# Inventorship, Priority, and CRISPR Patents: Insights from the United States and Europe

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Identifying and naming proper inventors is a key part of applying for patents around the world. However, recent legal developments in the United States and Europe demonstrate how inventorship affects ownership, validity and enforceability. The patent disputes over CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) in the United States and Europe illustrate how each jurisdiction originally adopted distinct approaches to inventorship, ownership, and priority that have gradually become more similar in important ways. The America Invents Act (AIA) aligned the U.S. patent system with other countries like Europe by adopting a first-inventor-to-file model, but also included statutory changes to inventorship. Likewise, Europe has recently updated its rules on inventor designation and priority to better harmonize with other patent systems, including the United States. These changes to the rules on inventorship and priority affect not only those interested in licensing CRISPR technology, but also patent practitioners seeking clarity on inventorship rules when filing international applications or seeking tactical litigation or prosecution advantages in specific jurisdictions.

This article provides a brief background on CRISPR technology and the ensuing patent disputes in the United States and Europe; inventorship and priority rules in the United States and Europe; the changing approach to priority in Europe and its impact on CRISPR patents; and analysis and takeaways.

## BACKGROUND

### CRISPR Technology

CRISPR refers to natural gene-editing capabilities found in simple organisms like bacteria. Scientists have been adapting CRISPR for gene-editing applications to treat genetic diseases by precisely editing DNA. The current technology has two essential components: (1) a guide RNA that matches the target gene for editing, and (2) a Cas9 protein that acts as molecular scissors, cutting the target DNA at a specific location. Emmanuelle Charpentier and Jennifer Doudna won the 2020 Nobel Prize in Chemistry for developing the "CRISPR/Cas9 genetic scissors."[1]

Researchers are already applying CRISPR to correct disease-causing genetic mutations, create disease models, and develop new cell therapies. In 2020, a patient with Leber congenital amaurosis – a genetic disorder causing blindness – received the first in vivo CRISPR treatment.[2] Then earlier this year, doctors treated a child with severe carbamoyl phosphate synthetase (CPS1) deficiency using a customized CRISPR therapy, alleviating the patient's symptoms.[3] These are examples of the growing potential and excitement around CRISPR treatments.

### CRISPR Patent Disputes

Two primary research groups have been fighting for entitlement to CRISPR patent priority dates: the Regents of University of California, the University of Vienna, and Emmanuelle Charpentier on one hand (often called CVC), and the Broad Institute, Harvard University, and MIT on the other (Broad). Both groups filed patent applications dating back to 2012. Generally, the CVC group has been credited with discovering the CRISPR-Cas9 system, while the Broad group demonstrated its use in eukaryotes.

These competing groups have filed patent applications and litigations around the world. In the United States, CVC and the Broad filed a series of interferences at the Patent Trial and Appeal Board (PTAB) to contest priority. The U.S. Court of Appeals for the Federal Circuit recently vacated a PTAB decision awarding priority for certain

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applications to the Broad, remanding for further proceedings.[4] On remand, the PTAB will need to "consider whether, despite subsequent, perceived difficulties and doubts, [CVC's] scientists described routine methods or skill at the asserted conception dates and used those methods or that skill to achieve purported successes during subsequent experimentation."[5]

In Europe, CVC filed opposition proceedings against Broad patents based on invalidity. As discussed further below, the European Patent Office (EPO) has ruled for and against both sides across different cases with a key issue being how the naming of inventors in priority applications affects the right to priority in later applications.

Because of these ongoing disputes in multiple jurisdictions, the CRISPR industry faces uncertainty about where to obtain patent licenses. Some have called for aggregating CRISPR patent portfolios. For example, "Broad continues to call on UCB [UC Berkeley] to join discussions for a patent pool or another coordinated licensing approach, such as the joint licensing framework Broad developed for CRISPR in agriculture."[6]

## INVENTORSHIP AND PRIORITY IN THE UNITED STATES

U.S. patent law requires that each named inventor contribute to the conception of the claimed invention. According to 35 U.S.C. § 120, when claiming priority to an earlier-filed application, only the inventor or joint inventor named in that earlier application needs to be named in the later application.[7]

### Inventorship Pitfalls

The consequences of naming incorrect inventors depend on whether a patent falls under the AIA. For patents governed by pre-AIA law (with effective filing dates before March 16, 2013), 35 U.S.C. § 102(f) states that a failure to name the correct inventor could render a patent invalid. The AIA's revisions to the law of novelty removed § 102(f) as a basis for invalidation. However, § 102(f) may still apply to pre-AIA patents, including many of the disputed CVC and Broad patents.

