

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

THORNE RESEARCH, INC. AND THORNE HEALTHTECH, INC.,
Petitioner,

v.

THE QUEEN'S UNIVERSITY OF BELFAST AND CHROMADEx, INC.,
Patent Owner.

Case No. PGR2026-00400
Patent No. 12,252,506 B2

**PETITIONER'S BRIEF IN SUPPORT OF
DISCRETIONARY DENIAL**

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I. INTRODUCTION

The Director should deny Patent Owner's request to exercise discretionary denial. First, the *Fintiv* factors do not support Patent Owner's request: a *Sotera* stipulation minimizes any risk of overlapping argument; a final written decision is expected well before trial; there has been little investment of resources in parallel litigation; and the Office is the best venue for correcting the Examiner's error. Second, the petition demonstrates material Examiner error, including based on arguments not previously addressed by the Office, making discretionary denial under 35 U.S.C. § 325(d) unwarranted. Patent Owner's arguments to the contrary are replete with misrepresentations of the facts and unsubstantiated arguments.

With its *inter partes* review petition, Thorne challenges the validity of the '506 patent in exactly the manner intended by Congress: it seeks to use the Office as a quick and cost-effective alternative to district court litigation, identifies new arguments not yet considered by the Office, and confines its arguments to the requirements of § 311(b).

ChromaDex's request for discretionary denial should be *denied*.

II. DISCRETIONARY DENIAL UNDER *FINTIV* IS NOT WARRANTED

A holistic analysis of the *Fintiv* factors favors a finding that discretionary denial should not be exercised. Notably, a *Sotera* stipulation minimizes any risk of overlapping litigation, and the likely date of trial will occur long after the expected

date of the final written decision in this administrative proceeding—contrary to ChromaDex’s misrepresentations.

A. The *Fintiv* Factors Weigh Against Discretionary Denial.

1. No Risk of Overlapping Litigation (*Fintiv* Factor 4).

Validity was not an issue in the co-pending district court litigation when the petition was filed. When counter-claims were filed that raised issues relating to validity, Thorne concurrently filed a *Sotera* stipulation, immediately addressing any potential concerns of overlap. There is no risk of overlapping litigation.

At the time the petition for this *inter partes* review was filed, it was the only challenge to ’506 patent validity. In response to ChromaDex’s APEX action, Thorne filed a narrow district court complaint requesting a declaratory judgment finding that Thorne did not infringe the ’506 patent. EX2002. As ChromaDex itself recognizes, Thorne did not raise an invalidity challenge in the district court complaint. EX2002; Paper 6, 10 (“validity is not yet in front of the district court”). Thus, only this *inter partes* review challenged validity.

Thorne filed a *Sotera* stipulation immediately when the issue was ripe. Patent Owner’s implication that a *Sotera* stipulation should have been

preemptively filed has no basis. Paper 6, 1, 10.¹ When Thorne filed its district court counterclaims (EX1027), it immediately addressed any potential issue of overlap by concurrently filing a *Sotera* stipulation. EX1028.

Thorne’s *Sotera* stipulation ensures there is no risk of overlapping litigation concerning validity of the ’506 patent. Thorne broadly stipulated it would not pursue, in the district court case “the specific grounds advanced in the instituted IPR or any ground that reasonably could have been raised in an IPR[.]” EX1028. Such a broad stipulation “mitigates concerns of duplicative efforts between the district court and the Board” and “weighs strongly in favor of not exercising discretion to deny institution.” *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 19 (PTAB Dec. 1, 2020) (precedential). This “ensures that an *inter partes* review is a ‘true alternative’ to the district court proceeding.” *Id.* Such stipulation is “highly relevant” to finding that there is no risk of overlapping litigation. *See* Boalick Memorandum (Mar. 24, 2025).

¹ Patent Owner’s inaccurate statement that Thorne “delayed” service of its complaint (Paper 6, 1, 3, 9-10) ignores the fact that Thorne postponed service of its complaint while it engaged in good faith in settlement discussions that *ChromaDex* initiated.

