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12

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 OPENING
CLAIM CONSTRUCTION BRIEF FOR
THE '797 PATENT**

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

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1 **I. INTRODUCTION**

2 Plaintiffs, on the one hand, and Defendant Bio-Rad, on the other, dispute the meaning of
3 several claim terms of U.S. Patent No. 12,168,797 (“the ’797 Patent”). The asserted claims of the
4 ’797 Patent (i.e., claims 1, 2, 5–11, 13–15, and 18) use clear, straightforward language that a person
5 of ordinary skill in the art (“POSITA”) would readily understand. Accordingly, for the three
6 disputed claim terms, no construction is required or the terms can be given their plain and ordinary
7 meaning. To the extent the Court deems it necessary to construe any of these terms, Plaintiffs’
8 proposed constructions are grounded in the claim language and intrinsic record of the ’797 Patent.
9 These constructions reflect how a POSITA would interpret the claims, as Plaintiffs’ technical expert
10 Dr. Weigl explains. By contrast, Bio-Rad’s proposed constructions (1) ignore and/or unnecessarily
11 and improperly deviate from the claim language and intrinsic record, and (2) depart from the
12 understanding of a POSITA. Moreover, Bio-Rad’s indefinite construction fails because the claims
13 viewed in light of the specification and prosecution history clearly inform those skilled in the art
14 about the scope of the invention, in particular the claim term “F,” with reasonable certainty.
15 Accordingly, Bio-Rad’s proposed constructions should be rejected.

16 **II. TECHNOLOGY OVERVIEW**

17 For an overview of technology relating to the ’797 Patent, Plaintiffs refer to the description
18 of the relevant technology in their opening claim construction brief for the other Caltech patents at
19 issue in this case. *See* No. 5:23-cv-06360, Dkt. 73 at §II; *see also* Declaration of Bernhard H. Weigl
20 in Support of Plaintiffs’ Claim Construction Brief (“Weigl Dec.”), §IV. As explained in Section III
21 below, these patents are related to and share a specification with the ’797 Patent.

22 **III. THE ’797 PATENT**

23 The ’797 Patent was filed on July 13, 2023 and issued on December 17, 2024. ’797 Patent,
24 (22), (45). The ’797 Patent is part of a chain of continuation applications dating back to February
25 1, 2013 and to provisional applications filed on September 19, 2012 and February 3, 2012. *Id.*, (60),
26 (63) (Related U.S. Application Data). This chain includes the ’170 and ’051 Patents that Caltech is
27 also asserting in this action; additionally, the ’797 Patent is in the same family as the asserted ’921
28

1 Patent. *Id.*, (63). These patents all share the same specification and together with the '797 Patent
2 are referred to herein as “the Caltech Asserted Patents.”

3 **A. The Claimed Invention**

4 Whereas the claims of the other Caltech Asserted Patents are directed to methods, assays,
5 and kits, the '797 Patent's asserted claims are directed to a system. '797 Patent, claim 1. The
6 claimed system includes a sample chamber configured to house a sample and mixtures of analyte-
7 specific hybridization probes and fluorophores for detecting analytes. *Id.*, claim 1, 9:22–34. Each
8 of the probes is labeled with a specific fluorophore or combination of fluorophores. *Id.*, claim 1,
9 11:25–31, 31:39–48; Weigl Dec., ¶23. The system can excite the different fluorophores and
10 measure electromagnetic signals (i.e., light) emitted at a particular wavelength (i.e., color) and
11 intensity from each of the excited fluorophore(s). '797 Patent, claim 1, 9:22–49, 32:18–40, 35:48–
12 58; Weigl Dec., ¶23.

13 The system includes a multi-channel detector to detect electromagnetic signals at
14 corresponding emission wavelengths, each corresponding to a type of fluorophore. '797 Patent,
15 claim 1; Weigl Dec., ¶24. In claim 1, the claimed detector uses at least four distinct color channels,
16 one for each fluorophore, each associated with its own wavelength of emitted light. '797 Patent,
17 claim 1 (“[T]he multi-channel detector comprises C channels” and “C=4, 5, or 6.”); Weigl Dec.,
18 ¶24. The constituent electromagnetic signals (i.e., one for each color channel on the detector) are
19 combined into a cumulative signal including a first component comprising intensity values, and a
20 second component comprising wavelength values. '797 Patent, claim 1, 27:32–49; Weigl Dec., ¶24.
21 The intensity values for a given color are both additive and digital. '797 Patent, 15:55–58; Weigl
22 Dec., ¶24. Furthermore, there is a maximum cumulative intensity value when all analytes associated
23 with a given color channel are present: the claimed “maximum cumulative intensity” (F). '797
24 Patent, claim 1 (“F is a positive integer and is equal to the maximum cumulative intensity ... when
25 all of the analytes are present[.]”); *see also id.*, 19:46–52, 23:21–24; Weigl Dec., ¶24.

