

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE

PHARMACYCLICS LLC,

Plaintiff,

v.

ACERTA PHARMA B.V., ACERTA  
PHARMA LLC, and ASTRAZENECA  
PHARMACEUTICALS LP,

Defendants.

No. 17-cv-1582-RGA

MEMORANDUM ORDER

Presently before the Court is the issue of claim construction of multiple terms in U.S. Patent Nos. 9,079,908 (“the ’908 patent”), 9,139,591 (“the ’591 patent”), and 9,556,182 (“the ’182 patent”) (collectively, “the asserted patents”).<sup>1</sup> I have considered the parties’ joint claim construction chart and brief. (D.I. 119, 140). I heard oral argument on May 8, 2019. (D.I. 171).

**A. BACKGROUND**

On November 3, 2017, Plaintiff filed suit against Defendants for infringement of the asserted patents. (D.I. 1). The asserted patents relate to small molecule compounds that bind to a protein known as Bruton’s tyrosine kinase (“BTK”). (*Id.* ¶ 1). The compounds act to irreversibly inhibit BTK activity. (*Id.*). Plaintiff obtained FDA approval for a new drug, Imbruvica, that allegedly practices the asserted patents. (*Id.* ¶¶ 3-5). On October 31, 2017, Defendants obtained FDA approval for a different new drug, Calquence. (*Id.* ¶ 16). Plaintiff

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<sup>1</sup> The asserted patents all share a common specification. (D.I. 119 at 2 n.1). For the purposes of this opinion, I will cite to the ’908 patent specification, but similar citations can be found in the ’591 and ’182 patents.

asserts that Calquence is a BTK inhibitor within the class of compounds claimed by the asserted patents.

## **B. LEGAL STANDARD**

“It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (citation omitted). “[T]here is no magic formula or catechism for conducting claim construction.’ Instead, the court is free to attach the appropriate weight to appropriate sources ‘in light of the statutes and policies that inform patent law.’” *SoftView LLC v. Apple Inc.*, 2013 WL 4758195, at \*1 (D. Del. Sept. 4, 2013) (quoting *Phillips*, 415 F.3d at 1324). When construing patent claims, a court considers the literal language of the claim, the patent specification, and the prosecution history. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979–80 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996). Of these sources, “the specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Phillips*, 415 F.3d at 1315.

“[T]he words of a claim are generally given their ordinary and customary meaning. . . . [This is] the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Id.* at 1312–13. “[T]he ordinary meaning of a claim term is its meaning to [an] ordinary artisan after reading the entire patent.” *Id.* at 1321. “In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.” *Id.* at 1314.

When a court relies solely upon the intrinsic evidence—the patent claims, the specification, and the prosecution history—the court’s construction is a determination of law. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015). The court may also make factual findings based upon consideration of extrinsic evidence, which “consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” *Phillips*, 415 F.3d at 1317–19. Extrinsic evidence may assist the court in understanding the underlying technology, the meaning of terms to one skilled in the art, and how the invention works. *Id.* Extrinsic evidence, however, is less reliable and less useful in claim construction than the patent and its prosecution history. *Id.*

“A claim construction is persuasive, not because it follows a certain rule, but because it defines terms in the context of the whole patent.” *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998). It follows that “a claim interpretation that would exclude the inventor’s device is rarely the correct interpretation.” *Osram GMBH v. Int’l Trade Comm’n*, 505 F.3d 1351, 1358 (Fed. Cir. 2007) (citation omitted).

**C. CONSTRUCTION OF AGREED-UPON TERMS**

The Court adopts the following agreed-upon constructions.

