

ARTICLE

SCIENTIFIC MUSE AND MISUSE:
REEVALUATING AUTHORSHIP ATTRIBUTION
AND LIABILITY ALLOCATION IN THE
GENERATIVE AI AGE

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*“[T]he same technologies that can be used to
concentrate wealth and power can also be used to
distribute it more widely and empower more people.”*
— Erik Brynjolfsson.[‡]

*Recent research on generative artificial intelligence has primarily
focused on two separate issues: (1) the attribution of copyright
authorship and ownership, and (2) the allocation of liability for harms*

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[‡] Nick Johnson, *Fixing the AI Skills Shortage: An Interview with Erik Brynjolfsson*_MIT INITIATIVE ON THE DIGIT. ECON. (Mar. 22, 2019), <https://ide.mit.edu/insights/fixing-the-ai-skills-shortage-an-interview-with-erik-brynjolfsson/> [<https://perma.cc/2Q2Z-2GQA> (staff-uploaded)].

resulting from artificial intelligence (“AI”) outputs. However, there is a significant but often-overlooked dimension: the interplay between authorship attribution and liability allocation in assisted scientific research. Therefore, this Article examines the similarities and differences between intellectual property and tort law, highlighting how generative AI challenges long-standing assumptions in both fields and encouraging a reevaluation of scientific standards, liability regimes, and governance of AI.

Drawing on comparative legal analysis, ethical guidelines, and a case study of MIT’s AI-driven antibiotic discovery, this Article develops a unified analytical framework for intellectual property and tort law that positions “control” as the cornerstone of both authorship and liability. This framework reveals how different actors—researchers, institutions, AI developers, and AI companies—exercise varying degrees of control over AI-assisted scientific research. This Article does not suggest that AI itself should be recognized as an author, but it contemplates the circumstances in which it may be appropriate for AI companies and developers to be acknowledged as co-authors and, accordingly, bear liability for misconduct.

This Article argues for developing a unified analytical framework that bridges the gap between copyright and tort law. Such a framework would provide policymakers, scientific institutions, and academic journals with a comprehensive toolkit for rethinking current authorship criteria, liability regimes, and ethical guidelines. It would safeguard incentives for innovation while ensuring accountability in the ever-evolving technological landscape.

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I. INTRODUCTION

In 1986, David Baltimore, Thereza Imanishi-Kari, and four of their colleagues published a research paper exploring immunoglobulin genes in transgenic mice.² A year after publication, Margot O’Toole, a postdoctoral researcher involved in the study, raised doubts about the data’s integrity and reported it to an advisor at the Massachusetts Institute of Technology (“MIT”).³ This report prompted various institutions, including the National Institutes of Health and the United States House Committee on Oversight, to investigate the integrity of the research findings.⁴ Despite initial findings indicating the absence of fraud, subsequent scrutiny revealed scientific misconduct by Imanishi-Kari. Although David Baltimore was not personally suspected of misconduct, his support of Imanishi-Kari’s work was viewed by some as unprofessional and imprudent.⁵ In light of this criticism, Baltimore ultimately resigned from his position at MIT.⁶ The Baltimore case raised questions about the ethical conduct

2. Daniel Kevles, *The Assault on David Baltimore*, NEW YORKER (May 27, 1996), www.maryellenmark.com/bibliography/magazines/article/the-new-yorker/the-assault-on-david-baltimore-637518008119215437/N [https://perma.cc/P328-FEP9 (staff-uploaded)] [hereinafter *The Assault on David Baltimore*].

3. *Id.*

4. See Serge Lang, *Questions of Scientific Responsibility: The Baltimore Case*, 3 ETHICS BEHAV. 3, 7–8 (1993).

5. *The Assault on David Baltimore*, *supra* note 2.

6. See Philip Weiss, *Conduct Unbecoming*, N.Y. TIMES (Oct. 29, 1989), <https://archive.nytimes.com/www.nytimes.com/books/98/09/20/specials/baltimore-mag.html> [https://perma.cc/7W76-JE3P (staff-uploaded)].

of scientific research, allocating liability among co-authors, and the mechanisms for policing it.

About forty years later, the landscape of scientific research has evolved profoundly. Researchers are increasingly integrating cutting-edge technologies into their research processes,⁷ including artificial intelligence (“AI”).⁸ In light of this, the Baltimore case can be reimaged with a contemporary twist: misconduct arising not from human error or misconduct, but from the output of AI systems employed in research.

This scenario raises substantial questions about authorship, accountability, and the governance of scientific conduct. Who should be held accountable for scientific misconduct in such cases? The authors of the paper? The AI developer? Or both? Does the author’s identity matter when assessing liability for scientific misconduct? How does our perspective change if AI manipulation is used to generate desired outcomes?

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7. See Pete Wilkins, *Racing Against Time: Why Scientists May Use AI ‘Research Assembly Lines’*, FORBES (Nov. 14, 2023), www.forbes.com/sites/peterandrewwilkins/2023/11/14/racing-against-time-why-scientists-may-use-ai-research-assembly-lines [https://perma.cc/W5WX-VM7K (staff-uploaded)]; see also Ziyu Chen et. al., *Research Integrity in the Era of Artificial Intelligence: Challenges and Responses*, MEDICINE 103, 104–06 (2024).
 8. There is no universal definition of AI, and defining “artificial intelligence” for legal purposes is often complex. See Matthew Scherer, 29 *Regulating Artificial Intelligence Systems*, HARV. J.L. & TECH. 353, 359–62 (2016); Bryan Casey & Mark Lemley, *You Might Be a Robot*, 105 CORNELL L. REV. 287, 290–92 (2019); This Article adopts the definition that was adopted by the European Commission in the AI Act of “AI system” as “a machine-based system that is designed to operate with varying levels of autonomy and that may exhibit adaptiveness after deployment, and that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments,” (Commission Guidelines on the definition of an artificial intelligence system established by Regulation 2024/1689, of the European Parliament and of the Council of 13 June 2024 Laying Down Harmonised Rules on Artificial Intelligence and Amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act), O.J. (L)).

The emergence of generative AI has sparked a worldwide legal debate on attributing authorship to generative AI outputs.⁹ As early as the 1980s, Pamela Samuelson described five options for authorship allocation in software outputs: the user, the computer, the program developer, both the developer and the user jointly, or no one (the public domain).¹⁰ However, as AI technologies become more sophisticated and the supply chain becomes more complex,¹¹ determining authorship for AI-generated works becomes challenging.¹²

The intersection of intellectual property (“IP”) and tort law has been largely overlooked in current discourse, specifically the interplay between authorship attribution and liability allocation.¹³ To fill this gap, this Article explores whether commonalities between copyright and tort law should influence the attribution of authorship in AI-generated works and liability within the context of scientific publications.

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9. See Mark A. Lemley, *How Generative AI Turns Copyright Upside Down*, 25 COLUM. SCI. & TECH. L. REV. 190, 192–95 (2024); A. Feder Cooper et. al., *Machine Unlearning Doesn’t Do What You Think: Lessons for Generative AI Policy and Research*, STAN. PUB. L. WORKING PAPER (June 2025), papers.ssrn.com/sol3/papers.cfm?abstract_id=5288768 [https://perma.cc/AP7K-WF7J] (staff-uploaded)].
 10. Pamela Samuelson, *Allocating Ownership Rights in Computer-generated Works*, 47 U. PITT. L. REV. 1185, 1190 (1986).
 11. A “Generative-AI Supply Chain” can be defined as a series of steps that turn training data (like millions of penguins’ photos) into outputs (such as a new, never-before-seen picture of a penguin). Looking at each step in the supply chains shows where companies and users make choices that can have legal effects—not just for copyright, but in other areas too. See Katherine Lee, et al., *Talkin’ Bout AI Generation: Copyright and the Generative-AI Supply Chain*, J. COPYRIGHT SOC’Y 1, 5, 32–56 (2024); James Muldoon et. al., *The Poverty of Ethical AI: Impact Sourcing and AI Supply Chains*, 40 AI & SOC’Y 529, 529–31 (2025). For a border discussion of supply chains in the digital era, see Jennifer Cobbe, Chris Norval & Jatinder Singh, *What Lies Beneath: Transparency in Online Service Supply Chains*, 5 J. SCI. CYBER POLICY 1, 2–5 (2020).
 12. Pamela Samuelson, *Generative AI Meets Copyright*, 381 SCIENCE 158, 159 (2023).
 13. See *infra* Part II.A

While the rationales behind the overarching goals of copyright and tort law differ, both attributing authorship and allocating liability are manifestations of control. Copyright can be viewed as a positive form of control, providing exclusive rights, whereas liability regimes can be seen as a negative form of control, imposing duties to prevent harm.¹⁴ Hence, the commonalities, or the lack thereof, between authorship and liability in the ever-evolving technological landscape encourage us to rethink the implications of allocating exclusive rights and duties.

This Article aims to deepen the understanding of how IP and tort law intersect through a case study on attributing authorship and liability in scientific publishing in an AI-driven age. This Article raises two key arguments. First, a nexus exists between attributing authorship and allocating liability in scientific papers. Generally, entities that benefit from the exclusive rights in scientific papers should bear liability for potential scientific misconduct. Second, the evolving supply chain in scientific research may justify assigning copyrights to new actors.