2. Expected Final Written Decision Significantly Precedes Likely Trial Date (*Fintiv* Factor 2).

The expected time for the district court litigation to reach trial is well after the anticipated time for a final written decision in this proceeding (Fall 2027). ChromaDex's misleading presentation of case filings cannot demonstrate otherwise.

The Office considers median time-to-trial statistics for civil actions when applying its *Fintiv* analysis. See Boalick Memorandum (Mar. 24, 2025) ("in applying *Fintiv*, the Board may consider any evidence that the parties make of record that bears on the proximity of the district court's trial date or the ITC's final determination target date, including median time-to-trial statistics for civil actions in the district court in which the parallel litigation resides.").

The median time-to-trial statistics here do not support ChromaDex's argument. The median time from civil filing to trial in the District of South Carolina is 38.5 months. EX1029, 24. The complaint was filed on April 28, 2026 (EX2002), and 38.5 months following April 28, 2026 is the middle of July 2029. In contrast, the petition in this case was filed June 22, 2026, an institution decision is expected around Fall 2026, and the Final Written Decision would be expected in the Fall of 2027. PTAB litigation will thus provide a fast and efficient invalidity alternative to district court litigation, resolving the issue of patent invalidity more

than a year before district court litigation is expected to occur.

ChromaDex misleads the Office by stating jury selection or trial has been set. Patent Owner contends that “[t]he District of South Carolina *has scheduled jury selection and/or trial* for July 6, 2027” and argues this weighs against institution. Paper 6, 9. No such jury selection or trial has actually been set. Instead, the scheduling order merely ensures no jury selection or trial could possibly occur before July 6, 2027. EX2001, 3; *cf. Sand Revolution II, LLC v. Continental Intermodal Group – Trucking LLC*, IPR2019-01393, Paper 24 (June 16, 2020) (informative) (“the district court’s express inclusion of the qualifier ‘or as available’ for each calendared trial date of its evolving schedule...indicates a continuing degree of recognized uncertainty of the court’s schedule by the court.”). As described above, the median time-to-trial statistics indicate that actual trial will occur much later. In this case, the pleadings are not even due to close until today. ChromaDex’s representation of a fixed trial date is thus patently false.

Indeed, the parties only submitted proposed schedules to the court this week. EX1030. Thorne proposed a date for jury selection and/or trial *no earlier than* April 3, 2028—well after the expected Final Written Decision date of Fall 2027. EX1030, 22. ChromaDex initially agreed to a Fall 2027 trial date, and then backtracked after it became apparent the date would have to be pushed even further back due to ChromaDex’s inability to produce the named inventors. Thorne’s

proposed trial date—or one later than April 2028—is thus likely to be granted due to the need for foreign discovery, which can take significant time. EX1030, 2-3, 18. Thorne’s proposed schedule balances both a reasonable trial date and the need for foreign discovery created by the non-cooperation of ChromaDex’s foreign inventors. *Id.*, 2-3, 18. Consistent with the relevant median time-to-trial statistics, trial is likely to take place *well after* the Fall 2027 Final Written Decision.

3. Investment in the Parallel Proceeding is Minimal (*Fintiv* Factor 3).

Very little work has been completed in the parallel district court litigation, weighing against discretionary denial.

The third *Fintiv* factor “consider[s] the amount and type of work already completed in the parallel litigation by the court and the parties at the time of the institution decision.... [i]f, at the time of the institution decision, the district court has not issued orders related to the patent at issue in the petition,” such as claim construction orders, “this fact weighs against exercising discretion to deny institution[.]” *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11, 7 (Mar. 20, 2020) (precedential) (“*Fintiv I*”).

Here, the district court action is in the early stages: parties have not substantively briefed on matters such as claim construction, and the proposed schedule does not even account for issues such as *Markman* arguments. EX2001.

Accordingly, the early stages of district court litigation and the expeditious filing of the petition in this *inter partes* review weigh against discretionary denial.

