

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

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| CYTONOME/ST, LLC, |) | |
| |) | |
| Plaintiff, |) | |
| |) | |
| v. |) | C.A. No. 19-301 (RGA) |
| |) | |
| NANOCELLECT BIOMEDICAL, INC., |) | |
| |) | |
| Defendant. |) | |

JOINT CLAIM CONSTRUCTION BRIEF

MORRIS, NICHOLS, ARSHT & TUNNELL LLP
Rodger D. Smith II (#3778)
Anthony D. Raucci (#5948)
1201 North Market Street
P.O. Box 1347
Wilmington, DE 19899
(302) 658-9200
rsmith@mnat.com
araucci@mnat.com
Attorneys for Plaintiff Cytonome/ST, LLC

WILSON SONSINI GOODRICH & ROSATI, P.C.
Ian R. Liston (#5507)
222 Delaware Avenue, Suite 800
Wilmington, DE 19801
(302) 304-7600
iliston@wsgr.com
*Attorneys for Defendant
NanoCelect Biomedical, Inc.*

OF COUNSEL:

Kirt S. O'Neill
Daniel L. Moffett
AKIN GUMP STRAUSS HAUER & FELD LLP
112 E. Pecan Street, Suite 1010
San Antonio, TX 78205
(210) 281-7000

Thomas W. Landers IV
AKIN GUMP STRAUSS HAUER & FELD LLP
1111 Louisiana Street, 44th Floor
Houston, TX 77002
(713) 220-5800

OF COUNSEL:

Douglas H. Carsten
Rhyea Malik
WILSON SONSINI GOODRICH & ROSATI, P.C.
12235 El Camino Real
San Diego, CA 92130

Adam Burrowbridge
WILSON SONSINI GOODRICH & ROSATI, P.C.
1700 K Street NW, Fifth Floor
Washington, DC 20006

February 21, 2020

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I. PLAINTIFF'S INTRODUCTION

Cytonome/ST, LLC (“Cytonome”) is a pioneer in developing high speed microfluidic devices or “chips” that accurately and gently sort biological cells based on their characteristics. These devices are highly useful in the study of cells and pharmaceuticals. *See, e.g.*, '528 Patent at 1:24–2:31; '850 Patent at 1:34–61. Generally, microfluidic chips include very small inlets and channels (less than half a millimeter wide) etched into stacked layers of a substrate material such as fused silica, glass, or plastic. *Id.*; *see also* '528 Patent at 6:55–7:10. When used as a cell sorter, a sheath or “carrier” fluid is flowed through the channels of the microfluidic chip, and then a cell sample is injected into the carrier fluid. *See* '850 Patent at 1:44–61. Due to the principles of microfluidics, the carrier fluid and sample flow in separate layers, and the cells are confined to the center of the channel, ideally in a single-file line. Once aligned, the cells pass by a detector, and a processor determines whether the cells have a selected characteristic. *Id.* Based on that determination, the sorter deflects desired cells into a separate outlet channel from the other cells. *Id.* If this sorting operation is successful—i.e., if it is accurate and does not damage cells—the sample can be collected as two distinct populations and studied.

Before the inventions of the patents-in-suit, traditional sorters were relatively inaccurate, damaging to cells, and expensive. *See, e.g.*, '528 Patent at 2:31–51; '850 Patent at 1:62–3:21. Many of these sorters used heating elements or electrodes to generate a “gas bubble” in the channel to increase pressure and divert cells from the sample stream. *Id.* These systems were inaccurate, however, because gas bubbles accumulated in the channels and caused pressure waves throughout the device, which created unwanted resistance and erroneously deflects non-selected particles. *Id.* Additionally, the generated bubbles contained oxygen, hydrogen, and/or ions (OH^- and H^+) that negatively affected cells as they passed by, in some cases completely destroying fragile cells. *Id.* Moreover, these systems were expensive to operate and manufacture

due to the power required to generate the gas bubbles, the complexity of the circuitry, and the difficulty of mounting electrodes/heaters at such small scales. *Id.*

In the early 2000s, Cytonome successfully addressed these problems when it developed devices with—among other novel features—a dual “reservoir” design that eliminates the need to use gas bubbles to divert cells. *See, e.g.*, ’850 Patent at 3:25–4:49, 5:25–35, Figs. 1–7. This design incorporates an actuator at one reservoir and a “buffer” at an opposing reservoir, which together generate and absorb a pressure pulse *at the point of deflection*. *Id.* The pressure pulse therefore impacts only a single, selected cell, making the device extremely accurate. *Id.* By eliminating the gas bubble, Cytonome’s inventions are gentler on cells and less expensive than traditional sorters. *Id.* Cytonome has secured a number of patents on these devices (and methods of using them), including the seven patents at issue in this case—all but one of them (namely, the ’188 Patent) claiming priority to a single provisional application. Cytonome also uses the patented design in its own products, including the “GigaSort” cell sorter that is licensed and used by an international pharmaceutical company for the study of Parkinson’s disease.

Many of NanoCollect’s proposed constructions improperly limit the scope of Cytonome’s claimed inventions. For example, for claims that include the word “buffer” or “reservoir,” NanoCollect improperly invokes 35 U.S.C. § 112 ¶ 6 to restrict Cytonome’s novel actuator-buffer reservoir system to a single, specific structure from one disclosed embodiment. Cytonome’s proposed constructions, on the other hand, are drawn directly from the intrinsic record and do not improperly limit the scope of the claims.

Moreover, most of NanoCollect’s proposed claim constructions do not relate to any material dispute in the case and simply replace straightforward claim language with synonyms and dictionary definitions. The jury will easily understand the meaning of those terms, and the

Court should not construe them. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need to be construed that are in controversy, and only to the extent necessary to resolve the controversy.”); *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) (“[D]istrict courts are not (and should not be) required to construe *every* limitation present in a patent’s asserted claims.”).

II. DEFENDANT’S INTRODUCTION

The parties have taken divergent approaches to construing the disputed claim terms of the seven Asserted Patents.¹ Defendant NanoCollect Biomedical, Inc.’s (“Defendant” or “NanoCollect”) offered constructions for the disputed claim terms reflect the terms’ meaning to a person of ordinary skill in the art (“POSA”) in view of the intrinsic evidence. Specifically, NanoCollect sought to accord the disputed claim terms with constructions based on the plain and ordinary meaning and the intrinsic evidence.

Cytonome repeatedly violates relevant legal tenets by proposing claim constructions that fail to consider the plain and ordinary meaning of claim terms as understood by the POSA in view of the teachings of the specifications. Cytonome’s proposed claim constructions are attempts to expand Cytonome’s patent rights in order to manufacture infringement arguments that are not supported by the claims themselves or the intrinsic record. NanoCollect, on the other hand, has been mindful of the “goal of claim construction”—that is, “to determine what an ordinary artisan would deem the invention claimed by the patent, taking the claims together with the rest of the specification.” *Astrazeneca AB v. Mutual Pharm. Co.*, 384 F.3d 1333, 1337 (Fed. Cir. 2004). Moreover, at bottom, the purpose of claim construction is to assist the jury in

¹ U.S. Patent No. 6,877,528 (“the ’528”); U.S. Patent No. 8,623,295 (“the ’295”), U.S. Patent No. 9,011,797 (“the ’797”); U.S. Patent No. 9,339,850 (“the ’850”); U.S. Patent No. 10,029,263 (“the ’263”); U.S. Patent No. 10,029,283 (“the ’283”); U.S. Patent No. 10,065,188 (“the ’188”) (the “Asserted Patents”) (D.I. 1-1, Exs. 1-7).

understanding the scope of the claims and technology at issue. *St. Clair Intellectual Prop. Consultants, Inc. v. Apple, Inc.*, No. CA 10-982-LPS, 2012 WL 3238252, at *9 (D. Del. Aug. 7, 2012) (“in light of the complex technology involved here, claim construction is appropriate to assist the jury in understanding the meaning of the patent claims it will be asked to consider.”).

As Plaintiff first proposed, several claim terms in the Asserted Patents are means-plus-function terms. *See* Ex. E at 1 (“a buffer . . . for absorbing the pressure pulse”). Plaintiff’s opening Markman brief states that certain claim terms equate to different words in the specification. For example, Plaintiff states that it “equates the term ‘buffer’ to a ‘reservoir’ that receives a pressure pulse.” *Infra* at 28 (citing D.I. 39-3, September 22, 2004 response (a “reservoir or buffer for absorbing a pressure”)). The Federal Circuit’s “cases have emphasized that the essential inquiry is not merely the presence or absence of the word ‘means’ but whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure.” *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1350 (Fed. Cir. 2015) (finding claim “merely replaces the term ‘means’ with ‘nonce’ word ‘module,’ thereby connoting a generic ‘black box’ for performing the recited computer-implemented functions.”).

To construe a disputed means-plus-function term, the Court must “attempt to construe the disputed claim term by identifying the ‘corresponding structure, material, or acts described in the specification’ to which the claim term will be limited.” *Robert Bosch, LLC v. Snap-On, Inc.*, 769 F.3d 1094, 1097 (Fed. Cir. 2014) (*quoting Welker Bearing Co. v. PHD, Inc.*, 550 F.3d 1090, 1097 (Fed. Cir. 2008)). The Federal Circuit determines disputed claim terms to be a means-plus-function term where it has no commonly understood meaning, was not generally viewed by one skilled in the art to connote a particular structure, and the specification “only describes the term’s

function and interaction with other parts in the system.” *Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1372-73 (Fed. Cir. 2015).

NanoCollect hereby submits this brief in support of their proposed claim construction of the disputed claim terms and in response to the proposed claim constructions and arguments set forth in Cytonome’s Opening Claim Construction Brief (the “Brief”). D.I. 43. There remain 42 asserted claims in this litigation. NanoCollect believes that this is an excessive amount of claims for this case. Given the number of asserted claims at issue, and associated terms, NanoCollect cannot sufficiently address all of the potential claim disputes in this brief. In order to make this brief as productive as possible for the Court and the parties, NanoCollect focuses on those claim terms that, at this point in time, seem likely to be presented by Cytonome at trial. NanoCollect reserves its right to request the Court to construe additional terms as needed. Further, NanoCollect reserves the right to amend these proposed constructions, including to modify proposed terms and constructions and to add extrinsic evidence, or to offer a construction in lieu of “plain and ordinary meaning,” based on Cytonome’s positions in this litigation, information subsequently produced or disclosed, or as may be occasioned by the occurrence of any other development in the litigation.

For the following reasons, NanoCollect respectfully requests that this Court adopt NanoCollect’s proposed constructions.

III. AGREED-UPON CONSTRUCTIONS

| Asserted Patents and Claims | Claim Term | Agreed Construction |
|------------------------------------|--|--|
| ’263 cls 1, 15 ’188 cls. 12, 17 | “generate” and variants “generated,” “generating” | “create,” “created,” “creating” |
| ’263 cls. 1, 5, 8, 15 | “switching device” and variants | “a component separate from the actuator for switching” |

| Asserted Patents and Claims | Claim Term | Agreed Construction |
|--|--|--|
| | “switch component” | |
| ’188 cl. 15 | “switch element” | “a component separate from the actuator for switching” |
| ’263 cls. 5, 16 | “originate” and variants “originating” | “create” and “creating” |
| ’295 cls. 1, 9 ’797 cls. 1, 18 ’850 cl. 1 ’263 cls. 1, 15 | “dampen” and variants (Term 22 from the Joint Claim Chart (D.I. 39-1)). | “to meaningfully dissipate” |

IV. TERMS IDENTIFIED FOR CONSTRUCTION THAT HAVE NOT BEEN ADDRESSED HEREIN

The following terms were listed in the parties’ Joint Claim Chart (D.I. 39-1) but have not been briefed. Certain of these terms were not briefed because they were associated with claims that are no longer asserted. It is NanoCollect’s position that the remainder of these terms were not briefed given the number of Asserted Claims and page limitations set forth in the Scheduling Order. It is Cytonome’s position that NanoCollect elected not to brief these remaining terms despite NanoCollect putting the terms in dispute and Cytonome’s addressing them in its opening brief.

| No. ² | Term |
|------------------|--|
| 2 | “deflect” and variants “deflectable,” “deflection,” “deflecting” |
| 3 | “movable membrane” |
| 4 | “a second plate for enclosing the microchannel bonded to the first plate having a first aperture formed on a first side of the groove” |
| 5 | “bubble valve” |

² “No.” refers to the term numbers from the parties’ Joint Claim Chart (D.I. 39-1).

| No. ² | Term |
|------------------|--|
| 9 | “the side channel” |
| 14 | “in communication” |
| 15 | “sealed reservoir” |
| 16 | “a second reservoir for absorbing a pressure variation in the microchannel induced by the actuator” |
| 17 | “a second reservoir formed on a second side of the groove opposite the first reservoir for absorbing pressure variations in the groove” |
| 18 | “the actuator comprises air trapped in a sealed reservoir” |
| 21 | “operatively associated with” |
| 23 | “propagated” and variants “propagating” |
| 24 | “pressurizer” |
| 25 | “first reservoir include(s) a resilient wall” |
| 27 | “resilient properties” |
| 28 | “configured to fluidically co-operate with the actuator” |
| 29 | “a sealed chamber positioned adjacent to the side channel, wherein the carrier liquid forms a meniscus in the side channel to separate the sealed chamber from the carrier liquid” |
| 30 | “movable wall” |
| 31 | “operatively coupled” |
| 33 | “integrally provided on” |
| 34 | “external actuator” |
| 35 | “operatively engage” |
| 36 | “pressure wave” |
| 38 | “the microfluidic chip including at least one microsorter having a switching region, and a microfluidic channel formed in the microfluidic chip fluidically coupled to a sample input a keep output, a waste output, the switching region” |

| No. ² | Term |
|------------------|--|
| 39 | “actuator external to the microfluidic chip” and variants “actuator is external to the particle processing assembly,” “pressure pulse generator external to the microfluidic particle sorting component” |
| 40 | “operatively interfacing” |
| 41(a) | “first reservoir” |
| 41(b) | “a second reservoir for absorbing a pressure variation” |
| 41(c) | “a second reservoir . . . for absorbing pressure variations” |
| 41(d) | “a second reservoir for absorbing the pressure pulse” |
| 41(h) | “a first reservoir . . . adapted for dampening or absorbing a pressure pulse” |

V. DISPUTED CONSTRUCTIONS

A. “absorbing” and variants including “absorbs”

| No. ³ | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|------------------|--|-----------------------------------|-------------------------------------|
| 1 | ’528 cls. 18, 22 ’295 cls. 1, 9 ’797 cls. 1, 18 ’850 cl. 1 ’263 cls. 1, 15 | Plain and ordinary meaning | “to receive without recoil or echo” |

1. Plaintiff’s Opening Position

The claim term “absorbing” and its variants do not need to be construed, and the plain and ordinary meaning of these terms should apply. The general rule is that, unless the patentee clearly redefines a term in the patent or explicitly gives up claim scope, the ordinary meaning of a claim term should apply. *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012). There is no reason to deviate from the general rule here. NanoCollect purports to

³ Term numbers correspond to the term numbers from the parties’ Joint Claim Chart (D.I. 39-1).

identify intrinsic evidence to support its construction, but none of the identified evidence contains an explicit definition, nor does it explain “absorbing” in terms of the “recoil” or “echo” NanoCollect includes in its construction.

2. Defendant’s Response Position

Defendant’s construction of “absorb” is “to receive without recoil or echo” and should be adopted because it is consistent with a POSA’s understanding of the term in light of the claims and specifications. “Absorb” is not defined in any of the Asserted Patents as having a special definition that differs from a POSA’s understanding of the term in light of the specification. A POSA would understand that in light of the specifications and claims of the Asserted Patents, “absorb” is “to receive without recoil or echo.” A POSA would further understand that “absorb” and the related term “dampen” are different levels of degree describing the dissipation or conversion of mechanical energy to something else, like heat or sound. Based on the specifications of the Asserted Patents, a POSA would understand that absorption of a pressure pulse prevents disturbance to the flow of the non-selected particles in the stream of particles. *See also* the ’850 patent (D.I. 1-1, Ex. 4) at 7:35-37 (“allowing the pressure pulse to be absorbed and *preventing disturbance* to the flow of the non-selected particles in the stream of particles.”) (emphasis added); *id.* at 9:48-51; the ’263 patent (D.I. 1-1, Ex. 5) at 9:29-33. Such a disturbance is caused by a recoil or echo off a surface. In other words, a pressure pulse that is absorbed does not recoil or echo into the “flow of the non-selected particles in the stream of particles,” and, therefore, does not create a disturbance to the flow of non-selected particles. The dictionary meaning of “absorb” supports NanoCollect’s proposed construction. *See* Ex. D (the dictionary definition of “absorb” is “to receive without recoil or echo”).

The prosecution history of the '528 patent provides further evidence that absorbing a pressure pulse prevents it from recoiling or echoing. Cytonome distinguished the claims from the Dunaway reference by declaring that:

the pressure differential created by selectively opening one of the apertures in Dunaway is not absorbed by a reservoir or buffer, but rather transferred to the stream of fluid to change the flow path of the entire stream... *In contrast, the claimed second reservoir prevents the pressure variation or pulse from influencing the overall flow of fluid through a channel.*

Ex. F at CYTLLC_001298. The USPTO allowed the application two months later as a result of this response. *See id.* at CYTLLC_001279-282.

Thus, the term “absorb” should be construed such that it prevents disturbance to the flow of the non-selected particles in the stream of particles, which is consistent with NanoCollect’s proposed construction that upon being absorbed, a pressure pulse is received without recoil or echo, thereby preventing the pulse from reflecting off of the absorbent to cause a disturbance through a channel.

3. Plaintiff’s Reply Position

Although Cytonome believes this term needs no construction, it does not take issue with the first part of NanoCollect’s proposed construction, namely that absorb means “to receive.” Ex. H, Vacca Decl. ¶¶ 50–55. Defining “absorbing” to mean “receiving” or “taking in” would be fully consistent with the only mention of the word “absorb” in the '528 Patent’s specification: “The second side passage 174b and the second bubble valve absorb the transient pressure variations in the measurement duct . . . The resilient properties [of the reservoir] allow the flow of liquid into the second side passage.” '528 Patent at 12:28–34.

The second part of NanoCollect’s proposed construction, however—“to receive without recoil or echo”—improperly and unnecessarily imposes a stringent requirement that the absorption be perfectly achieved. Ex. H, Vacca Decl. ¶¶ 50–55. No part of any of the asserted

patents requires *perfect* absorption, and persons of skill would not understand the inventions to require it. In fact, a person of skill in the art would readily understand that perfect absorption of a pressure pulse in a microfluidic device is impossible—there will always be at least *some* “recoil” or “echo” due to typical design constraints, such as size. *Id.* Accordingly, a person of skill would understand that the “absorption” required in the claims is whatever absorption is necessary for the given application. *Id.* Indeed, the specification addresses this exact issue:

The spring constant of the buffer 100b may be varied according to the particular requirements by varying the volume of the buffer chamber 70b, the cross-sectional area of the side passage 24b and/or the stiffness or the thickness of a flexible membrane (reference 72 in FIG. 7) forming the buffer chamber 70b.

