

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

IMPOSSIBLE FOODS INC.,	)	
	)	
Plaintiff,	)	
	)	
v.	)	C.A. No. 22-311 (WCB)
	)	
MOTIF FOODWORKS, INC.,	)	PUBLIC VERSION
	)	
Defendant.	)	Confidential Version Filed: June 28, 2023
	)	Public Version Filed: July 7, 2023

DEFENDANT MOTIF FOODWORKS, INC.’S
ANSWERING CLAIM CONSTRUCTION BRIEF

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TABLE OF ABBREVIATIONS

Abbreviation	Phrase
Impossible	Impossible Foods Inc.
Motif	Motif FoodWorks, Inc.
'096 patent	U.S. Patent No. 9,943,096
'241 patent	U.S. Patent No. 11,224,241
'761 patent	U.S. Patent No. 10,863,761
'306 patent	U.S. Patent No. 10,039,306
'250 patent	U.S. Patent No. 11,013,250
'492 patent	U.S. Patent No. 10,273,492
'656 patent	U.S. Patent No. 10,689,656
Batt, ¶ __	Declaration of Dr. Carl Batt, filed concurrently herewith
Legako, ¶ __	Declaration of Dr. Jerrad Legako, filed concurrently herewith
McGorin, ¶ __	Declaration of Dr. Robert McGorin, filed concurrently herewith
Ex.	Exhibits attached to Motif's Answering Brief
Compound Terms	"at least one sugar compound" ('761 patent) / "a sugar selected from glucose, ribose, sucrose, fructose, xylose, maltodextrin, and combinations thereof" ('306, '250 patents)/ "a compound selected from glucose, ribose, fructose, lactose, xylose, arabinose, glucose-6-phosphate, maltose, and galactose, and mixtures of two or more thereof" ('096, '241 patents)/ "one or more of glucose, ribose, fructose, lactose, xylose, arabinose, glucose-6-phosphate, maltose, and galactose" ('241 patent)/ "at least one sulfur compound" ('761 patent) / "at least one sulfur compound selected from methionine, cysteine and thiamine" ('306, '250 patents) / "a compound selected from cysteine, cystine, thiamine, methionine, and mixtures of two or more thereof" ('096, '241 patents)/ "one or more of cysteine, cystine, thiamine, and methionine" ('241 patent)
Term __	Numbered list of terms in Section II of the Joint Claim Construction Statement (D.I. 94-1).

*** All emphasis herein is added, and all internal citations and quotations are omitted unless otherwise noted.**

I. INTRODUCTION

Impossible told the patent office that it invented products made of non-animal heme-protein combined with free, stand-alone sugar and sulfur compounds and existing plant substrates to produce a meat/beef taste and aroma upon cooking. Motif does not make or sell products embodying the alleged inventions. Motif uses a novel expression system to synthesize animal myoglobin, identical to the heme-protein found in cows, and combines that ingredient with others outside the scope of the claims. Impossible's proposals stretch its claims well beyond their plain meaning and what it purported to have invented and should be rejected. Motif's constructions, by contrast, are well supported by the intrinsic record.

II. LEGAL STANDARDS

Claims are generally given the “ordinary meaning” they would have to a person of ordinary skill in the art at the time of the invention in view of the intrinsic record. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (*en banc*). When construing claims in patents that derive from the same parent application and share common terms, the court “must interpret the claims consistently across all asserted patents.” *NTP, Inc. v. Research In Motion, Ltd.*, 418 F.3d 1282, 1293 (Fed. Cir. 2005); *see also Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1350 (Fed. Cir. 2004) (prosecution statements are relevant to the scope of all related patents).

In some cases, a term's “ordinary” meaning does not resolve the parties' dispute. *See O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1361-62. Circumstances also may arise where a court may deviate from “ordinary” meaning, such as when a patentee acts as his own lexicographer or disavows scope. *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012). Extrinsic evidence also may be considered to “help educate the court

regarding the field of the invention and...what a person of ordinary skill in the art would understand claim terms to mean.” *Phillips*, 415 F.3d at 1319.

III. DISPUTED TERMS

A. “Animal” and “Non-Animal” Terms

The parties dispute whether recombinantly-produced bovine myoglobin, the heme-protein found in cows, is “non-animal” and whether products containing it are somehow free of “animal” proteins and products. As explained below, a POSITA would understand from the intrinsic record and extrinsic evidence that whether a protein is animal or non-animal is based on its sequence and not the method by which it was produced. *Batt*, §§IX.A-B.

1. “a non-animal heme-containing protein” (’306, ’250 patents)/“free of animal heme-containing protein” (’241 patent)

Motif’s Construction	Impossible’s Construction
“a heme-containing protein that does not have the amino acid sequence of any animal heme-containing protein”/ “free of any protein that has the amino acid sequence of any animal heme-containing protein”	“[[a heme-containing protein that contains no]/[free of proteins]] proteins the synthesis of which occurred inside an animal”

The claims recite the adjectives “animal” or “non-animal” consistently to modify the nouns “proteins” or “products”—not their method of production.¹ The ordinary meaning of the adjective “animal” means “of, relating to, or characteristic of animals,” not that an animal is a physical source. Ex. 5. A protein is considered “animal” because it has a sequence encoded by an animal

¹ These terms should be construed consistently because, according to Impossible, the patents are related and claim priority to U.S. Application No. 13/941,211. *See* Exs. 1-4 (Impossible’s petitions to correct priority claims); *NTP*, 418 F.3d at 1293.

genome, and this “animal” identity does not change if it is produced recombinantly. Batt, §IX.A, ¶115.

The patents’ disclosure is consistent with these adjectives’ ordinary meaning. In a section titled “Proteins,” the specification describes preparing “non-animal proteins (*e.g.*, plant proteins)....” ’306 patent §III.B, 20:19-24. The patent does not define “animal” or “non-animal” proteins by the method of their production. It explains that one *optional* way to produce proteins is by using non-animal sources. *Id.* 20:32-33 (“proteins *can be* isolated from one or more other components of a non-animal source”); 20:64-21:6. By the patents’ plain language, “animal” or “non-animal” identity is not co-extensive with source.

