UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF CALIFORNIA

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA; and BECTON, DICKINSON and COMPANY, Plaintiffs, v. AFFYMETRIX, INC.; and LIFE TECHNOLOGIES CORP., Defendants.	Case No.: 17-cv-01394-H-NLS **CLAIM CONSTRUCTION ORDER FOR THE '613 PATENT, THE '303 PATENT, THE '869 PATENT, AND THE '008 PATENT**

In the present action, Plaintiffs the Regents of the University of California, Becton, Dickinson and Company, Sirigen, Inc., and Sirigen II Limited assert claims of patent infringement against Defendants Affymetrix, Inc. and Life Technologies Corp., alleging infringement of U.S. Patent No. 8,455,613, U.S. Patent No. 8,575,303, U.S. Patent No. 9,139,869, and U.S. Patent No. 9,547,008.[1] (Doc. No. 101, FAC ¶¶ 82-115.) On June 15,

[1] In this action, Plaintiffs also assert claims of patent infringement against Defendants for infringement of U.S. Patent No. 9,085,799, U.S. Patent No. 8,110,673, and U.S. Patent No. 8,835,113 (Doc. No. 101, FAC ¶¶ 52-81.) The Court issued a prior claim construction order for the '799 patent, the '673 patent, and the '113 patent on March 26, 2018. (Doc. No. 138.) In addition, on May 1, 2018, the Court granted Defendants' motion for summary judgment of non-infringement of the '799 patent. (Doc. No. 170.)

2018, the parties filed their joint claim construction prehearing statement, chart, and worksheet, identifying the disputed claim terms from the ’613 patent, the ’303 patent, the ’869 patent, and the ’008 patent. (Doc. No. 195.) On July 20, 2018, the parties each filed an opening claim construction brief. (Doc. Nos. 219, 221.) On August 3, 2018, the parties each filed a responsive claim construction brief. (Doc. No. 252, 253.) On August 30, 2018, the Court issued a tentative claim construction order. (Doc. No. 270.)

The Court held a claim construction hearing on August 31, 2018. Donald R. Ware, Barbara Fiacco, and Jesse Hindman appeared for Plaintiffs. Douglas E. Lumish, Jeffrey G. Homrig, and Brent T. Watson appeared for Defendants. After considering the parties’ briefs, the parties’ arguments at the hearing, and all relevant information, the Court construes the disputed terms from the’613 patent, the ’303 patent, the ’869 patent, and the ’008 patent.

Background

On July 10, 2017, Plaintiffs Regents and Becton, Dickinson filed a complaint for patent infringement against Defendants Affymetrix and Life Technologies, alleging infringement of U.S. Patent No. 9,085,799, U.S. Patent No. 8,110,673, and U.S. Patent No. 8,835,113. (Doc. No. 1, Compl.) On September 8, 2017, Defendants filed an answer to Plaintiffs’ complaint. (Doc. No. 37.)

On October 6, 2017, the Court issued a scheduling order. (Doc. No. 55.) On November 20, 2017, the Court denied Plaintiff Becton, Dickinson’s motion for a preliminary injunction without prejudice. (Doc No. 69.) On November 30, 2017, the Court issued an amended scheduling order. (Doc. No. 76.)

On February 7, 2018, the Court granted the parties’ joint motion for leave for Plaintiffs to file a first amended complaint and to modify the scheduling order. (Doc. No. 100.) On February 9, 2018, Plaintiffs filed an amended complaint: (1) adding Sirigen and Sirigen II as additional Plaintiffs and adding claims that Defendants’ products infringe four Sirigen patents: U.S. Patent No. 9,547,008, U.S. Patent No. 9,139,869, U.S. Patent No. 8,575,303, and U.S. Patent No. 8,455,613; (2) adding infringement allegations against

additional accused products; and (3) adding allegations of induced infringement against Defendants. (Doc. No. 101, FAC.)

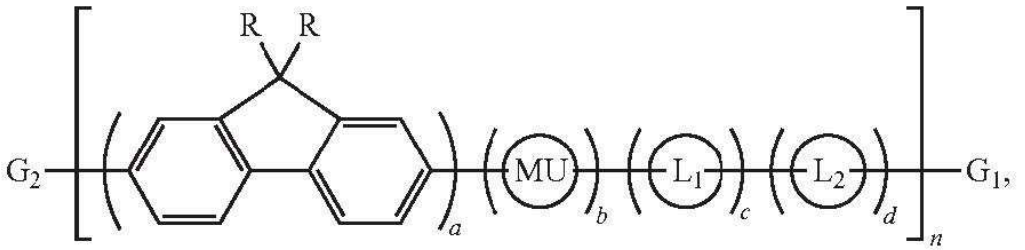
On February 23, 2018, the Court issued a second amended scheduling order. (Doc. No. 105.) On March 26, 2018, the Court issued a claim construction order, construing disputed claim terms from the '799 patent, the '673 patent, and the '113 patent. (Doc. No. 138.) On May 1, 2018, the Court granted Defendants' motion for summary judgment of non-infringement of the '799 patent. (Doc. No. 170.) On May 14, 2018, the Court denied Defendants' motion for summary judgment of non-infringement of the '673 patent and the '113 patent. (Doc. No. 183.)

By the present claim construction briefs, the parties request that the Court construe disputed claim terms from the'613 patent, the '303 patent, the '869 patent, and the '008 patent. (Doc. Nos. 219, 221.) The'613 patent, the '303 patent, the '869 patent, and the '008 patent are all entitled "Reagents for Directed Biomarker Signal Amplification," and these patents all share a common specification. U.S. Patent No. 8,455,613 (filed Jun. 4, 2013), at (54); U.S. Patent No. 8,575,303 (filed Nov. 5, 2013), at (54); U.S. Patent No. 9,139,869 (filed Sep. 22, 2015), at (54); U.S. Patent No. 9,547,008 (filed Jan. 17, 2017), at (54). The invention disclosed in the patents at issue relate to "neutral conjugated water-soluble polymers with linkers along the polymer main chain structure and terminal end capping units." '613 Patent at (57) (abstract).

