IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

10X GENOMICS, INC. and PRESIDENT AND FELLOWS OF HARVARD COLLEGE,	)	
Plaintiff,	)	
vs.	)	**Case No. 22 C 261**
NANOSTRING TECHNOLOGIES, INC.,	)	
Defendant.	)	
---	)	
NANOSTRING TECHNOLOGIES, INC.	)	
Plaintiff,	)	
vs.	)	**Case No. 22 C 595**
10X GENOMICS, INC.,	)	
Defendant.	)	
---	)	
10X GENOMICS, INC. and PRESIDENT AND FELLOWS OF HARVARD COLLEGE	)	
Plaintiff,	)	
vs.	)	**Case No. 22 C 1375**
VIZGEN, INC.,	)	
Defendant.	)	

MEMORANDUM OPINION AND ORDER

MATTHEW F. KENNELLY, District Judge:

The three cases before the Court arise from disputes among three biotechnology companies—10x Genomics, Inc., NanoString Technologies, and Vizgen, Inc.—as well

as the President and Fellows of Harvard College (Harvard). 10x Genomics and Harvard contend that NanoString and Vizgen have infringed numerous claims of the asserted patents. Vizgen and NanoString press their own claims of infringement of separate patents—Vizgen via a counterclaim and NanoString through a separate suit included here. There are eleven claim terms in dispute across the three cases. In this opinion, the Court sets forth its construction of the disputed claim terms.

Background

10x Genomics, NanoString, and Vizgen have developed or commercialized different technologies that allow for in situ and spatial molecular analyses of gene expression. The Court begins with a brief description of each.

Spatial technologies enable analysis of intact pieces of tissue and correlating genetic information with specific locations in that tissue. These technologies ultimately allow for the study of gene expression at different regions of a sample, which can help scientists better understand the biology of the tissue. Spatial technologies that predated the asserted patents generally lack the resolution required to tell which particular cell contained which detected analyte or where a particular analyte is located in a given cell. NanoString's GeoMx Digital Spatial Profiler (GeoMx DSP) and 10x's Visium Spatial System (Visium) are spatial analysis technologies. These technologies are at issue in Case No. 22-cv-1375.

In situ analysis allows for the detection of analytes "in place"—that is, with single or sub-cellular resolution. 10x's Xenium Platform, NanoString's CosMx Spatial Molecular Imager (SMI) platform, and Vizgen's MERSCOPE Platform are all in situ analysis technologies. These technologies are at issue in Case Nos. 22-cv-261 and 22-

cv-595.

10x Genomics and co-plaintiff Harvard (collectively 10x) have sued NanoString Technologies for patent infringement in Case No. 22-cv-261 (the 261 case). 10x asserts that NanoString's use and sale of the CosMx SMI in situ platform infringes on the following six patents: United States Patent Nos. 10,227,639 ('639 Patent), 11,021,737 ('737 Patent), 11,293,051 ('051 Patent), 11,293,052 ('052 Patent), 11,293,054 ('054 Patent), and 11,542,554 ('554 Patent).

10x has also sued Vizgen for patent infringement based on the use and sale of its MERSCOPE in situ analysis platform in Case No. 22-cv-595 (the 595 case). In the 595 case, 10x again asserts the infringement of patents '737, '051, and '052, as well as United States Patent Nos. 11,299,767 ('767 Patent) and 1,549,136 ('136 Patent). In that same case, Vizgen has asserted counterclaims, including a claim for infringement of a separate patent, United States Patent No. 11,098,303 ('303 Patent), based on 10x's use and sale of the Xenium platform.

Finally, NanoString has sued 10x for patent infringement in Case No. 22-cv-1375 (the 1375 case). NanoString asserts that 10x's use and sale of the GeoMx DSP spatial analysist technology infringes on United States Patent Nos. 11,473,142 ('142 Patent) and 11,377,689 ('689 Patent).

Discussion

"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) (internal quotation marks omitted). When construing patent claim language, "[t]he words of a claim are generally given their

ordinary and customary meaning as understood by a person of ordinary skill in the art when read in the context of the specification and prosecution history." *Thorner v. Sony Computer Ent. Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (citing *Phillips*, 415 F.3d at 1313). Though "'the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims.'" *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *see also Thorner*, 669 F.3d at 1366 ("We do not read limitations from the specification into claims").

There are two exceptions to the general rule that disputed claim terms are given their ordinary meaning: "1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution." *Thorner*, 669 F.3d at 1365. "Absent a clear disavowal in the specification or the prosecution history, the patentee is entitled to the full scope of its claim language." *Home Diagnostics, Inc. v. LifeScan, Inc.*, 381 F.3d 1352, 1358 (Fed. Cir. 2004).

A. Claim terms disputed in Case Nos. 261 and 595

1. Whether the steps of the method claims must be performed in the order written

a. *10x's proposed construction:*

i. Not all of the claimed method steps must be performed in the order written.

b. *NanoString and Vizgen's proposed construction:*

i. Claim steps must be performed in the order written.

c. *The Court's construction:*

i. Not all of the claimed method steps must be performed in the written order.

The parties dispute whether the steps of the method claims for patents '639, '737, '051, '052, '054, and '136 must be performed in the order in which they appear in the patents. "[A]s a general rule the claim is not limited to performance of the steps in the order recited, unless the claim explicitly or implicitly requires a specific order." *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1345 (Fed. Cir. 2008). "First, we look to the claim language to determine if, as a matter of logic or grammar, they must be performed in the order written." *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1369 (Fed. Cir. 2003). "If not, we next look to the rest of the specification to determine whether it directly or implicitly requires such a narrow construction." *Id.* at 1370.

10x argues that neither grammar, logic, nor the specification require that all the claims must be performed in the order written, and where ordering is required, a jury can discern the order from the claim language. NanoString and Vizgen contend that the claim language requires that the steps be done in the order in which they appear in the claims.

NanoString and Vizgen primarily analyze method claim 1 of the '639 Patent and then generalize to the claims in the other five patents to support this assertion. Method claim 1 of the '639 Patent reads as follows:

1. A method for analyte identification, comprising:

(a) contacting a sample with a plurality of detection reagents, wherein said plurality of detection reagents comprises a detection reagent that targets an

> analyte of a plurality of analytes immobilized in the sample, wherein said detection reagent comprises: (i) probe targeting said analyte and (ii) a nucleic acid label comprising a plurality of pre-determined subsequences, wherein said probe and said nucleic acid label are conjugated together, and wherein said plurality of predetermined subsequences forms an identifier of said probe;
>
> (b) with said analyte immobilized in the sample and said probe coupled to said analyte, (i) hybridizing a first decoder probe with a first subsequence of said plurality of pre-determined subsequences, wherein said first decoder probe comprises a first detectable label, (ii) detecting a first signal signature from said first detectable label, (iii) hybridizing a second decoder probe with a second subsequence of said plurality of predetermined subsequences, wherein said second decoder probe comprises a second detectable label, and (iv) detecting a second signal signature from said second detectable label, to provide a set of signal signatures comprising said first signal signature and said second signal signature; and
>
> (c) comparing said set of signal signatures against set of signal signatures assigned to different analytes including said analyte, to identify said probe, thereby identifying said analyte immobilized in the sample.

'639 Patent, Cl. 1 (A0577).

NanoString and Vizgen argue that step (b) is dependent on immobilizing and coupling a probe to the analyte in step (a), and step (c) is dependent on the signal signatures generated in step (b). Because (c) requires the results of (b), and (b) requires the results of (a), NanoString and Vizgen contend that the steps must be performed in the order written. Critically, they argue that "all of the asserted claims include a parallel structure wherein the results of previous steps are prerequisites for later claim steps." Consol. Br. at 8.