’850 Patent, 9:51–56; Ex. H, Vacca Decl. ¶¶ 50–55. In other words, the “spring constant”—a characteristic of buffers known by persons of skill to be indicative of the absorption of pressure waves—can vary based on application and does not have to be “perfect.” Ex. H, Vacca Decl. ¶¶ 50–55. Depending on whether the “particular requirements” of a device involve absorbing more or less of the pressure pulse, the size of the buffer or the side passages can be changed, a membrane with a different degree of flexibility can be used, or a gas or liquid with lower compressibility can be used. *Id.* None of this is inconsistent with the asserted patents’ claims or specification, which allow for some recoil or echo in the buffer/reservoirs when sorting selected particles, as long as the non-selected particles are not deflected out of their intended flow path. *See id.*; ’850 Patent at 7:35–37, 9:48–51.

NanoCollect appears to have arrived at its proposed construction by combing through dictionary definitions and cherry-picking the one that would most limit the patented inventions. NanoCollect’s proposed construction is lifted directly from one of multiple dictionary definitions of the word “absorb.” Notably, though, NanoCollect does not adopt the first definition listed in its own dictionary, namely “to take in (something, such as water) in a natural or gradual way.”

(Ex. D to Decl. of I. Liston). That definition does not require perfect absorption. Instead, NanoCollect reaches down the page to propose one variation of the fourth listed definition. The Court should not make such a similar reach.

4. Defendant's Sur-Reply Position

A POSA would have understood the claim term “absorb” to, at minimum, prevent disturbance to the flow of the non-selected particles. Ex. K, Di Carlo Decl., ¶ 29. While Cytonome disagrees that to “absorb” a pressure pulse it must receive it “without recoil or echo,” its expert explicitly agrees that “a POSA would understand that absorption of a pressure pulse prevents disturbance to the flow of the non-selected particles in the stream of particles.” Ex. H, Vacca Decl., ¶ 50. Similarly, it is undisputed that a POSA would have understood that “dampen” means “to meaningfully dissipate.” *Id.*, ¶ 56. As an initial matter, the parties agree that these are relative terms of degree. Ex. H, Vacca Decl., ¶ 53 (describing POSA’s ability to select “different levels of absorption”); Ex. K, Di Carlo Decl., ¶ 32.

When *claiming* the subject matter of its claimed invention, Cytonome chose distinct words (“absorbing or dampening”) to cover different claim scope in the context of regulating the pressure pulse. *See e.g.* ’850 patent, Claim 1. *See Stumbo v. Eastman Outdoors, Inc.*, 508 F.3d 1358, 1362 (Fed. Cir. 2007); *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) (“A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.”); *see also Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950 (Fed. Cir. 2006) (interpreting claims “with an eye toward giving effect to all terms in the claim” explaining that “[a]llowing a patentee to argue that physical structures and characteristics specifically described in a claim are merely superfluous would render the scope of the patent ambiguous, leaving examiners and the public to guess about which claim language the drafter deems necessary . . . and which language is merely superfluous, nonlimiting elaboration”).

Now, Cytonome argues that “absorb” means “*whatever* absorption is necessary for the given application.” *Supra* at 11 (emphasis added). Because, a POSA would have understood

that “absorb” means more than “dampen” (Ex. K, Di Carlo Decl., ¶¶ 32, 42) and Cytonome agrees that “dampen” means “to meaningfully dissipate,” a POSA would have understood “absorb” to mean, at minimum, meaningfully dissipate the pressure pulse and prevent disturbance to the flow of the non-selected particles.

B. “carrier fluid” and variants “carrier liquid”

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|-----|-----------------------------|---|--|
| 6 | ’528 cls. 18, 22 | “a sheath of compatible liquid surrounding a particle for carrying one or more particles through a duct or channel” | “fluid containing the particles moving through the system” |

1. Plaintiff’s Opening Position

The express definition from the ’850 Patent should be adopted for the related ’528 Patent claims, namely “a sheath of compatible liquid surrounding a particle for carrying one or more particles through a duct or channel.” *See* ’850 Patent at 5:56–58.

2. Defendant’s Response Position

Defendant’s construction of “carrier fluid” to mean “fluid containing the particles moving through the system” should be adopted because it is consistent with a POSA’s understanding of the term in light of the claims and specifications. This claim term is implicated by asserted claims 18 and 22 of the ’528 patent. “Carrier fluid” is not defined in the specification of the ’528 patent as having a special definition that differs from a POSA’s understanding of the term. Accordingly, Plaintiff did not—and, indeed, cannot—point to a portion of the specification of the ’528 patent where the inventors clearly set forth a definition for “carrier fluid.” Thus, rather than pointing to disclosure of the ’528 patent, Plaintiff attempts to import its lexicography from the specification of the later-filed ’850 patent despite its explicit limitation to the disclosure of the

'850 patent. *See* '850 patent (D.I. 1-1, Ex. 4) at 5:56-58 (“The term ‘carrier fluid’ *as used herein* refers to a sheath of compatible liquid surrounding a particle for carrying one or more particles through a duct or channel.”) (emphasis added). Plaintiff’s reliance on a patent with a substantially different specification makes it readily apparent that Plaintiff did not otherwise define “carrier fluid” in the '528 patent.

Based on the disclosure and intrinsic record of the '528 patent, however, a POSA would understand that “carrier fluid” is a “fluid containing the particles moving through the system.” *See* the '528 patent (D.I. 1-1, Ex. 1) at 4:34-36 (“a side channel in communication with a channel through which a stream of particles in a carrier fluid passes”); *id.* at cl. 17 (“a channel in communication with a channel through which a stream of particles in a carrier fluid passes”); *id.* at cl. 18 (“a channel for conveying a stream of particles in a carrier fluid”); *id.* at cl. 22 (“a primary channel for conveying a stream of particles in a carrier fluid”).

By contrast, Plaintiff’s proposed construction of “a sheath of compatible liquid surrounding a particle for carrying one or more particles through a duct or channel” lacks support in the specification, and seeks to re-write and improperly narrow the scope of this claim term in the '528 patent. Plaintiff adds multiple limitations to the plain and ordinary meaning of “carrier fluid” as described in the specification. First, Plaintiff argues that the fluid must be a “sheath.” The term “sheath” does not appear in the '528 patent and would fail to clarify the term “carrier fluid” to a jury. Worse, a sheath would be understood by a POSA as a specific type of carrier fluid. Plaintiff’s shift in claim scope is apparent by its use of the term “compatible,” *i.e.* Plaintiff argues that the Court should restrict “carrier fluid” to a “sheath” that is “compatible” with “particles.” This is a transparent attempt to narrow the claim term to avoid prior art encompassing the term “carrier fluid” and should be rejected. Second, Plaintiff attempts to limit

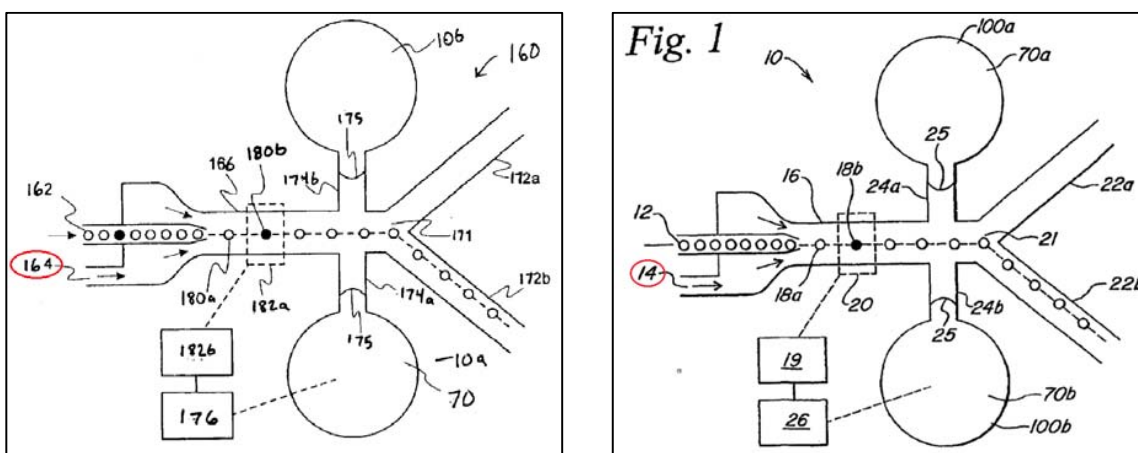
the term “carrier fluid” to only define fluid in specific locations, *i.e.* in a “duct or channel.” The specification, however, does not provide such a limitation; the POSA would not understand the same fluid that flows through and between several components of the claimed device to be named differently based on its location in the system. Third, claim 17 makes clear that the carrier fluid must be capable of “form[ing] a meniscus” in the side channel. Because a POSA would not understand the meniscus or the side channel to comprise a “sheath surrounding a particle,” Plaintiff’s proposal should be rejected.

Accordingly, Defendant’s construction should be adopted because “carrier fluid” is a technical term in the ’528 patent, and Defendant’s construction reflects the scope of the claim term as understood by a POSA in light of the specification.

3. Plaintiff’s Reply Position

Contrary to NanoCollect’s contentions, the definition of “carrier fluid” expressed in the ’850 Patent is highly relevant to the construction of the same term in the ’528 Patent because the two patents “derive from the same parent application and share many common terms.” *NTP, Inc. v. Research In Motion, Ltd.*, 418 F.3d 1282, 1293 (Fed. Cir. 2005) (citing *Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1350 (Fed. Cir. 2004) (relying on prosecution history of *later-issued* patent to construe common terms in earlier-issued patent)). The ’528 and ’850 Patent derive from Provisional Application No. 60/373,256, both cover microfluidic systems for particle sorting, and both name Manish Deshpande and John Gilbert as inventors. The patents also share many common terms, including “carrier fluid” and several other disputed terms identified by NanoCollect. *See* D.I. 39-1, Joint Claim Chart. Indeed, NanoCollect acknowledges that such common terms should be construed the same way by seeking consistent constructions for such terms across the asserted patents. *Id.*

With respect to “carrier fluid,” the ’528 and ’850 Patents’ specifications both use the term to describe “a sheath of compatible liquid surrounding a particle for carrying one or more particles through a duct or channel.” For example, Figure 16 from the ’528 Patent (left) and Figure 1 from the ’850 Patent (right) are nearly identical figures that show the carrier fluid entering a microfluidic device through supply duct 164 and then surrounding the injected particles to center them in a “sheath” as they pass through the device:



See ’528 Patent at 11:53–60 and ’850 Patent at 5:63–6:3 (providing the same descriptions for these common figures). Moreover, contrary to NanoCollect’s assertion, just because the carrier fluid must be “compatible” with particles and serve as a “sheath” does not mean the same fluid cannot also be located in “side channels” without particles. If that were the case, NanoCollect’s construction would be incorrect because it requires the “carrier fluid” to “contain[] particles.”

4. Defendant’s Sur-Reply Position

A POSA would have understood “carrier fluid” to mean “fluid containing the particles moving through the system.” Cytonome fails to substantively address NanoCollect’s proposed construction *as it relates to the* ’528 Patent’s claims and specification. Rather it attempts to

impermissibly import lexicography from a later patent's disclosure. Cytonome invites legal error. *See Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005).⁴

Contrary to Cytonome's contentions, the definition of "carrier fluid" expressed in the '850 patent is irrelevant to the construction of the same term in the '528 patent, even though the two patents "derive from the same parent application and share many common terms," because the specifications of the two patents are different. Cytonome cites to *NTP, Inc. v. Research In Motion, Ltd.*, (*supra* at 15), but fails to disclose that in *NTP* all the continuations of the single parent application contained the *same* written descriptions (418 F.3d 1282, 1289 (Fed. Cir. 2005)). Here, the two patents relate to different inventions and were developed by a different set of inventors. Ex. K, Di Carlo Decl., ¶¶ 89-90. Cytonome sheepishly makes one substantive argument: "just because the carrier fluid must be 'compatible' with particles and serve as a 'sheath' does not mean that the same fluid cannot also be located in 'side channels' without particles." *Supra* at 16. This erroneous argument relies on rewriting its own construction as "a sheath of compatible liquid surrounding a particle" requires that the sheath "surround[] a particle." NanoCollect, however, agrees that the carrier fluid can exist "without particles."

C. "pressure pulse"

| No. | Asserted Patents and Claims | Plaintiff's Proposed Construction | Defendant's Proposed Construction |
|-----|--|-----------------------------------|--|
| 7 | '528 cls. 18, 19, 22 '295 cls. 1-3, 9 | Plain and ordinary meaning | "a unidirectional flow to the [microchannel/supply |

⁴ *Invitrogen Corp. v. Clontech Labs., Inc.*, 429 F.3d 1052, 1078 (Fed. Cir. 2005) ("[T]he prosecution of one claim term in a parent application will generally not limit different claim language in a continuation application.")

| No. | Asserted Patents and Claims | Plaintiff's Proposed Construction | Defendant's Proposed Construction |
|-----|--|-----------------------------------|-----------------------------------|
| | '797 cls. 1-2, 13, 16, 18, 19 '850 cls. 1, 7, 8 '263 cls. 1, 5, 6, 15, 16 '188 cls. 1, 12, 17 | | duct]” |

1. Plaintiff's Opening Position

“Pressure pulse” needs no construction and should carry its plain and ordinary meaning. If the term is construed, however, it should be given a meaning consistent with how the patentee used the term during prosecution. For example, during prosecution of the '528 Patent, the patentee explained that pressure pulses “are *transient* increases in pressure.” *See* D.I. 39-3, 9/22/2004 Applicant Remarks at 9 (emphasis added). And during the prosecution of the '263 Patent, the patentee explained that a pressure pulse is “a *momentary* flow disturbance.” *See* D.I. 39-10, 6/6/2016 Applicant Remarks at 17 (emphasis added). NanoCollect's construction is inconsistent with the patentee's usage and should not be adopted.

2. Defendant's Response Position

Defendant's construction of “pressure pulse” to mean “a unidirectional flow to the [microchannel/supply duct]” should be adopted because it is consistent with a POSA's understanding of the term in light of the claims and specifications. Plaintiff argues that, if construed, the term should be understood as a “transient increase in pressure.” That characterization, however, is incomplete. The term “pressure pulse” as used in the Asserted Patents is a technical term describing how the actuator works to “selectively deflect a particle,” and describing what is “absorb[ed].” '528 patent (D.I. 1-1, Ex. 1) at cl. 18. As claimed in the '528 patent, the pressure pulse only moves in one direction: from the actuator to the microchannel/supply duct/stream of particles and then to the second reservoir/buffer. This is the

only understanding supported by the '528 patent. It is also consistent with the disclosure of the '263 patent, which shares the disclosure of Figs. 1-4 with the '528 patent, and makes the direction of the pressure pulse explicit in “deliver[ing] a transient pressure pulse *in a direction substantially perpendicular to a flow direction of the fluidic stream of particles.*” See the '263 patent (D.I. 1-1, Ex. 5) at 14:4-9. See also the '528 patent (D.I. 1-1, Ex. 1) at 12:46-50 (“the flow through the duct is deflected causing the selected particle of interest 178b located between the first side passage 174a and the second side passage 174b to be shifted *perpendicular to its flow direction* in the normal state.”) (emphasis added). As claimed, the pressure pulse described in the Asserted Patents is unidirectional pressure initiated at a particular location within the device and that moves in a single direction across the flow of the stream. This is consistent with NanoCollect’s proposed construction, “a unidirectional flow to the [microchannel/supply duct].”

In contrast, Cytonome’s proposed constructions seek to broaden the term beyond what can be supported by the claim language and the intrinsic record. Cytonome’s proposed constructions of “pressure pulse” as *any* “transient increases in pressure” or “momentary flow disturbance” encompass all possible changes in pressure or types of flow disturbance. For example, Plaintiff’s proposed construction of “a transient increase in pressure” would cover all transient increases, including even those transient increases that have no effect on the particles, much less deflect a particle. Such a construction is contrary to the meaning of the term “pressure pulse” as used in the Asserted Patents.

3. Plaintiff’s Reply Position

The Court should reject NanoCollect’s construction of “pressure pulse” because it improperly and unnecessarily injects a directionality (“a unidirectional flow . . .”) into the claim language. First, directionality cannot be read into the “pressure pulse” because, where the patentee intended to impose a directional requirement, it did so explicitly, using other claim

language. The best example of this is in claims 1 and 7 of the '850 Patent. Claim 1 includes a “pressure pulse” limitation, and claim 7—which depends from claim 1—narrows the scope of that “pressure pulse” limitation by specifying that the “pressure pulse is applied across the duct.” This demonstrates that the patentee intended the “pressure pulse” of claim 1 to be broader than the unidirectional pressure pulse of dependent claim 7.

Second, NanoCollect’s proposed construction would improperly exclude one of the embodiments described in the specification. *See Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1305 (Fed. Cir. 2007) (“We normally do not interpret claim terms in a way that excludes disclosed examples in the specification”). Figure 6 of the '850 Patent and the associated text describe a version of the claimed system without an actuating reservoir. Instead, a pressure wave generator (e.g., a plunger or a piezo) acts directly on the liquid in the main flow channel. '850 Patent, 9:39-44 (“[T]he pressure wave generator . . . can act upon the flowing liquid, either directly or via deflection . . .”). In this embodiment, the resulting pressure pulse would not be unidirectional. Instead, the pressure pulse would radiate outwardly in all directions, including upstream and downstream in the flow channel. Construing the pressure pulse to be unidirectional, as NanoCollect urges, would exclude the embodiment of Figure 6 from at least claim 1 of the '850 Patent. The Court should not adopt a construction that would read disclosed embodiments out of the claims. *See Verizon*, 503 F.3d at 1305.

4. Defendant’s Sur-Reply Position

A POSA reviewing the Asserted Patents would have understood the term “pressure pulse” to be “a unidirectional flow to the [microchannel/supply duct]” as this understanding is required by the patents’ claim language and consistent with the functional embodiments disclosed. Cytonome argues that NanoCollect’s construction should be rejected because it would improperly exclude a single embodiment of a single patent. *Supra* at 20. However, a POSA

would have understood that Figure 6 of the '850 patent describes an alternative embodiment without an actuating reservoir, or another “suitable pressure wave generator (*in place of a bubble valve*)” ('850 patent at 9:35-38 (emphasis added)) and, without more, is inoperable to sort particles as claimed. The '850 patent discloses this alternative embodiment that must have “a plunger that can act upon the flowing liquid . . . to selectively deflect particles.” *Id.* at 9:41-44. A POSA would have understood that “a plunger” would create a unidirectional flow toward the buffer and that simply placing an actuator in channel, without more, as shown in Fig. 6 could not be used for “particle sorting” as required by the Asserted Claims. Ex. K, Di Carlo Decl., ¶ 91.

To alter the proper construction of “pressure pulse” across six patents—which consistently claim and disclose a unidirectional flow—to encompass an inoperable embodiment would contradict the language of the claims and specifications of the Asserted Patents. *See TIP Sys., LLC v. Phillips & Brooks/Gladwin, Inc.*, 529 F.3d 1364, 1373 (Fed. Cir. 2008) (“to construe the claim term to encompass the alternative embodiment in this case would contradict the language of the claims. Indeed, read in the context of the specification, the claims of the patent need not encompass all disclosed embodiments. Our precedent is replete with examples of subject matter that is included in the specification, but is not claimed. Therefore, the mere fact that there is an alternative embodiment disclosed . . . does not outweigh the language of the claim, especially when the court’s construction is supported by the intrinsic evidence.”) (internal citation omitted); *Sinorgchem Co. v. ITC*, 511 F.3d 1132, 1138-39 (Fed. Cir. 2007).