As an exemplary claim, Claim 1 of the '303 Patent provides:

1. A water soluble conjugated polymer having the structure of Formula (Ia):

(Ia)



wherein:

each R is independently a non-ionic side group capable of imparting solubility in water in excess of 10 mg/mL;

MU is a polymer modifying unit or band gap modifying unit that is evenly or randomly distributed along the polymer main chain and is optionally substituted with one or more optionally substituted substituents selected from halogen, hydroxyl, C_1-C_{12} alkyl, C_2-C_{12} alkene, C_2-C_{12} alkyne, C_3-C_{12} cycloalkyl, C_1-C_{12} haloalkyl, C_1-C_{12} alkoxy, C_2-C_{18} (hetero)aryloxy, C_2-C_{18} (hetero)arylamino, $(CH_2)_{x'}(OCH_2CH_2)_{y'}OCH_3$ where each x′ is independently an integer from 0-20, y′ is independently an integer from 0 to 50, or a C_2-C^{18} (hetero)aryl group;

each optional linker L_1 and L_2 are aryl or heteroaryl groups evenly or randomly distributed along the polymer main chain and are substituted with one or more pendant chains terminated with a functional group selected from amine, carbamate, carboxylic acid, carboxylate, maleimide, activated esters, N-hydroxysuccinimidyl, hydrazines, hydrazids, hydrazones, azide, alkyne, aldehydes, thiols, and protected groups thereof for conjugation to another substrate, molecule or biomolecule;

G_1 and G_2 are each independently selected from hydrogen, halogen, alkyne, optionally substituted aryl, optionally substituted heteroaryl, halogen substituted aryl, boronic acid substituted aryl, boronic ester substituted aryl, boronic esters, boronic acids, optionally substituted fluorine and aryl or heteroaryl substituted with one or more pendant chains terminated with a functional group, molecule or biomolecule selected from amine, carbamate, carboxylic acid, carboxylate, maleimide, activated esters, N-hydroxysuccinimidyl, hydrazines, hydrazids, hydrazones, azide, alkyne,

aldehydes, thiols, and protected groups thereof for conjugation to another substrate, molecule or biomolecule;

wherein the polymer comprises at least 1 functional group selected from amine, carbamate, carboxylic acid, carboxylate, maleimide, activated esters, N-hydroxysuccinimidyl, hydrazines, hydrazids, hydrazones, azide, alkyne, aldehydes, and thiols within G_1, G_2, L_1 or L_2 that allows, for functional conjugation to another molecule, substrate or biomolecule;

n is an integer from 1 to about 10,000; and

a, b, c and d define the mol % of each unit within the structure which each can be evenly or randomly repeated and where a is a mol % from 10 to 100%, b is a mol % from 0 to 90%, and each c and d are mol % from 0 to 25%.

'303 Patent at 239:29-240:56.

Discussion

I. Legal Standards for Claim Construction

Claim construction is an issue of law for the court to decide. Teva Pharm. USA, Inc. v. Sandoz, Inc., 135 S. Ct. 831, 838 (2015); Markman v. Westview Instr., Inc., 517 U.S. 370, 372 (1996). Although claim construction is ultimately a question of law, "subsidiary factfinding is sometimes necessary." Teva, 135 S. Ct. at 838.

"The purpose of claim construction is to 'determin[e] the meaning and scope of the patent claims asserted to be infringed.'" O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co., 521 F.3d 1351, 1360 (Fed. Cir. 2008). "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).

Claim terms "'are generally given their ordinary and customary meaning[,]'" which "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." Id. at 1312–13. "In some cases, the ordinary meaning of claim language as understood by a [PHOSITA] 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. "However, in many

cases, the meaning of a claim term as understood by persons of skill in the art is not readily apparent." O2 Micro, 521 F.3d at 1360. If the meaning of the term is not readily apparent, the court must look to "those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean," including intrinsic and extrinsic evidence. See Phillips, 415 F.3d at 1314. A court should begin with the intrinsic record, which consists of the language of the claims, the patent specification, and, if in evidence, the prosecution history of the asserted patent. Id.; see also Vederi, LLC v. Google, Inc., 744 F.3d 1376, 1382 (Fed. Cir. 2014) ("In construing claims, this court relies primarily on the claim language, the specification, and the prosecution history.").

In determining the proper construction of a claim, a court should first look to the language of the claims. See Vitronics, 90 F.3d at 1582; see also Comark Commc'ns v. Harris Corp., 156 F.3d 1182, 1186 (Fed. Cir. 1998) ("The appropriate starting point . . . is always with the language of the asserted claim itself."). The context in which a disputed term is used in the asserted claims may provide substantial guidance as to the meaning of the term. See Phillips, 415 F.3d at 1314. In addition, the context in which the disputed term is used in other claims, both asserted and unasserted, may provide guidance because "the usage of a term in one claim can often illuminate the meaning of the same term in other claims." Id. Furthermore, a disputed term should be construed "consistently with its appearance in other places in the same claim or in other claims of the same patent." Rexnord Corp. v. Laitram Corp., 274 F.3d 1336, 1342 (Fed. Cir. 2001); accord Microprocessor Enhancement Corp. v. Texas Instruments Inc., 520 F.3d 1367, 1375 (Fed. Cir. 2008); see also Paragon Sols., LLC v. Timex Corp., 566 F.3d 1075, 1087 (Fed. Cir. 2009) ("We apply a presumption that the same terms appearing in different portions of the claims should be given the same meaning." (internal quotation marks omitted)). Moreover, "'[a] claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.'" Vederi, 744 F.3d 1383.

