IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN

ABS GLOBAL, INC.,

Plaintiff/Counterclaim Defendant,

v.

INGURAN, LLC,

Defendant/Counterclaimant/Third-Party Plaintiff,

and

XY, LLC,

Intervening Defendant/Counterclaimant/Third-Party Plaintiff,

and

CYTONOME/ST., LLC,

Intervening Defendant,

v.

GENUS PLC,

Third-Party Defendant.

OPINION & ORDER

14-cv-503-wmc

This lawsuit arises out of the breakdown of a now ten-year business relationship between plaintiff ABS Global, Inc. ("ABS") and defendant/counterclaimant Inguran, LLC d/b/a Sexing Technologies ("ST"). Originally, ABS sued seeking a declaration that the parties' latest agreement, under which ST is to continue to provide sexed semen processing services for prized bulls at ABS facilities from 2012 to at least 2017, is void under § 2 of the Sherman Antitrust Act and Wisconsin unfair competition law. Not to be outdone, ST then counterclaimed that: (1) ABS and ABS's parent company, Genus plc ("Genus"), had fraudulently induced ST to enter into the Agreement; (2) ABS and

Genus breached the agreement in a number of ways; (3) ABS and Genus are liable under an alternative theory of promissory estoppel; and (4) ABS and Genus has infringed two U.S. patents owned by ST. Finally, ST's wholly-owned subsidiary, XY, LLC ("XY"), intervened in this action with its own claims against ABS and Genus for infringement of two additional U.S. patents owned by XY, and for misappropriation of XY's alleged trade secrets. Sadly for all concerned, most of these claims will now proceed to a jury trial for the reasons set forth below.

OVERVIEW OF UNDISPUTED FACTS[1]

I. The Parties

ABS is in the business of providing bull semen to dairy and beef producers for artificial insemination. ST provides a service to ABS and other similar companies using "sorting" technology to separate male and female bull sperm. From 2006 to 2012, ABS and ST did business together under the terms of several contracts called "Sorting Agreements." In 2012, ABS explored alternatives to doing business with ST, including use of its own technology for sorting, but was unsuccessful. As a result, ABS reupped, signing a 2012 Semen Sorting Agreement with ST (the "Agreement") after some six months of negotiation over its specific terms. Also in 2012, ABS continued researching and developing technology for processing sexed bovine semen, which it calls "Genus Sexed Semen" or "GSS" technology.

[1] Except as otherwise noted, the court finds the following facts to be material and undisputed for purposes of summary judgment. Additionally undisputed facts are set forth in the court's Opinion below in the context of specific counts in the complaint.

II. Background

Although the parties' characterizations of the bull semen market differ drastically, they do not appear to dispute the following facts that provide necessary context to their claims and defenses.[2] Dairy and beef producers often use artificial insemination to impregnate cows with semen from a high quality bull. The suppliers of bull semen like ABS are referred to as "bull studs." Along with ABS, who appears to be the industry leader, just three other major bull studs -- Select Sires, Cooperative Resources International ("CRI") and Accelerated Genetics -- represent some 96% of the U.S. market for bull studs.

Although ST also operates as a bull stud, it is mainly in the business of sorting bull ejaculate so that the viable sperm cells are either predominantly female or male. The parties, and apparently the marketplace, refer to the final product of this process as "sexed semen" or "sexed bovine semen."

On dairy farms, female calves are generally more valuable than male calves. Inseminating cows with sexed semen that has a higher proportion of X-chromosome sperm is more likely to lead to birth of a female calf than impregnating them with so-called "conventional" semen that is not sexed. As a result, sexed semen has become a tool for many (although not all) dairy producers using artificial insemination, especially for heifers, who tend to be more fertile and therefore more likely to be impregnated by

[2] As the parties' respective proposed findings of facts have not included this background information, the court has referred to their respective expert reports to fill in the gaps. (*See* Kevin Murphy Am. Expert Rpt. (dkt. #298) at 7-8; Barry C. Harris Expert Rpt. (dkt. #322) at 8-11.) Most of the general background appears to be in dispute; neither is it strictly material to the outcome of the parties' respective motions for summary judgment.

the substantially more expensive, though generally less potent sexed semen.[3] Accordingly, even though the majority of its sales are comprised of conventional semen, companies like ABS and the three other major American bull studs, offer both conventional bovine semen and sexed semen.

ST was founded in October of 2002, and it began attempting to commercialize sexed semen processing in 2003. ST entered into its first contract with a U.S. bull stud to provide sexed semen processing services in 2004. By virtue of its patented method and related advantages it has received from acquiring XY, Inc. (as described below), ST currently has nearly 100 percent of the sales of sexed semen processing services in the United States. ABS asserts (and ST disputes) that bull studs like ABS have had no choice but to work with and accept ST's contract terms, including those in the Agreement at issue here. In particular, ABS and ST dispute whether ABS needed, or had the ability to find, another source for sexed semen processing.

III. The Agreement

The Agreement became effective September 1, 2012, and continues by its terms until at least September 1, 2017, with the opportunity for additional one-year extensions. In it, ABS agreed to provide raw ejaculate from bulls owned or leased by ABS for sorting by ST. The agreement is governed by Texas law and contains the following preamble:

> ST is engaged in the business of sorting and freezing bovine semen into X (female) chromosome bearing and Y (male) chromosome bearing populations, for use in the artificial insemination of cattle (herein the processing service shall be known as "Sort Semen" or "Sorting Semen" and

[3] By definition, a "cow" has given birth to at least one calf, while a "heifer" is a female who has never had a calf.

> resultant X or Y chromosome bearing populations of sperm shall be known as "Sorted Semen"). ABS wishes to engage ST as a service provider to Sort Semen from its bulls in strict compliance with Certified Semen Services' processes and procedures (known as "CSS Compliance") and retain the X (female) and Y (male) chromosome bearing population, respectively, as separated (known as "Cells").

(Agreement, Ex. 7 to Horowitz decl., dkt. #258-7.)

The parties' contractual and antitrust/unfair competition-related disputes stem from several sections of this agreement, principally involving:

- Section 2, which includes annual commitments for ABS and ST. Each year, ABS must provide a certain annual amount of semen and ST must provide its services for a certain amount of semen.

- Section 3, which includes a provision that makes the contract extend for an additional year "unless either party … gives written notice to the other party of its election not to so extend the term" three years in advance. (Agreement, dkt. #258-7, at ING_005740.)