But NanoString and Vizgen are incorrect to argue that all of the claims have a structure parallel to the '639 Patent in a way that allows generalizing the analysis to all of the disputed patents and concluding that all claim steps must be performed in written order. As an initial matter, the fact that some claim steps must be performed in a certain order does not mean that all of them must be performed in a certain order. *See*

Baldwin, 512 F.3d at 1509 (finding that only certain claim steps were required to be performed in order). For example, a determination that steps (a), (b), and (c) in a claim need be done in order does not require that their sub-steps must also be done in order.

As 10x argues, method claim 1 of the '052 Patent is an example of the different structures at play in the patents. That claim recites the following in relevant part:

> 1. . . .
> (b) performing three or more readout cycles to generate said temporal order of signal signatures, wherein said three or more readout cycles comprise:
>
> (i) a first readout cycle, comprising: (1) imaging said biological sample and detecting a *first optical signal* at said location, . . . thereby obtaining a first signal signature of said temporal order of signal signatures, . . .
>
> (ii) a second readout cycle, comprising imaging said biological sample and detecting an *absence of an optical signal* at said location, thereby obtaining a second signal signature of said temporal order of signal signatures
>
> (iii) a third readout cycle, comprising imaging said biological sample and detecting a *second optical signal* at said location, . . . thereby obtaining a third signal signature of said temporal order of signal signatures.

'052 Patent, Cl. 1 (A0967-68). None of the three cycles above refer to each other or rely upon completion of earlier-stated steps within paragraph (b). Nor must they be performed in the order stated—as 10x argues, the "second readout cycle," which records the absence of an optical signal, can occur before a first optical signal is detected (i.e., before the "first readout cycle"), or after a second optical signal is detected (i.e., after the "third readout cycle"). The performance of the readout cycles in any order will still generate a temporal order of signal signatures.

Moreover, the patent's dependent claims confirm an order is not required. Method claim 25 specifically claims the method where said readout cycles are performed in sequential order, and method claim 31 does the same where said cycles are performed "in any order." '052 Patent, Cl. 25, 31 (A0968-69). 10x argues that

requiring the steps be done in the order written would make claim 25 superfluous. *See Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1380 (Fed. Cir. 2006) ("[R]eading an additional limitation from a dependent claim into an independent claim would not only make that additional limitation superfluous, it might render the dependent claim invalid."); *Versa Corp. v. Ag-Bag Int'l Ltd.*, 392 F.3d 1325, 1330 (Fed. Cir. 2004) ("The doctrine of claim differentiation creates a presumption that each claim in a patent has a different scope.") It would also make claim 31 have a broader scope than the independent claim from which it depends. *See Alcon Research, LTD. v. Apotex Inc.*, 687 F.3d 1362, 1367 (Fed. Cir. 2012) ("It is axiomatic that a dependent claim cannot be broader than the claim from which it depends.")

NanoString and Vizgen point to use of the terms "first" and "second" in patents '639 and '054 as evidence that the steps must be performed in the order written. They read the use of "first" and "second" to mean "first [or second] in time," in contrast to 10x's interpretation of the terms to mean "in the first or second instance." NanoString and Vizgen note that paragraphs (b)(i)-(iv) of claim 1 of the '639 Patent, quoted earlier, use "first" and "second" to describe decoder probes and signal signatures, indicating that the sequence must be performed in order. They argue that claim 4 of the '639 Patent—which specifies that "said first signal signature" from paragraph (b)(ii) of claim 1 is removed "prior to hybridizing said second decoder probe" in paragraph (b)(iii)—would make no sense unless the the steps in paragraphs (b)(ii) and (b)(iii) were performed in the order written. Consol. Br. at 8-9. Their observation regarding the '054 Patent is similar. Claim 1 of that patent reads as follows:

1. A method for identifying an analyte, comprising:

(a) contacting a cell or tissue sample comprising said analyte with a detection reagent comprising (i) a probe targeting said analyte and (ii) a nucleic acid label coupled to said probe, to permit said probe to bind to said analyte, wherein said nucleic acid label comprises a plurality of subsequences;

(b) generating a set of signal signatures in said cell or tissue sample at least in part by

(i) coupling a first decoder probe to a first subsequence of said plurality of subsequences, wherein said first decoder probe comprises a first detectable label,

(ii) detecting a first signal signature from said first detectable label,

(iii) coupling a second decoder probe to a second subsequence of said plurality of subsequences, wherein said second decoder probe comprises a second detectable label, and

(iv) detecting a second signal signature from said second detectable label; and

(c) processing said set of signal signatures to identify said analyte.

'054 Patent, Cl. 1 (A1043). NanoString and Vizgen point to dependent claim 17 of the '054 Patent, which—using language similar to that in claim 4 of the '639 patent—also specifies that the "first signal signature" detected in claim 1, paragraph (b)(ii) should be removed "prior to coupling said second decoder probe to said second subsequence" per paragraph (b)(iii).

But "[t]he use of the terms 'first' and 'second' is a common patent-law convention to distinguish between repeated instances of an element or limitation." *3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1371 (Fed. Cir. 2003). The Court agrees with 10x that, in this case, the terms "first" and "second" are best understood in this manner—as repeated instances of an occurrence—rather than as denoting an occurrence as happening "first [or second] in time." "First" and "second" indicate that for any one analyte, the steps for that one cycle are happening at a different time than

another cycle for that analyte. They do not indicate that each cycle of events must be performed in the order in which they appear or excludes simultaneous events occurring for *other* analytes.

Independent claims in the '136, '051, and '737 Patents illustrate both this understanding of how the way "first" and "second" are used and the different structures present throughout the claims.

The '136 Patent demonstrates how the claim language can indicate that some steps must be performed in a specific order, but not others.[1] Independent method claims 1 and 24 in this patent read as follows:

> 1. (b) generating a first hybridized complex comprising (i) a first decoder probe hybridized to said first predetermined sequence and (ii) a first detectable label;
>
> (c) detecting said first detectable label to obtain a first signal signature from said first hybridized complex;
>
> (d) removing said first signal signature from said first hybridized complex;
>
> (e) generating a second hybridized complex comprising (i) a second decoder probe hybridized to said second predetermined sequence and (ii) a second detectable label;
>
> ...
>
> 24. (a) binding a plurality of detection reagents to ribonucleic acid (RNA) molecule in a cell or tissue sample . . .
> (b) performing a plurality of readout cycles, thereby obtaining a temporal order of signal signatures associated with said RNA molecule, said plurality of readout cycles comprising:
>
> > (i) a first readout cycle comprising: (1) generating a first hybridized complex comprising (A) a first decoder probe hybridized to said first predetermined sequence and (B) a first optical label; (2) detecting a first signal signature from said first optical label of said first hybridized complex; and (3) removing said first signal signature from said first hybridized complex; and

[1] The claim language in the independent claims of patent '051 are substantially similar to those in '136 Patent. *See* '136 Patent, Cl. 1, 26 (A0898-99).

(ii) a second readout cycle comprising: (1) generating a second hybridized complex comprising (A) a second decoder probe hybridized to said second predetermined sequence and (B) a second optical label; and (2) detecting a second signal signature from said second optical label of said second hybridized complex; and

(c) using said temporal order of signal signatures to identify said RNA molecule.

'136 Patent, Cl. 1, 24 (A1110-11).

