

1 SHEPPARD, MULLIN, RICHTER & HAMPTON LLP
MARTIN R. BADER, SBN 222865
2 mbader@sheppardmullin.com
3 JESSE A. SALEN, SBN 292043
jsalen@sheppardmullin.com
4 12275 El Camino Real, Suite 100
San Diego, California 92130-4092
5 Telephone: 858.720.8900
Facsimile: 858.509.3691
6

7 BRADLEY C. GRAVELINE, *pro hac vice*
bgraveline@sheppardmullin.com
8 321 North Clark Street, 32nd Floor
Chicago, Illinois 60654
9 Telephone: 312.499.6300
Facsimile: 312.499.6301
10

11 Attorneys for Plaintiffs and Counter-Defendants
CALIFORNIA INSTITUTE OF TECHNOLOGY
12 and CHROMACODE, INC.

13 UNITED STATES DISTRICT COURT
14 NORTHERN DISTRICT OF CALIFORNIA
15

16 IN RE: CHROMACODE LITIGATION

Case No. 5:23-cv-04823-EKL (VKD)
(Consolidated)

**PLAINTIFFS CALIFORNIA INSTITUTE
OF TECHNOLOGY AND
CHROMACODE, INC.'S RESPONSIVE
CLAIM CONSTRUCTION BRIEF FOR
THE '797 PATENT**

Date: December 18, 2025
Time: 1:30 p.m.
Ctrm: 7
Judge: Hon. Eumi K. Lee

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

TABLE OF CONTENTS

Page

I. INTRODUCTION.....1

II. ARGUMENT2

 A. “F” (claims 1, 5).....2

 1. Bio-Rad’s Dependent-Claim-Based Indefiniteness Attack Is
 Contrary to Federal Circuit Precedent.....2

 2. Bio-Rad’s Conflicting-Independent-Claim Attack Is Groundless
 Under the Law and the Facts.....4

 3. Bio-Rad’s Attack Based on the Specification Ignores the ’797
 Patent’s Extensive Teachings.....8

 4. Bio-Rad’s Attack Based on Infringement Contentions Is Baseless13

 5. No Construction of “F” Is Needed, But If Needed, Plaintiffs’
 Construction Should Be Adopted.....16

 B. “associating, for each analyte, a first value in a first component of the
 cumulative signal...” (claim 1)17

 C. “analyte-specific hybridization probes” (claims 1, 10).....18

III. CONCLUSION19

TABLE OF AUTHORITIES

	Page(s)
<u>Cases</u>	
<i>Barrday, Inc. v. Lincoln Fabrics Inc.</i> No. 2022-1903, 2023 WL 7871688 (Fed. Cir. Nov. 16, 2023) (unpublished).....	3
<i>BASF Corp. v. Johnson Matthey Inc.</i> 875 F.3d 1360 (Fed. Cir. 2017).....	2
<i>Dow Chem. Co. v. Nova Chems. Corp. (Can.)</i> 803 F.3d 620 (Fed. Cir. 2015).....	14, 15
<i>Fortinet, Inc. v. Forescout Techs., Inc.</i> No. 20-CV-03343-EMC, 2022 WL 17254313 (N.D. Cal. Nov. 28, 2022).....	3
<i>GE Lighting Sols., LLC v. AgiLight, Inc.</i> 750 F.3d 1304 (Fed. Cir. 2014).....	19
<i>Lifescan Scotland, Ltd. v. Shasta Techs., LLC</i> No. 11-cv-04494-WHO, 2014 WL 11206411 (N.D. Cal. Nov. 10, 2014).....	16
<i>Multilayer Stretch Cling Film Holdings, Inc. v. Berry Plastics Corp.</i> 831 F.3d 1350 (Fed. Cir. 2018).....	3, 7
<i>ParkerVision, Inc. v. Qualcomm Inc.</i> 116 F.4th 1345 (Fed. Cir. 2024).....	15
<i>Profectus Tech. LLC v. Huawei Techs. Co.</i> 823 F.3d 1375 (Fed. Cir. 2016).....	15
<i>Renishaw PLC v. Marposs Societa' Per Azoni</i> 158 F.3d 1243 (Fed. Cir. 1998).....	18
<i>Rexnord Corp. v. Laitram Corp.</i> 274 F.3d 1336 (Fed. Cir. 2001).....	4, 6, 7, 18, 19
<i>SQIP, LLC v. Cambia Co.</i> No. 24-cv-1111.....	6
<i>Trs. Of Columbia Univ. v. Symantec Corp.</i> 811 F.3d 1359 (Fed. Cir. 2016).....	7
<i>Vascular Sols. LLC v. Medtronic, Inc.</i> 117 F.4th 1361 (Fed. Cir. 2024).....	5, 6, 7
<u>Statutes</u>	
35 U.S.C. § 282(a).....	6

1 **I. INTRODUCTION**

2 In the '797 Patent claims, the disputed terms' meanings are clear in view of the claim
3 language, specification, drawings, and the balance of the intrinsic record, each of which fully
4 supports Plaintiffs' constructions, as Plaintiffs and Dr. Weigl explained. *See generally* Dkt. Nos.
5 160, 160-1. Bio-Rad's constructions, by contrast, should be rejected because they deviate from both
6 the intrinsic and extrinsic record and the understanding of a POSITA.

7 First, regarding the claim term "F," Bio-Rad's indefiniteness attacks should be rejected
8 because neither the law nor the record—inclusive of Dr. Wiegl's unrebutted expert testimony—
9 support Bio-Rad's positions. Bio-Rad does not come close to meeting its burden of demonstrating
10 by clear and convincing evidence that a POSITA would not have been able to understand the claims
11 with reasonable certainty. "F" does not require construction, but to the extent a construction of "F"
12 is required, Plaintiffs' construction—unlike Bio-Rad's—is fully consistent with the intrinsic record,
13 extrinsic record, and understanding of a POSITA and should therefore be adopted.

