SHARING THE GOLD WITH THE MOUNTAIN: A PROPOSED QUASI-PROPERTY DOCTRINE FOR HEALTH DATA COMPENSATION

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Abstract

This Note provides a legal answer to the moral question of whether a person should be compensated for lucrative health data that was collected from them. The moral question is examined through the lens of various doctrines in property, privacy, intellectual property, and ethics, in light of landmark cases concerning biomaterials and genetic information. A new doctrine for health data compensation is proposed, based on quasi-property and borrowing elements from equity, intellectual property, and profit-sharing. The proposed doctrine is evaluated by applying it to a hypothetical commercialization of one person's health data via a precision medicine product.

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INTRODUCTION

If prospectors found gold on the side of a mountain, the prospectors probably could not fathom sharing any of their earnings with the mountain from which the gold originated. The inanimate mountain had no idea it contained gold and had no use for the gold anyway. Furthermore, the prospectors were the ones who extracted the gold, used it to create something marketable, and found the right buyers. But if the inanimate mountain were instead a living, breathing person, it would likely give those same prospectors pause to look that person in the eye and say: "We are taking this. It is a part of who you are, but it will make us rich, and you will receive nothing."

The issue of health data compensation initially appears to be one of morality. Taking a person's health data, creating a product, and profiting from it while sharing nothing with the person, plainly put, feels wrong. But does any legal doctrine support this gut feeling?

If, instead of health data, we were to consider compensation for human biomaterials, the answer would be . . . possibly? In the 1990 case *Moore v. Regents of the University of California*,[1] the court ruled that Moore was not entitled to compensation after his cells were taken and used to develop a cell line with an estimated market value of $3 billion (in 1990!).[2] Out of thirteen causes of action stated by Moore,[3] the court allowed only the claims for breach of fiduciary duty and lack of informed consent to proceed, and rejected the conversion claim, holding that Moore did not retain a property interest in his excised cells.[4] In a 2003 case with similar

1. Moore v. Regents of the Univ. of Cal., 793 P.2d 479, 493 (Cal. 1990).

2. *Id.* at 482, 493.

3. *Id.* at 482 n.4 (listing the causes of action as:"(1) 'Conversion'; (2) 'lack of informed consent'; (3) 'breach of fiduciary duty'; (4) 'fraud and deceit'; (5) 'unjust enrichment'; (6) 'quasi-contract'; (7) 'bad faith breach of the implied covenant of good faith and fair dealing'; (8) 'intentional infliction of emotional distress'; (9) 'negligent misrepresentation'; (10) 'intentional interference with prospective advantageous economic relationships'; (11) 'slander of title'; (12) 'accounting'; and (13) 'declaratory relief.").

4. *Id.* at 480, 497.

facts, *Greenberg v. Miami Children's Hospital Research Institute*,[5] the court rejected five of the plaintiffs' causes of action,[6] but allowed the plaintiffs' claim of unjust enrichment, a claim that was rejected in *Moore*.[7] The conflicting rulings were due to exceptional circumstances in *Greenberg*;[8] the reasoning against compensation for human biomaterials in *Moore* remains the standard.[9]

Alas, health data is not human biomaterials, although a similar argument to the *Moore* standard can be made against health data compensation. There are widespread benefits to maintaining broad access to health data. Health data has many stakeholders, each with varying and intersecting rights.[10]Clinical care, public health, and research would be hindered by the restriction of health data access.[11] Additionally, compensation for access to health data faces a conundrum: one person's health data has little value on its own.[12]

Also, compared to human biomaterials, it is not as apparent how one person's health data can be directly monetized (in a similar way to how a person's biomaterials with unique properties can serve as the building block for lucrative cell lines[13]). This is where precision medicine comes in.

Precision medicine, also referred to as personalized medicine, encompasses a variety of methods to deliver customized treatments for individual patients based on analysis of personal data and biomarkers.[14] By collecting a high volume of data, including genetic biomarkers

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5. Greenberg v. Miami Children's Hosp. Rsch. Inst., 264 F. Supp. 2d 1064, 1068 (S.D. Fla. 2003).

6. Mary R. Anderlik & Mark A. Rothstein, *Canavan Decision Favors Researchers Over Families*, 31 J. OF L., MED. & ETHICS 450, 451–52 (2003) (listing the rejected causes of action as: breach of informed consent, breach of fiduciary duty, fraudulent concealment, conversion, and misappropriation of trade secrets).

7. *Moore*, 793 P.2d at 482.

8. *See* Anderlik & Rothstein, *supra* note 6, at 452 (stating that the *Greenberg* court ruled in favor of the plaintiffs on the unjust enrichment claim because the plaintiffs went "beyond the ordinary role of subject or donor" by investing "time and significant resources").

9. *See* David C. Szostak, *Something More to the Story: Moore v. Regents of the University of California Two Decades Later*, 31 THE JOURNAL OF LEGAL MEDICINE 443, 444 (2010) (referencing the *Moore* decision as the "crescendo" of "the state of the law as far as property rights in biological materials" is concerned).

10. Hannah K. Galvin & Paul R. DeMuro, *Developments in Privacy and Data Ownership in Mobile Health Technologies, 2016-2019*, 29 YEARBOOK OF MEDICAL INFORMATICS 32 (2020) (listing such stakeholders as "including patients, providers, healthcare systems, government bodies, technical service vendors, and network infrastructure suppliers").

11. *See generally* Barbara J. Evans, *Much Ado About Data Ownership*, 25 HARV. J. L. & TECH. 69 (2011) (discussing access to health data for public health and research).

12. *Id.*

13. *Id.*

14. *See* Christopher J. Phillips, *Precision Medicine and Its Imprecise History*, HARV. DATA SCI. REV., Jan. 31, 2020, at 2.

obtained through biobanks, and then aggregating that large, diverse data set alongside therapeutic outcomes, precision medicine allows researchers to identify patterns that can be applied in areas such as pharmacogenetics and disease diagnosis.[15] Pharmacogenetics applications include genomic tests to identify patients who will respond to drugs that treat certain cancers, childhood diabetes, and cystic fibrosis.[16] Disease diagnosis and treatment applications include identification of genes, biomarkers, and other factors that are associated with an increased risk of acquiring a disease.[17]

The genomic tests in pharmacogenetics applications illustrate the volume and complexity of the data required for precision medicine. Unlike genetics, a term that refers to the study of specific genes, genomics has an increased scope, which includes an entire genome and the interactions of all genes with each other and the environment.[18] In addition to genomics, data from other "omics"—research based on measurements of huge numbers of related biological molecules[19]—such as proteomics (protein data), metabolomics (metabolic data), and radiomics (radiology data) are used in precision medicine.[20] While omics are the health data that this Note seeks to examine, much of the focus will be on genetics, a source of data that has availed multitudes of research and case law over the years.

Various mechanisms have been proposed to protect interests in genetic information for the people who are the source of the genetic information,[21] including tort and privacy protections.[22] Legal scholars

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15. *Id.* at 4.

16. Richard W. Peck, *Precision Medicine is Not Just Genomics: The Right Dose for Every Patient*, 58 ANNUAL REV. OF PHARMACOLOGY & TOXICOLOGY 105, 106 (2018) (stating that for most drugs, patients do not respond well or benefit, and one mission of precision medicine is to overcome this obstacle, while emphasizing the importance of optimal individual dosage for each patient in addition to simply identifying the drug that the patient will respond to).

17. *See* Phillips, *supra* note 14, at 4–5.

18. Nat'l Hum. Genome Research Inst., *Genetics vs. Genomics Fact Sheet*, NAT'L INST. OF HEALTH (2018), https://www.genome.gov/about-genomics/fact-sheets/Genetics-vs-Genomics [https://perma.cc/Q22M-H336] (last visited Sept. 12, 2025).

19. COMM. ON THE REV. OF OMICS-BASED TESTS FOR PREDICTING PATIENT OUTCOMES IN CLINICAL TRIALS; BD. ON HEALTH CARE SERVS.; BD. ON HEALTH SCIS. POL'Y; INST. OF MED., *Omics-Based Clinical Discovery: Science, Technology, and Applications*, *in Evolution of Translational Omics: Lessons Learned and the Path Forward* (Christine M. Micheel et al. eds., 2012).

20. Sarah J. MacEachern & Nils D. Forkert, *Machine Learning for Precision Medicine*, 64 GENOME 416, 417 (2021).

21. *See* Ellen Wright Clayton et al., *The Law of Genetic Privacy: Applications, Implications, and Limitations*, 6 J.L. & BIOSCI. 1,5 (2019).

22. Morten Ebbe Juul Nielsen et al., *Property and Human Genetic Information*, 10 J. CMTY. GENET. 95, 95 (2019).

have proposed property law doctrines such as progressive property,[23] intangible property,[24] and quasi-property[25] as justifications for creating interests in genetic information.

