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Paper No. 8
Date: September 15, 2020

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SYNGENTA CROP PROTECTION AG,
Petitioner,

v.

FMC Corporation,
Patent Owner.

PGR2020-00028
Patent 10,294,202 B2

Before SUSAN L. C. MITCHELL, ZHENYU YANG, and CYNTHIA M. HARDMAN, *Administrative Patent Judges.*

HARDMAN, *Administrative Patent Judge*

DECISION
Granting Institution of Post-Grant Review
35 U.S.C. § 324

I. INTRODUCTION

Syngenta Crop Protection AG ("Petitioner") filed a Petition requesting post-grant review of claims 1–7, 9–13, and 21–31 of U.S. Patent No. 10,294,202 B2 ("the '202 Patent," Ex. 1001). Paper 1 ("Pet."). FMC Corporation ("Patent Owner") filed a Preliminary Response to the Petition. Paper 7 ("Prelim. Resp.").

To institute a post-grant review, we must determine that the information presented in the Petition demonstrates "that it is more likely than not that at least 1 of the claims challenged in the petition is unpatentable." 35 U.S.C. § 324(a). For the reasons explained below, we institute a post-grant review of the challenged claims based on the grounds of unpatentability identified in the Petition. Pet. 5 (statement of grounds).

The following preliminary findings of fact and conclusions of law are made for the sole purpose of determining whether to institute review. Any final decision will be based on the full trial record.

A. Related Matters

Petitioner identifies the following two applications to which the '202 Patent claims priority: (1) U.S. Provisional Application No. 61/911,324 (filed 12/3/2013); and (2) PCT/US2014/068073, WO2015/084796 (published June 11, 2015). Pet. 3–4.

Patent Owner states that it "knows of no judicial or administrative matters that may affect or be affected by a decision in this proceeding." Paper 3 (Patent Owner Mandatory Notices), 2.

B. The '202 Patent (Ex. 1001)

The '202 Patent, titled "Pyrrolidinones as Herbicides," "relates to certain pyrrolidinones, their N-oxides and salts, and compositions and

methods of their use for controlling undesirable vegetation." Ex. 1001, code (54), 1:5–7. The specification states that "[t]he control of undesired vegetation is extremely important in achieving high crop efficiency," and that "[m]any products are commercially available for these purposes, but the need continues for new compounds that are more effective, less costly, less toxic, environmentally safer or have different sites of action." *Id.* at 1:11–23.

The challenged claims of the '202 Patent cover a genus of pyrrolidinone compounds (claims 1–7, 22–31), herbicidal compositions and mixtures comprising such compounds (claims 9–12, 21), and a method for controlling the growth of undesired vegetation comprising using such compounds (claim 13). *Id.* at 285:29–293:24. The '202 Patent provides sixteen synthesis schemes for preparing the disclosed compounds (*id.* at 33:9–41:49), as well as seven example syntheses (*id.* at 42:44–50:35). The '202 Patent also discloses approximately 350 compounds that were prepared (Index Tables A–D) and tested for herbicidal effect on various crop and weed species (Tables A–H5). *Id.* at 173:49–54, 174:1–182:50, 182:57–285:27.

C. Prosecution History

We provide a brief overview of the prosecution history to supply context for the dispute between the parties. The '202 Patent issued from U.S. Patent Application Serial No. 15/101,615 ("the '615 application"), filed on December 2, 2014, as PCT/US2014/068073. Ex. 1001, codes (21), (22), (86). The '202 Patent claims earliest priority to Provisional Application No. 61/911,324, filed on December 3, 2013. *Id.* at code (60).

The '615 application was filed with eleven claims, of which claim 1 was independent. Ex. 1002, 2230–2235. Pursuant to an election of species requirement, applicants elected Compound 351, which is a compound of Formula 1 wherein:

Q^1 is Ph(3-CF_3) (e.g., phenyl substituted with 1 substituent selected from R^7; R^7 is C_1-C_8 haloalkyl (3-trifluoromethyl));

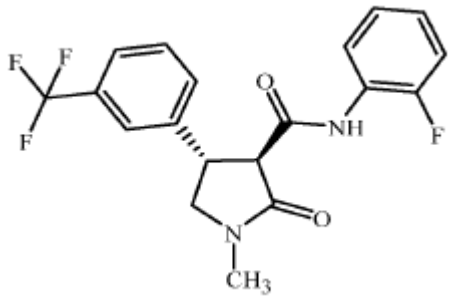
Q^2 is Ph(2-F) (e.g., phenyl substituted with 1 substituent selected from R^{10}; R^{10} is halogen (2-fluoro));

Y^1 and Y^2 are both O;

R^2, R^3, R^4, R^5 and R^6 are each H; and

R^1 is CH_3 (i.e. methyl).

Id. at 1700, 1690. Compound 351 is depicted below:



Id. at 1690.

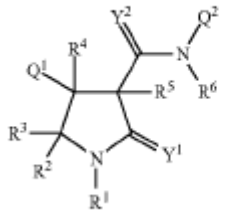
The Examiner subsequently rejected the claims as anticipated by Kotoku et al., US 2016/0137639 (equivalent of WO2014/065413). *Id.* at 1033. Applicants initially sought to amend claim 1 to disclaim the compounds found in Kotoku by adding exclusionary provisos (*id.* at 1011), but the Examiner found that the proposed amendments added new matter (*id.* at 990).

Applicants filed a Request for Continued Examination, and to overcome the new matter rejection and exclude the compounds disclosed in Kotoku, provided claims that, *inter alia*, removed the exclusionary provisos and amended the definition of R^7. *Id.* at 959–63, 972.

The Examiner issued a Notice of Allowability (*id.* at 56), and the '202 Patent thereafter issued in due course.

D. Illustrative Claim

Of the challenged claims, claims 1 and 31 are independent. Claim 1, reproduced below, is illustrative:

> 1. A compound selected from Formula I, N-oxides and salts thereof:
>
> 
>
> wherein
>
> Q^1 is a phenyl ring optionally substituted with up to 5 substituents independently selected from R^7; or a 5- to 6-membered heterocyclic ring or an 8- to 10-membered heteroaromatic bicyclic ring system, each ring or ring system containing ring members selected from carbon atoms and 1 to 4 heteroatoms independently selected from up to 2 O, up to 2 S and up to 4 N atoms, wherein up to 3 carbon ring members are independently selected from C(═O) and C(═S), and the sulfur atom ring members are independently selected from $S(═O)_u(═NR^8)_v$, each ring or ring system optionally substituted with up to 5 substituents independently selected from R^7 on carbon atom ring members and selected from R^9 on nitrogen atom ring members;

Q^2 is a phenyl ring or a naphthalenyl ring system, each ring or ring system optionally substituted with up to 5 substituents independently selected from R^{10}; or a 5- to 6-membered fully unsaturated heterocyclic ring or an 8- to 10-membered heteroaromatic bicyclic ring system, each ring or ring system containing ring members selected from carbon atoms and 1 to 4 heteroatoms independently selected from up to 2 O, up to 2 S and up to 4 N atoms, wherein up to 3 carbon ring members are independently selected from C(═O) and C(═S), and the sulfur atom ring members are independently selected from $S(═O)_u(═NR^8)_v$, each ring or ring system optionally substituted with up to 5 substituents independently selected from R^{10} on carbon atom ring members and selected from R^{11} on nitrogen atom ring members;

Y^1 and Y^2 are each independently O, S or NR^{12};

R^1 is H, hydroxy, amino, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_2-C_6 alkenyl, C_3-C_6 alkynyl, C_4-C_8 cycloalkylalkyl, C_2-C_8 alkoxyalkyl, C_2-C_8 haloalkoxyalkyl, C_2-C_8 alkylthioalkyl, C_2-C_8 alkylsulfinylalkyl, C_2-C_8 alkylsulfonylalkyl, C_2-C_8 alkylcarbonyl, C_2-C_8 haloalkylcarbonyl, C_4-C_{10} cycloalkylcarbonyl, C_2-C_8 alkoxycarbonyl, C_2-C_8 haloalkoxycarbonyl, C_4-C_{10} cycloalkoxycarbonyl, C_2-C_8 alkylaminocarbonyl, C_3-C_{10} dialkylaminocarbonyl, C_4-C_{10} cycloalkylaminocarbonyl, C_1-C_6 alkoxy, C_1-C_6 alkylthio, C_1-C_6 haloalkylthio, C_3-C_8 cycloalkylthio, C_1-C_6 alkylsulfinyl, C_1-C_6 haloalkylsulfinyl, C_3-C_8 cycloalkylsulfinyl, C_1-C_6 alkylsulfonyl, C_1-C_6 haloalkylsulfonyl, C_3-C_8 cycloalkylsulfonyl, C_1-C_6 alkylaminosulfonyl, C_2-C_8 dialkylaminosulfonyl, C_3-C_{10} trialkylsilyl or G^1;

R^2 and R^3 are each independently H, halogen or C_1-C_4 alkyl; or

R^2 and R^3 are taken together with the carbon atom to which they are bonded to form a C_3-C_7 cycloalkyl ring;

R^4 and R^5 are each independently H, halogen or C_1-C_4 alkyl;

R^6 is H, hydroxy, amino, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_2-C_6 alkenyl, C_3-C_6 alkynyl, C_2-C_8 alkoxyalkyl, C_2-C_8 haloalkoxyalkyl, C_2-C_8 alkylthioalkyl, C_2-C_8 alkylsulfinylalkyl, C_2-C_8 alkylsulfonylalkyl, C_2-