14 Second, regarding the "associating" term, Bio-Rad's arguments fare no better. First, as
15 previously explained, Bio-Rad's proposed construction does not account for both color and intensity
16 (or ranges of intensities). Dkt. No. 160 at 19-20. Moreover, Federal Circuit authority does not
17 support Bio-Rad's position that the specific embodiments covered by the claimed mathematical
18 formula for M, which is recited in claim limitations *other than* the more general "associating" term,
19 should be grafted into this term.

20 Lastly, regarding "analyte specific hybridization probes," as explained in Plaintiff's opening
21 brief, Bio-Rad's proposed construction is incomplete and should be rejected to the extent it excludes
22 preferred embodiments described in the specification (e.g., the use of TAQMAN probes). Dkt. No.
23 160 at 15-18.

24 Accordingly, Bio-Rad's proposed constructions should be rejected. Either the disputed
25 terms should be given their plain and ordinary meaning, or Plaintiffs' proposed constructions should
26 be adopted.

27
28

1 **II. ARGUMENT**

2 **A. “F” (claims 1, 5)**

Claim Term(s)	Plaintiffs’ Proposed Construction	Bio-Rad’s Proposed Construction
“F”	<p>No construction of “F” is required for the asserted claims because the claims expressly recite that “F is a positive integer and is equal to the maximum cumulative intensity of the first component of the signal, for any second value, when all of the analytes are present, ... wherein F+1 is a positive integer and F+1 is a power of 2.”</p> <p>To the extent a construction is required, this term should be construed to mean “F, a value that scales with a constituent signal.”</p>	Indefinite.

15 Bio-Rad’s indefiniteness arguments for “F” are contrary to law, the claim language, the
 16 intrinsic and extrinsic record, and the understanding of a POSITA. Accordingly, Bio-Rad has failed
 17 to carry its burden of proving by clear and convincing evidence that this term, or the claims as a
 18 whole, are indefinite. *See generally BASF Corp. v. Johnson Matthey Inc.*, 875 F.3d 1360, 1365
 19 (Fed. Cir. 2017). While no construction of “F” is necessary, if the Court deems otherwise, Plaintiffs’
 20 construction should be adopted because it fully comports with the intrinsic evidence, extrinsic
 21 evidence, and understanding of a POSITA, as explained below and in Plaintiffs’ opening brief. Dkt.
 22 No. 160 at 13-15.

23 1. Bio-Rad’s Dependent-Claim-Based Indefiniteness Attack Is Contrary to
 24 Federal Circuit Precedent

25 Bio-Rad argues that the formula in claim 1 “dictates that ‘F’ has to be 3 or greater” but F
 26 can take on a value of 1 in claim 4 and, therefore, claim 1 is allegedly indefinite. Dkt. No. 161 at
 27 10-11. This argument is squarely contrary to the law and should be rejected.

1 More specifically, Bio-Rad argues that because dependent claim 4 recites a Markush group
2 where “F” can be 1 (as well as multiple other values), but in claim 1 the minimum value for “F” is
3 3, claim 4 is purportedly impermissibly broader than and inconsistent with claim 1. Dkt. No. 161
4 at 10-12. Accordingly, Bio-Rad concludes a POSITA would not know what value “F” could have
5 in claim 1. *Id.* But tellingly, Bio-Rad cites no authority supporting its position that an *independent*
6 claim is rendered indefinite by deficiencies in a *dependent* claim. Indeed, relevant Federal Circuit
7 holdings establish the opposite—*i.e.*, “the language of a dependent claim *cannot* change the scope
8 of an independent claim whose meaning is clear on its face ... The dependent claim tail cannot wag
9 the independent claim dog.” *Multilayer Stretch Cling Film Holdings, Inc. v. Berry Plastics Corp.*,
10 831 F.3d 1350, 1360-62 (Fed. Cir. 2018) (emphasis added); *accord Barrday, Inc. v. Lincoln Fabrics*
11 *Inc.*, No. 2022-1903, 2023 WL 7871688, at *6-7 (Fed. Cir. Nov. 16, 2023) (unpublished)
12 (independent claim construction supported by specification was proper although it rendered a
13 dependent claim meaningless); *Fortinet, Inc. v. Forescout Techs., Inc.*, No. 20-CV-03343-EMC,
14 2022 WL 17254313, at *23 (N.D. Cal. Nov. 28, 2022) (independent claim not indefinite even though
15 it could not technically include all components in its dependent claims).

16 The Federal Circuit’s decision in *Enzo Biochem, Inc. v. Applera Corp.* is instructive:
17 “dependent claims cannot broaden an independent claim from which they depend.” 780 F.3d 1149,
18 1156 (Fed. Cir. 2015). In *Enzo*, because the independent claim was “limited to indirect detection
19 by its own plain meaning, it [was] inappropriate to use the doctrine of claim differentiation to
20 broaden claim 1 to include a limitation imported from a dependent claim, such as direct detection.”
21 *Id.* The same applies here with respect to “F.”

22 Accordingly, as a matter of law, the language of claim 4 cannot change the scope of claim
23 1. *Enzo*, 780 F.3d at 1156; *Multilayer Stretch*, 831 F.3d at 1360-62. This is particularly true here
24 because, as Bio-Rad itself expressly acknowledges, the meaning of “F” in claim 1 is crystal clear in
25 that it is mathematically determined to be at least 3. *See, e.g.*, Dkt. No. 161 at 11 (Bio-Rad’s
26 admission that claim 1 “*dictates* that ‘F’ has to be 3 or greater.” (emphasis added)).