Claim Term	Construction
“heterocycle”; “heterocyclic”	“Heteroaromatic and heteroalicyclic groups containing one to four heteroatoms each selected from O, S and N, wherein each heterocyclic group has from 4 to 10 atoms in its ring system, and with the proviso that the ring of said group does not contain two adjacent O or S atoms. Herein, whenever the number of carbon atoms in a heterocycle is indicated (e.g., C1-C6 heterocycle), at least one other atom (the heteroatom) must be present in the ring. Designations such as ‘C1-C6 heterocycle’ refer only to the number of

Claim Term	Construction
	<p>carbon atoms in the ring and do not refer to the total number of atoms in the ring. It is understood that the heterocyclic ring can have additional heteroatoms in the ring. Designations such as ‘4-6 membered heterocycle’ refer to the total number of atoms that are contained in the ring (i.e., a four, five, or six membered ring, in which at least one atom is a carbon atom, at least one atom is a heteroatom and the remaining two to four atoms are either carbon atoms or heteroatoms). In heterocycles that have two or more heteroatoms, those two or more heteroatoms can be the same or different from one another. Heterocycles can be optionally substituted. Binding to a heterocycle can be at a heteroatom or via a carbon atom. Non-aromatic heterocyclic groups include groups having only 4 atoms in their ring system, but aromatic heterocyclic groups must have at least 5 atoms in their ring system. The foregoing groups, as derived from the groups listed above, are optionally C-attached or N-attached where such is possible. Depending on the structure, a heterocycle group can be a monoradical or a diradical (i.e., a heterocyclene group).”</p>
“lower heterocycloalkyl”	“A heterocycloalkyl having a maximum of 8 carbon atoms.” <sup>2</sup>

**D. CONSTRUCTION OF DISPUTED TERMS**

The asserted patents provide express definitions for each of the disputed terms, which both parties adopt into their proposed constructions. The parties disagree, however, on what those definitions mean. Specifically, Defendants seek to add a sentence clarifying that each of the following four phrases “imposes no upper limit on the number of carbon atoms”: (1)

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<sup>2</sup> Defendants agreed to Plaintiff’s proposed construction in the parties’ joint claim construction brief. (D.I. 140 at 75-76). I will not construe “heterocycloalkyl” alone as it does not appear as an unmodified claim term and the parties directed their arguments at “lower heterocycloalkyl.” (*See id.*).

“optionally has 1 to 10 carbon atoms,” (2) “include groups having from 3 to 10 ring atoms,” (3) “can be formed by five, six, seven, eight, nine, or more than nine carbon atoms,” and (4) “includes one or more ring heteroatoms.” In addition, the parties dispute whether “substituted,” as defined, imposes a limit on the number of substitutions that can be made.

#### 1. “alkyl”; “lower alkyl”

- a. *Plaintiff’s Proposed Construction*: “An aliphatic hydrocarbon group. The alkyl moiety includes a ‘saturated alkyl’ group, which means that it does not contain any alkene or alkyne moieties. The alkyl moiety also includes an ‘unsaturated alkyl’ moiety, which means that it contains at least one alkene or alkyne moiety. An ‘alkene’ moiety refers to a group that has at least one carbon-carbon double bond, and an ‘alkyne’ moiety refers to a group that has at least one carbon-carbon triple bond. The alkyl moiety, whether saturated or unsaturated, includes branched, straight chain, or cyclic moieties. Depending on the structure, an alkyl group includes a monoradical or a diradical (i.e., an alkylene group), and if a ‘lower alkyl’ having 1 to 6 carbon atoms. As used herein, C1-C<sub>x</sub> includes C1-C2, C1-C3 . . . C1-C<sub>x</sub>. The ‘alkyl’ moiety optionally has 1 to 10 carbon atoms (whenever it appears herein, a numerical range such as ‘1 to 10’ refers to each integer in the given range; e.g., ‘1 to 10 carbon atoms’ means that the alkyl group is selected from a moiety having 1 carbon atom, 2 carbon atoms, 3 carbon atoms, etc., up to and including 10 carbon atoms, although the present definition also covers the occurrence of the term ‘alkyl’ where no numerical range is designated). The alkyl group of the compounds described herein may be designated as ‘C1-C4 alkyl’ or similar designations. Alkyl groups are optionally substituted or unsubstituted.”
- b. *Defendants’ Proposed Construction*: Identical to Plaintiff’s proposed construction, except adding, “For clarity, the definition of alkyl imposes no upper limit on the number of carbon atoms.”
- c. *Court’s Construction*: “An aliphatic hydrocarbon group. The alkyl moiety includes a ‘saturated alkyl’ group, which means that it does not contain any alkene or alkyne moieties. The alkyl moiety also includes an ‘unsaturated alkyl’ moiety, which means that it contains at least one alkene or alkyne moiety. An ‘alkene’ moiety refers to a group that has at least one carbon-carbon double bond, and an ‘alkyne’ moiety refers to a group that has at least one carbon-carbon triple bond. The alkyl moiety, whether saturated or unsaturated, includes branched, straight chain, or cyclic moieties. Depending on the structure, an alkyl group includes a monoradical or a diradical (i.e., an alkylene group), and if a ‘lower alkyl’ having 1 to 6 carbon atoms. As used herein, C1-C<sub>x</sub> includes C1-C2, C1-C3 . . . C1-C<sub>x</sub>. The ‘alkyl’ moiety optionally has 1 to 10 carbon atoms (whenever it appears herein, a numerical range such as ‘1 to 10’ refers to each integer in the given range; e.g., ‘1 to 10 carbon atoms’ means that the alkyl group is selected from a moiety having 1 carbon atom, 2 carbon atoms, 3 carbon atoms, etc., up to and including 10 carbon