26 The system further includes a processor controlled analyzer to receive the cumulative signal
27 from the multi-channel detector and then apply a decoding matrix to the cumulative signal to
28 unambiguously detect the presence or absence of each analyte in the sample volume. '797 Patent,

1 claim 1. For each possible combination of analytes present in the sample volume, the decoding
2 matrix enumerates the cumulative intensity values for possible assay results, where the results are
3 different possible combinations of analyte(s) which together generate a cumulative signal based on
4 the probes that respectively hybridized to those analytes. *See, e.g.*, '797 Patent, tables 3–4, 8, 14:11–
5 24 (discussing “enumerating each of the possible cumulative assay results”); Weigl Dec., ¶26. The
6 decoding matrix derives from the encoding method employed during the probe labeling process,
7 and the encoding method determines how the electromagnetic signals (i.e. the light) emitted by
8 different possible combinations of fluorescence from probes that hybridized to their respective
9 analyte combine into the cumulative signal measured at the detector. *See, e.g.*, '797 Patent, tables
10 3–4, 8, 14:11–24, 15:55–63; Weigl Dec., ¶26. When the analyzer “applies” the decoding matrix, it
11 references the combined cumulative intensity values measured for each color channel to a specific,
12 corresponding combination of analytes, and based on this reference determines that such
13 combination is present in the sample. *E.g.*, '797 Patent, tables 3 and 4, 15:64–16:9 (“Table 4 allows
14 the conversion of a cumulative measurement of intensity in four ranges of fluorescent wavelengths
15 ... into the corresponding analytes present in the sample.”), claim 1; *see also id.*, table 8; Weigl
16 Dec., ¶26.

17 The variables M, C, and F describe certain system parameters and are described by specific
18 mathematic relations. Weigl Dec., ¶27. C is defined to be the number of second values
19 (wavelengths/colors) measured on the multi-channel detector, and the value of C, as recited in the
20 '797 Patent claims, must be 4, 5, or 6. '797 Patent, claim 1; Weigl Dec., ¶27. F is defined to be the
21 maximum cumulative intensity measured for any second value (color channel on the multi-channel
22 detector) when all analytes are present, and its value, as recited in the '797 Patent claims, must be a
23 positive integer, and F+1 must be a power of 2. '797 Patent, claim 1; Weigl Dec., ¶27. Finally, M
24 is defined to be the number of analytes unambiguously detected, and its value, as recited in the '797
25 Patent claims, must satisfy the equation $M=C*\log_2(F+1)$. '797 Patent, claim 1; Weigl Dec., ¶27.

1 **B. Illustrative Example of the Claimed System**

2 Illustratively, the specification discloses a system practicing the claimed invention that, in
3 the disclosed example, uses an “encoding method[] using one color and one intensity per analyte
4 but different intensities among analytes.” ’797 Patent, 21:47–22:3. In this example, the sample
5 chamber is configured to house a sample and analyte-specific reagent mixtures of analyte-specific
6 probes labeled with fluorophores at intensities in accordance with table 8, which is reproduced
7 below. Weigl Dec., ¶28; ’797 Patent, table 8, 14:11–23, 21:47–23:38.

8
9 TABLE 8

10 Example of encoding method using one color and one
11 intensity per analyte, but different intensities among analytes.

Tier	Analyte	B	G	Y	R
1	A	1	0	0	0
	B	2	0	0	0
	C	4	0	0	0
	D	8	0	0	0
2	E	0	1	0	0
	F	0	2	0	0
	G	0	4	0	0
	H	0	8	0	0
3	I	0	0	1	0
	J	0	0	2	0
	K	0	0	4	0
	L	0	0	8	0
4	M	0	0	0	1
	N	0	0	0	2
	O	0	0	0	4
	P	0	0	0	8
		15	15	15	15

21
22 ’797 Patent, table 8.

23 A POSITA¹ would understand from this disclosure that the multi-channel detector of this
24 illustrative system detects electromagnetic signals on four color channels: blue, green, yellow, and
25 red, i.e., C=4. Weigl Dec., ¶29; ’797 Patent, table 8, 21:65–67. The F value is limited by the number
26 of “multiplicity states,” which is the number of distinct intensity values or ranges of intensity values

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28 ¹ See Weigl Dec., §VI for the characteristics of a POSITA.