27 Accordingly, any purported inconsistencies between the potential values of “F”
28 encompassed by claim 1, and those covered by claim 4, cannot render claim 1 indefinite.

2. Bio-Rad’s Conflicting-Independent-Claim Attack Is Groundless Under the Law and the Facts

Bio-Rad also incorrectly asserts that the independent claims are inconsistent with respect to “F,” which purportedly “confirms indefiniteness” because a “claim term should be construed consistently with its appearance in other places in the same claim or in other claims of the same patent.” Dkt. No. 161 at 10 (quoting *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342 (Fed. Cir. 2001)). Here again, Bio-Rad’s argument is contrary to the claim language, specification, understanding of a POSITA, and the law, and therefore should be rejected. Indeed, as explained below, the independent claims cover different embodiments but nonetheless use the term “F” consistently with each other, the intrinsic record, and the understanding of a POSITA, in accordance with Federal Circuit precedent.

First, regarding independent claim 19, Bio-Rad alleges it requires “exactly 6 analytes such that M is necessarily 6” and “four wavelength signals such that C *may* take on a value of 4.” Dkt. No. 161 at 11 (emphasis added). Bio-Rad complains that inserting M=6 and C=4 into the formula in claim 19 “leads to a value of roughly 1.8284,” *i.e.*, a non-integer, which purportedly “cannot be squared with the claim language requiring that F be a ‘positive integer.’” *Id.* However, Bio-Rad plainly misconstrues the requirements of unasserted claim 19 in an attempt to cast shade on claim 1.

Indeed, among the many reasons that Bio-Rad’s arguments are fatally flawed, claim 19 simply does not require M=6 or C=4 as Bio-Rad contends. This is because M and C are system parameters: M is the maximum number of detectable—not measured—analytes, and C is the number of color channels of the system—not the number of colors actually measured. For example, the ’797 Patent describes, with reference to FIG. 5B, a configuration 507 where band pass filters 512, 513, 514 restrict the passage of light to specific ranges, and the “intensity of each of the filtered lights 515, 516, 517 may then be quantified by a photodetector 518.” ’797 Patent, 35:43-36:26. A POSITA would not remotely consider the total number of colors the system is configured to measure (C), or the total number of analytes the system is configured to detect (M), to change based on which particular combination of analytes may generate a *particular* cumulative signal at a given time, and

1 Bio-Rad fails to show otherwise. *See also id.* at 2:11-13 (“capable of unambiguously detecting the
2 presence or absence of M analytes”), claim 19 (“multichannel detector with four channels”).

3 In contrast to these system parameters, the “six fluorescently labeled analytes” and four
4 wavelengths recited in claim 19 are *measured* within the cumulative signal (i.e., “the cumulative
5 signal comprises...”), and thus can differ from the maximum number of analytes the system can
6 detect (M) and the number of color channels the system’s detector is capable of measuring (C). ’797
7 Patent at 2:11-13. Illustratively, in an example four-channel system, $C = 4$ (which would also meet
8 the requirements of claim 19), F can be 3, and $M = 8$ ($M = 4 * \log_2(3+1) = 8$), but there is no
9 requirement to *use* the system to detect all eight analytes, or that a given cumulative signal must
10 include contributions from all eight analytes. Instead, the system may be used to detect either M
11 analytes *or* fewer than M analytes, e.g., may be used to detect six analytes, which does not change
12 the system parameters of $C = 4$, $F = 3$, and $M = 8$. Or, in an example six-channel system, $C = 6$
13 (which would also meet the requirements of claim 19), F can be 3, and $M = 12$ analytes ($M =$
14 $6 * \log_2(3+1) = 12$), but again there is no requirement to *use* the system to detect all twelve analytes,
15 or that a given cumulative signal must include contributions from all twelve analytes. Instead, again,
16 the system may be used to detect either M analytes *or* fewer than M analytes, e.g., may be used to
17 detect six analytes, which does not change the system parameters of $C = 6$, $F = 3$, and $M = 12$. None
18 of these possible system configurations require that the cumulative signal *measured* from a
19 particular sample volume must actually comprise exactly the M analytes or C wavelengths reflected
20 in the system’s capabilities. *Id.*

21 As such, Bio-Rad improperly conflates the claimed “six fluorescently labeled analytes” of
22 the cumulative signal data with M; and improperly conflates the claimed “wavelengths” of the
23 cumulative signal data with C. But Bio-Rad’s interpretations do not comport with the plain claim
24 language, intrinsic evidence, or understanding of a POSITA.

25 And, even if, *arguendo*, Bio-Rad were correct in its interpretation of claim 19’s C and M
26 values (it is not), Bio-Rad’s argument that an inconsistency between claim 19 and asserted claim 1
27 should somehow render claim 1 indefinite is wrong as a matter of law. *See Vascular Sols. LLC v.*
28 *Medtronic, Inc.*, 117 F.4th 1361, 1370 (Fed. Cir. 2024) (independent claims were not necessarily

1 “mutually exclusive” since each recited a “different ordered combination of limitations,” district
2 court directed to “conduct claim construction on a claim-by-claim basis”). Moreover, “even if a
3 claim term appears in two independent claims in the same patent, and a court finds that term
4 indefinite as to one of those claims, the other claim is still entitled to a presumption of validity.”
5 *SQIP, LLC v. Cambia Co.*, No. 24-cv-1111 (LMP/DJF), at *5 (D. Minn. Oct. 21, 2025) (citing 35
6 U.S.C. § 282(a); *Vascular Sols*, 117 F.4th at 1370).