As written, the claim language makes clear that some steps depend upon the completion of preceding steps. For example, as a matter of logic and grammar, you can't "obtain a first signal signature from said first hybridized complex" in step (1)(c) without "generating a first hybridized complex" in (1)(b). But there is nothing which indicates that steps (1)(b) and (1)(e) cannot happen simultaneously, as 10x explains in its brief, Consol. Br. at 18, or that (e) cannot happen first, as the processes are the same. The same is true of claim 24, and this is highlighted by how the claim intends "a plurality of readout cycles" to "obtain[] a temporal order of signal signatures," "comprising," of a first and second cycle. '136 Patent (A1111). The fact that "plurality" and "comprising" are used "indicates that the claim is open-ended and allows for additional [cycles]," *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 327 F.3d 1364, 1368 (Fed. Cir. 2003), in an order not specified.

The relevant independent method claims from the '737 Patent are written concisely. Claims 1(b) and 24(c) simply say, "detecting a temporal order of signal signatures [in said cell or tissue sample/at said location], wherein said temporal order of signal signatures is associated with said one or more pre-determined subsequences," without reference to cycle order at all. '737 Patent, Cl. 1, 24 (A0832-33). This likewise indicates that the cycles are independent events that may be completed in an order

other than the one written.

NanoString and Vizgen also argue that the prosecution history contradicts 10x's position because 10x did not contest a particular part of the patent examiner's interpretation of what would become the '054 Patent. The Examiner interpreted "[t]he parts of the second step" of '054 Patent as "being performed in the order they are recited in view of the instant specification, which describes an ordered and sequential detection of signals to generate a signature or pattern of signals that can be processed in order to identify the analyte." J.A., Ex. N2 (A1250) ('054 Patent file history). This interpretation is reiterated in the Notice of Allowance for the '054 patent. *See id.* at (A1306-07).

But the fact that 10x did not contest that characterization during prosecution is not dispositive. "In construing claims, 'this court. . . considers the prosecution history to determine whether the applicant clearly and unambiguously disclaimed or disavowed any interpretation during prosecution in order to obtain claim allowance." *Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1345 (Fed. Cir. 2005) (quoting *3M Innovative Props. Co.*, 350 F.3d at 1371) (collecting cases); *see also Chimie v. PPG Indus., Inc.*, 402 F.3d 1371, 1384 (Fed. Cir. 2005) ("The purpose of consulting the prosecution history in construing a claim is to exclude any interpretation that was disclaimed during prosecution.") (internal quotation omitted). The Federal Circuit has made clear that "an applicant's silence regarding statements made by the examiner during prosecution, without more, cannot amount to a clear and unmistakable disavowal of claim scope." *Salazar*, 414 F.3d at 1345. "Prosecution history cannot be used to limit the scope of a claim unless the *applicant* took a position before the PTO." *3M Innovative Props. Co.*,

350 F.3d at 1373.

NanoString and Vizgen's reliance on *Biogen Idec, Inc. v. GlaxoSmithKline LLC*, 713 F.3d 1090, 1096 (Fed. Cir. 2013), to suggest otherwise lacks merit. In *Biogen*, the applicants responded to the examiner's construction of the terms with concessions that made "clear that they were limiting their invention to what the examiner believed they enabled." *Id.* Thus, in *Biogen* the applicant did, in fact, take a position before the PTO and the court determined that they had disclaimed their claim scope. *Id.* at 1096-97. That is not the case here.

Underlying all this, the dispute appears to be, at least in part, about what one understands "temporal" in the phrase "a temporal order of signal signatures" to mean; whether that should color the method claim construction; and, if so, how. The parties have agreed that a "temporal order of signal signatures" is "a sequence of signal signatures determined in a temporally-sequential manner, i.e., the sequence of signal signatures is progressed through by a number of active operations performed in a temporally-sequential manner." Consol. Br. at 16-17. NanoString and Vizgen fail to make clear why the "temporally-sequential manner" must be the specific sequence in which the steps are listed in the claim term.

In sum, neither grammar, logic, nor the specification impose a requirement that *all* the steps of the relevant claim be performed in the order written. The readout cycles on which this dispute primarily focuses are independent of one another and can be conducted in sequential orders other than those listed in the claim terms when creating a temporal order of signal signatures. Given this, and the Federal Circuit's acknowledgement that "[t]he use of the terms 'first' and 'second' is a common patent-law

convention to distinguish between repeated instances of an element or limitation," *3M Innovative*, 350 F.3d at 1371, use of the terms "first" and "second" in relation to these cycles is best understood as denoting an instance rather a mandatory order of steps.

As a result, the Court declines to adopt NanoString and Vizgen's proposed construction requiring that all the claim steps be performed in the order written.

2. "detection reagent"

a. *10x's proposed construction:*

i. plain and ordinary meaning

b. *NanoString and Viz*gen's *proposed construction:*

i. "a molecule comprising a probe conjugated to a nucleic acid label comprising one or more pre-determined subsequences such that each nucleic acid label identifies said probe and its corresponding analyte"

c. *The Court's construction:*

i. plain and ordinary meaning

The parties dispute the meaning of "detection reagent" across several claims in the '639, '737, '051, '052, and '136 Patents. The '737 and '639 Patents offer representative examples of how the term "detection agent" is used in these instances. Claim 1 of '737 provides the following:

> 1. A method for identifying an analyte, comprising:
>
> (a) contacting a cell or tissue sample comprising said analyte with a detection reagent, wherein said **detection reagent** comprises (i) a probe that binds to said analyte and (ii) a nucleic acid label comprising one or more pre-determined subsequences

'737 Patent, Cl. 1 (emphasis added) (A0832). In patent '639 the term appears as

follows:

> 1. A method for analyte identification, comprising:
>
> a) contacting a sample with a plurality of **detection reagents**, wherein said plurality of detection reagents comprises a **detection reagent** that targets an analyte of a plurality of analytes immobilized in the sample, wherein said **detection reagent** comprises: (i) probe targeting said analyte and (ii) a nucleic acid label comprising a plurality of pre-determined subsequences, wherein said probe and said nucleic acid label are conjugated together, and wherein said plurality of predetermined subsequences forms an identifier of said probe;

'639 Patent, Cl. 1 (A0577) (emphasis added).

NanoString and Vizgen propose a construction that interprets "detection reagent" to be "a molecule comprising a probe conjugated to a nucleic acid label comprising one or more pre-determined subsequences such that each nucleic acid label identifies said probe and its corresponding analyte." Consol. Br. at 21. They contend that this construction appropriately captures a one-to-one relationship between probe and analyte that "aligns with the actual invention" and is supported by "the totality of the intrinsic evidence." *Id*. at 24. In the Court's view, however, the claims already specify what a "detection reagent" comprises—a probe targeting an analyte, and a nucleic acid label.

In support of their proposed construction, NanoString and Vizgen cite the following passage in the '737 Patent's specification:

> The detection reagent comprises at least one probe reagent and at least one nucleic acid label, wherein said at least one nucleic acid label comprises at least one predetermined subsequence to be detected in a temporally-sequential manner; wherein said at least one pre-determined subsequence forms an identifier of said at least one probe reagent; and wherein said at least one probe reagent and said at least one nucleic acid label are conjugated together.

'737 Patent (A0805); '639 Patent (A0535, 528). They argue that their construction aligns with this passage of the specification. At oral argument, they noted that because

the specification says use of the word "a" and equivalents includes plural referents, *see* '737 Patent (A0829), their construction's use of the phrases "a molecule," "comprising a probe," and "conjugated to a nucleic acid label" is not actually narrower than the specification's repeated use of the phrase "at least one." NanoString and Vizgen also contend their construction correctly reflects that the detection reagent comprises both a probe and a nucleic acid label and that the probe is conjugated to a nucleic acid label. Finally, they argue that where the specification says, "forms an identifier of said at least one probe reagent," it actually means that it identifies one unique, specific, probe and its corresponding analyte. They contend their proposed language "identifies said probe and its corresponding analyte" expresses that meaning more clearly.