atoms, although the present definition also covers the occurrence of the term ‘alkyl’ where no numerical range is designated). The alkyl group of the compounds described herein may be designated as ‘C1-C4 alkyl’ or similar designations. Alkyl groups are optionally substituted or unsubstituted. I do not understand this express definition to impose an upper limit of 10 on the number of carbon atoms.”

The specification defines “alkyl” as a moiety that “optionally has 1 to 10 carbon atoms.” ’908 patent at 27:63-28:15. The specification explains, “[A] numerical range such as ‘1 to 10’ refers to each integer in the given range; e.g., ‘1 to 10 carbon atoms’ means that the alkyl group is selected from a moiety having 1 carbon atom, 2 carbon atoms, 3 carbon atoms, etc., up to and including 10 carbon atoms.” *Id.* Therefore, the only dispute is over the meaning of “optionally.” Plaintiff argues that “optionally has 1 to 10 carbon atoms” means a maximum of 10 carbon atoms. (D.I. 140 at 7). Defendants argue that “optionally” indicates that there is no upper limit on the number of carbon atoms. (*Id.* at 21).

Defendants argue that Plaintiff’s construction renders “optionally” superfluous. (*Id.* at 22-23). I agree. The specification expressly states that “1 to 10 carbon atoms” means any number of carbon atoms between 1 and 10, which is no different from Plaintiff’s proposed construction of “optionally has 1 to 10 carbon atoms.” In contrast, the specification defines “lower alkyl” as simply “having 1 to 6 carbons,” which the parties agree creates an upper limit of 6 carbons. (*Id.* at 22). Therefore, construing “optionally has 1 to 10” to mean an upper limit of 10 would ignore the difference in wording between the definitions of “alkyl” and “lower alkyl.” “A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.” *Merck & Co., Inc. v. Teva Pharma. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005); *Sanofi-Aventis U.S. LLC v. Merck Sharp & Dohme Corp.*, 2018 WL 389183, at \*7 (D. Del. Jan. 12, 2018) (rejecting a proposed construction that rendered meaningless the difference in the way two limitations were written).

Plaintiff argues that it is consistent with other parts of the specification to read out “optionally” from “optionally has 1 to 10.” For example, the specification states, “Alkyl groups are optionally substituted or unsubstituted.” ’908 patent at 28:10-11. It is undisputed that a group can only be “substituted” or “unsubstituted.” There is no third possibility. Therefore, there is no difference between stating “optionally substituted or unsubstituted” and simply “substituted or unsubstituted.”