1 that the detector’s precision permits reliable measurement in for a given color channel. ’797 Patent,
 2 22:62–23:2, 27:24–27; Weigl Dec., ¶29. In the illustrative example of table 8, the precision of the
 3 multi-channel detector supports sufficient state multiplicity to reliably measure up to 15 intensity
 4 values, or ranges of intensity values, on each color channel. Weigl Dec., ¶29; ’797 Patent, table 8,
 5 21:65–22:2. In the illustrative example of table 8, analyte-specific probes are labeled with
 6 fluorophores at intensity values corresponding to powers of 2, up to an intensity of 8 on a given
 7 color channel. Weigl Dec., ¶29; ’797 Patent, table 8, 21:65–67. For the example shown in table 8,
 8 the processor controlled analyzer unambiguously detects the presence or absence of up to 16
 9 analytes by applying the decoding matrix to the cumulative signal. Weigl Dec., ¶29; ’797 Patent,
 10 table 8 (showing 16 analytes, A–P, labeled with specific colors and intensities).

11 A POSITA would understand that a decoding matrix associated with this illustrative system
 12 may be built by enumerating each possible cumulative intensity value and referencing that value to
 13 a possible combination of analytes present in the sample volume. Weigl Dec., ¶29; ’797 Patent,
 14 tables 3–4, 14:11–24. There are 2^{16} , or 65,536, possible combinations of 16 analytes—far too
 15 many to exhaustively list herein the full decoding matrix associated with table 8. Weigl Dec., ¶29.
 16 Instead, purely for simplicity, a reduced version based only on the analytes that are labeled with
 17 blue fluorophore intensities, is provided below:

18

19 **Example Decoding Matrix for Analytes of Table 8 in Blue Channel**

Possible Cumulative Intensity Value on Blue Channel	Present Analytes (Blue Fluorophore Intensity Label)	Sum of Blue Fluorophore Intensity Labels of Present Analytes
0	None(0)	0
1	A(1)	1
2	B(2)	2
3	A(1), B(2)	1+2 = 3
4	C(4)	4

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Example Decoding Matrix for Analytes of Table 8 in Blue Channel		
Possible Cumulative Intensity Value on Blue Channel	Present Analytes (Blue Fluorophore Intensity Label)	Sum of Blue Fluorophore Intensity Labels of Present Analytes
5	A(1), C(4)	1+4 = 5
6	B(2), C(4)	2+4 = 6
7	A(1), B(2), C(4)	1+2+4 = 7
8	D(8)	8 = 8
9	A(1), D(8)	1+8 = 9
10	B(2), D(8)	2+8 = 10
11	A(1), B(2), D(8)	1+2+8 = 11
12	C(4), D(8)	4+8 = 12
13	A(1), C(4), D(8)	1+4+8 = 13
14	B(2), C(4), D(8)	2+4+8 = 14
15	A(1), B(2), C(4), D(8)	1+2+4+8 = 15

Weigl Dec., ¶29.

Because encoding schemes such as described in relation to table 8 are non-degenerate by construction, only one combination of analytes has fluorophore intensity labels that sum to each possible cumulative intensity measurement. Weigl Dec., ¶30 (compare first and third columns above); '797 Patent at 21:56–22:2. For instance, if analyte B (labeled with blue fluorophore intensity of 2) and analyte D (labeled with blue fluorophore intensity of 8) were both present, the emitted blue wavelength electromagnetic signals would additively combine, resulting in a cumulative measured fluorophore intensity in the blue channel of 2+8, or 10. Weigl Dec., ¶30. In other words, when the analyzer of the illustrative system receives a cumulative intensity measurement corresponding to a value of 10 on the blue channel, the analyzer “applies the decoding matrix” by referencing the combination of analytes enumerated for a cumulative intensity measurement of 10 on the blue channel (analytes B and C), resulting in a determination that analytes

1 B and C are present in the sample and that the other 14 analytes (A, D–P) are not present. Weigl
2 Dec., ¶30; ’797 Patent, tables 3–4, table 8, 15:64–16:2. Thus, applying the example decoding matrix
3 above *unambiguously* identifies the presence or absence of any combination of the four analytes
4 (A–D) that are labeled with blue fluorophore intensities. Weigl Dec., ¶30; ’797 Patent, tables 3–4,
5 table 8, 15:64–16:2. A fuller decoding matrix enumerating all 65,536 possible combinations of the
6 16 analytes (A–P), when applied by the analyzer to the cumulative signal including all four color
7 channels, would similarly unambiguously identify the 16 analytes (A–P) in any combination of
8 presence or absence. Weigl Dec., ¶30.