This Article argues that an AI cannot, and should not, be considered an author or co-author of scientific papers. However, the advancement of generative AI may warrant copyright attribution to an AI company or developer as a co-author where AI outputs have substantially contributed to the research. Accordingly, scientific journals should reevaluate the mechanisms available for addressing alleged scientific misconduct to respond to this new era of authors.

This Article is structured into three main parts. Part II discusses the critical role of control in determining authorship within copyright law, distinguishing it from other attribution concepts, and further examines the criteria for authorship in scientific research. Part III sheds light on the interplay between authorship and liability in scientific research. It tackles the challenges posed by collaborative projects involving multiple contributors. Part IV uses a case study of

14. Jeremy Waldron, *From Authors to Copiers: Individual Rights and Social Values in Intellectual Property*, 68 CHI.-KENT L. REV. 841, 842, 866 (1992); Jane C. Ginsburg, *Copyright and Control Over New Technologies of Dissemination*, 101 COLUM. L. REV. 1613, 1613–14 (2001); Catherine M. Sharkey, *Modern Tort Law: Preventing Harms, Not Recognizing Wrongs*, 134 HARV. L. REV. 1423, 1446–47 (2021).

MIT's recent research on antibiotics to introduce a comprehensive framework designed to navigate the complex issues of attributing authorship and liability in the era of generative AI.

II. ATTRIBUTING AUTHORSHIP IN THE GENERATIVE AI ERA

A. *Control as the Cornerstone of Copyright Attribution*

Copyright law is a branch of IP law that protects a wide variety of creative works fixed in a tangible form of expression, including literary works, musical compositions, visual art, film and television recordings, and computer programs. Copyright law grants the creators the exclusive rights to reproduce, distribute, display, and adapt their works.¹⁵ Thus, copyright law defines the rights of creators in relation to non-owners, empowering creators to prohibit the unauthorized exploitation of their works.¹⁶

The duration of copyright protection varies across jurisdictions and according to the type of work. For instance, under both United States and United Kingdom legislation, literary, dramatic, musical, and artistic works are generally protected for 70 years after the author's death.¹⁷ This constitutes a significant duration in which the creator exercises exclusive rights over a work that would otherwise be accessible as a common resource (public domain).¹⁸

By attributing the creators this bundle of exclusive rights for a specific period, i.e., temporary monopoly over the use of their works, copyright law seeks to encourage the creation and dissemination of socially valuable expression.¹⁹ However, the term “attribution” carries

15. *What is Copyright?*, U.S. COPYRIGHT OFF., www.copyright.gov/what-is-copyright/ [https://perma.cc/J2RD-EQRC (staff-uploaded)] (last visited Oct. 10, 2025).

16. Niva Elkin-Koren, *Tailoring Copyright to Social Production*, 12 THEORETICAL INQUIRIES L. 309, 332 (2011).

17. 17 U.S.C. §§ 302–304; Copyright, Designs and Patents Act 1988 c. 48 § 12 (UK).

18. Rochelle Cooper Dreyfuss, *Does IP Need IP? Accommodating Intellectual Production Outside the Intellectual Property Paradigm*, 31 CARDOZO L. REV. 1437, 1438 (2010).

19. Amy Adler & Jeanne C. Fromer, *Memes on Memes and the New Creativity*, 97 N.Y.U. L. REV. 453, 459 (2022); Oren Bracha, *The Ideology of Authorship Revisited: Authors, Markets, and Liberal Values in Early American Copyright*, 118 YALE L.J. 186, 218 (2008).

various concepts that should be disentangled. In general, attribution is “the act of saying or thinking that something is the result or work of a particular person or thing.”²⁰

This Article focuses on attributing authorship within the realm of copyright law. Under general conceptions of copyright law, the author is the original creator of the expression.²¹ Hereinafter, this Article will use the term “author” to refer to the individual recognized by copyright law as the creator of a work.

While there is a general understanding that an author is the central figure in copyright law, the justifications for establishing authorship vary according to jurisdiction.²² Under the personality approach, which is common in the European Union (“EU”), an author’s work is a form of self-actualization, embodying his personality.²³ Personality theorists, such as Immanuel Kant and Georg Wilhelm Friedrich Hegel, argue that private property rights are essential for fulfilling fundamental human needs.²⁴ This theory asserts deep connections between the author and his creations. Hence, respecting the author’s

20. 17 U.S.C. § 201(a). *Attribution*, CAMBRIDGE DICTIONARY, dictionary.cambridge.org/us/dictionary/english/attribution [https://perma.cc/B2XK-ZJPW (staff-uploaded)] (last visited Oct. 10, 2025).

21. Copyright, Designs and Patents Act 1988 c. 48, art. 2(1); 17 U.S.C. § 201(a).

22. Carys Craig & Ian Kerr, *The Death of the AI Author*, 52(1) OTT. L. REV. 31, 42 (2021); Martin Kretschmer, Lionel Bently & Ronan Deazley, *The History of Copyright History*, in PRIVILEGE & PROPERTY: ESSAYS ON THE HISTORY OF COPYRIGHT 1, 18 (R. Deazley, M. Kretschmer, & L. Bently eds., Cambridge: Open Book Publishers 2010); Stef van Gompel, *Les Formalités Sont Mortes, Vive Les Formalités!* [Copyright Formalities and the Reasons for Their Decline in Nineteenth Century Europe], in PRIVILEGE & PROPERTY: ESSAYS ON THE HISTORY OF COPYRIGHT 157, 183–84 (R. Deazley, M. Kretschmer & L. Bently eds., Cambridge: Open Book Publishers 2010); James O. Grunebaum, *Two Justifications of Property*, 17 AM. PHIL. Q. 53, 53 (1980); *Definitions*, U.S. COPYRIGHT OFF., www.copyright.gov/help/faq-definitions.html [https://perma.cc/MSM8-8JWE (staff-uploaded)] (last visited Oct. 10, 2025).

23. Justin Hughes, *The Philosophy of Intellectual Property*, 77 GEO. L.J. 287, 330–50 (1988).

24. G.W.F. HEGEL, PHILOSOPHY OF RIGHT 48–50 (S.W. Dyde trans., 2001); Jane C. Ginsburg, *The Concept of Authorship in Comparative Copyright Law*, 52 DEPAUL L. REV. 1063, 1080–81 (2003) [hereinafter *The Concept of Authorship*].

sense of self necessitates granting him ongoing control over the use and distribution of those works.²⁵

Meanwhile, under the utilitarian perspective—the predominant theory of American copyright law—exclusive rights are awarded to authors as an incentive for creating valuable works that “promote the progress of science and useful arts.”²⁶ The individual receives control over their work to promote societal benefit.²⁷ Thus, long-term societal benefits will be achieved through a temporary monopoly on inventions and works.²⁸

Though the justifications for attributing authorship differ, there appears to be a consensus in legislation and legal scholarship in both the European Union and the United States about the concept of “control” as a unifying thread across jurisdictions.²⁹

The concept of control is integrated into the creation process. Copyright is attributed to the entity that demonstrates sufficient creative choice and has the most significant contribution to the work.³⁰ For example, the painter chooses what to draw and which colors to use, and the photographer decides where to take pictures. In addition, the attribution of copyright grants the author exclusive entitlements

25. Christopher S. Yoo, *Rethinking Copyright and Personhood*, 2019 U. ILL. L. REV. 1039, 1041 (2019).

26. U.S. CONST. art. I, § 8, cl. 8; Jeanne C. Fromer, *Should the Law Care Why Intellectual Property Rights Have Been Asserted?*, 32 HOU. L. REV. 549, 553–56 (2015).

27. Mark A. Lemley, *Property, Intellectual Property, and Free Riding*, 83 TEX. L. REV. 1031, 1031 (2005); William Fisher, *Theories of Intellectual Property*, in NEW ESSAYS IN THE LEGAL AND POLITICAL THEORY OF PROPERTY 168, 169 (Stephen R. Munzer ed., 2001); Henning Grosse Ruse-Khan, *Does IP Improve the World? Technology and Its Impact on Our Planet*, in IMPROVING INTELLECTUAL PROPERTY: A GLOBAL PROJECT (Susy Frankel et al. eds., 2023) (A critical analysis of the utilitarian theory in intellectual property); William Landes & Richard Posner, *An Economic Analysis of Copyright Law*, 18 J. LEGAL STUDIES 325, 326 (1989).

28. Jeremy Bentham, AN INTRODUCTION TO THE PRINCIPLES OF MORALS AND LEGISLATION 6–9 (J. H. Burns, H. L. A. Hart eds., 1996); Ryan Abbott & Elizabeth Rothman, *Disrupting Creativity: Copyright Law in the Age of Generative Artificial Intelligence*, 75 FLA. L. REV. 1141, 1179 (2023).

29. Waldron, *supra* note 14, at 866.

30. *Rentmeester v. Nike, Inc.*, 883 F.3d 1111, 1120 (9th Cir. 2018).

that allow him to control the exploitation of the copyrighted materials.³¹ Therefore, the question “Who is the author?” can be reconceptualized: Who exercises control over the final work?