I agree that the specification does not always use “optionally” in a way that is strictly necessary. That does not mean, however, that all uses of “optionally” are superfluous. The plain and ordinary meaning of “optionally” is non-limiting. *See Optional*, Merriam-Webster.com Dictionary (2019) (“involving an option: not compulsory”). Where “optionally” is followed by all possible choices, such as “optionally substituted or unsubstituted,” it is superfluous. But where “optionally” is followed by a subset of possible choices, such as “optionally has 1 to 10 carbon atoms” or “optionally substituted,”<sup>3</sup> it has independent meaning. Both uses of “optionally” are non-limiting. In contrast, Plaintiff advocates for a construction that would read “optionally” as sometimes limiting and sometimes non-limiting. I do not think the record supports deviating from the plain and ordinary meaning of “optionally.” Therefore, I adopt Defendants’ proposed construction.<sup>4</sup>

## 2. “alkenyl”; “cycloalkenyl”

- a. *Plaintiff’s Proposed Construction*: “A type of alkyl group in which the first two atoms of the alkyl group form a double bond that is not part of an aromatic group. That is, an alkenyl group begins with the atoms  $-C(R)=C(R)-R$ , wherein R refers to the remaining portions of the alkenyl group, which are either the same or different. The alkenyl moiety is optionally branched, straight chain, or cyclic (in which case, it is also known as a ‘cycloalkenyl’ group). Depending on the structure, an alkenyl group includes a monoradical or a diradical (i.e., an alkenylene group). Alkenyl

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<sup>3</sup> In reference to a different term, the specification states, “Alkynyl groups are optionally substituted.” ’908 patent at 28:43-44.

<sup>4</sup> I make some changes for clarity. Similar changes are applied throughout.

groups are optionally substituted. Alkenyl groups optionally have 2 to 10 carbons, and if a 'lower alkenyl' having 2 to 6 carbon atoms."

- b. *Defendants' Proposed Construction*: Identical to Plaintiff's proposed construction, except adding, "For clarity, the definition of alkenyl imposes no upper limit on the number of carbon atoms."
- c. *Court's Construction*: "A type of alkyl group in which the first two atoms of the alkyl group form a double bond that is not part of an aromatic group. That is, an alkenyl group begins with the atoms  $-C(R)=C(R)-R$ , wherein R refers to the remaining portions of the alkenyl group, which are either the same or different. The alkenyl moiety is optionally branched, straight chain, or cyclic (in which case, it is also known as a 'cycloalkenyl' group). Depending on the structure, an alkenyl group includes a monoradical or a diradical (i.e., an alkenylene group). Alkenyl groups are optionally substituted. Alkenyl groups optionally have 2 to 10 carbons, and if a 'lower alkenyl' having 2 to 6 carbon atoms. I do not understand this express definition to impose an upper limit of 10 on the number of carbon atoms."

The specification states, "Alkenyl groups optionally have 2 to 10 carbons." '908 patent at 28:32-33. The same analysis applies to "alkenyl" as for "alkyl." Therefore, I adopt Defendants' proposed construction.

### 3. "alkynyl"

- a. *Plaintiff's Proposed Construction*: "A type of alkyl group in which the first two atoms of the alkyl group form a triple bond. That is, an alkynyl group begins with the atoms  $-C\equiv C-R$ , wherein R refers to the remaining portions of the alkynyl group, which is either the same or different. The "R" portion of the alkynyl moiety may be branched, straight chain, or cyclic. Depending on the structure, an alkynyl group includes a monoradical or a diradical (i.e., an alkynylene group). Alkynyl groups are optionally substituted. Alkynyl groups optionally have 2 to 10 carbons, and if a 'lower alkynyl' having 2 to 6 carbon atoms."
- b. *Defendants' Proposed Construction*: Identical to Plaintiff's proposed construction, except adding, "For clarity, the definition of alkynyl imposes no upper limit on the number of carbon atoms."
- c. *Court's Construction*: "A type of alkyl group in which the first two atoms of the alkyl group form a triple bond. That is, an alkynyl group begins with the atoms  $-C\equiv C-R$ , wherein R refers to the remaining portions of the alkynyl group, which is either the same or different. The "R" portion of the alkynyl moiety may be branched, straight chain, or cyclic. Depending on the structure, an alkynyl group includes a monoradical or a diradical (i.e., an alkynylene group). Alkynyl groups are optionally substituted. Alkynyl groups optionally have 2 to 10 carbons, and if a

'lower alkynyl' having 2 to 6 carbon atoms. I do not understand this express definition to impose an upper limit of 10 on the number of carbon atoms."