4. Examiner Error Countenances Against Discretionary Denial (*Fintiv* Factor 6).

The sixth *Fintiv* factor considers “other circumstances that impact the Board’s exercise of discretion, including the merits.” *Fintiv I*, 14-16. Here, the Examiner erred in failing to recognize Patent Owner acting as its own lexicographer and to apply the corresponding explicit definition to the claims, and the Office is the best venue for addressing such error. This circumstance countenances against discretionary denial.

Where there is material error in the issuance of a patent, the Office is the correct venue to address that error. *Padagis US LLC v. Neurelis, Inc.*, IPR2025-00464, -00465, -00466, Paper 12, 3 (PTAB July 16, 2025) (precedential) (“review of the challenged patents is an appropriate use of Office resources” where there are raised “concerns of material error”); *see also Anthony Inc. v. ControlTec, LLC*, IPR2025-00559, -00636, Paper 12 (PTAB July 16, 2025) (“Petitioner appears to show a material error by the Office, and it is an appropriate use of Office resources to review the potential error.”).

There was material error in allowing the ’506 patent at least because the Examiner failed to apply an explicit definition from the specification to the

claimed subject matter, and because the Examiner failed to evaluate whether there was a right to priority to the earliest-filed applications in view of that definition. In doing so, the Examiner overlooked an anticipatory reference. *See* Section II.B.1-2, below. Thus, the Office is the best venue for correcting the error and *Fintiv* Factor 6 weighs against discretionary denial.

5. The Status of Any Stay Is Neutral in This Case (*Fintiv* Factor 1).

Neither party has requested a stay in the parallel district court litigation—and indeed, such a motion for stay would be unripe at this time. The lack of a stay is neutral and thus does not weigh in favor of discretionary denial.

Where, as here, parties have not yet requested a stay of parallel district court litigation, this does not weigh for or against discretionary denial, and is therefore neutral. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 15, 9-12 (May 13, 2020) (informative) (“*Fintiv II*”) (“Neither party has requested a stay of the District Court case pending this proceeding. Thus, the District Court has not ruled on this issue.... We decline to infer, based on actions taken in different cases with different facts, how the District Court would rule should a stay be requested by the parties in the parallel case here. This factor does not weigh for or against discretionary denial in this case.”); *see also Sand Revolution II*, IPR2019-01393, Paper 24 (June 16, 2020) (informative) (similar).

ChromaDex implies that Thorne has a burden to demonstrate a likely stay, but there is no such requirement and ChromaDex’s caselaw is inapplicable. Patent Owner appears to require Thorne to demonstrate there is “concrete evidence of a likely stay” of litigation. Paper 6, 8-9 (“Petitioner identifies no stay, and the current record contains no evidence that the District of South Carolina has granted or is likely to grant a stay...”). But the PTAB’s informative *Fintiv II* decision shows Petitioner has no such burden: where neither party requests a stay, Factor 1 does not weigh for or against discretionary denial. *Fintiv II*, 9-12. Petitioner’s reliance on *Luxshare* is inapposite. Paper 6, 9. In that case, ITC litigation had proceeded beyond an initial determination, the ITC final determination was due just two months following the discretionary denial decision, and significant efforts had already taken place in the ITC litigation. *Luxshare Precision Industry v. Amphenol Corp.*, IPR2022-00132, Paper 10, at 9 (PTAB May 3, 2022). In contrast, here a request for stay would be premature and unripe. Parallel litigation trial is still far in the future (Section II.A.2) and there has not been significant investment of resources (Section II.A.3). Where, as here, there are “many legitimate reasons [that] may lead a party not to file a motion to stay prior to the Board’s institution decision, including that such a motion may be viewed as premature,” the Office will not speculate on the issue of a stay, and treats this *Fintiv* factor as neutral. *GlobalFoundries Inc. v. UNM Rainforest Innovations*, IPR2020-00984 Paper 11,

9-10 (PTAB Dec. 9, 2020).