For AIA patents, although § 102(f) no longer serves as a basis for invalidity, challenges to improper inventorship may still be pursued under other statutes such as 35 U.S.C. § 101. Section 101 allows a patent to be granted to "[w]hoever invents or discovers" an invention, thereby ensuring that patent rights are granted only to the true inventors. For example, in *Belcher Pharmaceuticals, LLC v. Hospira, Inc.*, the court determined that Belcher's chief executive officer, though named as an inventor, made no inventive contribution to the disputed patent, resulting in invalidity.[8] The AIA also introduced derivation proceedings at the PTAB to resolve certain inventorship disputes.[9] The Federal Circuit recently clarified how inventorship affects prior art to pre-AIA patent – to determine whether a reference naming common inventors is disclosure "by another," "the portions of the reference disclosure relied upon must reflect the collective work of the same inventive entity identified in the patent to be excluded as prior art."[10]

### Correcting Inventorship

Correction of inventorship in U.S. patents is also governed by varying statutory requirements depending on whether the patent is an AIA patent. For pre-AIA patents, corrections can be made via 35 U.S.C. § 116 (during prosecution before the U.S. Patent and Trademark Office (USPTO), provided the error was made "without deceptive intent") and § 256 (by the USPTO or a court for issued patents, again only if the error occurred without deceptive intent). There are multiple examples where courts corrected inventorship under § 256 instead of invalidating the patents in suit.[11] However, the AIA eliminated the "deceptive intent" requirement from both §§ 116 and 256, making it procedurally easier to correct inventorship on post-AIA patents – errors can be fixed regardless of original intent. For AIA patents, "[t]he named inventors are presumed correct, and the party seeking correction of inventorship must show by clear and convincing evidence that a joint inventor should have been listed."[12] This legal evolution reduces barriers to correcting good-faith errors, but maintains a high evidentiary standard for contested changes, supporting both flexibility and reliability in the U.S. patent system.

Intentional inventorship errors can still lead to inequitable conduct for both pre- and post-AIA patents, and under the heightened materiality standard of *TheraSense, Inc. v. Becton, Dickinson & Co*.[13] For example, the incorrect inventorship in *Belcher* also led to unenforceability for inequitable conduct.[14]

Even if errors with deceptive intent are correctable, the Federal Circuit observed that "[i]t is the inequitable conduct rules that provide a safety valve in the event of deceit."[15] Multiple courts have indicated that in the post-*TheraSense*, post-AIA world, it is still possible to plead inequitable conduct based on flawed inventorship.[16] A district court recently ruled five patents unenforceable after finding the patentee intentionally omitted two co-inventors from another company.[17]

The ongoing CRISPR patent battles show that inventorship and priority dates remain critical. For example, The Rockefeller University and the Broad Institute resolved a dispute over inventorship concerning Broad's patent filings on the use of CRISPR in eukaryotic cells. Rockefeller asserted that its faculty member Dr. Luciano Marraffini – who co-authored a landmark 2013 Science paper on CRISPR with Broad's Dr. Feng Zhang – deserved recognition as an inventor on the PCT application.[18] Nevertheless, in 2018, an independent arbitrator determined that neither Dr. Marraffini nor Rockefeller should be listed on the PCT application.[19] Furthermore, the Federal Circuit's recent decision in the CVC-Broad interferences is an example of how conception and priority dates affect patent rights. While inventorship was not directly contested in the interferences, the relative conception dates of the CVC and Broad inventors will determine priority, and the case was remanded to the PTAB for further review.[20]

## INVENTORSHIP AND PRIORITY IN EUROPE

The Paris Convention gives inventors the right to be named in patent applications. Under Article 4ter of the Paris Convention, "the inventor shall have the right to be mentioned as such in the patent."[21] This approach guarantees the moral rights of the inventor where such rights are non-economic and protect the dignity and personality of authors and inventors.[22]

Each European nation has its own laws on patent matters, including laws on inventorship, validity, and sufficiency of disclosure. Thus, applicants can either file a separate application in each E.U. country or file a single application at the EPO. A majority of European nations have entered into the European Patent Convention (the EPC) that sets forth articles on issues including inventorship, novelty, and sufficiency. The EPC also directs all signatories to amend their national laws to harmonize with the Articles of the EPC. This brings the laws of most European nations into harmony at least as to the matters of law set out in the EPC.