C_8 alkylcarbonyl, C_2-C_8 haloalkylcarbonyl, C_4-C_{10} cycloalkylcarbonyl, C_2-C_8 alkoxycarbonyl, C_2-C_8 haloalkoxycarbonyl, C_4-C_{10} cycloalkoxycarbonyl, C_2-C_8 alkylaminocarbonyl, C_3-C_{10} dialkylaminocarbonyl, C_4-C_{10} cycloalkylaminocarbonyl, C_1-C_6 alkoxy, C_1-C_6 alkylthio, C_1-C_6 haloalkylthio, C_3-C_8 cycloalkylthio, C_1-C_6 alkylsulfinyl, C_1-C_6 haloalkylsulfinyl, C_3-C_8 cycloalkylsulfinyl, C_1-C_6 alkylsulfonyl, C_1-C_6 haloalkylsulfonyl, C_3-C_8 cycloalkylsulfonyl, C_1-C_6 alkylaminosulfonyl, C_2-C_8 dialkylaminosulfonyl, C_3-C_{10} trialkylsilyl or G^1;

each R^7 and R^{10} is independently halogen, cyano, nitro, C_1-C_4 alkyl, C_1-C_4 haloalkyl, C_2-C_4 alkenyl, C_2-C_4 haloalkenyl C_2-C_4 alkynyl, C_2-C_4 haloalkynyl, C_1-C_4 nitroalkyl, C_2-C_4 nitroalkenyl, C_2-C_4 alkoxyalkyl, C_2-C_4 haloalkoxyalkyl, C_3-C_4 cycloalkyl, C_3-C_4 halocycloalkyl, cyclopropylmethyl, methylcyclopropyl, C_1-C_4 alkoxy, C_1-C_4 haloalkoxy, C_2-C_4 alkenyloxy, C_2-C_4 haloalkenyloxy, C_3-C_4 alkynyloxy, C_3-C_4 haloalkynyloxy, C_3-C_4 cycloalkoxy, C_1-C_4 alkylthio, C_1-C_4 haloalkylthio, C_1-C_4 alkylsulfinyl, C_1-C_4 haloalkylsulfinyl, C_1-C_4 alkylsulfonyl, C_1-C_4 haloalkylsulfonyl, hydroxy, formyl, C_2-C_4 alkylcarbonyl, C_2-C_4 alkylcarbonyloxy, C_1-C_4 alkylsulfonyloxy, C_1-C_4 haloalkylsulfonyloxy, formylamino, C_2-C_4 alkylcarbonylamino, —SF_5, —SCN, C_3-C_4 trialkylsilyl, trimethylsilylmethyl or trimethylsilylmethoxy;

each R^8 is independently H, cyano, C_2-C_3 alkylcarbonyl or C_2-C_3 haloalkylcarbonyl;

each R^9 and R^{11} is independently cyano, C_1-C_3 alkyl, C_2-C_3 alkenyl, C_2-C_3 alkynyl, C_3-C_6 cycloalkyl, C_2-C_3 alkoxyalkyl, C_1-C_3 alkoxy, C_2-C_3 alkylcarbonyl, C_2-C_3 alkoxycarbonyl, C_2-C_3 alkylaminoalkyl or C_3-C_4 dialkylaminoalkyl;

each R^{12} is independently H, cyano, C_1-C_4 alkyl, C_1-C_4 haloalkyl, —(C═O)CH_3 or —(C═O)CF_3;

each G^1 is independently phenyl, phenylmethyl, pyridinylmethyl, phenylcarbonyl, phenoxy, phenylethynyl, phenylsulfonyl or a 5- or 6-membered heteroaromatic ring,

each optionally substituted on ring members with up to 5 substituents independently selected from R^{13};

each R^{13} is independently halogen, cyano, hydroxy, amino, nitro, —CHO, —C(═O)OH, —C(═O)NH_2, —SO_2NH_2, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_2-C_8 alkylcarbonyl, C_2-C_8 haloalkylcarbonyl, C_2-C_8 alkoxycarbonyl, C_4-C_{10} cycloalkoxycarbonyl, C_5-C_{12} cycloalkylalkoxycarbonyl, C_2-C_8 alkylaminocarbonyl, C_3-C_{10} dialkylaminocarbonyl, C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, C_2-C_8 alkylcarbonyloxy, C_1-C_6 alkylthio, C_1-C_6 haloalkylthio, C_1-C_6 alkylsulfinyl, C_1-C_6 haloalkylsulfinyl, C_1-C_6 alkylsulfonyl, C_1-C_6 haloalkylsulfonyl, C_1-C_6 alkylaminosulfonyl, C_2-C_8 dialkylaminosulfonyl, C_3-C_{10} trialkylsilyl, C_1-C_6 alkylamino, C_2-C_8 dialkylamino, C_2-C_8 alkylcarbonylamino, C_1-C_6 alkylsulfonylamino, phenyl, pyridinyl or thienyl; and

each u and v are independently 0, 1 or 2 in each instance of $S(=O)_u(=NR^8)_v$, provided that the sum of u and v is 0, 1 or 2;

provided that

(a) the compound of Formula 1 is other than N-1H-benzotriazol-1-yl-2-oxo-4-phenyl-3-pyrrolidinecarboxamide;

(b) when Q^1 is a 3-furanyl or 3-pyridinyl ring, then said ring is substituted with at least one substituent selected from R^7;

(c) when Q^1 is unsubstituted phenyl, and Q^2 is a phenyl or pyridyl ring, then said Q^2 ring is substituted with R^{10} other than optionally substituted phenoxy at a 2-position (relative to the bond of the Q^2 ring to the remainder of Formula 1), and unsubstituted at the 5- and 6-positions (with respect to the 2-position), and R^5 is H or halogen;

(d) when Q^1 is a phenyl ring and said ring is substituted with R^7 at both ortho positions (relative to the bond to the remainder of Formula 1), then said ring is also independently substituted with R^7 on at least one additional position;

(e) Q^2 is other than optionally substituted 1H-pyrazol-5-yl; and

> (f) when Q^2 is a 1H-pyrazol-3-yl ring, said ring is substituted at the 1-position with R^{11}.

Ex. 1001, 285:29–288:13.

Dependent claims 2–7 and 22–30 narrow the choices for various substituents on the compounds recited in claim 1. *Id.* at 288:14–48, 291:1–292:44. Independent claim 31 recites the same core compound as claim 1, but as compared to claim 1, recites fewer options for several of the substituents. *Id.* at 292:45–293:24.

Claims 9–12 and 21 cover an "herbicidal composition," an "herbicidal mixture," or a "mixture" that includes a compound of claim 1. *Id.* at 288:61–289:30, 290:63–67. Claim 13 covers controlling vegetation growth using an "herbicidally effective amount" of a compound of claim 1. *Id.* at 289:31–34.

E. The Asserted Grounds of Unpatentability

Petitioner asserts that claims 1–7, 9–13, and 21–31 are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–3, 9–13, 21–30	§ 112(a)[1]	Enablement
9–13	§ 112(a)	Written Description
1–7, 22–31	§ 102(a)(1)	Olsson[2]
1–7, 22–31	§ 103	Olsson

Pet. 5. Petitioner relies upon the Declaration of Dr. David Allen Hunt, Ph.D. (Ex. 1003) to support its contentions.

II. ANALYSIS

A. Post-Grant Review Eligibility

The post-grant review provisions apply only to patents that contain a claim with an effective filing date on or after March 16, 2013. *See* AIA, Pub. L. No. 112-29, 125 Stat. 284 (2011), §§ 3(n)(1), 6(f)(2)(A).

The '202 Patent issued from an application filed on December 2, 2014, which is after March 16, 2013. Ex. 1001, code (22). The '202 Patent claims earliest priority to a provisional application filed on December 3, 2013, which is also after March 16, 2013. *Id.* at code (60). Accordingly, the '202 Patent is eligible for post-grant review.

[1] The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) ("AIA"), amended 35 U.S.C. §§ 102, 103, and 112. Because the challenged claims have an effective filing date after the effective date of the applicable AIA amendments, we refer to the AIA versions of 35 U.S.C. §§ 102, 103, and 112 throughout this Decision.

[2] Olsson et al., U.S. Patent Pub. 2007/0123508 A1, published May 31, 2007 ("Olsson," Ex. 1004). During prosecution, applicants filed an Invention Disclosure Statement listing Olsson, among other references. Ex. 1002, 1704.

B. Level of Ordinary Skill in the Art

We consider the grounds of unpatentability in view of the understanding of a person of ordinary skill in the art ("POSA") at the time of the invention. Petitioner contends that such a person would have had "at least a Bachelor's degree in biochemistry or chemistry with several years' experience in agrochemistry, or alternatively, an advanced degree (Masters or Ph.D.) in biochemistry or organic chemistry with emphasis in these same areas," and "may also work in collaboration with other scientists and/or clinicians who have experience in weed science, plant pathology, or related disciplines." Pet. 13 (citing Ex. 1003 ¶ 66). Patent Owner states that for purposes of its preliminary response, it does not contest Petitioner's definition. Prelim. Resp. 20.

Because Petitioner's proposed definition is unopposed at this stage and is not inconsistent with the cited prior art, we adopt it for the purposes of this Decision.

C. Claim Construction

We interpret a claim "using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b)." 37 C.F.R. § 42.100(b) (2019). Under this standard, we construe the claim "in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent." *Id.*

Petitioner asserts that claims 1 and 31 include limitations in a "when" clause, which it contends "only limits the claim's scope to the extent the cited condition occurs, and should be read as 'if.'" Pet. 13–14. Petitioner states that the '202 Patent defines "several terms related to chemical

structures in 5:36–9:9, as well as terms related to herbicidal mixtures at 28:61–33:8," and that it has adopted those definitions. *Id.* at 14. Petitioner asserts that the "remaining terms are to be construed in accordance with their ordinary and customary meaning." *Id.*

Patent Owner agrees with Petitioner that "the 'when' clauses appearing in claims 1 and 31 only limit the claim scope when the cited condition occurs." Prelim. Resp. 3. Patent Owner additionally states that "all claim terms should be given their plain and ordinary meaning, in light of the definitions set forth in the '202 Patent specification." *Id.*

At this stage of the proceeding, for the purpose of deciding whether to institute review, we agree with the parties that the "when" clauses appearing in claims 1 and 31 only limit the claim scope when the cited conditions occur, and that all remaining claim terms should be given their plain and ordinary meaning in light of the definitions set forth in the Specification. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) ("[W]e need only construe terms 'that are in controversy, and only to the extent necessary to resolve the controversy.'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

Any final written decision entered in this case may include final claim constructions that differ from the preliminary understanding of the claims set forth above, or from any discussion of claim scope provided in our analysis below. Any final claim constructions will be based on the full trial record, where each party has an opportunity to be heard.

D. Real Parties in Interest

Petitioner identifies itself as the real party in interest ("RPI"). Pet. 3. Petitioner also states: "While not a real-party-in-interest, Syngenta AG owns 100% of Syngenta Crop Protection AG." *Id.*

Patent Owner argues that the Petition "fails to name all real parties in interest," specifically, parent companies Syngenta AG, ChemChina, and CNAC. Prelim. Resp. 2, 61. Patent Owner asserts that Syngenta AG "owns 100% of the capital and voting rights" of Petitioner, and this fact alone "establishes the requisite control over [Petitioner] to qualify Syngenta AG as a real party in interest." *Id.* at 61. Patent Owner further asserts that Syngenta AG is a wholly-owned subsidiary of CNAC, which in turn is a wholly-owned subsidiary of ChemChina. *Id.* Patent Owner additionally asserts that (1) the chairperson of ChemChina is also the chairperson of Syngenta Group (a group Patent Owner alleges encompasses Syngenta AG), and (2) the CEO of Syngenta Group is also the chairperson of Syngenta AG. *Id.* at 61–62. Patent Owner argues that "[t]he corporate structure of which Petitioner is a part suggests that Syngenta AG, CNAC, and ChemChina had a pre-existing relationship with Petitioner and the opportunity to control Petitioner." *Id.* at 62.