Of these doctrines, quasi-property shows the most promise to support health data compensation, due to the similarities between health data and the "things" that quasi-property was conceived to protect interests in. The concept of quasi-property originated in *International News Service v. Associated Press*,[26] where a newspaper that published first had its publication protected against other news providers reusing and selling the reporting as their own, instead of expending labor to gather and summarize the information like the first news provider did.[27] In *International News*, the "thing" the quasi-property rights protected was news reporting,[28] which, like health data, is intangible information. An expansion of the application of quasi-property arose in *Newman v. Sathyavaglswaran*,[29] wherein rights were recognized for relatives of a deceased person with respect to the corpse.[30] In *Newman*, the "thing" the quasi-property rights protected was human biomaterials, which, like health data, have the potential to improve public health (the biomaterials were used to treat cataracts, but were taken without consent or knowledge of the relatives).[31] But just because quasi-property originated to protect interests in "things" similar to health data does not necessarily mean that a quasi-property doctrine can be used as a legal basis for health data compensation.

This Note is divided into two parts. Part I will evaluate the problem of health data compensation through the lens of various legal doctrines in an exercise that will arrive at a proposed quasi-property doctrine. Part II will apply the proposed quasi-property doctrine to a hypothetical commercialization of one person's health data via a precision medicine product.

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23. Jessica L. Roberts, *Progressive Genetic Ownership*, 93 NOTRE DAME L. REV. 1105, 1156 (2018).

24. Adam D. Moore, *Owning Genetic Information and Gene Enhancement Techniques: Why Privacy and Property Rights May Undermine Social Control of the Human Genome*, 14 BIOETHICS 97, 97 (2000).

25. Jeffery Lawrence Weeden, *Genetic Liberty, Genetic Property: Protecting Genetic Information*, 4 AVE MARIA L. REV. 611, 641 (2006).

26. Int'l News Serv. v. AP, 248 U.S. 215, 229 (1918).

27. Shyamkrishna Balganesh, *Quasi-Property: Like, but Not Quite Property*, 160 U. PA. L. REV. 1889 (2011).

28. *See Int'l News Serv.*, 248 U.S. at 229–31.

29. Newman v. Sathyavaglswaran, 287 F.3d 786, 788 (9th Cir. 2002).

30. *See* Balganesh, *supra* note 27, at 1891.

31. *See Newman*, 287 F.3d at 788.

I. SHOULD THERE BE HEALTH DATA COMPENSATION?

Most of the doctrines discussed in this section fall under the umbrella of either property or privacy. Given the value of health data to society, it would be asking too much to argue for full property or privacy rights in a person's health data, but these doctrines will be valuable in the quest to support mere compensation. In addition, doctrines in intellectual property and ethics will be considered.

For many of the doctrines, the illustrations most relevant to health data compensation involve the doctrine's application towards compensation for human biomaterials or genetic information.

The following table summarizes the analysis in this section.

Table 1: Compilation of Analyzed Doctrines

Doctrine	**How does it relate to health data compensation?**	**Why?**
The Right to Property		
Property, in general	oppose	Utilitarian basis: compensation would impede potential beneficial uses of health data
Ownership interests	facilitate	Broad range of rights that would include compensation, if elements are met
The right to exclude	alternative	Instead of compensation, limiting or restricting access to or uses of health data
Quasi-property	facilitate	if elements are met, would provide mechanism for compensation
Conversion	facilitate	if elements are met, would provide mechanism for compensation
Abandonment	oppose	No right to compensation because ownership of health data has changed
Adverse possession	oppose	No right to compensation because ownership of health data has changed

The Right to Privacy		
Privacy, in general	support	Constitutional basis: not getting compensation diminishes one's personality
Informed consent	facilitate	if elements are met, would provide mechanism for compensation
Intellectual Property		
Infringement and Remedies	facilitate	if elements are met, would provide mechanism for compensation
Subject Matter	oppose	Health data is considered natural phenomena and therefore not protected
Fair Use	oppose	Health data is used to benefit society and therefore not protected
Ethics and the Law		
Custodianship	support	Custodians of the data may have an ethical obligation to provide compensation
Profit Sharing	facilitate	Contractual agreement for health data compensation
Equity	support	Legal doctrine for correcting situation that feels wrong but does not fit other legal doctrines
Unjust Enrichment	facilitate	if elements are met, would provide mechanism for compensation

A. *The Right to Property*

1. Property, in General

A property right in health data would appear to be the quickest, cleanest path to health data compensation; however, the utilitarian basis of property law does not support health data compensation. Although it may seem counterintuitive, utilitarian arguments exist against people having property rights in "their" genetic information ("theirs" as in the genetic information originated in their bodies). One argument hinges on the nature of genetic information: while everyone's genome is unique,

most of the genetic information that makes up one person's genome can be found in other people, with the most shared genetic information found in that person's relatives.[32] This means that there could exist common interests in the shared elements of a person's genome, and exercising ownership interests to exclude others from accessing a person's genetic information could have negative health impacts for people that share elements of that person's genome.[33] Therefore, property rights in genetic information to support compensation for one person are outweighed by the utilitarian goal of allowing access to genetic information to benefit others who share portions of that genetic information.[34]

2. Ownership Interests

Ownership interests in health data are legally enforceable rights, privileges, powers, and immunities,[35] and therefore impact who has access to health data, in what ways health data can be used, and who can benefit from these uses of health data. When more than one party has an interest in health data, the issue of compensation can depend on which interests allow a party to have ownership because ownership includes a right to compensation.

Many states have enacted or proposed statutes that grant ownership interests to individuals with respect to their genomes.[36] Some of these statutes have been cited in cases[37] to support tort causes of action by tortfeasors against owners of genetic material as recognized by state statute.[38]

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32. *See* Clayton, *supra* note 21, at 2.

33. *Id.*

34. Richard A. Spinello, *Property Rights in Genetic Information*, 6 ETHICS & INFO. TECH. 29, 38 (2004).

35. *See* RESTATEMENT OF PROP. §§ 1–4, 5, 10 (1936). The First Restatement of Property uses the term "interests" to describe one or an aggregation of rights, privileges, powers, and immunities a person may have with respect to a thing. Having the totality of all possible legal interests in one thing would mean a person has complete property in that thing. A person with complete property in a thing has "ownership." The owner can part with some of the interests and still be considered the owner of the thing. For example, the owner of a car can mortgage it or have a lien put on it and still be considered the owner. There is no precise rule for how many or which interests a person can part with while retaining ownership.

36. Nat'l Hum. Genome Research Inst., *Genome Statute and Legislation Database*, NAT'L INST. OF HEALTH, https://www.genome.gov/about-genomics/policy-issues/Genome-Statute-Legislation-Database [https://perma.cc/8ZFD-C8ZK] (last visited Sept. 12, 2025).

37. Peerenboom v. Perlmutter, No. 2013-CA-015257, 2017 Fla. Cir. LEXIS 14957, at *15 (Fla. 15th Cir. Ct. Jan. 23, 2017) ("Florida law itself already recognizes a property right in one's DNA in limited circumstances.") (citing FLA. STAT. § 760.40(2)(a) (stating that the results of a DNA test, "whether held by a public or private entity, are exclusive property of the person tested")); Cole v. Gene by Gene, Ltd., No. 1:14-CV-00004-SLG, 2019 WL 2571244, at *3 (D. Alaska June 21, 2019) (citing ALASKA STAT. § 18.13.020)).

38. *See* Clayton, *supra* note 21, at 26.

3. The Right to Exclude

An important property interest with respect to human biomaterials is the right to exclude. In this context, the right to exclude encompasses control of access and use of human biomaterials by others. A right to exclude would be exercised independently from a right to compensation, which requires access and use of human biomaterials by others to make a commercial product (whether granted by a person with the right to exclude or open to others due to a person's lack of a right to exclude). Indeed, many human biomaterials cases do not concern compensation at all, and the plaintiffs are only interested in excluding others from using human biomaterials for research or other purposes.[39]

4. Quasi-Property

Quasi-property protections arise in circumstances where there could be an equitable basis for health data compensation. While property rights are typically held *in rem* (against the world) or *in personam* (against a specified party), quasi-property rights are held against a specified class of actors and only upon the occurrence of a specific triggering event.[40] These requirements could support health data compensation because compensation would only be equitable if it were against a specific class (entities that create usable health data from a person's "raw information") and only triggered by a certain event (the health data is used to generate substantial earnings).

Quasi-property already protects "things" which have qualities similar to those of health data.[41] Quasi-property rights have been proposed to protect the personal data of deceased persons,[42] akin to the protections

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39. *See* Joanna Pawlikowska et al., *Biobanking of Human Biological Material and the Principle of Noncommercialisation of the Human Body and its Parts*, 37 BIOETHICS 154, 157 (2023) (citing Complaint, Beleno v. Tex. Dep't of State Health Servs., No. SA-09-CA-188-FB, (W.D. Tex. 2009); Adams v. King Cnty., 192 P.3d 891 (Wash. 2008); Wash. Univ. v. Catalona, 490 F.3d 667 (8th Cir. 2007); Complaint, Havasupai Tribe v. Ariz. State Univ., Case No. CV2005-013190 (Ariz. 2004).