A court must also read claims "in view of the specification, of which they are a part." Markman, 52 F.3d at 979; see 35 U.S.C. § 112(b) ("The specification shall conclude with

one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention."). "'Apart from the claim language itself, the specification is the single best guide to the meaning of a claim term.'" Vederi, 744 F.3d at 1382. For example, "a claim construction that excludes [a] preferred embodiment [described in the specification] 'is rarely, if ever, correct and would require highly persuasive evidentiary support.'" Adams Respiratory Therapeutics, Inc. v. Perrigo Co., 616 F.3d 1283, 1290 (Fed. Cir. 2010).

But "[t]he written description part of the specification does not delimit the right to exclude. That is the function and purpose of claims." Markman v. Westview Instruments, Inc., 52 F.3d 967, 980 (Fed. Cir. 1995) (en banc). Therefore, "it is improper to read limitations from a preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited." Dealertrack, Inc. v. Huber, 674 F.3d 1315, 1327 (Fed. Cir. 2012); see also Kara Tech. Inc. v. Stamps.com Inc., 582 F.3d 1341, 1348 (Fed. Cir. 2009) ("The patentee is entitled to the full scope of his claims, and we will not limit him to his preferred embodiment or import a limitation from the specification into the claims.").

In most situations, analysis of the intrinsic evidence will resolve claim construction disputes. See Vitronics, 90 F.3d at 1583; Teva, 135 S. Ct. at 841. However, "[w]here the intrinsic record is ambiguous, and when necessary," district courts may "rely on extrinsic evidence, which 'consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.'" Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc., 711 F.3d 1348, 1360 (Fed. Cir. 2013) (quoting Phillips, 415 F.3d at 1317). A court must evaluate all extrinsic evidence in light of the intrinsic evidence. Phillips, 415 F.3d at 1319. "Extrinsic evidence may not be used 'to contradict claim meaning that is unambiguous in light of the intrinsic evidence.'" Summit 6, LLC v. Samsung Elecs. Co., 802 F.3d 1283, 1290 (Fed. Cir. 2015); see also Bell Atl. Network Servs., Inc. v. Covad Commc'ns Grp., Inc., 262 F.3d 1258, 1269 (Fed. Cir.

2001) ("[E]xtrinsic evidence . . . may not be used to vary, contradict, expand, or limit the claim language from how it is defined, even by implication, in the specification or file history."); Vederi, 744 F.3d at 1382 ("[E]xtrinsic evidence may be less reliable than the intrinsic evidence."). In cases where subsidiary facts contained in the extrinsic evidence "are in dispute, courts will need to make subsidiary factual findings about that extrinsic evidence." Teva, 135 S. Ct. at 841.

"[D]istrict courts are not (and should not be) required to construe every limitation present in a patent's asserted claims." O2 Micro, 521 F.3d at 1362. In certain situations, it is appropriate for a court to determine that a claim term needs no construction and its plain and ordinary meaning applies. See id.; Phillips, 415 F.3d at 1314. But "[a] determination that a claim term 'needs no construction' or has the 'plain and ordinary meaning' may be inadequate when a term has more than one 'ordinary' meaning or when reliance on a term's 'ordinary' meaning does not resolve the parties' dispute." O2 Micro, 521 F.3d at 1361. If the parties dispute the scope of a certain claim term, it is the court's duty to resolve the dispute. Id. at 1362; accord Eon Corp. IP Holdings v. Silver Spring Networks, 815 F.3d 1314, 1318 (Fed. Cir. 2016).

II. Analysis of the Disputed Claim Terms

A. "NH_2"

Plaintiffs propose that the term "NH_2" be construed as "an -NH_2 group, or an -NH- group that is the product of conjugation of an -NH_2 group to another chemical group." (Doc. No. 221 at 6.) In their briefing, Defendants propose that the term "NH_2" be construed as "an -NH_2 group." (Doc. No. 219 at 7.) Following the issuance of the Court's tentative claim construction, at the claim construction hearing, Defendants submitted a revised claim construction for the term "NH_2" proposing that the term be construed as "an -NH_2 group, which may be used in a reaction that results in an -NH group conjugated to another chemical group." Because the parties dispute the scope of this claim term, the Court must resolve the parties' dispute. See O2 Micro, 521 F.3d at 1361; Eon, 815 F.3d at 1318.

As an initial matter and in an effort to provide context to the present claim

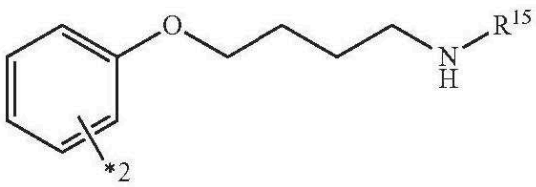
construction dispute, the Court notes that both parties' experts agree that after a -NH_2 group is conjugated to another group, the chemical structure is no longer -NH_2. (Doc. No. 195-3, Swager Decl. ¶¶ 10, 13; Doc. No. 195-4, Burgess Decl. ¶ 33.) The end product is -NH-, not -NH_2. (Id.)