Under the EPC, the "inventor shall have the right, vis-à-vis the applicant for or proprietor of a European patent, to be mentioned as such before the European Patent Office."[23] The EPC requires designating inventors,[24] but does not set forth Articles on what acts make someone an inventor. On that point, national laws are likely to apply. A central issue to the CRISPR patent disputes in Europe has been how the designation of inventors in priority applications affects entitlement to priority in subsequent applications.

Generally, under European laws, patent rights will belong to the inventor or their successor in title or employer.[25] If the inventor is an employee, the right to a European patent is determined by the national law of the country where the inventor is mainly employed.[26] For instance, in the Netherlands, employers own the patent rights for inventions created by employees if the invention falls within the scope of the employee's job duties and the employment relationship.[27] Article 81 of the EPC requires the applicant to designate the inventor.[28] But "if the applicant is not the inventor or is not the sole inventor, the designation shall contain a statement indicating the origin of the right to the European patent,"[29] namely the way title was transferred to the applicant.

As in the United States, the EPO does not verify whether the designation of inventor(s) in the patent application is correct.[30] Instead, the public must raise the issue of incorrect inventors. Patents with incorrect inventorship can be corrected under specific legal and procedural requirements.

Rule 21 of the EPC's Implementing Regulations describes how to correct an inventor designation. Such an error "shall be rectified upon request and only with the consent of the wrongly designated person and, where such a request is filed by a third party, the consent of the applicant for or proprietor of the patent."[31] The EPO rules also specify a deadline to correct inventorship when an inventor was not designated during the application process or the designation was invalid due to a deficiency (such as a missing inventor's name, country, place of residence, or applicant's signature).[32] The applicant

has 16 months from the date of filing or, if priority is claimed, from the priority date to remedy these specific errors. If the applicant does not correct the designation, the EPO will refuse the application.[33]

While incorrect inventorship and lack of entitlement are not sufficient for the EPO to revoke a patent, it can be a basis for challenging validity through national nullity proceedings in specific European countries. A challenging party needs to demonstrate it has been harmed by improper entitlement when bringing this claim.

## THE EPO'S CHANGING PRESUMPTION FOR PRIORITY CLAIMS AND INVENTORS

Against this legal backdrop, the EPO has recently changed the rules for how designating inventors affects priority. As the timeline and discussion show, these alterations have directly affected the Broad's CRISPR patents in Europe while further harmonizing the European and American approaches to priority.

### The "Same-Applicant" Approach

Before 2023, the EPO previously applied a strict "same-applicant" or "all-applicants" approach to priority, which required that all applicants in a priority application also appear in all subsequent applications.[34] Any defects could hurt a patent application's priority date, potentially expanding the scope of available prior art.

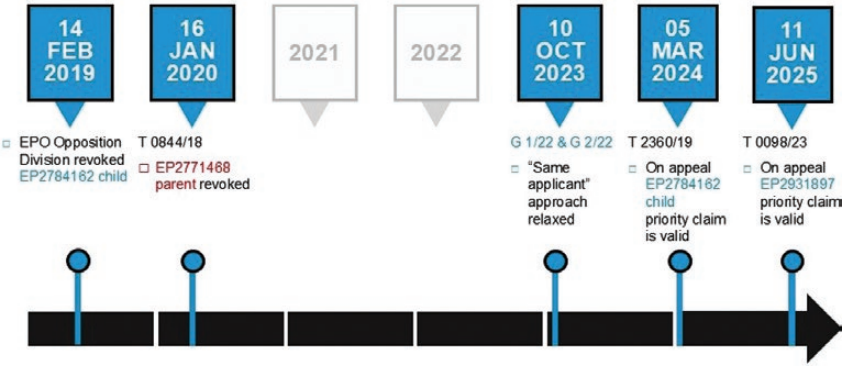
The EPO initially applied this approach to the Broad's CRISPR patents. In T 0844/18 (2020), the Technical Board of Appeal addressed a challenge to Broad patent EP2771468B1. The challenged patent claimed priority from twelve U.S. provisional applications.[35] Four of the provisional applications named Dr. Marraffini as an inventor.[36] However, neither Dr. Marraffini nor his successor in title, Rockefeller, was named on the international PCT application that originated the Broad's European family, including the challenged patent.[37] As noted above, an independent arbitrator ruled in 2018 that neither Dr. Marraffini nor Rockefeller should have been named in the PCT application or the challenged patent.[38] "In this particular case the applicants for the Subsequent Application were not the same as those for the Priority Application, one applicant was missing from the Subsequent Application and no question of successor in title arose."[39]