- Section 4(a), which provides for liquidated damages if either party terminates the Agreement for any reason other than the other party's material breach, as defined by Section 19 of the Agreement. Section 4(b) provides that ABS will pay ST $1,500,000 "as liquidated damages" if ABS terminates the agreement, including by non-renewal under Section 3, or if ST terminates it due to ABS's material breach.

- Section 16, which defines "ST's Confidential Information" and ABS agreed not to use, disclose or make such information available to any third party.

- Section 18(a), which restricts ABS's ability to research and develop a sorting technology that would compete with ST's technology. Section 18(b) permits ABS to continue research and development on programs that were in place at least ninety (90) days prior to the Agreement's effective date.

IV. The Technology

A. ST Sexed Semen Processing

ST originally based its sexed semen technology on a process developed by Lawrence Johnson at the U.S. Department of Agriculture (the "Johnson method"). The Johnson method is the subject of U.S. Patent No. 5,135,759 ("Johnson Patent") and requires a device called a flow cytometer, which is used to separate cells physically based on their different properties. The Johnson Patent involves the use of fluorescent dye that binds to the DNA in sperm cells. Because X chromosomes, which are female, have more DNA than Y chromosomes, which are male, an X-carrying/female sperm will give off more fluorescent light when exposed to a detection laser than a Y-carrying/male sperm. The Johnson method uses this difference in fluorescence to sort female from male sperm by applying a positive, negative or no charge to a droplet containing an individual cell and then deflecting the charged droplet one way or another with electrostatic deflection plates.

Since the Johnson Patent expired in 2006, ST has purchased, acquired or licensed several U.S. patents related to sexed semen processing. Principally, ST acquired control of XY, Inc., in 2007. At the time, ST was one of several U.S. licensees using XY's U.S. Patent Nos. 7,195,920 ("'920 patent") and 7,820,425 ("'425 patent"). The parties dispute exactly how the other licenses ended, but they do not dispute that ST is now XY's sole current licensee for its patented sexed semen process in the United States for bull studs. Since 2007, XY has also been a wholly-owned subsidiary of ST. In 2008, ST also purchased several pending patent applications related to sexed semen processing

from Monsanto Company ("Monsanto"). Those applications matured into 24 U.S. patents, including U.S. Patent Nos. 8,206,987 ("'987 patent") and 8,198,092 ("'092 patent") that remain in suit here. Finally, ST obtained an exclusive license for non-human applications to a portfolio of U.S. patents relating to sexed semen processing from Cytonome, Inc., covering an additional 46 U.S. patents related to sexed semen.

B. ABS Sexed Semen Processing

ABS has developed its own technology, known as the "GSS technology" for "Genus Sexed Semen," that uses a laser-based method for producing sexed semen. The GSS technology kills or incapacitates the male or female sperm, rather than separating sperm by sex. Through this technology, all of the sperm remain in a single stream throughout the process and are collected in a single container after the laser operates on them. ABS's corporate representative indicates that the GSS technology has worked in field trials and is ready to launch, but ABS has put off the launch due to this lawsuit.

OPINION

I. Contract Claims

The parties' Agreement includes a Texas choice of law provision, and so Texas law controls. (Duncan Decl. Ex. 1 (dkt. #245-1) [hereinafter "Agreement"] ¶ 27.) Under Texas law, "[t]he construction of an unambiguous contract is a question of law for the court." *Willis v. Donnelly*, 199 S.W.3d 262, 275 (Tex. 2006) (citing *MCI Telecomms. Corp. v. Tex. Utils. Elec. Co.*, 995 S.W.2d 647, 650 (Tex. 1999)). "In construing a written contract, the primary concern of the court is to ascertain the true intentions of the parties

as expressed in the instrument." *Coker v. Coker*, 650 S.W.2d 391, 393 (Tex. 1983). This effort requires the court to "examine and consider *the entire writing* in an effort to harmonize and give effect to *all the provisions* of the contract so that none will be rendered meaningless." *Id.* (emphasis in original) (citing *Universal C.I.T. Credit Corp. v. Daniel*, 150 Tex. 513, 243 S.W.2d 154, 158 (1951)).

"If the written instrument is so worded that it can be given a certain or definite legal meaning or interpretation, then it is not ambiguous and the court will construe the contract as a matter of law." *Id.* If, however, "by looking at the contract as a whole in light of the circumstances present when the contract was entered," a contract is "reasonably susceptible to more than one meaning," then it is ambiguous. *Id.* at 393-94. In the event that a contract is ambiguous, "interpretation of the instrument becomes a fact issue." *Id.* at 394.

With respect to the Agreement itself, ABS moves for summary judgment on four grounds: (1) its development and expected commercialization of the GSS technology does not breach the Agreement; (2) ST's fraudulent inducement and promissory estoppel claims fail as a matter of law; (3) ABS did not breach the confidentiality provisions of the Agreement; and (4) the liquidated damages provision of the Agreement is unenforceable. In response, ST moves for summary judgment on the basis that: (1) the non-compete clause of the Agreement expressly *encompasses* the GSS technology; and (2) the Agreement's covenant not to compete is enforceable under Texas law.

A. Research and Development of the GSS Technology

Since both ABS and ST move for summary judgment on the question of whether the GSS technology violates the Agreement's non-compete clause, the court begins there. The clause provides:

> To further ensure the efficient and full utilization of ST's sorting capacity and to ensure the protection of ST's Confidential Information, neither ABS nor any of its Affiliates shall, at any time during the Term of this Agreement (including any Renewal Years), **directly or indirectly** (whether by means of financing or investing in another entity or its activities), **create, develop, sell or market any method**, apparatus, or technology ***for sorting mammalian semen into X (female) chromosome bearing and Y (male) chromosome bearing sperm populations***, **where such method, apparatus or technology is, or is intended to be, directly competitive** with (i) ST's technology for Sorting Semen, or (ii) any sorted semen produced by ST's technology for Sorting Semen. For the avoidance of any doubt, in the event of termination of this Agreement prior to the expiration of the Term, excluding termination by ABS due to ST's material breach, the obligations under this Section 18 shall survive until the end of the Term (including any Renewal Years then accrued).

(Agreement ¶ 18(a) (emphasis added).)