The claims and the specifications of the Asserted Patents clearly support NanoCollect’s construction. Ex. K, Di Carlo Decl., ¶ 91. *See also* '850 patent, Claim 1 (“[a] particle sorting system” requiring “a buffer . . . for absorbing . . . *the* [singular] pressure pulse *to allow other particles in the stream of particles to normally flow*”) (emphases added); '263 patent, Claim 1 (“pressure pulse *in a direction* substantially *perpendicular* to a flow direction”) (emphases added).

D. “from the stream of particles”

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|------------|-------------------------------------|--|--|
| 8 | ’528 cls. 18, 22 ’188 cls. 1, 12 | Plain and ordinary meaning | “from the continuous moving procession of fluid and particles” |

1. Plaintiff’s Opening Position

“From the stream of particles” should carry its plain and ordinary meaning, and NanoCollect’s proposed construction—“from the continuous moving procession of fluid and particles”—should not be adopted. NanoCollect’s construction serves only to complicate the claim language by replacing the readily-understood word “stream” with “continuous moving procession.” NanoCollect also incorrectly expands the definition of “stream of particles” to encompass both the particles and the carrier fluid. This term appears in the context of a broader phrase, namely “deflect a particle . . . from the stream of particles.” Thus, when the claim is read using NanoCollect’s proposed construction of both “deflect” (i.e., “remove”) and “from the stream of particles,” NanoCollect’s proposals amount to requiring that the particle be removed from both the stream of particles AND the carrier fluid (“remove a particle . . . from the continuous moving procession of fluid and particles”). This is inconsistent with the specification’s description of the invention, which plainly encompasses simply re-directing a particle without removing it from the carrier fluid. *See, e.g.*, ’528 Patent, 12:14-21.

2. Defendant’s Response Position

Defendant’s construction of “from the stream of particles” is “from the continuous moving procession of fluid and particles” and should be adopted because it is consistent with a POSA’s understanding of the phrase in light of the claims and specifications. The claim phrase is

implicated by the asserted claims 18 and 22 of the '528 patent and 1 and 12 of the '188 patent. This claim phrase is not defined in the '528 or the '188 patents as having a special definition that differs from a POSA's understanding of the term in light of the specifications. Accordingly, a POSA would understand "from the stream of particles" as from the continuous moving procession of the fluid carrying the particles. The ordinary meaning of "stream" supports NanoCollect's proposed construction. *See* Ex. B at NANO_00009720 (the dictionary definition of "stream" is "a continuous moving procession"). In the context of the specifications of the '528 and the '188 patents, a POSA would understand that the particles are moving in a continuous procession.

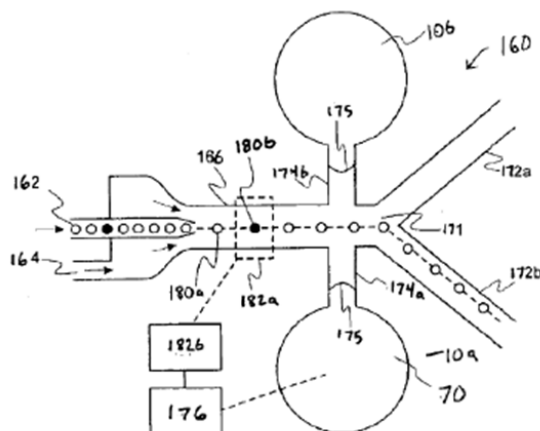


FIG. 16

See the '528 patent (D.I. 1-1, Ex. 1) at figs. 16, 17C; the '188 patent (D.I. 1-1, Ex. 7) at figs. 3, 5A, 5B, 5C, 5D (figures depicting continuous moving procession of the particles). Further, in the context of the specifications of the '528 and the '188 patents, a POSA would understand that the particles must be encompassed in a fluid because the particles cannot be introduced into or flow through the claimed devices without being encompassed in a fluid. *See* the '528 patent (D.I. 1-1, Ex. 1) at 11:53-57 (the stream of particles is introduced into the first supply duct); the '188 patent, fig 5A (figure depicting a stream of suspended particles).

Further, during the prosecution of the '528 patent, Plaintiff argued that the Dunaway reference “fails to teach or suggest using a pressure pulse to deflect a particle in a stream of particles flowing through a channel *from* the stream of particles.” *See* Ex. C (dictionary definition of “from” as “used as a function word to indicate physical separation or an act or condition of removal, abstention, exclusion, release, subtraction, or differentiation.”). Plaintiff asserted that “the Dunaway reference only teaches changing the path of an *entire* stream of fluid between two outlets”; further, Plaintiff asserted that the “Dunaway reference ... redirects the flow path of an entire stream of fluid”; “the pressure differential ... in Dunaway is ... transferred *to the stream of fluid* to change the flow path of the entire stream”; and that, unlike the claimed invention, “[t]here is no teaching or suggestion in Dunaway that a selected particle can be separated from the *stream of fluid* flowing through the fluid amplifier.” *See* Ex. F at CYTLLC_001297-298. Thus, Plaintiff’s own understanding of “from the stream of particles” is that the phrase “stream of particles” must necessarily encompass both the particles and the fluid.

Furthermore, again in the context of the specifications and claims of the '528 and the '188 patents, a POSA would understand that deflecting a particle in the stream of particles “from the stream of particles” is deflecting a particle from the continuous moving procession of the particles in a fluid. *See* the '528 patent (D.I. 1-1, Ex. 1) at cls. 18, 22, figs. 17A, 17B, 17C; the '188 patent (D.I. 1-1, Ex. 7) at cls. 1, 12, figs. 5A, 5B, 5C, 5D. Plaintiff even said so much during prosecution arguing that, unlike the claimed invention, “[t]here is no teaching or suggestion in Dunaway that *a selected particle can be separated from the stream of fluid* flowing through the fluid amplifier.” *See* Ex. F at CYTLLC_001298 (emphasis added). The USPTO allowed the '586 application as a result of this Response. *See id.* at CYTLLC_001279-282. Thus,

“from the stream of particles” is “from the continuous moving procession of fluid and particles,” consistent with the construction proposed by Defendant.

Plaintiff argues that Defendant’s proposed construction complicates the claim language by replacing “stream” with “continuous moving procession.” On the contrary, “continuous moving procession” is how a POSA would understand the plain and ordinary meaning of “stream” in light of the specification. Moreover, it provides the jury with a straightforward description of the term “stream” as used in the specification. Defendant’s construction, thus, assists the jury in understanding the language of this claim phrase. Plaintiff further argues that Defendant has expanded the definition of “stream of particles” to encompass both the particles and the carrier fluid. Plaintiff’s argument is incorrect. As disclosed in the specifications, a “stream of particles” would *necessarily* be suspended in a fluid in order to be introduced into or flow through the claimed devices; the devices would not work as claimed if the particles were not suspended in a fluid. As explained above, Defendant’s construction finds support in the specifications of the ’528 and the ’188 patents. Further, in the context of the broader phrase “deflect a particle ... from the stream of particles,” per Defendant’s proposed construction, a particle will be deflected from the continuous moving procession of fluid and particles, which is in line with the specifications of the ’528 and the ’188 patents. *See* the ’528 patent (D.I. 1-1, Ex. 1) at fig 17C; the ’188 patent (D.I. 1-1, Ex. 7) at fig. 5A.

3. Plaintiff’s Reply Position

NanoCollect’s construction is wrong because, as NanoCollect acknowledges, it could be understood to mean that deflected particles must be removed entirely from the carrier fluid and not just from the “stream of particles” as claimed. That understanding is contradicted by every sorting embodiment in the asserted patents, which show that an actuator deflects the particles to alter their paths within the carrier fluid. *See, e.g.,* ’188 Patent, 3:35–46, 4:59–5:6, 5:32–61, Figs.

3, 5A–5D; ’528 Patent at 12:35–59, Figs. 16–17C. NanoCollect mischaracterizes the prosecution history when arguing that “Plaintiff’s own understanding” is that the phrase must “encompass both the particles and the fluid.” In the prosecution history cited by NanoCollect, the Cytonome applicants never argued that Dunaway is different from the claimed invention because Dunaway fails to deflect particles from the “stream of fluid.” (*See* Ex. F to Decl. of I. Liston at CYTLLC_001297–298). The applicants’ argument was that Dunaway fails to deflect individual selected particles from the other particles because “[t]he Dunaway reference describes an actuator for a fluid amplifier that selectively redirects the flow path of an entire stream of fluid.” *Id.* at 1297 (emphasis in original); *see also id.* at 1298 (“[T]he Dunaway reference only teaches changing the path of an *entire* stream of fluid between two outlets.”) (emphasis in original).

In any event, NanoCollect’s construction is unnecessarily complicated. NanoCollect admits that the term “stream” takes on its “ordinary meaning” but further argues that using the phrase “continuous moving procession” in place of “stream” would “assist[] the jury in understanding the language of this claim phrase.” But NanoCollect fails to explain why a jury would fail to understand the ordinary meaning of the term “stream” on its own or, even if “stream” were unclear, why “continuous moving procession” is any more clear.

4. Defendant’s Sur-Reply Position

Cytonome disputes NanoCollect’s reading of the prosecution history, but not its proposed construction, accordingly “continuous moving procession” should be adopted as it clarifies the relative time and space claimed and described by the Asserted Patents. Cytonome asks the Court to disregard the *microfluidic* invention as claimed. For example, claim 18 of the ’528 patent provides “a stream of particles *in a carrier fluid*” and claims deflection of “a particle in the stream of particles *from the stream of particles*” (emphases added). Cytonome

does not explain how the particle “*in the stream of particles*”—which is in carrier fluid—deflects from that “stream of particles” but would *not* leave the carrier fluid.

Cytonome alleges that NanoCollect is unnecessarily complicating the meaning of the term “stream,” but fails to explain why providing a more specific readily understandable explanation that is wholly supported by the claims, specification, and prosecution history would complicate rather than elucidate the meaning of “from the stream of particles” for the jury.

The above positions would also be applicable to NanoCollect’s construction of “from the fluidic stream of particles” as used in claims 1, 14, and 19 of the ’263 patent.

E. “buffer” (’528 Patent)

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|-----|-----------------------------|--|---|
| 10 | ’528 cls. 18, 22, 24 | “a physical structure that contains fluid and receives a pressure pulse” | <p>1) Indefinite</p> <p>or</p> <p>(2) 35 U.S.C. 112 ¶ 6</p> <p>Structure: None disclosed in specification</p> <p>Function: “for absorbing a pressure [pulse/variation]”</p> |

1. Plaintiff’s Opening Position

- a) The intrinsic record makes clear that a “buffer” is “a physical structure that contains fluid and receives a pressure pulse.”*

The intrinsic record demonstrates that a “buffer” in the ’528 Patent claims is “a physical structure that contains fluid and receives a pressure pulse.” For example, claim 22 of the ’528 Patent recites two “side channels” that are “in communication with” a “primary channel for

conveying a stream of particles in a carrier fluid” and “a buffer in communication with the second side channel for absorbing the pressure pulse.” The phrase “in communication with” specifies that the fluid travels between the primary channel, the side channels, and the buffer—meaning the buffer must be capable of containing fluid. And the phrase “absorbing the pressure pulse” means that the buffer receives the pressure pulse so that it can be absorbed.

The specification further supports Cytonome’s construction by linking the “buffer” in the claims to a “reservoir” structure in the figures that receives a pressure pulse. For example, Figure 17A closely tracks claim 22, depicting a second side channel 174b in communication with a primary channel 166 and a fluid-filled “reservoir” 70. *See* ’528 Patent at Fig. 17A, 12:27–30. As indicated by the upward arrow in Figure 17A, this reservoir receives the pressure pulse generated by actuator 176. The reservoir in Figure 17A is therefore a physical structure that contains fluid and receives a pressure pulse and is one example of the claimed “buffer.”

The ’528 Patent file history similarly equates the term “buffer” to a “reservoir” that receives a pressure pulse. For example, in response to an office action, the applicants explained that the “Dunaway” reference lacks a “*buffer* for absorbing a pressure pulse” because the reference “teaches away from a second *reservoir* capable of absorbing a pressure variation of pressure pulse.” *See* D.I. 39-3, 9/22/2004 Applicant Remarks at 9 (emphases added). For these same reasons, the term has a clear and precise scope and is not indefinite.

b) The “buffer” terms are not “means-plus-function” terms.

The “buffer” terms in the ’528 Patent claims are not “means-plus-function” terms subject to 35 U.S.C. § 112 ¶ 6, as NanoCollect contends. As an initial matter, there is a presumption that the terms are not means-plus-function terms because they do not use the word “means.” *See Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349 (Fed. Cir. 2015). And NanoCollect cannot overcome this presumption because “buffer” is not merely a “nonce word” tantamount to

using the term “means.” *See TEK Glob., S.R.L. v. Sealant Sys. Int’l*, 920 F.3d 777, 786 (Fed. Cir. 2019) (referring to “‘mechanism,’ ‘element,’ ‘device’” as possible “nonce” words). Indeed, as shown above, “buffer” refers to a specific physical structure that contains fluid, receives a pressure pulse, and performs the claimed “absorbing.” Additionally, dependent claim 24 removes any doubt that the buffer is a structure by reciting a particular structural feature—namely, “a flexible membrane”—that comprises the buffer. *See TEK*, 920 F.3d at 786 (holding that “conduits” in an independent claim is not a means-plus-function term where dependent claims recite “particular structural features”—e.g., “hoses”—that comprise the “conduits”).

Even if the “buffer” terms are “means-plus-function” terms, NanoCollect incorrectly contends that there is no structure disclosed in the specification for carrying out the alleged function of “absorbing a pressure [pulse/variation].” For example, the specification explicitly discloses such a structure when it explains that the valve, side channels, and reservoir in Figure 16 “*absorb the transient pressure variations*” that are “induced via the actuator 176.” *See* ’528 Patent at 12:27–30 (emphasis added); *see also* Figs. 17a–c.

2. Defendant’s Response Position

a) *The term “buffer” has no plain and ordinary meaning as used.*

The term “buffer” is indefinite because the term is not used, let alone defined, anywhere in the specification of the ’528 patent and the POSA would not understand its metes and bounds. There is no commonly understood structure associated with the term “buffer,” it does not have a plain and ordinary meaning as used, and was not commonly used in the field of microfluidics to describe components that receive pressure pulses at the time of the invention. Cytonome, the patent drafter, proposes the construction “a physical structure that contains fluid and receives a pressure pulse.” *Supra* at 27. This definition, however, could encompass any number of structures described in the ’528 patent, including side channel 174b attached to bubble valve 10b

in Figure 16. Side channel 174b is a physical structure that contains a fluid and receives a pressure pulse. There is no way for a POSA to have notice of what the term “buffer” means if the patent owner itself affirmatively construes “buffer” so broad as to cover multiple disclosed, and otherwise claimed, components. Cytonome’s definition of “buffer” is also conspicuously similar to its initial construction of a “reservoir,” which it defined as a “a physical structure that contains fluid,” D.I. 37 at 2, wherein claim 17 claims a “reservoir for absorbing a pressure pulse.”

The prosecution history of the ’528 patent provides additional persuasive evidence that the term “buffer” has nowhere been described in the specification of the ’528 patent. During examination of Application No. 14/689,508 (which is a continuation of the ’528 patent and shares the ’528 patent’s specification), the Examiner rejected claim 10 due to its unsupported use of the term “buffer reservoir.” Specifically, the Examiner stated “Claim 10 recites the microfluidic device comprising a buffer reservoir; however, after reviewing the specification, the Examiner contends that the specification does not provide a description for a buffer reservoir. In fact, the only instance in which the word “buffer” is recited is in the text of claim 10.” Ex. G at NANO_00009744. Rather than reply to the Examiner’s rejection, either by arguing that the POSA would understand the term by its plain and ordinary meaning or pointing to specific structure disclosed in the specification defining the buffer’s limitations, Cytonome acquiesced and amended the claim. *Id.* at NANO_00009734-735. In each subsequent application, Cytonome replaced the term “buffer” with other terms and/or disclosed new structure. The specification at issue in Application 14/689,508 is the same as the specification of the ’528 patent. A POSA would not understand the metes and bounds of the term “buffer” as the ’528 specification provides no sufficiently definite structure.

b) Alternatively, the term “buffer” is a nonce term invoking a means-plus-function construction

Claim 18 of the '528 patent recites “a buffer for absorbing the pressure pulse.” As described above, the term “buffer” does not have a plain and ordinary meaning as used in the specification, is not used or defined in the specification, and does not sufficiently define a structure. As such, the term “buffer” acts as a nonce term. *See Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1350 (Fed. Cir. 2015) (finding claim “merely replaces the term ‘means’ with ‘nonce’ word ‘module,’ thereby connoting a generic ‘black box’ for performing the recited . . . functions.”). The claim, “buffer,” is a generic blackbox and is only defined by what it *does*, *i.e.*, its function (“absorbing the pressure pulse”) rather than what it structurally is. Thus, the presumption that the claim is not a means-plus-function claim because it does not use the term “means” is overcome. *Id.* at 1348 (“our cases have emphasized that the essential inquiry is not merely the presence or absence of the word ‘means’ but whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure.”).

As discussed above, the '528 specification has no disclosure supporting the term “buffer.” Plaintiff argues that dependent claim 24 proves that “buffer” is a structure by reciting particular structural feature—*i.e.*, “a flexible membrane” that could comprise a buffer. *Supra* at 29. Plaintiff does not explain how the independent claim without this more structural limitation would be understood by a POSA as defining a particular structure. Accordingly, the specification discloses no corresponding structure for this element.

Cytonome contends that as understood by the '528 specification, the term “buffer” is understood to the POSA as “a physical structure that contains fluid and receives a pressure pulse.” Cytonome’s proposed construction is erroneous for several reasons. Despite arguing that

“the buffer terms are not means-plus-function terms,” Cytonome’s own construction of the term “buffer” invokes § 112, para 6. Cytonome construes a buffer to be “a *physical structure* that contains fluid and receives a pressure pulse.” *Supra* at 27 (emphasis added). A “physical structure” is literally a nonce term describing a physical structure as it fails to sufficiently define or specify any *particular* structure. Cytonome merely defines this physical structure by its alleged function (to contain fluid and receive a pressure pulse) without identifying corresponding structure.

Plaintiff argues that such a structure is disclosed and points to “valve, side channels, and reservoir in Figure 16” as structures that “absorb the transient pressure variations.” *Supra* at 29. Plaintiff further points to “fluid-filled ‘reservoir’” 70 of Figure 17A of the ’528 patent. *Supra* at 28. Claim 26 makes clear that a “buffer” can “compromise[] air trapped in a sealed reservoir.” Accordingly, “air trapped in a sealed reservoir” is narrower than “buffer.” As discussed, Plaintiff argues that a buffer’s corresponding structure is “the valve, side channels, and reservoir”—other claimed elements in the ’528 patent. However, the POSA would not understand that these structures alone are sufficient to “absorb[] the pressure pulse.” Rather, the structures in the specification that would allow “buffer” to be understood by the POSA to have a sufficiently definite structure would at least include 70 (described as 70b), 10b, 174b, and 175 as disclosed by the specification and should thus alternatively be construed to require these structures.

3. Plaintiff’s Reply Position

a) “Buffer” has a well-understood meaning and is not indefinite.

