, or distributing the claimed product, they destroy almost all the strands in the bundle of property rights. Such an extensive interference with the property rights of an affected individual is likely to tip the scale in favor of finding a taking.

The intrusive scope of patents is much greater than regulations on personal property sanctioned by the Court’s takings jurisprudence. For instance, in Andrus, the Court found that regulations prohibiting the sale of bald or golden eagle parts had not resulted in a taking because the claimants retained the “rights to possess and transport their property, and to donate or devise the protected birds.” In contrast, patents on human biological products would not allow a person to isolate, use, or even donate the biological product without the patentee’s permission.

Even though the Penn Central inquiry suggests a taking, some may argue that the purpose of the Takings Clause is only to “bar Government from forcing some people alone to bear public burdens which, in all fairness and justice,
should be borne by the public as a whole.” 171 Arguably, most patented human biological materials like proteins, genes, vitamins, and small molecules are not unique to a human being. 172 Since all American citizens are equally affected by the issuance of patents on these products, no single person is disproportionately bearing the burden for the public good. But the Fifth Amendment’s protections are not premised upon private property being unique. The plain language of the Takings Clause imposes no such limitation on compensable “private property.” Although courts have consistently asserted the maxim that “land is unique,” the takings jurisprudence has never required a claimant to show that her private property is distinctive in order to receive compensation under the Fifth Amendment. 173 Neither does the takings analysis depend on the number of people affected. All laws and their corresponding restrictions apply equally to all affected citizens, but depending upon their individual circumstances, some citizens would be more impacted than others. As Professor Richard Epstein noted, as an initial inquiry, “[i]t is only the character of the government action . . . that determines whether there is a taking of private property” regardless of whether many or few are burdened. 174 If that were not so, the state could constitutionally take any property from its citizens without compensating them as long as it deprived all citizens equally.

In sum, one may quite reasonably argue that under Penn Central, patents on human biological products would be considered a taking of private property.

D. A Comparative Study

In addition to the Penn Central factors, which clearly weigh in favor of finding a taking, a comparison of patents on human biological products with constitutional, noncompensable regulations—like zoning and health regulations—reveals a couple of key distinctions. These distinctions show that patents on human biological materials are not of the same nature as some of the noncompensable regulations, and affected individuals may indeed have

172. While this statement may be true for small molecules, for macromolecules like genes and proteins this is not a precise observation. For instance, the nucleotide diversity between human DNA is about 0.1 percent. “This means that about one base pair out of every 1,000 will be different between any two individuals.” See Teacher’s Guide: Understanding Human Genetic Variation, NATIONAL INSTITUTES OF HEALTH, http://science.education.nih.gov/supplements/nih1/genetic/guide/genetic_variation1.htm (last visited Jan. 5, 2014).
173. Indeed, many scholars have even started challenging the traditional notion that land is “unique.” See, e.g., Dooling, supra note 136, at 456 (“[T]he maxim that land is unique . . . is not as axiomatic as it seems.”); Peñalver, supra note 139, at 232 (noting that “scholars who have discussed the Court’s favoritism towards landownership in the context of regulatory takings have often dismissed its cogency out of hand”); Nancy Perkins Spyke, What’s Land Got to Do with It?: Rhetoric and Indeterminacy in Land’s Favored Legal Status, 52 BUFF. L. REV. 387, 388 (2003) (“[T]he impact of land’s uniqueness is indeterminate rather than consistent.”).
legitimate compensation claims under the Takings Clause. First, regulations like zoning and health regulations typically involve a partial regulation of private property, as opposed to the complete monopoly obtained through patents. Second, unlike patents, these regulations do not transfer property rights from one private party to another. Last, but perhaps most importantly, most of these regulations tend to regulate activities that are deemed undesirable or even harmful to society.