6. Party Identity (*Fintiv* Factor 5) Does Not Tip The Balance Toward Exercising Discretionary Denial.

The last *Fintiv* factor—identity of the parties (Factor 5)—is neutral, or at most is to be afforded little weight. A holistic evaluation of the *Fintiv* factors should find that discretionary denial is not warranted, even should this factor slightly weigh in favor of discretionary denial.

Where there is no substantial overlap between invalidity contentions and the petition challenges, the Office can consider other factors and treat the fifth *Fintiv* factor as neutral. In the precedential *Snap* decision, the Board found that when considerations included that “there is not substantial overlap between the invalidity contentions and the Petition challenges, we regard the consideration of the fifth *Fintiv* factor as neutral or, at most, weighing slightly in favor of exercising discretion to deny institution” even where there was no dispute that the parties were the same in the district court litigation. *Snap, Inc. v. SRK Technology LLC*, IPR2020-00820, Paper 15, 16 (PTAB Oct. 21, 2020).

Here, because there is no risk of overlapping invalidity arguments, the Office should find that the fifth *Fintiv* factor is neutral. Though parties in the parallel litigation match those in this *inter partes* review challenge, Thorne ensured there is no risk of overlapping arguments by filing a *Sotera* stipulation. *See* Section

II.A.1. The remaining *Fintiv* factors are favorable to Thorne, and the Office should treat the fifth *Fintiv* factor as neutral, as it did in *Snap*.

The Office routinely refuses to exercise discretionary denial though there is identity between parties in the PTAB and parallel district court litigation. For example, in the precedential *Sotera* decision, “the parties [were] the same in the *inter partes* proceeding and in the parallel proceeding” but under a holistic approach, the Board “decline[d] to deny institution under § 314(a).” *Sotera*, IPR2020-01019, Paper 12 at 19-21. Similarly, in the informative *Sand Revolution II* decision (IPR2019-01393, Paper 24), the Board declined to exercise discretionary denial though the parties were “the same as those of the related district court litigation,” noting this was “far from an unusual circumstance.” IPR2019-01393, Paper 24, 12-13.

Thus, the Office should treat *Fintiv* factor 5 as neutral, or at most should afford it very little weight, as it does not overcome the remaining *Fintiv* factors, which countenance against discretionary denial. *Sections* II.A.1-5.

In sum, a holistic evaluation of the *Fintiv* factors finds in favor of Petitioner, and ChromaDex’s request for discretionary denial should be denied.

B. The Petition Raises Novel Issues Overlooked During Examination.

Thorne’s arguments raised in its petition are novel, thus discretionary denial under § 325(d) should not be exercised. ChromaDex never demonstrates that the

Examiner considered the issue of priority based on a lack of written description or enablement. The Examiner's twofold error—ignoring an explicit definition and overlooking a lack of right to priority—led to improperly allowed claims. This *inter partes* review raises these issues for the first time and the petition should not be discretionarily denied under § 325(d).

1. The Examiner Erred By Failing To Recognize An Explicit Definition.

ChromaDex acted as its own lexicographer in drafting its patent specification, providing a clear and express definition for certain R-groups. It later sought claims that are impossible in view of its own defined R-groups. The Examiner erred in failing to recognize the ChromaDex defined terminology, and Patent Owner now asks the Office to countenance that error.

It is black-letter law that a patentee's definitions are given deference when it acts as its own lexicographer, and that the best guide for claim term definitions is within the specification. "[T]he specification 'acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1321 (Fed. Cir. 2005); *see also Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). "[T]he patentee **must be bound** by the express definition." *Sinorgchem Co. v. Int'l Trade Comm'n*, 511 F.3d 1132, 1136 (Fed. Cir. 2007).