One such protein is myoglobin. *E.g.*, ’306 patent 21:15-35; 22:14-23; ’241 patent 9:40-48; ’761 patent 2:33-54. A POSITA would recognize that myoglobin is intrinsically an *animal* muscle protein as it is found in an animal’s genome. Batt, ¶120. The patents’ Examiner had the same understanding. In allowing the ’306 patent, and with Impossible’s explicit authorization in an interview, the Examiner made a clarifying amendment to the claims to recite “*non-animal* heme-containing protein.” Ex. 6 (U.S. Application No. 14/796,970, 3/2/2018 Interview, 4/4/2018 Examiner amendment of allowed claims 1, 4, 7, 11, 47, 50). Concomitantly, she *deleted* the animal protein “myoglobin” from all dependent claims. *Id.* The intrinsic record therefore supports Motif’s and a POSITA’s interpretation of “non-animal.”

The “Proteins” section of the specification also describes specific proteins in terms of their genetic identity. ’306 patent 23:7-40; ’241 patent 10:25-58. It explains that heme-proteins can have “sequence identity to the amino acid sequence of the corresponding wild-type” heme-protein, including “a *mammalian myoglobin protein* such as the *Bos taurus* (SEQ ID NO:18) myoglobin,” among other specific sequences. *E.g.*, ’306 patent 23:12-35; ’761 patent 3:8-52. The claim term

“plant proteins” are similarly described by their genetic identity, not how they are produced. ’306 patent 23:12-19, 23:22-24.

If, as Impossible asserts, “non-animal” proteins are defined by source of manufacture while ignoring sequence identity, Impossible knew how to draft claims to make clear what it intended to claim. At various times in prosecution, Impossible pursued claims to proteins/products “derived from animal sources” or “derived from a non-animal source” such as “a plant source” or “genetically modified yeast or bacteria.” *E.g.*, Ex. 7 (’211 Application, 7/12/2013 claims 167-168); Ex. 8 (’211 Application, 9/13/2018 claims 226, 227). Impossible also knew how to claim methods of producing heme-proteins—*e.g.*, the asserted ’492 and ’656 patents. The claims at issue here do not recite such source or method of production limitations.

It would be improper to read a process or source-related limitation into the claims as Impossible urges where there is none claimed. The specifications’ discussion of “non-animal sources” is *merely an embodiment* of the methods. Under “Sources of Components of the Consumable,” *e.g.*, the ’306 patent provides that “proteins *can be* derived from non-animal sources” such as plants, fungi, genetically modified organisms, or even *in vitro* chemical synthesis. ’306 patent 18:4-6 & §III.A; *see also id.* 17:58-67, 24:25-34, 47:20-25 (similar); ’241 patent 11:41-12:28; 761 patent 2:55-65; 5:66-6:4 (listing “embodiments” of protein sources, *e.g.*, “genetically modified yeast or bacteria”). Moreover, the patents do not teach that using a non-animal source

of manufacture changes an otherwise-undisputedly animal protein, such as myoglobin, into a “non-animal” protein.²

The intrinsic record likewise does not support limiting the claims’ exclusion of “animal” proteins to only live animal tissue-sourced proteins—a high bar to meet. The patents do not describe excluding animal tissue-sourced proteins as an essential or even preferred embodiment of methods using “non-animal” proteins—and, even if this manufacturing approach were preferred, the patents do not “manifest a clear intention to restrict the scope of the claims” thereto. *Info-Hold, Inc. v. Applied Media Techs. Corp.*, 783 F.3d 1262, 1267 (Fed. Cir. 2015) (citing *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004)).

Advances in genetic engineering have informed the way POSITAs understand what “animal” means in this context. Batt, §IX.A. In conflating a protein’s identity with its source, Impossible’s interpretation flouts the ordinary usage of “animal” and “non-animal”. Historically, animal proteins were produced in one source—the animal. Batt, §IX.A.1. The advent of genetic engineering permitted manufacture of “recombinant” proteins in other organisms, triggering FDA and consumer concerns that, *e.g.*, “tomatoes might contain animal genes.” *Id.*, §§IX.A.2-3. The safety concern is real as a consumer with an egg, peanut, or wheat gluten allergy could be allergic to a meat replica containing those plant or animal proteins even if the proteins were recombinantly synthesized in other organisms. *Id.* §IX.A.3. Effective communication in this field demands the

² *E.g.*, Impossible knew how to claim proteins produced in “genetically modified yeast” and even “fungal heme-containing protein[s].” Ex. 9 (U.S. 17/081,908, 11/18/2020 Preliminary Amendment claims 2, 7). Impossible chose a different scope for the asserted claims.

clarity of distinguishing proteins from sources that produce them, *id.* ¶99, and the patents claim the former, not the latter.³

2. “no animal products” (’096, ’761 patents) / “free of animal products” (’241 patent)

Motif’s Construction	Impossible’s Construction
“[[no products]/[free of any products]] that are the same (e.g., amino acid sequence) as those found in an animal”	“[[no]/[free of]] proteins the synthesis of which occurred inside an animal”

In certain claims, the adjective “animal” modifies “products” rather than proteins. A POSITA would understand that “animal’s” meaning in this context applies in the same way as explained above for “proteins.”

The patents contain little description of “animal products” but the specifications are consistent with Motif’s interpretation. *E.g.*, ’241 patent 18:56-58 (“Food products described herein can be free of *animal products (e.g., animal heme-containing proteins* or other animal products).”). Thus, although “products” has a broader scope than “proteins,” the patents make clear that “animal products” includes “animal” proteins which are defined by their identity as explained above. Any change in meaning from “animal” proteins (discussed *supra*) is due to the broader scope of “products,” not “animal.” Batt, §IX.B. For example, although “products” could include materials sourced from live animals (*e.g.*, butter, ’306 patent 33:37-39), the patents do not teach that “products” changes “animal’s” ordinary meaning.

³ Motif’s extrinsic promotional materials cited by Impossible, which are untethered to the intrinsic record and post-date a POSITA’s understanding by about a decade, are not a proper source of evidence to interpret claim scope. *Phillips*, 415 F.3d at 1319.

The intrinsic record further reflects Impossible's and the Examiner's understanding that animal proteins like myoglobin are animal products. During prosecution of the '096 patent's parent application, for example, Impossible canceled claims reciting myoglobin after the Examiner rejected the claims over prior art teaching beef. Ex. 10 (U.S. Application 14/797,006 7/10/2015 as-filed claim 10, canceled 2/26/2016). Following a similar rejection during prosecution of the '096 patent, the patentee deleted "mammalian" heme-containing protein from its claims while simultaneously amending them to recite "no animal products." Ex. 11 ('096 patent File History, 9/27/2017 Supplemental Amendment, claims 31, 36).