In NanoString and Vizgen's own words, the dispute over this claim term "boils down to whether a 'detection reagent' must identify a specific probe and its corresponding analyte." Consol. Br. at 31. In 10x's view, the term "detection reagent" is not ambiguous and does not require construction because its ordinary meaning is clear, particularly in context of the surrounding claim language. 10x also argues that the principle underlying NanoString and Vizgen's construction—that "each probe has a corresponding analyte, in a one-to-one relationship"—is erroneous, and their proposed construction is, accordingly, too narrow. *Id.*

The Court is in agreement with 10x. Even if one sets aside that a "molecule" is not the same as a "reagent"—as 10x points out and NanoString and Vizgen do not meaningfully dispute—the specification states that "[i]n some embodiments, a detection reagent described herein can target at least two distinct analytes." '737 Patent (A0792); '639 Patent (AO527). NanoString and Vizgen do not address this clear statement.

They argue that the specification defines the detection reagent's nucleic acid label as "used to identify an analyte or a target," '737 Patent (A0809); '639 Patent (A0539), and defines a "probe" as corresponding to "the target or the analyte." *See* '737 Patent (A0805). These examples, they argue, indicate the invention operates based on a one-to-one relationship. But their own earlier argument that the specification intends "[t]he singular terms 'a,' an,' and 'the' [to] include plural referents" undercuts this contention. '737 Patent (A0829).

In sum, NanoString and Vizgen ask the Court to endorse a narrower construction that is not supported by the claim language or specification. The Court declines to do so. The meaning of the claim term is set out in the claim language such that it would be clear to a person of ordinary skill in the art. For these reasons, the Court overrules NanoString and Vizgen's proposed construction and concludes that the term "detection reagent" does not require construction beyond its plain and ordinary meaning.

3. "decoding reagent"

a. *10x's proposed construction:*

i. plain and ordinary meaning

b. *NanoString and Vizgen's proposed construction:*

i. "any reagent that can yield a signal signature"

c. *The Court's construction:*

i. plain and ordinary meaning

The parties dispute whether the claim term "decoding reagent" requires a specialized construction or if the surrounding claim language makes clear what a decoding reagent is. The term is present in three claims in the '051 Patent excerpted as

follows:

> 1. . . .
> (b) performing a first readout cycle comprising: (i) associating a first plurality of **decoding reagents** with a first subset of said plurality of said detection reagents bound to said plurality of analytes in said cell or tissue sample and (ii) detecting a first plurality of signal signatures from said first plurality of **decoding reagents**.
> . . .
>
> 90. The method of claim 89 [which claims the method of claim 1 where the plurality of analytes is a plurality of mRNA], wherein said first plurality of **decoding reagents** comprises a first plurality of decoder probes and a first plurality of optical labels
> . . .
>
> 96. . . .
> (ii) performing a third readout cycle comprising:
>
> (1) associating a third plurality of **decoding reagents** with a third subset of said plurality of detection reagents bound to said plurality of analytes in said cell or tissue sample, wherein said third plurality of **decoding reagents** comprises a third plurality of decoder probes and a third plurality of optical labels…

'051 Patent, Cl. 1, 90, 96 (emphasis added) (A0898, A0902).

NanoString and Vizgen argue that the term "decoding reagent" should be construed to mean "any reagent that can yield a signal signature," Consol. Br. at 34, where the word "yield" means "generate," *id.* at 37. In their view, the term would be confusing to a "layperson" because the only detail about "decoding regents" in the language of claim 1 is that the one would "detect . . . signal signatures" from them. *Id.* at 34.

The parties do not actually dispute that the claim language, particularly paragraph 1(b)(ii), accurately describes what a "decoding reagent" is and does. 10x argues that the plain meaning is apparent from the claim language. In 10x's view, NanoString and Vizgen's proposed construction restates what is clear from the claim but adds words in a manner that results in unnecessary confusion. Specifically, 10x argues

that requiring the decoding reagent to "yield" a signal signature is confusing because it could be understood to exclude the absence of color as a valid signal signature. 10x also argues, with respect to claims 90 and 96, that they include a structural blueprint that says a decoding reagent comprises a "plurality of decoder probes" and a "plurality of optical labels," providing even more guidance as to what a "decoding reagent" is.

10x has the better of the argument here. NanoString and Vizgen put forth their proposed construction in an apparent attempt to ward off as yet unmade narrowing or validity arguments by 10x. But the Federal Circuit has "not endorsed a regime in which validity analysis is a regular component of claim construction." *Phillips*, 413 F.3d at 1327. Such analyses are limited to "cases in which the court concludes, after applying all the available tools of claim construction, that the claim is still ambiguous." *Id.* (internal quotation omitted). That is not the case here.

The Court assesses whether the plain meaning of the claim term is clear to a person of ordinary skill in the art, not a layperson. *See Thorner,* 669 F.3d at 1365. In doing so, "we look to the words of the claims themselves . . . to define the scope of the patented invention." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). The language in claims 1, 90, and 96 make clear what a "decoding reagent" is and what it does. This is true even though claims 90 and 96—and their structural requirements—are dependent claims from claim 89, which addresses only when the plurality of analytes in a tissue sample is mRNA.

Even setting aside the dispute over the word "yields," the additions in NanoString and Vizgen's proposed construction still create confusion. The structural blueprint in claims 90 and 96 makes clear that a "decoding reagent" is not always "any reagent," as

NanoString and Vizgen would have the Court say. Once courts "begin to include elements not mentioned in the claim, in order to limit such claim . . . we should never know where to stop." *McCarty v. Lehigh Valley R.R. Co.*, 160 U.S. 110, 116 (1895). There is no appropriate basis to do so here.

4. "identifier"

a. *10x's proposed construction:*

i. plain and ordinary meaning

b. *NanoString's proposed construction:*

i. "a unique expression to distinguish variations from one to another among a class of substances, items, or objects"

c. *The Court's construction:*

i. plain and ordinary meaning

Claim 1 of the '639 Patent claims a method for analyte identification, comprising:

> (a) contacting a sample with a plurality of detection reagents, wherein said plurality of detection reagents comprises a detection reagent that targets an analyte of a plurality of analytes immobilized in the sample, wherein said detection reagent comprises: (i) probe targeting said analyte and (ii) a nucleic acid label comprising a plurality of predetermined subsequences, wherein said probe and said nucleic acid label are conjugated together, and wherein said plurality of predetermined subsequences forms an **identifier** of said probe

'639 Patent, Cl. 1 (A0577) (emphasis added). The parties dispute the construction of the term "identifier" in light of definitional statements in the patent's specification:

> As used herein, the term "identifier" generally refers to a unique expression to distinguish variations from one to another among a class of substances, items, or objects. In particular embodiments, the term "identifier" as used herein refers to association of a unique pre-determined subsequence to a specific probe reagent, thus conferring the presence and identity of the probe reagent when the predetermined subsequence is detected.

'639 Patent (A0560).

NanoString argues that this statement in the specification meets the standard for finding lexicography, and its proposal for construing the term incorporates verbatim a portion of the first quoted sentence—that an "identifier" is "a unique expression to distinguish variations from one to another among a class of substances, items, or objects." Consol. Br. at 37. 10x argues that the statement falls short of the exacting standard for lexicography. It contends that use of the term "generally" in the quoted specification language demonstrates that the patentee did not intend to restrict the term to a single, narrowing definition, contrary to NanoString's proposed construction, which would require the identifier be "unique." 10x also argues that the phrasing in the specification represents a deviation from the linguistic formula patentees used when defining other terms. *Id.* at 38.