9 Regarding the claimed mathematical relationship of the system’s parameters C, F, and M
10 explained above, C and M for this illustrative system are 4 and 16, respectively. F, which is the
11 maximum cumulative intensity measured for any second value (color channel on the multi-channel
12 detector) when all analytes are present—can be determined by: (1) adding the fluorophore intensity
13 labels of each analyte detected using a given color channel, (2) repeating this calculation for every
14 color channel, and (3) setting F to the highest calculated sum for any color channel. Weigl Dec.,
15 ¶31; *see also* ’797 Patent, claim 1 (“F ... is equal to the maximum cumulative intensity of the
16 [intensity value] of the [cumulative] signal, for any [wavelength/color], when all of the analytes are
17 present[.]”). The result of this determination for the blue channel is provided in the bottom row of
18 the reduced decoding matrix above—when all blue fluorophore labeled analytes (A labeled 1, B
19 labeled 2, C labeled 4, and D labeled 8) are present, the sum of their blue fluorophore intensity labels
20 is 1+2+4+8, or 15. Weigl Dec., ¶31; ’797 Patent, 21:67–22:2. Because the other analytes (E–P) are
21 labeled with intensity values corresponding to powers of 2, but with different color fluorophores,
22 the same calculation for the green, yellow, and red channels will also result in a cumulative intensity
23 measurement of 15 for those channels when all of the associated analytes are present. Weigl Dec.,
24 ¶31; ’797 Patent, 21:67–22:2. Thus, F for the illustrative system is 15. Weigl Dec., ¶31. As a final
25 check, the values of the C, F, and M parameters of the illustrative system are consistent with the
26 claimed mathematical relationship: C=4 (C can be 4, 5, or 6); F=15 (15 is a positive integer, 15+1
27 = 16 is a power of 2); M = 16 (M = C*log₂(F+1), and C*log₂(F+1) = 4*log₂(15+1) = 4*log₂(16)
28 = 4*4 = 16). Weigl Dec., ¶31. In other words, the system described herein is illustrative of the

1 claimed invention’s system and consistent with the way a POSITA would understand it from reading
2 the specification. Weigl Dec., ¶31.

3 In an example assay performed using the system of the ’797 Patent, F, which is the maximum
4 cumulative intensity for any second value (for example maximum fluorescence intensity in any
5 channel), represents a normalized and quantized integer value typically representing a band of
6 signals measured by the analytical system (for example as arbitrary fluorescence units). Weigl Dec.,
7 ¶25. For each droplet, the multi-channel detector will report arbitrary intensity values in respective
8 channels that correspond to bands of values around respective integer values in the decoding matrix,
9 e.g., around 1, 2, 4, 8, 16, etc. Weigl Dec., ¶25. This scales, or normalizes, the arbitrary fluorescence
10 units that are measured to a constituent signal (e.g., by dividing the arbitrary fluorescence units by
11 a common multiple), and then quantizes the scaled numbers to the closest integer by assigning each
12 scaled droplet intensity that integer intensity value. Weigl Dec., ¶25. This allows any combination
13 of presence or absence of each analyte, in each droplet, to be uniquely and unambiguously
14 determined. *See, e.g.*, ’797 Patent, 22:62–23:8, 49:5–25; Weigl Dec., ¶25.

15 **IV. LEGAL STANDARD**

16 Claim construction is a question of law. *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 574 U.S.
17 318, 326 (2015). The goal for the Court when construing a disputed term is to identify the term’s
18 “plain and ordinary” meaning to a POSITA at the time of the invention. *Sumitomo Dainippon*
19 *Pharma Co. v. Emcure Pharms. Ltd.*, 887 F.3d 1153, 1157–58 (Fed. Cir. 2018). “Plain and ordinary
20 meaning[] is the meaning [a POSITA] would ascribe to a term when read in the context of the claim,
21 specification, and prosecution history,” i.e., the intrinsic record. *Apple Inc. v. MPH Techs. Oy*, 28
22 F.4th 254, 259 (Fed. Cir. 2022). Courts may depart from the plain and ordinary meaning in two
23 instances: lexicography and disavowal. *GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304,
24 1309 (Fed. Cir. 2014).

25 “[C]laim construction must begin with the words of the claims themselves.” *Allergan Sales,*
26 *LLC v. Sandoz, Inc.*, 935 F.3d 1370, 1373 (Fed. Cir. 2019). Next, courts review the patent’s
27 specification, as it is “always highly relevant to the claim construction analysis.” *Phillips v. AWH*
28 *Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (en banc) (“Usually, [the specification] is dispositive;

1 it is the single best guide to the meaning of a disputed term.” (citation omitted)). Claims should not
2 be limited to exemplary aspects of an invention described in the specification but cannot be
3 construed to go against the “heart of the invention’s ... improvement over the prior art.” *Tech.*
4 *Patents LLC v. T-Mobile (UK) Ltd.*, 700 F.3d 482, 493–94 (Fed. Cir. 2012). Similarly, exemplary
5 embodiments do not limit a claim’s scope but rather, “[a] patentee may claim an invention broadly
6 and expect enforcement of the full scope of that language[.]” *Home Diagnostics, Inc. v. LifeScan,*
7 *Inc.*, 381 F.3d 1352, 1357 (Fed. Cir. 2004); *Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367,
8 1371 (Fed. Cir. 2014) (Courts “do not read limitations from the embodiments in the specification
9 into the claims.”); *In re ChromaCode Litig.*, No. 23-cv-04823-EKL, 2025 U.S. Dist. LEXIS 140288,
10 at *15–16 (N.D. Cal. July 22, 2025). Finally, the Court “consider[s] the patent’s prosecution
11 history” to the extent it addresses the claim term. *Phillips*, 415 F.3d at 1317.

