

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WESTMINSTER PHARMACEUTICALS, LLC,
Petitioner,

v.

LPRI FRANCE,¹
Patent Owner.

IPR2022-00677
Patent 8,183,227 B1

Before TIMOTHY G. MAJORS, CYNTHIA M. HARDMAN, and
JAMIE T. WISZ, *Administrative Patent Judges*.

HARDMAN, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

¹ The Petition identified Patent Owner as Chemo S.A. France. We updated the case caption based on Patent Owner's representation in its Mandatory Notices that Chemo S.A. France is now known as LPRI France. Paper 4, 1.

I. INTRODUCTION

Petitioner Westminster Pharmaceuticals, LLC requests *inter partes* review of claims 1–10 of U.S. Patent No. 8,183,227 B1 (“the ’227 patent,” Ex. 1001). Paper 1 (“Pet.”). Patent Owner LPRI France (formerly known as Chemo S.A. France) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”); Paper 4, 1.

Considering the arguments and evidence of record, we determine that the Petition does not demonstrate “a reasonable likelihood that [P]etitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). Accordingly, we do not institute an *inter partes* review.

A. *Real Parties in Interest*

Petitioner and Patent Owner each identify themselves as the real party in interest. Pet. 9; Paper 4, 1. Patent Owner adds that “Insud Pharma, S.L.U. (formerly known as Chemo Iberica, S.A., Chemo Group) is its parent.” Paper 4, 1.

B. *Related Matters*

The parties state that the ’227 patent was the subject of two cases, *Everett Labs., Inc. v. Acella Pharms., LLC*, 1:13-cv-03470 (D.N.J.)² and *Acella Pharms., LLC v. Chemo S.A. France*, 2:13-cv-573 (N.D. Va.), both of which settled in 2014. Pet. 6; Paper 4, 1.

² Petitioner informs us that a motion for preliminary injunction was filed, but denied, in the New Jersey district court case. See Pet. 6–8; Ex. 1032 (*Everett Labs., Inc. v. Acella Pharms., LLC*, 13-cv-3470, 2013 WL 5179006, at *4–8 (D.N.J. Sept. 13, 2013) (denying plaintiff’s motion based on a substantial question of invalidity and no showing of irreparable harm)).

The parties identify three U.S. patent applications that “claim the benefit of the ’227 patent”: U.S. Patent Application Nos. 13/475,182, 15/343,599, and 17/534,817. Pet. 9–10; Paper 4, 1.

C. The ’227 Patent (Ex. 1001)

The ’227 patent, titled “Compositions, Kits and Methods for Nutrition Supplementation,” relates to the administration of various vitamins, minerals, and nutrient compositions.³ Ex. 1001, code (57). The Specification states that proper nutrition is important when the body faces physiological stress such as pregnancy and lactation, and “vitamin and mineral needs are almost universally increased during these natural processes.” *Id.* at 1:25–31. According to the Specification, “a present problem with nutritional supplements that include multiple vitamins, nutrients and minerals is the ability to include all the components in one composition.” *Id.* at 2:39–41. Per the Specification, “the present invention relates to novel compositions of vitamins, minerals, and omega-3 fatty acids that can be used to supplement the nutritional deficiencies observed in patients throughout physiologically stressful states,” such as pregnancy and lactation. *Id.* at 3:23–28. The Specification includes exemplary formulations. *Id.* at 36:33–37:61.

³ The ’227 patent claims priority to a provisional application filed on July 7, 2011. Ex. 1001, code (60). Petitioner assumes, and Patent Owner does not dispute, that the challenged claims are entitled to claim priority to this date. Pet. 12; *see generally* Prelim. Resp. We similarly assume, without deciding, that the challenged claims are entitled to claim priority to July 7, 2011.

D. The Challenged Claims

Petitioner challenges claims 1–10 (all claims) of the '227 patent.

Pet. 1. We reproduce claim 1, the only independent claim, below:

1. A composition consisting of vitamin D in an amount of about 1000 I.U., iodine in an amount of about 150 µg, vitamin B1 in an amount of about 1.6 mg, vitamin B6 in an amount of about 2.5 mg, vitamin B12 in an amount of about 12 µg, vitamin B2 in an amount of about 1.8 mg, vitamin B9 in an amount of about 1.0 mg, vitamin E in an amount of about 20 I.U., vitamin A in an amount of about 1100 I.U., vitamin C in an amount of about 30 mg, vitamin B3 in an amount of about 15 mg, iron in an amount of about 29 mg, zinc in an amount of about 25 mg, copper in an amount of about 2.0 mg, magnesium in an amount of about 20 mg, omega 3 fatty acids comprising DHA in an amount of about 200 mg, and one or more pharmaceutically acceptable carriers.

Ex. 1001, 40:27–39.

Claims 2 and 3 respectively add that the dosage form is a gelcap or liquid gelcap. *Id.* at 40:40–43. Claims 4 and 5 relate to the source of the DHA. *Id.* at 40:44–47. Claim 6 relates to the pharmaceutically acceptable carriers. *Id.* at 40:48–52. Claim 7 recites that the composition “does not contain fish oils.” *Id.* at 40:53–54. Claims 8–10 relate to methods of providing the compositions to patients. *Id.* at 40:55–64.

E. The Asserted Grounds of Unpatentability

Petitioner asserts that claims 1–10 are unpatentable on the following grounds:

Ground	Claim(s) Challenged	35 U.S.C. § ⁴	Reference(s)/Basis
1	1–10	§ 103(a)	Bentley, ⁵ Bischoff-Ferrari, ⁶ Koletzko ⁷
2	1–10	§ 103(a)	Bentley, McCullough, ⁸ Koletzko
3	2–3	§ 103(a)	Bentley, Bischoff-Ferrari, Koletzko, Edwards ⁹
4	2–3	§ 103(a)	Bentley, McCullough,

⁴ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended several provisions of 35 U.S.C., including § 103. Because the July 7, 2011, priority date we apply herein for the challenged claims (*see supra* n.3) is before the effective date of the applicable AIA amendments, we refer to the pre-AIA version of 35 U.S.C. § 103.

⁵ Bentley et al., *Comparative Effectiveness of a Prenatal Medical Food to Prenatal Vitamins on Hemoglobin Levels and Adverse Outcomes: A Retrospective Analysis*, *Clinical Therapeutics*, 33(2), 204–210 (2011) (“Bentley,” Ex. 1004).

⁶ Bischoff-Ferrari, *Optimal Serum 25-Hydroxyvitamin D Levels for Multiple Health Outcomes*, in *SUNLIGHT, VITAMIN D AND SKIN CANCER* 55–71 (Reichrath ed. 2008), *Advances in Experimental Medicine and Biology*, Vol. 624 (“Bischoff-Ferrari,” Ex. 1008).

⁷ Koletzko et al., *The roles of long-chain polyunsaturated fatty acids in pregnancy, lactation and infancy: review of current knowledge and consensus recommendations*, *J. Perinat. Med.*, 36, 5-14 (2008) (“Koletzko,” Ex. 1009).

⁸ McCullough, *Vitamin D Deficiency in Pregnancy: Bringing the Issues to Light*, *The Journal of Nutrition*, Vol. 137(2), 305-6 (2007) (“McCullough,” Ex. 1007).

⁹ Edwards et al., WO/2009/151457, published December 17, 2009 (“Edwards,” Ex. 1014).

Ground	Claim(s) Challenged	35 U.S.C. § ⁴	Reference(s)/Basis
			Koletzko, Edwards
5	1–10	§ 103(a)	MPR, ¹⁰ Bischoff-Ferrari, Koletzko
6	1–10	§ 103(a)	MPR, McCullough, Koletzko
7	2–3	§ 103(a)	MPR, Bischoff-Ferrari, Koletzko, Edwards
8	2–3	§ 103(a)	MPR, McCullough, Koletzko, Edwards

Pet. 34. Petitioner supports its contentions with the Declaration of Marie A. Caudill, Ph.D., R.D. Ex. 1003. Patent Owner supports its contentions with the Declaration of Jesse F. Gregory III, Ph.D. Ex. 2001.