Under 35 U.S.C. § 322(a)(2), a petition may be considered only if it identifies all RPIs. We generally accept a petitioner's initial identification of RPI(s), unless the patent owner presents some evidence to support its argument that an unnamed party should also be included. *See Worlds Inc. v. Bungie, Inc.*, 903 F.3d 1237, 1242 (Fed. Cir. 2018) (explaining that "an IPR petitioner's initial identification of the real parties in interest should be accepted unless and until disputed by a patent owner," and that "a patent

owner must produce some evidence to support its argument that a particular third party should be named a real party in interest"). Because Patent Owner here "produce[d] *some* evidence that tends to show that a particular third party should be named a real party in interest," *Worlds*, 903 F.3d at 1244 (emphasis in original), we proceed to address the merits of the RPI issue. *See* Prelim. Resp. 59−62 (citing Exs. 2001−2004).

"[A]t a general level, the 'real party-in-interest' is the party that desires review of the patent." Patent Trial and Appeal Board Consolidated Trial Practice Guide 73 (Nov. 2019), https://www.uspto.gov/TrialPracticeGuideConsolidated ("TPG") 14. "Whether a party who is not a named participant in a given proceeding nonetheless constitutes a 'real party-in-interest' . . . is a highly fact-dependent question," and is assessed "on a case-by-case basis." TPG 13 (citing *Taylor v. Sturgell*, 553 U.S. 880, 893–95 (2008)). "Determining whether a non-party is a 'real party in interest' demands a flexible approach that takes into account both equitable and practical considerations, with an eye toward determining whether the non-party is a clear beneficiary that has a preexisting, established relationship with the petitioner." *Applications in Internet Time, LLC v. RPX Corp.*, 897 F.3d 1336, 1351 (Fed. Cir. 2018). Not just any relationship will be sufficient. Instead, Congress intended the term "real party in interest" to have its "common-law meaning," *id.*, and "the common law seeks to ascertain who, from a practical and equitable standpoint, will benefit from the redress that the chosen tribunal might provide." *Id.* at 1349 (citation omitted). Relevant factors for determining whether a non-party is an RPI include the non-party's relationship with the petitioner, the non-party's

relationship to the petition, and the nature of the entity filing the petition. *Id.* at 1351.

As discussed above, Patent Owner alleges that the relationship between Petitioner and each of Syngenta AG, CNAC, and ChemChina is that of subsidiary and parent. The traditional rule is that mere status as a corporate parent is insufficient to render an entity an RPI (or even a privy). *See Taylor*, 553 U.S. at 893–95 (summarizing the common-law rule as recognizing six types of relationships that constitute privity, but not including a parent-child corporate relationship among them). As the Federal Circuit has held in the context of privity, "control of a *party* . . . through stock ownership or corporate officership is not enough to create privity, absent a showing that the corporate form has been ignored." *Gillig v. Nike, Inc.*, 602 F.3d 1354, 1362 (Fed. Cir. 2010) (emphasis in original). We see no reason why this rationale does not equally apply to the determination of whether a relationship is sufficient to give rise to an RPI.

Although it could be argued that the parent company of a petitioner always "has a preexisting, established relationship with the petitioner" and is likely to benefit when its subsidiary benefits, the preservation of the common-law meaning of RPI in *Applications* suggests that the mere establishment of parent-company status is insufficient to render a non-party an RPI. *Applications*, 897 F.3d at 1351. Additionally, on this record, we see no evidence relating to the relationship of Syngenta AG, CNAC, or ChemChina to the Petition. Further, on this record, the mere overlap of personnel between (1) parent entities ChemChina and Syngenta Group, and (2) parent entities Syngenta Group and Syngenta AG, does not indicate a sufficient blurring of corporate separation such that the parent corporations

could have controlled the filing and participation of the Petition. *Cf. Galderma S.A. v. Allergan Industrie, SAS*, IPR2014-01422, Paper 14 at 12–13 (PTAB Mar. 5, 2015) (parent company determined to be an RPI where the same person was President and CEO of both companies and there was a "pattern of control" by the parent over the subsidiary).

The present record provides insufficient basis to conclude that Syngenta AG, CNAC, and/or ChemChina are RPIs to this proceeding. We therefore decline to deny institution for Petitioner's alleged failure to identify Syngenta AG, CNAC, or ChemChina as RPIs.[3] Nevertheless, given that Patent Owner has raised a disputed issue of fact, we concurrently enter an order addressing this issue. *See* Conduct of Proceeding, entered concurrently herewith.

E. The Asserted Grounds of Unpatentability

We address in turn the following grounds of unpatentability advanced in the Petition: (1) lack of enablement of claims 1–3, 9–13, and 21–30; (2) lack of written description support for claims 9–13; (3) anticipation of claims 1–7 and 22–31 by Olsson; and (4) obviousness of claims 1–7 and 22–31 over Olsson. Pet. 5.

[3] We note that even if Petitioner failed to identify certain RPIs, denial of institution is not the appropriate remedy. *Cf. Lumentum Holdings, Inc. v. Capella Photonics, Inc.*, IPR2015-00739, Paper 38, 5 (PTAB Mar. 4, 2016) (precedential) (holding that "a lapse in compliance with" the requirements of 35 U.S.C. § 312(a) "does not deprive the Board of jurisdiction over the proceeding, or preclude the Board from permitting such lapse to be rectified"); *Adello Biologics LLC v. Amgen Inc.*, PGR2019-00001, Paper 11, 3 (PTAB Feb. 14, 2019) (precedential) (granting a petitioner's motion to amend its mandatory notices to identify additional RPI).

1. Enablement

A patent's specification must describe the invention and "the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same." 35 U.S.C. § 112(a) (2012). The enablement requirement asks whether "the specification teach[es] those in the art to make and use the invention without undue experimentation." *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988). In analyzing undue experimentation, we consider factors such as: "(1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims." *Id.*

Petitioner asserts that the Specification fails to enable both (1) ***use*** of the full scope of compounds of claims 1–3, 9–13 and 21–30 as herbicides; and (2) ***how to make*** the full scope of the compounds encompassed by claims 1– 3, 9–13, 21, 23, and 27–30. Pet. 15, 32. We address each argument in turn.

a) Whether the '202 Patent Enables a Skilled Artisan to Use the Full Scope of Claims 1–3, 9–13, and 21–30

(1) The Parties' Contentions

Petitioner asserts that claim 1 "covers over a billion[] compounds," Pet. 18 (citing Ex. 1003 ¶ 139), and it would require undue experimentation to determine which of these compounds would be an effective herbicide. *Id.* at 18–19 (citing Ex. 1003 ¶¶ 140–155; Exs. 1007, 1011–1016). Petitioner

contends that "[t]he biological data provided . . . fails to enumerate the majority of the substituents available at each position" of the claimed genus, and "indicates that substitutions, particularly at the Q^1, Q^2, R^1, and R^6 positions, can strongly impact herbicidal activity and even eliminate it." *Id.* at 16 (citing Ex. 1003 ¶¶ 135, 136, 144, 151, 155–172). Petitioner asserts that "several of the compounds tested failed to exhibit any herbicidal activity at the high screening levels (*e.g.*, 1000 and 500 g ai/ha), which would indicate that a POSA would not be able to use the claimed compounds as an herbicide without undue experimentation, if at all." *Id.* at 16–17 (citing Ex. 1003 ¶ 137); *see also id.* at 22–30 (citing, *e.g.*, Ex. 1003 ¶¶ 153–172).

Petitioner asserts that small substitutions can have dramatic effects on herbicidal activity by altering properties such as lipophilicity, metabolism, plant uptake, and translocation, yet the '202 Patent fails to teach a structure-activity relationship, mode of action, or what enzymes or binding sites (if any) the claimed compounds affect. *Id.* at 17, 19–20. Petitioner further asserts that the '202 Patent exemplifies only 350 compounds, many of which lack variation at positions including Q^1, Q^2, Y^2, R^4, and Y^1. *Id.* at 19–20. Petitioner asserts that "[a] POSA reading the '202 Patent is left to guess how changing substituents outside of the limited active examples provided will impact herbicidal efficacy, and would not be able to determine, without undue experimentation, which compounds of claim 1 will be effective." *Id.* at 21 (citing Ex. 1003 ¶¶ 150–151).

Patent Owner argues that Petitioner has failed to properly analyze the *Wands* factors, and that this alone "should lead to non-institution." Prelim. Resp. 23. Patent Owner further argues that an analysis of the *Wands* factors shows that the claims are enabled. *Id.* at 6. Patent Owner asserts that claims

1–3 and 21–30 "are compound claims and do not specifically recite use as an herbicide." *Id.* at 8–9.

Patent Owner argues that the quantity of experimentation needed is not viewed in the abstract, but as a function of the pertinent art, and in the agrochemical field—which Patent Owner characterizes as "well-developed" and "mature and sophisticated"—a high level of experimentation is expected, given the many different species of plants and potential times of herbicide application. *Id.* at 19, 6–7 (citing Ex. 1001, 155:17–156:13; Ex. 1003 ¶ 38; Pet. 11–12); *see also id.* at 21 (arguing that the agrochemical field is considered "unpredictable," but there is "no requirement to know in advance precisely all of the compounds that will show herbicidal activity against the desired vegetation"). Patent Owner also characterizes the level of skill in the art as "high." *Id.* at 20; *see also supra* Section II.B.

Patent Owner argues that the '202 Patent teaches and uses standard organic syntheses to make the compounds and standard assays for determining herbicidal activity. Prelim. Resp. 8, 11–17. Patent Owner also argues that the '202 Patent provides "numerous working examples" of how to synthesize the compounds and formulate herbicides, and provides biological data showing herbicidal efficacy. *Id.* at 18. Patent Owner asserts that the law permits even a considerable amount of experimentation, and that Petitioner has not argued that the required experimentation here is not routine. *Id.* at 23–24. Patent Owner also asserts that "determination of whether an embodiment is operative is well within the routine experimentation expected in the field." *Id.* at 32–33. Patent Owner argues that Petitioner seeks to impose an "overly high 'predictability' standard" that

would require a skilled artisan to be able to predict *a priori* whether a specific structure will have herbicidal activity. *Id.* at 30.