NanoCollect offers *no* evidence to support its contention that a “POSA would not understand” the scope of the term “buffer,” falling well short of the “clear and convincing evidence” needed to prove indefiniteness. *BASF Corp. v. Johnson Matthey Inc.*, 875 F.3d 1360, 1365–68 (Fed. Cir. 2017). In *BASF*, the Federal Circuit reversed an indefiniteness finding in a

similar case to this one where the defendant failed to cite any relevant evidence of what a person of skill would understand. There, the claim-at-issue recited “a material composition A effective for catalyzing NH₃ oxidation.” *Id.* at 1362–63. The district court found the claim indefinite because “a person of ordinary skill in the art could not determine which materials are within the ‘material composition A.’” *Id.* at 1365–66. The Federal Circuit reversed that finding because the rationale was “entirely unsupported, whether by reference to the specification or other intrinsic evidence or by reference to extrinsic evidence.” *Id.* at 1366–67. Here, NanoCollect also fails to cite any intrinsic or extrinsic evidence to support its bald assertion that “the POSA would not understand [the] metes and bounds” of the term “buffer,” and thus its indefiniteness argument should likewise be rejected.⁵

The *BASF* court also disregarded an expert opinion analogous to NanoCollect’s assertion that “[t]here is no way for a POSA to have notice of what the term ‘buffer’ means if the patent owner itself affirmatively construes ‘buffer’ so broad as to cover multiple disclosed, and otherwise claimed, components.” The *BASF* defendant’s expert argued that “there are effectively a ‘limitless number’ of materials that can” serve as the claimed “material” and thus the claim is indefinite. *Id.* at 1364. In rejecting that argument, the Federal Circuit viewed the specification’s “numerous examples” of the claimed material as evidence *against* indefiniteness, and further noted that patentability did not turn on the particular material chosen. *Id.* at 1367–68. Similarly, here, the ’528 Patent discloses several examples of buffer structures used for “absorbing” a

⁵ This Court should also reject NanoCollect’s indefiniteness argument because it is based on mere attorney argument. *See, e.g., Dasso Int’l, Inc. v. Moso N. Am., Inc.*, C.A. No. 17-1574-RGA, 2019 WL 2135855, at *2 (D. Del. May 16, 2019); *MiiCs & Partners Am., Inc. v. Toshiba Corp.*, C.A. No. 14-803-RGA, 2016 WL 4573103, at *10 n. 3 (D. Del. Aug. 31, 2016); *M2M Sols. LLC v. Sierra Wireless Am., Inc.*, C.A. No. 12-30-RGA, 2016 WL 1298961, at *3, 6 (D. Del. Mar. 31, 2016); *IBSA Institut Biochimique, S.A. v. Teva Pharm. USA, Inc.*, C.A. No. 18-555-RGA, 2019 WL 3936656, at *9 (D. Del. Aug. 20, 2019).

pressure pulse, and patentability does not turn on the particular structure chosen. *See, e.g.*, '528 Patent at 12:27–30. Therefore, if anything,⁶ NanoCollect's acknowledging that the specification discloses “multiple” components that could serve as a buffer cuts *against* indefiniteness.

In any event, a person of skill would readily understand the term “buffer” as a “physical structure that contains fluid and receives a pressure pulse” in light of the intrinsic evidence. Ex. H, Vacca Decl. ¶ 35–43. A person of skill would consider the top “reservoir 70” in Figure 17A of the '528 Patent as one example of a buffer because it receives the pressure pulse to be absorbed and is connected to a “side channel” as described, for example, in claim 22. Ex. H, Vacca Decl. ¶ 35–43.

References cited during prosecution further demonstrate that “buffer” was commonly used in the art to describe such pressure-absorbing structures. For example, U.S. Patent No. 5,777,649 to Otsuka (“Otsuka”)—which covers an “ink jet printing head”—repeatedly refers to a “buffer chamber” or “buffering chamber” that is a chamber structure “for retaining air to absorb vibration of the ink.” Otsuka at 6:24–39, Figs. 1 and 2 (depicting a “buffer chamber” as component 13); Ex. H, Vacca Decl. ¶ 38. And although the asserted patents are distinguishable over Otsuka and the other prior art, allowance did not hinge on a different use of the term “buffer” in the prior art than in the claims.

Moreover, the '528 Patent's prosecution history shows that the term “buffer” is used interchangeably with a “reservoir” that receives a pressure pulse. During prosecution, the applicants added claims reciting “*a buffer . . . for absorbing a pressure variation*” and amended other claims to recite “a second *reservoir* for absorbing a pressure variation.” D.I. 39-2 at 2–5

⁶ NanoCollect's argument should not even be considered because, unlike the defendant in *BASF* (who provided an expert declaration), NanoCollect fails to offer any evidence of what a person of skill would understand.

(emphasis added); *see also* D.I. 39-3, Applicant Response at 7. The Examiner likewise made no distinction between the terms, rejecting both the “buffer” and “reservoir” claims based on “reservoirs” described in Dunaway. Ex. I, 6/22/2004 Office Action at 2. The Examiner and the applicants therefore both used the terms “buffer” and “reservoir,” and a reservoir is a well-understood structure in the art. Ex. H, Vacca Decl. ¶¶ 19–34.

Finally, NanoCollect cites no authority for its suggestion that “buffer” may be indefinite solely because the term is not expressly defined or described in the specification. That is not the law. Courts regularly reject indefiniteness arguments in such cases. *See, e.g., Trover Grp., Inc. v. Tyco Int’l, Ltd.*, No. 2:13-CV-0052-WCB, 2014 WL 3736340, at *9 (E.D. Tex. July 28, 2014) (Bryson, J.) (citing *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014)); *STX, LLC v. Epoch Lacrosse, LLC*, C.A. No. RDB-14-3511, 2015 WL 4885534, at *7 (D. Md. Aug. 14, 2015).

b) “Buffer” is not a “nonce” word and does not invoke a means-plus-function construction.

As explained above, the term “buffer” invokes a structure described in the intrinsic record—namely a physical structure that receives a pressure pulse—and thus does not trigger § 112 ¶ 6. NanoCollect incorrectly contends that a term “defined by what it *does*” is necessarily a “nonce word” that rebuts the presumption against invoking § 112 ¶ 6 here. That is not the standard.⁷ Section 112 ¶ 6 does not apply “if the claim term is used in common parlance or by persons of skill in the pertinent art to designate structure, even if the term covers a broad class of

⁷ Even if it were the standard, “buffer” would not be subject to § 112 ¶ 6 because the term is not defined solely by “what it does.” A “buffer” must be an actual, physical structure in the claimed microfluidic device. If the pressure pulse were “absorbed” or “dampened” by removing fluid from the device, for example, the “absorbing” or “dampening” functions would occur, but there is not necessarily a physical “buffer” present.

structures and *even if the term identifies the structures by their function.*” *Skky, Inc. v. MindGeek s.a.r.l.*, 859 F.3d 1014, 1019–20 (Fed. Cir. 2017) (emphasis added) (quotes omitted).⁸

Moreover, although NanoCollect fails to address it, the *TEK Global* case explained that “particular structural elements” added in dependent claims are additional evidence against subjecting a related *independent claim* to § 112 ¶ 6. 920 F.3d at 786. NanoCollect does not dispute that the “flexible membrane” in dependent claim 24 describes a “particular structural feature” that can be part of the claimed “buffer.” Accordingly, the intrinsic record shows that the term “buffer” was used by the patentees and persons of skill in the art to designate structure and is not a “nonce” word.

To the extent the Court considers them, dictionary definitions further militate against invoking § 112 ¶ 6 because they define “buffer” “as a noun denoting structure.” *See Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1360 (Fed. Cir. 2004), *overruled on other grounds by Williamson*, 792 F.3d at 1339. Similar to the way “connector” was defined in *Lighting World* as “any of various devices for connecting one object to another” (382 F.3d at 1360), Merriam-Webster defines “buffer” as “any of various devices or pieces of material for reducing shock or damage due to contact” (Ex. J). This is strong evidence that “buffer” would be understood by a person of skill to designate structure and is not subject to § 112 ¶ 6. *Wasica Fin. GMBH v. Schrader Int’l, Inc.*, C.A. No. 13-1353-LPS, 2019 WL 1011321, at *8 (D. Del. Mar. 4, 2019) (viewing dictionary definition “as strong evidence that the term [‘switching element’] would have a known meaning to a person of ordinary skill” and declining to apply § 112 ¶ 6 despite the term’s “functional” definition).

⁸ *See also Personalized Media v. Int’l Trade Comm’n*, 161 F.3d 696, 705 (Fed. Cir. 1998) (refusing to construe “detector” as a means-plus-function term even though “a ‘detector’ is defined in terms of its function” and “does not connote a precise physical structure in the minds of those of skill in the art”)).

Finally, if NanoCollect maintains its position that “buffer” is indefinite even if the Court were to rule that § 112 ¶ 6 applies, NanoCollect would be incorrect. As NanoCollect acknowledges, the patent provides at least one example of a structure that a person of skill would understand as a “buffer,” namely components “70 (described as 70b), 10b, 174b, and 175 as disclosed by the specification.” This alone is sufficient to overcome any indefiniteness challenge to a means-plus-function claim. *See Intel Corp. v. VIA Technologies*, 319 F.3d 1357, 1365–67 (Fed. Cir. 2003) (holding that claim was “not indefinite merely because no specific circuitry is disclosed” where patentability did not turn on the specific circuitry employed) (citing *In re Kullmann*, 115 F.3d 942, 946–47 (Fed. Cir. 1997) (holding that a computer was the structure to perform the claimed function even though “computer” did not appear in the specification)).

4. Defendant’s Sur-Reply Position

Cytonome equates “buffer” with “reservoir,” and provides identical constructions for both the terms: “a physical structure that contains fluid,” with “buffer” further construed as “a physical structure that contains fluid and receives a pressure pulse.” *Supra* at 34-35, *Infra* at 53. “Buffer” and “reservoir” as claimed are “generic terms . . . that operate, like means, to claim particular function rather than describe a sufficiently definite structure.” *MTD Prods. Inc. v. Iancu*, 933 F.3d 1336, 1341 (Fed. Cir. 2019) (citation & internal quotations omitted). These claim terms/phrases should be construed as means-plus-function. The claim terms “buffer” and “reservoir” as used in the Asserted Patents are nonce terms that substitute for the word “means.” These claim terms are only defined in the applicable claims by function. Ex. K, Di Carlo Decl., ¶¶ 45-80. As such, the terms “buffer” and “reservoir” simply recite a function rather than definite structure, and, thus, should be construed as means-plus-function limitations.

Specifically, addressing the construction of “buffer” as used in the ’528 patent, Cytonome argues that the “‘flexible membrane’ in dependent claim 24 describes a ‘particular structural feature’ that ‘can be’ part of the claimed ‘buffer.’” *Supra* at 36. Tellingly, Cytonome never tells the

Court what *is necessarily* part of the claimed buffer. The mere fact that a dependent claim recites structure for a claim term does not mean that the term, as found in the independent claim, escapes the mandate of 112 ¶ 6. *Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1538 (Fed. Cir. 1991) (holding that a term “cannot escape” the § 112, ¶6 mandate by merely adding a dependent claim specifically reciting a structure for that term). Further, Cytonome’s reliance on *TEK Global, S.R.L. v. Sealant Sys. Int’l*, 920 F.3d 777 (Fed. Cir. 2019) is unavailing and *Williamson v. Citrix Online, LLC* provides that “§112, para. 6 will apply 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*’” 792 F.3d 1339, 1349 (Fed. Cir. 2015)) (citation omitted, emphasis added). Here, knowing that a buffer “can” comprise a “flexible membrane”,⁹ as Cytonome indicates, is insufficient for a POSA to understand the metes and bounds of “buffer” that absorbs a pressure pulse if not construed as means-plus-function. Ex. K, Di Carlo Decl., ¶¶ 45-80. A POSA would have understood that the intrinsic evidence clearly links and associates the gas filled area, side channels, and meniscus to the claimed functions of absorbing and/or dampening the pressure pulse (*id.*, ¶¶ 54, 59, 62, 67, 72, and 74), and the fluid filled structure and side channels to the claimed functions of generating/originating the pressure pulse (*id.*, ¶¶ 77, 79, and 80). A POSA would have understood that these structures are corresponding structures to achieve the claimed functions.

Cytonome’s construction of a “physical structure that contains fluid and receives a pressure pulse” would cover multiple disclosed, and otherwise claimed, components. For instance, while Plaintiff asserts “the top ‘reservoir 70’ in Figure 17A of the ’528 patent as one example of a buffer” (*supra* at 34), under Plaintiff’s construction, a POSA would have understood numerous structures in the ’528 patent be a “buffer” as they are physical structures that contain fluid and receive a pressure pulse. Ex. K, Di Carlo Decl., ¶ 50. Moreover, instead of clarifying the structure of “buffer,” Cytonome’s proposed construction refers to a “physical

⁹ *Williamson* overruled the strict requirement of “a showing that the limitation essentially is devoid of anything that can be construed as structure.” *Id.* at 1349.

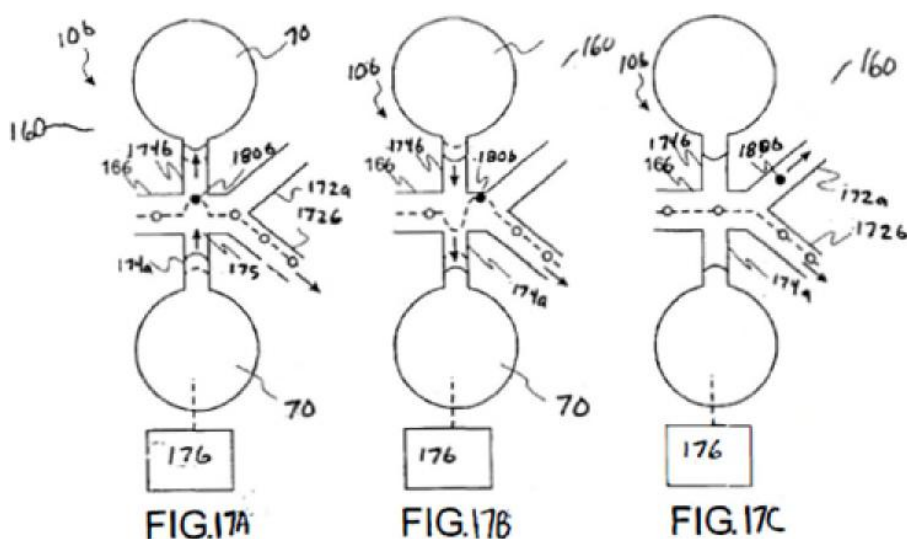
structure,” which is literally a nonce term as it fails to sufficiently define or specify any *particular* structure, and Cytonome defines this physical structure merely by its alleged function (to contain fluid and receive a pressure pulse). *Supra* at 35; Ex. K, Di Carlo Decl., ¶¶ 49-50.

Although Cytonome cites to the dictionary definition of “buffer” as “*any* of various devices or pieces of material *for* reducing shock or damage due to contact” (*supra* at 36) (emphasis added), this definition further demonstrates that “buffer” is a nonce term that fails to provide sufficient structure for the buffer. *Verint Sys. Inc. v. Red Box Recorders Ltd.*, 166 F. Supp. 3d 364, 379-80 (S.D.N.Y. 2016).

These arguments for the use of the term “buffer” in the ’528 patent also apply to the use of the terms “buffer” and “reservoir” in the other Asserted Patents to claim function that a POSA would not understand without the corresponding structure identified, specifically, claim terms/phrases 11, 19, 41e, 41f, 41i, 41j, 41k, 41l, 42a, and 42b. Ex. K, Di Carlo Decl., ¶¶ 45-80. Further, the use of the words “adapted for” along with the term “reservoir” supports invocation of § 112, ¶6 for “reservoir” because “reservoir” is defined in the claim only by its function. Ex. K, Di Carlo Decl., ¶ 59. *Sarif Biomedical LLC v. Brainlab, Inc.*, No. 13-846-LPS, 2015 WL 5072085, at *6 (D. Del. Aug. 26, 2015) (The Court held that “Claim 1’s ‘computer adapted to’ perform this function is an insufficient disclosure of structure as there is no disclosure as to how the computer would perform the function” explaining that “‘the fact that one of skill in the art could program a computer to perform the recited functions cannot create structure where none otherwise is disclosed.’”) (quoting *Williamson*, 792 F.3d at 1351).

Given § 112 ¶ 6 applies to the term “buffer” and “reservoir” as used in the Asserted Patents, the components in the specification of the Asserted Patents that would provide a sufficiently definite structure of “buffer” and “reservoir” to a POSA include at least include 70 (described as 70b), 10b, 174b, and 175 of the ’528 patent; 70a, 100a, 24a, and 25 of the ’850 patent; 10a, 70, and 174a of the ’295 patent; and 70a, 70b, 100a, 100b, 25a, 24a, and 24b of the ’263 patent. *Id.*, ¶¶ 60, 63, 70, 73, 74, 77, 79, and 80.

As Cytonome agrees that components “70 (described as 70b), 10b, 174b, and 175 as disclosed by the specification” of the ’528 patent provide at least one example of a structure that a POSA would have understood as a “buffer” (*supra* at 37), the structures of “buffer” and “reservoir” for the ’850, ’295, and ’263 patents should be similarly equated to the corresponding components of their respective specifications as identified above and by Dr. Di Carlo in his accompanying declaration. Ex. K, Di Carlo Decl., ¶¶ 60, 63, 70, 73, 74, 77, 79, and 80.



F. “buffer” (’850 Patent)

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|-----|-----------------------------|--|---|
| 11 | ’850 cls. 1, 11 | “a physical structure that contains fluid and receives a pressure pulse” | <p>1) Indefinite</p> <p>or</p> <p>(2) 35 U.S.C. 112 ¶ 6</p> <p>Structure: [Buffer chamber/reservoir] 70a, buffer chamber 70b, buffer bubble valve 100a, buffer bubble valve 100b, or valve 100</p> <p>Function:</p> |

| | | | |
|--|--|--|---|
| | | | “for absorbing or dampening the pressure pulse” |
|--|--|--|---|

1. Plaintiff’s Opening Position

The above arguments for the term “buffer” in the ’528 Patent apply to the “buffer” term in the related, later-issued ’850 Patent. *See Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 980 (Fed. Cir. 1999). The ’850 Patent specification further supports that “buffer” means “a physical structure that contains fluid and receives a pressure pulse.” For example, regarding Figure 1, the specification explains that “[t]he second bubble valve 100a serves as **a buffer** for absorbing the pressure pulse.” ’850 Patent at 6:24–26 (emphasis added); *see also id.* at 9:35–56 (repeatedly referring to “100b” in Figure 6 as a “buffer”); 9:57–61 (referring to “valve 100” in Figure 7 as “a buffer”). As shown in the figures, these “buffer” structures contain fluid and receive a pressure pulse from an actuator (26) or pressure wave generator (260).

Moreover, NanoCollect cannot overcome the presumption that the “buffer” terms—which do not use the word “means”—are not means-plus-function claims because the term “buffer” itself provides the structure for performing the function of “absorbing or dampening the pressure pulse.” Indeed, “buffer” must be a structural term because dependent claim 11 of the ’850 Patent explicitly recites that the buffer can be comprised of a specific structure, namely “a non-flow-through chamber in fluid communication with the duct.” *See TEK*, 920 F.3d at 786.