II. ANALYSIS

A. *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. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Petitioner contends that a person of ordinary skill in the art is:

a person with at least a Master’s degree or equivalent thereof in nutritional science, pharmacy, biotechnology, biology, chemistry or a similar field and additionally has knowledge related to formulating nutritional supplements, or a person with a bachelor’s degree in biotechnology, chemistry, chemical engineering, biology or a related field and additionally has a minimum of three years of experience in the dietary supplement industry related to nutritional supplementation, prenatal nutrition supplements and/or women nutrition supplementation.

¹⁰ *Monthly Prescribing Reference*, Obstetrician & Gynecologist Edition, 2010, 21(1), 119-127 (April 2010) (“MPR,” Ex. 1006).

The [person of ordinary skill in the art] would be expected to have either personal knowledge or have access to a team with knowledge regarding designing appropriate dosage forms for vitamin supplements.

Pet. 17–18 (spacing added). For purposes of the Preliminary Response, Patent Owner adopts Petitioner’s proposal. Prelim. Resp. 7.

Because Petitioner’s proposal is consistent with the cited prior art and is undisputed on this record, we adopt it for purposes of this Decision.

B. Claim Construction

In an *inter partes* review, 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),” i.e., 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.” 37 C.F.R. § 42.100(b).

Petitioner addresses one term, “about,” which appears in claim 1. Pet. 19. Patent Owner states “no construction is necessary” at this stage. Prelim. Resp. 8.

For purposes of institution, we determine that we need not construe any claim terms. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those 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)).

C. Alleged Obviousness

Under pre-AIA § 103(a), a claim is unpatentable as obvious “if the differences between the subject matter sought to be patented and the prior art

are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a) (2006); *see also KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved based on underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) any objective indicia of nonobviousness.¹¹ *Graham*, 383 U.S. at 17–18. An obviousness determination requires finding a reason to combine the asserted prior art “accompanied by a reasonable expectation of achieving what is claimed in the patent-at-issue.” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016).

1. *Overview of Asserted Prior Art*

a) *Bentley (Ex. 1004)*

Bentley is titled “Comparative Effectiveness of a Prenatal Medical Food to Prenatal Vitamins on Hemoglobin Levels and Adverse Outcomes: A Retrospective Analysis.” Ex. 1004, 204. Bentley compares the effects of prenatal medical food and standard prenatal vitamins (“PNVs”) on hemoglobin levels and adverse outcomes through pregnancy. *Id.* Bentley concludes: “[i]n the present study, supplementation with a prenatal medical food containing L-methylfolate and high-dose vitamin B₁₂ may maintain hemoglobin levels and decrease rates of anemia in pregnancy more

¹¹ Patent Owner does not submit objective indicia of nonobviousness on this record.

effectively than standard prenatal vitamins; however, prospective, controlled studies are warranted.” *Id.*

Bentley’s Table I discloses a “[c]omparison of nutritional content in prenatal medical food without docosahexaenoic acid (DHA), prenatal food with DHA, and prenatal vitamins,” wherein the “[n]utritional content for prenatal vitamins was taken from: Prenatal vitamins. *MPR (Monthly Prescribing Reference)*. 2010;21:121.”¹² *Id.* at 206.

b) Koletzko (Ex. 1009)

Koletzko, titled “The roles of long-chain polyunsaturated fatty acids in pregnancy, lactation and infancy: review of current knowledge and consensus recommendations,” reviews the role of DHA in “maternal and term infant nutrition as well as infant development.” Ex. 1009, 5. Koletzko states that “a systematic review of available evidence and a formal consensus process” resulted in a consensus document recommending “an average DHA intake of at least 200 mg/day during both pregnancy and lactation.” *Id.* at 7. Koletzko noted that “[w]omen of childbearing age can meet the recommended intake of DHA by consuming one to two portions of sea fish per week.” *Id.*

c) Bischoff-Ferrari (Ex. 1008)

Bischoff-Ferrari is titled “Optimal Serum 25-Hydroxyvitamin D Levels for Multiple Health Outcomes.” Ex. 1008, 55. It summarizes evidence from different studies that evaluated threshold levels for serum

¹² The cited MPR appears in this record as Exhibit 1006.

25(OH)D¹³ levels in relation to bone mineral density, lower extremity function, dental health, risk of falls, admission to nursing home, fractures, cancer prevention, and incident hypertension. *Id.* Bischoff-Ferrari concludes that “[f]or all endpoints, the most advantageous serum levels for 25(OH)D appeared to be at least 75 nmol/l,” and that “[a]n intake of no less than 1000 IU (25 mcg) of vitamin D3 (cholecalciferol) per day for all adults may bring at least 50% of the population” up to this level. *Id.*

d) McCullough (Ex. 1007)

McCullough is titled “Vitamin D Deficiency in Pregnancy: Bringing the Issues to Light.” Ex. 1007, 305. McCullough comments on an article simultaneously published in the same journal, stating that it provides “compelling evidence that 1) pregnant women and their neonates living in the northern U.S. are at risk of vitamin D deficiency, 2) this problem is worse for blacks than whites, 3) seasonal variation contributes little to vitamin D status among black women and their neonates, and 4) current formulations of prenatal vitamin supplements may be inadequate achieve desired serum 25 hydroxy vitamin D [25(OH) D] (storage form of vitamin D) concentrations.” *Id.* (alteration in original). McCullough states: “[c]onsidering these findings, why not raise the DRI [Dietary Reference Intake] for vitamin D? Most experts agree that the current DRI of 200–600 IU is too low, and that, based on current evidence, daily requirements may be closer to 1000 IU or higher.” *Id.* at 306. McCullough concludes:

¹³ Petitioner’s declarant, Dr. Caudill, testifies that “[c]irculating [25(OH)D] is a reliable biomarker of vitamin D status.” Ex. 1003 ¶ 68 n.4 (second alteration in original).

Whereas more studies are needed to determine precise vitamin D requirements in all populations, we do have enough evidence to show that current practices are not serving at-risk groups. Because pregnant women are already under medical care and taking a prenatal vitamin, the benefits of a higher dose of vitamin D supplementation and perhaps 25(OH) D screening (in high-risk groups) is worthy of further investigation.

Id.

e) MPR (Ex. 1006)

MPR is the Monthly Prescribing Reference Obstetrician and Gynecological Edition. Ex. 1006, 1.¹⁴ It provides a guide on common pharmaceutical and over the counter products. *Id.* Section 11 of the MPR relates to “vitamins/minerals/supplements.” *Id.* at 2. MPR provides a chart showing various brands of prenatal vitamins, together with their nutrient content and the amounts of each nutrient in the vitamin. *Id.* at 4.

f) Edwards (Ex. 1014)

Edwards, titled “Nutritional Preparations,” discloses compositions and methods that are “particularly useful for the neurological, visual, and cognitive development of an embryo, fetus, or infant and the nutritional and physiological well-being of the mother, fetus, and infant.” Ex. 1014, codes (54), (57). Edwards teaches that the compositions can contain essential fatty acids, vitamins, and minerals formulated in the same dosage unit, e.g., soft-gel capsules. *Id.* at 18:25–19:10.

¹⁴ For MPR (Ex. 1006), we use Petitioner’s applied page numbering, rather than any original page numbering.

2. *Grounds 1 and 2: Alleged Obviousness Over Bentley, Koletzko, and either Bischoff-Ferrari or McCullough*

Petitioner asserts that claims 1–10 are unpatentable under 35 U.S.C. § 103 as obvious over Bentley, Koletzko, and Bischoff-Ferrari (Ground 1) or Bentley, Koletzko, and McCullough (Ground 2). Pet. 35–50. For the reasons discussed below, on this record we determine that Petitioner has not shown a reasonable likelihood of establishing that at least one of the challenged claims is unpatentable as obvious over these combinations of prior art.

a) *Brief Summary of Petitioner’s Arguments*

Petitioner asserts that a person of ordinary skill in the art would have been motivated to develop an “*all-in-one*” prenatal vitamin containing multiple vitamins, minerals, and DHA to “increase[] manufacturing efficiency, save[] cost and improve[] patient drug compliance.” Pet. 35 (citing Ex. 1003 ¶ 103). Petitioner argues that the “starting point would have naturally been Bentley since it discloses in Table I the ‘standard PNV [i.e., prenatal vitamin]’ formulation based on the contents of the prenatal vitamins available on the market as of April 2010.” *Id.* at 35–36 (alteration in original) (citing Ex. 1003 ¶ 104; Ex. 1004, 204, Table I).