3. **"wherein the heme-containing protein is selected from the group consisting of ... a myoglobin ..." ('096, '241 patents) / "wherein the heme-containing protein comprises [an] amino acid sequence having at least 80% sequence identity to [SEQ ID:18]" ('241 patent)**

Motif's Construction	Impossible's Construction
Indefinite	Ordinary meaning

Claim 2 of the '096 patent is irreconcilably inconsistent with the patent's independent claim because it recites both myoglobin, an "animal" protein, and "no animal products." Impossible's reliance on basic claim differentiation principles is therefore of no moment, and should be rejected.

As noted above, the '306 patent Examiner recognized that myoglobin is an "animal" protein in rejecting the claims over the prior art and therefore required an amendment to exclude such proteins in allowing those claims. Ex. 6. Animal proteins like myoglobin are animal products. *See supra*. Impossible's failure to delete "myoglobin" from the claims during the '096 patent prosecution, as it agreed to in other patents, renders them indefinite. Claim 2 cannot have "no" animal products, as recited in independent claim 1, yet expand the scope of the claim to encompass such products, e.g., animal myoglobin, as recited in claim 2. Dependent claims' "use

of [a] disputed phrase in a way that contradicts the independent claims” leads to the former’s indefiniteness. *TVnGO Ltd. (BVI) v. LG Elecs. Inc.*, 861 F. App’x 453, 459-60 (Fed. Cir. 2021).

Similarly, ’096 patent claim 3 and ’241 patent claim 7 recite, *inter alia*, that the claimed heme-containing protein has at least 80% similarity to bovine myoglobin. *See, e.g.*, ’096 patent, Fig. 1, SEQ ID NO. 18. Yet the ’096 patent claim 1 (reciting “no animal products”) and the ’241 patent claim 1 (reciting “free of animal heme-containing protein”). To the extent these claims cover animal protein sequences that are excluded by the independent claims, they are indefinite. *TVnGO*, 861 F. App’x at 459-60.

B. “Muscle Replica”/ “Fat Tissue Replica” (’761 patent)

Motif’s Construction	Impossible’s Construction
“a composition, separate from other replicas, that mimics key features of [[muscle tissue] /[[fat tissue]] before or after cooking; the composition may be partially derived from animal sources”	Ordinary meaning, and to exclude the actual material being replicated or approximated.

The parties dispute whether these terms require construction. The “muscle replica” and “fat tissue replica” terms should be construed to ensure that disavowed claim scope is clearly excluded, and that the claim terms are properly understood in the context of the intrinsic record. Motif’s construction achieves this by requiring replicas that are (1) “separate” from one another, and (2) may be “partially derived from animal sources.”⁴

As to the “separate” language, this qualifier is supported by the specification and subject to Impossible’s express disavowal to overcome prior art in IPR2022-00887. Impossible criticizes this language as not supported by the specification. *See* D.I. 106, 7. But the specification discloses

⁴ The ’761 patent claims 1-11 and 13-16 do not contain a “non-animal” limitation like those found in Impossible’s other foodstuff patents discussed above.

examples where a muscle replica and a fat tissue replica are prepared using separate ingredients and then combined to form a beef replica. ’761 patent, 44:53-45:48; *see also* Legako, ¶¶96-100. Moreover, during IPR2022-00887, Impossible distinguished the claims over a prior art reference (the “McMindes” reference) in that proceeding on the basis that the claimed “muscle replica” and “fat tissue replica” must be “*two separate components*.” Ex. 12 (IPR2022-00887 POPR), at 32-33. Having successfully advanced this argument in convincing the patent office to deny institution, the law prohibits Impossible’s litigation-driven interpretation. *See Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1576 (“[e]xtending the prosecution disclaimer doctrine to IPR proceedings [to] ensure that claims are not argued one way in order to maintain their patentability and in a different way against accused infringers.”).

Impossible’s disavowal renders entirely irrelevant its citation to *MBO Lab’ys, Inc.* for the proposition that claims should rarely be construed to exclude preferred embodiments. D.I. 106, 9. Disclaimers and disavowals trump that general rule: “[h]owever, we have interpreted claims to exclude embodiments of the patented invention where those embodiments are clearly disclaimed...” *See Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1277 (Fed. Cir. 2008); *see also North Am. Container, Inc. v. Plastipak Packaging, Inc.*, 415 F.3d 1335, 1345–46 (Fed. Cir. 2005). Accordingly, the Court should not allow Impossible to recapture disclaimed embodiments. *See Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323 (Fed. Cir. 2003) (prosecution disclaimer “preclud[es] patentees from recapturing through claim interpretation specific meanings disclaimed during prosecution.”).

As to the “partially derived from animal sources” language, the breadth of “replica” is described exactly this way in the specification, stating that “[i]n some embodiments, the muscle replica ...[is] partially derived from animal sources,” and that “[i]n some embodiments, the fat

replica ...[is] partially derived from animal sources.” ’761 patent, 25:42-45, 27:17-19, 50:26-28; *see also id.*, 33:66-34:4. Impossible agrees that replicas can include material “partially derived from animal sources” in some cases, but not when that derived material consists of muscle or fat tissue themselves. D.I. 106, 7-8. As such, Impossible asks the Court to exclude from any replica even a small amount of the “actual material being replicated or approximated.” While Impossible’s proposal is consistent with the way the PTAB construed the term “replica” in IPR, Motif submits that is wrong.

First, negative limitations such as this require written description support, and there is none. *See Seabed Geosolutions (US) Inc. v. Magseis FF LLC*, 8 F.4th 1285, 1288 (Fed. Cir. 2021) (“[S]ilence does not support reading the claims to exclude gimbaled geophones.”). The ’761 patent never states that muscle and fat tissue cannot be used as an ingredient in their respective “replicas.” The specification says the exact opposite.

Second, because the specification specifically states that the replica can be “partially derived from animal sources,” a POSITA would understand that the term “replica” encompasses compositions that include some amount of the actual material being replicated. Legako, ¶¶101-113. A POSITA would also understand that this is consistent with the prior art that describes “meat substitutes” that partially include meat. Ex. 13 (Vega), [0037]-[0038]; *see also* Legako, ¶¶108-112.