In an argument that echoes in the parties' patent disputes, ABS argues primarily that Section 18(a) does not apply because the GSS technology "kills undesired cells but does not separate them from the desired cells, is not a technology for 'sorting mammalian semen into X (female) chromosome bearing and Y (male) chromosome bearing sperm populations,' and therefore ST cannot establish any breach of Section 18(a)." (Pl.'s Opening Br. (dkt. #270) at 58.) Even more specifically, ABS argues, "a processing technology that collects the processed semen in a single container does not 'sort' into two

'populations' and is therefore not affected by the provision's restrictions on sorting technologies." (*Id.*)

In support of its reading of "sorting" under Section 18(a), ABS refers to three other provisions in the Agreement. Two are found in its "prelude": (1) "ST is engaged in the business of *sorting* and freezing bovine *semen into X (female) chromosome bearing and Y (male) chromosome bearing populations*" (Agreement (dkt. #245-1) at 1 (emphasis added)); and (2) "ABS wishes to engage ST as a service provider to Sort Semen . . . and retain the X (female) and Y (male) chromosome bearing population, respectively, as separated[.]" (*Id.*) The third provision concerns the Agreement's definition of "purity," which is "the ratio of the number of sperm cells of the requested gender to the total number of sperm cells in each straw." (*Id.* at ¶ 1.) ABS also cites the Oxford English Dictionary, which defines "sort" as "to separate and put into different sorts or classes," as well as the American Heritage Dictionary, which defines "sort" as "to separate from others," and provides for the example that of sorting "the wheat from the chaff."

On the other hand, ST argues that "[w]hen viewed in light of the entire agreement, 'sorting' covers *any and all techniques*, including droplet sorting, photo-damage sorting, fluid-switching sorting, or similar techniques." (Def.'s Opening Br. (dkt. #275) at 30.) ST further argues that in addition to the preamble of the agreement not limiting sorting to a process that "separates" or "divides," it also merely concerns the extent of processing services ST was agreeing to provide, and not which activities Section 18 barred. Moreover, ST points to the second half of one of the preamble sentences that

states "the purpose of the sorting is to create sperm populations 'for use in the artificial insemination of cattle.'" (*Id.* at 29.)

Taking the contract as a whole, the court is persuaded that ABS's interpretation of "sorting" in Section 18(a) is too limited to give effect to the intentions of the parties. Beginning with the plain language of the Agreement, even under the dictionary definitions provided by ABS, the verb "sort" concerns *the process by which* one "separates" or "puts into different classes," not the form of the resulting thing or things that were sorted. By way of example only, ABS's extremely narrow reading of "sorting" would exclude a gym teacher who separates a group of elementary school students into two soccer teams by handing half of them the same color jersey, but not physically separating them into two distinct groups. Nevertheless, few would disagree that the teacher had "sorted" his students under a plain or ordinary understanding of the word. Thus, while the meaning of "sorting" certainly extends to circumstances where one separates a population into smaller, separate populations -- and indeed, if that is the narrow method called for by a patent's express terms, might even require it -- but one can sort something, such as children into two teams, library books into genres or sperm cells into a population comprising sperm cells of a single sex, without ever physically separating them.

The context of the Agreement as a whole confirms that the parties intended a broader meaning than that now championed by ABS. First, the language of the non-compete clause is broad, restricting ABS from doing anything to "directly or indirectly . . . create, develop, sell or market any method, apparatus, or technology for

sorting mammalian semen[.]" (Agreement ¶ 18(a).) Second, the non-compete clause restricts devices that sort semen into "X (female) chromosome bearing and Y (male) chromosome bearing sperm populations," which again by its plain language is not limited to physical separation of sperm into *two separate* containers, provided the *ultimate* product creates an acceptably pure female or male chromosome bearing sperm population. Third, and perhaps most important, the non-compete clause itself explains that the purpose of the clause is to restrict a "method, apparatus or technology [that] is, or is intended to be, directly competitive with (i) ST's technology for Sorting Semen; *or* (ii) any sorted semen produced by ST's technology for Sorting Semen," at least one of which there is no dispute does not in fact "sort" using physical separation. Accordingly, the non-compete clause demonstrates that the primary purpose for the clause is to limit direct competition with *either* the particular technology utilized by ST or the product created with that technology, and not just a specific method for sorting semen by sex.

Since ABS's express desire to compete with ST is at the heart of the current lawsuit, ABS does not contend, nor could it contend, that its GSS technology is not designed to compete directly with ST's technology. Indeed, ABS brings antitrust claims against ST based on that very theory. For all of these reasons, ST's assertion that "sorting" in Section 18 encompasses ABS's GSS technology, better captures the context of the Agreement as a whole, and gives effect to the plain language of the non-compete clause in particular, whereas ABS's interpretation would render that clause relatively meaningless.

That said, however, the Agreement also includes a "safe harbor" provision that was the subject of much negotiation:

> Notwithstanding Section 18(a) above or any other provision of this Agreement, nothing herein shall operate to restrict ABS or its affiliates from fulfilling or continuing their research and development program that has been in place at least ninety (90) days prior to the Effective Date of this Agreement (as demonstrated by ABS's or its Affiliates' contemporaneous written records), including the utilization of ABS' own personnel and resources and any third party for research or development of semen sorting technology or for investment in such research or development in fulfillment of that program; provided, however, that the aforesaid research and development program shall not include any marketing or sales of Sorted Semen or any use of Sorted Semen in third-party animals. For purposes of the foregoing sentence, "field trials" shall be limited as follows: (1) "field trials" shall be conducted with no more than 12,000 cumulative doses per annum and no more than 75 of ABS's co-operator herds in any year, (ii) "field trials" cannot include the use of conventional or Sorted Semen produced by or under the authority of ST or its Affiliates, whether as a control or otherwise, and (iii) an animal leased to ABS or any of its Affiliates shall be considered a third-party animal.

(*Id.* at ¶ 18(b).)

ST does not effectively dispute that the safe harbor in Section 18(b) exempts ABS's research and development of the GSS technology from any restrictions found in Section 18(a), although it accuses ABS of fraud in not disclosing the scope or progress in that technology during negotiations, a claim addressed below. While the safe harbor does not extend to any efforts by ABS to sell or market competing technologies, there is also no dispute that ABS is currently doing neither. As a result, the parties' current contract dispute comes down to ABS's claim for a declaratory judgment that it may

compete with ST in the sexed bovine sperm market using its own GSS technology despite an express contractual prohibition to its doing so.