We reproduce Bentley Table I below:

Table I. Comparison of nutritional content in prenatal medical food without docosahexaenoic acid (DHA), prenatal food with DHA, and prenatal vitamins.			
Content	Prenatal Medical Food Without DHA	Prenatal Medical Food With DHA	Prenatal Vitamins*
L-Methylfolate, mg	1.13	1.13	
Folic acid, mg	0.4	0.4	0.4–1.0
Vitamin A, IU	–	–	0–4000
Vitamin B ₁ , mg	3	–	1.5–3.0
Vitamin B ₂ , mg	3.4	–	1.6–4.0
Vitamin B ₃ , mg	20	–	15–20
Vitamin B ₅ , mg	7	–	0–10
Vitamin B ₆ , mg	2.6	25	2.5–50.0
Vitamin B ₁₂ , µg	500	1000	0–12
Biotin, µg	0.003	–	0–30
Vitamin C, mg	80	40	28–120
Vitamin D, IU	400	–	200–400
Vitamin E, IU	30	30	10–30
Calcium, mg	200	75	100–230
Iron, mg	29	27	20–35
Copper, mg	2.0	–	0–2
Iodine, mg	–	–	0–0.175
Magnesium, mg	40	–	0–40
Selenium, µg	–	–	0–65
Zinc, mg	15	–	15–26

*Nutritional content for prenatal vitamins was taken from: Prenatal vitamins. *MPR (Monthly Prescribing Reference)*. 2010;21:121.

Ex. 1004, 206. Bentley Table I, reproduced above, compares the “nutritional content in prenatal medical food without docosahexaenoic acid (DHA), prenatal food with DHA, and prenatal vitamins.” *Id.* Petitioner contends that “with only a few exceptions,” Bentley Table I “discloses all the recited ingredients [of claim 1] . . . in amounts that encompass the claimed dosage ranges for every ingredient,” such that “the dosage amounts claimed in the ’227 patent are disclosed in the Bentley’s composition with a few obvious modifications.” Pet. 38, 44–45. Petitioner identifies three alleged differences between “Bentley’s composition” and the composition recited in claim 1, namely: “1) a lower amount of vitamin D of 200-400 IU in Bentley’s composition as compared with about 1000 IU in claim 1 of the

'227 patent; 2) inclusion of a specific amount of about 200 mg DHA in Bentley's composition; and 3) elimination of calcium from the Bentley composition." *Id.* at 38 (citing Ex. 1003 ¶ 107).

As to vitamin D, Petitioner contends that "given the well-recognized prevalent issue among pregnant women of vitamin D deficiency," a person of ordinary skill in the art would have been motivated to increase the amount of vitamin D in Bentley's composition from 200-400 I.U. to about 1000 I.U. *Id.* (citing Ex. 1003 ¶ 109). For Ground 1, Petitioner relies on Bischoff-Ferrari's statement that "a daily intake of about 1000 IU per day of vitamin D [would] enable 50% of the population to achieve serum 25-hydroxyvitamin D (25(OH)D) levels of 75 nmol/l (i.e., 30 ng/ml)." *Id.* (citing Ex. 1003 ¶ 110); *see also* Ex. 1008, 55 (Abstr.); Ex. 1001 at 18:58–61 (challenged patent cites Bischoff-Ferrari). For Ground 2, Petitioner asserts that "McCullough supports increasing the dose amount of vitamin D, disclosing that most experts suggest that daily requirements for vitamin D intake 'may be closer to 1000 IU or higher.'" Pet. 39–40 (quoting Ex. 1007, 306 (emphasis Petitioner's); citing Ex. 1003 ¶ 111).

As to DHA, Petitioner asserts that in view of Koletzko's recommendation of "an average DHA intake of at least 200 mg/day during both pregnancy and lactation," a person of ordinary skill "would have been motivated to include 200 mg of DHA in an all-in-one prenatal vitamin with a reasonable expectation that the product would be advantageous for pregnant woman, and would improve patient-taking vitamin compliance." *Id.* at 40–41 (citing Ex. 1003 ¶¶ 113–15; Ex. 1009, 11).

As to calcium, Petitioner contends that a person of ordinary skill in the art would have "removed calcium from the Bentley composition for two

reasons,” i.e., because (1) “it was commonly known that calcium has an inhibitory effect on iron absorption when taken at the same time,” and (2) “calcium as a component of prenatal vitamins would result in a significant volume increase in the dosage form.” *Id.* at 41–42 (citing Ex. 1003 ¶¶ 115–16; Ex. 1010, 46, 48; Ex. 1011, 154; Ex. 1012, 742; Ex. 1013, 231, 234; Ex. 1018 ¶ 14).

b) Analysis

Challenged claim 1 recites a composition “consisting of” sixteen different nutrients in specific amounts, together with one or more pharmaceutically acceptable carriers. Ex. 1001, 40:27–39. Petitioner asserts that a person of ordinary skill in the art would have started with “Bentley’s composition” and would have made several changes, resulting in the claimed composition. *See, e.g.*, Pet. 43. As discussed below, we are not persuaded by Petitioner’s arguments, including with respect to the alleged motivations to start with “Bentley’s composition,” increase the amount of vitamin D to 1000 I.U., and eliminate calcium.

(1) “Bentley’s Composition”

Petitioner and its declarant, Dr. Caudill, describe Bentley’s Table I as disclosing “a standard prenatal vitamin composition (PNV) where the nutritional content was based on the prescription-only prenatal vitamins available in the market as of April 2010.” Ex. 1003 ¶ 74; Pet. 35. Petitioner further argues that for nearly every ingredient recited in challenged claim 1, Table I discloses a dose range that encompasses or overlaps with the claimed dose, such that “the dosage amounts claimed in the ’227 patent are merely a selection of a narrow range from within a somewhat broader range disclosed in the Bentley’s composition with a few obvious modifications.” Pet. 38,

44–45. Petitioner argues that under these circumstances, claim 1 is prima facie obvious. *Id.* at 44–45 (citing *In re Peterson*, 315 F.3d 1325, 1330 (Fed. Cir. 2003)).

On this record, we find that Petitioner’s arguments are based on a mischaracterization of Bentley’s Table I. Petitioner does not adequately explain why a person of ordinary skill in the art would have viewed Table I as disclosing “a standard prenatal vitamin composition” with dose ranges that overlap with or encompass the claimed composition. Ex. 1003 ¶¶ 74, 107. Instead we agree with Patent Owner that Table I “does not teach a standard PNV at all,” and “Petitioner is reading too much into Bentley’s Table 1 by asserting that Bentley teaches ranges from which a [person of ordinary skill in the art] would have optimized.” Prelim. Resp. 26, 27. Patent Owner’s declarant Dr. Gregory articulates a more credible reading of Bentley Table I, namely that a person of ordinary skill in the art “would have understood that the doses recited in Table 1 of Bentley describe **aggregate** dose ranges of nutrients in prenatal vitamins listed in MPR.” Ex. 2001 ¶ 43.

The proper characterization of Bentley is important because when viewing Bentley for what it is—an aggregate of different products rather than a “standard” PNV composition—it becomes apparent that to arrive at the claimed composition, a person of ordinary skill in the art would have needed to do more than merely select a dose amount from within the purported “ranges” disclosed in “Bentley’s composition.” Pet. 44–45. Instead, the person of ordinary skill in the art would have needed to select the particular claimed ingredients, in the particular claimed amounts, “from among the countless possible combinations possible in Bentley.” Ex. 2001 ¶ 35. Patent Owner establishes that “[e]ven without considering doses and

just picking the different combinations of nutrients, there are 2¹⁹ (524,288) possible compositions that could be formed by combining 1 or more of the 19 nutrients from Table 1,” only one of which matches the claimed composition, which *consists of* and is thus limited to a particular group of sixteen nutrients. Prelim. Resp. 26–27 (citing Ex. 2001 ¶ 45).