Indeed, Motif’s understanding of the term “replica” is consistent with the way Impossible and the USPTO understood “replica” during prosecution of Impossible’s ’306 patent. There, claims directed at a “meat replica” were rejected over a prior art reference (“Vega”) that disclosed a meat substitute that partially included real meat. Ex. 14 (’306 Patent FH, 2/25/16 Final Rejection). Rather than argue, as it does now, that a “replica” cannot include any amount of the

material being replicated, Impossible amended the claims to recite “contains no animal products”—which is the *same* limitation present in ‘761 patent claim 12 here—and argued that Vega’s disclosure of a meat-containing meat substitute failed to satisfy the *amended* claims. Ex. 15 (’306 Patent FH, 4/20/16 Remarks). This supports Motif’s position that only the ‘761 patent’s dependent claim 12 excludes real animal “muscle” and/or “fat tissue,” while the other claims have no such restriction.

C. “Wherein Said Muscle Replica and Fat Tissue Replica Are Assembled In A Manner That Approximates the Physical Organization of Meat” (’761 patent)

Motif’s Construction	Impossible’s Construction
Indefinite To the extent the Court construes this term: “the muscle replica and fat tissue replica are combined to mimic the appearance of meat, and are visually distinguishable from each other after being combined”	Ordinary meaning, and to exclude the actual material being replicated or approximated.

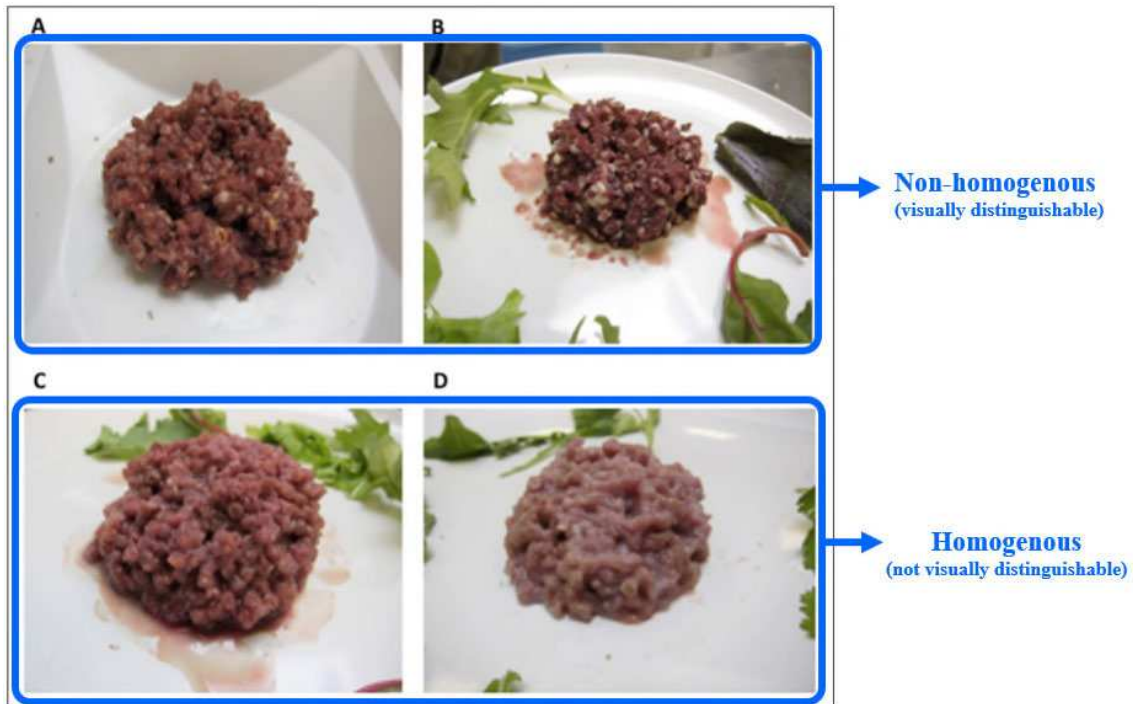
Motif submits that this claim limitation is indefinite because a POSITA would not understand the metes and bounds of this claim limitation. Impossible contends that because the specification (i) explains that “physical organization” of a substitute can be “manipulated by controlling the localization, organization, assembly, or orientation of the muscle, fat, and/or connective tissue replicas,” and (ii) includes pictures of substitutes in Figures 15-16, that a POSITA would understand with reasonable certainty what “approximates the physical organization of meat.” D.I. 106, 9. Impossible is wrong for at least two reasons.

First, the phrase “physical organization of meat” is not a term of art, and the specification is silent about the boundaries of this phrase. Legako, ¶¶115-116. The disclosure that physical organization can be “manipulated” provides no clarity on the specific meaning. *Id.*, ¶122. A

disclosure of how to manipulate physical organization says nothing about whether or not such manipulations result in a product that “approximates the physical organization of meat” or not.⁵

Second, Impossible’s reliance on the pictures in Figures 15-16 actually supports Motif’s position and, when read in view of the complete intrinsic record, highlights the indefiniteness of this term. For example, Figures 15A-B depict two imitation ground beef compositions where the “muscle replica” and “fat tissue replica” are assembled to form a visibly *non-homogenous* composition (the replicas remain visually distinguishable), and Figures 15C-D depict two imitation ground beef compositions where the replicas are mixed into more *homogenous* composition (i.e., the replicas are not visually distinguishable).

⁵ The disclosure also is not tied to any particular type of “meat,” further contributing to the lack of clarity about what “approximates the physical organization of meat.” For example, “meat” could refer to various cuts from a diverse array of animals, or mixtures of different kinds of meats manipulated into man-made products, each of which has a different structure. Legako, ¶122.



See '761 patent, Figs. 15A-D.

Thus, the specification appears to support the notion that homogeneous mixtures are covered by the claims. Legako, ¶¶ 119-121. By contrast, and in direct contradiction, when trying to defend the '761 patent from IPR, Impossible distinguished the claims from the McMIndes prior art reference by arguing that “mixing all ingredients into a *homogenous* ... food product, and then cutting or shaping the product into a meat-like shape” did not satisfy “assembl[y] in a manner that approximates the physical organization of meat.” See Ex. 12 (IPR2022-00887, POPR at 33). Impossible insisted that a “homogenous” mixture did not “approximate the *physical organization* of meat.” *Id.* at 34 (emphasis original). Based on these inconsistencies in the intrinsic record, a POSITA would not be able to discern which homogenous mixtures may or may not satisfy this claim term, and thus would not be able to discern the meets and bounds of this term with reasonable certainty. Legako, ¶¶ 119-123.