ChromaDex cannot credibly deny that the functional groups R₆-R₈ were explicitly defined as hydroxyl-protecting groups. The '506 patent describes R₆-R₈ for the first time when describing formula (III), and expressly states that “**R₆, R₇ and R₈**, which may be the same or different, **are each independently a hydroxyl-protecting group.**” EX1001, 8:17-28. This is a straightforward definition: there are no caveats, exceptions, or variations. R₆-R₈ **must** each be “a hydroxyl-protecting group.” When addressing formula (IV), the specification explains that R₆-R₈ are “as defined above.” *Id.*, 7:1-16. This is both a recognition that the previous description was, in fact, an express definition, and explains that the very same definition applies to formula (IV)—the formula at issue in the '506 patent claims.

Notwithstanding this explicit definition of R₆-R₈, ChromaDex sought the claims that issued here, reciting formula (IV) wherein “R₆, R₇ and R₈, which may be the same or different, are each independently H or a hydroxyl-protecting group; or wherein R₆ is a phosphate.” EX1001, Claim 1. These claims are “contrary to the specification’s clear definition that formula (IV) R₆-R₈ must be hydroxyl-protecting groups.” EX1013, ¶43.

While ChromaDex argues there is support in priority applications for R₆-R₈ as hydrogen (rebutted below, Sections II.B.3-4), its request for discretionary denial **never denies or even addresses that there is no § 112 support for R₆ as a phosphate** from the priority applications. Pet., 14, 18; EX1013, ¶¶69, 73, 77, 91,

105. This is yet another reason why the '506 patent has no right to priority before April 26, 2023 (Pet., 8). The Examiner committed error in allowing the '506 patent claims, and ChromaDex provides no reason to find to the contrary.

The Examiner materially erred in overlooking an express definition of terms, and ChromaDex requests that the Office countenance that error by discretionarily denying this challenge. ChromaDex's request never denies that the Examiner overlooked the specification's express definition of R_6 - R_8 as applied to formula (IV). The record here is clear that the specification expressly defined the terms R_6 - R_8 as limited to hydroxyl-protecting groups and the Examiner erred by overlooking the definition and issuing claims lacking descriptive support in the priority documents, thereby invoking intervening art problems.

2. The Examiner's Error Was Material: Failure To Address Lack Of Priority And Intervening Prior Art.

In failing to apply the express definition of R_6 - R_8 to the claims, the Examiner overlooked that unsupported subject matter (i.e., R_6 - R_8 as hydrogen, or R_6 as phosphate) does not have a right to priority to the earliest-filed applications in the patent family. Because the Examiner was unaware of this lack of priority, the Examiner failed to consider an earlier patent publication as anticipatory intervening prior art. The Examiner's error was material and is a novel issue Thorne raises for the Office for the first time with its petition.

ChromaDex points to nothing in the record to demonstrate that the Examiner considered the issue of whether R₆-R₈ as hydrogen or R₆ as phosphate had a right of priority to the PCT or earliest utility applications. At most, Patent Owner implies the Examiner considered support from the specification for certain claim amendments (Paper 6, 6-8), but there is no indication that the Examiner ever considered whether or not there was a lack of priority to the earliest applications in the patent family. As Dr. Prestwich explained, the '506 patent has no right of priority to the earliest filed applications, thus the Examiner's failure to address this lack of priority was in error. EX1013, ¶¶65-78.

Where, as here, a patent does not have a right to priority to its earliest-filed applications, then earlier-filed members of that patent family can be relied upon as anticipatory intervening art. *Indivior UK Ltd. v. Reddy's Labs. S.A.*, 18 F.4th 1323, 1325 (Fed. Cir. 2021); *see also Arthrex, Inc. v. Smith & Nephew, Inc.*, 35 F.4th 1328, 1342 (Fed. Cir. 2022).

The Examiner erred in not considering the '184 patent publication as intervening anticipatory prior art. Because the record does not indicate that the Examiner ever considered the issue of priority, it does not show that the Examiner ever considered the '184 publication as intervening prior art. ChromaDex contends that the '184 publication "was no stranger to the examiner" because, *inter alia*, the Examiner applied the '184 publication for obviousness-type double patenting.

Paper 6, 17-18. But there is nothing in the record to indicate that the Examiner ever considered the '184 publication as potential intervening prior art, which was erroneous because this reference is anticipatory.