40. *See* Balganesh, *supra* note 27, at 1892; *see also Int'l News Serv.*, 248 U.S. 215. The newspaper had a quasi-property right of exclusion that applied only to other newspapers and was triggered solely when another newspaper republished the first newspaper's reporting as its own work. *Id.* at 236–42. Under this quasi-property protection, the original newspaper's reporting could still be shared by anyone outside the class of newspapers, for example, any individual could tell a friend about what they had read. *Id.* at 239. Additionally, other newspapers within the protected class could still access and use the first newspaper's reporting, provided they did not publish it as their own original work. *Id.* at 243–44.

41. *See supra* notes 26–31 and accompanying text.

42. Gianclaudio Malgieri, *R.I.P.: Rest in Privacy or Rest in (Quasi-) Property? Personal Data Protection of Deceased Data Subjects Between Theoretical Scenarios and National Solutions*, *in* 11 DATA PROTECTION AND PRIVACY: THE INTERNET OF BODIES 300–20 (Ronald Leenes, Rosamunde van Brakel, Serge Gutwirth & Paul De Hert eds., Hart Publ'g 2018).

already available for their corpses. Furthermore, quasi-property rights to exclude and to compensation have been proposed for biomaterials.[43] It appears the next logical step would be to propose quasi-property protections for health data.

5. Conversion

Conversion is civil theft, a hybrid of property and tort law.[44] In *Moore*, the court did not allow the plaintiff to assert the cause of action of conversion.[45] Because conversion requires a bad actor, it would not apply to all cases in which a person's health data generated earnings for another party. But if the elements of conversion are met, a remedy for conversion of health data would be compensation.

6. Abandonment

Health data compensation would not be supported if the health data was considered abandoned by the person from whom the data was collected. For example, the property doctrine of abandonment[46] can be used to support an argument against a person owning their genetic information. People consent to providing their genetic information to a number of entities, including healthcare providers, but also for other services like identification or genealogy.[47] Additionally, people discard biological materials, such as nail clippings and hair, in their garbage, and garbage has been ruled to be abandoned property.[48] Once ownership of a "thing," such as health data, has been abandoned, the next entity to possess that thing would be the new owner.

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43. JoAnne Belisle, *Recognizing a Quasi-Property Right in Biomaterials*, 3 U.C. IRVINE L. REV. 767, 786 (2013).

44. Sarah Green, *To Have and to Hold? Conversion and Intangible Property*, 71 MOD. L. REV. 114, 119 (2008), https://www.jstor.org/stable/25151180 (last visited Nov. 5, 2025).

45. *See Moore*, 793 P.2d 479 at 482–98. The plaintiff asserted that his removed cells were his property, and conversion was committed because he did not authorize the use of his cells for a commercial application. The plaintiff sought compensation not as a share of the earnings from the commercialization of his cells but instead as a remedy for a tort committed against him. The court ruled against imposing tort liability for conversion in cases of human biomaterials used in medical research for three reasons: (1) a policy argument based on the social utility of medical research; (2) deference to the legislature to resolve the issue; and (3) a proposed alternative resolution through enforcement of physicians obligations to disclose research and economic interests to their patients.

46. RESTATEMENT OF PROP. § 558 (1944). Abandonment is intentional relinquishment of a property interest that is indicated by a person's conduct (the intent is not directly communicated with words, although a person's words are considered when evaluating the circumstances around possible abandonment).

47. *See* Clayton, *supra* note 21, at 16, 28.

48. *Id.* at 33–34.

7. Adverse Possession

Health data compensation would also not be supported if the party collecting the data took ownership of the data through adverse possession.[49] Allowing adverse possession of health data would incentivize the effort and ingenuity to commercialize health data by providing a windfall for the adverse possessor of the data.[50] The windfall would be in the form of ownership of the health data, awarded because the possessor improved the health "raw information" to create something useful.

B. *The Right to Privacy*

1. Privacy, in General

Health data is protected by the privacy doctrines of the HIPAA Privacy Rule[51] and the Common Rule.[52] Genetic information, protected as health data under the HIPAA Privacy Rule and Common Rule, is afforded additional privacy protections due to its non-healthcare applications.[53] These existing privacy protections for health data do not include compensation, but they could be expanded. However, like the utilitarian case against ownership of health data, there are arguments to limit the right to privacy in health data because of the societal benefit that access to health data provides.[54]

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49. *See generally* Jeffrey Evans Stake, *The Uneasy Case for Adverse Possession*, 89 GEO. L.J. 2419 (2000). Adverse possession is the right to own property if one has actual possession of it for a period of time and the actions of the possessor are continuous, hostile, notorious, open, and exclusive to the actual owner. The requirements of knowledge and inaction of the owner are similar to abandonment, but adverse possession essentially requires less effort by the owner and more effort by the new possessor to change ownership. Adverse possession has a utilitarian basis, encouraging the development of land if the owner is not using it by rewarding the possessor who improves the land with ownership of that land.

50. *See* Neil Maddox, *'Abandonment' and the Acquisition of Property Rights in Separated Human Biomaterials*, 16 MED. L. INT'L 229, 246 (2016).

51. April Moreno Arellano et al., *Privacy Policy and Technology in Biomedical Data Science*, 1 ANN. REV. OF BIOMEDICAL DATA SCI. 115, 116 (2018); Takako Takai-Igarashi et al., *Security Controls in an Integrated Biobank to Protect Privacy in Data Sharing: Rationale and Study Design*, 17 BMC MED. INFORMATICS & DECISION MAKING 1, 2 (2017).

52. *See* Lawrence O. Gostin & James G. Hodge, Jr., *Personal Privacy and Common Goods: A Framework for Balancing Under the National Health Information Privacy Rule*, 86 MINN. L. REV. 1439, 1472 (2002).

53. *See* Clayton, *supra* note 21, at 3, 16 (listing non-healthcare applications of genetic information); Jessica L. Roberts, *Preempting Discrimination: Lessons from the Genetic Information Nondiscrimination Act*, 63 VAND. L. REV. 439, 462–63 (2010) (discussing protections against discrimination based on genetic information).

54. Peter D. Jacobson, *Medical Records and HIPAA: Is it Too Late to Protect Privacy*, 86 MINN. L. REV. 1497, 1501–03 (2001) (examining rationales for disclosure of protected health information).

The right to privacy is a broad term with origins in constitutional law.[55] Privacy has been applied to areas outside health, such as the press[56] and search and seizure,[57] and was recognized as a fundamental right by the Supreme Court in health areas, including contraception[58] and abortion.[59] An important distinction is that these health cases concerned an individual's right to make a decision on a healthcare procedure.[60] Privacy has a different meaning when applied to health data,[61] described in legal scholarship as a right to control[62] or limit access[63] to health data. In this way, the right to privacy parallels the property right to exclude.[64]

While privacy may protect a parallel interest to property, privacy differs from property in how the person and the body are conceptualized.[65] Under property law, a person's body is a separate object that the person can exclude others from, but under privacy law, the body is a part of the person, and the person's right to exclude others from their body is a protection of personal identity.[66] The most robust support for health data compensation may come from adopting both of these approaches simultaneously: the health data constitute an object separate from the person (so that it can be commercialized), but that object remains a representation of the person's identity (so that the person has a claim for compensation).

2. Informed Consent

Informed consent is another doctrine that would not apply to all cases where a person's health data was used by another party to generate

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55. Griswold v. Connecticut, 381 U.S. 479, 485–86 (1965) (recognizing a constitutional "right to privacy" derived from the penumbra of the Bill of Rights).

56. *See, e.g.*, Branzburg v. Hayes, 408 U.S. 665, 693–98 (1972) (discussing "reporter's privilege" in the context of individual privacy rights).

57. *See, e.g.*, Katz v. United States, 389 U.S. 347, 350–51 (1967) (describing privacy protections afforded by the Fourth Amendment).

58. Eisenstadt v. Baird, 405 U.S. 438, 452–53 (1972) ("To say that contraceptives . . . are to be forbidden . . . conflicts with fundamental human rights.); *Griswold*, 381 U.S. 479, 485–86 (1965).

59. Roe v. Wade, 410 U.S. 113, 153 (1973) ("The right of privacy . . . is broad enough to encompass [abortion]."); *but see* Dobbs v. Jackson Women's Health Org., 597 U.S. 215, 292 (2022) ("We therefore hold that the Constitution does not confer a right to abortion.").