For this reason, Petitioner’s attempt to establish *prima facie* obviousness based on routine experimentation of Bentley’s “composition” fails on this record. *See, e.g.*, Pet. 43–44. *Peterson*’s holding is limited to “[s]electing a narrow range from within a somewhat broader range disclosed in a prior art reference.” *Peterson*, 315 F.3d at 1329–30; *Genetics Instit., LLC v. Novartis Vaccines & Diagnostics, Inc.*, 655 F.3d 1291, 1306 (Fed. Cir. 2011); Prelim. Resp. 27. We agree with Patent Owner that this case is closer to *Genetics Institute*, where the Federal Circuit rejected an attempt to “shoehorn” the facts of that case into *Peterson*’s holding. *Genetics Instit.*, 655 F.3d at 1306. In *Genetics Institute*, the prior art disclosure was “so broad as to encompass a very large number of possible distinct compositions,” namely, 68,000 variants. *Id.* The Federal Circuit declined to apply a presumption of obviousness under those circumstances, and we do the same here, where Bentley’s disclosure leads to over 500,000 possible compositions.

Even if Petitioner could rely on a theory of routine experimentation based on Bentley’s “composition,” Petitioner must still “provide some rational underpinning explaining why a person of ordinary skill in the art would have arrived at the claimed invention.” *In re Stepan Co.*, 868 F.3d 1342, 1346 (Fed. Cir. 2017). Here, the Petition does not address the motivating factors a person of ordinary skill in the art would have

considered when optimizing a PNV. Accordingly, although Petitioner is correct that “Table I of Bentley discloses all the recited ingredients of claim 1” (Pet. 38), Petitioner has not adequately established why a person of ordinary skill in the art reading Bentley would have been motivated to start with a composition that included all of the nutrients and vitamins recited in claim 1 and only those nutrients and vitamins, except for the changes needed with respect to calcium, DHA, and vitamin D.

For example, Table I identifies nineteen vitamins and minerals in the known PNVs, whereas claim 1 recites a composition consisting of sixteen vitamins and minerals. Accordingly, a person of ordinary skill in the art would have needed to affirmatively exclude several of the listed vitamins and minerals (including vitamin B5, biotin, and selenium) to arrive at the claimed composition. In Grounds 1 and 2, however, Petitioner provides no explanation for why a person of ordinary skill in the art would have excluded these ingredients.

Even recognizing that Table I indicates possible amounts of vitamin B5, biotin, and selenium at 0–10 mg, 0–30 µg, and 0–65 µg, respectively, any notion that zero is disclosed for these nutrients does not support Petitioner’s challenge on this record. Ex. 1004, 3. If Petitioner interprets zero for these nutrients as a basis for excluding them, Petitioner fails to explain why several other nutrients that need not be included according to Table 1 of Bentley are retained in Petitioner’s hypothetical composition to arrive at the subject matter of claim 1. Specifically, claim 1 requires, among other nutrients, vitamin A, vitamin B12, copper, iodine, and magnesium. For these vitamins and minerals, as with vitamin B5, biotin, and selenium, Table I shows a range from zero to some amount, indicating to a person of

ordinary skill in the art that these vitamins and minerals are included in some PNVs, but not others. Ex. 2001 ¶ 43. Yet Petitioner provides no explanation for why a person of ordinary skill in the art would have chosen to affirmatively include these vitamins and minerals, even though they are not present in all other PNVs, while simultaneously excluding biotin, vitamin B5, and selenium. Such picking and choosing from Bentley's Table I of only those nutrients needed to arrive at the claimed composition, without a sufficient evidentiary basis or explanation, looks like hindsight on this record.

Moreover, claim 1 is narrowed by reciting *particular amounts* of the sixteen nutrients. Even if Petitioner had established that a person of ordinary skill in the art would have landed on a composition comprising the sixteen recited ingredients, Petitioner has not articulated a reason why, in optimizing, they would have selected the claimed amounts of the recited ingredients, as opposed to some other amount in Bentley's disclosed "ranges." As Dr. Gregory states, "[m]ultiplying the number of different possibilities for each dose of each vitamin and mineral that is presented in [Bentley's] laundry list yields billions or more possible combinations available to one of ordinary skill in the art." Ex. 2001 ¶ 110; Prelim. Resp. 47. Given Bentley's very broad disclosure, Petitioner fails to persuade us that the ordinarily skilled artisan, through routine optimization, would have reached the claimed dosage amounts for each of the sixteen recited ingredients. See, e.g., *E.I. DuPont de Nemours & Co. v. Synvina C.V.*, 904 F.3d 996, 1006 (Fed. Cir. 2018) ("[D]isclosure of very broad ranges may not invite routine optimization."); *Genetics Inst., LLC*, 655 F.3d at 1306

(holding that ordinary motivation to optimize did not apply where disclosure was 68,000 protein variants).

For at least these reasons, we find that Petitioner has not established a reasonable likelihood of prevailing with respect to claim 1. Below we address additional, independent reasons why Petitioner has not established a reasonable likelihood of prevailing.

(2) *Vitamin D*

Claim 1 recites “vitamin D in an amount of about 1000 I.U.” Ex. 1001, 40:27–28. Petitioner asserts that “it was commonly known that a daily intake of 200 – 600 IU of vitamin D (as in Bentley’s composition) is inadequate to achieve its optimal health benefits.” Pet. 39 (citing Ex. 1003 ¶ 109). In Grounds 1 and 2, Petitioner respectively asserts that teachings in Bischoff-Ferrari and McCullough would have motivated a person of ordinary skill in the art “to increase the dose amount of vitamin D in Bentley’s composition to 1000 IU.” *Id.* at 40 (citing Ex. 1003 ¶ 112).

Petitioner’s arguments are not persuasive. We address Bischoff-Ferrari and McCullough in turn.

(a) *Bischoff-Ferrari (Ground 1)*

Bischoff-Ferrari does not address pregnancy or prenatal development. Prelim. Resp. 35 (citing Ex. 2001 ¶ 70). It instead describes studies that evaluate the relationship between 25(OH)D levels and several clinical endpoints, including bone mineral density (BMD), lower extremity function, dental health, risk of falls, admission to nursing home, fracture prevention, cancer prevention, and hypertension. *Id.* at 34 (citing Ex. 2001 ¶ 70; Ex. 1008, 1).

Like Patent Owner, we question the degree to which the skilled artisan would have considered the clinical endpoints described in Bischoff-Ferrari to be relevant to pregnant women. *Id.* at 35. “Bischoff-Ferrari is focused on Vitamin D deficiency in a certain category of women (mostly post-menopausal women), and in cancer patients, and describes ongoing research into Vitamin D supplementation in elder women.” Ex. 2001 ¶ 70. This matters because a person of ordinary skill in the art “would have understood that Vitamin D intake requirements of pregnant women are different from Vitamin D intake requirements of non-pregnant women (especially older women).” Prelim. Resp. 35–36; *see also* Ex. 2001 ¶¶ 70, 71, 78. As such, we credit Dr. Gregory’s opinion that a person of ordinary skill in the art “would likely have discounted any alleged teaching by Bischoff-Ferrari as being limited to the older population, including post-menopausal women, because their Dietary Reference Intakes (DRIs), which indicate nutrient requirements, tend to be higher, and were in fact higher for Vitamin D at this time.” Ex. 2001 ¶ 71 (citing Ex. 1029 at 287–91) (indicating that the DRI for women ages 51 and up is at least 400 I.U./day, whereas the DRI for pregnancy is 200 I.U./day).

Additionally, Bischoff-Ferrari indicates that “50% of the population may achieve serum 25(OH)D levels of 75 nmol/l with a daily intake of about 1000 IU per day.” Ex. 1008, 66. Petitioner has not explained persuasively why a person of ordinary skill in the art would have pursued a dose that brings only 50% of the population (and not even the relevant population) up to the specified level of vitamin D. As Dr. Gregory points out, “a 50% efficacy is far too low of a standard,” and a person of ordinary skill in the art would have instead “consider[ed] doses that achieve a serum level in a

much higher proportion of the population.” Ex. 2001 ¶ 79. Bischoff-Ferrari, however, teaches that “limited data is available for intake estimates that would bring all adults up to this range [i.e., 75 nmol/l].” Ex. 1008, 66. Petitioner has not adequately explained why a person of ordinary skill in the art would have been motivated to pursue doses that were likely to meet the nutritional requirements of a comparatively low percentage of those who ingested the PNV. Prelim. Resp. 36–37.