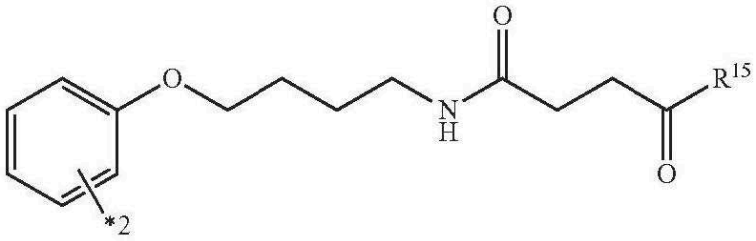
The Court now turns to the claim language at issue. Claim 1 of the '303 Patent claims "[a] water soluble conjugated polymer" having a structure where "each optional linker L_1 and L_2 are . . . for conjugation to another substrate, molecule or biomolecule." '303 Patent at 239:58-67. Further, dependent claim 5 of the '303 patent expressly claims the polymer of claim 1 "wherein optional linker L_1 or L_2 are" a structure including "NH_2." Id. at 244:36-50; see also '613 Patent at 231:2, 232:20-38. Here, claim 5 of the '303 patent describes a polymer having a linker with a -NH_2 group that allows the polymer to be conjugated to another substrate, molecule, or biomolecule. See Phillips, 415 F.3d at 1314 ("[T]he usage of a term in one claim can often illuminate the meaning of the same term in other claims."). And the parties' experts agree that once a -NH_2 group is conjugated to another group, the chemical structure is -NH-, not -NH_2. (Doc. No. 195-3, Swager Decl. ¶¶ 10, 13; Doc. No. 195-4, Burgess Decl. ¶ 33.) Thus, Defendant's initial proposed construction construing the term "NH_2" as simply "an -NH_2 group" would be improper because it fails to acknowledge that once a -NH_2 group is conjugated to another group, something that is expressly contemplated by the claim language, the chemical structure becomes -NH-, not -NH_2.

As revised, both parties' claim construction now properly reflects the fact that once a -NH_2 group is conjugated to another group, the chemical structure becomes -NH-. Defendants argue that their revised proposed construction is preferable over Plaintiffs' proposal, because their construction properly reflects that when the claims at issue refer to "NH_2," it is at the pre-conjugation stage. The Court agrees. For example, dependent claim 5 of the '303 patent claims linkers with a structure including a "NH_2" group. '303 Patent at 244:36-50. Claim 1, from which claim 5 depends, explains that the linkers are "for conjugation to another substrate, molecule or biomolecule." Id. at 239:66-67. Thus, under

the plain language of the claims, the claims are describing the linkers at the pre-conjugation stage. The claims describe the linkers as components of the polymer that are then used "for conjugation" to another group.

Further, in describing the linkers, the claims distinguish -NH- from -NH_2. For example, dependent claim 4 of '303 patent claims a polymer "wherein optional linkers L_1 or L_2 are selected from the group consisting of a-j having the structures:





'303 Patent at 240:66-241:10; see also '613 Patent at 231:60-65. The fact that the claims are careful to distinguish -NH- from -NH_2 in claiming the structures at issue further supports the notion that the claims when describing these structures are describing them at the pre-conjugation stage. Defendants' revised proposed claim construction reflects this concept whereas Plaintiffs' proposed construction does not. As a result, Defendants' revised proposed construction is preferable over Plaintiffs' proposal.

In addition, Defendants' revised proposed construction is supported by the patents' common specification. The specification provides: "In some instances, a signaling chromophore is attached to the polymer via the NH_2 group." '613 Patent at 21:1-2. Here, the specification describes using a NH_2 group to attach a signaling chromophore to the polymer. In this passage, as in the claims, the specification describes the NH_2 group as being at the pre-conjugation stage. As such, the specification also supports Defendants' revised proposed construction.

In sum, the Court adopts Defendants' revised proposed construction for this claim term, and the Court rejects Plaintiffs' proposed construction. The Court construes the term "NH_2" as "an -NH_2 group, which may be used in a reaction that results in an -NH group conjugated to another chemical group."

B. "polymer modifying unit"

Plaintiffs propose that the term "polymer modifying unit" be construed as "a unit in the polymer different than the units wherein the ratios are denoted by the letters a, c, and d." (Doc. No. 221 at 12.) Defendants argue that the claim term "polymer modifying unit" is indefinite. (Doc. No. 219 at 11.)

Section 112 of the Patent Act requires that a patent's specification "conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as [the] invention." 35 U.S.C. § 112, ¶ 2. In Nautilus, Inc. v. Biosig Instruments, Inc., 134 S. Ct. 2120, 2124 (2014), the Supreme Court "h[e]ld that a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." See also id. at 2129 ("[W]e read § 112, ¶ 2 to require that a patent's claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty."). Definiteness is measured from the viewpoint of a PHOSITA at the time the patent was filed. Id. at 2128.

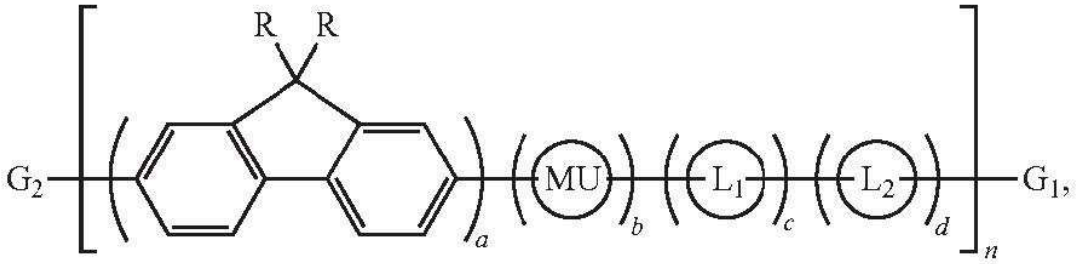
Indefiniteness is a question of law involving underlying factual determinations. Teva Pharm. USA, Inc. v. Sandoz, Inc., 789 F.3d 1335, 1341 (Fed. Cir. 2015); Green Edge Enters., LLC v. Rubber Mulch Etc., LLC, 620 F.3d 1287, 1299 (Fed. Cir. 2010). The party challenging the validity of the patents-in-suit bears the burden of proving indefiniteness by clear and convincing evidence. See Nautilus, 134 S. Ct. at 2130 n.10 (citing Microsoft Corp. v. i4i Ltd. Partnership, 131 S. Ct. 2238, 2242 (2011)); see, e.g., Teva, 789 F.3d at 1345.