The Court agrees with 10x. "To act as its own lexicographer, a patentee must clearly set forth a definition of the disputed claim term other than its plain and ordinary meaning and must clearly express an intent to redefine the term." *Kyocera Senco Indus. Tools Inc. v. Int'l Trade Comm'n*, 22 F.4th 1369, 1378 (Fed. Cir. 2022) (citation omitted). NanoString argues that "[c]ourts often find the use" of [the phrase] 'generally refers to' as definitional." Consol. Br. at 39. But calling something "definitional" does not necessarily mean that the patentee was acting with a lexicographer's clear intent to redefine a term. The surrounding language in the specification makes clear that the requisite intent was absent in this instance.

First, other definitions in the specification of '639 Patent use consistent, absolute phrasing that does not include the qualifier "generally." For example, definitions in the specification consistently employ the phrasing "as used herein, the term [] refers to . . ."

or "the term [] means . . ." *See* '639 Patent (A0560). Deviation from that formula signals that the patentee lacked the required intent to supplant the plain meaning definition with this one. *See Meds. Co. v. Mylan, Inc*. 853 F.3d 1296, 1306 (Fed. Cir. 2017) ("[I]t does not accord with the linguistic formula used by the patentee to signal the designation of other defined terms . . . Because it departs from this format, the statement Medicines relies on lacks the clear expression of intent necessary for a patentee to act as its own lexicographer."). In addition, the "generally refers to" definition is followed by a statement that "*in particular embodiments*, the term identifier" operates in a manner that comports with the "generally refers to" definition. As 10x's expert appropriately states, this further highlights "that only some particular embodiments of the disclosed inventions use an identifier that uniquely identifies a specific probe reagent, while other embodiments of the disclosed inventions do not." J.A., Ex. 17 (A0748).

In sum, NanoString's proposed construction effectively asks the Court to import into the claim, as a limitation, language from the specification that by its terms references an example. Though courts may use the specification in interpreting a claim, importing limitations from the specification has long been considered inappropriate. *See Philips*, 415 F.3d at 1323; *Thorner*, 669 F.3d at 1366 ("We do not read limitations from the specification into claims"). The Court overrules NanoString and Vizgen's proposed construction and concludes that the term "identifier" should be given its plain and ordinary meaning.

5. "analyte"

a. *10x's proposed construction:*

i. "the molecule detected, identified or measured by binding of a detection reagent whose probe reagent(s) recognize it (i.e., are specific binding partners thereto)"

b. *NanoString and Vizgen's proposed construction:*

i. "the molecule detected, identified or measured by binding of a detection reagent whose probe reagent(s) recognize (i.e., are specific binding partners) thereto"

c. *The Court's construction:*

i. "the molecule detected, identified or measured by binding of a detection reagent whose probe reagent(s) recognize it (i.e., are specific binding partners thereto)"

The parties substantially agree that "analyte" should be construed based on the definition found in the specifications of the '639 and '737 Patents. Their dispute concerns whether the Court's construction may modify that definition for grammatical correctness.

The patents at issue expressly define the term "analyte" as "the molecule detected, identified or measured by binding of a detection reagent described herein whose probe reagent(s) recognize (i.e., are specific binding partners) thereto." *See e.g.*, '639 Patent (A0551); '737 Patent (A0820). 10x's proposed construction would alter the definition to read "the molecule detected, identified or measured by binding of a

detection reagent whose probe reagent(s) *recognize it (i.e., are specific binding partners thereto)*." Consol. Br. at 41 (emphasis added). In other words, 10x proposes to (1) include "it" as the object of the sentence, which it argues was inadvertently omitted, and (2) move the adverb "thereto" inside the parentheses with the phrase it modifies.

NanoString contends that a typographical modification at this stage would be contrary to 35 U.S.C. § 255 and 37 C.F.R. § 1.121(b), which set out the requirements for amending a patent specification in certain situations. The cited authorities are inapposite. The cited regulation, 37 C.F.R. § 1.121, addresses the "[m]anner of making amendments in applications." But the Court is not addressing a patent application, and the regulation does not affect a court's ability to make minor typographical changes. Regarding 35 U.S.C. § 255, the Federal Circuit has held that section 255 does not "address the authority of the district courts to correct patents by construction where no certificate of correction has been issued by the PTO." *Novo Indus., L.P. v. Micro Molds Corp.*, 350 F.3d 1348, 1356 (Fed. Cir. 2003). "A district court can correct a patent only if (1) the correction is not subject to reasonable debate based on consideration of the claim language and the specification and (2) the prosecution history does not suggest a different interpretation of the claims." *Id.* at 1357.

The Federal Circuit recently reviewed the law in this regard. "A district court may correct obvious minor typographical and clerical errors in patents." *Pavo Sols. LLC v. Kingston Tech. Co.*, 35 F.4th 1367, 1373 (Fed. Cir. 2022) (citation omitted). Such correction is appropriate only if the error is "evident from the face of the patent" from the point of view of one skilled in the art and is "not subject to reasonable debate based on consideration of the claim language and the specification," and "the prosecution history

does not suggest a different interpretation of the claims." *Id.* NanoString argues this applies only to patent *claims* because that is where courts most make these minor corrections, but it cites no precedent that limits a court's authority to claims as opposed to the other parts of a patent. Rather, the conferred authority, subject to the above limitations, is to "correct minor typographical and clerical errors *in patents*." *Id.* (emphasis added); *see also Novo Indus., L.P.*, 350 F.3d at 1356.

In this case, the grammatical error is evident from the face of the patent; it is not subject to debate based on the claim language and specification; and the prosecution history does not suggest a different interpretation of the claims affected by that grammatical error.

Moreover, making the grammatical correction comports with basic tenets of claim construction involving lexicography by the inventor. Under controlling Federal Circuit case law, "the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess." *Phillips*, 415 F.3d at 1316. "[I]n such cases, the inventor's lexicography governs." *Id.* The Federal Circuit has also made clear that "[t]he inventor's words that are used to describe the invention—the inventor's lexicography—must be understood and interpreted by the court as they would be understood and interpreted by a person in that field of technology." *Id.* at 1313 (quoting *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1477 (Fed. Cir. 1998)). A person of ordinary skill in the art would read the patentee's words and understand their meaning without the obvious typographical error, and it is appropriate for the Court to construe the definitional phrase as such.

For the foregoing reasons, the Court adopts 10x's proposed construction of

"analyte": "the molecule detected, identified or measured by binding of a detection reagent whose probe reagent(s) recognize it (i.e., are specific binding partners thereto)[.]"

6. "using 3D fluorescence imaging to identify said cellular nucleic acid molecules"

a. *10x's proposed construction:*

i. plain and ordinary meaning

b. *NanoString and Vizgen's proposed construction:*

i. "using 3D fluorescence imaging of amplicons to identify said cellular nucleic acid molecules"

c. *The Court's construction:*

i. plain and ordinary meaning

Claim 1 of the '767 Patent is a "comprising" claim that describes a method of analyzing a biological sample where a 3D matrix is generated that preserves the spatial orientation of nucleic acid molecules in a sample and imaging is used to identify the nucleic acids. The claim reads as follows:

> 1. A method of analyzing a biological sample, comprising:
>
> (a) permeabilizing said biological sample, wherein said biological sample comprises a plurality of cells, wherein a cell of said plurality of cells comprises cellular nucleic acid molecules having a relative three-dimensional (3D) spatial orientation within said cell;
>
> (b) generating a 3D matrix comprising said cellular nucleic acid molecules attached thereto
>
> (c) contacting said 3D matrix with reagents to selectively remove a non-nucleic acid component from said biological sample; and
>
> (d) **using 3D fluorescence imaging to identify said cellular nucleic acid**

> **molecules** and said relative 3D spatial orientation of said cellular nucleic acid molecules within said cell.