(2) Analysis

We begin by addressing Patent Owner's assertion that claims 1–3 and 21–30 "are compound claims and do not specifically recite use as an herbicide." Prelim. Resp. 8–9. To the extent Patent Owner is suggesting that the '202 Patent need not enable a person of ordinary skill in the art to use these claimed compounds because the claims themselves do not recite a specific use, on this record, we disagree. "The how to use prong of section 112 incorporates as a matter of law the requirement of 35 U.S.C. § 101 that the specification disclose as a matter of fact a practical utility for the invention." *In re Ziegler*, 992 F.2d 1197, 1200–01 (Fed. Cir. 1993); *see also In re Fouche*, 439 F.2d 1237, 1243 (CCPA 1971) ("[I]f [the claimed] compositions are in fact useless, appellant's specification cannot have taught how to use them."). In other words, in order to enable these compound claims, the Specification must support some utility for the compounds. *See also In re Gardner*, 475 F.2d 1389, 1391–92 (CCPA 1973) (reversing enablement rejection of compound claims where Examiner identified no reasonable basis for assertion that the 17 compounds encompassed by the claimed genus would lack antihypertensive activity). Here, the Specification teaches that the disclosed compounds control undesirable vegetation and modify plant growth. Ex. 1001, 1:5–7, 155:56–57. Accordingly, we include claims 1–3 and 21–30 in our analysis of whether the '202 Patent enables use of the claimed compounds as herbicides.

We next turn to Patent Owner's contention that we should deny institution because Petitioner has failed to properly analyze the *Wands*

factors. Prelim. Resp. 23. First, the *Wands* factors "while illustrative are not mandatory." *Cephalon, Inc. v. Watson Pharms., Inc.*, 707 F.3d 1330, 1336 (Fed. Cir. 2013). Second, even though not expressly denominated as such, we find that the Petition does analyze the *Wands* factors. For example and without limitation, the Petition addresses (1) the quantity of experimentation necessary (*see, e.g.*, Pet. 21–22 (discussing burden of synthetizing compounds for testing)); (2) the amount of direction or guidance presented (*id.* at, e.g., 17 (arguing that the Specification "fail[s] . . . to provide sufficient data for structure activity relationship")); (3) the presence or absence of working examples (*id.* at, e.g., 16–17 (arguing the limited nature of the working examples)); (4) the nature of the invention (*id.* at, e.g., 6–9); (5) the state of the prior art (*id.* at, e.g., 11–12); (6) the relative skill of those in the art (*id.* at 13); (7) the predictability or unpredictability of the art (*id.* at, e.g., 19–20 (arguing unpredictable effect of substitutions); and (8) the breadth of the claims (*id.* at, e.g., 18 (addressing breadth of claims)). We proceed to analyzing the parties' arguments for each of these factors.

(a) Nature of the Invention, Predictability or Unpredictability of the Art, and Relative Skill in the Art

The field of the invention is agrochemicals, and specifically herbicides. *See, e.g.*, Ex. 1001, codes (54), (57). Patent Owner characterizes the agrochemical field as "well-developed" and "mature and sophisticated," Prelim. Resp. 19, which appears to be consistent with the teachings of the prior art presently of record. *See, e.g.*, Ex. 1006, 85 (discussing multibillion dollar global herbicide market), 86 (referencing 184 herbicides marketed between 1970 and 2005).

Both parties agree that the art is unpredictable. Pet. 19–20 (discussing lack of predictability); Ex. 1003 ¶¶ 142–143; Prelim. Resp. 21 (arguing that "the agrochemical field [has] traditionally been considered 'unpredictable'"). Patent Owner asserts that a high level of experimentation is expected in the field, given the many different species of plants and potential times of herbicide application. Prelim. Resp. 7 (citing Ex. 1001, 155:17–156:13; Ex. 1003 ¶ 38; Pet. 11–12). Although there is some support in the record for the notion that companies may synthesize and screen large numbers of compounds in the search for new herbicides (*see, e.g.*, Ex. 1019, 116–117), on this record we are not persuaded that an expectation of a high level of experimentation is relevant to establishing enablement of the '202 Patent. That is because a specification must provide more than "a starting point, a direction for further research." *ALZA Corp. v. Andrx Pharm., LLC*, 603 F.3d 935, 941 (Fed. Cir. 2010). A specification that requires a skilled artisan to "engage in an iterative, trial-and-error process to practice the claimed invention" does not provide an enabling disclosure. *Id.* That said, we agree with Patent Owner that when analyzing enablement, the quantity of experimentation needed is not viewed in the abstract, but as a function of the pertinent art. Prelim. Resp. 6–7. "The test [for undue experimentation] is not merely quantitative, since a considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed." *PPG Indus., Inc. v. Guardian Indus. Corp.*, 75 F.3d 1558, 1564 (Fed. Cir. 1996) (citation omitted).

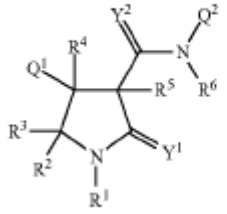
As we have found for purposes of our decision on institution, *see* Section II.B, the level of skill here is relatively high, requiring "at least a

Bachelor's degree in biochemistry or chemistry with several years' experience in agrochemistry, or alternatively, an advanced degree (Masters or Ph.D.) in biochemistry or organic chemistry with emphasis in these same areas," where the skilled person "may also work in collaboration with other scientists and/or clinicians who have experience in weed science, plant pathology, or related disciplines." Pet. 13 (citing Ex. 1003 ¶ 66); Prelim. Resp. 20 (agreeing level of ordinary skill is "high").

For purposes of institution, we find that the relative skill in the art is reasonably high and the invention falls within a mature field, which weighs in favor of enablement, but the unpredictability in the field weighs against enablement.

(b) Breadth of Claims and Direction or Guidance

Challenged claim 1 is extremely broad. It recites "[a] compound selected from Formula I, N-oxides and salts thereof:



,"

wherein each of the substituents Q^1, Q^2, Y^1, Y^2, R^1, R^2, R^3, R^4, R^5, and R^6, may be independently selected from a wide range of substituents. Ex. 1001, 285:29–288:13; Ex. 1003 ¶ 49. Specifically, R^2, R^3, R^4, and R^5, "are each independently H, halogen, or C_1-C_4 alkyl" (Ex. 1001, 286:52–58), and Y^1 and Y^2 "are each independently O, S or NR^{12}," where "each R^{12} is independently H, cyano, C_1-C_4 alkyl, C_1-C_4 haloalkyl, —(C═O)CH_3

or —(C═O)CF_3." *Id.* at 287:31–32. The choices for the Q^1, Q^2, R^1, and R^6 groups "are much larger, and each [group] provides for well over a thousand possible independent options, particularly given that many of options for Q^1, Q^2, R^1, and R^6 substituents may themselves be substituted." Ex. 1003 ¶ 49 (citing Ex. 1001, 285:44–286:51, 286:59–287:6, 287:33–38). "Q^1 and Q^2, for example, may be optionally substituted with up to five different substituents, each of which is selected from a long list of available options." *Id.* (citing Ex. 1001, 285:44-286:51). It is presently undisputed that claim 1 "covers more than a billion different compounds." Ex. 1003 ¶ 139.

On this record, we have not been directed to guidance in the Specification as to how modifying each of the claimed variables would or would not impact the functionality of the claimed compounds as herbicides. Rather, Petitioner sufficiently demonstrates, for purposes of institution, that the Specification fails to "provide information as to what mode of action and/or what enzymes or binding sites (if any) are affected by the compounds, or to provide sufficient data for structure activity relationship," which appears to leave the skilled artisan to "experiment randomly" to determine which compounds meet the claims. Pet. 17 (citing Ex. 1003 ¶¶ 133–134); *see also id.* at 19–20. Patent Owner contends that Dr. Hunt "provides no explanation as to why" "predicting herbicidal activity of the claimed compounds . . . would be 'difficult.'" Prelim. Resp. 34 (citing Ex. 1003 ¶¶ 142, 199). However, at this juncture, we credit Dr. Hunt's testimony, which stands unrebutted on the current record, that "[w]ithout knowing the mechanism by which the herbicide affects plant growth, a POSA has little ability to predict how changes on the structure of a molecule can impact biological activity." Ex. 1003 ¶ 146; *see also id.* ¶ 142 (asserting

that "[w]hat might appear to be minor substitutions . . . can have dramatic effects on activity" and citing extrinsic evidence of examples), ¶¶ 43, 143 (discussing differing effects of enantiomers), ¶ 42 (discussing effect of small structural changes on biological activity, citing Ex. 1007). On this record, we find Dr. Hunt's unrebutted testimony regarding unpredictability credible, particularly in view of the lack of guidance in the Specification regarding a structure-activity relationship or mode of action.

Accordingly, Petitioner demonstrates sufficiently, for purposes of trial institution, that the challenged claims are extremely broad, and that the '202 Patent fails to provide meaningful guidance as to how modifying each of the ten claimed variables would or would not impact the functionality of the claimed compounds as herbicides, which weighs against enablement.

(c) Working Examples

Patent Owner asserts that the '202 Patent "employs . . . standard agrochemical pre-emergent, post-emergent, and flood test protocols to test the herbicidal activity for 335 of the 351 compounds synthesized according to the methods disclosed in the patent." Prelim. Resp. 14 (citing Ex. 1001, cols. 182–285); *see also id.* at 15–17 (detailing the compounds tested, types of tests, and application rates). Patent Owner also asserts that the '202 Patent teaches "10 specific examples of herbicide formulations," *id.* at 11 (citing Ex. 1001, 149:1–155:15), mixtures of "22 different compounds in the claimed genus with a wide variety of known herbicides," *id.* at 12 (citing Ex. 1001, 166:60–173:38), and "detailed instruction showing how to test individual compounds covered by the claims in combination with other known herbicides." *Id.* at 17 (citing Ex. 1001, cols. 275–285); *see also id.* at 18–19.

