No. 15-1182

# Supreme Court of the United States

SEQUENOM, INC.,
*Petitioner,*
v.
ARIOSA DIAGNOSTICS, INC., AND
DNA DIAGNOSTICS CENTER, INC.,
*Respondents.*

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

## BRIEF OF AMICUS CURIAE BOSTON PATENT LAW ASSOCIATION IN SUPPORT OF SEQUENOM, INC.'S PETITION FOR A WRIT OF CERTIORARI


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## INTEREST OF AMICUS CURIAE

The Boston Patent Law Association (BPLA) is a professional association of approximately 1000 attorneys and other professionals whose interests and practices lie in the area of intellectual property. The BPLA's members include both in-house and outside counsel representing a diverse range of clients. The BPLA therefore has an institutional interest in seeing the law develop in a clear, predictable, and intellectually coherent way. It also has an interest in seeing U.S. law interpreted in a manner that promotes innovation. In this case, the BPLA has an interest in seeing the reasonable boundaries of this Court's Section 101 doctrine clarified and restored.[1]

## INTRODUCTION

The patent claims in this case reflect a startling scientific discovery, a novel application of scientific tools, a new and useful result, and a revolutionary improvement in medicine. The discovery in 1996 was that cell-free fetal DNA (cffDNA) could be found in maternal plasma, which scientists had for years discarded as medical waste. Pet. App. at 3a; Patent 1:41-55. The scientific tools involved genetic amplification methods, applied for the first time to maternal plasma. *Id.* And the invention itself combined these man-made tools "in a new way that revolutionized prenatal care." Pet. App. at 18a. No

[1] The BPLA has no financial interest in any party or the outcome of this case. This brief was neither authored nor paid for, in whole or in part, by any party. The attorneys and law firms who worked on this brief contributed their time *pro bono*. Each party filed a blanket consent for *amicus* briefs.

one had combined these steps or yielded these results. *Id.* Yet in a set of decisions, concurrences, and dissents that may be charitably characterized as diverse, the Federal Circuit has invalidated the claims.

Clearly something is wrong. This Court could not have intended such a result when it set forth its *Mayo*/*Alice* framework. It could not have intended so broad a reading of the first *Mayo*/*Alice* prong, nor such a mechanical and parsimonious reading of the second – in isolation – such that a novel discovery exploited by conventional techniques is always categorically barred from patenting. Nor could this Court have intended the lower courts to abandon its preemption analysis, an antecedent test that keeps the "natural phenomenon" exception from consuming the whole of patentable subject matter. Section 101 doctrine today lacks any discernible limits.

This Court must respond. The Federal Circuit's misinterpretation of *Mayo*/*Alice* and its abandonment of this Court's preemption jurisprudence has jeopardized significant fields of innovation. The panel decision below, if left standing, will retard investment and harm innovation in the fields of medical diagnostics and personalized medicine, fields of considerable importance to the health and economy of the nation.

## ARGUMENT

This Court in *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294 (2012), sought to cabin the broad wording of 35 U.S.C. § 101, wording that would otherwise permit the patenting

of "anything under the sun that is made by man." *Diamond v. Chakrabarty* 447 U.S. 303, 309 (1980) (citing the 1952 Patent Act Committee Report). The Court sought to distinguish patent-ineligible *discoveries* from patent-eligible *applications* of discoveries. To do so, the Court sketched out a two-part test: (1) Is the claim directed to a judicially-excepted category (*e.g.* a natural law) and, if so; (2) Does the claim "add enough . . . to allow the processes . . . to qualify as patent-eligible processes that apply natural laws." *Mayo*, 132 S.Ct. at 1297. The test was designed to prevent claims from improperly "preempting" all uses of a newly discovered phenomenon. *Id.* The Court reiterated the test again in *Alice Corp. Pty. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014).

The two-part *Mayo/Alice* test has many, many critics.[2] For purposes of this appeal, however, the Court need only note that the Federal Circuit has made something of a hash of it.

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[2] *See, e.g.*, http://www.ipwatchdog.com/2014/09/25/broken-patent-eligibility-test-of-alice-and-mayo/id=51370/; http://patentlyo.com/patent/2014/06/eligibility-implemented-inventions.html. Several commentators have noted that Section 101 may already give the USPTO and courts sufficient guidance, without the need for additional court-created exceptions. By definition, a natural law can be newly *discovered* but not *new* since it existed before anyone discovered it. Section 101 therefore arguably proscribes its patenting without need for further analysis. Several commentators have advocated dropping the judicially-created exceptions at issue in this case. *See, e.g.*, Br. for Amici Curiae Eli Lily and Company et al. (April 1, 2016).