'767 Patent, Cl. 1 (A1141) (emphasis added). The parties dispute whether paragraph 1(d), which includes the claim term "using 3D fluorescence imaging to identify said cellular nucleic acid molecules," should be construed to specify that the fluorescence imaging that occurs is of amplicons, as Vizgen proposes.

Vizgen argues that every example in the patent specification that uses fluorescent imaging to identify nucleic acid analytes within a sample first amplifies the nucleic acids to produce amplicons; that the patent does not describe imaging nucleic acids except in relation to amplicons and amplification; and that as a result, its proposed construction specifying that the imaging is of amplicons should be adopted. In Vizgen's view, the '767 Patent specification makes clear that "the actual invention" requires amplifying the nucleic acids before 3D fluorescence imaging occurs. Vizgen also notes that in describing "the present invention" the '767 Patent specification says the invention "relates to methods of making a three-dimensional matrix of nucleic acids and amplifying, detecting and sequencing such nucleic acids within the matrix." Consol. Br. at 43. It argues that because amplifying the nucleic acids to produce amplicons and imaging those amplicons is an aspect of "the present invention," the claims are not entitled to a broader scope. *Id.* (citing *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1330 (Fed. Cir. 2009) ("[W]hen the preferred embodiment is described in the specification as the invention itself, the claims are not necessarily entitled to a scope broader than that embodiment.")).

The claim language, however, does not require or mention amplicons or amplifying the nucleic acid molecules to create amplicons. A patentee is "free to

choose a broad term and expect to obtain the full scope of its plain and ordinary meaning unless the patentee explicitly redefines the term or disavows its full scope." *Thorner,* 669 F.3d at 1367. The patentee did not do so here. Vizgen's reliance on one "present invention" disclosure and the examples at the end of the specification do not constitute a clear and unmistakable disclaimer. *Cont'l Circuits LLC v. Intel Corp.*, 915 F.3d 788, 797 (Fed. Cir. 2019) ("To disavow claim scope, the specification must contain expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope."). There are multiple other instances of the "present invention" phrasing that make no mention of amplification or amplicons and refer only to the matrix of nucleic acids. *See* '767 Patent (A1132). This case is thus distinguishable from *Edwards Lifesciences*, because in that case, the surrounding claim language, lexicography, and every example required the importation of the limiting language into the construction of the term. *Edwards Lifesciences*, 582 F.3d 1322 at 1330.

Moreover, even if all the examples in the specification mention amplification or amplicons, reading claims in view of the specification does not mean "read[ing] limitations from the embodiments in the specification into the claims." *Hill-Rom Servs. v. Stryker Corp*., 755 F.3d 1367, 1371 (Fed. Cir. 2014). The Federal Circuit has been clear that it is "not enough that the only embodiments, or all of the embodiments, contain a particular limitation." *Thorner*, 669 F.3d at 1366. We still "do not read limitations from the specification into claims." *Id.*

For these reasons, the Court overrules 10x's proposed construction and determines that the phrase "using 3D fluorescence imaging to identify said cellular nucleic acid molecules" should be given its plain meaning.

7. "matching the codewords with valid codewords in a codebook by comparing the codewords to the valid codewords in the codebook"

a. *Vizgen's proposed construction:*

i. plain and ordinary meaning

b. *10x's proposed construction:*

i. "determining that each bit of a produced codeword is the same as each bit in the corresponding position of a valid codeword in the codebook"

c. *The Court's construction:*

i. "determining whether each bit of a produced codeword is the same as each bit in the corresponding position of a valid codeword in the codebook"

Claim 1 of the '303 Patent describes a method for detecting nucleic acid targets in a sample by in situ hybridization. The method includes producing codewords representing the plurality of different nucleic acid targets at locations within the sample, wherein each of the codewords represents one of the plurality of different nucleic acid targets and comprises multiple binary values 1 and 0. The disputed term involves the following paragraph in claim 1:

> 1. (j) **matching the codewords with valid codewords in a codebook by comparing the codewords to the valid codewords in the codebook**, and if one of the codewords is not matched with one of the valid codewords in the codebook, applying an error detection or correction system, matching the one of the codewords with another of the valid codewords in the codebook, or discarding the one of the codewords, wherein the codebook comprises the valid codewords of the plurality of nucleic acid targets

'303 Patent, Cl. 1 (A0423) (emphasis added). The parties dispute whether the claim

term "matching the codewords with valid codewords in a codebook by comparing the codeworks to the valid codewords in the codebook" should be construed as a bit-by-bit matching process, as 10x's proposed construction suggests.

10x's proposed construction is consistent with evidence in the prosecution history. The patent examiner initially rejected the application that led to the '303 Patent because it was not clear "in which situation, a codeword matches with a valid codeword and in which situation, a codeword does not match with a valid codeword." J.A., Ex. X8 at VIZ00002533 (A0449) (October 22, 2020 Rejection). In response, the applicant stated that "claim 1 has been amended to recite . . . identifying the codeword at each location matched to one of the valid codewords associated with the plurality of nucleic acid targets, by **comparing the values at each position of the codeword to the values at each position of the valid codeword**." Consol. Br. at 59 (quoting J.A., Ex. X7 at VIZ00002552 (A0433) (Applicant's January 22, 2021 Response)). Though prosecution history is not dispositive, it "can often inform the meaning of the claim language by demonstrating how the inventor understood the invention." *Phillips*, 415 F.3d at 1317. The applicant's statement lends supports to 10x's proposed construction.

Vizgen argues that 10x's proposed construction improperly narrows claim 1 to an embodiment where a "match" exists only if each bit of a codeword corresponds exactly with each bit in a valid codeword in the codebook. Consol. Br. at 57. It contends that 10x's construction ignores embodiments that allow matching despite differences, while the patent teaches that a "match" includes exact matches and matches with one or more one-bit errors. *Id.* at 58. For example, claim 11 provides for no match when there are "two errors" and thus allows matching with one error (or less than two). *See id.*

Vizgen also argues that the Webster's dictionary definition of "match" shows that imperfect matches are included in the plain meaning of the term: "3a(1): to put in a set possessing equal or harmonizing attributes; 3a(2): to cause to correspond; 3(b(1): to be the counterpart of; 3b(2): to harmonize with; 3c: to provide with a counterpart." *Id.* at 59.

As a result, the Court adopts a modified version of 10x's construction that reflects the consensus of the parties during oral argument: "determining whether each bit of a produced codeword is the same as each bit in the corresponding position of a valid codeword in the codebook." Construing the claim language as "determining *whether* each bit" is the same rather than as "determining *that* each bit" is the same resolves ambiguity about the match assessment process, and it eliminates Vizgen's concern that the construction recognizes only perfect matches.

8. "if one of the codewords is not matched with one of the valid codewords in the codebook, applying an error detection or correction system, matching the one of the codewords with another of the valid codewords in the codebook, or discarding the one of the codewords"

a. *Vizgen's proposed construction:*

i. plain and ordinary meaning

b. *10x's proposed construction:*

i. "The embodying system must be capable of performing the following conditional steps:

if each bit in a produced codeword does not correspond with the bit in the same location of a valid codeword, applying an

error detection or correction system [as construed] and either assigning the corrected codeword to another valid codeword or discarding the codeword"

c. *The Court's construction:*

i. "if one of the codewords is not matched, applying an error detection or correction system able to yield at least two outcomes: matching with another valid codeword in the codebook, or discarding the codeword."