The decision of whether and to whom to attribute copyright is a crucial question, as it inherently influences the distribution of economic and social wealth. The author is entitled to reap the benefits derived from his creative endeavors.³²

At the same time, the term “attribution” in copyright law refers not only to the identification of the author, but also to the notion of ownership. Under copyright law, the author is the first owner of their work.³³ While this Article discusses the rights and duties of the first author, today, there are usually subsequent transfers due to IP commercialization, licensing, or other forms of exploitation.³⁴ The

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31. Uri Y. Hachohen & Niva Elkin-Koren, *Copyright Regenerated: Harnessing GenAI to Measure Originality and Copyright Scope*, 37 HARV. J.L. & TECH., 555, 565–67 (2024); Jane C. Ginsburg & Luke Budiardjo, *Authors and Machines*, 34 BERKELEY TECH. L.J. 343, 371–78, 411 (2019); see also Jessica M. Silbey, *Control over Contemporary Photography: A Tangle of Copyright, Right of Publicity, and the First Amendment*, COLUM. J.L. & ARTS 351, 353 (2019) (“Photographers understand that copyright provides them with control over others’ use of their photographs.”).
 32. See e.g., Neal Solomon, *Adverse Effects of Moving from Property Rules to Liability Rules in Intellectual Property: A New View of the Cathedral Without the Disintegration of Property Rights in Patent Law* (2010), papers.ssrn.com/sol3/papers.cfm?abstract_id=1623977 [https://perma.cc/3YY4-SCZH (staff-uploaded)] (explaining the concept of exclusive control over ones idea or work created in a copyright system generates the incentives for a creative to make new, novel works since and be rewarded for that effort).
 33. *Harper & Row, Publishers, Inc. v. Nation Enterprises*, 471 U.S. 539, 546–47 (1985).
 34. Waldron, *supra* note 14, at 885. In legal philosophy, “control” is a multifaceted concept encompassing moral and political theories, raising profound questions about, *inter alia*, agency, autonomy, liberty, and intention. What does it mean to “control” an action, outcome, or entity? Is control tied to free will or intention? What legitimizes control? How do different perceptions of societal justice shape the manifestations of control? These different lenses of control influence IP rights attribution or the decision to withhold them. See generally Fisher, *supra* note 27 (demonstrating the presence of major philosophical ideas on ownership and authorship underlying IP theories from philosophers such as Emanuel Kant and Robert Nozick). Given the limited scope of this Article, these questions are left open for future research.

author can transfer their exclusive rights to another individual or entity, like a publisher, through a written contract.³⁵ Additionally, in cases of “works made for hire,” the employer is considered both the author and owner of the work.³⁶ The owner, who may not be the author, controls the work for commercial purposes, either in collaboration with the author or independently.³⁷ Thus, authorship and ownership do not always align.

Given the increasing complexity of modern supply chains, where the author is often not the owner due to intellectual property commercialization or licensing, using the lens of “control” is valuable for attributing exclusive rights and duties.

Meanwhile, attribution also plays a crucial role in reputation building. Attribution is linked to the receipt of awards or promotions, which can significantly influence career advancement. Attribution in the academic sphere is less about exclusive rights and more about gaining peer recognition and credit for contributions to a field.³⁸ This aspect of attribution includes different elements, including the allocation of credit (whose names appear on publications and in what order), and receiving prestigious awards such as the Nobel Prize.³⁹

Not everyone mentioned in a publication may receive credit or awards. For instance, a scientific paper often lists more authors than those recognized as the inventors of a patent resulting from the scientific research.⁴⁰ Furthermore, individuals or organizations that

35. See e.g., UK COPYRIGHT NOTICE 2/2014: ASSIGNMENT OF COPYRIGHT 2–3 (Nov. 2014).

36. 17 U.S.C. § 201(d).

37. See e.g., Molly Van Houweling, *Authors Versus Owners*, 54 HOU. L. REV. 371, 374–75 (2016) (explaining that, historically in the United States and United Kingdom, it was common practice for the author to deliberately assign their copyright on a work to a publisher for greater benefits such as higher royalties)

38. See generally Francesco Lissoni, Fabio Montobbio, & Lorenzo Zirulia, *Inventorship and Authorship as Attribution Rights: An Enquiry into the Economics of Scientific Credit*, 95 J. ECON. BEHAV. & ORG. 49 (2013) (explaining the importance of credit to building a career as an academic).

39. *Id.*

40. *Id.* (analyzing the allocation of authorship among research team members in publications and inventorship in patent-publication-pairs (“PPPs”), given existing bargaining power and incentives within the team).

contributed to the research or paper preparation might only be mentioned in the acknowledgments section, not as authors of a paper.⁴¹

An additional concept of attribution relates to liability, focusing on which entity is responsible for a piece of work and its potential harm. This aspect of attribution aims to establish an *ex ante* duty on a specific party to prevent potential damage and to impose an *ex post* duty to compensate the affected parties.⁴²

These four concepts of “attribution”—authorship, ownership, reputation, and liability—all fall under the umbrella of “control.” Nonetheless, they differ in the rights or duties they confer upon their holder. Given its limited scope, this Article focuses on attributing authorship under copyright law and explores the link between authorship and liability attribution. It acknowledges that further complexities within the generative AI supply chain, such as ownership and reputation attribution issues, warrant further examination in future research.

B. Authorship Attribution in the Scientific Field

Over the years, various scientific institutions and organizations have developed standards in their ethical guidelines for attributing authorship. Under these standards, authorship in scientific papers must be attributed to all substantial contributors, granting them control over the publication and future usage.⁴³

One of the most influential documents for attribution of authorship and responsibility in the scientific field is the recommendations of the International Committee of Medical Journal Editors (“ICMJE”). These recommendations developed four cumulative criteria for authorship attribution: (1) making

41. Jaime A. Teixeira da Silva, Panagiotis Tsigaris, & Quan-Hoang Vuong, *Acknowledgments in Scientific Papers*, 39 PUB. RES. Q. 280, 280–81 (2023).

42. Mario Biagioli, *The Instability of Authorship: Credit and Responsibility in Contemporary Biomedicine*, 12 FASEB J. 3, 4 (1998); Lissoni, Montobbio & Zirulia, *supra* note 38, at 51.

43. Off. of Provost, *Guidance on Authorship in Scholarly or Scientific Publications*, YALE UNI., provost.yale.edu/policies/academic-integrity/guidance-authorship-scholarly-or-scientific-publications [https://perma.cc/74GM-4WNN (staff-uploaded)] (last visited Oct. 11, 2025) [hereinafter *Yale Recommendations*].

substantial contributions to the conception, design, acquisition, analysis, or interpretation of data; (2) drafting or critically reviewing the work for important intellectual content; (3) providing final approval of the version to be published; and (4) agreeing to be responsible for all aspects of the work's integrity and accuracy.⁴⁴ Contributors must satisfy all four ICMJE criteria to be named as authors. If they do not meet these criteria, they should be acknowledged in the publication without being credited as authors.⁴⁵

Although these criteria primarily address authorship and responsibility for the publication's accuracy, the ICMJE notes that attributing authorship carries significant academic, social, and financial implications as it allocates responsibility and accountability for the published work.⁴⁶ Consequently, these criteria can also help determine authorship in copyright law, as copyright is attributed to the entity that demonstrates sufficient creative choices and has a significant contribution to the work.⁴⁷

Indeed, leading institutions and organizations widely adopted the ICMJE's recommendations. For example, Yale University ethical guidelines state "[a]uthorship of a scientific or scholarly paper should be limited to those individuals who have contributed in a meaningful and substantive way to its intellectual content."⁴⁸ Similar standards are

44. The fourth criterion will be discussed in detail in Part III.A and Part IV.B below. *Defining the Role of Authors and Contributors*, INT' COMM. MED. J. EDITORS, www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html [<https://perma.cc/Q9WU-K54G> (staff-uploaded)] (last visited Oct. 11, 2025) [hereinafter *ICMJE Recommendations*].