7 Bio-Rad’s position ostensibly relies on *Rexnord*’s proposition that a “claim term should be
8 construed consistently with its appearance in other places in the same claim or in other claims of the
9 same patent.” Dkt. No. 161 at 10 (quoting *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342
10 (Fed. Cir. 2001)). However, Bio-Rad’s reliance on *Rexnord* is both misplaced and inapposite
11 because it ignores how the *Rexnord* court itself qualified and applied this general guidance. *Rexnord*
12 involved a dispute over whether the term “portion” used in different independent claims should be
13 interpreted, in view of the intrinsic record, to cover both “integral” one-piece and “separate” two-
14 piece embodiments. 274 F.3d at 1341, 1345-46. Upon examining the claim language and written
15 description, the Federal Circuit found the patentee had “described an invention that embraces,
16 through the word ‘portion,’ structure that may be either ‘integral’ or ‘separate’” and therefore the
17 court interpreted the term “portion” as unambiguously encompassing **both** meanings. *Id.* at 1345,
18 1348. In sum, *Rexnord* involved using the specification and claim language to **generalize** the scope
19 of a claim term, not to find a claim term **indefinite**, as Bio-Rad seeks to do.

20 In contrast to *Rexnord*, Bio-Rad tries to limit the meaning of the variable “F” to the specific
21 values recited in the various independent claims (and dependent claims, for that matter), thus
22 creating ostensible confusion. But like the claimed “portion” in *Rexnord*, here “F” has a consistent
23 (and broad) meaning across the claims and specification of the ’797 Patent **because** they use this
24 term to cover different embodiments. For example, the ’797 Patent specification uses “F” to
25 describe different encoding schemes, including those in which degenerate codes are eliminated to
26 achieve non-degeneracy, *e.g.*, as described with reference to Table 6; and those which are “non-
27 degenerate by design” (meaning codes do not need to be eliminated from the scheme in order to
28 achieve non-degeneracy), *e.g.*, as described with reference to Table 8. *See* ’797 Patent at 18:26-

1 20:60, 21:56-23:27. As another example, the '797 Patent's independent claims may use the same
2 formula as each other, but nonetheless contain other limitations that differ from each other. For
3 example, claim 19 recites the same formula as claim 1 but does not require $M > C$ and therefore
4 permits different values of M, C, and F than does claim 1; while claim 22 is directed to a "reaction
5 mixture," rather than a "system," that expressly includes six hybridization probes. *Id.* at claims 1,
6 19, 22. Accordingly, *Rexnord* simply does not support Bio-Rad's attempt to (a) narrow "F" to the
7 specific values which *other* limitations in the respective independent claims impose on "F" (e.g.,
8 the formula recited in claim 1, combined with constraints on the values of C and M) and (b) assert
9 that differences between the resulting values renders "F" indefinite. *See Rexnord*, 274 F.3d at 1345,
10 1348.

11 Second, Bio-Rad's argument that claim 22 is allegedly confusing regarding "the proper
12 value of F," because it recites a "second value," should be rejected because it completely ignores
13 the specification's thorough and consistent teachings regarding first values including intensities and
14 second values including wavelengths. Dkt. No. 161 at 11; *see, e.g.*, '797 Patent at 2:1-10. And
15 claim 1 is in any case not impacted by the "second value" recited in claim 22. *Vascular Sols.*, 117
16 F.4th at 1370. Furthermore, Bio-Rad's arguments regarding purported inconsistencies between
17 claims 19 and 20, or between claims 22 and 23 (*see* Dkt. No. 161 at 11), should be rejected for the
18 same reasons provided above with respect to claim 4. *See Multilayer Stretch*, 831 F.3d at 1360,
19 1362.

20 Lastly, Bio-Rad's reliance on *Trs. Of Columbia Univ. v. Symantec Corp.*, 811 F.3d 1359,
21 1366-67 (Fed. Cir. 2016) is also misplaced. *See* Dkt. No. 161 at 12. *Columbia* is easily
22 distinguished. In *Columbia*, "the claims describe the step of extracting machine code instructions
23 from something that does *not* have machine code instructions," and the "overwhelming evidence"
24 from the specification confirmed this interpretation of the claim language. 811 F.3d at 1366-67
25 (emphasis added). Here, by contrast, the specification confirms that the *meaning* of "F" is clear
26 and applies equally to the different embodiments covered by the independent claims, even while
27 these embodiments and claims may use different formulas, strategies, and/or mathematical
28 constraints and thus ultimately may result in different possible *values* of "F."

1 Accordingly, claims 1, 19, and 22 should be analyzed on a claim-by-claim basis, and any
 2 differences or purported confusion as to the value of “F” in other independent claims should not
 3 affect the definiteness of claim 1, *particularly* in view of the specification’s broad and clear
 4 teachings.

5 3. Bio-Rad’s Attack Based on the Specification Ignores the ’797 Patent’s
 6 Extensive Teachings

7 Bio-Rad’s next attack on definiteness—that the ’797 Patent does not teach how to convert a
 8 raw fluorescence intensity to the integer “F” recited in the ’797 Patent claims—should be rejected
 9 because it is contrary to the record. Dkt. No. 161 at 12-19. In particular, Bio-Rad asserts that the
 10 claims and the specification allude to “[s]ome sort of unspecified method ... never described” which
 11 “lacks any explanation of how ‘F’ could be an integer.” *Id.* at 18. But the ’797 Patent specification
 12 thoroughly teaches *exactly* how to convert a fluorescence intensity to integer values which sum to
 13 the integer “F,” as explained below and confirmed by Plaintiffs’ opening brief and Dr. Weigl. Dkt.
 14 No. 161 at 18; Dkt No. 160 at 11, 20-21; Dkt. No. 160-1 at ¶¶25, 56.