The latter portion of the '303 Patent codeword matching method claim includes the following paragraph:

> 1.(j) . . . if **one of the codewords is not matched with one of the valid codewords in the codebook, applying an error detection or correction system, matching the one of the codewords with another of the valid codewords in the codebook, or discarding the one of the codewords**, wherein the codebook comprises the valid codewords of the plurality of nucleic acid targets

'303 Patent, Cl. 1 (A0423) (emphasis added). 10x argues that, without construction, the claim term has at least three possible interpretations:

> If one of the codewords is not matched, applying an error detection or correction system that yields two possible outcomes: matching with another valid codeword, or discarding the codeword.
>
> If one of the codewords is not matched, there are three options: (1) applying an error detection or correction system; (2) matching with another valid codeword in the codebook; or (3) discarding the codeword.
>
> If one of the codewords is not matched, there are two options: (1) applying an error detection or correction system to match the codeword with another valid codewords, [sic] or (2) discarding the codeword.

Consol. Br. at 62.

10x's argues that its proposed construction comports with the claim language

and the specification's description of the error detection or correction system and that it is written to track the first interpretation given above:

> The embodying system must be capable of performing the following conditional steps: "if each bit in a produced codeword does not correspond with the bit in the same location of a valid codeword, applying an error detection or correction system [as construed] and either assigning the corrected codeword to another valid codeword or discarding the codeword."

Id. at 61.

Vizgen does not dispute that the claim language recites "applying an error detection or correction system," and then "matching one of the codewords with another of the valid codewords in the codebook, or discarding the one of the codewords." *Id.* at 63. It contends, however, that this arises from the plain language of the claim and the specification. In Vizgen's view, 10x's addition of terms such as "each bit," "assigning," and "corrected" is unsupported and would confuse the jury. *Id*. at 63.

The Court agrees with 10x that, as originally written, the claim term has multiple plausible interpretations, resulting in ambiguity regarding its plain meaning. The Court does not, however, adopt 10x's proposed construction wholesale. Rather, the Court adopts a construction based on the first of the three possible interpretations of the claim terms that 10x identified, as well as the agreement of the parties at oral argument: "if one of the codewords is not matched, applying an error detection or correction system able to yield at least two outcomes: matching with another valid codeword in the codebook, or discarding the codeword."

This construction "stays true to the claim language and most naturally aligns with the patent's description of the invention." *Phillips*, 415 F.3d at 1316. The specification makes clear that the error detection or error correction system is, at least, able to detect

errors, correct those that are correctable, and discard those that are uncorrectable. *See* '303 Patent (A0385, 389-390, 397, 403, 412-413). The adopted construction reflects this capability in a manner that limits the addition of terms that are not present in the original claim language.

9. "an error detection or correction system"

a. *Vizgen's proposed construction:*

i. This claim limitation is not governed by 35 U.S.C. § 112(f). No construction necessary.

b. *10x's proposed construction:*

i. "This limitation is governed by 35 U.S.C. § 112(f).

Function: detecting or correcting unmatched bits in a produced codeword.

Structure: 'A Hamming system, a Golay code, or an extended Hamming system (or a SECDED system, i.e., single error correction, double error detection)' as disclosed in Col. 11:12-28, Col. 20:51-21:34, Col. 38:4-17, Col. 65:36-68:63."

c. *The Court's construction:*

i. "This limitation is governed by 35 U.S.C. § 112(f).

Function: detecting or correcting errors

Structure: A Hamming system, a Golay code, an extended Hamming system or a SECDED system (single error correction, double error detection), or equivalents thereof."

The parties dispute whether the phrase "an error detection or correction system" in '303 Patent claim 1(j) should be construed as a means-plus-function limitation under 35 U.S.C. § 112(f). The relevant paragraph in the claim states:

> 1.(j) . . . if one of the codewords is not matched with one of the valid codewords in the codebook, applying an error detection or correction system, matching the one of the codewords with another of the valid codewords in the codebook, or discarding the one of the codewords, wherein the codebook comprises the valid codewords of the plurality of nucleic acid targets

'303 Patent, Cl. 1 (A0423). And section 112(f) reads as follows:

> (f) Element in Claim for a Combination. —
>
> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof

35 U.S.C. § 112(f). Section 112(f) provides a mechanism for a patentee to "express a claim limitation by reciting a function to be performed" rather than a "structure for performing that function," but "it places constraints on how such a limitation is to be construed." *Williamson v. Citrix Online*, 792 F.3d 1339, 1347 (Fed. Cir. 2015). Claims subject to section 112(f) are limited to the "structure, materials, or acts described in the specification as corresponding to the claimed function and equivalents thereof." *Id.* Use of the word "means" in a claim element creates a rebuttable presumption that section 112(f) applies; the absence of the word "means" creates a rebuttable presumption that section 112(f) does *not* apply. *Id.* at 1348.

The latter is the case here. Because the language of paragraph 1(j) of the '303 Patent does not include the term "means," 10x must show, by a preponderance of the evidence, that persons of ordinary skill in the art would not have understood the ["error detection or correction system"] limitations to connote structure in light of the claim as a

whole." *Dyfan LLC v. Target Corp.*, 28 F.4th 1360, 1367 (Fed. Cir. 2022). The presumption can be overcome "if the challenger demonstrates that the claim term fails to recite sufficiently definite structure or else recites function without reciting sufficient structure for performing that function." *Williamson*, 792 F.3d at 1349.

10x has successfully rebutted the presumption that section 112(f) does not apply. The parties' submissions make apparent that there are times where "system" is a nonce word and times where it is not. But here, particularly when assessing the "words of the *claim*," *see Williamson*, 792 F.3d at 1348 (emphasis added), a person of ordinary skill in the art would not have a sufficient understanding of the structure of "an error detection or correction system."

The claim term "an error detection or correction system" recites only a function (detecting or correcting errors) and not a structure for doing so. Without more, a person of ordinary skill would recognize that error detection or correction for a binary codeword may be achieved in many different ways. Examples include using a brute force algorithm (e.g., changing "0" to "1" and "1" to "0" position by position until it matches a code), establishing a rule for the codebook and determining whether a produced codeword follows the rule, using a Hamming system, a parity bit, convolutional coding, or many others.

Vizgen argues that the language of paragraph 1(j) indicates the design of the error detection or correction system because the preceding paragraph, 1(i), discusses a codeword system where "each of the codeword represents one of the plurality of nucleic acid targets," and claim 8 of the '303 Patent notes an embodiment where "the valid codewords form an error-checking or an error-correcting code space." This language is

insufficient to clarify the structure of a complicated error detection or correction system. These claim terms describe how the codewords function, not the structure of a system to detect or correct errors in those codewords. Vizgen also argues that the specification speaks to, and provides examples of, the "variety of different error-correcting codes" developed in other contexts, "such as Golay codes or Hamming codes." '303 Patent (A0385, 389). But this adds no clarity when the relevant inquiry is based on the language of the claims, not the specification.

Still, even though 10x has successfully rebutted the presumption and has shown that section 112(f) applies to this claim term, its proposed construction of the claim term is unduly narrow. 10x's proposed construction of the function is "detecting or correcting unmatched bits in a produced codeword." But 10x has repeatedly, and properly, argued that the function of the system is made clear by the claim language itself, without the additional words it adds in its proposed construction—the system detects or corrects errors.

Regarding the proposed construction of the terms structure, in *Williamson* the Federal Circuit "restrict[ed] the scope of coverage to only the structure, materials, or acts described in the specification as corresponding to the claimed function and *equivalents thereof*." *Williamson*, 792 F.3d at 1347 (emphasis added). 10x's proposed construction identifies error detection or correction systems disclosed in the specification—"a Hamming system, a Golay code, or an extended Hamming system or a SECDED system (single error correction, double error detection)." *See e.g.*, '303 Patent (A0385). But it does not include "equivalents thereof," as required.

Accordingly, the Court adopts a modified version of the 10x's proposed

construction of "an error detection or correction system" which is consistent with governing law, reflects the agreement of the parties, and more closely aligns with the claim language: "This limitation is governed by 35 U.S.C. § 112(f). Function: detecting or correcting errors[;] Structure: A Hamming system, a Golay code, an extended Hamming system or a SECDED system (single error correction, double error detection), or equivalents thereof."