Patents are distinguishable from zoning regulations that place limits on the property owner’s right to make profitable use of some segments of his property. They are different with respect to both the nature of the property rights involved and the character of the regulations. It is one thing to say that an individual does not have a claim to the airspace above her land *ad infinitum*, while it is another thing to say that one does not have *any* property rights in her excised body parts. Compared to expansively claiming airspace *ad infinitum*, one's claim on one's excised bodily material is much smaller in scope. In addition, the intrusion into one’s right to one’s own bodily material is much more personal than the inhibitions imposed by zoning regulations. The government may have less authority or reason to interfere with individuals’ property claims, which are both smaller and more intimate than those regulated by zoning laws. Furthermore, while zoning regulations impose certain restrictions—such as on the height of the buildings or the usage of certain portions of the property—they typically do not completely eliminate all uses of the property. A patent on isolated human biological products, however, grants the patent owner the complete right to preclude a person from isolating these products from her body and using them, even if doing so is necessary for her own well-being.175

Patents are also unlike health and safety regulations that restrict the disposition of human tissues, anatomical human remains, or infectious waste.176 Such regulations merely seek to protect public health by ensuring proper disposal of hazardous biological material. In contrast to patents, they do not restrict all uses of the human biological products. They merely require that after the conclusion of say, a scientific use, these biological products be properly disposed of by following certain state-mandated measures.177 These regulations do not exclude people from proper scientific analysis of biological products or prevent them from selling or donating their products as long as they do so in a safe manner.

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175. For instance, if patented human biological material needs to be isolated to diagnose a disease, then the patent owner can prevent a person from doing so without her permission.

176. See, e.g., CAL. HEALTH & SAFETY CODE § 7054.4 (West 2007) (“Notwithstanding any other provision of law, recognizable anatomical parts, human tissues, anatomical human remains, or infectious waste following conclusion of scientific use shall be disposed of by interment, incineration, or any other method determined by the state department [of health services] to protect the public health and safety.”).

177. Id.
Second, unlike patents, these noncompensable regulations do not transfer property rights from one private party to another. Since the Takings Clause is primarily designed to prevent unfair forms of redistribution, a redistributive effect of a governmental regulation would be looked upon with suspicion.\textsuperscript{178} But where, as in the case of patents, the redistribution is not motivated “to benefit a particular class of identifiable individuals,” the governmental regulation is not \textit{per se} unconstitutional.\textsuperscript{179} Nevertheless, when the regulation involves a transfer of property interests to a third party by granting a patent monopoly, the argument for compensation becomes much stronger.

In addition, many of these noncompensable regulations impose private deprivations and benefits under the principle of “reciprocity of advantage,”\textsuperscript{180} which cannot be said for patents. As Justice Stevens, one of the key architects of the Court’s liberal takings jurisprudence, recognized, the “Court’s hesitance to find a taking when the State merely restrains uses of property that are tantamount to public nuisances is consistent with the notion of ‘reciprocity of advantage.’”\textsuperscript{181} In zoning, for instance, a particular landowner suffers some loss because he is precluded from certain putatively harmful uses of his property, but the same restriction also prevents others from imposing the same harm on him. Patents on human biological products do not confer an equivalent reciprocal advantage on the person who is precluded from using his biological product. At the most, the deprived individual shares in the societal benefit of the knowledge disclosed by the patent. But as discussed later, it is debatable whether this satisfies the just compensation requirement of the Constitution.

Finally, a fundamental difference between patents on human biological products and noncompensable regulations is the nature of the activity being regulated. While regulations related to zoning, health, and pollution tend to regulate activities that putatively harm the public, the use of one’s bodily material for transplantation, diagnosis, or research can hardly be defined as conduct harmful to societal interests. Indeed, scholars seeking a unified theory behind the takings jurisprudence have converged on this essential difference between activities that can be regulated without providing compensation to property owners and those that require it. Professor Andrea Peterson, for example, provides a descriptive theory of the Supreme Court’s takings decisions by observing that a compensable taking occurs whenever the government forces someone to give up his property unless the government is

\begin{itemize}
\item \textsuperscript{180} \textit{Penn. Coal Co. v. Mahon}, 260 U.S. 393, 415 (1922).
\end{itemize}
seeking to prevent some kind of wrongdoing. 182 Professor Joseph Sax similarly notes that many noncompensable governmental regulations share a common thread with judicial nuisance determinations. 183 He observes that just as courts use nuisance law to prevent uses of property that have harmful “spillover” effects on the neighboring properties, governmental regulations such as environmental regulations protect the public as a whole from adverse “spillover” effects. 184 Since the activities precluded by patents are not considered harmful, the governmental regulation resulting in their deprivation cannot escape the constitutional mandate of compensation.