At this stage, the present record sufficiently shows that the 351 compounds tested for herbicidal activity "represent only a minute fraction of compounds possible under claim 1." Pet. 20; Ex. 1003 ¶ 147. Petitioner contends, and Patent Owner does not dispute, that "[o]nly 36 compounds tested had a substituent other than a phenyl or substituted phenyl [at] Q^1, and only 18 had a substituent other than a phenyl or substituted phenyl group at Q^2," and the tested compounds lack variation at other positions as well. Pet. 20 (citing Ex. 1003 ¶ 148), 21 (citing Ex. 1003 ¶ 149). Petitioner directs us to information supporting the view that this lack of variation is important because the examples indicate that certain substitutions, particularly at the Q^1, Q^2, R^1, and R^6 positions, can diminish or eliminate herbicidal activity. Ex. 1003 ¶¶ 144, 153–155, 156–158 (discussing effect of variation at Q^1), 159–162 (discussing effect of variation at Q^2), 163–168 (discussing effect of variation at R^6), 169–172 (discussing effect of variation at R^1); Pet. 22–30.

Even though many of the example compounds in the Specification demonstrate herbicidal activity, on the present record we have not been directed to guidance in the Specification as to how to modify them in a way that would preserve or increase the activity. At this stage, we credit Dr. Hunt's opinions that "the[] examples do not provide sufficient guidance for a POSA to determine which of [the] billions of compounds claimed would be effective as an herbicide," Ex. 1003 ¶ 147, and a skilled artisan would be "left to guess how changing substituents outside of the limited examples provided will impact herbicidal efficacy." *Id.* ¶ 150. The additional examples in the Specification relating to herbicide formulations and mixtures, and the Specification's instructions showing how to test claimed compounds in combination with other known herbicides, do not

appear on this record to provide any guidance as to how changing substituents outside of the limited examples will impact herbicidal efficacy. Prelim. Resp. 11–12, 17.

Where, as here, "working examples are present but are 'very narrow, despite the wide breadth of the claims at issue,' this factor weighs against enablement." *Idenix Pharms. LLC v. Gilead Scis. Inc.*, 941 F.3d 1149, 1161 (Fed. Cir. 2019) (quoting *Enzo Biochem, Inc. v. Calgene, Inc.*, 188 F.3d 1362, 1374 (Fed. Cir. 1999); *see also Enzo Life Scis., Inc. v. Roche Molecular Sys., Inc.*, 928 F.3d 1340, 1348 (Fed. Cir. 2019) (working example was "insufficient to enable the breadth of the claims here, especially in light of the unpredictability of the art"). We acknowledge that the law requires neither that "a skilled artisan must be able to predict *a priori* whether a specific structure will have herbicidal activity," nor that a specification "exemplify every embodiment of the invention." Prelim. Resp. 30, 31. As noted above, however, a specification that requires a skilled artisan to "engage in an iterative, trial-and-error process to practice the claimed invention" does not provide an enabling disclosure. *ALZA Corp.*, 603 F.3d at 941. In view of Dr. Hunt's opinion that a skilled artisan would be "left to guess how changing substituents outside of the limited examples provided will impact herbicidal efficacy," Ex. 1003 ¶ 150, which is presently unrebutted, on this record we are unable to conclude that the Specification enables a skilled artisan to distinguish operative from inoperative compounds without the need for undue experimentation.

(d) Quantity of Experimentation

At this juncture, we credit Dr. Hunt's opinion, which is presently unrebutted, that "it would likely take significant time (on the order of 7-8

days/compound following the procedure as outlined in the '202 Patent . . .) to prepare a new compound" within the scope of claim 1. Ex. 1003 ¶ 152. We also credit Dr. Hunt's opinion that "[t]his would make it time-consuming and burdensome for persons skilled in the art to try to create a broad range of compounds to test for activity," "particularly if [a] POSA sought to create widely varied structures in order to test the impact of substitutions at different groups." *Id.*

As noted above, Patent Owner emphasizes that "[t]he question of how much experimentation is needed is not viewed in the abstract, but as a function of the art to which the claims are directed." Prelim. Resp. 6. Patent Owner asserts that in "the agrochemical field, a high level of experimentation is expected and normal," and that "it is also typical, as Syngenta acknowledges, to synthesize a large number of compounds for screening." *Id.* at 7 (citing Pet. 12). Patent Owner further asserts that the '202 Patent teaches and uses standard organic synthesis and screening procedures, and that "[u]se of those [standard] techniques . . . does not require more experimentation than is expected in the field." *Id.* at 8. Patent Owner emphasizes that "[a] high quantity of experimentation is permissible where the specification provides reasonable guidance on how to conduct it and 'the experiments involve repetition of known or commonly used techniques.'" *Id.* at 23–24 (quoting *Cephalon*, 707 F.3d at 1338).

Even accepting as true, for purposes of institution, that the synthesis and assay methods needed to create and test the claimed compounds for herbicidal activity are routine, the sheer number of candidate compositions that must be synthesized (each of which, on this record, would take at least a week to make, *see* Ex. 1003 ¶ 152) and then assayed weighs against

enablement, especially in light of the lack of guidance in the Specification as to which of these compounds would have herbicidal activity. For example, as the Federal Circuit found in *Idenix*, "synthesis of an individual nucleoside was largely routine," but because the claims encompassed "at least many, many thousands of 2'-methyl-up nucleosides which need to be screened for HCV [hepatitis C virus] efficacy, the quantity of experimentation needed is large and weighs in favor of non-enablement." 941 F.3d at 1160, 1158.

(e) Conclusion

For purposes of deciding whether to institute trial, the present record sufficiently shows that in view of the breadth of the claims, unpredictability in the art, limited guidance provided in the Specification, large number of compounds falling within the claimed genus (at least one billion), and necessity of first synthesizing and then screening each of those compounds to determine whether it had herbicidal activity, it would take undue experimentation to practice the full scope of claim 1.

We acknowledge Federal Circuit precedent indicating that the test for undue experimentation is "not merely quantitative, since a considerable amount of experimentation is permissible." *PPG Indus., Inc.*, 75 F.3d at 1564; *see also Cephalon, Inc.*, 707 F.3d at 1339 ("[A] considerable amount of experimentation is permissible, if it is merely routine."). However, "[p]ermissible experimentation is, nevertheless, not without bounds." *Cephalon*, 707 F.3d at 1339. For example, in *Idenix*, the claims recited method of treating HCV by administering nucleoside compounds having a specific chemical and stereochemical structure. *Idenix*, 941 F.3d at 1154. The court found that "at least many, many thousands" of potential compounds met the requirements of the claims, and their synthesis was

routine. *Id.* at 1157, 1160. Nevertheless, in view the quantity of experimentation required, the lack of meaningful guidance or working examples across the full scope of the claim, and the immense breath of the screening required to determine which claimed compounds are effective against HCV, the court found undue experimentation. *Id.* at 1162.

On this record, it appears that a similar situation exists here. As discussed above, it is presently undisputed that claim 1 covers at least a billion compounds, and the Specification indicates that not all of the compounds falling within the claims are effective herbicides. *See, e.g.*, Pet. 22 (listing compounds that showed no herbicidal activity). The art is unpredictable, as admitted by Patent Owner (*see* Prelim. Resp. 21), and each of the claimed compounds (not tested in the Specification) would need to be screened to determine whether it is an effective herbicide. These compounds would also need to be synthesized prior to screening, which increases the quantity of experimentation required, even if the synthesis is routine. Although the level of skill in the art is high, for purposes of institution, Petitioner has sufficiently established that the '202 Patent does not provide meaningful guidance or working examples across the full scope of the claim to allow a skilled artisan to determine which compounds would be effective herbicides without extensive screening. Similar to *Idenix*, the "immense breadth of screening required to determine which [compounds] are effective [herbicides] can only be described as undue experimentation." *Idenix*, 941 F.3d at 1162; *see also Enzo Life Scis., Inc. v. Roche Molecular Sys., Inc.*, 928 F.3d 1340, 1348–49 (Fed. Cir. 2019) (affirming lack of enablement where claims covered "tens of thousands" of polynucleotides, each of which would need to be tested to determine whether it had the

claimed functionality); *Wyeth and Cordis Corp. v. Abbott Labs.*, 720 F.3d 1380, 1385 (Fed. Cir. 2013) (affirming lack of enablement where "practicing the full scope of the claims would require synthesizing and screening each of at least tens of thousands of compounds").

Patent Owner asserts that *Idenix* is distinguishable because there, "the field of nucleoside use for HCV treatment was 'in its infancy,'" and although the claims covered "millions of nucleosides," the specification disclosed only four examples, whereas here, "the agrochemical field is mature and well established, and the specification provides over 300 examples of compounds." Prelim. Resp. 26. With respect to the maturity of the relevant fields, Patent Owner is comparing apples to oranges—the narrow field of nucleoside use for HCV treatment versus the much broader field of agrochemicals. Additionally, the court in *Idenix* found that the claims encompassed "at least many, many thousands" of candidate compounds, and the specification included four working examples. 941 F.3d at 1159, 1161. Here, as discussed above, it is undisputed that claim 1 encompasses at least a billion compounds, and the Specification discloses approximately 350 example compounds. Given the much larger scope of challenged claim 1 here, we do not find the relative number of examples in *Idenix* versus here to persuasively distinguish *Idenix*.

Patent Owner relies on *In re Angstadt*, 537 F.2d 498 (CCPA 1976), where the specification disclosed a "large but finite list" of catalysts to use in the claimed method. *Id.* at 503. Here, in contrast, it cannot be said on this record that claim 1, which embraces a billion compounds, presents a "finite list" of compounds for use in the claimed invention.

For the above reasons, we find that on the present record, Petitioner has shown that it is more likely than not that challenged claim 1 is not sufficiently enabled. We emphasize that the question of enablement is a highly fact-dependent analysis, and any final decision on enablement will be based on the full trial record, including timely-filed information provided by a party during the course of this proceeding.

Claim 2 depends from claim 1 and narrows the choice of substituents for R^9 and R^{11}. Ex. 1001, 288:14–15. Claim 3 depends from claim 2 and further narrows the choice of substituents for Y^1, Y^2, R^1, R^2, R^3, R^4, R^5, and R^6. *Id.* at 288:16–20. The record does not reflect how many fewer compounds are encompassed by claims 2 and 3 as compared to claim 1. Nevertheless, neither claim 2 nor claim 3 directly narrows the substituents available at the Q^1 and Q^2 positions, *see* Ex. 1003 ¶¶ 176–179, and there are "thousands of possible variations" at each of these positions. Ex. 1003 ¶ 159 n.8, ¶ 162 n.9. As such, given the breadth of claims 2 and 3, on this record we find that the same analysis applied to claim 1 applies to these claims.