B. Enforceability of Non-Compete Under Texas Law

ST also moves for summary judgment on the basis that its non-compete clause is enforceable under Texas law, which ABS disputes. Under Texas law, "[a] covenant is unreasonable if it is greater than required for the protection of the person whose benefit the restraint is imposed or imposes undue hardship upon the person restricted." *Republic Servs., Inc. v. Rodriguez*, No. 14-12-01054-CV, 2014 WL 2936172, at *7 (Tex. App. 2014) (citation omitted). "Industrywide exclusions are therefore unreasonable" under Texas law. *Id.* An enforceable covenant not to compete must also be "ancillary to or part of an otherwise enforceable agreement" and reasonably limited in scope as to time and geography. Tex. Bus. & Com. Code § 15.50(a).

Here, ABS has a strong argument that the scope of the activity covered by Section 18(a) is too broad. First, ABS argues that to the extent Section 18 restricts ABS from "directly or indirectly" researching or marketing technology that would compete with ST's technology, it is arguable that Section 18 amounts to an unenforceable "industrywide exclusion" under Texas law. In response, defendants argue that the non-compete clause cannot be industrywide because it leaves ABS able to pursue any activities it wishes with respect to the research, development or commercialization of conventional bull semen processes. Since the Agreement concerns only sexed bull semen, it is unclear why the lack of any restrictions on conventional bull semen should save Section 18. Second, plaintiffs point out that Section 18's worldwide restriction on ABS's activity is

unreasonably large in scope, particularly given that ABS's only focus in foreign markets has been on sales of conventional bull semen. *Cf. Cobb v. Caye Publ'g Grp. Inc.*, 322 S.W.3d 780, 786 (Tex. App. 2010) (holding that a covenant not to compete extending to a particular county was unreasonable in scope when the defendant "had nothing more than a potential business interest" in that county) (emphasis in original).

However, Texas law also enables courts to reform covenants not to compete "[i]f the covenant is found to be ancillary to or part of an otherwise enforceable agreement but contains limitations as to time, geographical area, or scope of activity to be restrained that are not reasonable and impose a greater restraint than is necessary to protect the goodwill or other business interest of the promissee[.]" Tex. Bus. & Com. Code § 15.51. Until ST establishes a breach of the non-compete clause, however, the court will not reform it. Accordingly, the court will deny summary judgment to defendants on the issue of whether Section 18 is an enforceable covenant not to compete.

C. Confidential Information

Next, ABS seeks summary judgment on ST's claim that it breached the confidentiality provisions in the Agreement. Section 16 of the Agreement defines "ST's Confidential Information" as that which is "confidential, non-public, proprietary and/or generally not known to the public[.]" (Agreement ¶ 16.) The allegedly confidential information ST claims ABS misused includes "(1) ST's and XY's sexing protocols for preparing semen sorting media; (2) ST's method for calculating straw fill volumes; and

(3) ST's quality control data for sexed bulls."[4] (Defs.' Opp'n Br. (dkt. #334) at 63.) In moving for summary judgment, ABS asserts with respect to the first category that there is no evidence any sexing protocols were even disclosed to ABS. As for the second and third, ABS asserts that: ST's method for calculating straw fill volumes is not confidential; and the quality control data did not belong to ST. The court addresses each assertion in turn.

Starting with the first category, ABS concedes that XY's tort claim based on allegations that an ex-employee, Kathy Mean, stole sexing protocols to benefit the GSS technology must go to trial. ABS argues with respect to the breach of the confidentiality provision claims, however, that since Mean left XY to work at ABS in 2007, ST has failed to show that ABS used confidential information regarding the protocols disclosed during the life of the Agreement, which became effective in 2012.

In addition to Mean's claimed disclosures, ST points to evidence that it claims demonstrates ABS's receipt of media protocols. Generally, ST asserts that ABS employees had "unfettered access" to its laboratory in ABS's facility where ST kept its protocols in notebooks. Furthermore, ABS employee Eliza Roberts testified at her deposition that "confidential information about ST's sperm-sorting process was conveyed to [ABS employee] Jeff Betthauser when the ST lab was set up." Finally, ST employee Rich Neis testified at his deposition that he had multiple conversations with Roberts about adjusting the pH range of the ejaculate to better stain the sperm cells. In light of this varied testimony, ST has provided sufficient evidence that ABS received sexing

[4] ST has withdrawn a claim for breach of confidentiality based on "ST's morphology criteria." (Defs.' Opp'n Br. (dkt. #334) at 68-69.)

protocols during the life of the Agreement. Accordingly, ABS is not entitled to summary judgment on ST's claim for breach of contract with respect to ABS's alleged misuse for competitive advantage of confidential sexing protocols for preparing sorting media.

Likewise, ABS is not entitled to summary judgment on the third category, given that the court is unable to resolve the parties' conflicting evidence as to whether: (1) quality control data was owned by ABS or (2) any use of the quality control data by ABS could not have provided a competitive advantage. That being said, the court agrees with ABS that it *is* entitled to partial summary judgment as to the second category, since ST has failed to produce any evidence that so-called confidential information regarding its method for calculating straw fill volumes was not already disclosed in an earlier instruction manual or ABS memo on the subject. Accordingly, the court will grant in part and deny in part summary judgment as to ST's claims for breach of the Agreement's confidentiality provision.

D. Liquidated Damages

ABS moves for summary judgment on the grounds that the Agreement's liquidated damages provision is unenforceable. While this is a question of law for the court, *Phillips v. Phillips*, 820 S.W.2d 785, 788 (Tex. 1992), the party challenging the validity of a liquidated damages provision has the burden of proof. *Nortex Drug Distribs., Inc. v. Sunset Trails, Inc.*, 2000 WL 1230766, at *3 (Tex. App. Aug. 31, 2000).

Section 4 of the Agreement provides for several different, overlapping measures of "liquidated damages" recoverable by ST. In Section 4(a), the Agreement provides that ABS will pay ST $7.50 per unpurchased straw for all unfilled "Annual Minimum

Commitments" as "actual economic damages" should ABS commit a material breach or terminate the Agreement for any reason other than ST's material breach. (Agreement ¶ 4(a).) In Section 4(a), the Agreement also provides that ABS will pay ST $1,500,000 "for additional [unspecified but] actual economic damages" upon the early termination of the Agreement, ST terminates the contract due to ABS's material breach *or* (apparently) ABS merely gives timely notice of the Agreement's non-renewal under Section 3. (*Id.* at ¶ 4(b).)