## I. THE FEDERAL CIRCUIT MISCONSTRUED AND MISAPPLIED *MAYO/ALICE*

### A. The Panel Failed to Examine the Claim as a Whole

The Federal Circuit panel erred by failing to address the claim *as a whole* in the first step of its analysis. Instead of considering whether the claim as a whole was directed to a natural phenomenon – the correct test – the court considered whether just one part of the claim was directed to a natural phenomenon.

The panel applied the *Mayo/Alice* test as follows: (1) maternal cffDNA was a naturally-occurring phenomenon, Pet. App. at 10a, and thus the entire claim was "directed to" a natural phenomenon, Pet. App. at 12a; (2) the additional method steps used to exploit the phenomenon were not novel; Pet. App. at 13a; and thus (3) the overall invention was not novel. *Id.* "Because the [individual] method steps were well-understood, conventional and routine, the [overall] method of detecting paternally inherited cffDNA is not new and useful." *Id.*

The panel erred in the first step of *Mayo/Alice* by failing to consider the claim as a whole. It looked at just one part of the claim – *i.e.* the part concerning a natural phenomenon – and asked whether *that part* was directed to a natural phenomenon. Of course it was. Such reasoning would demand a "yes" answer in the first step for all inventions that mention or utilize natural phenomena.

By looking at just part of the claim, the panel also missed the significance of the entire claim. The panel missed the difference between a physical substance and *information* gleaned from the detection of a substance. The panel stated that the claimed method "begins and ends with a natural phenomenon." Not so. That characterization treats the amplified cffDNA produced by the claimed method the same as the original cffDNA in the maternal serum. The two may be chemically identical, but the claim is not directed to the cffDNA itself. The claim is directed to detecting *information*. The final cffDNA, amplified and purified by gel electrophoresis (the much-maligned conventional method), has been distilled out of the more voluminous maternal DNA. It acts as a signal of the existence of fetal characteristics. The method starts with noise and ends with signal. Had the panel viewed the claim as a whole, this inventive characteristic would have been more apparent.

The panel made exactly the same error in applying the second step of *Mayo/Alice*. *See* Pet. App. 13a. By unbundling the claim wording and examining the method steps individually, the panel understated the novelty of those steps as a whole (*i.e.* their application to this particular substance, to get this particular result). The panel characterized the steps as "well-known" without fully acknowledging that they had never been assembled and used in this particular manner. This was error.

Put differently, by disregarding the additional steps applied to the maternal serum on the theory that they were merely conventional, the court below

found that the only thing left in the claim was a natural phenomenon (cffDNA in maternal serum). As a result, it deemed the entire claim to be directed to a natural phenomenon.

That has not been this Court's jurisprudence. The Court has repeatedly said it is improper to dissect away "old" elements and ignore their presence in the analysis of the claim as a whole. The Court was especially clear on this point in *Diamond v. Diehr*, 450 U.S. 175 (1981):

> In determining the eligibility of respondents' claimed process for patent protection under §101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim, because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made. The 'novelty' of any element or steps in a process, or even of the process itself, is of *no relevance* in determining whether the subject matter of a claim falls within the §101 categories of possibly patentable subject matter.

*Diehr,* 450 U.S. at 188-9 (emphasis added).

This analysis is not changed by the presence, somewhere in the claim, of a law of nature. "[A] process is not unpatentable simply because it contains a law of nature or a mathematical algorithm. It is now commonplace that an *application* of a law of nature . . . may well be deserving of patent protection." *Id.* at 187 (emphasis in original).

*Diehr* would be done grave violence by omitting the "claim as a whole" analysis from the first step of the *Mayo*/*Alice* framework, because the answer to the first step would always be "yes." Any invention applying a law of nature to known steps to obtain a new and useful result would automatically be cast into the metaphysical search for an "inventive concept," which would nearly never be found, no matter how profound the impact of the invention. That result clearly cannot be squared with *Diehr*.[3]

The wrongness of the panel's decision is further shown by its dubious assertion that "the method of detecting paternally inherited cffDNA is *not new and useful*." Pet. App. at 13a. (emphasis added). The claimed method is certainly new. No one had done it before. And if it were not useful this case would not be before the Court today.

In sum, the claim as a whole was not directed to a natural phenomenon. The panel below should

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[3] Nor would *Diehr* countenance the panel's implicit disparagement of the "well-understood" process steps. Inventors work with the tools at hand all the time, when they exploit new discoveries to create a new and useful process. The exploiting steps are almost always known or conventional.

have stopped there, finding the first step of the *Mayo*/*Alice* test unmet.