Defendants argue that the term "polymer modifying unit" is indefinite because the term has no meaning to a person of ordinary skill in the art, and the common specification for the patent provides no guidance as to its meaning. (Doc. No. 219 at 11.) Defendants state that the term "polymer modifying unit" is not a term of art, and it has no commonly accepted definition. (Id. at 13.) But even assuming this is true, there is no requirement that a claim term must be a term of art or have a commonly accepted definition in order to be definite under section 112.

Defendants further argue that the common specification for the patents fails to provide sufficient guidance to a person of skill in the art as to the meaning of the term. (Doc. No. 219 at 13.) The Court disagrees. The term itself provides guidance as to its meaning. The Court agrees with Plaintiffs that each of the words used in the phrase "polymer modifying unit" has a common meaning that is understandable to a person of ordinary skill in the art. (Doc. No. 221 at 12.) Under its plain language, the term means a unit in the claimed polymer that modifies the polymer. Further, the specification provides sufficient examples of how the claimed polymer can be modified, giving one skilled in the art reasonable certainty regarding the scope of the claim term. See '613 Patent at 52:1-19. As a result, Defendants have failed to meet their burden of establishing that the claim term "polymer modifying unit" is indefinite.

Plaintiffs' proposed construction is supported by the claim language. For example, claim 1 of the '303 patent claims "[a] water soluble conjugated polymer having the structure of Formula (Ia):

(Ia)



wherein: . . . MU is a polymer modifying unit . . . . '303 Patent at 239:29-46. Here, the claim depicts the polymer modifying unit as being a unit that is different from the units that are denoted by the letter a, c, and d. Nevertheless, the Court slightly alters Plaintiffs' proposed construction to include the requirement that the unit modify the polymer.

In sum, the Court rejects Defendants' contention that the claim term "polymer modifying unit" is indefinite. The Court adopts Plaintiffs' proposed constructed as modified. The Court construes "polymer modifying unit" as "a unit in the polymer that modifies the polymer and is different than the units wherein the ratios are denoted by the letters a, c, and d."

C. "band gap modifying unit"

Plaintiffs propose that the term "band gap modifying unit" be construed as "a unit in the polymer that modifies the wavelengths at which the polymer absorbs or emits light." (Doc. No. 221 at 14.) Defendants propose that the term be construed as "a unit in the polymer that either increases or decreases the band gap of the polymer." (Doc. No. 219 at 17.) Because the parties dispute the scope of this claim term, the Court must resolve the parties' dispute. See O2 Micro, 521 F.3d at 1361; Eon, 815 F.3d at 1318.

As an initial matter, the Court notes that the parties and their experts agree on the definition for the term "band gap." Plaintiffs' expert, Dr. Swager, explains that: "A 'band gap' is a particular property of a material that refers to the energy gap between the highest occupied molecular orbital and the lowest unoccupied molecular orbital." (Doc. No. 195-

3, Swager Decl. ¶ 31.) Defendants' expert, Dr. Burgess, explains: "The term 'band gap' is conceptually used to describe the gap in energy between the highest occupied molecular orbital and the lowest unoccupied molecular orbital." (Doc. No. 195-4, Burgess Decl. ¶ 43.) In light of this agreement between the experts as to the term "band gap," the Court construes the term "band gap" as "the energy gap between the highest occupied molecular orbital and the lowest unoccupied molecular orbital."

Turning to the full phrase "band gap modifying unit," Defendants' proposed construction is supported by a review of the intrinsic record. The claim language provides an initial definition for this claim term. For example, claim 1 of the '303 patent claims: "A water soluble conjugated polymer having the structure of Formula (Ia) . . . wherein: . . . MU is a polymer modifying unit or band gap modifying unit that is evenly or randomly distributed along the polymer main chain." '303 Patent at 239:29-48. Here, the plain language of claim 1 of the '303 patent describes the "band gap modifying unit" as a unit in the polymer that modifies the band gap. Further, the specification explains the manner in which these units modify the bandgap. The common specification provides: "Incorporation of repeat units that decrease the band gap can produce conjugated polymers with such characteristics." '613 Patent at 52:41-42. Here, the specification explains that the units at issue modify the band gap by decreasing it. As such, Defendants' proposed construction providing that a "band gap modifying unit" is a unit in the polymer that either increases or decreases the band gap is well supported by the intrinsic record.[2]

Plaintiffs argue that Defendants' proposed construction for the term "band gap modifying unit" would be unhelpful to the jury because it uses the technical term "band gap" within the proposed construction. (Doc. No. 221 at 15.) But any concerns regarding Defendants' use of the term "band gap" in their proposed construction are alleviated by the

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[2] In their claim construction brief, Defendants argue that the Court's construction for the term "band gap modifying unit" should cover both increasing and decreasing the band gap. (Doc. No. 219 at 18-20.) In response, Plaintiffs explain that it is not their position that that the "band gap modifying unit" should be read narrowly to mean only decreasing the band gap. (Doc. No. 252 at 8.) As such, the Court's construction for this claim term will cover both increasing and decreasing the band gap.

Court separately construing the term "band gap" based on the experts' agreed upon definition. As such, the Court rejects Plaintiffs' contention. In addition, the Court agrees with Defendants that Plaintiffs' proposed construction is flawed because it replaces the agreed meaning of the term "band gap" with its downstream effect. (See Doc. No. 219 at 18.)

In sum, the Court adopts Defendants' proposed construction for this claim term, and the Court rejects Plaintiffs' proposed construction. The Court construes the term "band gap modifying unit" as "a unit in the polymer that either increases or decreases the band gap of the polymer."