Claims 9–12 and 21 cover herbicidal compositions and mixtures. Ex. 1001, 288:61–289:30, 290:63–67. Claim 13 covers controlling vegetation growth using an "herbicidally effective amount" of a compound of claim 1. *Id.* at 289:31–35. None of claims 9–13 or 21 limit the breadth of compounds covered by claim 1, and thus, the same analysis applied to claim 1 applies equally to these claims.

Claims 22–24 each depend from claim 1, and only limit the substituents available at Q^1, without narrowing Q^2, R^1 and R^6. *Id.* at 291:1–19; Ex. 1003 ¶¶ 182–184. Claims 25–30 each depend from claim 1, and only limit the substituents available at Q^2, without narrowing Q^1, R^1 and R^6.

Ex. 1001, 291:20–292:44; Ex. 1003 ¶¶ 185–190. Because there are still "thousands of possible variations" at each of Q^1 and Q^2, *see* Ex. 1003 ¶ 159 n.8, *id.* ¶ 162 n.9, on this record we find that the same analysis applied to claim 1 applies to these claims.

Accordingly, for the reasons discussed above, we institute post-grant review of claims 1–3, 9–13, and 21–30 on the ground of lack of enablement.

b) Whether the '202 Patent Enables a Skilled Artisan to Make the Full Scope of Claims 1–3, 9–13, 21, 23, and 27–30

Petitioner separately argues that the Specification does not enable a skilled artisan to make the full scope of the invention of claims 1–3, 9–13, 21, 23, and 27–30. Pet. 32. In the interest of completeness, and to provide guidance to the parties, we supply reasons that give us pause as to whether Petitioner has met the threshold showing for post grant review with respect to this challenge.

(1) The Parties' Contentions

Petitioner contends that "[d]espite claiming over a billion compounds, the '202 Patent provides only seven specific examples of syntheses, corresponding to compounds 44, 74, 92, 93, 95, 103, 204 and 351." Pet. 32 (citing, e.g., Ex. 1003 ¶¶ 191–196). Petitioner contends that the potential substituents at each of the R^1, R^6, Q^1, and Q^2 positions have significantly different properties, including polarity, electron density, steric hindrance, acid-base properties, orientation, and size, which "could impact their ability to be synthesized." *Id.* at 32–33 (citing, e.g., Ex. 1003 ¶ 192; Exs. 1017, 1025). Petitioner further contends that a person of ordinary skill in the art would not have been able to make a compound with N-linked heterocycles and heteroaromatics at position Q^1 "using the synthesis method of the '202

Patent, or even standard organic methods, without undue experimentation because of problems with reaction regioselectivities (the preference of one direction of chemical bond making or breaking over other possible directions)." *Id.* at 34 (citing Ex. 1003 ¶¶ 198–200).

Patent Owner asserts that the Specification provides sixteen detailed synthetic schemes and seven working synthesis examples (Prelim. Resp. 9), and "explain[s] that the 'compounds of Formula 1 can be prepared by general methods known in the art of synthetic organic chemistry'" (*id.* (quoting Ex. 1001, 33:9–10)). Patent Owner states that the Specification cites "relevant textbooks and papers that describe methods for synthesizing compounds like those covered in the claims, including aromatic and non-aromatic heterocyclic rings and ring systems, as well as N-oxides of heterocycles and tertiary amines." *Id.* (citing Ex. 1001, 18:18–27, 20:51–21:10, 35:26–28, 41:51–52); *see also id.* at 33. Patent Owner argues that "even if it were impossible or inoperative to make certain N-linked heterocycle compounds, Syngenta does not show that the number of inoperative embodiments would be so great as to lead to a lack of enablement." *Id.* at 33.

(2) Analysis

The same analysis discussed above with respect to the nature of the invention, relative skill in the art, predictability or unpredictability of the art, and breadth of claims applies here. Thus we focus on the direction or guidance provided in the Specification regarding how to synthesize the claimed compounds, the relevant working examples, and the quantity of experimentation necessary to synthesize the claimed compounds.

There is no dispute that the Specification details a number of synthetic schemes and provides seven specific examples of syntheses. *See, e.g.*, Pet. 32–33; Prelim. Resp. 9. Petitioner and Dr. Hunt contend, however, that the list of potential substituents at each of the R^1, R^6 ,Q^1 and Q^2 positions "each encompass hundreds, or even thousands of different molecules," and the synthesis examples "cover only a minute fraction [] of the claimed molecules." Ex. 1003 ¶¶ 192, 195. According to Petitioner and Dr. Hunt, "the substituent[s] disclosed at each group have significantly different properties that could impact their ability to be synthesized, including without limitation, polarity, electron density (HOMO/LUMO differences), steric hinderance, and acid-base properties orientation." Ex. 1003 ¶ 192; Pet. 32–33; Exs. 1017, 1025. Dr. Hunt also contends that "the size of functional groups at each position is a consideration," which can "retard a reaction to the point of non-reactivity." Ex. 1003 ¶ 193.

We agree with Patent Owner that "[o]n the experimentation required for synthesis of the claimed compounds, Syngenta's expert only vaguely suggests that 'the substituents disclosed at each group have significantly different properties that could impact their ability to be synthesized,' with no explanation or evidence as to any purported difficulties that would cause." Prelim. Resp. 24 (citing Ex. 1003 ¶ 192). While the Specification demonstrates inoperative embodiments with respect to herbicidal activity (*see, e.g.*, Pet. 22 (listing compounds showing no herbicidal activity)), on this record, we have not been directed to persuasive evidence demonstrating that embodiments within the claims cannot be synthesized.

Petitioner and Dr. Hunt provide only one specific example of compounds that purportedly cannot be synthesized, i.e., "N-linked aromatic

heterocycles at Q^1." Ex. 1003 ¶ 198. But even in this instance, Petitioner and Dr. Hunt only vaguely reference "problems with reaction regioselectivities." *Id.*; *see also* Pet. 34. Dr. Hunt also asserts that the starting material required to prepare a substituted pyrrolidinone ring system does not exist and cannot be prepared without undue experimentation, thereby precluding synthesis of "any N-linked heteroaromatic group, and likely any N-linked heterocyclic group, at the Q^1 position." Ex. 1003 ¶ 200; *see also id.* ¶¶ 198–199. This analysis, however, is devoid of citation to corroborating evidence supporting the assertions. *See id.* ¶¶ 198–200; *see also In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2004) ("[T]he Board is entitled to weigh the declarations and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations.").

The analysis is also incomplete. On this record, we have not been directed to information indicating that Dr. Hunt took into account the textbooks and papers cited in the Specification, which describe methods for synthesizing compounds like those covered in the claims, including aromatic and non-aromatic heterocyclic rings and ring systems, as well as N-oxides of heterocycles and tertiary amines. *See* Prelim. Resp. 9 (citing Ex. 1001, 18:18–27 (referencing two multi-volume sets on heterocycle chemistry), 20:51–21:10 (citing various textbooks regarding preparation of N-oxides), 35:26–28 (citing papers addressing reaction conditions for scheme 5), 41:51–52 (citing textbook addressing interconversion of functional groups)); *see also id.* at 24; Ex. 1001, 42:3–7 (citing textbook addressing protective groups).

Even if we were to accept Dr. Hunt's assertion that any N-linked heteroaromatic and/or heterocyclic group at the Q^1 position would be impossible to make, the challenged claims do not necessarily fail the enablement requirement for that reason. "It is not a function of the claims to specifically exclude . . . possible inoperative substances . . . ." *Atlas Powder Co. v. E.I. du Pont De Nemours & Co.*, 750 F.2d 1569, 1576–77 (Fed. Cir. 1984) (quoting *In re Dinh-Nguyen*, 492 F.2d 856, 858–59 (CCPA 1974)) (alternations in original). The number of inoperative embodiments within the scope of a claim is relevant if it forces one of ordinary skill in the art to experiment unduly in order to practice the claimed invention. *Id.* Petitioner has not put into context the number of operative embodiments embraced by the claims versus the purported inoperative embodiments (i.e., the compounds having N-linked heteroaromatic or heterocyclic groups at Q^1).

2. Whether the '202 Patent Provides Adequate Written Description Support for Claims 9–13

Petitioner argues that the Specification does not provide adequate written description support for claims 9–13, which recite an herbicidal composition or mixture comprising a compound of claim 1 (claims 9–12), or a method for controlling the growth of undesired vegetation comprising use of an herbicidally effective amount of a compound of claim 1. Pet. 32; Ex. 1001, 288:61–289:35. In the interest of completeness, and to provide guidance to the parties, we supply reasons for our finding that Petitioner has met the threshold showing for post grant review of claims 9–13 with respect to this challenge.

(1) The Parties' Contentions

Petitioner asserts that "[w]here, as here, the claims cover a broad genus, the disclosure must adequately reflect the structural diversity of the claimed genus, either through the disclosure of sufficient species that are 'representative of the full variety or scope of the genus,' or by the establishment of 'a reasonable structure-function correlation.'" Pet. 35 (quoting *AbbVie Deutschland GmbH & Co., KG v. Janssen Biotech, Inc.*, 759 F.3d 1285, 1300 (Fed. Cir. 2014)). Petitioner asserts that "[t]he same data that demonstrates that the patentee had not enabled use of the full scope of the compounds of claim 1 also demonstrates that it was not in possession of the full scope of the claimed inventions of claims 9–13." *Id.* at 36 (citing Ex. 1003 ¶ 201). Petitioner further asserts that "[t]he biological data fails to show herbicidal activity for the vast majority of the claimed compounds and in fact indicates that many claimed compounds showed no herbicidal activity." *Id.*

Patent Owner asserts that Petitioner's written description argument is "cursory and insubstantial," and that "the same disclosure that demonstrates enablement . . . also demonstrates written description." Prelim. Resp. 35, 36.

(2) Analysis

35 U.S.C. § 112 requires that a patent's specification "contain a written description of the invention . . . in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains . . . to make and use the same." *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). This provision ensures that "the inventor actually invented the invention claimed" and "had possession of the

claimed subject matter as of the filing date." *Id.* at 1350–51. The test "requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art." *Id.* at 1351.