15 First, Bio-Rad’s premise that “‘intensity is not, in general, an ‘integer’ quantity” and “is just
 16 the strength of a light signal and need not be an integer” should be rejected because it completely
 17 ignores the specification’s teachings about using “bands” to convert intensities to integer values, as
 18 detailed in Plaintiffs’ opening brief, and is otherwise unsubstantiated. Dkt. No. 161 at 12; Dkt. No.
 19 160 at 11. Indeed, FIG. 3 of the ’797 Patent and the description thereof explain an example method
 20 for aggregating ranges of intensities into a single integer value for “F.” *See* Dkt. No. 161 at 12-13.
 21 Specifically, FIG. 3 provides an example where six analytes are encoded using the following coding
 22 scheme:

23 TABLE 16

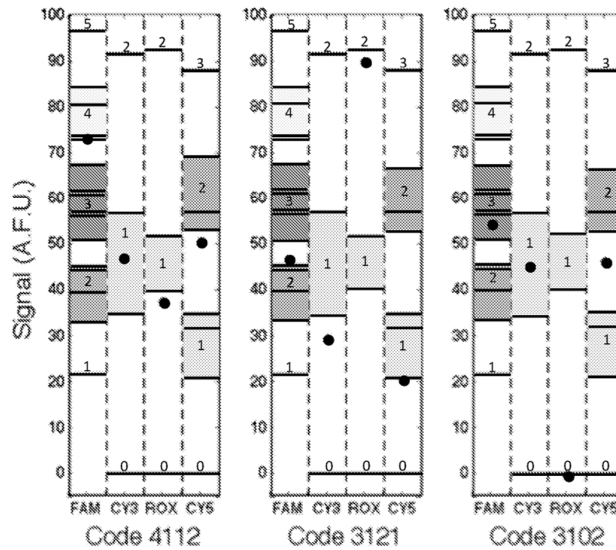
24 Coding scheme for detection of pathogens.

	FAM	Cy3	ROX	Cy5
HIV poly-protease	1	0	0	0
HIV p17	1	1	0	0
<i>Plasmodium</i>	1	0	1	0
HSV	1	0	0	1
<i>Mycobacterium</i>	1	1	0	1
Dengue Virus	1	1	1	1

1 '797 Patent at 48:28-57.

2 The '797 Patent explains that FIG. 3, reproduced below, was constructed using positive
 3 controls—reactions 1, 3, 5, 7, 9 described in Table 15—“to assemble every possible combination of
 4 present sequences, in each color,” and the “cumulative signals were plotted in a diagram, called a
 5 ‘chromatogram’ (FIG. 3).” '797 Patent at 48:58-62.

6 **Fig. 3**



7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20 The specification further explains that “[c]umulative signals corresponding to all possible
 21 combinations of the same rank in the same color were organized into their own band” and that doing
 22 this “for all four colors produced a level and band structure” against which experimental results of
 23 different combinations could be evaluated. '797 Patent at 48:62-67. “FIG. 3 shows three replicates
 24 of a chromatogram constructed using the positive control samples, with experimental results 4112,
 25 3121, and 3102 superimposed on the chromatogram” and that the “experimental results are indicated
 26 by black dots.” *Id.* at 48:67-49:4. In FIG. 3, the bands constructed using the positive control samples
 27 represent **ranges** of intensities, rather than single intensity values. *Id.* at 48:62-67. The '797 Patent
 28

1 explains why these bands are “relatively wide,” and explains how to adjust the bands’ respective
2 widths:

3 FIG. 3 shows that each rank containing multiple combinations has a
4 *relatively wide band*. The width of the band is ultimately the
5 difference between the highest and lowest cumulative signals for the
6 positive control samples. If all positive controls in the particular
7 color produced exactly the same fluorescence signal, then the width
8 of each band would be zero. Since instead those signals are
9 somewhat different, the resulting bands are relatively wide.
10 However, there is a *simple means to tighten the bands*. Instead of
11 loading all probes at the same concentration, as was done for the
12 experiment above, the concentration of each probe can be adjusted
13 so that each of the resulting positive-control signals is the same as
14 the others in the same color. This approach would significantly
15 tighten the bands, making it easier to determine the multiplicity of a
16 signal for a sample containing analytes.

17 ’797 Patent at 49:51-67 (emphasis added).

18 The specification describes a multi-step analysis for using the bands (and their associated
19 ranges of intensities) to assign experimental intensity measurement results to *integer values* for
20 decoding combinations of analytes:

21 The intensity value for each color in reactions 11-14 was measure[d]
22 in arbitrary fluorescence units (AFU), plotted on the chromatogram,
23 and then *assigned to a band* based on two criteria. First, if an
24 experimental result was within a band, then the result was assigned
25 to the multiplicity of the band (e.g., the *Cy3 value of 1* [*i.e.*, an
26 integer value] in the left-most chromatogram of FIG. 3). Second, if
27 an experimental result was between two bands, a two-step analysis
28 was employed. If the experimental result was between two
legitimate results, the experimental result was assigned to the closest
band. (e.g., the *Cy5 value of 2* [*i.e.*, an integer value] in the right-
most chromatogram of FIG. 3). If the experimental result was
between a legitimate result and an illegitimate result, the result was
assigned to the band with the legitimate result (e.g., the *FAM value
of 3* [*i.e.*, an integer value] in the middle chromatogram of FIG. 3).