12 A court may also consider extrinsic evidence, which “consists of all evidence external to the
13 patent and prosecution history, including expert and inventor testimony[.]...” *Phillips*, 415 F.3d at
14 1317–18. Expert testimony can help “provide background on the technology at issue, to explain
15 how an invention works, to ensure that the court’s understanding of the technical aspects of the
16 patent is consistent with that of a [POSITA], or to establish that a particular term in a patent or the
17 prior art has a particular meaning in the pertinent field.” *Id.* Additionally, extrinsic evidence,
18 including expert testimony, “can help the court determine what a [POSITA] would understand claim
19 terms to mean.” *Id.* at 1319.

20 Claims viewed in light of the specification and prosecution history must “inform those
21 skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus, Inc. v. Biosig*
22 *Instruments, Inc.*, 572 U.S. 898, 910 (2014); *AbCellera Biologics Inc. v. Bruker Cellular Analysis,*
23 *Inc.*, No. 20-cv-08624-JST, 2024 U.S. Dist. LEXIS 167587, at *40 (N.D. Cal. Sept. 17, 2024).
24 Failing to do so renders a claim indefinite. 35 U.S.C. §112; *AbCellera*, 2024 U.S. Dist. LEXIS
25 167587, at *41 (citing *Nautilus*, 572 U.S. at 901).

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1 **V. CLAIM TERMS FOR CONSTRUCTION**

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
 16 No construction for the term “F” is needed because the claim language already defines F
 17 using clear language, reciting that “F is a positive integer and is equal to the maximum cumulative
 18 intensity of the first component of the signal, for any second value, when all of the analytes are
 19 present, ... wherein F+1 is a positive integer and F+1 is a power of 2.” Thus, under the plain and
 20 ordinary meaning in view of the patent specification, a POSITA would have understood that F is
 21 the value resulting from: (1) adding the fluorophore intensity labels of each analyte detected using
 22 a given color channel (“F ... is equal to ... the ... *cumulative* intensity of the first component of the
 23 signal ... when all of the analytes are present...”), (2) repeating this calculation for every color
 24 channel (“... for any second value (i.e., wavelength)...”), and (3) setting F to the highest calculated
 25 sum for any color channel (“F ... is equal to the *maximum* cumulative intensity...”). Weigl Dec.,
 26 ¶36; ’797 Patent, claim 1 (emphasis added).

27 For example, as shown in table 8, when analytes A–D are present in a droplet, the blue
 28 fluorophore intensity labels for analytes A–D sum to 15: A is labeled 1, B is labeled 2, C is labeled

1 4, D is labeled 8, and $1+2+4+8$ is 15. '797 Patent, table 8, 21:65–22:2; Weigl Dec., ¶37. Thus, 15
2 is the cumulative intensity value associated with the presence of all analytes labeled with blue
3 fluorophore intensity values (A–D). '797 Patent, table 8, 21:65–22:2; Weigl Dec., ¶37. The
4 cumulative intensity value for all other color channels can be shown to be the same for analytes
5 labeled with green, yellow, or red fluorophore intensity values (E–H present = 15 cumulative green
6 intensity, I–L present = 15 cumulative yellow intensity, M–P present = 15 cumulative red intensity);
7 accordingly the *maximum* cumulative intensity (F) associated with the encoding scheme employed
8 in the table 8 embodiment is 15. '797 Patent, table 8, 21:65–22:2; Weigl Dec., ¶37; *see also supra*
9 §III.B. The '797 Patent specification supports this understanding. *Supra* §III.A; Weigl Dec., ¶37.
10 These intensity and cumulative intensity values may be arrived at by scaling and quantizing the
11 arbitrary fluorescence units that are measured by the multi-channel detector. *Supra* §III; Weigl
12 Dec., ¶38.

13 To the extent a construction is required, “F” should be construed to mean “F, a value that
14 scales with a constituent signal.” Weigl Dec., ¶39.

15 The intrinsic evidence and understanding of a POSITA fully support this construction. For
16 example, the '797 Patent teaches that “the cumulative signal scales with the constituent signals of
17 the same color[.]” '797 Patent, 28:15–28; Weigl Dec., ¶40. The patent explains that “the presence
18 of each analyte results in a particular intensity ... in each of the four colors.... The combination of
19 these constituent signals leads to a cumulative signal that may be measured by measuring an
20 intensity at each wavelength or range of wavelengths.” '797 Patent, 27:44–55; *see also id.*, table 8,
21 21:65–22:2. Accordingly, F, which is the maximum cumulative intensity value for any color
22 channel of the cumulative signal, measured when all analytes are present, scales with the sum of the
23 fluorophore color and intensity labels assigned to all individual analytes identified using a given
24 color channel. Weigl Dec., ¶40.