Here, each of challenged claims 9–13 require herbicidal activity. Ex. 1001, 288:61–289:35. The pertinent question is whether the '202 Patent demonstrates that the inventors were in possession of compounds, beyond those exemplified in the Specification, that fall within the claims and are effective herbicides. *See, e.g.*, *Idenix*, 941 F.3d at 1163. While the '202 Patent may provide adequate written description for the compounds that fall within the claims, as discussed above in connection with enablement, on this record we have not been directed to disclosure in the Specification that permits a skilled artisan to understand how changes to the structure of the exemplified compounds impact herbicidal activity. *See, e.g.*, Ex. 1003 ¶ 150 ("A person reading the '202 Patent is left to guess how changing substituents outside of the limited examples provided will impact herbicidal efficacy."); ¶ 133 (asserting that the Specification "does not state what the intended mode of action is for the herbicidal use of the claimed compounds"); ¶ 146 ("Without knowing the mechanism by which the herbicide affects plant growth, a POSA has little ability to predict how changes on the structure of a molecule can impact biological activity."); ¶ 147 (asserting that the examples in the Specification "do not provide sufficient guidance for a POSA to determine which of billions of compounds claimed would be effective as an herbicide"). Thus, as in *Idenix*, a person of ordinary skill in the art "is deprived of any meaningful guidance into what compounds beyond the examples and formulas, if any, would provide the same result," and "[i]n the absence of that guidance, the listed examples and formulas

cannot provide adequate written description support for undisclosed" compounds that also have herbicidal effect. 941 F.3d at 1164.

Accordingly, on the present record, we conclude that it is more likely than not that Petitioner will succeed in demonstrating that claims 9–13 lack adequate written description support.

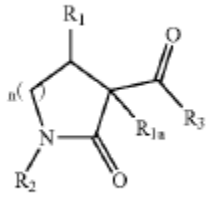
3. Anticipation of Claims 1–7 and 22–31 by Olsson (Ex. 1004)

Petitioner asserts that claims 1–7 and 22–31 are unpatentable under 35 U.S.C. § 102(a)(1) as anticipated by Olsson. Pet. 36. In the interest of completeness, and to provide guidance to the parties, we supply reasons that give us pause as to whether Petitioner has met the threshold showing for post grant review of any challenged claim with respect to anticipation.

a) Overview of Olsson (Ex. 1004)

Olsson, titled "PAR2-Modulating Compounds and Their Use," "relates to compounds that modulate the activity of proteinase-activated receptor-2 (PAR2), to the use of the compounds as tools for the further elucidation of the role of PAR2 in biological systems and to the treatment and prevention of diseases and disorders related to PAR-2." Ex. 1004, code (54), ¶ 2. Olsson states that PAR2 receptors have been implicated in numerous physiological processes, and lists treatment applications for the disclosed compounds. *Id.* ¶¶ 5, 32–64, 185.

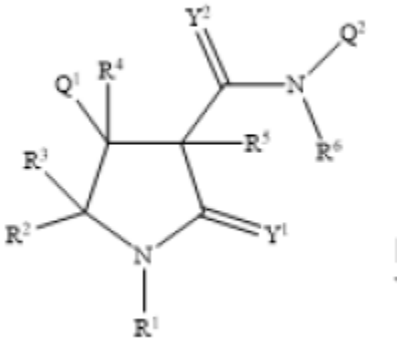
Olsson discloses a genus of compounds having a core that comprises a pyrrolidinone ring:



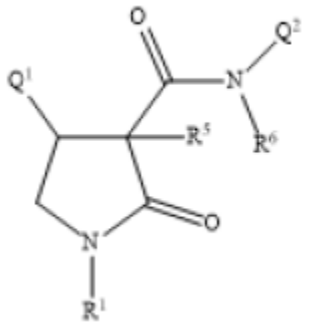
Id. ¶ 7. Olsson discloses various choices for the substituents on this core, and discloses several specific compounds. *See, e.g.*, *id.* ¶¶ 8–31, 65–128. Olsson provides synthetic routes for making the compounds, and discloses "a method for treating or preventing a disease or disorder related to abnormal PAR2 activity comprising administering a therapeutically effective amount of one or more of the compounds." *Id.* ¶¶ 129, 184.

b) The Parties' Contentions

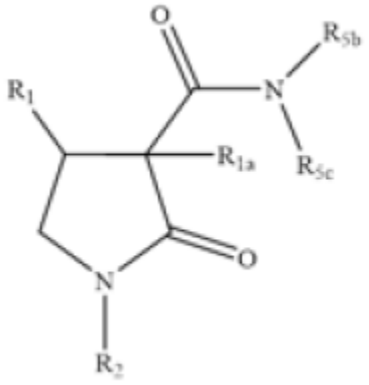
Formula I recited in claim 1 of the '202 Patent appears as follows:



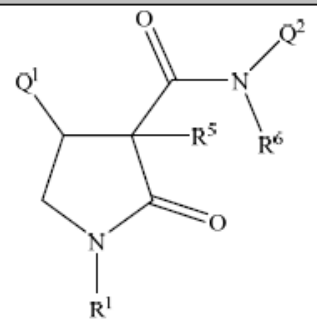
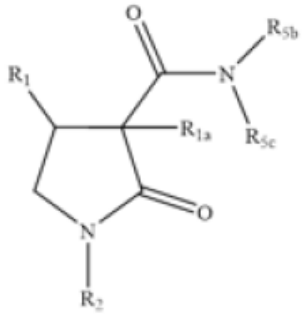
Ex. 1001, 285:31–41. Petitioner argues that when R^2, R^3, and R^4 are hydrogen, and Y^1 and Y^2 are oxygen, the structure of formula I becomes:



Pet. 38–39 (citing Ex. 1003 ¶ 82). Petitioner argues that "[t]his is the same core as of Olsson (described in paragraph 7), when (n) is set to 1 (as disclosed in paragraph 8, and as illustrated in paragraph 7), and R_3 is selected as —$NR_{5b}R_{5c}$, which is one of the three options identified in paragraph 15, and in Olsson's claim 2." *Id.* at 39 (citing Ex. 1004 ¶¶ 7, 8, 15, 184; Ex. 1003 ¶ 83). Petitioner provides the following depiction of Olsson's core structure with these substitutions:



Id. at 39. Petitioner also provides the following side-by-side comparison of Formula I of the '202 Patent with the above substitutions (shown on the left), and Olsson's core structure with the above substitutions (shown on the right):

Structure of the '202 Patent *when: R^2, R^3, and R^4 are H, Y^1 and Y^2 are O	Structure of Olsson *when: n is 1 and R_3 is —$NR_{5b}R_{5c}$
	

Id. at 40.

Petitioner further argues that R_1 in Olsson corresponds to the Q^1 group in claim 1 of the '202 Patent, and that for R_1, Olsson describes "[o]ptionally substituted aryls and heteroaryls [as] the first choices," where aryls are defined to include benzene rings. *Id.* at 41–42 (citing Olsson ¶¶ 25, 133). Petitioner further argues that "a benzene ring attached to a carbon atom at the R^1 position of Olsson[4] would be a phenyl group," and "a POSA would understand and be able to envisage that Olsson describes the phenyl group of Q^1." *Id.* at 42 (citing Ex. 1003 ¶ 88); *see also id.* at 42–43 (arguing that based on other choices for R_1 disclosed in Olsson, a skilled artisan could visualize other substituents defined in the '202 Patent for Q^1). As will be discussed further below, Petitioner makes similar arguments that Olsson defines other substituents on its core structure that overlap with substituents

[4] Although Petitioner sometimes uses superscripts when referring to positions on Olsson's core (*see, e.g.*, Pet. 41, referencing Olsson's "R^1" group), Olsson uses subscripts (*see, e.g.*, Ex. 1004 ¶ 7, referencing "R_1"). For clarity, except when quoting Petitioner or Dr. Hunt, we use Olsson's convention.

that are defined for Formula I in challenged claim 1. *See id.* at 43–46 (discussing the Q^2 position in challenged claim 1), 47 (discussing the R^1, R^5, and R^6 positions in challenged claim 1); *see also id.* at 49–68 (claim chart comparing the limitations of challenged claim 1 with Olsson's disclosures).

Patent Owner argues that Petitioner does not "attempt to show that any embodiment disclosed in Olsson falls within the scope of any claim of the '202 patent," and that "none of the compounds that Olsson actually provides falls within the scope of the challenged claims." Prelim. Resp. 39, 43. Patent Owner argues that Petitioner's anticipation argument instead "relies on picking and choosing unrelated disclosures from disparate and unconnected aspects of the Olsson reference," *id.* at 39, in an effort to "cobble together a molecule that fits within the scope of claim 1 of the '202 patent." *Id.* at 43.

c) Analysis

"To anticipate, the reference must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements arranged as in the claim." *Sanofi-Synthelabo v. Apotex, Inc.*, 550 F. 3d 1075, 1083 (Fed. Cir. 2008) (internal quotation omitted). In other words, it is not enough to be able to find all of the pieces of the claimed invention somewhere in a prior art reference; rather, those elements must be set out in the prior art reference in the same way they are in the claimed invention. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) ("Because the hallmark of anticipation is prior invention, the prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document,

but must also disclose those elements 'arranged as in the claim.'") (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)).

Petitioner has not directed us to any species compound in Olsson that falls within the scope of the challenged claims. Instead, as demonstrated by Patent Owner, Petitioner's argument "relies on picking and choosing unrelated disclosures from disparate and unconnected aspects of the Olsson reference," and Petitioner has not pointed us to guidance in Olsson that directs a skilled artisan to make all of the necessary choices simultaneously. Prelim. Resp. at 39.

First, while Olsson's core structure allows for either a 5-, 6-, or 7-membered ring, Petitioner focuses on a 5-member ring. Ex. 1004 ¶¶ 7, 8; Pet. 39. Petitioner does point us to a reason to focus on 5-member rings, noting that Olsson describes such rings in seven of its eight syntheses schemes. Pet. 39 (citing Ex. 1004 ¶ 184; Ex. 1003 ¶ 83 (noting that "a 5 membered ring (*e.g.*, n=1) is the configuration that Olsson depicts in most of its syntheses schemes (schemes 2-8)")).

Second, from among the options Olsson specifies for the R_3 position, Petitioner selects an amine functional group, $NR_{5b}R_{5c}$. Pet. 39. Petitioner asserts that where R_3 is $NR_{5b}R_{5c}$, R_{5b} and R_{5c} respectively correspond to the Q^2 and R^6 positions in the '202 Patent. *Id.* at 41 (table), 43. Although Petitioner asserts that $NR_{5b}R_{5c}$ "is one of the three options identified in [Olsson's] paragraph 15, and in Olsson's claim 2" (*id.*), this rationale fails to account for the multitude of other options for R_3 disclosed in Olsson. *See* Ex. 1004 ¶¶ 12, 19, 26. That said, Petitioner also points us to Olsson's Scheme 3, which depicts a core having a 5-membered ring, where R_3 is $NR_{5b}R_{5c}$, and more specifically, where R_{5b} is a substituted phenyl ring and

R_{5c} is hydrogen. Pet. 40–41 (citing Ex. 1004 ¶ 184; Ex. 1003 ¶¶ 83–84). Petitioner notes that Olsson also separately provides that R_{5b} may be, among other things, an aryl ring. *Id.* at 43; Ex. 1004 ¶ 18.