The Examiner's failure to consider the '184 publication as anticipatory prior art was a material error, and the petition in this *inter partes* review raises this argument for the first time for the Office to consider. Thus, there is no basis to discretionarily deny the petition under § 325(d).

3. ChromaDex's Formula (I) Attorney Argument Is Unsubstantiated.

ChromaDex argues that "Formula (I), which also appears 'above' Formula (IV)...expressly shows R₆, R₇, and R₈ as hydrogen...." But formula (I) and the description of the same never once describes the presence of R₆, R₇, or R₈ *at all*, let alone as hydrogen. ChromaDex offers nothing more than unsubstantiated attorney argument, which is deficient to rebut Thorne's expert witness' testimony.

ChromaDex's misreading of the specification and chemical structures rests upon mere attorney argument, but "attorney argument [is] not the kind of factual evidence that is required to rebut a prima facie case of obviousness." *In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997). *See also In re Natures Remedies, LTD*, 315 F. App'x 300, 305 (Fed. Cir. 2009) ("Attorney argument, however, cannot take the place of record evidence.").

Patent Owner argues that R₆-R₈ as hydrogen is supported by the specification's formula (I) (Paper 6, 14, 16), but this is directly rebutted by the specification itself—and as Thorne's expert witness explained, this distinction matters. The specification is clear: formula (I) does not include any of R₆-R₈. EX1001 2:37-3:4. Dr. Prestwich explained that R₆-R₈ as hydroxyl-protecting groups in formulas (III) and (IV) is important in the chemical synthesis of the ultimate synthetic target, formula (I). EX1013, ¶¶41-42. The R₆-R₈ groups are deprotected from formula (III), providing the corresponding hydrogen atoms for formula (I). EX1013, ¶¶41, 74. This deprotection is one step toward making the ultimate compound pharmaceutically acceptable. EX1013, ¶58. The fact that R₆-R₈ are *not* present in formula (I) is therefore a distinction that matters, as compared to formulae (III) and (IV) that do have R₆-R₈. ChromaDex's interpretation of formula (I) as somehow illustrating R₆-R₈ as hydrogen is unsubstantiated.

4. ChromaDex's Reliance On An Earlier Application Is Unavailing And Invites Further Error.

ChromaDex argues that an earlier application in the patent family included claims having formula (III) (i.e., not formula (IV) as claimed here) with R₆-R₈ as optionally hydrogen. This argument does nothing to resolve the lack of priority in this case, does not address the claimed R₆ as phosphate, and is nothing more than an invitation from the Office to accumulate errors throughout the patent family.

Patent Owner contends that R₆-R₈ as hydrogen in formula (IV) in the currently challenged '506 patent is somehow supported by a great-grandparent application claiming R₆-R₈ as optionally hydrogen in formula (III). First, this does not resolve the issue of the '184 publication as anticipatory intervening art. The claims upon which ChromaDex relies for support were first filed February 27, 2018. Paper 6, 6; EX2008, 315. Even if considered, it does not counter Petitioner's anticipatory prior art reference, US 2016/0168184 (EX1022), published June 16, 2016—*more than one year* before the great-grandparent application was filed. Second, even if the great-grandparent application introduced hydrogen into a claim contrary to the express definition, consideration of that application still does nothing to address the '506 claims' introduction of R₆ as a phosphate (EX1001, claims). Thus even if, *arguendo*, its great-grandparent filing is considered, the '184 publication still anticipates the claimed subject matter.