45. *Id.*

46. *Id.*

47. See *Rentmeester v. Nike, Inc.*, 883 F.3d 1111, 1120 (9th Cir. 2018).

48. *Yale Recommendations*, *supra* note 43.

articulated at institutions such as MIT,⁴⁹ Harvard University,⁵⁰ and ETH Zurich.⁵¹

However, attributing authorship has become increasingly complex given the rise of generative AI technologies. From the Industrial Revolution to the digital age and the emergence of AI, these transformative shifts include a growing number of stakeholders in the creation and distribution processes. As these technologies become more sophisticated and new stakeholders join the supply chain, determining authorship for expressive works becomes more challenging.⁵²

C. *When the Muse Is a Machine*

For centuries, legislators and courts worldwide have grappled with the creation and distribution of socially valuable expressive works

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49. *Best Practices for Promoting Research Integrity*, MASS. INST. TECHNOLOGY, <https://research.mit.edu/security-integrity-and-compliance/research-integrity/best-practices-promoting-research-integrity> [<https://perma.cc/W9HV-FK7J>] (staff-uploaded)] (last visited Oct. 11, 2025).
 50. Ombuds Off., *Authorship Guidelines*, HARV. MED. SCH. 1–2, <https://hms.harvard.edu/sites/default/files/assets/Sites/Ombuds/files/AUTHORSHIP%20GUIDELINES.pdf> [<https://perma.cc/8HTZ-4BPH>] (staff-uploaded)] (1999) [hereinafter *Harvard Guidelines*].
 51. ETH ZURICH EXEC. BD., ETH ZURICH GUIDELINES ON SCIENTIFIC INTEGRITY (INTEGRITY GUIDELINES) 7 (2022); see also *Editorial Policies*, NEW ENG. J. MED., www.nejm.org/about-nejm/editorial-policies [<https://perma.cc/S7LL-PZDE>] (staff-uploaded)] (last visited Oct. 11, 2025) (Prior to publication, the paper’s authors are required to provide a declaration affirming compliance with the four authorship criteria set forth in the *ICMJE Recommendations*); *Guidelines on Authorship*, UNIV. CAMBRIDGE, www.research-integrity.admin.cam.ac.uk/integrity-guidelines-authorship [<https://perma.cc/FJ5D-R5DL>] (staff-uploaded)] (last visited Oct. 11, 2025) (“Normally, an author is an individual judged to have made a substantial intellectual or practical contribution to a publication and who agrees to be accountable for that contribution.”). While the *ICMJE Recommendations* on authorship are influential worldwide, they are not uniformly followed, even by journals that subscribe to the ICMJE’s rules. See NICHOLAS H. STENECK, DEP’T OF HEALTH & HUM. SERVS., ORI INTRODUCTION TO THE RESPONSIBLE CONDUCT OF RESEARCH 133–47 (2007) [hereinafter *Office of Research & Integrity*].
 52. Samuelson, *supra* note 10, at 1190.

within a changing technological landscape.⁵³ As discussed above, the five options described by Pamela Samuelson⁵⁴ described the possibilities for authorship attribution in software outputs: the user, the computer, the program developer, both the developer and the user jointly, or no one (the public domain).⁵⁵ While these options are equally applicable to generative AI technologies, the issue of authorship attribution in generative AI outputs remains controversial.

Some scholars argue for the adaptability of copyright law to include generative AI tools, such as ChatGPT, Midjourney, or Dall-E. According to this approach, researchers have always used various tools to enhance their research. Over time, these tools have become more sophisticated, empowering researchers to generate knowledge more efficiently.⁵⁶ Through this lens, generative AI is like previous technologies. A researcher utilizing generative AI is akin to a researcher using a microscope or a computer: both control the technological tools in the creation process. Therefore, there should not be a temptation to fundamentally alter copyright law on account of new generative AI technologies.⁵⁷

Conversely, other scholars contend that the AI should be recognized as the author for copyright purposes.⁵⁸ While this approach seems opposed to the personality theory of copyright, it may align with a utilitarian perspective that emphasizes social and economic benefits.⁵⁹ Machines, generative AI or not, may promote public welfare.

53. Dan L. Burk, *Cheap Creativity and What It Will Do*, 57 GA. L. REV. 1669, 1677 (2023); see Margot E. Kaminski, *Authorship, Disrupted: AI Authors in Copyright and First Amendment Law*, 51 U.C. DAVIS L. REV. 589, 590 (2017).

54. See *supra* Part I.

55. Samuelson, *supra* note 10, at 1190; Annemarie Bridy, *The Evolution of Authorship: Work Made by Code*, 39 COLUM. J.L. & ARTS 395, 398–400 (2016).

56. Michael Jay Polonsky & Jeffrey D. Rotman, *Should Artificial Intelligent Agents be Your Co-author? Arguments in Favour, Informed by ChatGPT*, 31 AUSTRALASIAN MKTG. J. 91, 91–92 (2023).

57. P. Bernt Hugenholtz & João Pedro Quintais, *Copyright and Artificial Creation: Does EU Copyright Law Protect AI-Assisted Output?*, 52 THE INT'L REV. INTEL. PROP. & COMPETITION L. 1190, 1212–13 (2021).

58. Abbott & Rothman, *supra* note 28, at 1201; Emmanuel Salami, *AI-generated Works and Copyright Law: Towards a Union of Strange Bedfellows*, 16 J. INTEL. PROP. L. & PRAC. 124, 124, 134–35 (2021).

59. *Id.*; Salami, *supra* note 55, at 129; Bridy, *supra* note 55, at 398–400.

Nonetheless, this stance was rejected by the U.S. Copyright Office, which determined that copyright can only be allocated to human beings.⁶⁰ Humans control AI, and therefore AI does not supersede human authorship.⁶¹ While a similar position has not yet been adopted in EU legislation or regulations, the Court of Justice of the EU implied that copyright applies solely to original works that stem from the “author’s own intellectual creation,”⁶² an interpretation that seems to be tied to human authorship.

As will be detailed in Part III.A, a similar position was adopted by the scientific community that copyright cannot be attributed to AI.⁶³ Therefore, the idea of recognizing AI as an author has been largely rejected at present.

Meanwhile, some scholars attribute authorship to the AI company or its developers since they are responsible for configuring AIs, choosing its input, and controlling its training data.⁶⁴ This perspective has found some legal recognition. For instance, in 2019, a Chinese district court attributed authorship in an AI-generated robot to the

60. U.S. COPYRIGHT OFFICE, COMPENDIUM OF U.S. COPYRIGHT OFFICE PRACTICES § 306 (3d ed. 2021); see *Thaler v. Perlmutter*, 130 F.4th 1039, 1044–45 (D.C. Cir. 2025) (upholding the U.S. Copyright Office’s requirement that copyrighted work requires human authorship); James Grimmelman, *There is No Such Thing as a Computer-Authored - And It’s a Good Thing, Too*, 39 COLUM. J.L. & ARTS 403, 403–04 (2016).

61. Abbott & Rothman, *supra* note 28, at 1173.

62. Case C-5/08, *Infopaq Int’l A/S v. Danske Dagblades Forening*, 2009 E.C.R. I-6570; Marta Duque Lizarralde & Christofer Meinecke, *Authorless AI-Assisted Productions: Recent Developments Impacting Their Protection in the European Union*, 14 J. INTELL. PROP. INFO. TECH. & ELEC. COM. L. 84, 88 (2023); Beatriz Botero Arcila, *If It a Platform? Is It a Search Engine? It’s Chat GPT! The European Liability Regime for Large Language Models*, 3 J. FREE SPEECH L., 455, 457–58 (2023); *Artificial Intelligence Act - Amendments Adopted By the European Parliament*, EUROPEAN PARLIAMENT (June 2023), artificialintelligenceact.eu/wp-content/uploads/2023/06/AIA-%E2%80%93IMCO-LIBE-Draft-Compromise-Amendments-14-June-2023.pdf [https://perma.cc/7HQL-X3BV (staff-uploaded)]; Hugenholtz & Quintais, *supra* note 57.

63. See *infra* Part III.A.

64. Andres Guadamuz, *Artificial Intelligence and Copyright*, WIPO (Oct. 1, 2017), <https://www.wipo.int/en/web/wipo-magazine/articles/artificial-intelligence-and-copyright-40141> [https://perma.cc/SVJ9-WBCZ (staff-uploaded)].

developer.⁶⁵ However, as will be detailed in Part IV.B, critics may argue that granting entitlements to AI companies or developers could undermine incentives for academic research.⁶⁶

Interestingly, the ICMJE recommendations and most scientific journals in the United States do not prohibit authorship attribution to the AI company or developer. Thus, it can be argued that OpenAI, Google, or Meta should be co-authors of the scientific paper, as their AI models substantially contribute to the research. Nevertheless, many generative AI providers have chosen not to argue copyright over the AI outputs. Accordingly, they will not be identified as co-authors of scientific papers.⁶⁷ At the same time, a shift in the prevailing trend may occur. With the newfound capabilities of generative AI potentially enhancing the economic value of research and scientific publications, AI companies may seek to benefit from the AI's role in scientific research.⁶⁸

Another approach views the users as the authors of the AI output, depending on their level of engagement in prompt engineering. For example, Mark Lemley suggests a reevaluation of the notion of creativity, putting forward that the more detailed and extensive the users' prompt engineering becomes, the greater the likelihood that the output will be copyrightable.⁶⁹ In the scientific field, the "users" of the AI technologies are the researchers. Hence, when researchers utilize AI models solely for monitoring or expediting research processes, the human contribution to the research is maintained.

65. Sylvia Polydor, Martyna Czapska, & Karen Roberts, *Chinese Dreamwriter Decision: a Dream Come True for AI-generated Works?*, BAKER MCKENZIE (Apr. 20, 2020), www.connectontech.com/chinese-dreamwriter-decision-a-dream-come-true-for-ai-generated-works/ [https://perma.cc/7XQP-5PWS (staff-uploaded)].

66. See *infra* Part IV.B

67. Lee et al., *supra* note 11, at 58. See, for example, *Terms of Use*, OPENAI (Dec. 11, 2024), <https://openai.com/policies/terms-of-use/> [https://perma.cc/D9DQ-SNKH (staff-uploaded)].