Section 3 of the Agreement, an "evergreen" provision, explains that the term of the Agreement will automatically be extended for additional one-year intervals unless and until either party provides written notice no later than three years before its then effective end date. (*Id.* at ¶ 3.) Effectively then, the original 5-year term of the Agreement will be extended for one additional year on the anniversary of the second year of the Agreement until either party gives timely notice that it no longer wishes to extend further. (*Id.*)

Finally, Section 4(c) states:

> The parties agree that the sums set forth in Sections 4(a) and 4(b) above are a reasonable estimate of the damages that would be suffered by ST due solely to the lost sales of Sorted Semen as a result of the termination scenarios set forth in Sections 4(a) and 4(b), as the case may be, and that such sums are not intended to be a penalty. These liquidated damages shall not be exclusive of each other, nor of any other remedy available to ST at law or in equity, including but not limited to termination of this Agreement, or of the recovery of any damages caused by any other breach of this Agreement by ABS.

(Agreement ¶ 4(c).)

Defendants ST and XY argue primarily that, by its terms, the $1.5 million fee set forth in Section 4(b) is not a liquidated damages provision or unenforceable penalty at all, but rather a bargained-for "cancellation fee." There is at least some support in the case law for the proposition that a provision can only be invalidated as an unenforceable liquidated damages provision under Texas law if it is triggered as the result of a breach. *See Blanchard & Co., Inc. v. Heritage Capital Corp.*, No. Civ. A. 3: 97-CV-0690-H, 1998 WL 597160, at *3-4 (N.D. Tex. Aug. 26, 1998) (holding that a provision was "neither a penalty nor a liquidated damages provision" because the condition triggering the provision did not result in a breach of contract); *B.F. Saul Real Estate Inv. Tr. v. McGovern*, 683 S.W.2d 531, 534 (Tex. App. 1984) ("The whole subject of penalty versus liquidated damages only arises when the parties to a contract have attempted to provide for a remedial right upon a breach of contract."). Indeed, at least one Texas court has concluded that a "cancellation damages provision" was not an unenforceable liquidated damages penalty under Texas law. *See Nortex Drug Distribs.*, 2000 WL 1230766 at *3 (finding). *But see Garza v. Dealers Elec. Supply*, No. 14-02-01227-CV, 2004 WL 1193698, at *1 n.6 (Tex. App. 2004) ("A party has no right to have a contract term enforced that violates the rule limiting compensation to the damages actually sustained. *Phillips*, 820 S.W.2d at 788. Thus, even if a liquidated damage term in the form of a 100% cancellation fee had been expressly agreed to . . ., it would have required proof that the actual damage amount was difficult to ascertain and that the liquidated damage amount was a reasonable forecast of just compensation, neither of which was shown in this case.").

In an attempt to make sense of this somewhat muddled standard, defendants argue that case law requires Texas courts to look to "the substance of the contract's terms to determine if the provision constitutes 'liquidated damages,'" meaning that it is not dispositive that Section 4(a) of the Agreement refers to the $1.5 million figure as "liquidated damages." *Sunbelt Servs., Inc. v. Grove Temp. Serv., Inc.*, No. 05-05-01090-CV, 2006 WL 2130144, at *3 (Tex. App. Aug. 1, 2006). They further assert that "ABS and Genus only challenge the $1.5 million payment in the context of Section 4(b)(i)," and therefore, "Section 4(b)(ii) is not at issue." While ABS and Genus's briefing lacks some clarity with respect to their arguments as to the enforceability of Section 4 of the agreement, however, the fairest reading of their motion is that they intend to challenge the enforceability of Section 4 more broadly.[5]

Ultimately, the court is *not* persuaded that the $1.5 million fee is merely "compensation for the cost of setting up [ST's] sorting lab onsite at ABS's Wisconsin facility" (Def.'s Opp'n Br. (dkt. #334) at 78), which after all would not seem all that difficult to ascertain in actual dollars. Although it is arguable that this fee operates as a cancellation fee for breach under Section 4(b)(i), it clearly is a liquidated damages fee under 4(b)(ii). Accordingly, even under the Texas cases requiring that a breach of contract trigger the fee before invalidating it as an unenforceable liquidated damages provision, the $1.5 million fee *is* a liquidated damages provision.

[5] ABS and Genus confirm as much in their response to ST and XY's "proposed finding of fact" to this effect, stating that they are challenging the enforceability of Section 4(b) as a whole. (Resp. Supp. PFOF (dkt. #350) ¶ 428.)

For a liquidated damages provision to be enforceable under Texas law, the relevant harm caused by the breach must also be "incapable or difficult of estimation" and the amount of liquidated damages must be "a reasonable forecast of just compensation." *FPL Energy, LLC v. TXU Portfolio Mgmt. Co., L.P.*, 426 S.W.3d 59, 69 (Tex. 2014) (citations omitted). Defendants do not respond to ABS's arguments that the liquidated damages available under Section 4 fail to meet these criteria, relying instead on their original arguments that: (1) the $1.5 million figure in Section 4(b)(i) is merely a "cancellation fee"; and (2) plaintiffs do not challenge the enforceability of Section 4(b)(ii). Having rejected both arguments, the court further agrees with ABS that the flat $1.5 million fee cannot be a reasonable forecast of just compensation, since it applies equally in the first year of the agreement as it does to the last. *See Bethel v. Butler Drilling Co.*, 635 S.W.2d 834, 837-38 (Tex. App. 1982) (finding that a liquidated damages provision was an unenforceable penalty because it did not account for the proportionality of the harm caused by the breach). This conclusion is bolstered by the statement in Section 4(c) of the Agreement that "the sums set forth in Sections 4(a) and 4(b) above are a reasonable estimate of the damages that would be suffered by ST *due solely to the lost sales of Sorted Semen*[.]" (Agreement ¶ 4(c).)