Courts have found claim terms like this to be indefinite in similar situations. For example, in *IQASR LLC v. Wendt Corp.*, the court found the term “magnetic fuzz” indefinite where it was not a term of art, and the intrinsic record provided several inconsistent descriptions. 825 F. App’x 900, 905 (Fed. Cir. 2020). Similarly, here, due to the aforementioned inconsistencies, a POSITA could not discern with reasonable certainty the boundaries of this claim phrase, rendering it indefinite. Legako, ¶¶115-123.

Nevertheless, to the extent the Court construes this claim phrase, Motif submits that Impossible’s disavowal of claim scope described above requires that, in its assembled form, the “muscle replica” and the “fat tissue replica” must remain “visually distinguishable from each other after being combined.” Accordingly, if the Court construes this claim at all, it should adopt Motif’s alternative construction.

D. “A Concentration of At Least 1.5 mM” (’241 patent)

Motif’s Construction	Impossible’s Construction
“in a liquid composition having a concentration of at least 1.5 mM”	Ordinary meaning

The parties agree that “in a concentration of at least 1.5 mM” is a process step of a product-by-process claim, and that the term identifies the molar concentration (*i.e.*, molarity) of compounds “as a volume of liquid.” D.I. 106, 10. However, the parties dispute whether the term refers to the concentration of the claimed compound (*e.g.*, cysteine) as an *ingredient before* it is combined with the other claimed ingredients or *after* in the final *meat-like-food product*.

Claim 1 recites a meat-like-food product produced by “*combining*” four ingredients: “plant proteins,” “heme-containing protein...,” “compound selected from glucose...,” and “compound selected from cysteine...in a concentration of...1.5 mM.” That the claim language recites four distinct ingredients (delineated from each other by semicolons) that are combined together as part

of a *process* to make a product makes clear to a POSITA that the “1.5 mM” concentration refers to the sulfur compound concentration as a *starting ingredient*. McGorin, ¶¶17, 83. Consequently, the term has no patentable weight for purposes of *patentability* because the term relates to *how* the product is made instead of a characteristic of the claimed product itself. *In re Thorpe*, 777 F.2d 695, 697 (Fed. Cir. 1985) (“The patentability of a product does not depend on its method of production.”).

Impossible argues that, despite being a process step, the term has patentable weight because its claimed molar concentration allegedly provides structural and functional differences to the claimed product. D.I. 106, 10. However, the term only specifies the minimum *concentration* (1.5 mM) of the compound(s) to be added. It does not inform a POSITA as to the amount of liquid volume of the compound(s) (at that concentration) that is to be added. McGorin, ¶¶84-87. Consequently, a POSITA cannot determine *how much* of the compound(s) are found in the claimed end product and therefore the limitation cannot provide structural and functional differences to the claimed product. *Id.* This conclusion is supported by the prosecution history where the Examiner considered only whether the claimed compounds were present in the art, not their concentration before or after incorporation in the prior art product. *Id.*, ¶¶91; Ex. 16 (’241 FH 02/08/21 Final Rejection), 3-4; Ex. 17 (’241 FH 04/27/21 Notice of Allowance), 2.

Impossible provides no evidence to rebut this point (or support its assertion that structural and functional differences are imparted by this limitation). Moreover, Impossible’s reliance on the ’241 patent examples is misplaced. D.I. 106, 10. A POSITA would understand that while the high-level examples specify the molarity concentration of the flavor precursors used (’241 patent, 20:7-35, 21:15-32), the specification is silent as to the *quantity* of the precursor added and a POSITA therefore could not discern whether, or at what quantity, the precursor might cause a

structural and functional difference to the food product that, for instance, manifests itself as a change in flavor/aroma. McGorin, ¶¶88-90.

E. “Food Flavor Additive Composition” (’096 Patent)

Motif’s Construction	Impossible’s Construction
“composition added to a food product to modulate flavor and/or aroma”	Ordinary meaning

The plain language of the claims makes clear that a “food flavor additive composition” (FFAC) is an *additive composition* that adds flavor to a final food form like a burger. This is consistent with the specification which explains that “[c]onsumable food products for use in the present disclosure can be flavor additive compositions, *e.g., for addition to another consumable food product* before, during, or after its cooking process.” ’096 patent, 3:32-35. The specification also discloses that the FFAC is used to “*modulate the flavor and/or aroma* profile of a consumable food product.” *Id.*, 3:38-43; *see also id.*, 3:45-46 (same), 3:52-54 (same), 17:31-34 (same). Hence, an FFAC is a composition that is *added* to a food product, it is not the end food product itself.

Contrary to Plaintiff’s assertion (D.I. 106, 11), Motif’s construction does not insert a method step into the claimed composition. Impossible’s dispute appears to take issue with the grammar of Motif’s construction, rather than its substance. Motif’s construction can just the same be grammatically reworded as: “a composition that modulates a food product’s flavor and/or aroma *when* added to the food product.”

Impossible’s interpretation unhelpfully incorporates the term that is the source of the parties dispute—“additive”—which improperly leaves its interpretation to the jury. *O2 Micro*, 521 F.3d at 1361-62. Impossible also reads the term “composition” out of the claims.

Moreover, Impossible’s infringement contentions treat the term FFAC as anything but an “additive” and reveal that Impossible’s true interpretation of the term is inconsistent with the

intrinsic evidence. *Wilson Sporting Goods Company v. Hillerich & Bradsby Co.*, 442 F.3d 1322, 1326-27 (Fed. Cir. 2006) (“knowledge of [the accused] product or process provides meaningful context for ... claim construction”). Impossible alleges that *multiple, unrelated* ingredients in Motif’s end food products (e.g., burger patty) are together a single FFAC simply by virtue of being *present* in the patty.⁶ Impossible does not allege that these ingredients are combined as a “composition” (i.e., mixture) that is then added to the patty to modulate its flavor/aroma.⁷ *INVISTA North America S.a.r.l. v. M&G USA Corp.*, 951 F. Supp. 2d 604, 613 (Fed. Cir. 2013) (composition is “a mixture of substances” that “exists at the moment the ingredients are mixed together,” not before). Hence, Impossible interprets an FFAC as simply any combination of ingredients that are *present* in an end food product even if those ingredients were never a “composition” (i.e., mixture of ingredients) added to modulate the food product’s flavor/aroma. This interpretation directly conflicts with the claim language and the specification. ’096 patent, 3:32-35 (FFAC is a composition that is “*add[ed]* to *another* consumable food product”).