68. See Part IV.B for more detail. See Rochelle Cooper Dreyfuss, *Expressive Genericity: Trademarks as Language in the Pepsi Generation*, 65 NOTRE DAME L. REV. 397, 405 (1990).

69. Lemley, *supra* note 7, at 194–95.

On the other hand, when AI has enabled the researchers “to make progress in answering biological questions where progress was previously infeasible,”⁷⁰ some scholars argue that the researchers should not be the authors of the output and the results that stem from it. In this context, the user’s control over the prompts may differ from control over the output. Therefore, copyright may only be attributed to the user (researcher) for the prompts. Nevertheless, one might argue that the researchers’ clever usage of AI to answer the scientific question is the creative aspect of the research.⁷¹

An example of this nuanced approach is the legislation in the UK, which allocates authorship in computer-generated work to “the person by whom the arrangements necessary for the creation of the work are undertaken.”⁷² This legislation can lead to attributing authorship to the AI developer or user, depending on the amount of control they have over the final output.

Meanwhile, several scholars argue that copyright can be attributed to multiple actors in the supply chain. Under this approach, the AI developer or company collaborates with the researchers.⁷³ They collectively exert control and make decisions over the research and scientific paper. Hence, the doctrine of joint authorship should be applied to AI developers and users, recognizing both as the output’s authors.⁷⁴ This approach opens the door to various interpretations of authorship in AI-generated works, including scientific papers.

Nonetheless, the U.S. Department of the Interior stated that while “making available data collected from previously reported or published work or providing materials or specimens” is an important

70. Richard Van Noorden & Jeffrey M. Perkel, *AI and Science: What 1,600 Researchers Think*, NATURE (Sep. 27, 2023), www.nature.com/articles/d41586-023-02980-0 [https://perma.cc/AAR7-8P76 (staff-uploaded)].

71. *Id.*

72. Copyright, Designs and Patents Act 1988, c. 48, § 9(3) (U.K.).

73. Shyamkrishna Balganes, *Unplanned Coauthorship*, 100 VA. L. REV. 1683, 1725 (2014).

74. *Id.*

contribution to the scientific paper, it does not merit authorship.⁷⁵ Under this approach, the AI company would be acknowledged only as a contributor rather than a paper co-author. Another perspective emphasizes the advancement of the public domain theory. Some scholars, including Jane Ginsburg and Luke Budiardjo, contend that neither the user nor the developer is sufficiently involved in the conception and execution of the final work to assert authorship.⁷⁶ Thus, no entity in the generative AI supply chain exerts sufficient control over the output. Therefore, AI-generated works are “authorless,” lacking an identifiable human author, and fall into the public domain. According to this approach, in the age of “cheap creativity,” the incentives provided by copyright law may no longer be essential.⁷⁷

Nevertheless, an endless trove of public domain works does not seem like a realistic scenario. In particular, where AI-generated outputs hold significant economic value, it is reasonable to expect some actors will assert authorship over them.⁷⁸

Moreover, this Article addresses the specific matter of publishing scientific papers. A scientific paper cannot enter the public domain because it must have at least one author—whether an individual researcher, a corporation, or a research institution—in order to be

75. *Frequently Asked Questions Regarding Authorship in Scientific and Scholarly Work Products*, U.S. DEP’T INTERIOR, <https://www.doi.gov/scientificintegrity/frequently-asked-questions-regarding-authorship-scientific-and-scholarly-work> [https://perma.cc/296C-DGZH (staff-uploaded)] (last visited Oct. 11, 2025).

76. Ginsburg & Budiardjo, *supra* note 31, at 376; Matt Blaszczyk, *Impossibility of Emergent Works’ Protection in U.S. and EU Copyright Law*, 25 N.C. J.L. & TECH. 1, 7–9, 43, 53–54 (2023); Haochen Sun, *Redesigning Copyright Protection in the Era of Artificial Intelligence*, 107 IOWA L. REV. 1213, 1235, 1247–49 (2022).

77. Lemley, *supra* note 9, at 28; Patrick Zurth, *Artificial Creativity? A Case Against Copyright Protection for AI Generated Works*, UCLA J.L. & TECH. 1, 15 (2021).

78. Lemley, *supra* note 9, at 25; Zurth, *supra* note 77, at 9–10; Dreyfuss, *supra* note 68, at 405. For a critical discussion of the “if value, then (property) right” approach, see generally Carys J. Craig, *The AI-Copyright Trap*, 100 CHI.-KENT L. REV. 107 (2025).

published in a journal. Therefore, the idea that AI-generated works are ‘authorless’ seems impossible in the context of scientific papers.⁷⁹

Given all of the above, three conclusions can be drawn. First, the different perspectives of authorship result in different copyright attributions, yet the notion of control remains paramount in the era of generative AI. Second, there is a consensus within the scientific community that scientific papers cannot be attributed to AI or fall into the public domain. Third, no legislation, standards, or guidelines currently prohibit authorship attribution to new stakeholders in the supply chain, such as AI companies or developers.

III. THE INTERPLAY BETWEEN AUTHORSHIP AND LIABILITY IN THE SCIENTIFIC ARENA

A. Control as the Cornerstone of Liability Allocation

The concept of control underlies both copyright and tort law. Exercising copyright, as a form of IP, represents one side of the control coin: the right to direct and benefit from creative output. On the other side, when that work harms a third party, the same notion of control raises questions of liability.⁸⁰

In tort law, attribution has dual purposes: establishing an *ex ante* duty on a specific party to prevent potential harm and imposing an *ex post* duty to compensate the affected parties.⁸¹ Thus, the work’s author, who may also be its owner, can be responsible for ensuring that his work does not cause damage.⁸² Hence, imposing duties on the author to prevent harm can be seen as a negative aspect of control.

79. *The Concept of Authorship*, *supra* note 24, at 1063; *Code of Practice for Research Promoting Good Practice and Preventing Misconduct*, U.K. RSCH. INTEGRITY OFF., 6, 13 (July, 8, 2025) (U.K.).

80. See generally Guido Calabresi, *Concerning Cause and the Law of Torts: An Essay for Harry Kalven, Jr.*, 43 U. CHI. L. REV. 69 (1975). As mentioned in Part II.A, the term “attribution” includes various concepts. While these other concepts can also be helpful for tort law purposes, they exceed the scope of this Article.

81. See *supra* Part II.A.

82. Sharkey, *supra* note 14, at 1446–47; Ernest Weinrib, *Civil Recourse and Corrective Justice*, 39 FLA. ST. U. L. REV. 273, 276–82 (2011).

In the scientific community, there is a profound awareness of responsibility issues. Given the significant public investment in academic research, scientists are held accountable to the public.⁸³ The trust of the public in scientific research depends on the unwavering dedication of all participants in the scholarly process to uphold stringent ethical standards.⁸⁴ Fraud or scientific misconduct, including acts like falsification, fabrication, or plagiarism, poses risks to public trust and to those directly relying on the research.⁸⁵ Consequently, ethical guidelines across universities and journals in both the United States and the EU mandate that researchers are held accountable for the entire research process and must take measures to prevent academic misconduct.

In this context, the scientific community explicitly links the attribution of authorship for the scientific paper and the assignment of liability for the content published. For example, the ICMJE's recommendations emphasize that "[a]uthorship also implies responsibility and accountability for published work."⁸⁶ Similarly, Harvard's Medical School Authorship Guidelines declare that "[a]uthorship is an explicit way of assigning responsibility and giving credit for intellectual work,"⁸⁷ and Stanford University guidelines state that "[t]here is a tight coupling between authorship and responsibility."⁸⁸ Oxford Academics, the academic research platform

83. *Yale Recommendations*, *supra* note 43.

84. *Id.*

85. For a detailed explanation on scientific misconduct, see David Resnik et al., *Authorship Policies of Scientific Journals*, 42 J. MED. ETHICS 199, 199–202 (2016); Office of Research Integrity, *Definition of Research Misconduct*, U.S. DEPT OF HEALTH & HUM. SERVS., ori.hhs.gov/definition-research-misconduct [<https://perma.cc/FW7M-38YT> (staff-uploaded)]; *Responsible Acting in Science, Rules of Conduct for Good Scientific Practice – How to Handle Scientific Misconduct*, MAX PLANCK SOCIETY 50–51 (2021), mpimet.mpg.de/fileadmin/o2_Forschung/o8_Gute_wissenschaftliche_Praxis/regeln_WissPraxis.pdf [<https://perma.cc/2UP8-68W2> (staff-uploaded)].

86. *ICMJE Recommendations*, *supra* note 44.

87. *Harvard Guidelines*, *supra* note 50.

88. *On Academic Authorship*, STAN. U., doresearch.stanford.edu/policies/research-policy-handbook/conduct-research/academic-authorship [<https://perma.cc/HEP7-H7YQ> (staff-uploaded)] (last visited Oct. 11, 2025); see also *Authorship and Responsible* footnote continued on next page

for Oxford University, also clarifies that “[e]ach author should have participated sufficiently in the work to take public responsibility for the content.”⁸⁹ Therefore, the scientific community not only acknowledges the commonalities between authorship attribution and liability allocation, but also embraces them as the backbone of its ethical guidelines.