25 When using this construction, the remaining language in the claim regarding F is retained.
26 That is, the claim would read “F, a value that scales with a constituent signal, is a positive integer
27 and is equal to the maximum cumulative intensity of the first component of the signal, for any
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1 second value, when all of the analytes are present,” “wherein F+1 is a positive integer and wherein
 2 F+1 is a power of 2,” etc. Weigl Dec., ¶41.

3 Accordingly, the meaning of “F” is clear and the claims viewed in light of the specification
 4 and prosecution history “inform those skilled in the art about the scope of [this term] with reasonable
 5 certainty” *Nautilus*, 572 U.S. at 910. Thus, the claims are not indefinite, and Bio-Rad’s proposed
 6 construction should be rejected. Weigl Dec., ¶42.

7 **B. “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”

16 This term should be given its plain and ordinary meaning.

17 The ’797 Patent teaches that an “analyte” “may be any suitable analyte, such as a
 18 polynucleotide, a protein, a small molecule, a lipid, a carbohydrate, or mixtures thereof.” ’797
 19 Patent, 9:13–15; Weigl Dec., ¶44.

20 The ’797 Patent teaches that “[t]he term ‘probe,’ as used herein, generally refers to a reagent
 21 capable of generating a signal in the presence of a particular analyte.” ’797 Patent, 11:19–21; Weigl
 22 Dec., ¶45. According to the ’797 Patent, a “probe generally has at least two portions: a portion
 23 capable of specifically recognizing an analyte, or a portion thereof, and a portion capable of
 24 generating a signal in the presence of an analyte, or a portion thereof.” ’797 Patent, 11:21–24; *see*
 25 *also id.* at 31:39–48 (disclosing that probes, or hybridization probes, or reagents, generate signals in
 26 the presence of an analyte, and generally have an analyte-specific portion and a signal-generating
 27 portion); Weigl Dec., ¶45. According to the specification, “[a]ny suitable probe may be used with
 28 the methods presented in this disclosure, so long as the probe generates a quantifiable signal in the

1 presence of an analyte.” ’797 Patent, 11:31–33; Weigl Dec., ¶45. “For example, the analyte-specific
2 portion of a probe may be coupled to an enzyme that, in the presence of an analyte, converts an
3 uncharged substrate into a charged product, thereby increasing the electrical conductivity in the
4 medium over time.” ’797 Patent, 11:33–38; Weigl Dec., ¶45. “[D]ifferent analytes may be encoded
5 by coupling the analyte-specific portion of the probe (e.g., hybridization probe or antibody) to an
6 enzyme at different ratios.” ’797 Patent, 11:38–41; Weigl Dec., ¶45. In other words, a given probe
7 may be complementary to a sequence in an analyte. ’797 Patent, 10:39–42; Weigl Dec., ¶45.

8 The ’797 specification specifically enumerates “TAQMAN” probes, which also may be
9 referred to as “hydrolysis probes” and are well understood by POSITAs and include a
10 polynucleotide sequence, a fluorophore, and a quencher. *See, e.g.*, ’797 Patent, 9:22–34, 10:31–55,
11 54:9–24; Weigl, ¶46. When the quencher and fluorophore are in proximity, bound to each other by
12 the polynucleotide sequence, the quencher quenches the fluorescence emitted by the fluorophore
13 upon excitation by a light source. ’797 Patent, at 10:36–39; Weigl, ¶46. The polynucleotide
14 sequence of the TAQMAN probe hybridizes to a polynucleotide sequence of an analyte it is
15 designed to detect: “The sequence of the ... probe is designed to be complementary to a
16 polynucleotide sequence present in an analyte, and therefore capable of hybridizing to the
17 polynucleotide sequence present in the analyte.” ’797 Patent, 10:39–42; Weigl Dec., ¶46. Then,
18 when a polymerase is used to generate a copy of the sequence in the analyte to which the TAQMAN
19 probe is hybridized, the quencher and the fluorophore are released from each other, resulting in a
20 detectable signal, as “[t]he proximity between the fluorophore and the quencher is broken and the
21 signal from the fluorophore is no longer quenched.” ’797 Patent, 10:45–52; Weigl Dec., ¶46.
22 Moreover, “the amount of fluorescence detected is a function of the amount of analyte present. If
23 no analyte is present, the probe will not hybridize to an analyte, and the fluorophore and quencher
24 will remain in close proximity. Little or no signal will be produced.” ’797 Patent, 10:50–55; Weigl
25 Dec., ¶46. The ’797 Patent’s description of probes is consistent with the understanding of a
26 POSITA. Weigl, ¶46.