The Technical Board framed the dispute this way: "A and B are applicants for the priority application. A alone is the applicant for the subsequent application. Is a priority claim valid even without any assignment of priority right from B to A?"[40] Applying the "so-called 'all applicants' approach," the Technical Board ruled against the Broad and agreed "with the EPO's long established practice on this issue."[41]

### The EPO's New Priority Approach

All this changed in 2023, when the Enlarged Board of Appeal relaxed the "same-applicant" approach in consolidated decisions G 1/22 and G 2/22. The disputed patent did not involve CRISPR technology, but rather methods for prolonging survival of an allograft in a mammal. There, the priority right to the disputed patent was originally flawed because only one of three inventors assigned rights to the proprietor.[42] Recognizing the significance of the pending G 1/22 and G 2/22 decision on this recurring issue, on March 31, 2022, the EPO

**Timeline**



stayed all examination and opposition proceedings that turned on a priority claim where "the priority right was transferred from the applicant of the priority application to the applicant of the application in question before the filing date of the latter."[43]

On October 10, 2023, the Enlarged Board decided that the "same-applicant" approach was too rigid, and that lower standards for priority would better promote harmonization with national laws.[44] Accordingly, the Enlarged Board concluded that "entitlement to priority should in principle be presumed to exist to the benefit of the subsequent applicant of the European patent application."[45] The Enlarged Board also determined that the EPO is competent to assess entitlement to claim priority under Article 87(1) EPC, while the title to the subsequent application and "[i]ts transfer is governed by national laws."[46]

This presumption is strong under "normal circumstances."[47] It is only rebuttable in "rare exceptional cases" such as conduct "related to bad faith behavior on the side of the subsequent applicant or to the outcome of other proceedings such as litigation before national courts about the title to the subsequent application."[48] This shifts the burden to the examining division, opponent, or third party to prove that an implicit or explicit agreement transferring priority rights is missing.[49] Now when an applicant claims priority under EPC Article 88(1) there is "a presumption that a claim to priority was valid, by way of an implicit agreement on the transfer of the right to claim priority, which applied to any case where the subsequent applicant was not identical with the priority applicant."[50] This implicit agreement should "be accepted under almost any circumstances, including *ex post* (retroactive, *nunc pro tunc*, *ex tunc*) transfers concluded after the filing of the subsequent application."[51]

G 1/22 and G 2/22 prompted significant revisions to the EPO's Guidelines for Examination in 2024, specifically highlighting the critical distinction between transfer of a valid priority right as opposed to the transfer of a priority application, the latter being governed by national law.[52] The Guidelines also introduced the rebuttable presumption under the EPC that applicants claiming priority under Article 88(1) and Rule 52 are entitled to the claimed priority.[53] Although the Guidelines are not binding on the boards of appeal, they are still persuasive.[54]

## CRISPR Under the New Presumption of Priority

The new, rebuttable presumption of correct priority directly impacted the CVC-Broad CRISPR disputes. Opponents challenged EP2784162B1, another Broad CRISPR patent, which claimed priority from twelve U.S. provisional applications. This patent had the same defect as the parent patent (EP2771468B1, discussed above in T 0844/18) where Dr. Marraffini was named on four provisional applications but neither he nor Rockefeller was named on the international PCT application that originated the challenged patent.[55]

**The new, rebuttable presumption of correct priority directly impacted the CVC-Broad CRISPR disputes.**

Under the "all applicants approach," the Opposition Division initially found in 2019 that EP2784162B1 lacked a valid priority claim and therefore lacked novelty over cited prior art.[56] During the appeal of that decision, the EPO decided G 1/22 and G 2/22 (2023). In T 2360/19 (2024), the Technical Board of Appeal reviewed the priority claim for EP2784162B1 in light of the intervening G 1/22 and G 2/22 decision. Would the challenged CRISPR patent fare any differently than its parent under the new legal standards for priority?