One of the most prominent examples of the interplay between copyright and tort law regarding scientific papers is the consensus in the scientific community that the AI model itself cannot be listed as the author of the paper. The ICMJE recommendations declare that AI systems “should not be listed as authors” because the AI “cannot be responsible for the accuracy, integrity, and originality of the work, and these responsibilities are required for authorship.”⁹⁰ As humans, researchers are entitled to exclusive rights over the paper, but also bear liability for any potential harm that it may cause.⁹¹

Accordingly, prominent scientific journals and institutions have aligned their guidelines with those set forth by the ICMJE, echoing the notion that AI cannot be an author since it cannot bear liability. For example, the Nature Journal states that “Large Language Models (LLMs), such as ChatGPT, do not currently satisfy our authorship criteria. Notably, an attribution of authorship carries with it accountability for the work, which cannot be effectively applied to LLMs.”⁹² MIT also declares that “AI tools do not meet the requirements for authorship since they cannot assume ethical and legal

Research Publication Guidelines, N.Y.U. (March 2023), www.nyu.edu/content/dam/nyu/provost/documents/Authorship%20and%20Responsible%20Research%20Publication%20Practices%20March%202023.docx.pdf [https://perma.cc/A45L-MX95 (staff-uploaded)].

89. *Authorship Guidelines*, GIGASCIENCE, OXFORD ACADEMIC, academic.oup.com/gigascience/pages/authorship_guidelines [https://perma.cc/V6G3-EATD (staff-uploaded)].

90. *ICMJE Recommendations*, *supra* note 44.

91. *Id.*

92. *Editorial Policies: Artificial Intelligence (AI)*, NATURE PORTFOLIO, <https://www.nature.com/nature-portfolio/editorial-policies/ai> [https://perma.cc/ME3K-D74D (staff-uploaded)] (last visited Oct. 11, 2025).

responsibility for their work.”⁹³ Similarly, the American Office of Research Integrity states that “[a]uthorship is generally limited to individuals who make significant contributions to the work that is reported. This includes anyone who . . . assumed responsibility for data collection and interpretation.”⁹⁴

While most journals do not prohibit researchers from using AI technologies, including generative AI, in various stages of the research process, the common stance in the scientific community is that generative AI should not be used for writing research papers.⁹⁵ Nevertheless, many in the scientific community believe generative AI can be beneficial in other research assignments, such as data collection, varying analysis, and figure generation.⁹⁶

In this context, most journals require authors to disclose AI use throughout their research. As bioethicist David Resnik, from the National Institute of Environmental Health Sciences, put it nicely: “AI

93. *Journal Publication Ethics*, MIT PRESS DIRECT, direct.mit.edu/journals/pages/publication-ethics [<https://perma.cc/5LNW-C5VY> (staff-uploaded)] (last visited Oct. 11, 2025); MIT Library, *Citing AI tools: Home*, MIT, libguides.mit.edu/cite-AI-tools [<https://perma.cc/P58L-F8TY> (staff-uploaded)] (last visited Oct. 11, 2025).

94. *Office of Research & Integrity*, *supra* note 51. *See also AI Policy*, STAN. UNIV. PRESS, www.sup.org/about/ai-policy [<https://perma.cc/3C39-JV5Q> (staff-uploaded)] (last visited Oct. 11, 2025) (“Authors are solely accountable and legally responsible for the entirety of their work. AI tools do not qualify as authors and cannot be listed or cited as such on any publication”). It is worth noting that a few exceptions arose in early 2023, shortly after the release of ChatGPT. For example, in February 2023, a paper by Siobhan O’Connor in *Nurse Education in Practice Journal* briefly listed “ChatGPT” as a co-author. A subsequent corrigendum removed “ChatGPT,” explaining that it “does not qualify for authorship according to the journal’s Guide for Authors and Elsevier’s Publishing Ethics Policies.” *See* Siobhan O’Connor, *Corrigendum to ‘Open Artificial Intelligence Platforms in Nursing Education: Tools for Academic Progress or Abuse?’*, 67 NURSE EDUC. PRACT. art. no. 103572, at 4 (2023).

95. *Office of Research & Integrity*, *supra* note 51.

96. EURO. COMM’N, LIVING GUIDELINES ON THE RESPONSIBLE USE OF GENERATIVE AI IN RESEARCH 5 (Apr. 2025), https://research-and-innovation.ec.europa.eu/document/download/2b6cf7e5-36ac-41cb-aab5-od32050143dc_en?filename=ec_rtd_ai-guidelines.pdf [<https://perma.cc/P3ZN-F398>].

cannot be held accountable or responsible for the work . . . [s]ome human person has to take accountability for the text. So, we emphasize transparency, honesty, and full disclosure of use of these types of capabilities.”⁹⁷

Alongside the disclosure requirement, some publishers suggest including AI’s contribution to scientific papers in the acknowledgment section rather than the traditional author’s list.⁹⁸ Thus, beyond the discovery of AI’s use, there will be a certain recognition of its contribution to research.

One way or another, in scientific research, the author of the work is responsible for ensuring that their material does not cause damage. Today, researchers or their affiliated institutions have exclusive rights to scientific papers. They have control over its usage and distribution, and they reap the benefits of their creative endeavors. At the same time, however, they bear the duty of ensuring that the output is comprehensive, accurate, and unbiased.⁹⁹

B. All for One, All at Fault? The Puzzle of Co-Authors

The interplay between authorship and liability becomes complex in collaborative research, where scientific papers are the product of joint efforts involving multiple contributors. Over the last decades, the average number of collaborations on scientific papers has grown exponentially. The collaborative efforts today can involve multiple researchers, sometimes hundreds, who are credited as co-authors of a

97. Jennifer Harker, *Science Journals Set New Authorship Guidelines for AI-Generated Text*, NAT’L INST. OF ENV’T HEALTH SCIS., <https://www.niehs.nih.gov/news/factor/2023/3/feature/2-artificial-intelligence-ethics> [https://perma.cc/ZzEL-5DMU (staff-uploaded)] (last visited Oct. 11, 2025).

98. Chris Stokel-Walker, *ChatGPT Listed as Author on Research Papers: Many Scientists Disapprove*, NATURE (Jan. 18, 2023), www.nature.com/articles/d41586-023-00107-z [https://perma.cc/C6AH-UE6B (staff-uploaded)].

99. *Id.*; see *Submission and Peer Review Policies*, IEEE, journals.ieeeauthorcenter.ieee.org/become-an-ieee-journal-author/publishing-ethics/guidelines-and-policies/submission-and-peer-review-policies/#ai-generated-text [https://perma.cc/ZQX5-VQL3 (staff-uploaded)] (last visited Oct. 11, 2025).

paper.¹⁰⁰ This raises questions about the allocation of liability when only one team member is found to have committed misconduct.

The Baltimore Case is a powerful illustration.¹⁰¹ David Baltimore was never suspected of misconduct himself. However, he defended the part of the research that was conducted by his colleague, Thereza Imanishi-Kari, one of six co-authors of the paper. Baltimore's unwavering support for her work was deemed by some to be unprofessional, imprudent, and even irresponsible.¹⁰² Given the criticism against him and the responsibility attributed to him by many within the scientific community and the public, Baltimore was compelled to resign from MIT.¹⁰³

The Baltimore Case highlights an underlying principle in the scientific community: Those who have control over the publication of a paper, be they sole authors or co-authors, bear the responsibility for preventing harm that may arise from their work, including the prevention of misconduct by their colleagues.¹⁰⁴ Co-authors are entitled to enjoy the benefits of their creative endeavors as a group, yet they are also all liable for any potential damage that may arise. In this context, the ICMJE recommendations clarify that “an author should be able to identify which co-authors are responsible for specific

100. Amy Brand et al., *Beyond Authorship: Attribution, Contribution, Collaboration, and Credit*, 28 LEARNED PUBLISHING 151, 151 (2015); Rochelle Cooper Dreyfuss, *Collaborative Research: Conflicts on Authorship, Ownership, and Accountability*, 53 VAND. L. REV. 1161, 1162 (2000).

101. See *supra* Part I.

102. Daniel J. Kevles, *The Assault on David Baltimore*, NEW YORKER (May 27, 1996), www.newyorker.com/magazine/1996/05/27/the-assault-on-david-baltimore [<https://perma.cc/6WSQ-5RZF> (staff-uploaded)].

103. *Id.*

104. *Editorial and Publishing Policies*, SCI. REPS. www.nature.com/srep/journal-policies/editorial-policies#author-responsibilities [<https://perma.cc/5NU2-ZUW7> (staff-uploaded)] (last visited Oct. 11, 2025) (“Each author is expected to . . . have agreed both to be personally accountable for the author’s own contributions and to ensure that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature”).

other parts of the work. In addition, authors should have confidence in the integrity of the contributions of their co-authors.”¹⁰⁵

The growing trend of multi-authorship in scientific research has led to initiatives like Contributor Roles Taxonomy (“CRediT”), by the National Information Standards Organization (“NISO”). The CRediT aims to define researchers’ main roles and contributions in a publication, helping the credit attribution process and minimizing disputes among researchers. Thus, the CRediT framework encompasses fourteen contribution roles in scholarship, including conceptualization, data curation, formal analysis, validation, supervision, writing, and funding acquisition.¹⁰⁶

However, as the following Part will illustrate, integrating AI into the scientific field introduces new challenges and considerations regarding traditional roles and responsibilities. Research tasks typically carried out by a human co-author may now be performed by an AI system. The evolving technological landscape invites the scientific community to discuss the differences—or lack thereof—between AI collaboration and human collaboration.