ST and XY also fail to respond to ABS and Genus's argument that Section 4(c) renders the liquidated damages provision unenforceable because it explicitly states that "[t]hese liquidated damages shall not be exclusive of each other, nor of any other remedy available to ST at law or in equity," violating Texas law prohibiting liquidated damages provisions allowing for such cumulative remedies. *See Nextar Broadcasting, Inc. v. Gray*,

No. 09-07-364 CV, 2008 WL 2521967, at *3 (Tex. App. June 26, 2008) ("Generally, a contractual provision that does not exclude further liability for actual damages is not a reasonable forecast of just compensation and is an unenforceable penalty.") The court, therefore, will dismiss ST's claim for damages under the liquidated damages provision in Section 4(b) of the Agreement.

E. Fraudulent Inducement

Alternatively, ST claims that plaintiffs made two material misrepresentations that fraudulently induced it to enter the Agreement: (1) ABS and Genus told ST that they wanted a long-term contract despite never actually intending to perform the agreed-upon, five-year period called for under the Agreement (Answer (dkt. #302) ¶¶ 208-209); and (2) ABS and Genus only partially disclosed the nature of the GSS technology, concealing their belief that it was not subject to the non-compete provision. (*Id.* at ¶¶ 211-14.)

Under Texas law, a plaintiff proves fraudulent inducement by showing "a material misrepresentation[,] . . . known to be false when made or was made recklessly as a positive assertion without knowledge of its truth[,] which was intended to be acted upon[,] . . . was relied upon[,] and . . . caused injury." *Fletcher v. Edwards*, 26 S.W.3d 66, 77 (Tex. App. 2000) (citing *Ins. Co. of N. Am. v. Morris*, 981 S.W.2d 667, 674 (Tex. 1998)). To prove that a representation involving a promise to do something in the future was false, a plaintiff must show that the party who made the promise "had no intention of performing the act" at the time the promise was made. *T.O. Stanley Boot Co., Inc. v. Bank of El Paso*, 847 S.W.2d 218, 222 (Tex. 1992).

Even assuming a stated intention to perform a long-term contract could serve as an actionable misrepresentation, ST cannot show that ABS had no intention to perform at the time it made that "promise."[6] As an initial matter, the parties agree that ABS has continued performing its end of the bargain throughout this litigation, even after giving timely notice of its desire to non-renew undermining any reasonable inference that ABS and Genus did not intend to perform under the five-year renewable contract when they entered into it nearly four years ago. Furthermore, the most ST provides by way of evidence of ABS's contrary intent at the time of contracting is: (1) a statement during an internal presentation that ABS "need[ed] to buy more time to have a product at parity to compete with ST"; (2) ABS's internal projection made in January of 2012 that GSS could begin production in April of 2013; (3) "ABS solidif[ying] its plan to launch its GSS technology by 2014"; and (4) documents dated nine months after the Agreement showing that ABS had already considered the cost of cancelling the Agreement and marketing the GSS technology. (Defs. Opp'n Br. (dkt. #334) at 54.) Even taken together, these pieces of evidence cannot support a claim for fraudulent misrepresentation under Texas law because they do not demonstrate that ABS and Genus

[6] ST cites two examples of ABS and Genus's fraudulent misrepresentations regarding their intention to perform the under the Agreement -- "we look forward to working together over the coming years to our mutual benefit" and "we look forward to working with you in the years ahead." (Defs.' Opp'n Br. (dkt. #334) at 53.) Both statements certainly sound more aspirational than representations of fact upon which ST could reasonably rely. *Italian Cowboy Partners, Ltd. v. Prudential Ins. Co. of Am.*, 341 S.W.3d 323, 327 (Tex. 2011) ("Material means a reasonable person would attach importance to and would be induced to act on the information in determining his choice of actions in the transaction in question."). Regardless, the Agreement's integration clause disavowal of "all previous communications, representations or undertakings" renders defendants' supposed reliance of these general statements unreasonable. (Agreement (dkt. #258-7) ¶ 21.)

"had no intention" of performing under the contract when they made the alleged misrepresentations. *T.O. Stanley Boot Co.*, 847 S.W.2d at 222.

ST also claims that ABS fraudulently omitted details about its laser-kill GSS technology, and thereby "intentionally created the false impression that its GSS technology would be covered by Section 18 during negotiations (and execution) of the 2012." (Def.'s Opp'n Br. (dkt. #334) at 56.) "Generally, no duty of disclosure arises without evidence of a confidential or fiduciary relationship," *Morris*, 981 S.W.2d at 674, something an arms-length negotiation between sophisticated commercial entities simply not satisfy. To avoid this obvious conclusion, ST maintains instead that since ABS knew ST intended to prevent ABS from launching its GSS technology by including the non-compete clause in the Agreement, it thus created "the false impression that Section 18 covered its GSS technology." (Defs.' Opp'n Br. (dkt. #334) at 58.) At best, this claim is a stretch under Texas law. *Compare Bradford v. Vento*, 48 S.W.3d 749, 755-56 (Tex. 2001) (noting that Texas had not yet adopted "a general duty to disclose information . . . when a party makes a partial disclosure that, although true, conveys a false impression"), *with Hoggett v. Brown*, 971 S.W.2d 472, 487 (Tex. App. 1997) ("A duty to disclose may arise . . . when one makes a partial disclosure and conveys a false impression.").

Fortunately, this claim need not turn on an unsettled question of law, since the court has already determined that Section 18 *does* cover the GSS technology, making the matter essentially moot, except as it concerns the parties' negotiation of a safe harbor provision. Of course, the underlying premise that any alleged subterfuge by ABS created

a *duty* to disclose is also flawed. Specifically, even if true, ST's assertion that ABS had knowledge of its purpose in pursuing a non-compete clause did not create a duty to disclose more details about the development of its technology. If anything, that is what an arms-length negotiation is all about. If ST wanted additional information regarding the technology, or assurances as to its falling under Section 18, that is what due diligence leading up to contract, and representations and warranties in contracts, are intended to address.

This does not give carte blanche to a contracting party to lie, or even withhold information when a duty to disclose does exist (or even when a failure to disclose would amount to a lie), but none of the evidence here supports a reasonable jury finding that ABS lied or failed to disclose facts amounting to a lie, especially since ST wholly fails to specify what particular alleged "partial disclosures" made ABS's affirmative representations misleading. Accordingly, ABS and Genus are entitled to summary judgment on ST and XY's fraudulent misrepresentation claims.