The answer was yes. The Technical Board of Appeal applied the presumption established in G 1/22 and G 2/22, ruling that the priority claim was valid despite inconsistent naming of Dr. Marraffini and Rockefeller across applications. The 2018 U.S. arbitration decision supported priority since both parties wanted to be named in the PCT application and neither acted to invalidate the priority claim.[57] The arbitration also resulted in an ex post agreement on transfer of priority rights that the G 1/22 and G 2/22 decision expressly approved.[58] Even without the arbitration, the result would be the same because "the presumption of a valid priority claim" was not rebutted.[59] "There is always a party who is entitled to claim priority even if this party has to be determined in a national proceedings."[60] Ultimately, "this right was not 'lost' somewhere in an inventorship dispute."[61] Similarly, two other Broad patents that were initially revoked under the

"same-applicant" approach were determined to have valid priority claim on appeal post G 1/22 and G 2/22.[62]

Notably, the T 2360/19 decision found it "useful to set out its understanding of US patent applications," discussing differences and similarities between the American and European systems for inventorship and priority.[63]

## ANALYSIS AND TAKEAWAYS

After enactment of the AIA and the EPO's decision in G 1/22 and G 2/22, there are more similarities between inventorship rules in the United States and Europe. In both jurisdictions, it is now more difficult to contest inventorship. The AIA eliminated the "without deceptive intent" requirement for inventorship correction, allowing fixes for any reason. In Europe, priority claims are now presumed valid, even if different inventors are named across related applications, absent convincing evidence. For patent challengers, inventorship is now less powerful as a defense. For patent owners, the best practice is still to confirm inventorship for each application in a family.

**Inventorship and priority challenges will likely continue in the CRISPR patent landscape.**

Despite these changes, inventorship remains an important consideration. In the U.S., true misconduct in naming inventors could still affect invalidity or inequitable conduct. In Europe, the EPO indicated that national laws should control ownership rights, so it remains important to ensure that patent assignments comply with local rules.

Inventorship and priority challenges will likely continue in the CRISPR patent landscape. CRISPR patent holders have been self-revoking European patents to negate adverse EPO decisions. At least the CVC inventors, Sigma-Aldrich, and the Broad have used this strategy to avoid unfavorable rulings that could affect related patents.[64] We can expect these disputes to continue, and inventorship issues to persist.