To the extent Petitioner argues that the Specification admits “it was well known in the art that a daily intake of 200-400 IU of vitamin D was inadequate, and that the amount should be about 1000 IU,” we disagree. Pet. 23. The Specification does cite a “global epidemic related to vitamin D deficiency,” and cites Bischoff-Ferrari’s findings, among other studies, in support of a need to increase vitamin D doses in supplements. Ex. 1001, 19:2–4; *see also id.* at 18:37–19:25, 2:15–38. The Specification does not, however, indicate that persons of ordinary skill in the art had concluded that the amount of vitamin D in existing PNVs should be increased to about 1000 I.U. Indeed, in addition to identifying a dose of 1000 I.U., the Specification more broadly states that “vitamin D may be present in the amount ranging from about 400 IU to about 1600 IU.” Ex. 1001, 19:51–58. Accordingly, although the Specification indicates that at least the inventors recognized a need to increase vitamin D levels in nutritional supplements, we do not view it as “admitting” it was “well known in the art . . . that the amount should be about 1000 IU,” particularly as part of a prenatal multi-vitamin composition as urged by Petitioner.¹⁵ Pet. 23; *see also* Prelim. Resp. 40 (arguing that the

¹⁵ To the extent Petitioner argues that the Specification’s citation of Bischoff-Ferrari concedes the relevance of the studies therein to pregnancy

Specification does not indicate it is describing the understanding and knowledge of a person of ordinary skill in the art); *see also* Ex. 2012, 5–6 (explaining that in providing evidence of the general knowledge in the art, specifications “sometimes include statements such as ‘It is well known that...’, ‘It is well understood that...’, ‘One of skill in the art would readily understand that...’; or may describe technology as ‘conventional,’ or ‘well-known’”).

For at least these additional reasons, Petitioner has not established a reasonable likelihood of prevailing on Ground 1.

(b) McCullough (Ground 2)

Unlike Bischoff-Ferrari, McCullough is specifically directed to vitamin D requirements during pregnancy. *See* Ex. 1007, 305. The article comments on a study, which was co-published with McCullough, that provided “compelling evidence” that many pregnant women are at risk of vitamin D deficiency, and that current formulations of PNV “may be inadequate to achieve desired serum 25 hydroxy vitamin D [25(OH) D]

and fetal health, we disagree. Although Petitioner’s arguments are built around development of a PNV, neither the challenged claims, nor the Specification, are limited to PNVs. Indeed, Petitioner itself recognizes that the challenged patent relates to compositions “that can be used to supplement the nutritional deficiencies observed in patients throughout physiologically stressful states, **which can include** prenatal, pregnant and breast-feeding women.” Pet. 15 (citing Ex. 1001, 3:20–28) (emphasis added). And while challenged claim 9 is directed to a method of providing the claimed composition to a pregnant or breast-feeding female, the other claims are not so limited. Accordingly, we do not view the Specification’s citation of Bischoff-Ferrari as a concession that the studies therein are necessarily relevant to pregnancy and fetal health.

(storage form of vitamin D) concentrations.” *Id.* (alteration in original).

McCullough states:

Considering these findings, why not raise the DRI for vitamin D? Most experts agree that the current DRI of 200–600 IU is too low, and that, based on current evidence, daily requirements ***may be closer to 1000 IU or higher***. Recent reviews and consensus panels on vitamin D and health also conclude that ***more research is needed on optimal vitamin D doses*** and blood concentrations for several health outcomes, and on the safety of long-term higher-dose vitamin D supplementation in all populations. . . .

Whereas more studies are needed to determine precise vitamin D requirements in all populations, we do have enough evidence to show that current practices are not serving at-risk groups. Because pregnant women are already under medical care and taking a prenatal vitamin, ***the benefits of a higher dose of vitamin D supplementation and perhaps 25(OH) D screening (in high-risk groups) is worthy of further investigation***.

Id. at 306 (emphases added) (references omitted).

We are not persuaded that McCullough would have motivated a person of ordinary skill in the art to increase the vitamin D doses in Bentley to about 1000 I.U. as claimed. Pet. 40; Ex. 1003 ¶ 111. McCullough does teach that current PNV formulations contain too little vitamin D, and does postulate raising the DRI for vitamin D. See Ex. 1007, 305, 306 (“[W]hy not raise the DRI higher?”). Petitioner has not, however, persuaded us that McCullough teaches increasing the PNV dose to about 1000 I.U. Prelim. Resp. 43. Rather, McCullough suggests investigating higher doses of vitamin D, and notes that “daily requirements ***may be closer to 1000 IU or higher***.” *Id.* (emphasis added). Petitioner does not explain sufficiently why a person of ordinary skill in the art would have taken this equivocal

statement (“**may be**”) as a suggestion to increase a PNV dose to about 1000 I.U., particularly where 1000 I.U. is merely the floor (that is, McCullough refers to “1000 IU **or higher**”).

Petitioner also does not grapple with the other equivocations in McCullough, which cast doubt on Petitioner’s claim that this reference would have motivated selection of a 1000 I.U. dose. Prelim. Resp. 43–44. Specifically, McCullough states that “more research is needed on optimal vitamin D doses.” Ex. 1007, 306. It also acknowledges that “[d]eveloping expert recommendations is a complex task, because vitamin D needs vary depending on sun exposure (season, latitude, skin pigmentation, and sun exposure practices).” *Id.* It also acknowledges that “more research is needed on . . . the safety of long-term higher dose vitamin D supplementation.” *Id.* As Dr. Gregory indicates, “long term safety of higher doses of Vitamin D would have been of particular concern for pregnant and lactating women.” Ex. 2001 ¶ 93. McCullough concludes that “the benefits of a higher dose of vitamin D supplementation . . . is worthy of further investigation.” Ex. 1007, 306. McCullough simply does not provide a sound motivation to pursue a dose of about 1000 I.U., but instead represents, at best, a starting point for further research.

Petitioner also has not established that McCullough represents the state of the art as of the relevant priority date. McCullough postulates increasing “the current DRI of 200–600 IU,” but this range was the DRI in 1997. Ex. 1007, 306 n.8; Ex. 2001 ¶ 95. The 1997 standards were updated in 2010 (before the priority date), to an RDA of 600 I.U. for pregnant and

lactating women. *Compare* Ex. 1029, 292–93,¹⁶ *with* Ex. 1028, 54, Table 1; *see also* Ex. 2001 ¶ 95. Petitioner’s arguments do not take into account that the increase McCullough suggests had already taken place. We agree with Patent Owner that a person of ordinary skill in the art “could have considered that any concerns discussed in McCullough were addressed by this increase in the DRI standard,” which undermines a conclusion that a person of ordinary skill would have considered 1000 I.U. vitamin D to be an obvious amount for use in Petitioner’s hypothetical prenatal multi-vitamin composition at the time of the invention. Prelim. Resp. 43.

In sum, we find that even if a person of ordinary skill in the art had been motivated to increase the amount of vitamin D disclosed in Bentley, Petitioner has not established a reasonable likelihood that based on McCullough they would have increased the amount to about 1000 I.U. as claimed. For at least this additional reason, Petitioner has not established a reasonable likelihood of prevailing on Ground 2.

(3) Eliminating Calcium

Petitioner asserts that in designing an all-in-one prenatal vitamin, a person of ordinary skill in the art would have “removed calcium from the Bentley composition for two reasons.” Pet. 41. First, Petitioner asserts that “it was commonly known that calcium has an inhibitory effect on iron absorption,” and thus it was understood that calcium and iron “should be taken at different times of the day.” *Id.* (citing Ex. 1003 ¶ 115; Ex. 1010, 48; Ex. 1011, 154; Ex. 1013, 234). Second, Petitioner asserts that including

¹⁶ For Exhibit 1029, we use Petitioner’s applied page numbering, rather than any original page numbering.

calcium would have resulted “in a significant volume increase in the dosage form (since calcium occupies more bulk space).” *Id.* (citing Ex. 1003 ¶ 115).