D. "solubility"

Plaintiffs propose that the term "solubility" be construed as "miscible in a solvent with no visible particulates." (Doc. No. 221 at 16.) Defendants propose that the term "solubility" be construed as "ability or tendency of a substance to dissolve a solvent." (Doc. No. 219 at 20.) Here, the parties dispute whether the term "solubility" requires that the polymer be capable of being mixed in water or an aqueous solution such that no visible particulates remain. Because the parties dispute the scope of this claim term, the Court must resolve the parties' dispute. See O2 Micro, 521 F.3d at 1361; Eon, 815 F.3d at 1318.

In support of their proposed claim construction, Plaintiffs argue that the common specification for the patents at issue provides an express definition for the term "solubility." (Doc. No. 221 at 16.) The Court agrees. The common specification provides: "Non-ionic side groups capable of imparting solubility in water as used herein refer to side groups which are not charged and allow the resulting polymer to be soluble in water or aqueous solutions with no visible particulates." '613 Patent at 54:8-11. Here, the common specification explains that the term "imparting solubility" with respect to non-ionic side groups "as used herein" means to allow "the resulting polymer to be soluble in water or aqueous solutions with no visible particulates." Id. Plaintiffs' proposed construction properly incorporates this definition from the common specification. See Honeywell Int'l, Inc. v. Universal Avionics Sys. Corp., 493 F.3d 1358, 1361 (Fed. Cir. 2007) ("When a

patentee defines a claim term, the patentee's definition governs, even if it is contrary to the conventional meaning of the term. A claim term may be defined in a particular manner for purposes of a patent even 'without an explicit statement of redefinition.'" (citation omitted)); Phillips, 415 F.3d at 1321 ("[T]he specification 'acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.'").

Defendants argue that the passage at issue does not set forth a clear definition for the term "solubility." (Doc. No. 253 at 9.) Defendants note that the common specification for the patents at issue contains a specific section entitled "definitions," but the passage Plaintiffs rely on from the specification is not in that section, and the "definitions" section does not include a definition for the term "solubility." (Id. at (citing '613 Patent at 37:63-41:55).) But the fact that the passage at issue is not included in the "definitions" section of the specification is of no consequence. In the passage at issue, the specification uses clear definitional language when it uses the phrase "as used herein refer to" when describing the non-iconic side groups capable of imparting solubility in water. '613 Patent at 54:8-11. In light of this language, this passage in the specification sets forth a definition even if it is not specifically found within the "definitions" section of the specification.

Defendants also argue that the passage at issue fails to set forth a clear definition for the specific term "solubility" because the passage is merely describe a preferred embodiment of the claimed invention, the "non-ionic side groups" embodiment. (Doc. No. 219 at 21.) The Court recognizes that "it is improper to read limitations from a preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited." Dealertrack, 674 F.3d at 1327. In addition, the Court recognizes that the invention at issue is not limited to "non-ionic side groups." But Defendants' argument fails to appreciate the context in which the term "solubility" is used in the asserted claims. For example, claim 1 of the '303 patent claims "[a] water soluble conjugated polymer" wherein "each R is independently a non-ionic side group capable of imparting solubility in water in excess of 10 mg/mL." '303 Patent at 239:43-44; see also id. at 254:39-40 (claim 27),

262:55-56 (claim 33). Claim 4 of the '008 patent uses similar language in claiming: "wherein each R is a non-ionic side group capable of imparting solubility in water in excess of 10 mg/mL." '008 Patent at 226:21-22; see also id. at 229:44-45 (claim 9). Here, the claim 1 of the '303 patent and claim 4 of the '008 patent use the term "solubility" in the context of describing "non-ionic side groups," which is the exact same context as that term is used in the passage at issue from the specification. Thus, the definition from the specification controls in this context. As such, the Court rejects Defendants arguments.[3]

Defendants further argue that Plaintiffs' proposed construction is flawed because it uses the term "miscible," which refers to the ability of liquids and gasses to mix. (Doc. No. 219 at 21-22.) Defendants argue that conjugated polymers are neither liquid nor gas, and, thus, the word "miscible" makes no sense in this context. (Id. at 22.) In response, Plaintiff explain that the words "mixable" and "miscible" are synonyms. (Doc. No. 252 at 9 n.3.) As such, the Court slightly alters Plaintiffs' proposed construction for this term to use the word "mixable" instead of "miscible."[4]

In support of their proposed construction, Defendants merely rely on extrinsic evidence, specifically expert testimony and dictionary definitions. (Doc. No. 219 at 20.) But "[e]xtrinsic evidence may not be used 'to contradict claim meaning that is unambiguous in light of the intrinsic evidence.'" Summit 6, 802 F.3d at 1290; see Bell Atl. Network, 262 F.3d at 1269. The common specification contains clear language explaining what is meant by the term "solubility." Accordingly, Defendants cannot use extrinsic evidence to contradict or vary this clear language contained in the specification.

In sum, the Court adopts Plaintiffs' proposed construction for this claim term, and

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[3] The Court recognizes that the '008 patent and the '869 patent have claims that more broadly claim "a side group capable of imparting solubility in water." See, e.g., '869 Patent at 235:24-25; '008 Patent at 225:22-23. But even in these claims, the claims use the term "solubility" in the context of describing "a side group," which is a similar context to how the term "solubility" is used in the specification passage at issue.

[4] At the hearing, Plaintiffs stated that they did not object to the Court replacing the word "miscible" with "mixable" in its construction for this claim term.

the Court rejects Defendants' proposed construction. The Court construes the term "solubility" as "mixable in a solvent with no visible particulates."