### B. The Panel Fundamentally Misunderstood This Court's Guidance on Preemption

The panel compounded the foregoing look-at-part-but-not-the-whole error by announcing that no preemption analysis was required – the issue was "moot" – because the claim was patent-ineligible. Pet. App. at 16a-17a. That is, rather than undertaking a preemption analysis to help determine whether the claim was in fact directed to an ineligible category, the panel below "deemed" the claim directed to an ineligible category and then opted to skip the preemption analysis entirely. *Id.*

The panel actually started out on track. It began by noting that "[t]he Supreme Court has made clear that the principle of preemption is the basis for judicial exceptions to patentability." Pet. App. at 17a (citing *Alice*, 134 S.Ct. at 2354). Correct. The panel went further, noting that "patent claims should not prevent the use of the basic building blocks of technology—abstract ideas, naturally occurring phenomena, and natural laws." *Id.*

But then the panel veered off track, announcing for the first time that "[w]hile preemption may signal patent ineligible subject matter, the absence of complete preemption does not demonstrate patent eligibility." *Id.* at 16a.

This was error. Preemption is and always has been *the only* reason for the judicial exceptions. *Alice*, 134 S. Ct. at 2354-55 (stating that preemption

is "the concern that drives" the Section 101 exceptions). As the panel itself admitted: "preemption is *the* basis for the judicial exceptions." *Id.* (emphasis added).[4] Preemption does not merely signal ineligibility, it is the only basis for it.

The panel therefore erred in ignoring and/or skipping this Court's only concern in this area. The panel was "jettisoning the one reliable compass this Court had identified for Section 101 cases – the patent's preemptive scope." Pet. at 14. Under the panel's reading of *Mayo*/*Alice*, a claim would be found ineligible no matter how much evidence there was that it did not preempt a phenomenon or a field.

Again, this is wrong. A patent claim's preemptive scope must be determined first, to see whether or not it gives rise to an exemption. Such a preemption analysis is the "best-tested way of knowing when a patent claims only an application of a newly discovered phenomenon, rather than the whole phenomenon." Pet. at 22. It helps jurists "carefully [] constru[e] this exclusionary principle

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[4] "We have interpreted §101 and its predecessors in light of this exception for more than 150 years." *Alice*, 134 S. Ct. at 2354 (citing *Le Roy v. Tatham,* 14 How. 156, 174–175, 14 L.Ed. 367 (1853)). The Patent Act of 1793 defined statutory subject matter as "any new and useful art, machine, manufacture, or composition of matter, or any new or useful improvement [thereof]," Act of Feb. 21, 1793, § 1, 1 Stat. 319. Yet the Court has voiced a continuing concern that patents not unduly preempt what should be "free to all men and reserved exclusively to none." *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127,130 (1948). Hence the Court's creation of the judicial exceptions to Section 101's broad language. *Alice*, 134 S. Ct. at 2354.

lest it swallow all of patent law." *Alice*, 134 S.Ct. at 2355.

The preemption test also comports with the Court's broader articulation of the two-part test in *Alice*. The first prong of the test asks "whether the claims at issue are directed to one of those patent-ineligible concepts." *Id.* *Alice* asks what the claim actually claims, not merely what it contains. Preemption is based solely on what the patent actually claims, since that is the exclusionary boundary of the patent, *i.e.*, what the patentee can exclude others from doing. If the patent "claims" the natural phenomenon itself and allows the patentee to stop others from using the natural phenomenon, there is preemption. If it merely mentions, contains, or incorporates, a natural phenomenon, but does not "claim" it, there is no preclusion of others using the natural phenomenon for other applications.

Here, there is no preemption. The inventors did not claim the existence of maternal cffDNA. They did not claim naturally occurring sequences. They did not claim every application of them. Instead, they claimed one specific application involving one specific fraction of the naturally occurring cffDNA. Judge Lourie, joined by Judge Moore, explained that the claims merely "rely on or operate by, but do not recite, a natural phenomenon," Pet. App. at 79a. The particular uses of maternal cffDNA claimed here will not preclude other uses or applications of that same material or knowledge of its existence. Indeed, much of the ensuing innovation may come in patentably-different methods of exploiting the newly discovered phenomenon. Sequenom has offered

evidence that there are other uses of cffDNA. Pet. App. at 17a.

The lack of preemption should likewise be regarded as definitive evidence that Sequenom is not claiming a natural phenomenon. Thus the '540 patent claims should be deemed patentable, even though they contain or rely upon a natural phenomenon. Patents that "pose no comparable risk of pre-emption … remain eligible for the monopoly granted under our patent laws." *Alice*, 134 S. Ct. at 2354-55.