ChromaDex's argument that the great-grandparent application was not found to lack written description or enablement is both misleading and nonsensical. To be clear, the priority issues raised in the present petition simply were not raised or considered in the identified great-grandparent application. And, as indicated above, the identified great-grandparent claims are materially different than those at issue here. At any rate, the notion that the Examiner might have made two (different) errors in two related cases—one here and one in the great-grandparent—hardly

helps Patent Owner. ChromaDex’s reliance on great-grandparent formula (III) is misguided: as explained in the petition materials, the challenged patent describes the stepwise synthesis where formula (IV) is used to prepare formula (III), which is used to prepare formula (II), which is used to prepare formula (I). Pet., 6, EX1013, ¶¶38-41; EX1001, Figure 2; *see also* EX1001, Abstract (“...the invention relates to a method of preparing a compound of formula (I)...”). The synthesis thus runs from formula (IV) to formula (III), not the other way around. Formula (IV) is reduced to provide formula (III), and the protecting groups R₆-R₈—the lipophilicity of which facilitate migration to organic phase during formula (III) synthesis—remain until they are deprotected to provide formula (II). Pet., 7, 16-17, 23-24; EX1013, ¶¶74-76.

ChromaDex cites no authority to support its “two wrongs make a right” argument because none exists. Such argument does nothing more than invite the Office to accumulate different errors rather than correct them. Patent Owner provides no sound basis for such a request; its argument should be rejected.

C. Patent Owner Suggests Indefiniteness of Its Own Claims

Curiously, ChromaDex concludes its brief by essentially inviting indefiniteness onto its own claims in an effort to gain discretionary denial. Paper 6, 19-20. If the Director finds the ’506 patent claims as precluded from review due to lack of definiteness under § 112, it does so at ChromaDex’s urging. Should the

Director reach such a decision, Thorne respectfully requests such a finding be documented in any written order.

As to the present challenge, the petition identifies how 1) the '506 patent is not entitled to priority benefit due to lack of § 112 support for the challenged claims in the respective priority documents; and 2) the challenged claims are invalid over intervening art. *Compare* Paper 6, 19-20 *with* Pet., 10-11. Contrary to Patent Owner's characterization, Thorne's challenge conforms with the requirements of 35 U.S.C. § 311(b) and argues invalidity with the bases of anticipation and obviousness. It is ChromaDex that argues indefiniteness in its request for discretionary denial. Paper 6, 19-20.

III. CONCLUSION

Petitioner respectfully requests that Patent Owner's request for discretionary denial is *denied*.

Respectfully submitted,

Date: September 23, 2026

/ Michael T. Rosato /
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IV. APPENDIX

Exhibit No.	Description
1001	U.S. Patent No. 12,252,506
1002	Prosecution history for U.S. Patent App. No. 18/307,733
1003	United Kingdom Patent Application No. 1313465.5
1004	International Patent Application No. PCT/EP2014/065971
1005	U.S. Patent No. 10,000,519
1006	U.S. Patent No. 10,815,262
1007	U.S. Patent No. 11,584,770
1008	U.S. Patent No. 11,981,698
1009	G. Schabert et al., <i>New Crystalline Salts of Nicotinamide Riboside as Food Additives</i> , MOLECULES 26, 2729 (2021).
1010	<i>Intentionally left blank</i>
1011	<i>Intentionally left blank</i>
1012	JONATHAN CLAYDEN ET AL., ORGANIC CHEMISTRY (2009).
1013	Declaration of Dr. Glenn Prestwich
1014	Dr. Glenn Prestwich CV
1015	S. Tanimori et al., <i>An Efficient Chemical Synthesis of Nicotinamide Riboside (NAR) and Analogs</i> , BIOORGANIC & MEDICINAL CHEMISTRY LETTERS 12, 1135 (2002).
1016	P. Franchetti et al., <i>Stereoselective synthesis of nicotinamide β-ribose and nucleoside analogs</i> , BIOORGANIC & MEDICINAL CHEMISTRY LETTERS 14, 4655 (2004).
1017	SPHERIX CHROMADDEX CONSULTING, Generally Recognized as Safe (GRAS) Determination for Niagen™ (Nicotinamide