F. Promissory Estoppel

ST's promissory estoppel claims fail for largely the same reasons. Under Texas law, "[p]romissory estoppel may be utilized to enforce a promise when a plaintiff justifiably and reasonably relies on the promise to his detriment, it was foreseeable that the plaintiff would rely on the promise, and injustice can only be avoided by enforcement of the promise." *Esty v. Beal Bank S.S.B.*, 298 S.W.3d 280, 305 (Tex. App. 2009). Plaintiffs' statements regarding their intention to perform under the life of the contract are not promises that are sufficiently definite to be enforced under promissory estoppel.

Rather, it is a non-actionable, "speculation of future events, a statement of hope, an expression of opinion, an expectation, or an assumption." *Id.* Of course, those same representations are also part of a binding contract between the parties, and that is where ST's remedy lies, if any. *See El Paso Healthcare Sys., Ltd. v. Piping Rock Corp.*, 939 S.W.2d 695, 699 (Tex. App. 1997) (a party asserting promissory estoppel must "prove that the promise on which it relied to its detriment was outside" any contract between the parties).[7]

II. Antitrust Claim

ABS alleges that ST has monopolized and exercised market power in the alleged "Sexed Bovine Semen Processing Market" in violation of Section 2 of the Sherman Act (Am. Compl. (dkt. #226) ¶ 98.) ABS further claims that ST's conduct in maintaining its monopoly in the sexed semen market is anti-competitive, pointing to the Sorting Agreements ST has entered into with it and other bull studs that include multi-year commitments, minimum purchase requirements, as well prohibitions of or disincentives placed upon the research, development or commercialization of new technology. Finally, ABS claims that ST engages in unfair competition through its patent acquisitions and licenses.

[7] Defendants' alternative arguments for promissory estoppel, alleging that plaintiffs failed to disclose the scope of its GSS technology or "promised to be bound by the liquidated damages provisions in the Agreement" (Answer (dkt. #302) ¶ 231), are doomed for the same reason. Here, defendants simply seek to negate ABS's challenge to the liquidated damages provisions as unenforceable under Texas law. Having failed to explain how any promise to be bound by a contract is enforceable under a promissory estoppel theory, the court will dismiss defendants' promissory estoppel claims.

In seeking summary judgment as to these claims, ST disputes that it has monopoly power, taking issue in particular with ABS's proposed market, arguing that: it is too narrow because conventional semen is the dominant product in the overall semen market; ABS's sales are largely of conventional semen; and the relevant market is not just limited to the United States. In support, ST asserts that consumers view sexed and conventional semen as interchangeable, and that dairy farmers' demand for both conventional and sexed semen is highly elastic, depending on each individual's farmer's needs and circumstances, as well as the price of milk.

ST likewise disputes each of ABS's arguments that the Sorting Agreements are anti-competitive, arguing first that ABS and third-party bull studs like Microbix and CRI have been able to develop technology that competes with ST. Second, ST contends that the terms of the contracts are not anti-competitive because: (1) they have differing start dates and durations; (2) the purchase requirements are justified to offset significant costs ST incurs; (3) its customers are permitted to purchase additional straws from other suppliers; and (4) the duration of the contracts actually benefits the customers because they guaranty continuity of supply. Finally, ST disputes that its acquisition of patents constitutes exclusionary conduct, arguing that its acquisitions were investments in development of its product and that ABS has not shown that it was harmed by ST's patent acquisitions and licenses.

Turning to ABS's substance of the monopoly claim under § 2 of the Sherman Act, a plaintiff must first show that the defendant has monopoly power in the relevant

market. *United States v. Grinnell Corp.*, 384 U.S. 563, 571 (1966).[8] "The second element of a § 2 claim is the use of monopoly power 'to foreclose competition, to gain a competitive advantage, or to destroy a competitor.'" *Eastman Kodak Co. v. Image Tech. Servs., Inc.*, 504 U.S. 451, 482-83 (1992) (quoting *United States v. Griffith*, 334 U.S. 100, 107 (1948)). Put differently, § 2 prohibits "the willful acquisition or maintenance of [monopoly] power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident." *Grinnell Corp.*, 384 U.S. at 571-72. For the reasons that follow, the court finds that ABS has adequately established ST's position as a monopolist in the U.S. market for sexed bovine processing, but has failed to establish *per se* violations of its use of that power. At the same time, ST has not established on the record at summary judgment that no reasonable jury could find the aggressive efforts made to *maintain* that monopoly position has crossed the line of exclusionary conduct prohibited by § 2 of the Sherman Act.

A. Relevant Market

"A relevant market is comprised of those 'commodities reasonably interchangeable by consumers for the same purposes[.]'" *Fishman v. Estate of Wirtz*, 807 F.2d 520, 531 (7th Cir. 1986) (quoting *United States v. E.I. Du Pont de Nemours & Co.*, 351 U.S. 377, 395 (1956). "The outer boundaries of a product market are determined by . . . the cross-elasticity of demand between the product itself and substitutes for it." *Brown Shoe Co. v. United States*, 370 U.S. 294, 325 (1962). Within broad markets, submarkets may

[8] The parties agree that ABS's unfair competition claim under the common law of Wisconsin rises or falls with its Sherman Act claim, and so, it is not addressed separately.

exist, which themselves "constitute product markets for antitrust purposes." *E.I. Du Pont de Nemours & Co.*, 351 U.S. at 593-95. "The boundaries of such a submarket may be determined by examining such practical indicia as industry or public recognition of the submarket as a separate economic entity, the product's peculiar characteristics and uses, unique production facilities, distinct customers, distinct prices, sensitivity to price changes, and specialized vendors." *Brown Shoe Co.*, 370 U.S. at 325. The determination of a relevant market requires "a factual inquiry into the 'commercial realities' faced by consumers." *Eastman Kodak Co.*, 504 U.S. at 482.

With the support of its economic expert, ABS contends that the relevant market is "the market for sexed semen processing services in the U.S." (Pl.'s Opp'n Br. (dkt. #324) at 24.) Relying on its own expert, ST criticizes this definition as too narrow because it fails to include "both the processing and downstream sales of conventional semen," and the geographic region should be worldwide. (Def.'s Opening Br. (dkt. #275) at 44.) The core of ST's argument is that the relevant market must incorporate downstream products and services because "downstream competition constrain[s] the prices that ST may impose for its sexed semen processing services." (*Id.*)

The Supreme Court outlined the pertinent analysis concerning the interchangeability of products in a § 2 case in *E.I. du Pont de Nemours & Co.*:

> Monopoly power is the power to control prices or exclude competition. It seems apparent that du Pont's power to set the price of cellophane has been limited only by the competition afforded by other flexible packaging materials. Moreover, it may be practically impossible for anyone to commence manufacturing cellophane without full access to du Pont's technique. However, du Pont has no power to prevent competition from other wrapping materials. The trial

> court consequently had to determine whether competition from the other wrappings prevented du Pont from possessing monopoly power in violation of § 2.