60. *See* Radhika Rao, *Property, Privacy, and the Human Body*, 80 B.U. L. REV. 359, 388 n.107 (2000) (exploring privacy law protections for decisions on contraception and abortion, as well as for other healthcare procedures, including refusal of medical treatment and assisted suicide).

61. *See* Jacobson, *supra* note 54, at 1499.

62. *Id.*

63. *See id.*

64. *See* Rao, *supra* note 60, at 364.

65. *Id.*

66. *Id.*

earnings, but if the elements of informed consent are met,[67] the doctrine would provide a remedy for compensation. Federal regulations require informed consent for human subjects in research.[68] Arguments against informed consent characterize it as an obstacle to socially valuable research.[69] Informed consent was not obtained in *Moore* or *Greenberg*, yet the issue was not decided in either court, possibly due to this policy rationale.[70]

For health data, the privacy protection of informed consent has been eroded because the scope of data usage by "Big Data"[71] can make it difficult for subjects at the time consent is obtained to comprehend what their data will be used for in the future.

C. *Intellectual Property*

Intellectual property is given a separate subsection from property because intellectual property has specialized conventions for protecting rights in intangible things such as ideas, inventions, and artistic expression. Health data is similarly intangible, and so the specialized conventions of intellectual property law could be suitable for health data compensation.

1. Infringement and Remedies

Infringement occurs when one party's intellectual property has been used by another, violating the right to exclude others from the use of one's intellectual property.[72] Determining whether the intellectual property has been "used" generally requires a test comparing the intellectual property to the alleged infringing use, and although these tests vary across

67. Elizabeth Bromley et al., *From "Informed" to "Engaged" Consent: Risks and Obligations in Consent for Participation in a Health Data Repository*, 48 J. OF L., MED. & ETHICS 172, 172 (2020) (stating that informed consent requires that the choice to provide consent is made voluntarily and with sufficient information to comprehend the choice).

68. 45 C.F.R. § 46.116(a)(1) (2025).

69. Angela Ballantyne & G Owen Schaefer, *Consent and the Ethical Duty to Participate in Health Data Research*, J. MED. ETHICS 392, 392 (2018).

70. In *Moore*, the patient voluntarily allowed doctors to take biomaterials because he was misled to believe that it was part of his treatment and not solely for the purpose of research and commercialization. In *Greenberg*, the biomaterials were voluntarily provided for research but without the knowledge that the research would lead to commercialization. *See Moore*, 793 P.2d 479 at 126; *Greenberg*, 264 F. Supp. 2d at 1067–68.

71. A. Michael Froomkin, *Big Data: Destroyer of Informed Consent*, 21 YALE J. L. & TECH. 27, 27 (2019).

72. *See* 35 U.S.C. § 271 (2025).

patents,[73] design patents,[74] copyrights,[75] and trademarks,[76] each test shares a common goal of determining how similar the protected intellectual property is to the alleged infringing use. Elements of these tests could be adapted to compare a person's "raw information" to the health data at issue in an analysis of health data compensation.

Available remedies for infringement are injunctive relief and compensation.[77] In many cases, both types of relief are provided: injunctive relief to stop the other party from using the intellectual property, and compensation for the earnings the other party obtained by using the intellectual property.

If health data is considered intellectual property, then the mechanisms of infringement and remedies would support health data compensation.

2. Subject Matter

Health data would not be subject matter worthy of intellectual property protections, based on the Supreme Court's decision against classifying genetic information as patentable subject matter in *Association of Molecular Pathology v. Myriad Genetics*.[78] The policy

73. Warner-Lambert Co. v. Teva Pharms. USA, Inc., 418 F.3d 1326, 1340 (Fed. Cir. 2005) (stating that, as a question of fact, "the court must compare the accused product or process to the properly construed claims" and that "[i]nfringement may be found only where the accused product or process contains each limitation of the claim, either literally or under the doctrine of equivalents.").

74. Carl J. Hall, *A Patently Offensive Test: Proposing Changes to the Test for Design Patent Infringement*, 53 VAL. U. L. REV. 297, 302 n.26 (2018) (citing L.A. Gear, Inc. v. Thom McAn Shoe Co., 988 F.2d 1117, 1124 (Fed. Cir. 1993) (stating that the plaintiff has the burden to prove "by a preponderance of the evidence that the design protected by the design patent and the accused design are substantially similar.")).

75. Mark A. Lemley, *Our Bizarre System for Proving Copyright Infringement*, 57 J. COPYRIGHT SOC'Y 719 (2010) (citing Sid & Marty Krofft Television Prods., Inc. v. McDonald's Corp., 562 F.2d 1157, 1164 (9th Cir. 1977) (stating that the plaintiff must prove "substantial similarity not only of the general ideas but of the expressions of those ideas as well" between the plaintiff's work and the alleged infringing work)).

76. Barton Beebe, *An Empirical Study of the Multifactor Tests for Trademark Infringement*, 94 CALIF. L. REV. 1581, 1582 (2006) (stating that "each circuit requires that the district court conduct a multifactor analysis of the likelihood of consumer confusion according to the factors set out by that circuit").

77. Eric R. Claeys, *The Conceptual Relation Between IP Rights and Infringement Remedies*, 22 GEO. MASON L. REV. 825, 826–29 (2015).

78. *See* Ass'n for Molecular Pathology v. Myriad Genetics, 569 U.S. 576 (2013). In *Myriad*, the biotech company Myriad Genetics attempted patent testing for two genes that indicated a heightened risk for breast cancer. The Supreme Court ruled that the subject matter was unpatentable because human genes were natural phenomena and therefore a patent would be invalid under 35 U.S.C. § 101. The *Myriad* decision would appear to prevent any external parties from asserting control over a person's genetic information and, therefore, support an argument for health data compensation. But the *Myriad* decision also prevents that person from having rights with respect to their own genetic information.

rationale of the *Myriad* decision was to ensure that nobody could be excluded from performing potentially lifesaving tests to determine breast cancer risk.[79] Following this line of reasoning, the *Myriad* decision could be interpreted to mean that nobody can have an intellectual property interest in genetic information because restricting access to this data would be detrimental to the public good.

However, patent law is an intellectual property doctrine that not only encourages but also requires public disclosure of information.[80] The patent holder is rewarded for sharing their information to the public with the grant of the right to exclude others from marketing an invention[81] for a period—usually twenty years—after which the right to exclude expires.[82] In this way, a patent's right to exclude serves as compensation for the data shared by the patent holder with the public, and therefore, patent law could help support health data compensation, although health data compensation would be monetary rather than a right to exclude.

An intellectual property protection that could include genetic information as subject matter is trade secret law, which the *Myriad* decision led some biotechnology companies (including Myriad Genetics) to turn to for products created using genetic information.[83] However, trade secret law protects against public disclosure,[84] which, if applied to health data, would harm the public good.

This seems like a good place to review the difference in magnitude between the data discussed in this section and the data used in precision medicine. The medical data in the *Myriad* case were genes, small portions of genetic information that occur in a range of individuals, whereas precision medicine data includes genomes, which are entire sets of genetic information unique to each individual. When discussing compensation for health data, the conclusions in this section regarding protections of genetic information do not directly apply to protections of health data for precision medicine, due to differences in quantity and uniqueness of the data.

Also of note: why did the *Myriad* court evaluate genetic information as intellectual property? Intellectual property protects products of human

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79. *See* Ajay Dara & Pratap Devarapalli, *The Impact of Gene Patent Decision and the Changing IP Strategies of Myriad Genetics*, EUR. INTELL. PROP. REV., Aug. 2023, at 9. (explaining that while other gene patents were granted by the Supreme Court, Myriad Genetics' anticompetitive practices along with the prevalence and mortality of breast cancer swayed the court to rule differently in *Myriad*).

80. Jeanne C. Fromer, *Machines as the New Oompa-Loompas: Trade Secrecy, the Cloud, Machine Learning, and Automation*, 94 N.Y.U. L. REV. 706, 713 (2019).

81. Sarah Leah Schwartz, *Owning the Code of Life: Human Gene Patents in America* (2015) (S.M. Thesis, Massachusetts Institute of Technology) (on file with DSpace@MIT).

82. 35 U.S.C. § 154(a)(2) (2025).

83. Dara & Devarapalli, *supra* note 79, at 16.

84. Fromer, *supra* note 800, at 713.

intellect that are commercially valuable.[85] The genes in *Myriad* were discovered and isolated by humans and thus were claimed to be the product of human intellect.[86] The arguments concerning the genes in the *Myriad* case illustrate how "raw information" requires the input of human ingenuity and effort to create useful health data. But, based on the *Myriad* court's reasoning, no intellectual property protection could be afforded because the "raw information" fell into the subject matter category of natural phenomena, and in this case, not enough ingenuity and effort was applied to make something substantially different from the natural phenomenon. Intellectual property protections, encumbered by a need to distinguish between what occurs naturally and what is created, would frequently encounter gray areas (as in *Myriad*) if used in support of health data compensation.