The specification states, "Alkynyl groups optionally have 2 to 10 carbons." '908 patent at 28:46-47. The same analysis applies to "alkynyl" as for "alkyl" and "alkenyl." Therefore, I adopt Defendants' proposed construction.

#### 4. "heteroalkyl"

- a. *Plaintiff's Proposed Construction*: "Optionally substituted alkyl radicals in which one or more skeletal chain atoms is a heteroatom, e.g., oxygen, nitrogen, sulfur, silicon, phosphorus or combinations thereof. The heteroatom(s) are placed at any interior position of the heteralkyl group or at the position at which the heteroalkyl group is attached to the remainder of the molecule. In addition, in some embodiments, up to two heteroatoms are consecutive."
- b. *Defendants' Proposed Construction*: Identical to Plaintiff's proposed construction, except adding, "For clarity, the definition of heteroalkyl imposes no upper limit on the number of atoms."
- c. *Court's Construction*: "Optionally substituted alkyl radicals in which one or more skeletal chain atoms is a heteroatom, e.g., oxygen, nitrogen, sulfur, silicon, phosphorus or combinations thereof. The heteroatom(s) are placed at any interior position of the heteralkyl group or at the position at which the heteroalkyl group is attached to the remainder of the molecule. In addition, in some embodiments, up to two heteroatoms are consecutive. I do not understand this express definition to impose an upper limit of 10 on the number of carbon atoms."

Plaintiff argues that the definition of "heteroalkyl" incorporates the definition of "alkyl" and thus is limited to a maximum of 10 carbon atoms. (D.I. 140 at 60-61). Because I adopted Defendants' construction for "alkyl," I adopt Defendants' construction for "heteroalkyl."

#### 5. "cycloalkyl"; "lower cycloalkyl"; "cycloalkylene ring"

- a. *Plaintiff's Proposed Construction*: "A monocyclic or polycyclic radical that contains only carbon and hydrogen, and is optionally saturated, partially unsaturated, or fully unsaturated. Cycloalkyl groups include groups having from 3 to 10 ring atoms. Depending on the structure, a cycloalkyl group is either a monoradical or a diradical (e.g., an cycloalkylene group), and if a 'lower cycloalkyl' having 3 to 8 carbon atoms."

- b. *Defendants' Proposed Construction*: Identical to Plaintiff's proposed construction, except adding, "For clarity, the definition of cycloalkyl imposes no upper limit on the number of carbon atoms."
- c. *Court's Construction*: "A monocyclic or polycyclic radical that contains only carbon and hydrogen, and is optionally saturated, partially unsaturated, or fully unsaturated. Cycloalkyl groups include groups having from 3 to 10 ring atoms. Depending on the structure, a cycloalkyl group is either a monoradical or a diradical (e.g., an cycloalkylene group), and if a 'lower cycloalkyl' having 3 to 8 carbon atoms. I do not understand this express definition to impose an upper limit of 10 on the number of carbon atoms."

The dispute over "cycloalkyl" groups is similar to that for "alkyl," "alkenyl," and "alkynyl." (D.I. 140 at 54-60). The specification states, "Cycloalkyl groups include groups having from 3 to 10 ring atoms." '908 patent at 30:23-24. Like "optionally," the plain and ordinary meaning of "include" is non-limiting. The specification explicitly adopts that plain meaning. "[U]se of the term 'including' as well as other forms, such as 'include,' 'includes,' and 'included,' is not limiting." '908 patent at 27:7-9. Again, I do not think the record supports deviating from the plain and ordinary meaning. Therefore, I adopt Defendants' proposed construction.