27 The types of fluorophores attached to probes may be the same, or different, for respective
28 analytes that the probes specifically recognize, such that when the probes hybridize to those analytes

1 and then are degraded during PCR to release the fluorophore from the quencher, the fluorophores
2 produce the same, or different colors. '797 Patent, 17:5–26, tables 5 and 8; Weigl Dec., ¶47.
3 Illustratively, tables 9–14 contain example probe sequences that are complementary to, and thus
4 hybridizes to, one or more target sequences within the analytes listed in that table, and which contain
5 respective fluorophores and quenchers. '797 Patent, 40:21–58, tables 9–14; Weigl Dec., ¶48. For
6 example, the probe listed in the last row of table 9 is complementary to a portion of the HIV-1
7 polyprotease sequence, contains a FAM fluorophore, and a Black Hole Quencher (BHQ). '797
8 Patent, 40:21–58, table 9; Weigl Dec., ¶48. As another example, two probes are listed in the bottom
9 two rows of table 10 which are complementary to different portions of the HIV p17 sequence and
10 which respectively contain the FAM fluorophore and a BHQ or the Cy3 fluorophore and BHQ.
11 '797 Patent, 40:21–58, table 10; Weigl Dec., ¶48. A wide variety of examples of TAQMAN probes
12 (which may also be referred to as “hydrolysis probes”) are described throughout the '797 Patent
13 specification that are specific to sequences in other analytes. *See, e.g.*, '797 Patent, tables 15, 18–
14 24, S1-S27, and SEQ. ID. NOS. 4, 7, 8, 12, 13, 17, 18, 22, 23, 25, 28, 29, 31, 32; Weigl Dec., ¶48.
15 Accordingly, as a POSITA would understand from the '797 Patent specification, each of these and
16 other probes disclosed in the '797 Patent is analyte-specific. '797 Patent at 11:21–24, 31:39–48;
17 Weigl Dec., ¶48.

18 Given the above, this term should be given its plain and ordinary meaning. If a more specific
19 interpretation of the plain and ordinary meaning is required, this term should be construed as “a
20 probe that binds to a portion of an analyte having a specific sequence, with the sequence generally
21 also characterizing the analyte.” Weigl Dec., ¶49; *see also* '797 Patent, 32:23–27. In comparison,
22 Bio-Rad’s proposed construction is imprecise and inaccurate, and contrary to the understanding of
23 a POSITA, because it characterizes the probe as being “capable of generating a signal in the presence
24 of a particular analyte.” A POSITA would consider Bio-Rad’s characterization to be incomplete,
25 and inconsistent with the way TAQMAN probes work and with how they are described in the
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1 specification.² Weigl Dec., ¶50. Rather than “being capable of generating a signal in the presence
 2 of a particular analyte,” a POSITA would understand that a TAQMAN probe is only capable of
 3 generating a signal after (1) the probe hybridizes to a sequence in the analyte, (2) a polymerase
 4 copies that sequence which degrades the probe and releases the probe’s quencher from the probe’s
 5 fluorophore, and (3) the fluorophore is excited. *Id.*

6 Accordingly, this term should be given its plain and ordinary meaning, or Plaintiffs’
 7 construction should be adopted.

8 **C. “associating, for each analyte, a first value in a first component of the**
 9 **cumulative signal...” (claim 1)**

Claim Term(s)	Plaintiffs’ Proposed Construction	Bio-Rad’s Proposed Construction
“associating, for each analyte, a first value in a first component of the cumulative signal [and a second value in a second component of the cumulative signal, wherein each first value is an intensity or a range of intensities and each second value is a wavelength or a range of wavelengths]”	Plain and ordinary meaning. To the extent a construction is necessary, the Court should construe the entire term of “associating, for each analyte, a first value in a first component of the cumulative signal and a second value in a second component of the cumulative signal, wherein each first value is an intensity or a range of intensities and each second value is a wavelength or a range of wavelengths” to mean “assigning each analyte to an intensity value of the cumulative signal and a wavelength value of the cumulative signal, wherein each intensity value is an intensity or range of intensities and each wavelength value is a	“associating each analyte with one value in a series of values for a first component of the cumulative signal that follow the progression 1, 2, 4, 8, 16, and so on.”

26 _____
 27 ² TAQMAN probes are the primary type of probes described throughout the ’797 Patent
 28 specification and also happen to be the type of probe used in Bio-Rad’s systems that Plaintiffs are accusing of infringing the ’797 Patent claims.

	wavelength or a range of wavelengths.”	
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First, this term does not require construction and should be interpreted according to its plain and ordinary meaning. Weigl Dec., ¶52. According to the straightforward claim language, a POSITA would readily understand that an intensity or range of intensities and a wavelength (color) or range of wavelengths are associated with each analyte. *Id.*

Second, if the Court is inclined to construe this term, the full term of “associating, for each analyte, a first value in a first component of the cumulative signal and a second value in a second component of the cumulative signal, wherein each first value is an intensity or range of intensities and each second value is a wavelength or a range of wavelengths” should be construed, rather than the truncated term Bio-Rad proposes. Bio-Rad’s proposed construction of this portion of the term should be rejected because, contrary to the clear claim language, it does not account for the analyte being associated with a color channel (wavelength value) in addition to an intensity value (first component). ’797 Patent, claim 1; Weigl Dec., ¶53. Associating each analyte with both color and intensity according to the plain and ordinary meaning and Plaintiffs’ construction is—unlike Bio-Rad’s proposed construction—fully consistent with the plain claim language and the intrinsic evidence, as demonstrated below. ’797 Patent, claim 1; Weigl Dec., ¶53.