3. Fair Use

Fair use doctrine is a defense in copyright infringement similar to the public utility arguments supporting open access to health data.[87] Fair use doctrine has been used in defense of generative artificial intelligence algorithms trained using copyrighted data.[88] This relationship between algorithm and data is very close to that between precision medicine algorithms and health data. Therefore, the factors of fair use doctrine are worth considering when proposing a legal doctrine for health data compensation.

D. *Ethics and the Law*

1. Custodianship

Custodianship is an ethical model, not a legal doctrine. In the context of human biomaterials, custodianship places the burden on research entities to "recognize their ethical obligations and serve the best interests

85. *Intellectual Property*, BLACK'S LAW DICTIONARY (11th ed. 2019); *see* Weeden, *supra* note 25, at 643–44 (stating intellectual property protections could be suitable for genetic information because genetic information is intangible and has both fungible and non-fungible qualities).

86. *Myriad*, 569 U.S. at 580 (holding that naturally occurring DNA segments are products of nature and therefore not patentable, distinguishing them from complementary DNA (cDNA), which is patent eligible because it is synthetically created and not naturally occurring).

87. 17 U.S.C. § 107 (2025). Under fair use, how copyrighted material is used by a party can provide relief when that party has used copyrighted material without obtaining a license from the copyright holder. The factors for determining fair use are: (1) the purpose of the use; (2) the nature of the copyrighted work; (3) the proportion of the copyrighted work that was used; and (4) the effect of the use on the value of the copyrighted work.

88. Peter Henderson et al., *Foundation Models and Fair Use*, 24 J. OF MACH. LEARNING RSCH. 1, 5 (2023).

of biomedical research."[89] This means that, unlike legal doctrines, no legal action is required by the donor of the biomaterials to enforce their rights. The donor's interests are maintained by the researchers' adherence to the model of custodianship, one that "clarifies control of biospecimens and minimizes conflicts between concerned stakeholders."[90]

2. Profit Sharing

One proposal for biomaterials compensation places the burden on investigators who collect biospecimens to extend an offer to share in profits.[91] The proposed profit-sharing model would be based on the relative value of the contributions of the subjects and the investigators.[92] This model is supported by the American Medical Association Code of Ethics, which states that physicians should obtain permission to commercialize a patient's donated biomaterials and share any profits with the patient.[93]

3. Equity

Equity is both a legal doctrine and an ethical model. Equity can be a legal doctrine used to resolve conflicts when other areas of law are rigid and the facts do not conform.[94] Equity is also an ethical model that can lead to results contrary to those produced by the law.[95] Equity further provides the historical foundation for many legal doctrines and rules of civil procedure.[96]

In short, equity is pervasive and amorphous. For purposes of health data compensation, equity can be viewed as a formalized representation of the "gut feeling" described in the Introduction, providing the foundation for a proposed doctrine to support health data compensation.

4. Unjust Enrichment

Unfortunately for this analysis, the *Moore* court did not address the merits of Moore's unjust enrichment claim,[97] but unjust enrichment was

89. Rihab Yassin et al., *Custodianship as an Ethical Framework for Biospecimen-Based Research*, 19(4) CANCER EPIDEMIOLOGY, BIOMARKERS & PREVENTION 1012, 1013 (2010).

90. *Id.* at 1012.

91. David S. Wendler, *The Claims of Biospecimen Donors to Credit and Compensation*, 36 TRENDS IN GENETICS 630, 632 (2020).

92. *Id.* at. 631–32.

93. American Medical Association, *AMA Code of Ethics Opinion 7.3.9: Commerical Use of Human Biological Materials*, https://code-medical-ethics.ama-assn.org/ethics-opinions/commercial-use-human-biological-materials [https://perma.cc/WZ8T-MZNW] (last visited Sept. 4, 2025).

94. Henry E. Smith, *Equity as Meta-Law*, 130 YALE L.J. 1050, 1060 (2020).

95. *Id.* at 1050.

96. *Id.* at 1072.

97. Anderlik & Rothstein, *supra* note 6, at 452.

discussed as support for compensation in the dissenting opinion on Moore's conversion claim.[98] The dissent framed its unjust enrichment argument as a policy consideration combining equity and ethics.[99]

Unjust enrichment is a doctrine based on principles of equity and restitution[100] that may be applied to support remedies in contract and tort cases when a defendant is enriched as a result of a breach of contract or duty.[101] Unjust enrichment can support compensation in cases where contract, tort, or property theories do not,[102] giving the doctrine a gap-filling purpose similar to equity.[103] The flexible nature of unjust enrichment makes the doctrine difficult to define clearly,[104] but one concrete application is illustrated in the *Greenberg* case.[105]

The plaintiffs in *Greenberg* provided biomaterial samples from deceased relatives to a doctor motivated by a desire to help isolate the gene responsible for, and develop a screening test for, the disease that claimed their relatives' lives.[106] The doctor did just that, but then patented the gene and the testing method,[107] allowing himself to become enriched.[108] The court did not dismiss a claim for unjust enrichment because the plaintiffs "invest[ed] time and significant resources" in providing the biomaterial samples.[109] However, the court did not rule on the merits of the claim because the case was settled out of court.[110]

In a set of recent high-profile cases[111] in which unjust enrichment was similarly claimed to support compensation for human biomaterials, two

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98. *Moore*, 793 P.2d at 517.

99. *Id.*

100. Abigail C. Lepsch, *Greenberg v. Miami Children's Hospital Research Institute*, 3 GROVE CITY CJL PUB. POL'Y 145, 146 (2012).

101. Debra L. Greenfield, *Greenberg v. Miami Children's Hospital: Unjust Enrichment and the Patenting of Human Genetic Material*, 15 ANNALS HEALTH L. 213, 215 (2006).

102. *Id.*

103. *See* Smith, *supra* note 94.

104. *See* Lepsch, *supra* note 100, at 152–53.

105. *See* Greenberg, 264 F. Supp. 2d at 1072. In *Greenberg*, the court applied the elements of unjust enrichment from precedent in Florida case law: "(1) the plaintiff conferred a benefit on the defendant, who had knowledge of the benefit; (2) the defendant voluntarily accepted and retained the benefit; and (3) under the circumstances it would be inequitable for the defendant to retain the benefit without paying for it."

106. *Id.* at 1067.

107. *See Myriad*, 569 U.S. at 596; *see also supra* text accompanying note 78. Isolated genes responsible for diseases and associated testing methods for those genes are no longer valid subject matter after *Myriad*, so if the facts of *Greenberg* were to reoccur today, the doctor's patent application would be rejected, and the doctor would likely have never been enriched.

108. *See Greenberg*, 264 F. Supp. 2d at 1072–73.

109. *Id.* at 1073.

110. *See* Lepsch, *supra* note 100, at 148.

111. Civil Compl. & Request for Jury Trial, Estate of Lacks v. Thermo Fisher Sci., Inc., No. 1:21-cv-02524-DLB (D. Md. Oct. 4, 2021); ("Lacks I"); Civil Compl. & Request for Jury Trial, Estate of Lacks v. Viatris Inc., No. 1:24-cv-02267-DLB (D. Md. Aug. 5, 2024) ("Lacks II").

defendants so far have settled out of court. The suits were brought by the family of Henrietta Lacks against biotechnology and pharmaceutical companies.[112] Cervical cancer cells taken from Lacks in 1952 were used to create the notorious "HeLa" cell line, which has yielded over sixty tons of cells, numerous crucial scientific breakthroughs, and billions in earnings for private companies.[113] Unlike *Greenberg*, where the inequity basis for unjust enrichment arose from the plaintiffs' expended time and effort,[114] in *Lacks I* and *Lacks II*, the unjust enrichment claim was based on the disparity between the value of Lacks's cells (monumental societal benefit and private enrichment) and zero compensation for Lacks's family (prior to the two settlements), coupled with racial injustice surrounding the taking of Lacks's cells.[115]

Although for different reasons than in *Moore* and *Greenberg*, the unjust enrichment claim in *Lacks I* was also never decided in court.[116] Therefore, we are left without any clear doctrine for unjust enrichment in the context of human biomaterials compensation, outside the claim elements listed, but not ruled on, in *Greenberg*.

E. *The Winner: Quasi-Property*

The issue of health data compensation does not slot neatly into property, privacy, intellectual property, or ethics doctrines. Quasi-property is selected primarily because the core issue here is equity, and the doctrine of quasi-property was invented to solve an equity issue.[117] Quasi-property is selected over unjust enrichment because unjust enrichment would limit health data compensation to cases where the user of health data benefited at the detriment of the person whose health data was taken.