2. Defendant’s Response Position

a) *The term “buffer” has no plain and ordinary meaning as used.*

The arguments presented above for the term “buffer” in the ’528 patent also apply to the term “buffer” as used in the continuation-in-part issued as the ’850 patent. The limitations of the specification and claims of the ’528 patent in failing to describe the structure of “buffer” and how it is configured to receive a pressure pulse were not addressed in the later-filed ’850 patent.

b) Alternatively, the term “buffer” is a nonce term invoking a means-plus-function construction

The term “buffer” in the claim 1 of the ’850 patent is described using functional language, not structure: “a buffer configured to fluidically co-operate with the actuator for absorbing or dampening the pressure pulse.” The words “configured to” in claim 1 of the ’850 patent support invocation of § 112, para 6 for “buffer” because the claim term “buffer” is only defined in the claim by its function, which is to “fluidically co-operate with the actuator for absorbing or dampening the pressure pulse.” As such, the term “buffer” acts as a nonce term. As discussed above, the ’850 specification has no disclosure supporting the term “buffer.” Plaintiff argues that dependent claim 11 proves that “buffer” is a structure by reciting a particular structural feature—i.e., “a non-flow through chamber in fluid communication with the duct”. *Supra* at 41. Under this understanding a “buffer” requires “a non-flow through chamber.” Plaintiff does not explain how the independent claim without additional structural limitation would be understood by a POSA as defining a particular structure.

Further, Plaintiff contends that as understood by the ’850 specification, the term “buffer” is readily understandable to the POSA as “a physical structure that contains fluid and receives a pressure pulse.” As discussed above, Cytonome’s proposed construction similarly evokes means-plus-function. The structure in the specification that would allow “buffer” to be understood by the POSA to have a sufficiently definite structure includes 70a , 100a, 24, and 25 as disclosed by the specification and should thus be construed to require these structures. *See* the ’850 patent (D.I. 1-1, Ex. 4) at 6:33-36 (“a buffer chamber 70a in the second bubble valve 100a for absorbing pressure transients”); 7:31-37 (“Basically, the reservoir 70a of the second bubble valve 100a is a buffer chamber having a resilient wall or containing a compressible fluid, such as a gas.

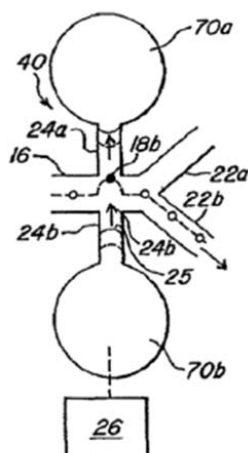


Fig. 2

The resilient properties allow the flow of liquid from the measurement duct into the second side passage 24a, allowing the pressure pulse to be absorbed and preventing disturbance to the flow of the non-selected particles in the stream of particles.”); 10:2-4 (“The carrier fluid in the side passage 24a forms a meniscus 25 at the interface between the side passage and the chamber.”).

The structure Plaintiff points to as supporting “buffer” includes at least second bubble valve 100a of Figure 1, 100b in Figure 6, and valve 100 in Figure 7 of the ’850 patent. *Supra* at 41.

3. Plaintiff’s Reply Position

The arguments for the term “buffer” in the ’528 Patent also apply to the ’850 Patent. Ex. H, Vacca Decl. ¶ 42–43. Additionally, the specification *repeatedly* uses the term in a way that confirms NanoCollect’s construction that a “buffer” is a structure that contains fluid and receives a pressure pulse. *Id.*; ’850 Patent at 6:24–26 (describing component 100a in Fig. 1 as “a buffer for absorbing the pressure pulse”), 9:51–53 (describing “buffer 100b” as a structure having a “spring constant” and a “volume”). Indeed, NanoCollect acknowledges that the term “buffer” refers to specific structures in the specification (e.g., components “70a, 100a, 24, and 25”) and is not “used in a purely functional manner.” See *Flo Healthcare Sols., LLC v. Kappos*, 697 F.3d 1367, 1374 (Fed. Cir. 2012) (holding Patent Trial and Appeal Board erred by invoking § 112 ¶ 6

where “[t]he term ‘height adjustment mechanism’ appear[ed] in the written description of the ’178 patent twenty-four times, and not once [wa]s it used in a purely functional manner”). That is different from using a “nonce word” in a claim to invoke a function (such as “a means for absorbing the pressure pulse”), which would have limited the claim to a structure (such as a “buffer” or “reservoir”) disclosed in the specification that can perform the claimed function.

4. Defendant’s Sur-Reply Position

See Defendant’s Sur-Reply Position for the term “buffer” (’528 Patent).

G. “selectively applying”

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|-----|-----------------------------|-----------------------------------|-----------------------------------|
| 12 | ’528 cl. 18 ’850 cl. 1 | Plain and ordinary meaning | Indefinite |

1. Plaintiff’s Opening Position

“Selectively applying” in the claim term “selectively applying a pressure pulse” is not indefinite. “[A] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Here, as the specification describes, the pressure pulse is applied to selectively deflect particles with a predetermined characteristic in a different direction. See ’528 Patent, 4:35-41. In this context, a person of skill in the art would readily understand that the pressure pulses are not applied randomly, but rather based on the characteristics of the particle to be deflected. Thus, the term “selectively applying” read in light of the specification reasonably informs a person of skill in the art about the scope of the invention, and is not indefinite.

2. Defendant's Response Position

The claim term “selectively applying” as recited in claim 18 of the ’528 patent and claim 1 of the ’850 patent in respect of “an actuator for selectively applying a pressure pulse” is indefinite under 35 U.S.C. § 112, ¶ 2. For example, it is unclear how the “actuator” can “selectively” apply a pressure pulse as opposed to simply “applying a pressure pulse.” Indeed, this claim term is not commonly used in the field of microfluidics in the context of an “actuator” applying a pressure pulse to deflect a particle in the stream of particles. Further, the specifications and claims of the ’528 patent and the ’850 patent do not define “selectively applying” or describe how an “actuator” is configured to “selectively” apply a pressure pulse. In fact, the specification makes clear that the actuator is a standard stand-alone component and is not specially adapted to “selectively apply” a pressure pulse. *See* the ’528 patent (D.I. 1-1, Ex. 1) at 7:23-25 (“[t]he actuator 50 may comprise *any suitable device* for deflecting the wall, such as an electromagnetic actuator or a piezoelectric element.”) (emphasis added).

Plaintiff refers to a single example embodiment in the specification of the ’528 patent wherein the embodiment is described to comprise “an actuator for deflecting the meniscus to create a pressure pulse to selectively deflect a particle having the predetermined characteristic.” *Supra* at 44-45, citing to the ’528 patent at 4:35-41. Here, the language “to selectively deflect a particle having the predetermined characteristic” only conveys the purpose of “selectively applying” a pressure pulse and does not sufficiently describe the structure of an actuator to “selectively apply” a pressure pulse. Plaintiff’s emphasis on the selection being based on the “characteristics of the particle to be deflected,” (*id.*) is limited to addressing the parameter of selective application, which does nothing to explain how a standard off the shelf actuator can “selectively apply” a pressure pulse. Furthermore, the specifications and claims of the ’528 patent and the ’850 patent do not identify any embodiment of an actuator that selects, among

others, when, where, and how much pressure pulse to apply to deflect a particle in the stream of particles. Typically, a standard off the shelf actuator does not inherently select when, where, and how much pressure pulse to apply. A standard actuator would require additional structures or qualities to select when, where, and how much pressure pulse to apply. No information regarding the structural features of an actuator to “selectively apply” a pressure pulse is recited in the specifications of the ’528 patent or the ’850 patent. Accordingly, a POSA cannot determine the metes and bounds of claims reciting “selectively applying” given the term does not have a plain and ordinary meaning as used and is not defined or described in the claims and specifications. The term an actuator for “selectively applying” is, therefore, indefinite.

3. Plaintiff’s Reply Position

The claim term “selectively applying” is not indefinite. NanoCollect’s argument depends on a deliberately obtuse reading of the claim language. NanoCollect misreads the claim language “an actuator for selectively applying,” interpreting that language to require the actuator itself to “select when, where, and how much pressure pulse to apply.” NanoCollect offers no evidence to support its assertion that a POSA would understand the claims this way. The actuator, though, need not actually make those “selection” decisions itself, and the patent specification makes clear that an actuator “selectively applying” a pressure pulse is readily understood by persons of skill in the art. As explained in the “Background” section of the ’850 Patent, known sorting devices—typically involving a computer—can analyze particles and decide how particles will be handled. ’850 Patent, 1:44-55. That decision is then used to electrically activate the actuator to generate a pressure pulse. *Id.* at 1:53-55 (“The outcome of the decision is then applied to deflect the direction of specific particle . . .”); *id.* at 2:45-50 (“ . . . an electrically activated transducer is located in the channel for deflecting a specific particle having an appropriate predetermined characteristic . . . yielding upon electrical activation a

pressure wave in the channel”). NanoCollect offers no evidence to contradict the specification or otherwise support its indefiniteness argument.

4. Defendant’s Sur-Reply Position

“Selectively applying” is indefinite because it is not expressly defined or described in the specifications of the ’528 or ’850 patents, and a POSA would not understand the metes and bounds of an “actuator” that selectively applies a pressure pulse as there is no ordinary and common actuator that selectively applies a pressure pulse in the field of microfluidics. Ex. K, Di Carlo Decl., ¶ 100. The specification describes the “actuator” as a standard component “piezo actuator” not an innovative actuator that has the capability to *itself* “select” when to “apply” a pressure pulse. *Id.*, ¶ 101. Cytonome seems to concede this and only cites to the “Background” section of the ’850 patent which refers to an *unclaimed* and undescribed “computer” that analyzes particles to “decide” how particles will be handled. *Supra* at 46-47. The specification confirms, “[t]he *outcome* of the [unclaimed] decision is then *applied* to deflect the direction of the specific particle[.]” ’850 patent at 1:53-55 (*i.e.*, not “selectively appl[ied]”) (emphasis added). Cytonome cannot point to any disclosure in the ’850 patent, where the *actuator* analyzes particles and decides which particles to “*selectively* apply[] a pressure pulse to[.]” Ex. K, Di Carlo Decl., ¶¶ 100-101.

H. “an actuator connected to the first side channel”

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|-----|-----------------------------|-----------------------------------|-----------------------------------|
| 13 | ’528 cl. 22 | Plain and ordinary meaning | Indefinite |

1. Plaintiff's Opening Position

“An actuator connected to the first side channel” is not indefinite. A person of skill in the art, reading the patent specification, would reasonably understand what “an actuator connected to the first side channel” means. NanoCollect claims that the prosecution history supports its assertion that the claim term is indefinite, but in the cited Office Action, the examiner did not raise or discuss indefiniteness, nor do the cited papers evidence any lack of definiteness.

2. Defendant's Response Position

The phrase “an actuator connected to the first side channel” in claim 22 of the '528 patent is indefinite under 35 U.S.C. § 112, ¶ 2 because the specifications and claims of the '528 patent do not identify any actuator connected to the first side channel. Although the terms of the claim phrase individually are commonly used in the field of microfluidics, there is no commonly understood structure associated with the phrase “an actuator connected to the first side channel,” and the claim phrase does not have a plain and ordinary meaning as used.

Further, the specification and claims of the '528 patent do not define “an actuator connected to the first side channel” or describe how an “actuator” is “connected to the first side channel.” In fact, recitation of the term actuator in the specification indicates that the actuator activates a gas-filled bubble valve or a gas-filled reservoir, *not* the side channel. *See, e.g.* the '528 patent (D.I. 1-1, Ex. 1) at 12:23-27 (“the actuator activates the first bubble valve 10a to cause pressure variations in the reservoir 70 of the first bubble valve. The activation of the first bubble valve causes a transient pressure variation in the first side passage 174a.”). Further, the specification of the '528 patent discloses the actuator as “external” and *not* connected to the first side channel. *Id.* at 12:3-6 (“An external actuator **176** is also provided for actuating the bubble valves **10a**, **10b**, which momentarily causes a flow disturbance in the duct to deflect the flow therein when activated by the actuator **176**.”); *id.* at Fig.16 (showing external actuator **176**

connected to the reservoir 70). As such, the specification of the '528 patent does not identify any structure of "an actuator connected to the first side channel."

Additionally, because each embodiment described in the specification of the '528 patent indicates that the actuator activates a gas-filled bubble valve or a gas-filled reservoir, it would be unclear to the POSA how the actuator can activate a gas-filled bubble valve or a gas-filled reservoir if it is physically connected to the side channel instead of the bubble valve.

Accordingly, a POSA reviewing the '528 patent's specification would not reasonably understand the metes and bounds of "an actuator connected to the first side channel." Plaintiff cites no evidence and only offers conclusory statements to the contrary. Thus, the claim phrase "an actuator connected to the first side channel" is indefinite.

3. Plaintiff's Reply Position

NanoCollect's own cited language from the '528 Patent shows an "actuator" that is "connected to the first side channel," and thus the claim is not indefinite. Namely, the patent explains that "activation of the first bubble valve [by the actuator] causes a transient pressure variation in the first side passage 174a." '528 Patent at 12:23–37. For the actuator to cause a "pressure variation" in the first side passage (an example of a "first side channel"), the actuator and side passage must be "connected." Figures 16–17C support this interpretation by showing an actuator 176 connected to a bubble valve 10a that includes a side passage 174a.

4. Defendant's Sur-Reply Position

This phrase as used in claim 22 of the '528 patent is indefinite because the specifications and claims of the '528 patent do not identify any actuator connected to the first side channel. Cytonome can only point to a *bubble valve* that is physically connected to the first side channel and *not* the actuator. *Supra* at 49; Ex. K, Di Carlo Decl., ¶ 82. Cytonome's cited figures clearly demonstrate this fact, wherein the actuator 176 appears to activate reservoir 70 of the bubble

valve 10a, not the side channel. '528 Patent at Figures 16-17C; *see also id.* at 12:23-27; 12:3-6; Ex. K, Di Carlo Decl., ¶ 82. In fact, Cytonome confirms NanoCollect's interpretation that an actuator is *not* connected to the first side channel by stating that "Figures 16-17C ... [show] an actuator 176 *connected to a bubble valve 10a* that includes a side passage 174a. *Supra* at 49 (emphasis added).

I. "a first reservoir operatively associated with the flow channel and adapted for dampening or absorbing a pressure pulse propagated across the flow channel"

| No. | Asserted Patents and Claims | Plaintiff's Proposed Construction | Defendant's Proposed Construction |
|-----|-----------------------------|---|--|
| 19 | '295 cl. 1 | <p>A reservoir is "a physical structure that contains fluid."</p> <p>Otherwise, the plain and ordinary meaning should be applied.</p> | <p>(1) Indefinite</p> <p>or</p> <p>(2) 35 U.S.C. 112 ¶ 6</p> <p>Structure: The second side passage 174b and second bubble valve 10b</p> <p>Function: "for dampening or absorbing a pressure pulse propagated across the flow channel"</p> <p>or</p> <p>(3) "the physical structure of a reservoir operatively associated with the flow channel and structurally designed for dampening or absorbing a pressure pulse propagated across the flow channel"</p> |

1. Plaintiff's Opening Position

a) *The intrinsic record makes clear that a “reservoir” is “a physical structure that contains fluid.”*

NanoCollect's own alternative construction demonstrates that a “reservoir” in the '295 Patent claims is “a physical structure that contains fluid.” In particular, NanoCollect proposes construing the “reservoir” term in claim 1 of the '295 Patent as “*the physical structure of a reservoir*” operatively associated with the flow channel and structurally designed for dampening or absorbing a pressure pulse propagated across the flow channel.” D.I. 29-1 at 12 (emphasis added). Accordingly, NanoCollect acknowledges that a reservoir connotes a “physical structure.”

The claim language and specification also demonstrate that a “reservoir” is a physical structure that contains fluid. For example, claim 1 of the '295 Patent describes “apertures” connecting a main flow channel to a first and second “reservoir.” The apertures allow a “suspension medium” fluid to flow from the flow channel into the claimed reservoirs, meaning that the reservoir contain fluid. The specification further explains that the two structural components labeled 70 in Figures 16–17C—which are shown to contain fluid—are examples of “reservoirs.” See '295 Patent at Figs. 16–17C, 12:9–18.

The remaining language identified by NanoCollect—“operatively associated with the flow channel and adapted for dampening or absorbing a pressure pulse propagated across the flow channel”—includes only ordinary English words that are easily understood by a jury and do not hold any special meaning. Accordingly, the plain and ordinary meaning of this language should apply. For the same reasons, the term has a clear and precise scope and is not indefinite.

b) *The “reservoir” terms are not “means-plus-function” terms.*

The “reservoir” terms in the '295 Patent claims are not “means-plus-function” terms subject to 35 U.S.C. § 112 ¶ 6, as NanoCollect contends. The terms do not use the word

“means,” and thus there is a presumption that § 112 ¶ 6 does not apply. *See Williamson*, 792 F.3d at 1349. NanoCollect cannot overcome this presumption because, as explained above, “reservoir” refers to an actual structural component and is not merely a “nonce word” tantamount to using the word “means.” *See TEK*, 920 F.3d at 786. Dependent claims 9 and 17 remove any doubt that a “reservoir” is a structure by reciting particular structural features—i.e., “a resilient wall” and “a deflectable flexible membrane”—that can be included in the reservoirs. *See id.*

2. Defendant’s Response Position

The claim phrase “a first reservoir operatively associated with the flow channel and adapted for dampening or absorbing a pressure pulse propagated across the flow channel” read by a POSA in light of the ’295 patent’s specification is indefinite as it fails to disclose a sufficiently definite structure. Plaintiff argues that dependent claims 9 and 17 prove that “reservoir” is a structure by reciting particular structural features—i.e., “a resilient wall” and “a deflectable flexible membrane”—that *can* be included in the reservoirs.” *Supra* at 52 (emphasis added). Plaintiff does not explain how the independent claims without these more structural limitations would be understood by a POSA as defining a particular structure. Accordingly, the specification discloses no corresponding structure for this element.

Alternatively, “a first reservoir operatively associated with the flow channel and adapted for dampening or absorbing a pressure pulse propagated across the flow channel” should be construed as a means-plus-function claim as the term “reservoir” is a nonce term as used in the specification and it does not have a plain and ordinary meaning as used in the specification, is not defined in the specification, and does not sufficiently define a structure. The word “buffer/reservoir” simply recites a function rather than any definite structure. The function of the “reservoir” is “dampening or absorbing a pressure pulse propagated across the flow channel.”

Plaintiff points to the two structural components labeled 70 in Figures 16-17C. *Supra* at 51. A POSA would not correlate structural components labeled 70 with “dampening or absorbing a pressure pulse propagated across the flow channel.” *See* the ’295 patent (D.I. 1-1, Ex. 2) at 12:12-15 (the “actuator activates the first bubble valve 10a to cause pressure variations in the reservoir 70 of the first bubble valve. The activation of the first bubble valves causes a transient pressure variation in the first side passage 174a.”). However, this recitation of structure is incomplete as the POSA would not understand that 70 alone to be sufficient to “dampen[] or absorb[] a pressure pulse propagated across the flow channel.” Plaintiff’s support shows at least structure 10 would also be required in order for the term to have a sufficiently definite structure to perform the stated function.