## II. THIS CASE IS A STRONG CANDIDATE FOR CERTIORARI REVIEW

This case is an excellent candidate for certiorari review because: (1) the Federal Circuit is in disarray; (2) the risk of systemic harm is great; and (3) a simple fix is at hand.

### A. The Federal Circuit is in Disarray

Most of the opinions below stated that the panel's decision was wrong but the Judges had no authority to change it. Only this Court can do that.

Judge Linn identified the problem in his concurrence. "I join the court's opinion …. only because I am bound by the sweeping language of the test set out in *Mayo*. This case represents the consequence – perhaps unintended – of that broad language in excluding a meritorious invention from the patent protection it deserves and should have been entitled to retain." Pet. App. at 20a-21a.

Indeed, Judge Linn was not the only one unhappy with the panel decision. None of the three opinions issued in response to the *en banc* petition supported the panel decision or its reasoning. Indeed, every judge who wrote an opinion in response to the *en banc* petition voiced some concern with this Court's guidance.

According to Judge Lourie, joined by Judge Moore, the patent should have been deemed eligible:

> In my view neither of the preclusions of laws of nature or of abstract ideas ought to prohibit patenting of the subject matter in this case. . . . [M]ethods that utilize laws of nature do not set forth or claim laws of nature. All physical steps of human ingenuity utilize natural laws or involve natural phenomena. Thus, those steps cannot be patent-ineligible solely on that basis because, under that reasoning, nothing in the physical universe would be patent-eligible.

Pet. App. at 77a. But he reluctantly concluded that "the panel did not err in its conclusion that under Supreme Court precedent it had no option but to affirm the district court." Pet. App. at 82a.

Judge Newman agreed the underlying decision had been "wrongly decided" and that the claims should have been found patent-eligible. Pet. App. at 100a. In her view:

> The facts of this case diverge significantly from the facts and rulings in *Mayo* [since] [in] *Mayo*, both the medicinal product and its metabolites were previously known, leaving sparse room for innovative advance in using this information as a diagnostic dosage tool. …. In the case now before us, the claimed method was not previously known, nor the diagnostic knowledge and benefit implemented by the method. Pet. App. at 100a-101a.

Judge Dyk, in his concurrence, announced that he "share[d] the concerns of some of my colleagues that a too restrictive test [under Section 101] may discourage development." But he admitted flatly: "Further guidance must come from the Supreme Court." Pet. App. at 84a.

Just as a traditional Circuit split warrants *cert*, the deep internal divisions within Federal Circuit warrant *cert* here in this patent law matter.

### B. If Left Standing, the *Sequenom* Decision Will Slow or Stall the Development of Promising Screening and Diagnostic Tests

The Federal Circuit's disarray and paralysis have potentially devastating consequences beyond this case.

Clinical screening and diagnostics are at the forefront of fighting and eradicating diseases. Drs. Lo and Wainscoat, for example, used the methodologies at issue in the '540 patent to detect

fetal aneuploidies like Down syndrome, an incurable genetic disorder caused by the presence of all or part of a third copy of chromosome 21. *See* U.S. Patent No. 6,258,540 at 3:44-52.[5] Children and adults with Down syndrome are at increased risk of epileptic seizures and ultimately Alzheimer's disease.[6] The pre-natal detection methodologies of Drs. Lo and Wainscoat would never have come to fruition had anyone known that they would be unpatentable.

Looking ahead, the recently active Zika virus has been linked to serious birth defects.[7] Currently there is no test available to detect the virus before it spreads from a pregnant woman to her fetus. Without patent protection, there is simply no incentive for a company to spend time, money, and effort to develop such a screening or a diagnostic methodology.

Perhaps most striking, the lack of patent protection for inventions like those claimed in the '540 patent will jeopardize the most promising field of medicine in a generation: "personalized" or "precision" medicine. In launching The Precision Medicine Initiative, President Obama stated that:

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[5] *See generally* Weijerman, ME *et al.*, *Clinical Practice. The Care of Children with Down Syndrome*, European Journal of Pediatrics (Dec 2010) 169(12):1445–52.

[6] Malt, EA *et al.*, *Health and Disease in Adults with Down Syndrome*, Journal of the Norwegian Medical Association (Feb 5, 2013) 133; M. William Schwartz, ed., *The 5-Minute Pediatric Consult* (6th ed. 2012) (Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins) 289, ISBN 978-1-4511-1656-4.