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112. Meredith Wadman, *What Does the Historic Settlement Won by Henrietta Lacks's Family Mean for Others?*, SCI. INSIDER (Aug. 7, 2023, at 11:45 AM), https://www.science.org/content/article/what-does-historic-settlement-won-henrietta-lacks-s-family-mean-others [https://perma.cc/W97Y-2R6T]; Jenna Greene, *Novartis Quietly Settles Henrietta Lacks Suit as Family's Legal Push Gains Steam*, REUTERS (Feb. 23, 2026), https://www.reuters.com/legal/litigation/novartis-quietly-settles-henrietta-lacks-suit-familys-legal-push-gains-steam-2026-02-24/ [https://perma.cc/8B3C-GC9D].

113. Robert Klitzman, *Henrietta Lacks' Family's Lawsuits: Ethical Questions and Solutions*, 40 TRENDS IN BIOTECH. 769, 769 (2022).

114. *See* Greenfield, *supra* note 101, at 228.

115. *See* Wadman, *supra* note 112 (noting that the extents of the disparity and racial injustice in Lacks' case are well documented).

116. *Id.*; *but see* Greene, *supra* note 112 (stating that *Lacks II* is pending against other defendants, separate suits are pending against different defendants, and additional litigation is likely forthcoming against other biotechnology and pharmaceutical companies, leaving open the possibility that a judge may rule on an unjust enrichment claim for this set of facts in the near future).

117. *See* Balganesh, *supra* note 27, at 1895.

The following table details the elements of the proposed quasi-property doctrine.

Table 2: Elements of Proposed Quasi-Property Doctrine

Element	Basis	Purpose
Δ uses π's health data	Quasi-property	Specific class, limits quasi-property right
Δ's use of π's health data generates earnings for Δ	Equity	Triggering event, limits quasi-property right
Substantial similarity between Δ's use and π's health data	Intellectual property	Defines "use" for specific class and triggering event elements
Dollar amount threshold for Δ's earnings	Quasi-property	Triggering event, limits quasi-property right
π's health data is substantial, unique, or useful	Quasi-property, intellectual property	Triggering event, limits quasi-property right
π does not receive equitable compensation from Δ	Quasi-property, profit-sharing, equity	Cause of action
Monetary relief for π	Equity	Remedy

The proposed quasi-property doctrine is classified as a subcategory of quasi-property, incorporating elements from other areas of law and ethics. A quasi-property right to health data compensation is a very limited right. The person holding the right has no control over the use of the data (meaning injunction is not an available remedy) but would be compensated if that use were especially commercially valuable. If an entity finds a use for the person's health data with high social utility but no commercial value, the person would not be compensated. This remains the same whether the entity is a private individual or organization, or a public agency or institution.

A quasi-property right to health data compensation is enforceable only against a specific class and triggered by a certain event. The specific class is any entity that uses a person's health data. The triggering event is that the entity's use of the person's health data generates earnings for the entity.

The specific class and triggering event are limited by other elements of the proposed quasi-property doctrine. The word "use" is limited by a

test of similarity borrowed from the tests for design patent and copyright infringement: the plaintiff must prove that the health data "use" that generates earnings for the entity is substantially similar to the person's "raw information" health data. The triggering event is limited by the requirement that the commercial value of the health data use must exceed a dollar amount threshold. The triggering event is further narrowed with a requirement similar to that in patent law, where an invention must be novel and useful.[118] For the quasi-property right, the triggering event definition includes that the health data must be substantial, unique, or useful.

The limitations of the quasi-property right are intended to overcome the policy objection that health data compensation would stifle socially valuable research. Another policy aim of limiting the right is to avoid encouraging people to make their health data available as a business venture. However, if a person's health data is taken through the course of care delivery, and the health data generates earnings for someone else, that person can receive equitable relief.

The cause of action is that the person has not received equitable compensation from the entity that benefits from the use of the health data. This means that there could still be a cause of action in a scenario where a profit-sharing agreement is already in place, but the agreement does not provide equitable compensation to the plaintiff.

If the elements of the proposed quasi-property doctrine are not met, a person may still be able to receive health data compensation through other means, such as an unjust enrichment suit or a profit-sharing agreement.

The next section evaluates the proposed quasi-property doctrine through application to a hypothetical.

II. COULD THERE BE HEALTH DATA COMPENSATION?

A proposed doctrine for health data compensation is not feasible if there is no real-world situation in which it applies. Therefore, in proposing the quasi-property doctrine, it is important to hypothesize a set of facts and apply the quasi-property doctrine to evaluate its feasibility. Here, the hypothetical is a health data analogue to the human biomaterials cases discussed previously, achieved through the technology of precision medicine. The proposed quasi-property doctrine is applied to the hypothetical to support the conclusion that health data compensation is justified in this case.

The following table shows the assumptions made in constructing the hypothetical.

118. *See Myriad*, 569 U.S. at 576–77.

Table 3: Assumptions for Hypothetical

Assumption	Purpose
The precision medicine algorithm is a commercial product that generates earnings, possibly by making discoveries or diagnoses.	Necessary condition for compensation to be an equitable remedy.
The precision medicine algorithm is a supervised machine learning model with only one person's health data used as labeled output data in training.	Hypothetical use of health data analogous to the uses of human biomaterials in *Moore*, *Greenberg*, *Lacks I,* and *Lacks II*, in that one person's health data is crucial to the success of the commercial product.
The person can be identified as the individual from whom the data was taken.	Proof that the person is the correct party to assert the quasi-property right to compensation.

A. *Constructing the Hypothetical*

1. What the Hypothetical Precision Medicine Algorithm Does

The hypothetical algorithm must be able to generate earnings. It could do so in ways similar to *Greenberg* and *Myriad*, where genes that caused diseases were discovered and isolated, patented, and then used to market diagnostic tests based on detection of those genes. The precision medicine algorithm could be an empirical tool shaped by the person's health data to discover and isolate new genes or compounds that correlate to certain conditions. The precision medicine algorithm could also be a diagnostic tool that would base its decisions (at least in part) on the person's health data and would be able to predict likelihood of a condition based on correlations between the "omics" of the person whose data were used to make the tool and the "omics" from patients that the tool receives as input.

2. How the Hypothetical Precision Medicine Algorithm Works

The person's health data must be crucial to the success of the hypothetical precision medicine algorithm. One way to build an algorithm that depends heavily on one person's health data, similar to how the commercial products in *Moore*, *Greenberg*, *Lacks I*, and *Lacks II* each relied on one person's biomaterials, is through machine learning.

Precision medicine can rely on technologies other than artificial intelligence.[119] But, because precision medicine requires analysis of vast amounts of complex data from varying sources, machine learning (a subset of artificial intelligence) offers several advantages over the statistical methods that have been traditionally used.[120]

Machine learning is a branch of artificial intelligence that involves computer algorithms that can get better at a given task with experience.[121] Just like artificial intelligence is not actual intelligence,[122] machine learning is not actually learning, but rather an algorithmic method of finding patterns in data and adjusting parameters to improve performance.[123]

From a legal perspective, it can be helpful to view machine learning as a multistep process consisting of two main workflows: "playing with the data" and "the running model."[124] The "playing with the data" workflow concerns the input that is used to select and train the appropriate machine learning model. In this workflow, the training data that is collected as the input is not "raw information" (a person's health data, as it originates, would likely not be useful like training data without the application of human ingenuity and effort, steps that would take place before the first workflow). The "running model" workflow results in the output of the machine learning model,[125] where the model makes decisions informed by what it learned from the data in the first workflow. Therefore, the training data is not simply used by the machine learning

119. *See* Peck, *supra* note 16.

120. *See* MacEachern & Forkert, *supra* note 20, at 11–12 (listing such advantages as: (1) most machine learning algorithms do not make strict assumptions about data distribution, allowing these algorithms to handle combinations of data sets and variables without extensive data preprocessing; (2) many machine learning algorithms use regularization, which offers an advantage when analyzing noisy data and large variances within the data; (3) machine learning algorithms can be trained on small datasets; and (4) machine learning algorithms can identify multifaceted, nonlinear patterns in the training data).

121. Harry Surden, *Machine Learning and Law*, 89 WASH. L. REV. 87, 89 (2014) [hereinafter *Machine Learning and Law*].

122. Harry Surden, *Artificial Intelligence and Law: An Overview*, 35 GA. ST. U. L. REV. 1305, 1309 (2019) [hereinafter *Artificial Intelligence and Law*] (claiming that artificial intelligence does not resemble or match human thinking but uses computational methods to achieve results that would require cognition if performed by humans).

123. *Machine Learning and Law*, *supra* note 121, at 89.

124. David Lehr & Paul Ohm, *Playing with the Data: What Legal Scholars Should Learn About Machine Learning*, 51 U.C. DAVIS L. REV. 653, 655 (2017) (claiming that legal scholarship is too focused on the outputs of the second workflow while neglecting the issues surrounding the first workflow. In the first workflow, a problem is defined, training data is collected, and then the training data is "played with" through data cleaning, summary statistics review, data partitioning, model selection, and model training. The second workflow is the model making real-world predictions, normally after being integrated with a larger software system).