3. Plaintiff’s Reply Position

NanoCollect fails to offer *any* argument that the phrase “a first reservoir operatively associated with the flow channel and adapted for dampening or absorbing a pressure pulse propagated across the flow channel” would not inform “those skilled in the art about the scope of the invention with reasonable certainty,” and thus NanoCollect fails to establish indefiniteness. *Nautilus*, 572 U.S. at 910; *BASF*, 875 F.3d at 1365 (requiring clear and convincing evidence to prove indefiniteness). NanoCollect’s only “indefiniteness” argument is a challenge of Cytonome’s argument (based on *TEK Global*, 920 F.3d at 786) that claim 1 is not subject to § 112 ¶ 6 because its dependent claims recite specific structural features. NanoCollect’s only indefiniteness argument therefore has nothing to do with indefiniteness and should be rejected. In any event, a person of skill would readily understand the term “reservoir” as a “physical structure that contains fluid” in light of the intrinsic evidence and alleged prior art cited therein. Ex. H, Vacca Decl. ¶¶ 19–34.

The Court should also reject NanoCollect’s alternate position that § 112 ¶ 6 applies because, as NanoCollect acknowledges, the term “reservoir” is used in the specification and describes a structure. It is not merely a substitute for the phrase “means for.” Instead of addressing the proper question of whether the term “reservoir” is a structure or a “nonce word,” NanoCollect argues that the function “dampening or absorbing a pressure pulse propagated across a flow channel” could not be achieved by the “reservoir” structure (e.g., component 70) disclosed in the specification. That is an enablement or written description argument as to whether the patent sufficiently discloses “a reservoir” that can be adapted for “dampening or absorbing.” It has no bearing on whether the term “reservoir” is a structure. To the extent the Court considers NanoCollect’s argument, the specification provides detailed examples of “reservoir” that can be “adapted for dampening or absorbing a pressure pulse.” *See, e.g., id.* at Fig. 16–17c, 11:63–12:65. Moreover, NanoCollect refers only to text describing “reservoir 70” on the pressure pulse generation side of the device—it fails to acknowledge that the reservoir on the absorption/dampening side of the device is also labeled “70.” *See* Fig. 17A.

4. Defendant’s Sur-Reply Position

See Defendant’s Sur-Reply Position for “buffer” (’528 Patent).

J. “dampening or absorbing the pressure pulse using a first reservoir in fluid communication with the microfluidic flow channel”

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|-----|-----------------------------|---|---|
| 20 | ’797 cl. 1 | A reservoir is “a physical structure that contains fluid.” Otherwise, the plain and ordinary meaning should be | (1) Indefinite or (2) “to meaningfully dissipate or to receive the unidirectional flow to the microchannel without recoil or echo using a first reservoir in fluid communication with the |

| | | | |
|--|--|----------|----------------------------|
| | | applied. | microfluidic flow channel” |
|--|--|----------|----------------------------|

1. Plaintiff’s Opening Position

The above arguments for the term “reservoir” in the ’295 Patent apply to the “reservoir” term in the related, later-issued ’797 Patent. *See Elkay*, 192 F.3d at 980. In both patents, “reservoir” means “a physical structure that contains fluid.” Moreover, the claim language other than “reservoir” identified by NanoCollect includes only ordinary English words that are easily understood by a jury and do not hold any special meaning. Accordingly, the plain and ordinary meaning should apply, and no further construction is needed. For the same reasons, the term also has a clear and precise scope and is not indefinite.

2. Defendant’s Response Position

The claim term incorporates several terms that the parties dispute. Rather than restate those arguments here, Defendant incorporates by reference its proposed definitions for the variants of “dampening,” “absorbing,” and “pressure pulse.”

3. Plaintiff’s Reply Position

See Plaintiff’s Reply Position for “dampening,” “absorbing,” and “pressure pulse.”

4. Defendant’s Sur-Reply Position

See Defendant’s Sur-Reply Position for “absorb.”

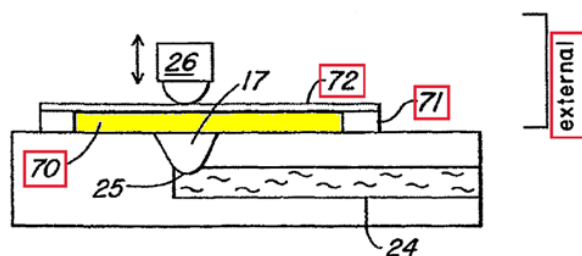
K. “otherwise sealed”

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|-----|-------------------------------|---|--|
| 26 | ’797 cl. 13 ’283 cls. 1, 6 | A reservoir or chamber that is “otherwise sealed [from]” is a reservoir or chamber that is not open to an exterior environment. | “otherwise closed off from fluid connection” |

1. Plaintiff's Opening Position

NanoCollect's construction of "otherwise sealed [from]"—"otherwise closed off from fluid connection"—ignores the intrinsic record and is too limiting because it would preclude fluid connections between the chamber and other *internal* components.

The claim language, the specification, and the file history demonstrate that "otherwise sealed" and variants "otherwise sealed from" in the '283 and '797 Patent claims means "not open to an exterior environment." Claim 1 of the '283 Patent recites a "first chamber in fluid communication with [a] duct via a first side opening and otherwise sealed" and an "actuator configured to increase a pressure within the first chamber." The phrase "otherwise sealed" means that, despite having an "opening" internal to the system, the chamber is "sealed" from the *exterior* environment so that the first chamber can be pressurized. This is consistent with the specification, particularly Figure 7, which shows that the seal 71 and membrane 72 form the compression chamber 70 by sealing the chamber from the *external* environment:



Id. at Fig. 7; *see also id.* at 10:3–21 (explaining Figure 7).

The prosecution history further supports Cytonome's interpretation by using the term "sealed," "otherwise sealed," and "otherwise sealed from an exterior environment" interchangeably to mean that the chamber is sealed from the external environment, not internal fluid connections. For example, during prosecution of a related patent that issued before the '283 and '797 Patents, the applicants explained that "apertures" in the "Dunaway" reference are not "sealed" because "the apertures of Dunaway *must be open and exposed to the environment*

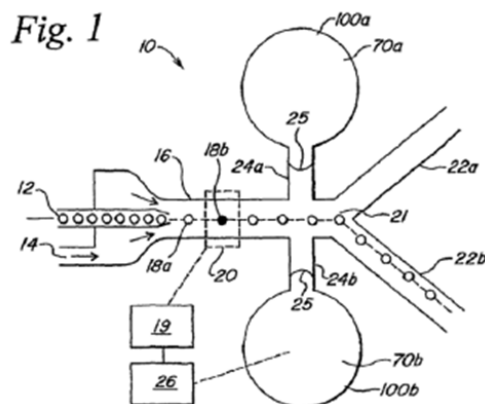
in order for the amplifier of Dunaway to operate, *which expressly teaches away from the claimed invention.*” D.I. 39-5, U.S. Pat. App. 11/433,781, June 25, 2007 Applicant Remarks at 10 (emphasis added); *see also id.*, Nov. 10, 2011 Applicant Remarks at 10–12 (explaining that the “chamber” in a “Glezer” reference is “*very different*” from the claimed chamber because “[t]he internal chamber 14 of Glezer is *not sealed, but is rather open to the external environment* through the orifice 16[.]”) (emphasis added). The prosecution history also confirms that “sealing” serves to increase the internal pressure of the actuation chamber. *Id.* Similarly, when presented with different prior art during prosecution of the ’797 Patent, the applicants expressly stated that “*a person of ordinary skill in the art would clearly understand the term ‘sealed’ as referring to the reservoir being otherwise sealed from an external environment.*” D.I. 39-8, Sept. 17, 2014 Applicant Remarks at 7 (emphasis added); *see also id.*, Nov. 17, 2014 Applicant Remarks at 7 (explaining that claim was amended to recite “otherwise sealed from an exterior environment” only to “clarify” the meaning of the term “sealed”).

2. Defendant’s Response Position

Defendant’s construction of “otherwise sealed” to mean “otherwise closed off from fluid connection” should be adopted because it is consistent with a POSA’s understanding of the term in light of the claims and specifications of the Asserted Patents. “Otherwise sealed” is not defined in the specification of the ’283 patent as having a special definition that differs from a POSA’s understanding of the term. Plaintiff did not—and, indeed, cannot—point to a portion of the specification of the ’283 patent where the inventors clearly set forth a definition for “otherwise sealed.” Nevertheless, a POSA would understand the phrase, “the first chamber in fluid communication with the duct via a first side opening and otherwise sealed” to mean that the first chamber includes one, and only one, side opening, which opening is in fluid communication with

the duct. That is, the first chamber is “otherwise closed off from fluid connection,” consistent with the construction proposed by Defendant.

While Defendant agrees that “otherwise sealed” encompasses “not open to an exterior environment,” Plaintiff’s definition is overly narrow and unsupported by the specification. A POSA would understand the term “otherwise sealed” as sealed except for the aforementioned first side opening. In other words, the first chamber in claim 1 is completely sealed off from fluid connection with a single exception: the duct via a first side opening. The first chamber is, therefore, also *unsealed* at the first side opening. Claim 1 and claim 6 refer to components (a first chamber and second chamber, respectively) that are “otherwise sealed.” Claim 1 specifically states that “a first chamber in fluid communication with the duct *via a first side opening and otherwise sealed.*” A “first side opening” is not disclosed in the specification, however, upon reviewing the claims and specification, a POSA would understand the “first side opening” to be the opening connecting the “first chamber” to the “first side passage **24b**.” See ’283 patent (D.I. 1-1, Ex. 6) at 6:34-39.



For example, the “first side passage **24b** is hydraulically connected to a compression chamber **70b** in the first bubble valve **100b**, so that if the pressure in this chamber is increased, the flow in the measurement duct near the side passage is displaced inwards, substantially

perpendicular to the normal flow in the duct.” *Id.* Because the first chamber is in fluid communication with the duct, and the duct is “formed in a substrate” of the particle sorting chip, the language of the claim itself makes clear that the only claimed opening, the first side opening, connects the chamber to an *internal* component: the duct. Plaintiff even admits that these components are open to the internal environments. *Supra* at 56 (“The phrase ‘otherwise sealed’ means that, despite having an ‘opening’ *internal* to the system...”) (emphasis added). Similarly, Claim 6 requires a particle sorting chip wherein the “second chamber is otherwise sealed.” Claim 6 depends from claim 5, which recites “a second chamber in fluid communication with the duct via a second side opening.” A “second chamber” is not disclosed by the specification, however, upon reviewing the claims and specification a POSA would understand the “second chamber” to be “the reservoir **70a** of the second bubble valve.” *See* ’283 patent (D.I. 1-1, Ex. 6) at 7:39-42. “The second side passage 24a and the second bubble valve 100a absorb the transient pressure variations in the measurement duct 16 induced via the actuator 26. Basically, the reservoir **70a** of the second bubble valve **100a** is a buffer chamber having a resilient wall or containing a compressible fluid, such as a gas.” *Id.* at 7:37-42. Accordingly, both the literal language of the claim and the corresponding description in the specification make clear that the “second chamber” is open to the internal environment. The use of the term “otherwise” in both claim 1 and claim 6 makes clear that the first side opening and second side opening are exceptions to the first chamber and second chamber being completely “sealed.” Thus, the first chamber and second chamber are unsealed at the first side opening and second side opening, respectively. In both instances, the recited unsealed portion is open to an *internal* environment, not an external environment. Accordingly, “otherwise sealed” would necessarily include being sealed from both the internal environment and the external environment. The term “otherwise” modifies the term

“sealed,” not the term “opening.” Plaintiff’s contention that “otherwise sealed” would only limit openings to the external environment, but not the internal environment, makes little sense unless such an exception was explicitly recited in the claim. Had Plaintiff intended to *exclude* this internal opening from consideration, the term “otherwise” would be unnecessary and the claims would have been drafted to claim “sealed,” not “otherwise sealed” chambers. Alternatively, Plaintiff was well aware of how to draft the claim it now proposes. *See* ’797 patent (D.I. 1-1, Ex. 3) at Claim 5 (“wherein the first reservoir is otherwise sealed from an exterior environment.”).

Plaintiff argues that Defendant’s definition of “otherwise sealed” is “too limiting because it would preclude fluid connections between the chambers and other *internal* components”. Plaintiff disregards the plain language of the claim and instead selectively cites parts of the prosecution history of a different patent, the ’797 patent, in an attempt to support its incomplete construction of a claim term in the ’283 patent. This is contrary to the well-settled process for construing claims, which begins with the claims themselves. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (“In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.”) Here, the meaning of the term “otherwise” is commonly understood. The fact that Plaintiff resorts to the prosecution history of an entirely different patent with a *different specification* renders the prosecution history of the ’797 patent even that much less helpful when construing a claim term that appears in the ’283 patent. What’s more, Plaintiff neglects to mention that Plaintiff explicitly defined the “external environment” during prosecution of the ’797 patent and only added the limitation “otherwise sealed from an external environment” because the USPTO rejected a claim reciting a “sealed first reservoir in

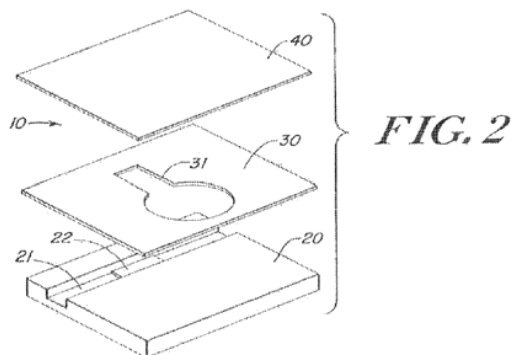
fluid communication with the flow channel” as indefinite. The claims of the ’283 patent provide sufficient context on their own to define the word “otherwise” and construe the meaning the claim term “otherwise sealed.” The first chamber and the second chamber each recite a single side opening and are “otherwise sealed.” It is unnecessary and unhelpful to try to import limitations from the prosecution history of a different patent when construing the word “otherwise.” A sealed chamber with a single recited opening, therefore, has *only* that single recited opening and is “otherwise closed off from fluid connection.”

3. Plaintiff’s Reply Position

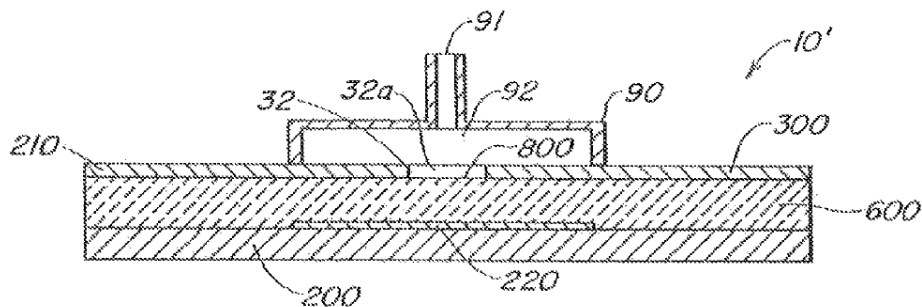
NanoCollect’s extreme position that “otherwise sealed” requires closing off reservoirs from all *internal* openings—except for the internal connection between the reservoirs and the flow channel—is at odds with the claim language. Claim 5 of the ’797 Patent recites “a first reservoir in fluid communication with the flow channel . . . wherein the first reservoir is otherwise sealed from an exterior environment.” NanoCollect incorrectly interprets the word “otherwise” to mean that there can be no openings “other” than the *internal* “fluid communication” recited in the claims. But that improperly reads the phrase “from an exterior environment” entirely out of the claim and cannot be correct. *Info-Hold, Inc. v. Muzak LLC*, 783 F.3d 1365, 1374 (Fed. Cir. 2015) (explaining that Federal Circuit “precedent prohibits us from adopting such a construction” that “read[s] the word ‘placed’ out of the claims”). “From an exterior environment” expressly indicates that “otherwise sealed” is not referring back to any internal openings. Indeed, the applicants added that language specifically to clarify that the “sealing” in the patents concerns only external openings. D.I. 39-8, Sept. 17, 2014 Applicant Remarks at 7; *id.*, Nov. 17, 2014 Applicant Remarks at 7.

NanoCollect’s construction is also inconsistent with the specification, which uses the term “sealed” to refer only to external openings. For example, the ’797 Patent describes an

embodiment with “a microchannel and a sealed, gas-filled reservoir positioned adjacent to and connected to the microchannel.” ’797 Patent at 3:4–6. The phrase “connected to the microchannel” means that the reservoir has an internal opening, but the reservoir is nonetheless described as “sealed.” That is because the reservoir is closed off from the *external* environment so that the fluid (gas or liquid) in the reservoir does not leak. The specification further confirms this by stating that, in Figure 2, “[a] third plate 40 is bonded on top of second plate 30 to close and seal the stacked structure.” *Id.* at 6:60–63. Figure 2 shows that this “sealing” occurs when aperture 31 is no longer open to the external environment above it:



Similarly, in an alternative embodiment, the patent describes forming a “sealed pressurizing chamber 92” in Figure 8A by attaching “pressurizer 90, pressed and sealed onto the top of the second plate 300 to form a tight seal”:



Id. at 8:50–51, Figs. 7–8C. As shown in the figure, chamber 92 is “sealed” despite an internal opening 32a.

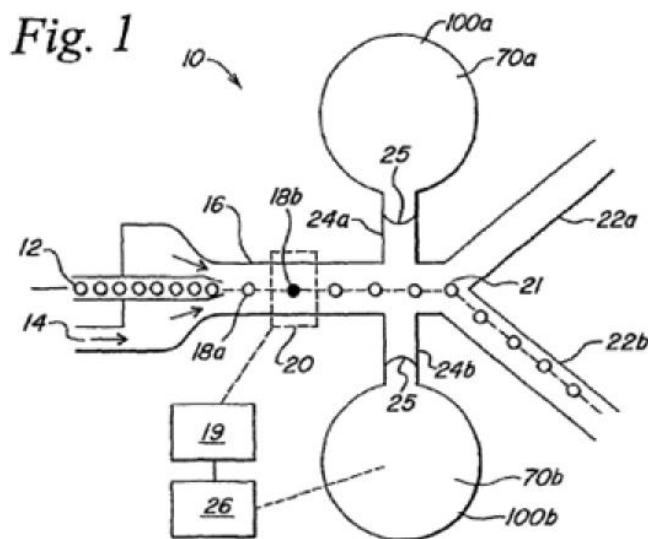
NanoCollect incorrectly argues that the ’797 Patent and its prosecution history are irrelevant for construing the term “otherwise sealed.” The ’797 Patent and its prosecution are highly relevant because the ’797 Patent is asserted in this case, and NanoCollect puts the phrase “otherwise sealed” from that patent in dispute. *See* D.I. 39-1 at 15 (grouping together “otherwise sealed” terms from ’283 and ’797 Patents and proposing same construction for both).

Additionally, the earlier-issued ’797 Patent and its prosecution history are highly relevant to the ’283 Patent because the two patents cover the same subject matter, share common inventors, and stem from a common parent application (the ’256 Application). *See Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1349–50 (Fed. Cir. 2004); *Jonsson v. Stanley Works*, 903 F.2d 812, 818 (Fed. Cir. 1990).