Petitioner has not adequately established that calcium’s inhibitory effect on iron absorption would have been a concern to a person of ordinary skill in the art in designing a PNV. Rather, we agree with Dr. Gregory that the references Petitioner cites “suggest, at most, that any effects of calcium on iron absorption are **short lasting**, and that **calcium intake has little or no significant long-term effects on iron absorption.**” Ex. 2001 ¶ 55; *see also id.* ¶¶ 56–68. For example, Bendich (Ex. 1010) states that while “[s]everal short-term studies have recently shown that concurrent ingestion of calcium and iron from the same meal inhibits iron absorption,” “[l]ong-term studies of calcium supplementation . . . do not indicate that iron status in women was decreased.” Ex. 1010, 46. Similarly, Lynch (Ex. 1011) states: “[a]ll but one of the multiple-meal studies indicate that Ca [(calcium)] is likely to have a far smaller influence on Fe [(iron)] absorption than would be predicted from the single-meal experiments.” Ex. 1011, 151. Harris (Ex. 1013) likewise states: “In general, studies of whole diets and studies conducted over several weeks tend to show no effect of increased calcium intake on iron absorption,” and “high calcium intake does not appear to adversely affect iron absorption or iron status over the long term in healthy people who eat a varied diet.” Ex. 1013, 231, 234. Consistent with these findings, “the majority of prenatal vitamins in MPR contained both iron and calcium.” Ex. 2001 ¶ 55. As such, Petitioner has not persuasively established that a person of ordinary skill in the art would have excluded calcium due to concerns about interference with iron absorption.

Petitioner's purported reason regarding a smaller dosage form is also unpersuasive. Sixteen of the twenty PNVs listed in the MPR contain calcium (Prelim. Resp. 30), which suggests that calcium does not always result in prohibitively large PNVs. Dr. Caudill relies on Soldati (Ex. 1018), which criticizes compositions disclosed in a different reference as containing "high amounts of calcium, resulting in a comparabl[y] voluminous dosage form, which is hard to swallow." See Ex. 1003 ¶ 115 (citing Ex. 1018 ¶ 14). Petitioner, however, does not compare the amount of calcium taught in Bentley (or the MPR) with the "high amounts" referenced in Soldati. Accordingly, Petitioner has not adequately established that a person of ordinary skill in the art would have been motivated to exclude calcium based on size concerns.

For the reasons above, Petitioner has not persuasively established that a person of ordinary skill in the art would have been motivated to eliminate calcium from any PNV taught or suggested by Bentley.

c) Conclusion

For at least the reasons discussed above, on this record we determine that Petitioner has not shown a reasonable likelihood of establishing that claim 1 is unpatentable as obvious over Bentley, Koletzko, and either Bischoff-Ferrari or McCullough. Petitioner's arguments on dependent claims 2–10 (Pet. 45–50) do not cure the deficiencies discussed above with respect to claim 1. Accordingly, Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to Grounds 1 or 2.

3. *Grounds 5 and 6: Alleged Obviousness Over MPR, Koletzko, and either Bischoff-Ferrari or McCullough*

Petitioner asserts that claims 1–10 are unpatentable under 35 U.S.C. § 103 as obvious over MPR, Koletzko, and Bischoff-Ferrari (Ground 5) or MPR, Koletzko, and McCullough (Ground 6). Pet. 52–58. For the reasons discussed below, on this record we determine that Petitioner has not shown a reasonable likelihood of establishing that at least one of the challenged claims is unpatentable as obvious over these combinations of prior art.

a) *Summary of Petitioner’s Arguments*

Petitioner asserts that “[f]or its design and development of an *all-in-one* prenatal supplement formulation, a [person of ordinary skill in the art] would have alternatively considered as a starting point the prenatal vitamins listed in the MPR.” Pet. 52. According to Petitioner, “[t]he MPR identifies in a chart all the nutritional and prescribing information for the prescription-only prenatal vitamin products available as of April 2010.” *Id.* (citing Ex. 1003 ¶¶ 135–36; Ex. 1006, 4).

We reproduce the MPR chart below:

PRENATAL VITAMINS																							
Brand Name	Company	Dosage Unit		Folic Acid (mg)	Vit. A (Iunits)	Vit. B1 (mg)	Vit. B2 (mg)	Vit. B3 (mg)	Vit. B5 (mg)	Vit. B6 (mg)	Vit. B12 (mg)	Biotin (mcg)	Vit. C (mg)	Vit. D (Iunits)	Vit. E	Calcium (mg)	Iron (mg)	Copper (mg)	Iodine (mg)	Magnesium (mg)	Selenium (mcg)	Zinc (mg)	Notes
CITRANATAL ASSURE	Mission Pharmacal	per tab per cap	1	1		3	3.4	20		25			120	400	30 IU	125	35	2	0.15			25	Dose is 1 tab + 1 gel cap daily. Tab contains: Calcium as citrate. Iron as carbonyl iron and ferrous gluconate. Also contains docusate sodium 50mg. Gel cap contains: DHA 300mg, derived from microalgae.
CITRANATAL B-CALM	Mission Pharmacal	per tab per tab	1	1						25			120	400		125	20						Dose is 1 tab every 8hrs starting with "Tablet 1."
CITRANATAL DHA	Mission Pharmacal	per tab per cap	1	1		3	3.4	20		20			120	400	30 IU	125	27	2	0.15			25	Calcium as citrate. Iron as carbonyl iron. Dose is 1 tab + 1 gel cap daily. Gel cap contains: DHA 250mg, derived from microalgae. Tab contains: Docusate sodium 50mg. Calcium as citrate. Iron as carbonyl iron and ferrous gluconate.
CITRANATAL 90 DHA	Mission Pharmacal	per tab per cap	1	1		3	3.4	20		20			120	400	30 IU	200	90	2	0.15			25	Dose is 1 tab + 1 gel cap daily. Gel cap contains: DHA 250mg, derived from microalgae. Tab contains: Docusate sodium 50mg. Calcium as citrate. Iron as carbonyl iron.
CITRANATAL RX	Mission Pharmacal	per tab	1	1		3	3.4	20		20			120	400	30 IU	125	27	2	0.15			25	Calcium as citrate. Iron as carbonyl iron and ferrous gluconate. Also contains docusate sodium 50mg.
DUET	Xanodyne	per tab	1	3000	1.8	4	20		25	12		120	400	30 mg	200	29	2		25		25	25	Vit. A as beta carotene. Calcium as carbonate. Iron as bisglycinate and IronAid. Chew tabs contain phenylalanine.
DUET CHEWABLE	Xanodyne	per tab	1	3000	1.8	4	20		25	12		120	400	30 mg	100	29	2		25	25	25	25	
DUET DHA w. FERRAZONE	Xanodyne	per tab softgel cap	1	3000	1.8	4	20		28	12		130	410	30 mg	230	30	2		25		26	26	Dose is 1 tab + 1 enteric-coated softgel cap daily. Enteric-coated softgel cap contains: omega-3 fatty acids 440mg (as docosahexaenoic acid 295mg; as other omega-3 fatty acids 145mg [icosapentaenoic acid, docosapentaenoic acid]). Calcium as carbonate. Iron as sodium iron EDTA, Ferrazone.
GESTICARE	Azur Pharma	per tab	1		3	3	20		50	8		120	420	30 IU	200	28		0.15			15	15	Calcium as carbonate. Iron as ferrous fumarate. Also contains choline (as bitartrate) 55mg.
GESTICARE DHA	Azur Pharma	per tab per cap	1		3	3	20		50	8		120	420	30 IU	200	28		0.15			15	15	Dose is 1 tab + 1 gel cap daily. Gel cap contains: DHA 250mg, derived from microalgae. Tab contains: Calcium as carbonate. Iron as ferrous fumarate. Also contains choline (as bitartrate) 55mg.
PRENATAL Rx 1	Ethex	per tab	1	4000	1.5	1.6	17	7	4	2.5	30	80	400	15 Units	200	60	3		100		25	25	Vit. A as 90% acetate and 10% beta carotene. Calcium as carbonate. Iron as fumarate.
NATACHEW	Warner Chilcott	per tab	1	1000	2	3	20		10	12		120	400	11 Units		29							Vit. A as beta carotene. Iron as fumarate. Chewable tablets.
NATAFORT	Warner Chilcott	per tab	1	1000	2	3	20		10	12		120	400	11 Units		60							Vit. A as acetate and beta carotene. Iron as carbonyl and sulfate.
NEEVO	PamLab	per caplet	0.4*		3	3.4	20	7	2.6	500	30	80	400	30 IU	200	29	2		40		15	15	Calcium as carbonate. Iron as polysaccharide complex. Gluten, lactose, yeast-free. *Also contains L-methylfolate 1mg.
NEEVO DHA	PamLab	per cap	0.4*						25	1000		40		30 IU	75	27							Calcium as tricalcium phosphate. Iron as ferrous fumarate. Contains docosahexaenoic acid (DHA, vegetarian source [algae]) 250mg and soy. *Also contains L-methylfolate 1mg.
PREFERA0B	Alaven	per tab	1		1.5	1.6	17	10	50	12	30		400	10 IU		28	0.8	0.175		65	15	15	Iron as polysaccharide iron complex 22mg + heme iron polypeptide as Proferm 6mg.
PRENATE DHA	Sciele	per softgel	0.4*						25	12		85	200	10 IU	150	27			50				Calcium as carbonate. Iron as fumarate. Also contains DHA 300mg, calcium docusate 50mg. *Also contains Metafolin 0.6mg.
PRENATE ELITE	Sciele	per tab	0.4*		3	3.4	20	6	20	12	30	120	400	10 IU	200	90	2		30		15	15	Also contains 50mg docusate sodium. Calcium as carbonate. Iron as carbonyl. *Also contains Metafolin 0.6mg.
PRENEXA	Upsher-Smith	per cap	1.2						25			28	400	30 IU	160	26							Calcium as phosphate. Iron as ferrous fumarate. Contains docosahexaenoic acid (DHA, plant-based source [algae]) 300mg, docusate sodium 55mg, and soy.
SELECT-0B	Everett	per tab	1	1700	1.6	1.8	15		2.5	5		60	400	30 IU		29			25		15	15	Tabs may be chewed or swallowed. Gluten, lactose, and iodine-free.