10. "under conditions that release"

a. *NanoString's proposed construction:*

i. plain and ordinary meaning

b. *10x's proposed construction:*

i. "providing a force to a location of the tissue sample sufficient to release"

c. *The Court's construction:*

i. plain and ordinary meaning

The parties dispute the whether the claim term "under conditions that release" in the '689 and '142 Patents is properly construed as "providing a force" that is "sufficient to release." As relevant here, patent '689 claims a method comprising:

> 16. . . .
> (c) collecting the ligated probes, or portions thereof, bound to each of the identical molecules from the at least one target analyte in a first location of the tissue sample **under conditions that release** the ligated probes, or portions thereof, from the first location of the tissue sample;

'689 Patent, Cl. 16(c) (A0163) (emphasis added). The '142 Patent similarly discloses "1.(a) collecting a plurality of oligonucleotides from a first location of a tissue sample **under conditions that release** the plurality of oligonucleotides from the first location of

the tissue sample." '142 Patent, Cl. 1 (A0282) (emphasis added).

Despite acknowledging that the claim term "under conditions that release" only appears in the claim language itself, 10x argues that the patentee was acting as a lexicographer regarding "conditions" when it provided definitional language for a different phrase—"providing a force to a location of the sample sufficient to release an identifier oligonucleotide." The specification states the following:

> [A]s used herein the phrase "providing a force to a location of the sample sufficient to release an identifier oligonucleotide" is used in its broadest sense to describe changing the conditions within a certain region of interest in a sample such that, for any probe bound to a target analyte within that region of interest, the linker between the target binding domain of the probe and the identifier oligonucleotide of the probe is cleaved, thereby separating the identifier oligonucleotide from the target binding domain so that the identifier oligonucleotide can be subsequently collected from solution.

'689 Patent (A0114).

In 10x's view, because the definition given for "providing a force to a location of the sample sufficient to release an identifier oligonucleotide" includes "in its broadest sense [] changing the conditions within a certain region of interest," then the definition for "under conditions that release" must likewise be "providing a force to a location of the tissue sample sufficient to release." 10x contends this is so because the patents use the terms "force" and "conditions" interchangeably, and it cites *Edwards Lifesciences*, 582 F.3dat 1329, as basis for this argument.

This argument is a stretch, for several reasons. As a matter of logic, it does not necessarily follow that because the broadest understanding of "providing a force to a location of the sample sufficient to release an identifier oligonucleotide" includes "changing the conditions within a certain region of interest in a sample" such that some specific outcomes occur, then the claim term "under conditions that release"—a term

that is similar but by no means identical to or as specific as the "changing the conditions" language—must also be limited to "providing a force . . . sufficient to release."

10x's construction of the claim term is based on an excerpt from another term—"providing a force"—which 10x then equates to an excerpt of that term's definition—use of the word "conditions." It then argues that "providing a force" and "conditions" are used interchangeably and that "interchangeable use of the two terms is akin to a definition equating the two." *Edwards Lifesciences*, 582 F.3d at 1329. But *Edwards Lifesciences* is not a comparable case, and these terms are not used interchangeably. In *Edwards Lifesciences*, "the specification consistently use[d] the words 'graft' and 'intraluminal graft' interchangeably. It state[d] that '*an intraluminal graft* as defined above' is carried through a catheter 'until *the graft* extends into the vessel.'" *Id.* In other words, the shorthand "graft" was used in the definition of the disputed claim term, "intramural graft," itself, and it was clearly and consistently used as a shorthand for that claim term throughout the patent. But in this case, the claim term "under conditions that release" has no definition in the specification—it doesn't appear in the specification at all. And even if the Court focuses on the word "conditions," one cannot say that "conditions" and "providing a force" are used interchangeably. The patent specification also discusses "conditions" suitable for other processes related to the claimed inventions, including protein-target binding conditions, DNA denaturing conditions, and DNA hybridization conditions. *See, e.g.*, '689 Patent (A0109, 111, 113). Nowhere in connection with these processes does the specification refer to a "force."

At bottom, 10x's argument fails to meet the exacting bar for lexicography, which

requires that "the patentee clearly sets forth a definition of the disputed claim term and clearly expresses an intent to redefine the term." *Guardant Health, Inc. v. Vidal*, No. 2021-1104, 2023 WL 3262962, at *2 (Fed. Cir. May 5, 2023)). The definition provided is not a definition of the disputed claim term, and the relevant specifications do not use the terms interchangeably throughout.

For these reasons, the Court overrules 10x's proposed construction and gives the term "under conditions that release" its plain and ordinary meaning.

11. "[first/second] location of the tissue sample"

a. *NanoString's proposed construction:*

i. plain and ordinary meaning

b. *10x's proposed construction:*

i. "[first/second] region of interest of the tissue sample"

c. *The Court's construction:*

i. plain and ordinary meaning

Claim 16 of the '689 Patent and claim 1 of the '142 Patent are directed to spatial detection. The claim term, "[first/second] location of the tissue sample" is repeated throughout the claims, and exemplified in claim 16 of the '689 Patent:

> (c/d) collecting the ligated probes, or portions thereof, bound to each of the identical molecules from the at least one target analyte in a **[first/second] location of the tissue sample** under conditions that release the ligated probes, or portions thereof, from the **[first/second] location of the tissue sample**;
>
> (e/f) performing an extension reaction that incorporates at least one nucleic acid sequence that identifies the **[first/second] location of the tissue sample** into each of the ligated probes, or portions thereof, collected in step [(c)/(d)], thereby forming a [first/second] plurality [of] extension products that comprise the ligated probes, or portions thereof, collected in step[s] [(c)/(d)] and the at least one

> nucleic acid sequence that identifies the **[first/at least second] location of the tissue sample**;
>
> (g) identifying the first plurality of extension products and the second plurality of extension products by sequencing the first plurality of extension products and the second plurality of extension products, thereby spatially detecting the at least one target analyte in the **first location of the tissue sample** and the **second location of the tissue sample**;

'689 Patent, Cl. 16(c-g) (A0163) (emphasis added). The parties dispute whether the claim term "[first/second] location of the tissue sample should be construed to mean "[first/second] region of interest."

"Spatial detection" is relevant because the parties have already agreed to construe "spatially detecting" as "identifying the presence of a specific target analyte within a specific region of interest in a sample." Consol. Br. at 83. 10x argues that the disputed claim term here, "location of the tissue sample," should be construed as "region of interest in the tissue sample" because it would match the "spatial detection" construction/use of "region of interest."

10x contends that the "patent specification confirms the proper construction by using definitional language to equate "location" with "region of interest." But what the specification actually does is equate "region of interest" with "location." It states that "[a]s used herein, the terms 'region of interest' and 'ROI' are used in their broadest sense to refer to a specific location within a sample that is to be analyzed using the methods of the present disclosure." '689 Patent (A0112). The end point of 10x's proposed claim construction would ultimately circle back to the claim term as originally written—i.e., "location" means "region of interest" which means "location."

"The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention [is], in the end, the correct construction."

Phillips, 415 F.3d at 1316. When drafting the this particular claim, the patentee used language that is clear on its face. The Court sees no reason to adopt a circuitous construction that ultimately leads back to the patentee's original chosen language.

For these reasons, the claim term "[first/second] location of the tissue sample" is given its plain and ordinary meaning.

Conclusion

The disputed claim terms are construed in accordance with the conclusions set forth in this Memorandum Opinion and Order.

MATTHEW F. KENNELLY
United States District Judge

Date: February 1, 2024