F. “Compound” Terms (’306, ’250, ’761, ’096, ’241 patents)

Motif’s Construction	Impossible’s Construction
“[X]/[a compound]/[at least one sulfur compound] added as a flavor precursor to said [[muscle replica]/[meat replica matrix]/[food flavor additive composition]/[meat-like food product]”	Ordinary meaning

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The parties dispute the meaning of the “compound” terms because Impossible’s constructions seek to stretch these terms, which require small-molecule flavorant compound ingredients, far beyond the scope of the purported invention to read on much larger compositions that comprise compounds as part of their building blocks. *O2 Micro*, 521 F.3d at 1361. For example, Impossible contends that the patents’ “sulfur compounds” limitation is met by [REDACTED] in Motif’s products. Ex. 20 (infringement contentions).⁸ Impossible’s interpretation should be rejected.

Motif’s construction aligns with the claims’ plain language, which expressly distinguishes the recited “compound” molecules from other claimed foodstuff ingredients *including* “plant proteins.” *E.g.*, ’306 patent claim 1 (replica comprises “*plant proteins*, a *sugar* ... and at least one *sulfur compound* ...”); ’241 patent claim 1 (“providing one or more *plant proteins*; *and combining*, with the one or more plant proteins: ... *a compound* selected from [sugars]; and *a compound* selected from [sulfur compounds]...”); ’761 patent claim 1 (at least one *sugar compound* and at least one *sulfur compound* ... and a denatured *plant protein*”). Absent contrary evidence, “different claim terms are presumed to have different meanings.” *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1382 (Fed. Cir. 2008). No contrary evidence exists here because, consistent with a POSITA’s understanding, the patents’ specifications

⁸ Although the patents’ specifications differ to some extent, Impossible contends they are related (Exs. 1-4) and does not contend that any “compound” terms should be construed differently from each other. A POSITA would interpret these terms consistently across all patents given the long use of sugar and sulfur compounds in the food flavoring art. *McGorin*, §VII.B; *see also NTP*, 418 F.3d at 1293.

expressly distinguish the claimed sugar and sulfur molecules from proteins. ’761 patent 36:18-21 (“Odorants released during cooking of meat are generated by reactions that can involve as reactants ... *protein*, ... *sulfur compounds*, *sugars* ...”); ’306 patent 51:41-44 (same).

The patents’ specification also consistently explain that “compounds” are flavorants added to foodstuffs to replicate natural meat’s flavor/aroma. *E.g.*, ’306 patent 30:66-31:15 (replica includes added compounds); *id.* 9:9-14, 12:31-35, 46:1-26; ’761 patent 25:33-38, 26:31-43. As a POSITA would recognize, flavor is the product of aroma (perceived by the nose) and taste (perceived by the tongue). McGorin, §V.A.

The patents explicitly refer to these “compounds” as “flavor precursors” and describe them as molecules **added to** replica products to mimic meat. ’096 patent 2:50-59 (“**Flavor precursor** molecules ... can be **added** to the uncooked food product ...”), 12:22-18:19 (describing use of “flavor precursors,” *e.g.*, cysteine and sugars glucose/ribose for “Modulating Flavor and/or Aroma Profiles”), Abstract (similar); ’306 patent 33:55-64 (similar), Examples 27 & 33. Multiple Examples use an added “flavor precursor mix” containing claimed sugar and sulfur-compounds to achieve desired aromas. ’306 patent Examples 21, 27, 31, & 33 and Tables 5 & 8-10; ’096 patent Examples 2-3, 4-8, & 10 (using “Maillard reaction mix” containing cysteine, glucose, and thiamine). The patents even attribute replicas’ “increased” “beefy flavor” to the “**addition** of precursors” compared to the flavor of replicas with “no precursors.” ’306 patent 84:12-20, Table 9. Consistent with the specifications, the “compound” terms also have a well-understood meaning in the art as, for decades, the flavoring industry recognized that heating added sugar and sulfur compounds can generate meaty flavorings and aromas via the “Maillard” reaction. McGorin, §§V.A-B, VIII. Motif’s inclusion of “flavor precursors” thus fully aligns with how a POSITA would understand these terms.

Impossible's limited support does not compel a different conclusion as it refers to sugars generally ('306 patent 28:22-35) or to animal meat components that the replica aims to mimic ('306 patent 30:66-31:15). Moreover, during '306 patent prosecution, the Examiner found, consistent with Motif's interpretation, that "while there is support for claiming sulfur compounds including methionine, cysteine, and thiamine, *when used in combination as part of a flavor precursor mix*, there is no support for claiming *any* sulfur compound." Ex. 21 ('306 patent FH 4/17/2017 Rejection, 3) (emphasis altered). In amending its claims in response to recite the claimed compounds, Impossible successfully pointed to the claimed flavor precursors to obtain allowance of its claims, citing experiments using "flavor reaction mixtures" containing leghemoglobin and two added compounds, ribose and cysteine. Ex. 22 ('306 patent FH 10/17/2017 Remarks, 14-18, and attached Declarations). Impossible cannot now argue a broader scope in litigation. *EMD Millipore Corp. v. AllPure Techs., Inc.*, 768 F.3d 1196, 1203 (Fed. Cir. 2014) (presumption that prosecution history estoppel applies when patentee narrows the scope of a claim via amendment).

The claims and intrinsic record likewise do not support the broad scope Impossible hopes to capture—*e.g.*, equating plant proteins with sulfur "compounds." The patents teach that plant proteins produce "planty" flavors that are unwanted in a *meat replica*. *E.g.*, '306 patent Example 34 ("Removal of Off-flavors from Plant Protein Solutions"); 7:22-34, 13:37-14:7 (listing methods of minimizing undesirable plant protein-associated odors); '096 patent 16:63-17:21.

G. "Meat-Associated Aroma" ('096, '241 patents) / "Beef-Like Aroma" ('306, and '250 patents)

Motif's Construction	Impossible's Construction
Indefinite	Ordinary meaning

Motif submits that “meat-associated aroma” and “beef-like aroma” are indefinite as claimed because they are not terms of art, and they do not have ordinary meanings in the field or context of the patents to a POSITA. Legako, ¶¶125-127. Where the claims and specification fail to “clarify the scope of the term or provide any objective criteria to identify or measure” it, the term is “purely subjective” and therefore indefinite. *HIP, Inc. v. Hormel Foods Corp.*, No. CV 18-615-CFC, 2019 WL 2579266, at *5 (D. Del. June 24, 2019), *aff’d*, 796 F. App’x 748 (Fed. Cir. 2020). Here, the terms are not explicitly defined in any of the patents, and any discussions about aromas do not provide clarity about which ones are “associated” with “meat” or “like” “beef.” *See, e.g.*, Legako, ¶¶125-136.