Regarding the ’797 Patent specification, the invention’s encoding solution encodes analytes using color and intensity. ’797 Patent, 8:66–9:21, 19:65–21:45. For example, table 8 discloses an encoding method for 16 analytes (A–P) where a color value and an intensity value are assigned to each analyte. ’797 Patent, table 8; Weigl Dec., ¶54. “Table 8 ... illustrat[es] four tiers of encoding based on four color and intensities 1, 2, 4, and 8.” ’797 Patent, 21:65–67. As table 8 shows, each analyte A–P is labeled with a fluorophore color (blue, green, yellow, or red) and, within the selected color channel, an intensity selected from the values 0, 1, 2, 4, and 8. ’797 Patent, table 8, 22:40–43; Weigl Dec., ¶54. As explained above in §III.B, the coding scheme shown in table 8 uses both color and intensity to generate a unique signal for every possible combination of presence or absence of each of the 16 analytes (of which there are 2¹⁶, or 65,536, possible combinations, and readily

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1 allows for the identification and detection of each such combination. Weigl Dec., ¶¶29, 54. As the
2 specification explains:

3 “[T]he presence of each analyte results in a particular intensity ... in
4 each of the four colors.... The combination of these constituent signals
5 leads to a cumulative signal that may be measured by measuring an
6 intensity at each wavelength or range of wavelengths. The
7 corresponding coding scheme or decoding matrix may then be used to
8 convert the cumulative measurement into a determination of the
9 presence or absence of an analyte.”

10 ’797 Patent, 27:44–55.

11 Regarding using both intensity and color to encode analytes, the patent teaches “assigning”
12 intensity values to analytes within a given color channel. ’797 Patent, 9:2–6, 21:49–55, 50:14–24,
13 54:26–27; Weigl Dec., ¶54.

14 Accordingly, in contrast to Bio-Rad’s proposed construction, each analyte is associated with
15 and assigned both an intensity value, which encompasses an intensity or range of intensities, and a
16 wavelength (color) value, which encompasses a wavelength or range of wavelengths. Weigl Dec.,
17 ¶54. Consistent with this, if the Court decides to construe this term, the full term should be
18 construed, and it should be construed to mean “assigning each analyte to an intensity value of the
19 cumulative signal and a wavelength value of the cumulative signal, wherein each intensity value is
20 an intensity or range of intensities and each wavelength value is a wavelength or a range of
21 wavelengths.” *Id.* at ¶55. Bio-Rad’s proposed construction should therefore be rejected. *Id.* at ¶56.

22 Bio-Rad’s proposed construction should also be rejected to the extent it seeks to limit the
23 claim scope to exclude associating analytes with bands, or ranges, of intensities, and cover only
24 associating each analyte with one specific intensity value because this is not supported by the claim
25 language or the ’797 Patent specification or the understanding of a POSITA. Weigl Dec., ¶56.
26 Namely, Bio-Rad’s proposed construction requires that each analyte be associated with one integer
27 intensity value among a progression of integer intensity values. But the ’797 Patent specification
28 describes embodiments where analytes are associated with intensity values by comparing

1 experimental results with “bands” that may cover ranges of intensities. *See, e.g.*, ’797 Patent, 48:62–
2 49:20 (“The intensity value for each color in reactions 11-14 was measure in arbitrary fluorescence
3 units (AFU), plotted on the chromatogram, and then assigned to a band based on two criteria. First,
4 if an experimental result was within a band, then the result was assigned to the multiplicity of the
5 band...”); *see also id.* at claim 1 (“each first value is an intensity or range of intensities...”); Weigl
6 Dec., ¶56.

7 Thus, the term in its entirety should be given its plain and ordinary meaning, or Plaintiffs’
8 construction should be adopted. Weigl Dec., ¶57.

9 **VI. CONCLUSION**

10 For the foregoing reasons, (1) no construction is needed for “F,” (2) “analyte-specific
11 hybridization problems” and “associating...” should be given their plain and ordinary meaning,
12 and/or (3) Plaintiffs’ proposed constructions should be adopted.

13 Dated: October 29, 2025

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CERTIFICATE OF SERVICE

I hereby certify that on October 29, 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).

/s/ Jesse A. Salen
Jesse A. Salen