4. Defendant’s Sur-Reply Position

The *relevant* evidence (the ’283 claims, specification, and prosecution history) confirm that “otherwise sealed” means “otherwise closed off from fluid connection.” *See Supra* at 58-61. Again, Cytonome offers *zero* evidence from the applicable patent and can only muster any argument supporting its proposed construction by referring to a different patent for different inventions developed by a different set of inventors that uses the explicit claim (“otherwise sealed from an *exterior* environment”) than it proposes here. *Id.* at 61-63. Cytonome argues that because “the ’797 Patent is asserted in this case, NanoCollect put[] the phrase ‘otherwise sealed’ from [the ’797] patent in dispute,” (*id.* at 63) and because it believes NanoCollect grouped together the term “otherwise sealed” from the ’283 and the ’797 patents by proposing the same construction for both, Cytonome can go outside the scope of the ’283 patent and rely upon the specification, claims, and prosecution history of the different ’797 patent to construe the use of “otherwise sealed” in the ’283 patent. Cytonome again invites legal error. *See Phillips*, 415 F.3d

at 1314. Cytonome relies upon *Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1349-50 (Fed. Cir. 2004) in support of its reliance on the prosecution history of the '797 patent for the construction of “otherwise sealed” in the '283 patent (*id.* at 63-64), but fails to point out that in that case the specifications were identical for all three concerned patents (*id.* at 1350), which is not the case here. *Compare* '283 patent, *with* '797 patent. Cytonome may not pick and choose claim language from different patents to broaden the scope of the '283 claims in hopes of manufacturing infringement.



L. “from the fluidic stream of particles”

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|-----|-----------------------------|-----------------------------------|---|
| 32 | '263 cl. 1 | Plain and ordinary meaning | “from the stream of fluid carrying the particles” |

1. Plaintiff's Opening Position

The claim term “from the fluidic stream of particles” is readily understandable by a lay jury and NanoCollect’s proposed construction—“from the stream of fluid carrying the particles”—does nothing to further clarify the term. Accordingly, no construction is warranted.

2. Defendant's Response Position

Defendant’s construction of “from the fluidic stream of particles” is “from the stream of fluid carrying the particles” and should be adopted because it is consistent with a POSA’s understanding of the term in light of the claims and specifications. The claim phrase is implicated by the asserted claim 1 of the ’263 patent. This claim phrase is not defined in the ’263 patent as having a special definition that differs from a POSA’s understanding of the term in light of the specifications. Accordingly, a POSA would understand “from the fluidic stream of particles” as from the stream of fluid carrying the particles. In the context of the specification of the ’263 patent, a POSA would understand that the particles are moving as a stream in a continuous procession. *See* the ’263 patent (D.I. 1-1, Ex. 5) at figs. 1, 2, 3, 4, 5, 6 (figures depicting continuous moving procession of the particles). Further, in the context of the specification and claims of the ’263 patent, a POSA would understand that the particles must be encompassed in a fluid because the particles cannot be introduced into and flow through the claimed devices without being encompassed in a fluid. *See id.* at cl. 1, 3:42-43, 3:44-45 (the stream of particles is introduced into the first supply duct), 4:9-11 (“conducting a stream of fluid into the duct inlet with a stream of particles suspended therein”), 6:64-66 (“conducting a stream of liquid into the duct inlet with a stream of particles suspended therein”), 7:61-63, 7:64-66 (“a stream of particles is introduced into the flow of carrier liquid”), 12:53-55 (“an input stream of particles in suspension ... from a particle input chamber ... is split among ... single sorting channels”). This support from the specification of the ’263 patent clearly refers to a “stream of

particles” encompassed in a fluid. Further, during the prosecution of the ’528 patent, while arguing that the Dunaway reference “fails to teach or suggest using a pressure pulse to deflect a particle in a stream of particles flowing through a channel *from* the stream of particles,” Plaintiff submitted to the patent examiner that “the Dunaway reference only teaches changing the path of an entire stream of fluid between two outlets”; “Dunaway reference ... redirects the flow path of an entire stream of fluid”; “the pressure differential ... in Dunaway is ... transferred *to the stream of fluid* to change the flow path of the entire stream”; and that “[t]here is no teaching or suggestion in Dunaway that a selected particle can be separated from the *stream of fluid* flowing through the fluid amplifier.” *See* Ex. F at CYTLLC_001298. Thus, Plaintiff’s own understanding of a “stream of particles” is that a “stream of particles” includes the “stream of fluid.”

Furthermore, given that claim 1 of the ’263 patent recites a “fluidic stream of particles,” and given that particles are not made out of fluid, a POSA would understand that a “fluidic stream of particles” must necessarily encompass both the particles and the stream of fluid carrying the particles. Thus, “from the fluidic stream of particles” is “from the stream of fluid carrying the particles,” consistent with the construction proposed by Defendant.

Plaintiff does not object to Defendant’s proposed construction for “from the fluidic stream of particles,” but only argues that Defendant’s proposed construction does nothing to further clarify the term. Defendant disagrees. Asking jurors to apply the “plain and ordinary meaning” of this technical term is at best unhelpful and at worst an attempt by Plaintiff to avoid any defined boundary for its claimed inventions. There can be no doubt that Defendant’s proposed construction simplifies the language of this claim phrase for the benefit of the jury.

3. Plaintiff’s Reply Position

See Plaintiff’s Reply Position for “from the stream of particles.” Furthermore, claim 1 of the ’263 Patent recites that “the selected particle *flows* into a second downstream outlet

configured to *output a second portion of the fluidic stream* of particles.” In other words, the selected particles continue to flow in a stream of fluid even after deflection.

4. Defendant’s Sur-Reply Position

See Defendant’s Sur-Reply Position for “from the stream of particles.”

M. “microsorter having a switching region and a microfluidic channel formed in the microfluidic chip fluidically coupled to a sample input a keep output, a waste output, and the switching region”

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|-----|-----------------------------|-----------------------------------|-----------------------------------|
| 37 | 188 cl. 1 | Plain and ordinary meaning | Indefinite |

1. Plaintiff’s Opening Position

This claim term is not indefinite, and NanoCollect has not identified any specific part of this claim term where the claim scope is not described with reasonable certainty. NanoCollect purports to identify office actions and responses in the prosecution history to support its argument for indefiniteness. But in the office action, the Examiner issued an indefiniteness rejection based on different language, namely the phrase “a microfluidic chip including at least one microsorter having fluid contact surfaces including a microfluidic channel having a sample input, a switching region, a keep output and a waste output.” The examiner’s rejection was premised on the specific structure of this sentence. Specifically, the examiner could not determine whether the “sample input, switching region, keep output, and waste output” are part of the microfluidic channel, the fluid contact surfaces, or the microsorter. In response, the patentee amended the claims to the current language. This resolved the examiner’s concern and the patent issued. Thus, the portions of the prosecution history NanoCollect identifies as

evidence of indefiniteness demonstrate that, in fact, all PTO concerns regarding the definiteness of the claim language were resolved prior to the patent issuing.

2. Defendant's Response Position

The term “microsorter having a switching region and a microfluidic channel formed in the microfluidic chip fluidically coupled to a sample input a keep output, and a waste output, and the switching region” is indefinite because a POSA would not understand the metes and bounds of claim 1 in light of the specification. For example, a POSA would not understand how the switching region could be connected to the switching region. It would also be unclear to a POSA whether the microfluidic channel is part of the microsorter.

3. Plaintiff's Reply Position

NanoCollect offers no evidence to support its assertion that this claim term is indefinite. Instead, NanoCollect just poses questions without engaging in an appropriate indefiniteness analysis, and seeks improperly to shift the burden of the indefiniteness inquiry to Cytonome. In any event, improperly parses this claim language to require “a switching region . . . connected to the switching region.” The claim language does not require that. Instead, in this claim language, the microsorter has (a) a switching region, and (b) a microfluidic channel. The microfluidic channel is “fluidically coupled” to a number of components, including the switching region. This language can be readily understood by viewing Fig. 3 and reading the text of the specification.

4. Defendant's Sur-Reply Position

This phrase as used in claim 1 of the '188 patent is indefinite because in light of the specification of the '188 patent, a POSA would not understand how the switching region could be connected to the switching region, and whether the microfluidic channel is part of the microsorter. Ex. K, Di Carlo Decl., ¶ 110. Although Cytonome posits that in this claim language

“the microsorter has (a) a switching region, and (b) a microfluidic channel” and that the “microfluidic channel is ‘fluidically coupled’ to a number of components, including the switching region” (*supra* at 69), this is mere attorney argument, and is *not* what has been claimed by Cytonome applicants. In fact, a POSA reading this claim language would have understood that the claim requires that *both* “**a switching region and a microfluidic channel formed in the microfluidic chip**” be “fluidically coupled to a sample input a keep output, a waste output, **and the switching region.**” ’188 Patent, Claim 1 (emphasis added); Ex. K, Di Carlo Decl., ¶ 110. Accordingly, a POSA would have understood that the claim provides for a “switching region” to be fluidically coupled to “the switching region.” Ex. K, Di Carlo Decl., ¶ 110. It would also be unclear to a POSA whether the microfluidic channel formed in the microfluidic chip is part of the claimed “microsorter.” *Id.*, ¶ 106-109. Given the specification of the ’188 patent provides no explanation or illustration thereto, this claim language is indefinite. Cytonome’s self-serving attorney argument is not sufficient reason to reject NanoCollect’s assertion.

N. “a first reservoir . . . adapted for dampening or absorbing a pressure pulse”

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|-------|-----------------------------|---|---|
| 41(e) | ’295 cl. 1 | <p>A reservoir is “a physical structure that contains fluid.”</p> <p>Otherwise, the plain and ordinary meaning should be applied.</p> | <p>(1) Indefinite</p> <p>or</p> <p>(2) 35 U.S.C. 112 ¶ 6</p> <p>Structure: The second side passage 24b and the second bubble valve 10b</p> <p>Function: “adapted for dampening or absorbing a pressure pulse”</p> |

1. Plaintiff's Opening Position

The arguments above for the “reservoir” terms from '295 Patent claim 1 apply here.

2. Defendant's Response Position

Claim phrase [41e] of the '295 patent is comprised in claim phrase [19] of '295 patent.

Accordingly, the arguments above for the claim phrase “a first reservoir operatively associated with the flow channel and adapted for dampening or absorbing a pressure pulse propagated across the flow channel” in claim 1 of the '295 patent apply here.

3. Plaintiff's Reply Position

See Plaintiff's Reply Position for the claim phrase “a first reservoir operatively associated with the flow channel and adapted for dampening or absorbing a pressure pulse propagated across the flow channel.”

4. Defendant's Sur-Reply Position

See Defendant's Sur-Reply Position for “buffer” ('528 Patent).

O. “a second reservoir . . . adapted for generating the pressure pulse”

| No. | Asserted Patents and Claims | Plaintiff's Proposed Construction | Defendant's Proposed Construction |
|-------|-----------------------------|---|---|
| 41(f) | '295 cl. 1 | <p>A reservoir is “a physical structure that contains fluid.”</p> <p>Otherwise, the plain and ordinary meaning should be applied.</p> | <p>(1) Indefinite</p> <p>or</p> <p>(2) 35 U.S.C. 112 ¶ 6</p> <p>Structure: None disclosed in specification</p> <p>Function: “adapted for generating the pressure pulse”</p> |

1. Plaintiff's Opening Position

The arguments above for the “reservoir” terms from ’295 Patent claim 1 also apply here. Furthermore, the term needs no construction beyond “reservoir” because the parties agreed on a construction for the word “generating,” and the phrase “pressure pulse” needs no construction for the reasons explained above. Moreover, even if “a second reservoir . . . adapted for generating the pressure pulse” is a “means-plus-function” term (it’s not), NanoCollect is wrong to contend that there is no structure disclosed in the specification that is “adapted for generating the pressure pulse.” The specification repeatedly explains that the volume of a reservoir can be varied to generate a “pressure pulse” (e.g., “a transient discharge of liquid”), for example by coupling a wall of the reservoir to an actuator. ’295 Patent at 12:24–28 (regarding Figures 17a–17c, “[u]pon activation of the actuator, the pressure within the reservoir of the first bubble valve 10a is increased, causing a transient discharge of liquid from the first side passage 174a as indicated by the arrow”); *see also id.* at 3:4–24, 7:14–17, 12:9–15.

2. Defendant's Response Position

The claim term “a second reservoir . . . adapted for generating the pressure pulse” read by a POSA in light of the ’295 patent’s specification is indefinite as it fails to disclose a sufficiently definite structure. For instance, the claim phrase does not have a plain and ordinary meaning as used. The term “reservoir” was not and is not commonly used in the field of microfluidics to describe a structure that generates a pressure pulse. As a result, there is no commonly understood structure associated with this claim phrase. Moreover, Plaintiff does not—and, indeed, cannot—point to any embodiments disclosed in the specification of the ’295 patent with these features. Thus, a POSA would be unable to determine the structure of the reservoir described in this claim phrase. As such, given that the claim phrase does not have a plain and ordinary meaning and the structure necessary to perform the recited function has not been identified in the specification of

the '295 patent, a POSA cannot determine the metes and bounds of claim 1 of the '295 patent, which recites this claim phrase. This claim phrase is, therefore, indefinite.

Alternatively, “a second reservoir . . . adapted for generating the pressure pulse” should be construed as a means-plus-function claim as the term “reservoir” is a nonce term as it does not have a plain and ordinary meaning as used in the specification, is not defined in the specification, and does not disclose a sufficiently definite structure. The function of the “second reservoir” is “generating the pressure pulse.” However, there is no corresponding structure for this function. Plaintiff argues that “NanoCollect is wrong to contend that there is no structure disclosed in the specification” yet fails to identify the structure for the “second reservoir” that “generat[es] the pressure pulse.” Instead, Plaintiff cites to language in the specification of the '295 patent that describes the functionality of “a reservoir” as varying the volume of “a reservoir” to generate a “pressure pulse.” *Supra* at 71-72. The actual structure of “a second reservoir” that results in this functionality has nowhere been identified in the specification of the '295 patent. Indeed, claim 1 of the '295 patent itself recites this functionality of the second reservoir. Claim 1 of the '295 patent recites “a second reservoir . . . generating the pressure pulse *based on a change in volume or pressure in the second reservoir*” (emphasis added). A reservoir does not inherently generate a pressure pulse or vary its volume. A reservoir would require additional structures or qualities to generate a pressure pulse. In this respect, Plaintiff has failed to identify any such “second reservoir” structure in the specification of the '295 patent. Instead, Plaintiff appears to argue that “coupling a wall of the reservoir to an actuator” is sufficiently definite structure to define the second reservoir. Yet again, as support, Plaintiff only describes the intended function of the “second reservoir” while particularly pointing to *other* disclosed structures, *i.e.*, the first bubble valve and first side passage. (“[u]pon activation of the actuator, the pressure within the reservoir

of the first bubble valve **10a** is increased, causing a transient discharge of liquid from the first side passage **174a** as indicated by the arrow.”). Alternatively, the structure identified by Plaintiff is incomplete, and to be understood by the POSA, a sufficiently definite structure to perform the stated function would also include at least 10a, 70, and 174a.

3. Plaintiff’s Reply Position

NanoCollect’s indefiniteness challenge for the phrase “a second reservoir . . . adapted for generating the pressure pulse” should be rejected because NanoCollect fails to offer *any* evidence of whether a person of skill would be reasonably informed of the claim scope. *Nautilus*, 572 U.S. at 910; *BASF*, 875 F.3d at 1365. To the extent the Court considers indefiniteness, the ’295 Patent, the prosecution history, and the prior art provide clear examples of “reservoirs” that would reasonably inform a person of skill of claim scope. *See* ’295 Patent at 6:64–67 (identifying a “reservoir 70” in Figures 3 and 4); Ex. H, Vacca Decl. ¶¶ 19–34.

The Court should also reject NanoCollect’s alternate position that § 112 ¶ 6 applies, because the term “reservoir” is used in the specification to describe a structure. It is therefore not merely a substitute for the phrase “means for.” Instead of addressing the proper question of whether the term “reservoir” is a structure or a “nonce word,” NanoCollect argues that the function “generating the pressure pulse” could not be achieved by the “reservoir” structures (e.g., component 70) disclosed in the specification. That is an enablement or written description argument as to whether the patent sufficiently discloses “a reservoir” capable of “generating the pressure pulse.” It has no bearing on whether the term “reservoir” is a structure. To the extent the Court considers NanoCollect’s argument, the specification provides several examples of how the “reservoir” can be “adapted for generating the pressure pulse.” *See, e.g., id.* at Figs. 16–17c, 3:4–24, 4:31–41, 6:21–35, 7:7–29, 7:57–8:15, 11:35–12:65.

4. Defendant’s Sur-Reply Position

See Defendant’s Sur-Reply Position for “buffer” (’528 Patent).

P. “dampening or absorbing the pressure pulse using [a/the] first reservoir”

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|-------|-----------------------------|--|--|
| 41(g) | ’797 cls. 1, 18 | A reservoir is “a physical structure that contains fluid.” Otherwise, the plain and ordinary meaning should be applied. | (1) Indefinite or (2) “to meaningfully dissipate or to receive the unidirectional flow to the microchannel without recoil or echo using [a/the] first reservoir” |

1. Plaintiff’s Opening Position

The arguments above regarding “dampening or absorbing the pressure pulse using a first reservoir in fluid communication with the microfluidic flow channel” from ’797 Patent, claim 1 apply here.

2. Defendant’s Response Position

Defendant’s construction of “dampening or absorbing the pressure pulse using [a/the] first reservoir” to mean “to meaningfully dissipate or to receive the unidirectional flow to the microchannel without recoil or echo using [a/the] first reservoir” should be adopted because it is consistent with a POSA’s understanding of the term in light of the claims and specifications of the Asserted Patents. The arguments above for the claim terms “dampen,” “absorb,” and “pressure pulse” apply here. The arguments above for the claim phrase “dampening or absorbing the pressure pulse using a first reservoir in fluid communication with the microfluidic flow channel” of claim 1 of the ’797 patent also apply here.

3. Plaintiff's Reply Position

See Plaintiff's Reply Position for the claim terms/phrases "absorb[ing]," "pressure pulse," and "dampening or absorbing the pressure pulse using a first reservoir in fluid communication with the microfluidic flow channel."

4. Defendant's Sur-Reply Position

See Defendant's Sur-Reply Position for "absorb."

Q. "a reservoir adapted for dampening or absorbing the transient pressure pulse"

| No. | Asserted Patents and Claims | Plaintiff's Proposed Construction | Defendant's Proposed Construction |
|-------|-----------------------------|---|---|
| 41(i) | '263 cl. 1 | <p>A reservoir is "a physical structure that contains fluid."</p> <p>Otherwise, the plain and ordinary meaning should be applied.</p> | <p>(1) Indefinite</p> <p>or</p> <p>(2) 35 U.S.C. 112 ¶ 6</p> <p>Structure: The second side passage 24b and the second bubble valve 100b, buffer chamber 70b, the buffer bubble valve 100b, or the bubble valve 100</p> <p>Function: "for dampening or absorbing the transient pressure pulse"</p> |

1. Plaintiff's Opening Position

The arguments above regarding the "reservoir" terms for the '797, '850, and '295 Patents also apply to the later-issued '263 Patent. See *Elkay*, 192 F.3d at 980. Additionally, the '263 Patent specification is consistent with the prior patents and intrinsic record, as it labels components 70a and 70b in Figures 1–7 as "reservoirs." See '263 Patent at 9:17–21, 10:18–63.