In sum, the exclusionary scope of patents on human biological products is broad enough to constitute a taking. A finding of compensable taking would essentially compel the government to stop issuing these patents since it would be impossible to compensate all claimants. As is generally the case with takings challenges, an as-applied claim would likely have a greater chance of succeeding in courts than a facial challenge.

The government may, however, rely on Professor Epstein’s theory of “in-kind compensation” to argue that a claimant receives “in-kind compensation” in the form of knowledge of a hitherto undiscovered human biological product, a resource-intense discovery incentivized by the patent grant. 185 It is true that the constitutional prescription of “just compensation” for a taking does not necessarily mandate cash compensation. The “in-kind compensation” theory provides a strong foundation for regulations involving reciprocal deprivations, such as zoning laws, where an individual’s deprivation is compensated in kind by the same deprivation suffered by other members of the community. 186

However, Professor Epstein’s theory presents significant empirical and conceptual challenges in this context since the deprivation and the compensation are not of the same kind or magnitude. For instance, how do we determine whether the knowledge of a newly discovered human biological product is a just compensation for the deprivation of property rights over the isolated product? This is not to suggest that there is no in-kind compensation provided by these regulations; the problem is in assessing the adequacy of the alleged compensation. We cannot just presume the adequacy of in-kind compensation for any regulation merely because it confers a societal benefit. Such a presumption would essentially exclude any social-welfare regulation

184. Id. at 161–65.
185. Professor Epstein argues that this kind of arrangement provides just compensation not in cash but in the form of an implicit “in-kind compensation,” thereby alleviating the need for further compensation. See Epstein, supra note 174, at 195–99.
186. See id.
from the scrutiny of the Takings Clause, a consequence unsupported by the current takings jurisprudence.

Of course, as discussed in Part I, even before courts reach the takings issue, they would first need to shed their traditional resistance to recognizing full property rights in human body parts. But as this Comment has argued, such recognition would be both equitable and in line with the reality of current socio-economic conditions. If the current trend is any indication, courts are on a trajectory towards a greater appreciation of property rights in isolated human bodily material, further increasing the vulnerability of these patents to takings challenges.

CONCLUSION

Unlike the patenting of machines, drugs, or even other natural products, the patenting of human bodily material raises multiple ethical issues, not just legal questions. Regardless of how the Myriad decision impacts patents on other human biological materials, the takings jurisprudence helps us appreciate these critical, distinctive concerns. As the colorful judge presiding over the case in Boston Legal noted, “The idea of one person getting a patent [on someone else’s blood]. Well, you don’t have to be a senile old goat to be befuddled by that.” In the television show, the judge finally ruled in favor of the patent owner without much explanation beyond his clear dislike for the plaintiff. As this Comment indicates, it is far from clear whether such an outcome would be correct doctrinally or desirable normatively. As far as the author knows, no court has directly addressed the issue. This Comment makes a case for property rights in human biological materials in light of recent technological and biomedical developments and evolving social mores. The takings analysis further suggests that patents on human biological products may implicate the Fifth Amendment by interfering with these private property rights. Even though the author sympathizes with the idea of some kind of government-granted monopoly to incentivize the discovery of human biological products, we must not forget Justice Holmes’s admonition that “a strong public desire to improve the public condition is not enough to warrant achieving the desire by a shorter cut than the constitutional way of paying for the change.”

188. Id. at 52:23–53:34. The judge ends his ruling with the following statement: “Legally, I suppose, he [the doctor] does have a patent, but I keep coming back to, this is Simon Griffin’s blood, and he’s an ass. I rule in favor of the doctor.” A confused plaintiff’s attorney asked his colleague, “What just happened?” He received the most satisfying legal answer to his question, “He played the ass card.” Id. at 53:23–53:49.