E. "where the specific signal is at least 3 fold greater than the same antibody conjugated to Pacific Blue"

Plaintiffs argue that the claim term "where the specific signal is at least 3 fold greater than the same antibody conjugated to Pacific Blue" needs no construction. (Doc. No. 221 at 16.) Plaintiffs propose, in the alternative, that if this claim term must be construed, the Court construe the claim term as "a specific signal that is at least 3 fold greater than the signal of the same antibody conjugated to the fluorescent dye Pacific Blue, with an inherent upper limit in the range of about 20-25 fold." (Doc. No. at 17.) Defendants propose that this claim term be construed as "a specific signal that is 3 fold or more greater than the signal of the same antibody conjugated to Pacific Blue, with no upper limit." (Doc. No. 219 at 22.) Here, the parties dispute whether the phrase "at least three fold greater" contains an inherent upper limit of about 20-25 fold. Because the parties dispute the scope of this claim term, the Court must resolve the parties' dispute. See O2 Micro, 521 F.3d at 1361; Eon, 815 F.3d at 1318.

The Court begins its analysis of the parties' dispute regarding the phrase "at least 3 fold greater" by examining the claim language. The claim language places no express upper limit on the increase in signal. For example, claim 21 of the '303 patent provides: "The water soluble conjugated polymer of claim 20, wherein the polymer and antibody excited at about 405 nm in a flow cytometry assay where the specific signal is at least 3 fold greater than the same antibody conjugated to Pacific Blue." '303 Patent at 253:66-254:3. The claim language of claim 1 of the '799 patent requires that the signal generated by the polymer and the antibody be at least 3 fold greater than when the same antibody is conjugated to Pacific Blue. The claim language does not provide an upper range. The claim language merely requires that the increase be at least 3 fold greater. Further, the Court notes that the Federal Circuit has held that "'[o]pen-ended claims are not inherently improper.'" Andersen Corp. v. Fiber Composites, LLC, 474 F.3d 1361, 1376 (Fed. Cir.

2007) (quoting Scripps Clinic & Research Found. v. Genentech, Inc., 927 F.2d 1565, 1572 (Fed. Cir. 1991)). Accordingly, the claim language supports Defendants' proposed construction, not Plaintiffs' proposal.

In support of their assertion that the phrase "at least 3 fold greater" has an inherent upper limit of about 20-25 fold, Plaintiffs rely on Federal Circuit case law holding that open-ended claims have inherent upper limits. (Doc. No. 221 at 17.) In Andersen Corp. v. Fiber Composites, LLC, the Federal Circuit explained that open-ended claims are permissible, and "'they may be supported if there is an inherent, albeit not precisely known, upper limit and the specification enables one of skill in the art to approach that limit.'" Andersen Corp. v. Fiber Composites, LLC, 474 F.3d 1361, 1376–77 (Fed. Cir. 2007). Plaintiffs assert that the evidence in the record shows that at the time of the invention a person of ordinary skill in the art would understand that the phrase "greater than 4 fold increase" had an inherent upper limit of approximately 20-25 fold. (Doc. No. 221 at 18 (citing Doc. No. 195-3, Swager Decl. ¶ 42).) But the problem with Plaintiffs' argument is that Plaintiffs have failed to provide the Court with any authority other than a general citation to Markman holding that the inherent upper limit of an open-ended claim term must be limited to what was known in the art at the time of the invention and would not include changes to that upper limit in the future. Markman does not specifically address this issue. In the absence of such authority, the Court declines to adopt Plaintiffs' proposed inherent upper limit of about 20-25.

Further, the data relied on by Plaintiffs' expert, Dr. Swager, does not actually support the imposition of an inherent upper limit of about 20-25. In his calculations, Dr. Swager utilizes an extinction coefficient of exactly 2,500,000 for the polymer dye, (Doc. No. 195-3, Swager Decl. ¶ 42), but the portion of the specification where Dr. Swager obtained this number from actually states that the extinction coefficient is "greater than 2,500,000." (Id. ¶ 41 (citing '613 Patent at 161:23-162:4).) Thus, Dr. Swager's calculation is faulty.

In sum, the Court adopts Defendants' proposed construction for this claim term, and the Court rejects Plaintiffs' proposed construction for this claim term. The Court construes

the term "where the specific signal is at least 3 fold greater than the same antibody conjugated to Pacific Blue" as "a specific signal that is 3 fold or more greater than the signal of the same antibody conjugated to Pacific Blue."[5]

F. Certain Chemical Structures

The parties dispute the proper constructions for several chemical structures claimed in the patents at issue. Plaintiffs argue that no construction of these chemical structures is necessary. (Doc. No. 221 at 18.) Plaintiffs argue, in the alternative, that if the Court must add a construction to these chemical structures, the structures should be construed to mean that "the chemical groups referred to have the chemical structures shown and have substitutions at the positions indicated by, for example, R, R', or R_{25}." (Id. at 20.) Defendants propose that these chemical structures be construed as "the chemical structure of this unit does not show hydrogen atoms, but the structure as shown is otherwise substituted only where indicated by R, R', or $R_{25.}$ * = site for covalent attachments to unsaturated backbone." (Doc. No. 219 at 4.)

Plaintiffs argue that the chemical structures at issue need no construction because line structures such as these are common in organic chemistry and fully convey to chemists the entire structure of the molecule in a simple and easy to understand manner. (Doc. No. 221 at 18 (citing Doc. No. 195-3, Swager Decl. ¶¶ 45-48).) But, here, the parties have an apparent dispute regarding whether the claimed structures can include substitutions other than at R, R', or $R_{25.}$ (Compare Doc. No. 219 at 5 with Doc. No. 221 at 19; Doc. No. 195-3, Swager Decl. ¶ 50.) Because the parties dispute the scope of these claimed structures in their briefing, the Court must resolve the parties' dispute. See O2 Micro, 521 F.3d at 1361; Eon, 815 F.3d at 1318.

The Court begins its analysis of the parties' dispute by reviewing the claim language.