[7] *See* www.cdc.gov/zika/pregnancy/index.html

> Doctors have always recognized that every patient is unique, and doctors have always tried to tailor their treatments as best they can to individuals. You can match a blood transfusion to a blood type – that was an important discovery. What if matching a cancer cure to our genetic code was just as easy, just as standard? What if figuring out the right dose of medicine was as simple as taking our temperature?[8]

The basic concept is that drugs behave differently on different patients. Drug A may work well on patient No. 1 but poorly on patient No. 2; the different responses arise out of different gene characteristics (called alleles), which can be used as trait markers. A patient with Gene N-allele-type-1 might respond well to Drug A, while a patient with Gene N-allele-type-2 might respond better to Drug B.

In this model, diagnostic testing is often employed for selecting the most appropriate and optimal therapies based on the context of a patient's genetic content or other molecular or cellular analysis.[9] Thus, precision medicine is driven by, and requires, appropriate diagnostics to make it work. A major problem though, is that such diagnostics are

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[8] *See* https://www.whitehouse.gov/precision-medicine.

[9] *See* http://www.personalizedmedicinecoalition.org/Userfiles/PMCCorporate/file/pmc_the_case_for_personalized_medicine.pdf

costly, difficult, and time consuming to bring to the market. Like the patent at issue in this case, they exploit natural phenomena (the relationship of genes and alleles to certain drugs) using known methods in novel and unexpected ways. Once made, they are easily copied.

Yet the panel's decision below would bar patent protection. Without patent protection, no rational company will undertake the effort to discover the underlying phenomena or to develop the diagnostic tests that exploit them. As Justice Stevens noted in his concurring opinion in *Bilski*,

> [S]cholars generally agree that when innovation is expensive, risky, and easily copied, inventors are less likely to undertake the guaranteed costs of innovation in order to obtain the mere possibility of an invention that others can copy. Both common sense and recent economic scholarship suggest that these dynamics of cost, risk and reward vary by the type of thing being patented.

*Bilski v. Kappos*, 130 S. Ct. 3218, 3253-54 (2010). Personalized medicine will slow or stall entirely.

As Dr. Francis Collins, Director of the National Institute of Health testified before the Senate, "We have waited a long time to reach the point where the technology would make [personalized medicine] possible and the time is now. We have really reached a remarkable inflection point in the potential of

medical research and we should not let this moment pass."[10]

### C. The Question Presented is Clear, Unambiguous, and Capable of Resolving These Problems

The Court can resolve this looming crisis by taking up this case. The Petitioner formulated the Question Presented in this case as:

> Whether a novel method is patent-eligible where: (1) a researcher is the first to discover a natural phenomenon; (2) that unique knowledge motivates him to apply a new combination of known techniques to that discovery; and (3) he thereby achieves a previously impossible result without preempting other uses of the discovery?

This strikes us as a balanced and fair question in light of the panel's decision. But the same question could perhaps be more pointedly re-cast in a way that focuses on the panel's errors:

> Where a claim (1) merely mentions or includes a natural phenomenon and adds (2) well-known method steps, such that (3) the combination is new and the outcome is new and useful, and (4) does not preempt other uses of the

[10] https://www.collins.senate.gov/newsroom/senator-collins-questions-top- health-officials-new-frontier-%E2%80%98precision-medicine%E2 %80%99

> phenomenon, is the claim patent-eligible?

The answer is clearly yes. More important, for purposes of the instant petition, an answer *either way* by this Court will give the public desperately needed guidance. A "yes" answer will drive investment into the diagnostics required for precision medicine. A "no" answer will either retard the exploitation of natural phenomena or drive the newly discovered laws of nature into the world of trade secrets. Either way, this Court's willingness to engage the question will resolve a sea of uncertainty in several important fields.

It would also resolve whether seemingly inconsistent statements by this Court still have viability. For example, a tension seems to exist between *Flook*[11] and *Diehr*. What is the quantum of postsolution activity that made the claimed subject matter not patent eligible in *Flook*, but patent eligible in *Diehr*? Nothing in the latter suggests that the process steps beyond the algorithm were unconventional or inventive. It seems that the difference was that in *Diehr*, incorporation of the algorithm made the claimed process more useful. And this is consistent with the language of Section 101. A "yes" answer to the Question Presented would be consistent with this, and would clarify this seeming tension. Conversely, a "no" answer would add to the ambiguity.

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[11] *Parker v. Flook*, 437 U.S. 584, 587 (1978).

## CONCLUSION

Inventions in the medical field today frequently follow close on the heels of discoveries of natural phenomena and apply known process steps. Often, they provide a useful and hitherto impossible result. This new and important field of invention is now in jeopardy. The Court should grant cert and clarify the boundaries of its Section 101 jurisprudence, "lest it swallow all of patent law." *Alice*, 134 S. Ct. at 2354.

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