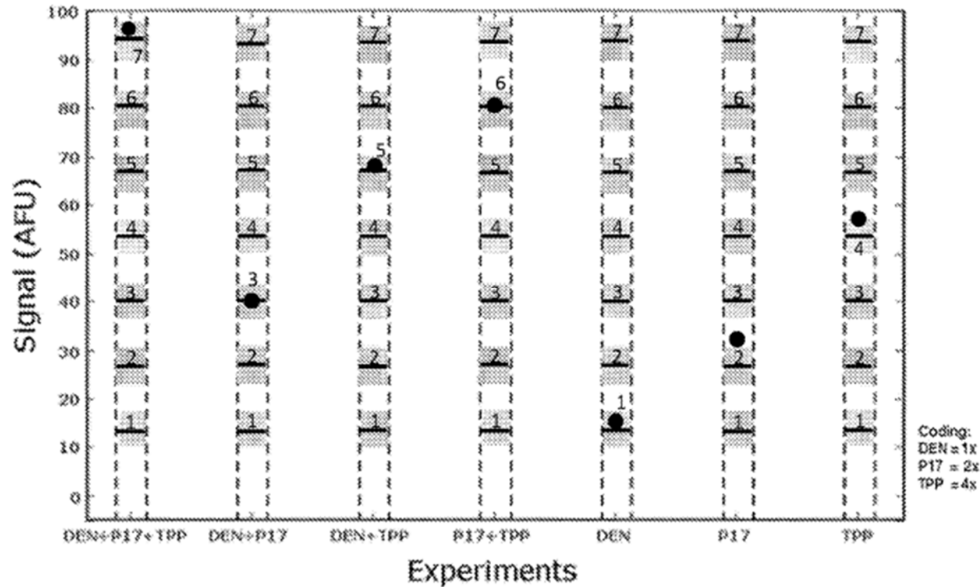
29 ’797 Patent at 49:5-25 (emphasis added).

30 Bio-Rad asks “if the constituent intensities that are somehow aggregated to form ‘F’ are not
31 themselves integers, then how can one be sure that ‘F’ is ultimately an integer?” Dkt. No. 161 at
32 12. The ’797 Patent yields the answer, expressly detailing how to transform an aggregation of

1 constituent intensities that are “not themselves integers,” into integer values for encoding and
2 decoding combinations of analytes, where F is the maximum intensity value, expressed as an integer,
3 in a given channel when all analytes are present. ’797 Patent at 19:46-64, 23:29-38. For example,
4 the black dots in FIG. 3 represent measured intensity values (in arbitrary fluorescence units) from
5 combinations of analytes. ’797 Patent at 48:46-49:6, FIG. 3. The levels of such dots in each channel
6 correspond to aggregated constituent intensities that “are not themselves integers”; for example, the
7 vertical axis of FIG. 3 shows the cumulative signals have different intensity values in units of AFU.
8 *Id.* If an experimental result—that is, a dot representing a measured intensity value in AFUs—falls
9 within the band level corresponding to a known combination of analytes, then that result is assigned
10 to an integer value associated with that band, “e.g., the Cy3 *value of 1* in the left-most chromatogram
11 of FIG. 3.” *Id.* at 49:5-11 (emphasis added). And if an experimental result is between two bands, a
12 two-step analysis is employed to assign the result either to an integer value associated with one of
13 the bands or designate the result as illegitimate. *Id.* at 49:11-25. As the ’797 Patent explains with
14 respect to Table 16, if all analytes are present, then the integer values from this conversion process
15 add up to 6 in the FAM channel, and accordingly F=6 in this example. *Id.* at 48:28-57; *see also id.*
16 at 19:46-64, 23:29-38.

17 ///
18 ///
19 ///
20 ///
21 ///
22 ///
23 ///
24 ///
25 ///
26 ///
27 ///
28 ///

1 Additionally, FIG. 7 of the '797 Patent, reproduced below, shows a chromatogram for an
 2 embodiment using the coding scheme shown in Table 17, which is “non-degenerate by design” and
 3 in which “each analyte was encoded as a single value of fluorescence intensity in a single color.”
 4 *Id.* at 50:1-35.



15 *Id.* at FIG. 7.

16 As described in the '797 Patent specification, the “fluorescence signals generated by the
 17 respective probes in positive-control endpoint PCR reactions were measured and used to calculate
 18 the probe concentrations that would produce 1x, 2x, and 4x signal intensities.” '797 Patent at 50:37-
 19 42. The '797 Patent states that:

21 The total fluorescence signal of each experiment was plotted on a
 22 chromatogram (FIG. 7) that was constructed as described above.
 23 The width of the bands around each positive control measurement is
 24 the propagated uncertainty of the 1X measurement. That uncertainty
 was equated to the standard deviation of the fluorescence signals of
 the last five PCR cycles in saturation.

25 *Id.* at 54:1-7.

26 The '797 Patent states that, “[a]s expected, the intensity values for combinations of analytes
 27 are equivalent to the summed intensities,” for example that a result of 7 “indicates the presence of
 28

1 all three analytes,” the results of 3, 5, and 6 similarly yielding readily decodable results. ’797 Patent
2 at 54:26-39.

3 Accordingly, the ’797 Patent clearly teaches how intensity can be an “integer,” and how a
4 “series of ‘ranges’ of numbers” can be aggregated to “ultimately yield a value for ‘F’ that is a single
5 integer, as the claim requires.” See Dkt. No. 161 at 12-13. And this is true for embodiments using
6 encoding schemes that are non-degenerate by design (e.g., as in FIG. 7), based on “assigning an
7 intensity value to each analyte that is equal to the cumulative intensity values for the prior analytes,
8 plus one” and those that are non-degenerate based on other types of coding schemes (e.g., as in FIG.
9 3). See ’797 Patent at 50:1-16, 54:1-24, Table 17 (FIG. 7 encoding scheme), 48:28-49:25, Table 16
10 (FIG. 3 encoding scheme).