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Ex. 1006, 4. This chart lists twenty commercial prenatal vitamins, together with the amounts of various nutrients found in each vitamin. *Id.*

According to Petitioner, “[t]he nutritional content of the prenatal vitamins listed in the MPR includes all 16 ingredients (including DHA) recited by claim 1 of the ’227 patent and additionally 4 other nutrition ingredients: calcium, vitamin B5, biotin, and selenium.” Pet. 52 (citing Ex. 1003 ¶ 137). Petitioner asserts that a person of ordinary skill in the art would have excluded calcium for the reasons discussed in Grounds 1 and 2 (i.e., because it purportedly interferes with iron absorption and takes up room). *Id.* at 53. Petitioner also asserts that a person of ordinary skill in the art would have excluded vitamin B5, biotin, and selenium because

deficiencies in these nutrients are rare, and because vitamin B5 and selenium are uncommon in prenatal vitamins. *Id.* at 52–53 (citing Ex. 1003 ¶¶ 138, 139).

Petitioner additionally asserts that the MPR discloses ten of the claimed ingredients (iodine, vitamins B1, B2, B3, B6, B9, B12, copper, iron, and zinc) “in the exact *same* dose amount in claim 1,” as well as dose ranges that encompass the claimed amounts of vitamins A, E, and C. *Id.* at 53–54 (citing Ex. 1003 ¶¶ 142–45; Ex. 1006, 4). Petitioner also argues that under its proposed construction of “about,” Bentley’s disclosure of 25 mg magnesium is sufficient to disclose the claimed amount of “about 20 mg” magnesium. *Id.* at 56 (citing, e.g., Ex. 1003 ¶ 149); *see also id.* at 19 (construing the term “about”).

As to DHA and vitamin D, Petitioner reiterates its arguments from Grounds 1 and 2 based on Koletzko, Bischoff-Ferrari, and McCullough. *Id.* at 57–58.

b) Analysis

As noted above, in Grounds 5 and 6, Petitioner relies on some of the same arguments it presented for Grounds 1 and 2, namely, that a person of ordinary skill in the art would have excluded calcium and would have increased the dose of vitamin D to 1000 I.U. based on either Bischoff-Ferrari or McCullough. Pet. 53, 57–58. The same deficiencies we discussed above apply equally here, and the failings in each of those arguments provide independent reasons why Petitioner has not established a likelihood of prevailing with respect to at least one claim for Grounds 5 and 6. Below we discuss additional, independent reasons why Petitioner has not established a likelihood of prevailing on these grounds.

Grounds 5 and 6 rely on the MPR. The MPR lists twenty PNVs and their ingredients. Ex. 1006, 4. None of these PNVs contains the same sixteen nutrients recited in challenged claim 1, let alone in the same amounts. Prelim. Resp. 45; Ex. 2001 ¶ 106. Petitioner has not established a persuasive motivation as to why a person of ordinary skill in the art would have selected the sixteen claimed ingredients, as opposed to a greater or lesser number of ingredients, in the specific claimed amounts, based on the MPR. Ex. 2001 ¶ 107.

Petitioner provides the following table that compares doses from the MPR with the claimed doses:

Ingredient	'227 Patent Claim 1	Disclosed Dose Amounts on Page 121 of MPR	Disclosed Dose Range in Page 121 of MPR
Vitamin D*	about 1000 IU		200 – 420 IU
Iodine	about 150 µg	150 µg (i.e., 0.15 mg) in Citranatal Assure, Citranatal DHA, Citranatal 90 DHA, Citranatal Rx, Gesticare, Gesticare DHA	150 – 175 µg ¹¹
Vitamin B1	about 1.6 mg	1.6 mg in Select-OB 1.5 mg in Prenatal Rx 1, PreferaOB	1.5 – 3.0 mg
Vitamin B6	about 2.5 mg	2.5 mg in Select-OB	2.5 – 50.0 mg
Vitamin B12	about 12 µg	12 µg (i.e., 12 mcg) in Duet, Duet Chewable, Duet DHA with Ferrazone, Natachew, Natafort	2.5 – 1000 µg
Vitamin B2	about 1.8 mg	1.8 mg in Select-OB 1.6 mg in Prenatal Rx 1, PreferaOB	1.6 – 4.0 mg

Vitamin B9 (folic acid)	about 1.0 mg	1.0 mg in Citranatal Assure, Citranatal DHA, Citranatal 90 DHA, Duet, Duet Chewable, Duet DHA with Ferrazone, Natachew, Natafort	0.4 – 1.0 mg
Vitamin E	about 20 IU		10 – 30 IU
Vitamin A	about 1100 IU	1000 IU in Natachew, Natafort	1000 – 4000 IU
Vitamin C	about 30 mg	28 mg in Prenexa	28 – 130 mg
Vitamin B3	about 15 mg	15 mg in Select-OB	15 – 20 mg
Iron	about 29 mg	29 mg in Duet, Duet Chewable, Natachew, Neevo 28 mg in Gesticare, Gesticare DHA, PreferaOB 30 mg in Duet DHA w. Ferrazone	20 – 90 mg
Zinc	about 25 mg	25 mg in Citranatal Assure, Citranatal DHA, Citranatal 90 DHA, Citranatal Rx, Duet, Duet Chewable, Prenatal Rx 1 26 mg in Duet DHA w. Ferrazone	15 – 26 mg
Copper	about 2.0 mg	2 mg in Citranatal Assure, Citranatal DHA, Citranatal 90 DHA, Citranatal Rx, Duet, Duet Chewable, Duet DHA w. Ferrazone, Neevo, Prenate Elite	0.8 – 3 mg
Magnesium*	about 20 mg	25 mg in Duet, Duet Chewable, Duet DHA w. Ferrazone, Select OB	25– 100 mg

Pet. 54–55 (footnote and asterisk text omitted); Ex. 1003 ¶ 146. Petitioner’s table reproduced above compares the claimed ingredients and dose amounts with products in the MPR that have the same ingredients in the same or

similar doses. The table also lists dose “ranges” for each ingredient that Petitioner compiled from the products listed in MPR. The many different products listed in Petitioner’s table illustrate that a person of ordinary skill in the art would have had to mix and match ingredients and doses from a variety of different products to reach Patent Owner’s claimed composition. Prelim. Resp. 49. Petitioner offers no rationale for why a person of ordinary skill in the art would have made the particular selections needed to reach the claimed composition.