These components are the same as those labeled “reservoir” in the preceding patents and are clearly “physical structures that contain fluid.” *Id.*

2. Defendant’s Response Position

The claim term “a reservoir adapted for dampening or absorbing the transient pressure pulse” read by a POSA in light of the ’263 patent’s specification is indefinite as it fails to disclose a sufficiently definite structure. Alternatively, “a reservoir adapted for dampening or absorbing the transient pressure pulse” should be construed as a means-plus-function claim as the term “reservoir” is a nonce term as used in the specification and it does not have a plain and ordinary meaning as used in the specification, is not defined in the specification, and does not sufficiently define a structure. The words “adapted for” support invocation of § 112, para 6 for “reservoir” because the claim term “reservoir” is only defined in the claim by its function, which is for “dampening or absorbing the transient pressure pulse.” Thus, the word “buffer/reservoir” simply recites a function rather than any definite structure. Specifically, the function of the “reservoir” is “dampening or absorbing the transient pressure pulse.”

The structure in the specification that would allow “a reservoir adapted for dampening or absorbing the transient pressure pulse” to be understood by the POSA to have a sufficiently definite meaning is 70b. Plaintiff also points to component 70a in Figures 1-7 of the ’263 patent. *Supra* at 76. A POSA would not correlate structural components labeled 70a with “dampening or absorbing a pressure pulse propagated across the flow channel.” *See* the ’263 patent (D.I. 1-1, Ex. 5) at 8:35-37 (“Upon pressurizing the compression chamber 70a an amount of liquid is transiently discharged from the first side passage 24a.”).

3. Plaintiff’s Reply Position

Like the other “reservoir” phrases above, NanoCollect fails to cite any evidence to support its conclusory indefiniteness arguments, and thus NanoCollect fails to establish

indefiniteness. *See also* Ex. H, Vacca Decl. ¶¶ 19–34. Moreover, the term is not subject to § 112 ¶ 6 because the claimed “reservoir” refers to the “reservoir” structures recited in the specification and thus is not a “nonce word.” *See, e.g.*, ’263 Patent at 8:13–14, 9:17–29, 10:21–29, 10:46–65, Figs. 1–7. Instead of addressing the proper question of whether the term “reservoir” is a structure or a “nonce word,” NanoCollect argues only that the term “reservoir” is “adapted for” performing a function. Claims that recite a structure to perform a function are not subject to § 112 ¶ 6. *TEK Glob.*, 920 F.3d at 785-87.

4. Defendant’s Sur-Reply Position

See Defendant’s Sur-Reply Position for “buffer” (’528 Patent).

R. “a reservoir . . . adapted for originating the transient pressure pulse”

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|-------|-----------------------------|---|--|
| 41(j) | ’263 cl. 5 | <p>A reservoir is “a physical structure that contains fluid.”</p> <p>Otherwise, the plain and ordinary meaning should be applied.</p> | <p>(1) Indefinite</p> <p>or</p> <p>(2) 35 U.S.C. 112 ¶ 6</p> <p>Structure: The first bubble valve 100a or the bubble valve 100</p> <p>Function: “for originating the transient pressure pulse”</p> |

1. Plaintiff’s Opening Position

The arguments above for the term “reservoir” in claim 1 of the ’263 Patent applies to claim 5 of the ’263 Patent. Moreover, as explained above and in the specification, a “reservoir” can either originate or receive a pressure pulse. *See* ’263 Patent, Figs. 1–7 (depicting 70a and 70b as “reservoirs” that receive and produce pressure pulses); *see also* 9:17–21, 10:18–63.

2. Defendant's Response Position

The claim term “a reservoir ... adapted for originating the transient pressure pulse” read by a POSA in light of the '263 patent's specification is indefinite as it fails to disclose a sufficiently definite structure. Alternatively, “a reservoir . . . adapted for originating the transient pressure pulse” should be construed as a means-plus-function claim as the term “reservoir” is a nonce term as used in the specification and it does not have a plain and ordinary meaning as used in the specification, is not defined in the specification, and does not sufficiently define a structure. The words “adapted for” support invocation of § 112, para 6 for “reservoir” because the claim term “reservoir” is only defined in the claim by its function, which is for “originating the transient pressure pulse.” Thus, the word “buffer/reservoir” simply recites a function rather than any definite structure. Specifically, the function of the “reservoir” is “originating the transient pressure pulse.”

The structure in the specification that would allow “a reservoir ... adapted for originating the transient pressure pulse” to be understood by the POSA to have a sufficiently definite meaning is 100b. Plaintiff also points to component 70a in Figures 1-7 of the '263 patent. *Supra* at 78. A POSA would not correlate structural components labeled 70a and 70b with “originating the transient pressure pulse.”

3. Plaintiff's Reply Position

NanoCollect again fails to cite any evidence to support its conclusory assertion that a “reservoir” term is indefinite, and thus its argument must be rejected. *See also* Ex. H, Vacca Decl. ¶¶ 19–34. Moreover, the term is not subject to § 112 ¶ 6, because the claimed “reservoir” refers to the “reservoir” structures recited in the specification and thus is not a “nonce word.” *See, e.g.*, '263 Patent at 7:57–8:34, 9:5–33, 10:21–29, 10:46–65, 11:34–12:6, Figs. 1–7. Instead of addressing the proper question of whether the term “reservoir” is a structure or a “nonce

word,” NanoCollect argues that the term “reservoir” is “adapted for” performing a function. As shown in the cases above, claims that recite a structure to perform a function are not subject to § 112 ¶ 6.

4. Defendant’s Sur-Reply Position

See Defendant’s Sur-Reply Position for “buffer” (’528 Patent).

S. “a reservoir . . . to dampen or absorb a transient pressure pulse”

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|-------|-----------------------------|---|--|
| 41(k) | ’263 cl. 15 | <p>A reservoir is “a physical structure that contains fluid.”</p> <p>Otherwise, the plain and ordinary meaning should be applied.</p> | <p>(1) Indefinite or (2) 35 U.S.C. 112 ¶ 6</p> <p>Structure: The second side passage 24b and the second bubble valve 100b, buffer chamber 70b, the buffer bubble valve 100b, or the bubble valve 100</p> <p>Function: “to dampen or absorb a transient pressure pulse”</p> |

1. Plaintiff’s Opening Position

The arguments above regarding the “reservoir” terms in claims 1 and 5 of the ’263 Patent apply to claim 15 of the ’263 Patent.

2. Defendant’s Response Position

The arguments above for the claim phrase “a reservoir adapted for dampening or absorbing the transient pressure pulse” in claim 1 of the ’263 patent also apply here for claim 15 of the ’263 patent.

3. Plaintiff's Reply Position

See Plaintiff's Reply Position for the claim phrase "a reservoir adapted for dampening or absorbing the transient pressure pulse" in claim 1 of the '263 Patent.

4. Defendant's Sur-Reply Position

See Defendant's Sur-Reply Position for "buffer" ('528 Patent).

T. "a reservoir . . . to originate the transient pressure pulse"

| No. | Asserted Patents and Claims | Plaintiff's Proposed Construction | Defendant's Proposed Construction |
|-------|-----------------------------|---|---|
| 41(l) | '263 cl. 16 | <p>A reservoir is "a physical structure that contains fluid."</p> <p>Otherwise, the plain and ordinary meaning should be applied.</p> | <p>(1) Indefinite</p> <p>or</p> <p>(2) 35 U.S.C. 112 ¶ 6</p> <p>Structure: The first bubble valve 100a or the bubble valve 100</p> <p>Function: "to originate the transient pressure pulse"</p> |

1. Plaintiff's Opening Position

The arguments above regarding the "reservoir" terms in claims 5 and 15 of the '263 Patent apply to claim 16 of the '263 Patent.

2. Defendant's Response Position

The arguments above for the claim phrase "a reservoir . . . adapted for originating the transient pressure pulse" in claim 5 of the '263 patent also apply here for claim 16 of the '263 patent.

3. Plaintiff's Reply Position

See Plaintiff's Reply Position for the claim phrase "a reservoir . . . adapted for originating the transient pressure pulse" in claim 5 of the '263 Patent.

4. Defendant's Sur-Reply Position

See Defendant's Sur-Reply Position for "buffer" ('528 Patent).

U. "a buffer . . . for absorbing the pressure pulse"

| No. | Asserted Patents and Claims | Plaintiff's Proposed Construction | Defendant's Proposed Construction |
|-------|-----------------------------|--|---|
| 42(a) | '528 cls. 18, 22 | <p>A buffer is "a physical structure that contains fluid and receives a pressure pulse."</p> <p>Otherwise, the plain and ordinary meaning should be applied.</p> | <p>(1) Indefinite</p> <p>or</p> <p>(2) 35 U.S.C. 112 ¶ 6</p> <p>Structure: The second side passage 174b and second bubble valve 10b</p> <p>Function: "for absorbing the pressure pulse"</p> |

1. Plaintiff's Opening Position

The arguments above regarding the term "buffer" from '528 Patent, claims 18, 22, and 24 apply here. Moreover, the remaining language identified by NanoCollect—"for absorbing the pressure pulse"—needs no construction for the reasons explained above for the terms "absorbing" and "pressure pulse."

2. Defendant's Response Position

The arguments above for the claim term “buffer” in respect of the '528 patent apply here. The structure in the specification that would allow “a buffer . . . for absorbing the pressure pulse” to be understood by the POSA to have a sufficiently definite meaning is 10b.

3. Plaintiff's Reply Position

See Plaintiff's Reply Position for the claim term “buffer” for the '528 Patent.

4. Defendant's Sur-Reply Position

See Defendant's Sur-Reply Position for “buffer” ('528 Patent).

V. “a buffer . . . for absorbing or dampening the pressure pulse”

| No. | Asserted Patents and Claims | Plaintiff's Proposed Construction | Defendant's Proposed Construction |
|-------|-----------------------------|--|---|
| 42(b) | '850 cl. 1 | <p>A buffer is “a physical structure that contains fluid and receives a pressure pulse.”</p> <p>Otherwise, the plain and ordinary meaning should be applied.</p> | <p>(1) Indefinite</p> <p>or</p> <p>(2) 35 U.S.C. 112 ¶ 6</p> <p>Structure: The second side passage 24a and the second bubble valve 100a, the buffer chamber 70a, or valve 100b</p> <p>Function: “for absorbing or dampening the pressure pulse”</p> |

1. Plaintiff's Opening Position

The arguments above regarding “buffer” from '850 Patent, claims 1 and 11 apply here.

2. Defendant's Response Position

The arguments above for the claim term “buffer” in respect of the '850 patent apply here.

3. Plaintiff's Reply Position

See Plaintiff's Reply Position for the claim term "buffer" for the '850 Patent.

4. Defendant's Sur-Reply Position

See Defendant's Sur-Reply Position for "buffer" ('528 Patent).

W. "fluid"

| No. | Asserted Patents and Claims | Plaintiff's Proposed Construction | Defendant's Proposed Construction |
|-----|---------------------------------------|-----------------------------------|-----------------------------------|
| 43 | '850 cls. 10, 11 '283 cls. 1, 4, 5 | "a liquid or a gas" | "a liquid" |

1. Plaintiff's Opening Position

NanoCollect's construction of "fluid" is scientifically incorrect and too limiting because it excludes gases from the definition. The patent specifications explicitly refer to "gas" as a "fluid," and so "gas" should be included in the construction. *See, e.g.*, '850 Patent: 6:17–19 ("The meniscus defines an interface between the carrier liquid and *another fluid, such as a gas* . . ."). In fact, it is common parlance in the scientific community to "call both liquids and gases fluids." Robert A. Granger, *Fluid Mechanics* § 2.2 (*What Is a Fluid?*) at 41 (2d ed. 1995).

X. "chamber"

| No. | Asserted Patents and Claims | Plaintiff's Proposed Construction | Defendant's Proposed Construction |
|-----|---------------------------------------|--|-----------------------------------|
| 44 | '850 cls. 10, 11 '283 cls. 1, 5, 6 | "a physical structure that contains fluid" | Plain and ordinary meaning |

1. Plaintiff's Opening Position

The Court should expressly construe the term "chamber" because it will likely be a critical term in the dispute. The claim language and specifications demonstrate that "chamber" in the '850 and '283 Patents—which have a common ancestry and share a specification—means

“a physical structure that contains fluid.” For example, claim 1 of the ’283 Patent recites a “duct” with a “first chamber in fluid communication with the duct via a first side opening,” and dependent claim 5 recites “a second chamber in fluid communication with the duct via a second side opening.” Because they are in fluid communication with the duct via side openings, the claimed chambers are structures that contain fluid. The specification provides examples of these “chambers,” such as components 70, 70a, and 70b in Figures 1–7, which show a fluid-filled physical structure that produces or receives a pressure pulse. *See* ’283 Patent at Figs. 1–7, 9:25–35, 6:44–62, 7:39–46, 9:63–10:21 (identifying 70b as a “compression” or “actuator” chamber and 70a as a “buffer” chamber); *see also* 4:35–50, 8:19–31. Notably, the ’797, ’850, and ’295 Patents contain the same drawings as the ’283 and ’850 Patents but identify these “chamber” components as “reservoirs.” *See, e.g.*, ’295 Patent at Fig. 16. This supports Cytonome’s position that “chamber” and “reservoir” have the same meaning.

2. Defendant’s Response Position

Defendant proposes that the term “chamber” be construed as per its plain and ordinary meaning and that no further construction is needed. Plaintiff is seeking to re-write the scope of the asserted claims of the ’850 and ’283 patents by effectively redefining the term “chamber” through Plaintiff’s proposed construction of “chamber” as “a physical structure that contains fluid”—the same construction that Plaintiff proposes for the term “reservoir.” *Supra* at 84–85. Indeed, Plaintiff argues that “chamber” is to have the same meaning as “reservoir.” *Id.* In effect, Plaintiff seeks to import the limitation “contains fluid” into the construction of the claim term “chamber” as well as “reservoir.” As support, Plaintiff cites to claims 1 and 5 of the ’283 patent, which recite a “chamber in fluid communication with the duct” via side openings to argue that the claimed chambers are structures that contain fluid. *Id.* Further, Plaintiff cites to components

70, 70a, and 70b in Figures 1-7 of the '283 patent—"compression" or "actuator" chamber and "buffer chamber"—to argue that these figures show a fluid-filled physical structure. *Id.*

However, Plaintiff's analysis is based on the operation of the claimed particle sorting chip and particle sorting system of the '283 and the '850 patents, respectively, wherein based on Plaintiff's arguments, the operation of the claimed devices results in fluid entering the compression or actuator chamber and the buffer chamber. Plaintiff does not cite to any support for their position that the chamber components of the device "contain fluid" when not in operation, either before or after. Further, in this analysis, Plaintiff conspicuously did not address the "Particle Input" chamber of the claimed invention. *See* component 88 of Figure 11 of the '283 patent and the '850 patent. Typically, particle input chambers are empty until sample is inputted into the chamber. As the construction of the term cannot be changed based on whether the device is in operation or not, Plaintiff's proposed construction is inconsistent with the claimed inventions of the '283 and the '850 patents.

3. Plaintiff's Reply Position

As an initial matter, the term "chamber" should be expressly construed by the Court because it has the same meaning as "reservoir" and a similar meaning to "buffer." *See also* Ex. H, Vacca Decl. ¶¶ 44–47. Because some of the asserted claims use the term "chamber," while others use the terms "reservoir" or "buffer," it would be helpful for the jury to know that "chamber" does not have a different meaning. NanoCollect acknowledges that the terms have the same meaning when it addresses the term "otherwise sealed." There, NanoCollect asserts that "a POSA would understand the 'second *chamber*' [in the claim] to be 'the *reservoir* 70a of the second bubble valve [in the specification]." *See* '283 Patent at 7:39–42.

NanoCollect's argument that "particle input chambers are empty until sample is inputted into the chamber" and thus a chamber does not "contain fluid" when the device is not in

operation is nonsensical. As explained in Plaintiff’s opening brief for the term “fluid,” a fluid can be a liquid or a gas. When the chamber is “empty,” it contains gas and thus contains a fluid. By that same token, the claimed “reservoirs” and “buffers” may contain liquid or gas fluid.

4. Defendant’s Sur-Reply Position

Cytonome equates “chamber” with “reservoir” and “buffer.” *Supra* at 86. However, the very fact that Cytonome chose to use three *different* words demonstrates that the three words do not have the same meaning. *See Stumbo*, 508 F.3d at 1362; *Merck*, 395 F.3d at 1372; *Bicon*, 441 F.3d at 951. In effect, Cytonome is seeking to narrow its claim to avoid invalidity by importing the limitation “contains fluid” into the construction of the claim term “chamber.” Instead, “chamber” should be construed by its plain and ordinary meaning as this term will be readily understood by the jury. *Ex. K*, Di Carlo Decl., ¶ 83.

Y. “unique identifier”

| No. | Asserted Patents and Claims | Plaintiff’s Proposed Construction | Defendant’s Proposed Construction |
|-----|-----------------------------|---|-----------------------------------|
| 45 | ’188 cl. 11 | “a unique label, such as a barcode, that renders an object fully traceable” | Plain and ordinary meaning |

1. Plaintiff’s Opening Position

The term “unique identifier” in the ’188 Patent claims means “a unique label, such as a barcode, that renders an object fully traceable.” This definition is consistent with the specification, which explains that “[e]ach cartridge . . . can be given a barcode or other unique identification, making all of the parts that represent possible sources of product contamination fully traceable.” ’188 Patent at 11:25–29.

2. Defendant's Response Position

Plaintiff is seeking to re-write the scope of claim 11 of the '188 patent by proposing construction of "unique identifier" as "a unique label, such as a barcode, that renders an object fully traceable." *Supra* at 87. The words "unique" and "identifier" are ordinary English words that are easily understood by a jury and do not hold any special meaning. Accordingly, the plain and ordinary meaning of this language should apply and no further construction is needed.

3. Plaintiff's Reply Position

By separately addressing the terms "unique" and "identifier," NanoCollect demonstrates why a construction of the phrase "unique identifier" is needed. Because the jury would likely understand the two terms separately as ordinary English words, it may fail to appreciate that the terms have a specific meaning when combined, namely "a unique label, such as a barcode, that renders an object fully traceable." *See* '188 Patent at 11:25–29 ("Each cartridge (and therefore all fluid contact surfaces needed for a single processing run) can be given a barcode or other unique identification, making all of the parts . . . fully traceable.").

MORRIS, NICHOLS, ARSHT & TUNNELL LLP

/s/ Anthony D. Raucci

Rodger D. Smith II (#3778)
Anthony D. Raucci (#5948)
1201 North Market Street
P.O. Box 1347
Wilmington, DE 19899
(302) 658-9200
rsmith@mnat.com
araucci@mnat.com
Attorneys for Plaintiff Cytonome/ST, LLC

OF COUNSEL:

Kirt S. O'Neill
Daniel L. Moffett
AKIN GUMP STRAUSS HAUER & FELD LLP
112 E. Pecan Street, Suite 1010
San Antonio, TX 78205
(210) 281-7000

Thomas W. Landers IV
AKIN GUMP STRAUSS HAUER & FELD LLP
1111 Louisiana Street, 44th Floor
Houston, TX 77002
(713) 220-5800

February 21, 2020

WILSON SONSINI GOODRICH & ROSATI, P.C.

/s/ Ian R. Liston

Ian R. Liston (#5507)
222 Delaware Avenue, Suite 800
Wilmington, DE 19801
(302) 304-7600
iliston@wsgr.com
*Attorneys for Defendant
NanoCollect Biomedical, Inc.*

OF COUNSEL:

Douglas H. Carsten
Rhyea Malik
WILSON SONSINI GOODRICH & ROSATI, P.C.
12235 El Camino Real
San Diego, CA 92130

Adam Burrowbridge
WILSON SONSINI GOODRICH & ROSATI, P.C.
1700 K Street NW, Fifth Floor
Washington, DC 20006