## 6. "aryl"

- a. *Plaintiff's Proposed Construction*: "An aromatic ring wherein each of the atoms forming the ring is a carbon atom. Aryl rings can be formed by five, six, seven, eight, nine, or more than nine carbon atoms. Aryl groups can be optionally substituted. Depending on the structure, an aryl group can be a monoradical or a diradical (i.e., an arylene group)."
- b. *Defendants' Proposed Construction*: Identical to Plaintiff's proposed construction, except adding, "For clarity, the definition of aryl imposes no upper limit on the number of carbon atoms."
- c. *Court's Construction*: "An aromatic ring wherein each of the atoms forming the ring is a carbon atom. Aryl rings can be formed by five, six, seven, eight, nine, or more than nine carbon atoms. Aryl groups can be optionally substituted. Depending on the structure, an aryl group can be a monoradical or a diradical (i.e., an arylene group). I do not understand this express definition to impose an upper limit on the number of carbon atoms."

The specification defines “aryl” as an aromatic ring that “can be formed by five, six, seven, eight, nine, or more than nine carbon atoms.” ’908 patent at 29:64-67. The dispute for claim construction is whether the phrase “or more than nine carbon atoms” imposes an upper limit on the number of carbon atoms. (D.I. 140 at 63-72). Plaintiff admits that the phrase is open-ended but argues that there may be “an inherently understood upper limit.” (D.I. 171 at 70:14-71:4). Defendants argue that the term should be explicitly construed to have no upper limit.

Plaintiff argues that “more than nine” imposes “some reasonable limit that would be understood by a person of ordinary skill in the art.” Plaintiff relies on *In re Anderson*, 471 F.2d 1237 (C.C.P.A. 1973). The court in *Anderson* addressed claims covering a wound dressing with “a medicament.” The patent examiner rejected the claims under 35 U.S.C. § 112 because the term “medicament” included medicaments not operative for the patent’s stated purpose. *Id.* at 1242. The court found that rejection unsound as the claims were “inherently limited—by common sense if nothing else—to such medication as would be useful in the particular application.” *Id.* (“No one of ordinary skill in the art would use any other kind of medicament and there is no practical way to restrict the claim language so as to exclude all inoperative or deleterious medicaments other than by the addition of such redundant terms as ‘suitable’ or ‘operative for the purposes described.’”). Plaintiff argues that, consistent with *Anderson*, it would have been redundant for the asserted patents to explicitly state that the number of carbon atoms is bounded by some reasonable limit. (D.I. 140 at 65).

Plaintiff attempts to use *Anderson* to ensure that “aryl” is construed in a manner consistent with the requirements of § 112. It is undisputed, however, that the specification’s definition of “aryl” imposes no limit on the number of carbon atoms. Not only is the

specification “the single best guide” for claim construction, *Phillips*, 415 F.3d at 1315, but the patentee has “acted as his own lexicographer and clearly set forth a definition of the disputed term,” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002). Plaintiff’s only argument to the contrary is its assertion that future expert testimony will support finding some reasonable upper limit. That is not sufficient to overcome the plain language of the specification. Claim construction does not depend on validity. *Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004) (“[C]ourts may not redraft claims . . . to make them operable or to sustain their validity.”). Therefore, I adopt Defendants’ proposed construction.

## 7. “heteroaryl”

- a. *Plaintiff’s Proposed Construction*: “An aromatic group that includes one or more ring heteroatoms selected from nitrogen, oxygen and sulfur. Depending on the structure, a heteroaryl group can be a monoradical or a diradical (i.e., a heteroarylene group).”
- b. *Defendants’ Proposed Construction*: Identical to Plaintiff’s proposed construction, except adding, “For clarity, the definition of heteroaryl imposes no upper limit on the number of atoms.”
- c. *Court’s Construction*: “An aromatic group that includes one or more ring heteroatoms selected from nitrogen, oxygen and sulfur. Depending on the structure, a heteroaryl group can be a monoradical or a diradical (i.e., a heteroarylene group). I do not understand this express definition to impose an upper limit on the number of carbon atoms.”