11 Lastly, Bio-Rad’s argument that the patent examiner’s alleged confusion about whether “F”
12 referred to “the number of fluorophores” should be rejected because presumably the examiner fully
13 understood “F” when allowing the claims given that he did not maintain an indefiniteness rejection.
14 Dkt. No. 161 at 19-20.

15 Accordingly, Bio-Rad’s argument should be rejected.

16 4. Bio-Rad’s Attack Based on Infringement Contentions Is Baseless

17 Bio-Rad’s arguments that “F” is indefinite based on Plaintiffs’ proposed but unentered
18 amendments to the ’921 Patent infringement contentions, and/or is indefinite based on the ’797
19 Patent infringement contentions, should be rejected for multiple reasons. Dkt. No. 161 at 13-18;
20 Dkt. No. 154 at 7-10.

21 First, the the ’921 Patent has different claim limitations than do the ’797 Patent claims,
22 particularly the term “F,” which in the ’921 Patent claims corresponds to “wavelength components”
23 and in the ’797 Patent claims corresponds to the “maximum cumulative intensity.” Compare ’921
24 Patent at claim 1 with ’797 Patent at claim 1. Indeed, claim 1 of the ’921 Patent does not recite
25 “intensity” at all, let alone constrain a maximum cumulative intensity using the specific formula for
26 and mathematical properties of “F” recited in the ’797 Patent’s claims. Compare ’921 Patent at
27 claim 1 with ’797 Patent at claim 1. Accordingly, the proposed ’921 Patent contentions simply do
28 not illuminate the meaning of “F” as that term is used in the ’797 Patent’s claims.

1 Second, to the extent the '921 Patent contentions map that patent's claims to intensities
2 (whether represented as an integer or not), Bio-Rad's assertion that Plaintiffs "could not have been
3 clearer that intensities may be non-integer decimal numbers" is irrelevant. Dkt. No. 161 at 13. As
4 explained in detail above, the '797 Patent (and the intrinsic record) teach how to assign integer
5 intensity values to non-integer intensity measurements to obtain and use "F" for different encoding
6 and decoding embodiments, in accordance with claim 1 of the '797 Patent. Dkt. No. 161 at 13;
7 *supra* §II.A.1-3. Indeed, Bio-Rad ignores these very teachings when arguing that, based on the
8 contentions, Plaintiffs have "offered multiple different potential methods for determining 'F,' none
9 of which are disclosed in the patent and that would lead to radically different results." Dkt. No. 161
10 at 18-19. The '797 Patent's (and intrinsic record's) teachings provide a specific method for
11 determining "F" by using bands to assign raw intensity measurements to integer values. *Supra*
12 §II.A.3. In comparison, the '921 Patent claims do not recite a "maximum cumulative intensity ...
13 when all of the analytes are present" or any equivalent limitation, nor provide any mathematical
14 constraints thereon. *See* '921 Patent, claim 1. Additionally, even if they were relevant to "F" as
15 recited in the '797 Patent claims, Plaintiffs' proposed contentions for the '921 Patent explained that
16 "the corresponding coding scheme... is generally represented as a pattern" and provided example
17 calculations showing how decimal entries in the coding tables were calculated from integer values
18 on the chromatogram axes. Dkt. No. 128-3 at 526-27. So, for example, multiplying each value by
19 10 in the tables would result in integer values. Thus, Bio-Rad's argument is baseless.

20 Bio-Rad further complains of the specific manner in which Plaintiffs mapped limitations of
21 both the '921 Patent claims and the '797 Patent claims onto Bio-Rad's products. *See* Dkt. No. 161
22 at 15-18. But, this argument also lacks merit because the '797 Patent specification teaches how to
23 obtain and use "F." *See supra* §II.A.1-3.

24 Bio-Rad's cited authority, *Dow Chem. Co. v. Nova Chems. Corp. (Can.)*, 803 F.3d 620, 630
25 (Fed. Cir. 2015), is easily distinguished. There, the claims recited a "slope of strain hardening
26 coefficient greater than or equal to 1.3." *Dow*, 803 F.3d at 631. The court found the patents taught
27 that "[t]he slope of strain hardening is calculated from the resulting tensile curve by drawing a line
28 parallel to the strain hardening region of the ... stress/strain curve," but did not actually contain any

1 figure showing a stress/strain curve. *Id.* at 633 (citations omitted). The court further found that four
2 different methods existed to determine the maximum slope, each of which may produce different
3 results, i.e., a different slope. *Id.* The court found the term indefinite because “the required guidance
4 [wa]s not provided by the claims, specification, and prosecution history.” *Id.* at 634.

5 Here, by contrast, “F” is clear in view of the intrinsic record and understanding of a
6 POSITA, as explained above: the ’797 Patent claims and specification provide the required guidance
7 regarding “F.” *Supra* §II.A.1-3. Plaintiffs and Dr. Weigl explained this guidance in great detail in
8 connection with Plaintiffs’ opening brief and Dr. Weigl’s declaration. Dkt. Nos. 160, 160-1. Indeed,
9 the present circumstance is fully analogous to *Biosig Instruments, Inc. v. Nautilus*, a case the Federal
10 Circuit in *Dow* distinguished because “unlike [in *Dow*] ... [i]n *Biosig*, we held that the prosecution
11 history, the language of the claims, and the knowledge of one skilled in the art demonstrated that ‘a
12 skilled artisan would understand the inherent parameters of the invention as provided in the intrinsic
13 evidence’ and that the claim term at issue ‘informs a skilled artisan with reasonable certainty of the
14 scope of the claim.’” *Dow*, 803 F.3d at 635, n. 10. That is precisely the case here regarding “F,” as
15 Plaintiffs and Dr. Weigl explained. The ’921 Patent contentions do not change this.