Impossible’s specification citations do not change this conclusion, showing only that certain volatile compounds are disclosed as having “meat-associated” or “beef-like” aromas. D.I. 106 at 13. But the claims are not limited to those particular volatile compounds. The question is not whether POSITAs could identify *any* “meat-associated” or “beef-like” aromas, but whether they would know the scope of the invention with “reasonable certainty.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014).

Notably, the ’096 and ’241 patent specifications never use the term “meat-associated” at all, instead referring only to “meaty” or “meat like” aromas. *See, e.g.*, ’096 patent, 2:12, 2:41, 2:48, 3:12; ’241 patent, 2:17, 2:46, 2:53, 3:17. And all of these terms appear in claims of the patents, suggesting that their meanings vary. *See* ’096 patent, cl. 10 (“meaty aroma”); ’241 patent, cls. 1-22 (“meat-like food product”); *Helmsderfer*, 527 F.3d at 1382. Impossible cannot even pin down definitions for the terms, interpreting “meat associated” to cover volatile compounds that are actually present in meat (*i.e.*, “volatile odorants that are elevated in beef compared to chicken”) as well as ones that are “meat-like.” D.I. 106 at 13.

The '096 and '241 patents also fail to provide objective boundaries for “meat-associated.” For example, when describing “certain characteristic meaty flavors and/or aromas,” the patents describe meat and non-meat aromas, such as “beefy,” “bloody,” “metallic,” “potato,” “bready,” and “plastic.” '096 patent 2:12-14, Tables 2, 7, 11; '241 patent 2:17-19, Tables 2, 7, 11. As determined in the EU Opposition Decision for EP2943072B2, a now invalidated family member to the '241 patent, such flavors as “bready, malty, browned, breadcrust” or “cooked potato” are “not considered to represent a smell of meat, even if they may form part of the combination of a multitude of flavouring compounds that constitute meat flavour.” Ex. 23, at 9.

Courts have found terms indefinite in similar situations. In *Hormel*, e.g., the term “resembling a pan-fried bacon product” was found indefinite because the specification failed to provide objective guidance for what “resembl[es] a pan-fried bacon product.” *Hormel*, 2019 WL 2579266, at *4; *see also IQASR LLC v. Wendt Corp.*, 825 F. App'x 900, 905-06 (Fed. Cir. 2020); *Cap. Sec. Sys., Inc. v. NCR Corp.*, 725 F. App'x 952, 956 (Fed. Cir. 2018). Here, the '096 and '241 patents fail to objectively define “meat-associated”, rendering the term indefinite.

Similarly, the '306 and '250 patents fail to objectively define “beef-like aroma.” Although the term “beef-like” does appear in the specification, it is never used in conjunction with “aroma,” and there is no definition of how or at what point something is considered “like” “beef.” The Federal Circuit’s decision in *In re Walter* is instructive. The Court found the term “block-like” to be “a term of degree without any accompanying guidance in the intrinsic record for determining its scope.” *In re Walter*, 698 F. App'x 1022, 1026-27 (Fed. Cir. 2017). The term “ostensibly covers a range of shapes that are sufficiently ‘like’ a ‘block’ and excludes those that are not.” *Id.* But the specification did not provide any objective boundary to determine whether a given shape falls into either category. *Id.* Here, the '306 and '250 patents provide no clarity on what range of

aromas would be covered under “beef-like.” In some embodiments, the specification provides examples of aromatic compounds that may be released upon cooking, listing such aromas as “sweet, musty, and soy-sauce” or “gravy, faint citrus and star anise.” ’250 patent 71:56-72:5; ’306 patent 72:11-27. But there is no discussion of which of these aromas, if any, are sufficiently “like” “beef.” Nor would a POSITA be sufficiently informed by these examples of what is meant by “beef-like aroma.” Legako, ¶¶125-136. Thus, the term is indefinite.

H. “[A Nucleic Acid Encoding] A Mxr1 Transcriptional Activator Sequence from *P. pastoris*” / “A First Exogenous Nucleic acid Encoding A Methanol Expression Regulator 1 (Mxr1) Transcriptional Activator” (’492, ’656 patents)

Motif’s Construction	Impossible’s Construction
“a first exogenous nucleic acid sequence of a native Mxr1 transcriptional activator” / “[a nucleic acid encoding] the sequence of the native <i>P. pastoris</i> Mxr1 transcriptional activator”	Ordinary meaning

There are two disputes involving “Mxr1 transcriptional activator”: (1) whether the Mxr1 must be *from* the *Pichia* species *P. pastoris* (’492 patent, claim 1, and ’656 patent, claims 1 and 26);⁹ and (2) whether the “Mxr1 transcriptional activator sequence” is the sequence of the gene encoding Mxr1 protein or the sequence to which the Mxr1 protein binds¹⁰ (’492 patent, claim 1).

⁹ The yeast at issue in this term is of the genus *Pichia* and species *pastoris*, abbreviated *P. pastoris*. Batt, §VIII.A, VIII.C.

¹⁰ Mxr1 regulates expression of genes. Batt, §VII.C, VIII.B-C. Some genes can be regulated “on” and “off.” *Id.* Transcriptional activators are proteins that bind to genes and turn them “on.” Then the genes are transcribed to mRNA, which is translated into protein. *Id.* Because transcriptional activators are proteins, they too are encoded by genetic sequences in the DNA. *Id.*

As to the first dispute, Motif's construction clearly aligns with the claim language, which requires that the claimed Mxr1 sequence is "*from*" *P. pastoris*. There is no other objective reading of this limitation. *See* Batt, §X.A-B. However, Impossible argues that the claim preamble extends the term Mxr1 to *any Pichia* species. D.I. 106, 14-15. In so doing, Impossible conflates the *Pichia* host cell of the preamble with the Mxr1 transcriptional activator, which is a separate claim element that is part of the expression system in the host cell but not required to be from the particular host.

Indeed, Impossible cites the specification stating that a heterologous nucleic acid sequence can be introduced into a host yeast cell of a genus or species different from the one in which the nucleic acid sequence is native. D.I. 106, 15; *see* Batt, §VIII.C. This is exactly what the plain language of the claims embody: a Mxr1 sequence *from P. pastoris* introduced into a *Pichia* host cell of any species. Impossible's conflation of the host cell and origin of Mxr1 sequence is wrong.