125. *See id.* at 716.

model in the first workflow and then discarded; the training data becomes part of the model and can influence any output the model produces.

There is a growing volume of legal scholarship[126] and litigation[127] surrounding copyright infringement by artificial intelligence arising from instances where copyrighted works are used in the first workflow to train machine learning models. The hypothetical begins to take form, considering that similar conflicts could arise when a person's health data (protected by the proposed quasi-property doctrine) is repurposed by machine learning in an analogous way to these instances where machine learning has repurposed a person's intellectual creation (protected by copyright law).

A variety of machine learning models show promise for applications in precision medicine. Machine learning models can be broadly categorized as reinforcement, unsupervised, or supervised.[128] Reinforcement models require direct feedback from humans in the loop, and as such are not widely used in precision medicine.[129] Unsupervised models rely on unlabeled data and find patterns within that data that can help identify smaller datasets for further analysis with different methods.[130] Unsupervised methods can be classified as association algorithms, which search for trends in data, or clustering algorithms, which search for common characteristics and sorts data accordingly.[131] Precision medicine applications for unsupervised models include the classification of brain tumor types to find new subclasses based on test

126. Jessica Gillotte, *Copyright Infringement in AI-Generated Artworks*, 53 U.C. DAVIS L. REV. 2655 (2020); Andres Guadamuz, *Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in Artificial Intelligence Generated Works*, INTELL. PROP. Q. (2017); Victor M. Palace, *What if Artificial Intelligence Wrote This: Artificial Intelligence and Copyright Law*, 71 FLA. L. REV. 217 (2019); Jane C. Ginsburg & Luke A. Budiardjo, *Authors and Machines*, 34 BERKELEY TECH. L.J. 343 (2019); Annemarie Bridy, *Coding Creativity: Copyright and the Artificially Intelligent Author*, STAN. TECH. L. REV. 5 (2012); Ana Ramalho, *Will Robots Rule the (Artistic) World? A Proposed Model for the Legal Status of Creations by Artificial Intelligence Systems*, J. OF INTERNET L. (2017).

127. Compl., *Alter v. OpenAI, Inc.*, No. 1:23-cv-10211 (S.D.N.Y. filed Nov. 28, 2023); Compl., *Authors Guild v. OpenAI, Inc.*, No. 1:23-cv-08292 (S.D.N.Y. filed Sept. 19, 2023); Compl., *Doe v. GitHub, Inc.*, No. 4:22-cv-06823-JST (N.D. Cal. filed Nov. 10, 2022); Compl., *N.Y. Times Co. v. Microsoft Corp.*, No. 1:23-cv-11195 (S.D.N.Y. filed Dec. 27, 2023).

128. *See* MacEachern & Forkert, *supra* note 20, at 418; *see* Hannah L. Nicholls et al., *Reaching the End-Game for GWAS: Machine Learning Approaches for the Prioritization of Complex Disease Loci*, 11 FRONTIERS IN GENETICS 350, 352 (2020).

129. *See* MacEachern & Forkert, *supra* note 20, at 418.

130. *Id.*; *see* Nicholls et al., *supra* note 128, at 2.

131. Guido Zampieri et al., *Machine and Deep Learning Meet Genome-Scale Metabolic Modeling*, 15(7) PLOS COMPUTATIONAL BIOLOGY ee1007084 (July 11, 2019), https://doi.org/10.1371/journal.pcbi.1007084 [https://perma.cc/S4Z2-RFC5].

cases[132] and identification of type 2 diabetes subgroups based on electronic medical records.[133]

Supervised models are distinct in that, during the "playing with the data" workflow, supervised models receive labeled output variables.[134] A labeled output variable represents a true value the model should predict based on the input data.[135] The model is selected and then "learns" based on its ability to consistently produce the labeled output variables from the input data.[136]

Because supervised models receive labeled data as training data, in addition to finding patterns, supervised models can also infer labels to those patterns without the need to apply other methods.[137] The ability of supervised models to handle multidimensional data makes them very practical for precision medicine applications involving multiple omics datasets.[138]

Supervised methods can be categorized as either classification, the goal of which is to predict sample classes, or regression, which aims to predict numerical results.[139] Supervised models include support vector machines, random forests, and deep neural networks,[140] some of which can accomplish both classification and regression tasks.[141] Precision medicine applications for supervised models include cancer survival analysis that can identify multi-omics contributing factors[142] and genome-wide association that can predict disease.[143]

While machine learning models are promising in their ability to handle complex datasets, machine learning models have inherent traits that may limit their applications in precision medicine.[144] Also, there are

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132. Derek Wong & Stephen Yip, *Machine Learning Classifies Cancer*, 555 NATURE 446, 447 (2018).

133. Li Li et al., *Identification of Type 2 Diabetes Subgroups Through Topological Analysis of Patient Similarity*, 7 SCI. TRANSLATIONAL MED. 311ra174 (Oct. 28, 2015) https://www.science.org/doi/10.1126/scitranslmed.aaa9364 [https://perma.cc/D3WK-H5SE].

134. *See* Lehr & Ohm, *supra* note 124, at 673.

135. *Id.*

136. *See id.* at 696; *see* Nicholls et al., *supra* note 128.

137. *See* MacEachern & Forkert, *supra* note 20; s*ee* a*lso* Nicholls et al., *supra* note 128.

138. Lianhe Zhao et al., *DeepOmix: A Scalable and Interpretable Multi-Omics Deep Learning Framework and Application in Cancer Survival Analysis*, 19 COMPUT. & STRUCTURAL BIOTECH. J. 2719 (2021).

139. *See* Zampieri et al., *supra* note 131.

140. *See* MacEachern & Forkert, *supra* note 20, at 418.

141. *See* Zampieri, et al., *supra* note 131, at 3.

142. *See* Zhao et al., *supra* note 138, at 2719–20.

143. Daniel Sik Wai Ho et al., *Machine Learning SNP Based Prediction for Precision Medicine*, 10 FRONT. GENETICS 267 (Mar. 27, 2019); *see also* Nicholls et al., *supra* note 128, at 6.

144. Jack Wilkinson et al., *Time to Reality Check the Promises of Machine Learning-Powered Precision Medicine*, 2 THE LANCET DIGIT. HEALTH 677, 677–79 (2020) (listing

concerns with the stated effectiveness of machine learning models in precision medicine, based on how some studies report results.[145]

Regardless of the model or the application, a precision medicine machine learning model can learn from health data. The decisions or predictions a precision medicine machine learning model yields later can be lucrative to the owner or licensee of the model. Those lucrative outputs, and the model itself, are directly shaped by the health data. For some models, such as supervised models trained with labeled data, health data could have an exceptionally high influence on both the model's creation and its outputs. The hypothetical now becomes clearer.

The hypothetical precision medicine algorithm is a supervised machine learning model. An output variable used to train the supervised model could be unique to one person, in which case that person's health data plays a critical role in every output of the model and the formation of the model itself. There is also evidence that the model, in some circumstances, could produce an output that is essentially a regurgitated copy of part of the training data.[146]

One crucial assumption for this hypothetical is that the training data for the precision medicine algorithm are linked to individuals. A concern with this assumption is that it might not be technically feasible due to characteristics including the size and complexity of the information. For a person to assert a claim on their genetic information, they would likely need other identifying information linked to the genetic information to recognize that it is, in fact, theirs. Technologies that can link genetic

limitations of machine learning applications in precision medicine as: (1) models are evaluated under conditions that are not relevant to routine clinical practice, emphasizing predictive performance over clinical utility; (2) models perform badly or require retraining when presented with data from different environments than the training data; (3) models are designed to make predictions or classifications, but not for causal explanation and causal effect estimation; and (4) models that are accurate over a large data set are not necessarily accurate on an individual level, and the goal of precision medicine is to provide tailored treatments to individuals).

145. *See* Darren Plant & Anne Barton, *Machine Learning in Precision Medicine: Lessons to Learn*, 17 NAT. REV. RHEUMATOLOGY. 5 (2021).

146. Nicholas Carlini et al., *Extracting Training Data from Diffusion Models*, 32 USENIX SEC. SYMP. 5253, 5256 (2023) (detailing an instance when the output of a generative artificial intelligence model, an image of a portrait, was just a copy of a portrait used as training data when providing the model with the name of person in the portrait as a prompt).

information to other identifying information include matrices,[147] blockchain,[148] and cloud encryption.[149]

In this hypothetical, three parties are responsible for guiding the person's health data from "raw information" to the hypothetical precision medicine algorithm. A hospital collects the "raw information" from the person. The hospital performs basic data processing to get health data from the "raw information," and then sells the health data to the data science firm. The data science firm further processes and manipulates the health data into useful data before it sells the useful data to the software firm. The software firm uses the useful data as labeled output data to train a supervised machine learning model for a precision medicine application that generates earnings for the software firm.