16 Finally, Bio-Rad’s arguments should be rejected because Bio-Rad cites no legal authority
17 explaining why the ’921 Patent contentions should be elevated above the ’797 Patent’s clear intrinsic
18 record regarding “F,” as discussed in Section II.A.1-3 above—*particularly* because the ’921 Patent
19 contentions were not actually entered. Dkt. No. 154. Indeed, the contentions are, at best, “[e]xtrinsic
20 evidence [that] may not be used to contradict claim meaning that is unambiguous in light of the
21 intrinsic evidence.” *Profectus Tech. LLC v. Huawei Techs. Co.*, 823 F.3d 1375, 1380 (Fed. Cir.
22 2016) (quotation marks omitted); *see also ParkerVision, Inc. v. Qualcomm Inc.*, 116 F.4th 1345,
23 1357 (Fed. Cir. 2024) .

24 Accordingly, Bio-Rad has fallen far short of proving by clear and convincing evidence that
25 “F” is indefinite.

26
27
28

1 scheme), 48:28-49:25, Table 16 (FIG. 3 encoding scheme). Accordingly, the “associating” term
 2 should be understood *not* to be limited to embodiments using the specific formula for “M” recited
 3 in claim 1. Bio-Rad cites no authority explaining why the specific embodiments using the formula
 4 for M should be read into the more general “*associating*” term which clearly applies to embodiments
 5 that do *not* use that formula.

6 And indeed, the Federal Circuit has confirmed that “[w]hen a claim term is expressed in
 7 general descriptive words, we will not ordinarily limit the term to a numerical range that may appear
 8 in the written description or in other claims.” *Renishaw PLC v. Marposs Societa’ Per Azoni*, 158
 9 F.3d 1243, 1249 (Fed. Cir. 1998). The “associating” term in claim 1 is expressed in general
 10 descriptive words and should not be limited to a numerical range, e.g., should not be limited to the
 11 specific values recited in the specification or required by *other* limitations of claim 1 (e.g., the
 12 recited formula for M), as Bio-Rad tries to do. *See* Dkt. No. 161 at 20-21; see ’797 Patent, claim 1.
 13 *See also Rexnord*, 274 F.3d at 1345, 1348 (Federal Circuit interpreted term as unambiguously
 14 encompassing both embodiments embraced by specification).

15 Accordingly, Bio-Rad’s construction should be rejected and this term, in its entirety, should
 16 be given its plain and ordinary meaning. Alternatively, if needed, Plaintiffs’ more specific
 17 construction should be adopted.

18 **C. “analyte-specific hybridization probes” (claims 1, 10)**

Claim Term(s)	Plaintiffs’ Proposed Construction	Bio-Rad’s Proposed Construction
“analyte-specific hybridization probes”	Plain and ordinary meaning. If a more specific interpretation of the plain and ordinary meaning is required, this term should be construed as “a probe that binds to a portion of an analyte having a specific sequence, with the sequence generally also characterizing the analyte.”	“a reagent capable of generating a signal in the presence of particular analyte and that hybridizes to the analyte”

26 This term should be given its plain and ordinary meaning, or Plaintiffs’ construction should
 27 be adopted. Bio-Rad’s proposed construction is incomplete and inaccurate, particularly to the extent
 28 that it attempts to exclude preferred embodiments described in the specification—e.g., TAQMAN

1 probes. Dkt. No. 160 at 15-18. *See GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1311
2 (Fed. Cir. 2014) (holding that claims should not be construed to exclude the preferred embodiment
3 absent probative evidence on the contrary); see also *Rexnord*, 274 F.3d at 1342–43 (explaining that
4 a claim construction excluding the preferred embodiment “is rarely, if ever, correct and would
5 require highly persuasive evidentiary support”). As Plaintiff’s opening brief and Dr. Weigl
6 explained, the ’797 Patent enumerates “TAQMAN” probes as its primary example of “analyte-
7 specific hybridization probes.” *See, e.g.*, ’797 Patent, 9:22-34, 10:31-55; Dkt. No. 160 at 16-18.
8 Accordingly, any construction of “analyte-specific hybridization probes” should encompass
9 TAQMAN probes, as the intrinsic and extrinsic record and the understanding of a POSITA confirm
10 “analyte-specific hybridization probes” do, both under the plain and ordinary meaning and under
11 Plaintiffs’ proposed construction.

12 **III. CONCLUSION**

13 For the foregoing reasons, Bio-Rad’s proposed constructions should be rejected. Bio-Rad
14 has failed to establish by clear and convincing evidence that “F” is indefinite. No construction of
15 “F” is needed. “[A]nalyte-specific hybridization probes” and “associating...” should also be given
16 their plain and ordinary meaning. Alternatively, Plaintiffs’ proposed constructions should be
17 adopted.

18
19 Dated: November 17, 2025

SHEPPARD, MULLIN, RICHTER &
HAMPTON, LLP

21 By: /s/ Jesse A. Salen
22 Jesse A. Salen
23 Attorneys for Plaintiffs and Counter-Defendants
24 CHROMACODE, INC. and CALIFORNIA
25 INSTITUTE OF TECHNOLOGY
26
27
28

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

CERTIFICATE OF SERVICE

I hereby certify that on November 17, 2025, a true and correct copy of the foregoing has been served on all counsel of record who are deemed to have consented to electronic service, via the Court’s CM/ECF system pursuant to Civil Local Rule 5.1(h).

Dated: November 17, 2025

/s/ Jesse A. Salen
Jesse A. Salen