## Notes

1. https://www.nobelprize.org/prizes/chemistry/2020/press-release/.
2. https://www.nature.com/articles/d41586-020-00655-8.
3. https://www.chop.edu/news/worlds-first-patient-treated-personalized-crispr-gene-editing-therapy-childrens-hospital.
4. Regents of the Univ. of Cal. v. Broad. Inst., Inc., 136 F.4th 1367 (Fed. Cir. 2025); see also https://www.whitecase.com/insight-alert/federal-circuit-clarifies-standard-patent-conception-ongoing-crispr-dispute.
5. Regents, 136 F.4th at 1381.
6. https://www.broadinstitute.org/crispr/journalists-statement-and-background-crispr-patent-process.
7. 37 C.F.R. § 1.78(a)(2) and MPEP § 211.01 mandate that each provisional application has the same inventor or at least one joint inventor in common with a later-filed application. Additionally, under 35 U.S.C. § 262, each named inventor holds an undivided ownership interest in the patent, underscoring the legal significance of correct inventorship designation in the patent rights structure.
8. 450 F. Supp. 3d 512, 546 (D. Del. 2020).
9. See 35 U.S.C. § 135; Manual of Patent Examining Procedure § 2157.
10. Merck Serono S.A. v. Hopewell Pharma Ventures, Inc., No. 2025-1210, slip op. at 21 (Fed. Cir. Oct. 30, 2025).
11. See, e.g., Dana-Farber Cancer Inst., Inc. v. Ono Pharm. Co., 964 F.3d 1365, 1370 (Fed. Cir. 2020);Yeda Research & Dev. Co. v. Imclone Sys. Inc., 443 F. Supp. 2d 570, 616 (S.D.N.Y. 2006).
12. Blue Gentian, LLC v. Tristar Prods., Inc., 70 F.4th 1351, 1357 (Fed. Cir. 2023).
13. 649 F.3d 1276, 1285 (Fed. Cir. 2011).
14. 450 F. Supp. 3d. at 548-50.
15. Egenera, Inc. v. Cisco Sys., 972 F.3d 1367, 1377 (Fed. Cir. 2020).
16. See, e.g., Equil IP Holdings LLC v. Akamai Techs., Inc., 2025 U.S. Dist. LEXIS 27026, *4-5 (D. Del. Feb. 14, 2025); ChriMar Sys. v. Cisco Sys., 2019 U.S. Dist. LEXIS 229938, *28-29 (N.D. Cal. Dec. 17, 2019); Apple Inc. v. Masimo Corp., 2024 U.S. Dist. LEXIS 182606, *9 (D. Del. Oct. 7, 2024).
17. Inline Plastics Corp. v. Lacerta Grp., Inc., No. 18-cv-11631-MRG, slip op. (D. Mass. Nov. 13, 2025).
18. https://www.broadinstitute.org/news/rockefeller-university-and-broad-institute-mit-and-harvard-announce-update-crispr-cas9.
19. Id.
20. Regents, 136 F.4th at 1382.
21. Paris Convention for the Protection of Industrial Property of March 1883 (latest version, Stockholm 1967, with 1979 amendments), Article 4ter.
22. G. Bodenhausen, WIPO Guide to the Application of the Paris Convention (Geneva 1968), at 64 (noting that Article 4ter reflects "what is commonly called the

'moral right' of the inventor to be named as such in the patents").
23. European Patent Convention, Article 62.
24. Id. at Article 81.
25. Id. at Article 60(1).
26. Id.
27. Rijksoctrooiwet 1995 (National Patent Act 1995) Netherlands, Article 12(1).
28. European Patent Convention, Article 81.
29. Id.
30. European Patent Convention, Implementing Regulations, Rule 19(2).
31. European Patent Convention, Implementing Regulations, Rule 21(1).
32. Guidelines for Examination in the European Patent Office, Part A, Chapter III, 5.4 Deficiencies.
33. Id.
34. T 0844/18 at 2.
35. Id. at 1.
36. T 2360/19 at 4.
37. Id. at 4-5.
38. Id.
39. T 0844/18 at 2.
40. Id. at 3.
41. Id. at 2, 50.
42. G 0001/22 and G 0002/22 at 2.
43. https://www.epo.org/en/legal/official-journal/2022/03/a27.html.
44. G 0001/22 and G 0002/22 at 37.
45. Id. at 38 (emphasis added).
46. Id. at 48.
47. Id. at 40.
48. Id. at 39.
49. Id. at 40.
50. T 2516/19 at 6.
51. Id.
52. See Guidelines for Examination in the European Patent Office, Part A, Chapter III, 6.1 General remarks; https://link.epo.org/web/legal/guidelines-epc/en-epc-guidelines-2024-hyperlinked-showing-modifications.pdf.
53. Id.
54. Case Law of the Boards of Appeal of the European Patent Office, III, W. 1. Guidelines not binding on boards; https://www.epo.org/en/legal/case-law/2025/clr_iii_w_1.html.
55. T 2360/19 at 4-5.
56. Id. at 2.
57. T 2360/19 at 14.
58. Id. at 15.
59. Id.
60. Id.
61. Id. at 16.
62. See T 2689/19 for Broad patent EP2764103;T 0098/23 for Broad patent EP2931897.
63. T 2360/19 at 2-4.
64. https://www.technologyreview.com/2024/09/25/1104475/nobel-prize-winners-cancel-crispr-patents-europe/; https://www.iam-media.com/article/breaking-broad-institute-self-revokes-core-crispr-cas9-patent-following-ucals- example.