For some ingredients (iodine, vitamins B1, B2, B3, B6, B9, B12, copper, iron, and zinc), Petitioner contends that the MPR discloses products that contain “the exact *same* dose amount in claim 1.” Pet. 53–54 (citing Ex. 1003 ¶¶ 142–44). Petitioner, however, relies only on products with dose amounts that are the same as or similar to the claimed doses, while ignoring products that have different doses. Pet. 54–55. As just one example, claim 1 recites “vitamin B1 in an amount of about 1.6 mg.” Ex. 1001, 40:28–29. Petitioner’s table reproduced above indicates that Select-OB contains 1.6 mg of vitamin B1, and Prenatal Rx 1 and PreferaOB contain 1.5 mg of vitamin B1. *Id.* at 54; Ex. 1003 ¶ 142. Petitioner, however, omits other products in the MPR that contain higher amounts of vitamin B1 (i.e., three products contain 1.8 mg, two products contain 2 mg, and eight products contain 3 mg), and omits four products that contain no vitamin B1 at all. Pet. 21; Ex. 1006, 4; *see also* Ex. 2001 ¶ 112. Thus, to arrive at the claimed amount of vitamin B1, a person of ordinary skill would have needed to affirmatively decide to include vitamin B1 (despite several products not having it), and would have had to select the 1.6 mg dose from among a

variety of other doses. The Petition provides no sufficient rationale for any of these selections.

For vitamins A, E, and C, Petitioner asserts that the MPR discloses dose amounts encompassing the claimed amounts. Pet. 53. This is incorrect. The MPR recites specific amounts of these vitamins, not ranges. Prelim. Resp. 47 (citing Ex. 2001 ¶ 104). For example, claim 1 recites “vitamin A in an amount of about 1100 I.U.” Ex. 1001, 40:33. Petitioner contends that the MPR discloses vitamin A “in an amount of 1000-4000 I.U.” Pet. 54. There is, however, no express disclosure of a range of vitamin A doses. The MPR instead indicates that products variously include 1000, 1700, 3000 and 4000 I.U. of vitamin A. Ex. 1006, 4. The MPR also indicates that numerous products contain no vitamin A at all. *Id.*

Under these circumstances, Petitioner has not explained why a person of ordinary skill in the art would have understood the MPR to teach or suggest a range for vitamin A. The same is true of Petitioner’s arguments for vitamins E and C. Pet. 54 (contending that MPR discloses ranges of these vitamins); Prelim. Resp. 50. Thus, to the extent Petitioner seeks to rely on a prima facie case of obviousness based on “overlapping ranges” for these vitamins, that is improper, because Petitioner has not made the threshold showing that MPR discloses dose ranges. *See ModernaTx, Inc. v. Arbutus Biopharma Corp.*, 18 F.4th 1364, 1373 (Fed. Cir. 2021) (rejecting appellant’s attempted reliance on a presumption of obviousness based on overlapping ranges where appellant failed to make a threshold showing that the prior art taught or suggested a range that overlapped with the claimed range).

Another independent basis for why Petitioner has not established a reasonable likelihood of prevailing on Grounds 5 and 6 is because it has not offered a persuasive reason why a person of ordinary skill in the art would have been motivated to co-formulate DHA with the other claimed vitamins and minerals (as opposed to providing DHA in a separate dosage form). Petitioner argues that a person of ordinary skill in the art would have been motivated to create an “all-in-one” product to increase manufacturing efficiency and patient compliance. *See, e.g.*, Ex. 1003 ¶ 134. This generic reasoning bears no relation to the specific combination of DHA with other vitamins and minerals. *See ActiveVideo Networks, Inc. v. Verizon Commc’ns, Inc.*, 694 F.3d 1312, 1328 (Fed. Cir. 2012). Moreover, the MPR calls Petitioner’s argument into question.

Eight of the twenty products listed in the MPR contain DHA. In five of these products, DHA is formulated in a separate gelcap. Ex. 1006, 4. In the remaining three products, DHA is formulated in an all-in-one dosage form. *Id.* As Patent Owner points out, the products containing DHA in an all-in-one format contain a lesser number of vitamins and minerals than the products that have a separate DHA gelcap. Prelim. Resp. 53. For example, “Neevo DHA,” which contains co-formulated DHA, contains only seven vitamins and minerals, but “Neevo,” which lacks DHA, contains sixteen vitamins and minerals. Prelim. Resp. 53–54; Ex. 1006, 4; Ex. 2001 ¶¶ 29, 108, 117. Given that Petitioner is contending a person of ordinary skill in the art would have formulated the claimed sixteen ingredients together with DHA despite it being seemingly uncommon based on the MPR, on this record Petitioner needs to do more than merely stand on generic motivations to co-formulate DHA. Because Petitioner’s purported motivation to

combine is conclusory and factually unsupported, we find it insufficient and fraught with hindsight bias. *See, e.g., ActiveVideo Networks, Inc.*, 694 F.3d at 1327; *Purdue Pharma L.P. v. Depomed, Inc.*, 643 F. App'x 960, 965 (Fed. Cir. 2016) (“[A] petitioner must . . . make a sufficient showing that is more than ‘mere conclusory statements,’ to establish a reason that would have prompted a skilled artisan to combine the prior art teachings in the way of the claimed invention.”) (quoting *KSR*, 550 U.S. at 418–19).

Finally, Petitioner argues that a person of ordinary skill in the art would have excluded selenium and vitamin B5 (both of which are listed in the MPR) because deficiencies in these nutrients are very rare, and because PNVs did not typically include these ingredients. Pet. 52–53 (citing Ex. 1003 ¶ 138; Ex. 1006, 4). Petitioner additionally argues that a person of ordinary skill in the art would have excluded biotin, because biotin deficiencies are rare. *Id.* at 53 (citing Ex. 1003 ¶ 139). Neither Petitioner nor Dr. Caudill cite any contemporaneous support corroborating that selenium, vitamin B5, and biotin deficiencies are rare. *See* Ex. 1003 ¶¶ 138–39; *see also* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”). Moreover, Petitioner’s argument that a person of ordinary skill would have excluded selenium and vitamin B5 because “there is only one prenatal vitamin that includes selenium and only 4 products that included vitamin B5” (Ex. 1003 ¶ 138) undercuts its argument that a person of ordinary skill in the art would have included DHA in an all-in-one product. As noted above, the MPR discloses that only three products have DHA in an all-in-one product. Ex. 1006, 4. As Dr. Gregory points out, and by Petitioner’s own logic, “if only 5 products teach a [person of ordinary

skill in the art] to exclude that particular nutrient (B5), then only 3 vitamins could not have motivated a [person of ordinary skill in the art] to include another nutrient (DHA).” Ex. 2001 ¶ 120.

c) Conclusion

For at least the reasons discussed above, on this record we determine that Petitioner has not shown a reasonable likelihood of establishing that claim 1 is unpatentable as obvious over MPR, Koletzko, and either Bischoff-Ferrari or McCullough. Petitioner’s arguments on the dependent claims (Pet. 58) do not cure the deficiencies discussed above with respect to claim 1. Accordingly, Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to Grounds 5 or 6.

4. Grounds 3, 4, 7, and 8

Grounds 3, 4, 7, and 8 are directed to the alleged unpatentability of dependent claims 2 and 3 over the following combinations of prior art:
(1) Bentley, Bischoff-Ferrari, Koletzko and Edwards (Ground 3);
(2) Bentley, McCullough, Koletzko and Edwards (Ground 4);
(3) MPR, Bischoff-Ferrari, Koletzko, and Edwards (Ground 7); and
(4) MPR, McCullough, Koletzko, and Edwards (Ground 8). Pet. 50–51, 58–59.

These grounds add Edwards to reach limitations of dependent claims 2 and 3 (*see* Pet. 50–51, 58–59), but do not cure the deficiencies discussed above with respect to Grounds 1, 2, 5, and 6. Accordingly, Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to claims 2 and 3 under Grounds 3, 4, 7, and 8.

III. CONCLUSION

After considering the evidence and arguments of record, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to any claim challenged in the Petition.¹⁷ Accordingly, we do not institute an *inter partes* review.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is *denied* as to all challenged claims, and no trial is instituted.

¹⁷ Because we deny the Petition on the merits, we do not reach Patent Owner's argument for discretionary denial under 35 U.S.C. § 325(d). Prelim. Resp. 8–24.

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