	Riboside Chloride), No. 635 (Mar. 3, 2016), <i>available at</i> https://www.hfpappexternal.fda.gov/scripts/fdcc/index.cfm?set=GRASNotices&id=635
1018	<i>GRN No. 635: Nicotinamide riboside chloride</i> , FDA, https://www.hfpappexternal.fda.gov/scripts/fdcc/index.cfm?set=GRASNotices&id=635 (last visited Apr. 24, 2026)
1019	<i>GRAS Notices</i> , FDA https://www.hfpappexternal.fda.gov/scripts/fdcc/index.cfm?set=GRASNotices (last visited Apr. 24, 2026)
1020	Archived <i>GRAS Notices</i> , FDA https://web.archive.org/web/20201222145917/https://www.cfsanappsexternal.fda.gov/scripts/fdcc/index.cfm?set=GRASNotices&sort=GRN_No&order=DESC&showAll=true&type=basic&search= (archived Dec. 22, 2020)
1021	Archived <i>GRN No. 635: Nicotinamide riboside chloride</i> , FDA, https://web.archive.org/web/20210124164020/https://www.cfsanappsexternal.fda.gov/scripts/fdcc/index.cfm?set=GRASNotices&id=635 (archived Jan. 24, 2021)
1022	U.S. Patent Application Publication No. US 2016/0168184
1023	USPTO Assignment Center, <i>Patent Assignment Abstract of Title for Patent No. 12,252,506</i> , https://assignmentcenter.uspto.gov/search/patent/abstract%3FpatentNumber%3D12252506 (last visited June 22, 2026).
1024	<i>Niagen Bioscience Acquires Existing Core Nicotinamide Riboside (NR) Patent Portfolio from Queen's University Belfast</i> , NIAGEN BIOSCIENCE, INC. (Dec. 22, 2025), https://investors.niagenbioscience.com/news/news-details/2025/Niagen-Bioscience-Acquires-Existing-Core-Nicotinamide-Riboside-NR-Patent-Portfolio-from-Queens-University-Belfast/default.aspx (last visited June 17, 2026).
1025	Niagen Bioscience, Inc., Annual Report (Form 10-K) (Mar. 4, 2026),

	https://www.sec.gov/Archives/edgar/data/1386570/000138657026000024/nageform10-k.pdf .
1026	<i>Niagen Bioscience Secures U.S. Patent for the Composition of Matter for Nicotinamide Riboside (NR) Salt Forms</i> , NIAGEN BIOSCIENCE, INC. (Mar. 20, 2025), https://investors.niagenbioscience.com/news/news-details/2025/Niagen-Bioscience-Secures-U-S--Patent-for-the-Composition-of-Matter-for-Nicotinamide-Riboside-NR-Salt-Forms/ (last visited June 17, 2026).
1027	Pls.' Answer & Affirmative Defenses to Def. ChromaDex, Inc.'s Countercl. & Counter-Countercls. Against Defs. Niagen Bioscience, Inc., ChromaDex, Inc. & the Queen's Univ. of Belfast, <i>Thorne Rsch., Inc. v. Niagen Biosciences, Inc.</i> , No. 2:26-cv-01758-RMG (D.S.C. Sept. 2, 2026), ECF No. 30.
1028	Pls.' Stipulation Concerning Invalidity Grounds, <i>Thorne Rsch., Inc. v. Niagen Biosciences, Inc.</i> , No. 2:26-cv-01758-RMG (D.S.C. Sept. 2, 2026), ECF No. 31.
1029	<i>Admin. Office of the U.S. Cts.</i> , U.S. District Court — Judicial Caseload Profile (June 30, 2026), <i>available at</i> https://www.uscourts.gov/sites/default/files/document/fcms_na_distprofile0630.2026.pdf
1030	Joint Rule 26(f) Report, <i>Thorne Rsch., Inc. v. Niagen Biosciences, Inc.</i> , No. 2:26-cv-01758-RMG (D.S.C. Sept. 2, 2026), ECF No. 40.

CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing Petitioners's Brief In Opposition of Discretionary Denial and accompanying Exhibits 1027-1030 were served on September 23, 2026, on the Petitioner at the electronic correspondence address of the Petitioner as follows:

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