The parties raise the same arguments for “heteroaryl” as for “aryl.” (D.I. 140 at 73-74). The specification expressly defines “heteroaryl” as including “one or more ring heteroatoms.” ’908 patent at 31:60-62. Like “more than nine,” it is undisputed that “one or more” does not impose an express upper limit on the number of atoms. (*Id.* at 73). Therefore, applying the analysis from my construction of “aryl,” I adopt Defendants’ proposed construction.

## 8. “substituted”

- a. *Plaintiff’s Proposed Construction*: “The referenced group may be substituted with one or more additional group(s) individually and independently selected from alkyl,

cycloalkyl, aryl, heteroaryl, heteroalicyclic, hydroxy, alkoxy, aryloxy, alkylthio, arylthio, alkylsulfoxide, arylsulfoxide, alkylsulfone, arylsulfone, cyano, halo, acyl, nitro, haloalkyl, fluoroalkyl, amino, including mono- and disubstituted amino groups, and the protected derivatives thereof.”

b. *Defendants’ Proposed Construction*: Identical to Plaintiff’s proposed construction, except adding, “For clarity, depending on the group, a substituted group may itself be ‘substituted’ as that term is defined.”

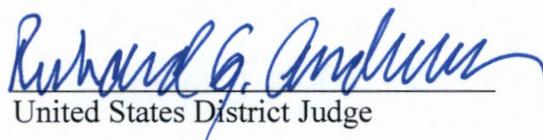
c. *Court’s Construction*: “The referenced group may be substituted with one or more additional group(s) individually and independently selected from alkyl, cycloalkyl, aryl, heteroaryl, heteroalicyclic, hydroxy, alkoxy, aryloxy, alkylthio, arylthio, alkylsulfoxide, arylsulfoxide, alkylsulfone, arylsulfone, cyano, halo, acyl, nitro, haloalkyl, fluoroalkyl, amino, including mono- and disubstituted amino groups, and the protected derivatives thereof. For clarity, the substituted group may itself be substituted as that term is defined.”

The dispute over “substituted” is similar to that over “aryl.” The specification states, “The term ‘optionally substituted’ or ‘substituted’ means that the referenced group may be substituted with one or more additional group(s) individually and independently selected from” the listed groups. ’908 patent at 34:15-34. The parties agree that, under certain circumstances, a substituted group may itself be substituted. (D.I. 171 at 92:25-93:3). Plaintiff argues, however, that “substituted” does not mean substituted *ad infinitum*, because the ability to substitute is limited by factors such as “ease of synthesis,” “overall general size of the molecule,” and “realistic structures.” (*Id.* at 94:12-95:18). In other words, as with “more than nine carbon atoms,” Plaintiff advocates for a construction that imports a reasonableness limitation despite there being no express limitation in the specification. (*See id.* at 99:3-7). Plaintiff points to no evidence in the record to support that limited construction. (*See D.I.* 140 at 76-77). Again, I think Plaintiff’s real argument relates to validity under § 112. (*See D.I.* 171 at 106:22-107:6).

There is no real dispute that a substituted group may itself be substituted as that term is defined. (*See id.* at 92:25-93:12, 103:8-20, 110:7-20). Defendants’ proposed addition of “depending on the group” is vague and superfluous. Providing that a group may be “substituted

as that term is defined” inherently limits substitutions “depending on the group.” (*See id.* at 102:4-8 (Defendants’ counsel explaining, “what it means by depending on the group is some of these groups, as they are defined, for example, alkyl allows for substitutes”)). Therefore, I adopt Defendants’ proposed construction, minus the phrase “depending on the group.”

IT IS SO ORDERED this 7 day of August 2019.

  
United States District Judge