In the following subsection, the actions of these three parties will be examined through the lens of the proposed quasi-property doctrine to determine whether the person whose health data is collected has a right to compensation.

B. *Application of the Quasi-Property Doctrine*

The mechanism for compensation is a lawsuit for violation of the quasi-property right to compensation. The plaintiff is the person from whom the health data is collected. There are multiple potential defendants, who could be any people or entities that benefit from the commercial value of the plaintiff's health data. The potential defendants in this hypothetical are the three parties identified in the previous subsection: (1) the hospital, which collected the plaintiff's "raw information" and performed initial data processing; (2) the data science firm, which purchased access to the health data from the hospital and further processed the health data to create useful data; and (3) the software firm, which purchased the useful data from the data science firm and then used the useful data to create the precision medicine machine learning algorithm. Under the proposed quasi-property doctrine, the plaintiff would be able to receive compensation if the limitations of the doctrine are met.

The plaintiff would have to show that the plaintiff is the source of the health data that was "used" by the defendant. This burden on the plaintiff

147. J. Patrick Woolley et al., *Responsible Sharing of Biomedical Data and Biospecimens Via the "Automatable Discovery and Access Matrix" (ADA-M)*, 3 NPJ GENOM. MED. 17 (July 23, 2018).

148. *See* S.A. Ahmed & R. Hrzic, *Blockchain and Homomorphic Encryption for Genomic and Health Data Sharing: An Ethical Perspective*, 33 ETHICS, MED. & PUB. HEALTH 101127 (May 29, 2025).

149. *See, e.g.*, Dmitry Grishin & George M. Church, *Blockchain-Enabled Genomic Data Sharing and Analysis Platform*, HARV. MED. SCH. (Feb. 7, 2018), https://arep.med.harvard.edu/pdf/Grishin_Church_v4.52_2018.pdf [https://perma.cc/HD5P-4XHF].

would limit the quasi-property right and serve to disincentivize litigation of quasi-property infringement in cases with a lower likelihood of success for the plaintiff. The plaintiff could prove that each defendant "used" the plaintiff's health data through a substantial similarity test based on the preponderance of the evidence, including: (1) a side-by-side comparison of the person's health "raw information" to the health data products that generated earnings for each defendant; (2) records of transactions between defendants that can be traced back to the entity that collected the "raw information" from the plaintiff; or (3) a showing that a health data product that generated earnings for a defendant is labeled with or contains information identifying the plaintiff. Here, there are records of transactions that can be traced from the software firm back to the data science firm and ultimately back to the hospital, which is the entity that collected the "raw information" from the plaintiff. Additionally, as part of the analysis, the hospital's health data, the data science firm's useful data, and the software firm's precision medicine machine learning algorithm would each be compared to the plaintiff's raw information to evaluate similarity. The hospital's health data and the software firm's useful data would be considered similar to the plaintiff's "raw information" because these products are processed forms of the plaintiff's "raw information." The software firm's precision medicine machine learning algorithm would be considered similar to the plaintiff's "raw information" because the algorithm is trained using a dataset consisting only of processed forms of the plaintiff's "raw information" as labeled output data. Furthermore, there would have to be identifying information in the hospital's health data, the software firm's useful data, and the software firm's precision medicine algorithm—otherwise the plaintiff would not be aware that a quasi-property health data compensation claim could be made against each defendant.

Therefore, any of the three potential defendants would meet the "specific class" limitation. Although they play various roles, all of them use the plaintiff's health data to generate earnings. The plaintiff could choose to sue any or all of the three parties, free to choose a strategy like that employed by the plaintiffs in *Lacks I* and *Lacks II*, where, based on their success against a first defendant, the plaintiff could pursue claims against other defendants.

To meet the "triggering event" limitation, the defendants' use of the plaintiff's health data must have generated earnings. For each defendant, this element is met: the hospital's sale of the health data generated earnings, the data science firm's sale of the useful data generated earnings, and the software firm's precision medicine machine learning algorithm is assumed to generate earnings.

Additionally, these earnings must be in excess of a dollar amount threshold. The threshold would be calculated based on the sum of all

earnings generated by use of the plaintiff's health data. Because earnings are considered instead of profit, the cost for the data science firm of purchasing access to the health data would not subtract from the earnings generated from the sale of the processed health data; both would be counted as earnings, for the hospital and data science firm, respectively. However, the court should consider proportions of earnings when determining whether to allow a cause of action against a defendant.

For example, if the hospital received a relatively small sum for providing access to the hospital's health data in proportion to the large earnings reaped by the software firm from marketing the algorithm, then the proposed doctrine would not support a claim for compensation against the hospital unless the software firm was included as a defendant in the action.

Another element of the "triggering event" limitation is the requirement for the plaintiff's health data to be substantial, useful, or unique. "Substantial" health data means that the plaintiff's health data used to generate earnings represents a high quantity of data, which could be determined by hardware storage space (gigabytes of data) or possibly as a percentage of total health data points possible for one person (if this is quantifiable). "Unique" health data means that the plaintiff's health data used to generate earnings represent uncommon or unusual data, which could be measured as a probability or percentage of identical data present in the health data of others—for example, a large proportion of the genome is shared among most of the global population,[150] so this health data would not be "unique" to one person. "Useful" health data means any other health data with qualities that the earnings generated can be attributed to. "Useful" health data would be harder to measure, and the definition and metrics could be molded by court interpretation. The cause of action is that the plaintiff did not receive equitable compensation from one or more of the defendants.

The remedy would be monetary damages awarded to the plaintiff. The amount of monetary damages in proportion to the earnings generated by the plaintiff's health data for each defendant could be evaluated on a case-by-case basis. There is no need in the proposed quasi-property doctrine for punitive damages in cases where there is a finding of bad behavior because this can be addressed with a separate claim of unjust enrichment.

CONCLUSION

First, a problem was identified: it feels wrong when people are not compensated for health data that generates earnings for others. After analysis of various legal doctrines and ethical models, a doctrine to

150. *See* Clayton, *supra* note 21, at 2.

support health data compensation was proposed and then applied to a hypothetical.

Because the hypothetical was designed specifically to illustrate the proposed doctrine, it is unresolved how the proposed doctrine would apply to other problems. Different hypotheticals or case studies would be needed to determine the range of situations to which the proposed doctrine could apply.

One area for further investigation could be evaluating whether the doctrine could be applied to cases with multiple plaintiffs, or even a class action. Having multiple plaintiffs could weaken the support for the proposed doctrine in areas such as privacy and equity.

An area of improvement for the proposed doctrine could be a disclosure requirement. The person who is the source of the health data cannot initiate an action for health data compensation without knowledge of how their health data is used. Research is needed to determine how much information should be disclosed and to whom, as well as how the disclosure requirement would be enforced and implemented.

Another future direction for this problem is the economics of health data compensation. Further research is needed to define equitable compensation, so that appropriate profit-sharing agreements could be offered to avoid health data compensation lawsuits. Additionally, further research is required to formulate an appropriate dollar amount threshold for earnings generated. In cases with multiple defendants, investigation is needed to confirm whether the threshold should apply to the earnings of individual entities or the sum of all entities using one person's health data, and to determine whether the liability for compensation should be market share or joint and several.

Among the assumptions made in the analysis is that health data is intangible. However, if health data is stored in a tangible medium and, as such, could be considered tangible, then a property doctrine could be more appropriate than the proposed quasi-property doctrine.

Another assumption is that health data should be analyzed similarly to human biomaterials and genetic information. Alternatively, health data could be analyzed similarly to other "things" such as biometric data or name, image, and likeness. These alternative analyses may lead to finding different doctrines more appropriate for health data compensation.

Also, the proposed quasi-property doctrine was selected instead of a privacy doctrine in large part because the analysis focused on United States legal doctrines. Evaluation of the problem through the lens of another legal doctrine, such as the European Union's GDPR—a privacy doctrine which provides a private right of action and recognizes eight fundamental rights of individuals regarding their broadly defined "personal data," in contrast with the implied constitutional protections and patchwork of industry-specific regulations for data privacy in the

United States[151]—may provide insight for improvement of the proposed quasi-property doctrine or an alternative privacy doctrine for health data compensation.

Finally, the mechanism for compensation should be evaluated. One of the reasons a mechanism of filing a quasi-property infringement lawsuit is proposed is because the most successful mechanism for human biomaterials compensation has been filing suit for unjust enrichment. This mechanism is inefficient because it relies on the court system, taking time and resources to resolve a dispute. There could be a more efficient mechanism for compensation than a lawsuit—possibly a process for grievance and mediation, or an application filed for review with a public entity.

151. Michael Cairo, *Synthetic Data and GDPR Compliance: How Artificial Intelligence Might Resolve the Privacy-Utility Tradeoff*, 28 J. TECH. L. & POL'Y 71, 80 (2023).