IV. AUTHORSHIP ATTRIBUTION AND LIABILITY ALLOCATION IN THE GENERATIVE AI ERA

A. Human-AI Relationship: A Case Study of Using AI to Discover Novel Antibiotic Compounds Against MRSA

With the growing integration of generative AI across diverse sectors, questions of authorship attribution and liability allocation in human-machine relationships are becoming increasingly urgent, particularly as accountability often blurs.¹⁰⁷ As modern supply chains

¹⁰⁵. ICMJE Recommendations, *supra* note 44.

¹⁰⁶. Contributor Role Taxonomy (CRediT), NISO, credit.niso.org/ [<https://perma.cc/GU8P-CLPY> (staff-uploaded)] (last visited Oct. 11, 2025).

¹⁰⁷. Maurice Chiodo et al., *Regulating AI: A Matrix for Gauging Impact and its Legal Implementation*, 12 U. CAMBRIDGE FAC. L. RSCH. PAPER NO. 12/2024, Mar. 2024, at 39–46; Herbert Zech, *Liability for AI: Public Policy Considerations*, 22 ERA F. 147, 154–55 (2021); Mala Chatterjee & Jeanne C. Fromer, *Minds, Machines, and the Law: The Case of Volition in Copyright Law*, 119 COLUM. L. REV. 1887, 1892 (2019); Margot E. Kaminski, *Regulating* footnote continued on next page

grow more complex, scenarios in which responsibility cannot be easily assigned to a single actor are becoming more frequent. For example, when AI-generated content proves defamatory or erroneous, the decisions of developers or AI companies can directly influence the liability borne by users, even if the latter are positioned further down the supply chain. In such cases, responsibility may be distributed among multiple actors, with users potentially carrying primary liability for harmful outputs while AI developers or providers assume secondary liability.¹⁰⁸

As scientific researchers have embraced the advancements brought by AI technologies, the scientific community has had to confront the question of allocating liability in the relationship between researchers and AI.

One notable case study in this regard involved MIT researchers who explored the development of new antibiotics. Using deep learning AI, they discovered a new class of compounds capable of killing methicillin-resistant *Staphylococcus Aureus* (“MRSA”), a bacterium causing over 10,000 deaths annually in the United States. The research began with training a deep learning AI on a dataset of approximately 39,000 compounds, each tagged with its antibiotic efficacy against MRSA. The researchers taught the AI model to associate specific chemical structures with antibiotic activity against MRSA.¹⁰⁹ The deep

the Risks of AI, 103 BOSTON U. L. REV. 1347, 1354, 1365–66 (2023); Mark A. Lemley & Bryan Casey, *Remedies for Robots*, 86 U. CHI. L. REV. 1311, 1313–38 (2019); Derek Bambauer & Mihai Surdeanu, *Authorbots*, 3 J. FREE SPEECH L., 375, 381–82 (2023).

108. Peter Henderson, Tatsunori Hashimoto, & Mark A. Lemley, *Where’s the Liability in Harmful AI Speech?*, 3 J. FREE SPEECH L. 559, 583–83 (2023); Nina Brown, *Bots Behaving Badly: A Products Liability Approach to Chatbot-Generated Defamation*, 3 J. FREE SPEECH L. 389, 397–403 (2023); Dan L. Burk, *Asemic Defamation or the Death of the AI Speaker*, 22 FIRST AMEND. L. REV. 189, 190–92 (2024); Jon Garon, *An AI’s Picture Paints a Thousand Lies: Designating Responsibility for Visual Libel*, 3 J. FREE SPEECH L. 425, 427–30, 437–42 (2023); Andrés Guadamuz, *A Scanner Darkly: Copyright Liability and Exceptions in Artificial Intelligence Inputs and Outputs*, 73 GRUR INTERNATIONAL III, 121–25 (2024).

109. Anne Trafton, *Using AI, MIT Researchers Identify a New Class of Antibiotic Candidates*, MIT NEWS (Dec. 20, 2023), news.mit.edu/2023/using-ai-mit-
footnote continued on next page

learning model, which excels at recognizing patterns in large datasets, meticulously analyzed the potential compounds, generating predictions regarding those with the new chemical structures that are likely to exhibit robust antimicrobial properties.¹¹⁰ The researchers then opened the “black box” of the AI to learn how it made its predictions. Additionally, to validate such predictions, the research team employed additional experiments and three other deep learning models.¹¹¹

Finally, the researchers used the trained AI model to screen 12 million commercially available compounds. The model identified several compounds that were predicted to exhibit activity against MRSA. These compounds were tested in laboratory settings against MRSA to evaluate their effectiveness.¹¹²

Throughout these stages, the AI model played a pivotal role in efficiently analyzing vast datasets, generating predictions, and directing experimental efforts toward the discovery of potential antibiotic compounds. The research team’s supervision and interpretation ensured both the reliability and the scientific relevance of the AI’s outputs. This collaboration produced groundbreaking findings with considerable commercial potential. Within this framework, the attribution of copyright may rest with the AI company or with the developer who exercised creative discretion in designing the deep learning system. The results may also be characterized as a joint work between the researchers and the AI company. Given the current circumstances, it is increasingly difficult to maintain that researchers should retain exclusive rights over predictions that could

researchers-identify-antibiotic-candidates-1220 [https://perma.cc/BM9W-LBRX (staff-uploaded)].

110. *Id.*; *AI Helps Find First New Antibiotic in 60 Years*, DRUG DISCOVERY WORLD (Jan. 5, 2024), www.ddw-online.com/ai-helps-find-first-new-antibiotic-in-60-years-27807-202401/ [https://perma.cc/YJ8M-EUX9 (staff-uploaded)]; Tanya Lewis, *New Class of Antibiotics Discovered Using AI*, SCI. AM. (Dec. 20, 2023), www.scientificamerican.com/article/new-class-of-antibiotics-discovered-using-ai/ [https://perma.cc/2FEE-CYKD (staff-uploaded)].

111. Trafton, *supra* note 109; DRUG DISCOVERY WORLD, *supra* note 110; Lewis, *supra* note 110.

112. *Id.*

not have been achieved without the AI's involvement. Likewise, the responsibility for potential scientific misconduct must be clearly assigned to the appropriate party.

In the MRSA case, the research results were published in December 2023, with twenty-three individuals listed as authors at the top of the paper. The AI company behind the deep learning model is not listed as a co-author nor are they mentioned in the acknowledgment section.¹¹³ This approach aligns with the prevailing consensus within regulatory bodies and the scientific community.

As discussed in Part II, there is a general agreement that AI itself cannot be, and should not be, attributed authorship of a scientific paper, as it cannot be liable for its content. Therefore, the deep learning AI cannot be the author of the MRSA scientific paper. Furthermore, scientific papers typically remain outside the public domain. Additionally, assessing the extent of each entity's contribution compared to others in the chain of research can be difficult, as exemplified by the MRSA study. Indeed, the authors in the published article did not specify a clear division of roles between them. Is this the proper way to attribute authorship and responsibility?

The answer appears to be negative. The MIT researchers assumed authorship of the entire MRSA paper, along with full accountability for it. However, the MRSA paper did not mention in the acknowledgements section either the AI developers or the company behind the model. Without close collaboration with them, it is unlikely that the researchers knew—or could have known, even after attempting to trace the model's predictions—what actually led to the new findings. As a result, if errors are later discovered in the model's predictions, the MIT researchers will be held liable. This liability remains even though the model was not under their sole control.

¹¹³. Felis Wong et al., *Discovery of a Structural Class of Antibiotics with Explainable Deep Learning*, 626 NATURE 177 (2024). According to the “Ethics Decelerations Section” in the article, two of the twenty-one authors have filed a patent based on the scientific paper's results, while the remaining authors declare no competing interests. As aforementioned, it raises many crucial questions about attribution for reputation purposes, but which exceed the scope of this Article.

Therefore, the MRSA case highlights the need for reevaluating the attribution of exclusive rights and duties of scientific papers when an AI substantially contributed to the work. Drawing on MRSA research, the following Part will elucidate how a cohesive analytical framework of copyright and tort law can enhance the discussion of attribution in the era of generative AI.

B. Generating a Unified Framework for IP and Tort Law

The commonalities between copyright and tort law can shed light on who should have exclusive rights and who should bear liability for harm that might occur. From a unified perspective, attributing authorship and allocating liability are manifestations of control.¹¹⁴ The actor who controls the use of copyrighted work will likely bear the liability for the damages caused by its use.

The MRSA case of AI-driven discovery of new antibiotics components, illustrates this notion of control. The deep learning model's contribution extended beyond merely automating tasks and reducing research costs. It substantially contributed to the research by providing new insights about compounds that may kill MRSA, which were otherwise inaccessible to MIT researchers.