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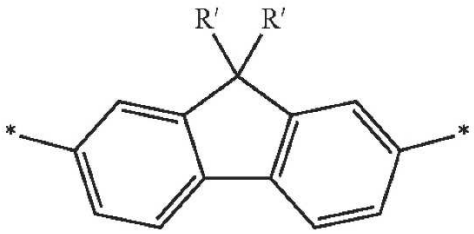
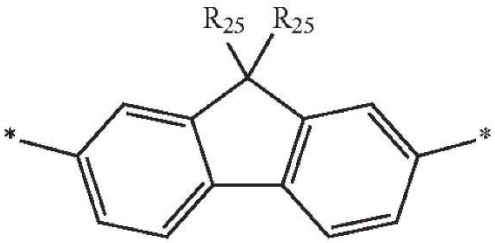
[5] The Court slightly alters Defendants' proposed construction to delete the phrase "no upper limit." Further, the Court notes that at this time, the Court is merely construing the disputed claim terms from the patents at issue as is proper at the Markman stage of an action for patent infringement. The Court's decision at claim construction should in no way be interpreted as resolving any potential disputes the parties may have regarding enablement or written description issues.

The claims at issue use chemical line structure drawings to define the scope of the claims. For example, claim 1 of the '613 patent claims the following chemical structure: "linker L_1 is"



'613 Patent at 232:20-30. In another example, claim 23 of the '869 patent claims the following chemical structure: "wherein the optional linkers L_1 or L_2 have the structure:"



'869 Patent at 249:12-22. The parties' experts agree that for the claim terms at issue, the terms "R," "R'," or "R_{25}" in the claimed structures are substitutions on the chemical structures shown. (Doc. No. 195-3, Swager Decl. ¶ 45 ("the chemical groups . . . have substitutions at the positions indicated by R, R', or R_{25}"); Doc. No. 195-4, Burgess Decl. ¶¶ 17, 22-23.) Plaintiffs' expert, Dr. Burgess, concedes that the claimed structures "do[] not literally show substituents at other positions." (Doc. No. 195-3, Swager Decl. ¶ 50.) Indeed, at the claim construction hearing, Plaintiffs conceded that the literal scope of the claims at issue only permit substitutions at the positions indicated by R, R', or R_{25}, and they do not permit substitutions at other places. Thus, the claim language supports Defendants' proposed construction.

Plaintiffs argue that an organic chemist would appreciate that other substitutions are possible. (Doc. No. 221 at 19; see also Doc. No. 195-3, Swager Decl. ¶ 50.) But Plaintiffs

fail to support this assertion with any citations to the intrinsic record. Plaintiffs fail to identify any language in the intrinsic record suggesting that other substitutions on the claimed structures at issue are possible. Indeed, at the claim construction hearing, Plaintiffs conceded that substitutions at places other than R, R', or R_{25} are not within the literal scope of the claims. As such, the intrinsic record supports Defendants' proposed construction, not Plaintiffs' proposal.

Plaintiffs also argue that Defendants' proposed construction is improper because the language "substituted only where indicated by R, R', or R_{25}" imposes a negative limitation on the claims. (Doc. No. 221 at 19.) But there is no prohibition against the use of negative limitations in claim constructions.[6] See, e.g., Eon, 815 F.3d at 1322-23 (construing the claims in the context of the specification to not cover "utility meters"); In re Gabapentin Patent Litig., 503 F.3d 1254, 1258, 1264-65 (Fed. Cir. 2007) (affirming district court's construction for the term "adjuvants" that contained a negative limitation explaining that the term "'[does not] refer to the ingredients of capsule shells or tablet coatings.'"). Here, both parties agree on the scope of the claim terms at issue and agree that the chemical structures at issue only permit substitutions where indicated by R, R', or R_{25} and do not permit substitutions elsewhere. Defendants' proposed construction, which includes the negative limitation "substituted only where indicated by R, R', or R_{25}," encompasses that agreement as to claim scope, Plaintiffs' proposed construction does not. The jury will be aided by a claim construction that provides greater clarity as to the scope of the claims than one that does not. As a result, the Court adopts Defendants' proposed construction.

Further, the latter portion of Defendants' proposed construction requiring that * = site for covalent attachments to unsaturated backbone is directly supported by both the claim language and the specification of the patents at issue. For example, claims 4, 7, 10 and 33 of '303 provide: "*=site for covalent attachment to [unsaturated] backbone." '303

[6] Indeed, the Court notes that Plaintiffs in their proposed construction for the claim term "polymer modifying unit," which the Court has adopted as modified, use a negative limitation.

Patent at 241:60, 244:35, 249:1, 252:50, 257:32; accord '869 Patent at 237:61, 240:8, 243:43, 248:45, 249:24. In addition, the common specification for the patents at issue provides: "*=site for covalent attachment to [unsaturated] backbone." '613 Patent at 3:59, 4:8, 4:54, 5:11, 8:13, 11:48, 16:15, 25:39, 27:15, 30:40. As such, the latter portion of Defendants' proposed construction is well supported by the intrinsic record.

In sum, the Court adopts Defendants' proposed construction for these chemical structures, and the Court rejects Plaintiffs' proposed construction. The Court construes the chemical structures at issue as "the chemical structure of this unit does not show hydrogen atoms, but the structure as shown is otherwise substituted only where indicated by R, R', or $R_{25.}$ * = site for covalent attachments to [unsaturated] backbone."[7]

Conclusion

For the reasons above, the Court adopts the constructions set forth above.

IT IS SO ORDERED.

DATED: September 4, 2018

MARILYN L. HUFF, District Judge
UNITED STATES DISTRICT COURT

[7] The Court notes that its construction for these chemical structures does not preclude Plaintiffs from arguing infringement under the doctrine of equivalents. "Under the doctrine of equivalents, 'a product or process that does not literally infringe . . . the express terms of a patent claim may nonetheless be found to infringe if there is "equivalence" between the elements of the accused product or process and the claimed elements of the patented invention.'" Mirror Worlds, LLC v. Apple Inc., 692 F.3d 1351, 1357 (Fed. Cir. 2012) (quoting Warner–Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 21 (1997)).