With regard to Petitioner's reliance on Scheme 3, Patent Owner asserts that "no example provided in Olsson shows a compound using this synthesis scheme, nor is it referenced anywhere else in Olsson." Prelim. Resp. 47. We do not view this as a reason to discount Scheme 3, because "[a]ll the disclosures in a reference must be evaluated, . . . and a reference is not limited to the disclosure of specific working examples." *In re Mills*, 470 F.2d 649, 651 (CCPA 1972) (internal citations omitted).

Third, Petitioner asserts that "Olsson's R^1 position corresponds to the '202 Patent's Q^1," and that Olsson describes aryl groups (which Petitioner asserts includes phenyl rings) among the first choices for R_1. *Id.* at Pet. 41–42 (citing Ex. 1004 ¶¶ 25, 133; Ex. 1003 ¶ 88). Petitioner also notes that synthesis schemes 7 and 8 depict a substituted phenyl group at the position corresponding to Q^1. *Id.* at 42 (citing Ex. 1004 ¶ 184).

Patent Owner responds that in focusing on such ring systems for the R_1 group in Olsson, Petitioner "skips past the first discussion of R_1 in Olsson . . ., which provides a large number of options for R_1." Prelim. Resp. 48 (citing Ex. 1004 ¶ 9). Patent Owner also asserts that Schemes 7 and 8 patent are both "missing the nitrogen-containing functional group required by every claim of the '202 patent, and both also fail to disclose a phenyl ring or a naphthalenyl ring system as is required for Q^2 in the '202 patent." *Id.* at 50.

While we agree with Patent Owner that Olsson indeed discloses a multitude of options for R_1 beyond those Petitioner focuses on, we note that

at least Schemes 7 and 8 depict a substituted phenyl group at R_1, which overlaps with the recitation in challenged claim 1 that Q^1 can be a phenyl group. *Compare* Ex. 1004 ¶ 184 *with* Ex. 1001, 285:44–45. We also decline to discount the disclosures of Schemes 7 and 8. Olsson indicates that the synthesis schemes provide "[g]eneral synthetic routes to the compounds of th[e] invention," and "are not intended . . . to limit the scope of th[e] invention." Ex. 1004 ¶ 184. Thus, we view the synthesis schemes as merely exemplifying various substituents that are possible at each position, rather than as limiting the combination of substituents that can be put together in a given compound.

Fourth and finally, with regard to the R^1, R^5, and R^6 positions of the '202 Patent, which Petitioner asserts respectively correspond to the R_2, R_{1a}, and R_{5c} (or R_{4a}) positions of Olsson (*see* Pet. 41, 47), Petitioner asserts for example that "Olsson discloses that any of the R positions may be H, a halogen or a C_1-C_4 alkyl, which falls within the scope of R^1, R^5, and R^6 in claim 1." *Id.* at 47 (citing Ex. 1004 ¶ 130; Ex. 1003 ¶ 101). Although Patent Owner argues that Olsson provides many more options for each of R_2, R_{1a}, R_{5c}, and R_{4a} positions (Prelim. Resp. 53), we note that Olsson at least recites hydrogen as the first choice for each position. *See* Ex. 1004 ¶¶ 10, 11, 14, 18.

On this record, Petitioner has directed us to information tending to show that individual substituents of the genus recited in challenged claim 1 can be found within Olsson's disclosure, as outlined above.[5] However,

[5] Petitioner additionally outlines where in Olsson's disclosure the optional substituents recited in challenged claim 1 are purportedly found. *See, e.g.*,

Petitioner's presentation lacks, for example, any rationale as to how Olsson teaches making each of these disparate choices simultaneously. To establish anticipation, a "reference must clearly and unequivocally disclose the claimed compound or direct those skilled in the art to the compound without *any* need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference." *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972). On this record, we are not persuaded that Petitioner has met this standard.

Petitioner's arguments for the remaining challenged claims suffer from the same flaws. Each of challenged dependent claims 2–7 and 22–30 narrow the choice of substituents at one or more positions of the generic formula recited in claim 1. *See* Ex. 1001, 288:14–48, 291:1–292:44. Independent claim 31 recites the same core compound as claim 1, but as compared to claim 1, recites fewer options for R^2–R^6, Q^1, Q^2, Y^1, and Y^2. *Id.* at 292:45–293:24. Petitioner points us to where in Olsson disclosure of the claimed options are taught, but once again, has not demonstrated that Olsson clearly and unequivocally discloses a compound falling within the scope of the claims, or directs skilled artisans to the claimed compounds without any need for picking or choosing. *See* Pet. 69–90.

4. Obviousness of Claims 1–7 and 22–31 Over Olsson (Ex. 1003)

Petitioner asserts that claims 1–7 and 22–31 are unpatentable as obvious over Olsson. Pet. 90. In the interest of completeness, and to provide guidance to the parties, we supply reasons that give us pause as to

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Pet. 45–47. Because the optional substituents are not necessary to anticipate challenged claim 1, we do not address them here.

whether Petitioner has met the threshold showing for post grant review of any challenged claim with respect to obviousness.

Petitioner reiterates that Olsson discloses "each and every limitation" of claims 1–7 and 22–31. Pet. 90. Petitioner argues that "it may be obvious to a person of ordinary skill in the art to try a combination of elements where there are a finite number of identifiable solutions and a good reason to pursue the technical solutions within their grasp," and that here, "Olsson explains that there was strong interest in modifying the compounds it discloses because of their applicability to the PAR2 enzyme, which was known to have wide applicability in treating a wide range of physiological conditions." *Id.* at 92–93.

Patent Owner responds that Petitioner "makes no attempt to show that Olsson is analogous art to the '202 patent." Prelim. Resp. 55. However, Petitioner's argument is directed to modifying compounds based on "their applicability to the PAR2 enzyme," not based on any purported utility as an herbicide. Pet. 93. "In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim. If the claim extends to what is obvious, it is invalid under § 103." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 419 (2007); *see also In re Beattie*, 974 F.2d 1309, 1312 (Fed. Cir. 1992) ("As long as some motivation or suggestion to combine the references [or teachings in a reference] is provided by the prior art taken as a whole, the law does not require that the references [or teachings] be combined for the reasons contemplated by the inventor.").

Patent Owner also argues that Olsson "posits a large number of options for each of the functional groups, [which] cuts against a finding of obviousness." Prelim. Resp. 57. We agree. Petitioner relies on an "obvious to try" theory. Pet. 92–93. In *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007), the Supreme Court explained that "obvious to try" may apply when "there are a finite number of identified, predictable solutions" to a known problem. The Federal Circuit "has elaborated that the identified path must 'present a finite (and small in the context of the art) number of options easily traversed to show obviousness.'" *Sanofi-Aventis Deutschland GmbH v. Glenmark Pharms. Inc., USA*, 748 F.3d 1354, 1360 (Fed. Cir. 2014) (quoting *Ortho–McNeil Pharm., Inc. v. Mylan Labs., Inc.*, 520 F.3d 1358, 1364 (Fed. Cir. 2008)). On this record, we determine that Petitioner has not demonstrated this is a situation with a "finite" or "small or easily traversed[] number of options that would convince an ordinarily skilled artisan of obviousness." *Ortho–McNeil Pharm.*, 520 F.3d at 1364.

Petitioner points to several selections that must be made from Olsson's disclosure to result in a compound that falls within the scope of the challenged claims, where each selection is chosen from a sizeable menu of possible options. Pet. 91–93 (discussing, for example, selection of a 5-membered ring core, and choices for, at a minimum, substituents R_3, $–R_{5b}$, $–R_{1a}$, $–R_{5c}$, R_1, and R_2 on this core); *see also id.* (acknowledging that "Olsson describes numerous options that satisfy each of the limitations (a)-(f) at the end of claim 1"). Additionally, Petitioner has not put forth a rationale as to how Olsson teaches making each of these disparate choices simultaneously. Rather, in focusing on the chosen substituents, it appears that Petitioner has

"use[d] the claimed compounds of the '202 patent to guide it through the disclosure of Olsson." Prelim. Resp. 58.

III. CONCLUSION

On the current record, Petitioner has sufficiently shown that it is more likely than not that at least one of the challenged claims is unpatentable for lack of enablement and lack of written description support. Nothing in this decision represents, or should be construed as, an invitation for Petitioner to supplement the information presented in the Petition on any ground.

A final written decision entered pursuant to 35 U.S.C. § 328(a) must decide the patentability of all claims challenged in a petition. *See SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348 (2018). Following Office policy, we institute a post grant review based on all claims and all grounds asserted in the Petition. *See* Guidance on the Impact of SAS on AIA Trial Proceedings (Apr. 26, 2018), https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/trials/guidance-impact-sas-aia-trial ("At this time, if the PTAB institutes a trial, the PTAB will institute on all challenges raised in the petition."); *Adidas AG v. Nike, Inc.*, 894 F.3d 1256, 1258 (Fed. Cir. 2018) (quoting *SAS*, 138 S. Ct. at 1356–1357) (endorsing that Office policy by explaining that "'the petitioner's petition, not the Director's discretion, is supposed to guide the life of the litigation' and 'that the petitioner's contentions, not the Director's discretion define the scope of the litigation all the way from institution through to conclusion'").

At this stage of the proceeding, the Board has not made a final determination as to the patentability of any challenged claim. Thus, our view with regard to any conclusion reached in the foregoing analysis could change upon completion of the record.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 324(a), a post-grant review is instituted to determine whether

(1) claims 1–3, 9–13, and 21–30 are unpatentable under 35 U.S.C. § 112(a) for lack of enablement;

(2) claims 9–13 are unpatentable under 35 U.S.C. § 112(a) for lack of adequate written description support;

(3) claims 1–7 and 22–31 are unpatentable under 35 U.S.C. § 102(a)(1) as anticipated by Olsson; and

(4) claims 1–7 and 22–31 are unpatentable under 35 U.S.C. § 103 as obvious over Olsson; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 324(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial commencing on the entry date of this Decision.

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