Setting aside its disregard for the claim language, Impossible does not dispute that Motif's construction captures the specification's express distinction between native Mxr1 proteins and engineered or mutated variants of it.¹¹ The specification explains that "*P. pastoris* contains an endogenous nucleic acid encoding a Mxr1 transcriptional activator." '656 patent, 4:18-19. Example 16 is titled "Construction of Native Mxr1 Expression Vector" and describes construction of "[a] plasmid containing the Mxr1 transcription regulator gene under the control of the pAOX1

¹¹ The sequence encoding the native *P. pastoris* Mxr1 transcriptional activator is the Mxr1 sequence that is naturally found in *P. pastoris*. Batt, §§X.A-B. Native Mxr1 sequences can be endogenous, meaning they originate within the host cell, or exogenous, meaning they originate outside the host cell but are introduced into the host cell. *Id.* Non-native Mxr1 variants also can be exogenously introduced into the host cell. *Id.*

promoter.” *Id.*, 26:13-47. Example 18 describes an expression system engineered to express “variant Mxr1.” *Id.* 27:8-32. Each time the patents reference a recombinant system engineered to express a non-native Mxr1 protein, the patents qualify it as “modif[ied]” or “variant.” *Id.* 4:21-22; 27:8-32. When referring to native Mxr1, the patents simply say “Mxr1.” *Id.* 4:18-20; 26:14-47.

As to the second dispute, Motif’s construction is consistent with the plain language of ’492 patent claim 1 referring to the Mxr1 transcriptional activator “*sequence*.” *See* Batt, §X.C. The claim does not refer to a “binding site,” which Impossible reads into the claim without support. If Impossible wanted to claim a binding site, it knew how to do so. Claim 26 of the ’656 patent, *e.g.*, distinguishes between a “Mxr1 sequence,” which encodes Mxr1 protein, and a Mxr1 binding site, to which Mxr1 protein binds. The specification also repeatedly describes a Mxr1 nucleic acid sequence that encodes Mxr1—not a binding site. *E.g.*, ’656 patent, 1:38-57.

I. “Promoter Element” (’492, ’656 patents)

Motif’s Construction	Impossible’s Construction
Indefinite	Ordinary meaning

The term “promoter element” is indefinite. Impossible contends this term covers artificial, engineered sequences in the expression system Motif uses to express proteins. *O2 Micro*, 521 F.3d at 1360. Yet the patents do not define “promoter element” or provide any structure for this term with respect to size, composition, or any other characteristic. Batt, §XI.A. Consequently, a POSITA would not understand the objective boundaries of this term. *Id.*; *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 789 F.3d 1335, 1341 (Fed. Cir. 2015).

Impossible’s “ordinary meaning” interpretation should be rejected for several reasons. First, Impossible conflates a “promoter” with a “promoter element.” D.I. 106, 15-16. A

“promoter” is familiar to a POSITA.¹² Batt, §XI.A.5. The patents make clear that a “promoter element” is something different, however, and Impossible chose “promoter element” for its claims. ’656 patent, 4:52-5:11 (reciting promoters “*or* a promoter element *therefrom*”); 6:28-51 (similar); 6:57-61 (similar). A POSITA would recognize that these terms are different—*e.g.*, a “promoter element” is some quantum of a promoter. Batt, §XI.A.5. But the specification does not describe how large or small a “promoter element” can be, or any defining structural features thereof. *Id.*, §XI.A.6-10. It is not the same as a binding site, for example. *Id.*, §XI.A.6. Even extremely small sequences can affect gene expression depending on their location within the promoter, but a POSITA would not be reasonably certain if they are “promoter elements.” *Id.*, §XI.A.9. Unlike “promoter,” therefore, the term “promoter element” does not have a well-understood or consistent meaning in the art. *Id.*, §XI.A.¹³

Second, Impossible improperly attempts to define “promoter element” using descriptions about *other terms*—“expression element” and “operably linked.” D.I. 106, 15, citing ’656 patent, 4:47-50, 9:66-10:2; Batt, §XI.B. Neither term is described as co-extensive with a “promoter element.” The description of expression elements and operably linking fails to objectively define

¹² A promoter is a DNA region near a gene. Batt, §VIII.B. A promoter is defined this way because the gene is expressed when “transcription factors” bind to that region. *Id.*; *see supra* (Mxr1 Terms). The GenBank Accession codes Impossible cites refer exclusively to promoters. ’656 patent, 4:60-5:11.

¹³ Motif’s IPR positions (D.I. 106, 16) are not to the contrary as they refer to prior art promoters, some quantum of which can be an “element.” “Promoter element” itself does not have a consistent meaning. Batt, *supra*.

or clarify a “promoter element” in any way. Batt, ¶182 (various “expression elements” are different structures).

Lastly, because the patents disclose no objective boundaries or structure for a “promoter element”, Impossible defines “promoter element” (incorrectly) in functional terms. D.I. 106, 15-16. If “promoter element” were defined purely by function, however, it should be treated as a means-plus-function term. *Zeroclick, LLC v. Apple Inc.*, 891 F.3d 1003, 1007 (Fed. Cir. 2018) (§ 112 ¶6 applies if claim term “fails to recite sufficiently definite structure or else recites function without reciting sufficient structure for performing that function”). The “essential inquiry” is “whether the words of the claim are understood by [POSITAs] to have a sufficiently definite meaning as the name for structure.” *Id.* They do not, as explained above. Impossible’s expert’s opinion does not support a different finding as he merely parrots the specification and his limited discussion of “Relevant Background” (Alper Decl. §IV.A) does not establish that “promoter element” has any well-understood or consistent meaning in the art, much less as the name for any particular structure. *Teva*, 789 F.3d at 1342 (“A party cannot transform into a factual matter the internal coherence and context assessment of the patent simply by having an expert offer an opinion on it.”). In fact, “promoter element” has no consistent meaning or structure and a POSITA would not be reasonably certain of its metes and bounds within the claims. Batt, §XI.A.11. Thus, the term is indefinite.

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CERTIFICATE OF COMPLIANCE

I certify that this document complies with Paragraph 13 of Court's Scheduling Order (D.I. 37) because it contains 7,494 words as determined by the word count feature of Microsoft Word (excluding the caption, tables, and signature blocks).

/s/ Jeremy A. Tigan

Jeremy A. Tigan (#5239)

CERTIFICATE OF SERVICE

I hereby certify that on June 28, 2023, I caused the foregoing to be electronically filed with the Clerk of the Court using CM/ECF, which will send notification of such filing to all registered participants.

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