The MRSA case illustrates a shift in control dynamics. Unlike traditional research tools, such as a microscope, the MIT researchers had no exclusive control over the AI models. Moreover, the researchers tried to understand how the AI model made its groundbreaking predictions.¹¹⁵

Under these circumstances, the researchers' supervision and interpretation of the AI's predictions do not give them absolute control over the AI models. The AI company and its developers control some parts of the deep learning model. Hence, the emergence of generative AI challenges traditional notions of control and is an opportunity to reevaluate authorship roles within the scientific field.

While the premise is that the AI itself cannot, and should not, be an author or a co-author of a scientific paper, the current ethical

¹¹⁴. See *supra* note 14–16 and accompanying texts.

¹¹⁵. Trafton, *supra* note 109; DRUG DISCOVERY WORLD, *supra* note 110; Lewis, *supra* note.

guidelines in the scientific community do not prohibit the attribution of authorship to the AI company or developer.¹¹⁶

Moreover, in some circumstances, the AI company or developer meets all the criteria for authorship attribution set by the ICMJE.¹¹⁷ In the MRSA case, the AI substantially contributed to research conception and data analysis by generating predictions regarding the compounds with the relevant chemical structures. Additionally, in the second phase of the research, other AI models were involved in critically revising the output. Furthermore, unlike the AI system, the AI company or developer, as a legal entity that can have rights and duties,¹¹⁸ can be liable for the paper's integrity and accuracy. Finally, the AI company or developer can approve the paper's final version for publication. In any case, this criterion should not prevent the acknowledgment of new authors. As with scientific papers with many authors, an implicit approval delegation can also occur from the AI company or developer.

As illustrated by the MRSA case, questions of control in the generative AI age—whether an AI developer or company substantially enhanced the research or if a researcher maintained control over the AI system—become pivotal. Similarly, in tort law, identifying the entity best positioned to prevent potential harm is crucial. A case-by-case analysis, grounded in the control principle, can help attribute authorship. Employing control as the cornerstone of a unified copyright and tort law framework allows a distinction between AI as a mere tool and as a substantial research contributor.¹¹⁹

As aforementioned, in the MRSA case study, the AI model provided indispensable predictions that fundamentally shaped the research.¹²⁰ Critical components of the model remained under the control of its developers, thereby constraining the MIT researchers'

116. See *supra* Part III.A.

117. *ICMJE Recommendations*, *supra* note 44.

118. Elizabeth Pollman, *Corporate Personhood and Limited Sovereignty*, 74 VAND. L. REV. 1727, 1728–29 (2021).

119. Noorden & Perkel, *supra* note 70.

120. Trafton, *supra* note 109; DRUG DISCOVERY WORLD, *supra* note 110; Lewis, *supra* note 110.

capacity for oversight.¹²¹ This division of control illustrates the need to allocate both authorship and liability based on the actual degree of influence exercised by each actor, rather than applying a one-size-fits-all rule.

Some might contend that, from a normative standpoint, we should consistently refrain from attributing authorship or co-authorship to AI developers and companies, since it could undermine researchers' incentives for future work. However, recognizing AI developers or companies as co-authors can enhance the progress of scientific research.

First, recognizing AI developers or companies as co-authors can enhance research reproducibility and transparency while alleviating liability concerns for researchers who do not have control over the AI systems. Consequently, researchers would only be held liable for AI model predictions when they exercise sufficient control over these models. Second, acknowledging AI companies or developers as authors in scientific publications could drive innovation in AI research. AI companies possess substantial resources that can be leveraged to finance groundbreaking studies.¹²² If these companies anticipate tangible benefits from research outcomes and publications, they will likely be more willing to invest in research endeavors.¹²³ Therefore, attributing authorship to these entities can significantly contribute to societal welfare.

In this context, the proposal in this Article is not as revolutionary as it may initially seem. Multiple scientific papers have listed non-human entities, such as corporations, associations, and research

121. Trafton, *supra* note 109; DRUG DISCOVERY WORLD, *supra* note 110; Lewis, *supra* note 110.

122. See e.g., *OpenAI's Annualized Revenue Hits \$10 Billion, Up from \$5.5 Billion in December 2024*, REUTERS, (June 10, 2025), https://www.reuters.com/business/media-telecom/openais-annualized-revenue-hits-10-billion-up-55-billion-december-2024-2025-06-09/?utm_source=chatgpt.com [https://perma.cc/HPS8-HEBU].

123. *Introducing NextGenAI: A Consortium to Advance Research and Education with AI*, OPENAI (Mar. 4, 2025), <https://openai.com/index/introducing-nextgenai/>; *Oxford and OpenAI Launch Collaboration to Advance Research and Education*, OXFORD UNI. (Mar. 4, 2025), <https://www.bodleian.ox.ac.uk/about/media/oxford-and-openailaunch#> [https://perma.cc/ZF83-RFAG].

centers as authors.¹²⁴ Just as the industrial and digital revolutions added new stakeholders, some of them non-human, so can the age of generative AI. This Article only argues that, under appropriate circumstances, an AI company or developer can be considered a co-author. It does not suggest that the use of AI necessarily requires the attribution of copyrights to the AI company or developer. Using a unified analysis of authorship and liability can help to identify these circumstances and improve the allocation of rights and duties in scientific papers in the generative AI era.

Consequently, this Article encourages national institutes and journals to reevaluate their recommendations, guidelines, and standards for addressing scientific misconduct in the age of new authors. The generative AI era necessitates reevaluating current ethical guidelines to accommodate the collaborative nature of modern scientific research, ensuring that copyright and tort laws continue to foster innovation while upholding integrity and accountability in scientific publications. At the same time, the interplay between copyright law and tort law should be kept, guiding this reevaluation.

It should be emphasized that attributing authorship to new actors in the generative AI supply chain raises further questions regarding contract and tort law. In situations where an AI company is credited as an author or co-author in the publication, the question arises whether it can contractually disclaim any liability stemming from this attribution (“Contracting Out”).¹²⁵ Does the principle of contractual freedom override the nexus between authorship and liability attribution? The response appears to be negative. The law establishes liability rules that cannot be contracted away.¹²⁶ As such, if an AI company holds the exclusive rights typically given to an author, it must also bear responsibility for any damages that might arise from the research and its subsequent publication.

Building upon Rochelle Dreyfuss’s proposal from twenty-four years ago, regarding collaborative research, courts should carefully examine agreements between researchers and AI companies (or developers) to ensure that the latter are not avoiding their

¹²⁴. Polonsky & Rotman, *supra* note 56, at 91–92.

¹²⁵. Dreyfuss, *supra* note 108, at 1227.

¹²⁶. *Id.*

responsibilities. If deemed necessary, these agreements should be subject to cancellation on the grounds of public policy and fairness.¹²⁷

As a final note, it is essential to highlight that this Article does not claim that copyright and tort laws are identical or should be identical. The rationales of each field are distinct. As aforementioned, copyright law aims to promote the creation and distribution of expressive works.¹²⁸ Tort law, on the other hand, has two primary rationales: restoring the injured party to their original position prior to the wrong being committed and preventing future harm through effective deterrence.¹²⁹

However, overlooking the intersection between authorship and liability may harm the overarching goals of both copyright and tort law. Thus, granting exclusive rights to an inappropriate actor in the supply chain may harm the incentive to generate new expressions, as well as make it difficult to compensate the injured party, and deter the relevant entity from producing future harm. Therefore, establishing a unified analytical framework for attributing authorship and allocating liability can propel progress in both realms, as exemplified by the case study guidelines for scientific papers.

V. CONCLUSION

Over many years, the scientific community has discussed issues related to authorship attribution, ethical conduct, authorship liability, and the mechanisms for ensuring scientific integrity. The generative AI era presents new challenges for authorship attribution and liability allocation.

This Article argues that there is an intersection between copyright law and tort law, particularly in the areas of authorship attribution and liability allocation. Both attributing authorship and allocating

¹²⁷. *Id.*

¹²⁸. See *supra* note 27 and accompanying texts.

¹²⁹. GUIDO CALABRESI, THE COST OF ACCIDENTS: A LEGAL AND ECONOMIC ANALYSIS 155 (1970); Sharkey, *supra* note 14, at 1446–47; Weinrib, *supra* note 82, at 273–75.

liability are manifestations of control.¹³⁰ Therefore, in general, those who benefit from exclusive rights should also bear responsibility for any misconduct.

For this reason, the publication of scientific papers is an interesting example, as it creates a nexus between authorship and liability allocation. At the same time, the commonalities between authorship attribution and liability allocation may justify assigning copyrights to new actors in the scientific research supply chain. Thus, if the four ICMJE authorship criteria exist, granting copyright to AI companies or developers as co-authors might be justified. Consequently, this Article argues for the need to reevaluate current ethical guidelines and standards in the scientific community to better reflect the notion of control in research and scientific papers in the age of generative AI.

Given its limited scope, this Article refrains from making definitive claims regarding the commonalities between authorship attribution and liability allocation beyond the topic of AI generative usage in scientific research. However, the insights from this study provide a basis for future research across various fields and other emerging technologies.

¹³⁰. As aforementioned, this Article focused on the attribution of authorship under copyright law. Other notions of “attribution,” such as attributing ownership or reputation, would influence the proposed analytical framework.