351 U.S. at 392-93 (footnote omitted).

As an initial matter, neither party engages in a rigorous analysis of the cross-elasticity between sexed bull semen and conventional bull semen. ST asserts that they are essentially interchangeable, as demonstrated by the 33% decline in ST's sexed semen sales compared to the only 4% decline in total U.S. semen sales when milk prices "crashed" in 2009. (Def.'s Opening Br. (dkt. #275) at 47.) In contrast to ST's argument that this disproportionate decline in price demonstrates *substitutability* between sexed semen and conventional semen, an equally reasonable inference is that *purchasers* of sexed semen straws simply stopped buying altogether when it became far less profitable to produce female cows due to the decline in dairy prices. For the most part, this would actually suggest that purchasers of both sexed and conventional bull semen are in separate product niches, something that might be determined by tracking actual sales during the period of declining milk prices, but neither side provides this data.

More to the point, "[a]n element of consideration as to cross-elasticity of demand between products is *the responsiveness of the sales of one product to price changes of the other*." *E.I. du Pont de Nemours & Co.*, 351 U.S. at 400 (emphasis added). Yet ST's expert fails to offer any evidence that the cross-elasticity of sexed and convention bull semen is positive. In other words, the limited data ST provides does little to establish as a matter of undisputed fact that purchasers of both sexed and conventional bull semen are sensitive to price changes in one product or the other.

ABS does little better in trying to establish the lack of or low cross-price elasticity between sexed and conventional bull semen, merely offering the opinion of its expert that there are no "reasonable substitutes for ST's processing services in the U.S." because "entry would lead to lower prices, [and] this means that there are no other products or services that are sufficiently close substitutes to constrain the prices charged by ST." (Pl.'s Opp'n Br. (dkt. #324) at 31.)

Instead, ABS changes the focus to the *Brown Shoe* factors, which encourage the consideration of such practical indicia "as industry or public recognition of the submarket as a separate economic entity," the product's peculiar characteristics and uses, unique production facilities, distinct customers, distinct prices, sensitivity to price changes, and specialized vendors." 370 U.S. at 325; *see also Cass Student Advert., Inc. v. Nat'l Educ. Advert. Serv., Inc.*, 516 F.2d 1092, 1099-1100 (7th Cir. 1975) (applying *Brown Shoe* factors to determine relevant market in case alleging monopoly power in a service market).

Applying these factors, ABS argues that sexed semen *processing* is in a separate market from the final sexed or conventional semen product. First, ABS asserts that a bull stud unable to obtain sexed semen processing services from ST would not find conventional bull semen straws to be an adequate substitute, since the latter includes *both* male and female sperm cells. Second, ABS points out that sexed semen processing uses unique production facilities with expensive semen sorting machines, while producing conventional semen straws requires no such expense. Third, ABS points out that bull studs purchase ST's processing services, whereas their downstream customers, such as

dairy producers and beef producers, purchase sexed or conventional semen straws as a final product. Fourth, ABS demonstrates that sexed and conventional semen straws have markedly different price points, with the average price per straw sold $24.75 and $8.87, respectively. Finally, ABS emphasizes that ST is the *only* firm "that sells sexed semen processing services to major bull studs in the U.S." (Pl.'s Opp'n Br. (dkt. #324) at 29.)

ST does not respond to ABS's fairly persuasive arguments regarding the *Brown Shoe* factors in its reply brief, electing instead to lean heavily on *Virginia Vermiculite, Ltd. v. W.R. Grace & Co.-Conn.*, 108 F. Supp. 2d 549 (W.D. Va. 2000), a case it originally cited in its opening brief. In that case, the district court held that the plaintiff's effort to define the relevant product market was inadequate in light of the defendants' evidence that: (1) "perlite constrains the value of vermiculite mining rights"; and (2) "the competitive position of vermiculite with other downstream minerals limited the royalty rate [the defendant] would pay for vermiculite mining rights." 108 F. Supp. 2d at 578. In particular, the court faulted plaintiffs for offering "*no* evidence that potential substitutes for the downstream concentrates do not affect the value of mining rights." *Id.* (emphasis added).

In contrast, ABS actually provides at least some evidence that the market for sexed bull semen *is* distinct from the market for conventional bull semen, but again does so almost entirely in the form of the *Brown Shoe* rubric. This failure is telling, although neither party addresses it, because a definition of a relevant market centered solely on the *Brown Shoe* factors is insufficient as a matter of law in this circuit. The Seventh Circuit

has repeatedly emphasized the need for both a quantitative and qualitative economic analysis in arriving at a market definition:

> While the "practical indicia" named in *Brown Shoe* and *Beatrice Foods Co.* are important considerations in defining a market, they were never intended to exclude economic analysis altogether.
>
> . . . .
>
> This Court has emphasized the use of economic analysis in the law. To demonstrate competition in an antitrust case, the plaintiff must provide an economic analysis of the relevant market. *See, e.g., Menasha*, 354 F.3d 661 (requiring economic evidence to prove the existence of a distinct market). Lacking any economic evidence [the plaintiff] has failed to show that the tying arrangement has foreclosed any portion of the market for real estate services.

Reifert v. South Cent. Wis. MLS Corp., 450 F.3d 312, 320 (7th Cir. 2006); *see also DSM Desotech Inc. v. 3D Sys. Corp.*, 749 F.3d 1332, 1342 (Fed. Cir. 2014) (applying *Reifert and Menasha* to hold that summary judgment against the plaintiff was appropriate because the plaintiff presented insufficient economic evidence for a reasonable jury to find a distinct product market); *contra McWane, Inc. v. F.T.C.*, 783 F.3d 814, 829-30 (11th Cir. 2015) (affirming relevant market definition on the basis of the qualitative *Brown Shoe* factors despite the lack of an econometric analysis). Still, ABS's expert provides an adequate economic analysis of the market for sexed semen processing in his report for a reasonable jury to find that market to be relevant.

Certainly, ABS's principal expert, University of Chicago Economics Professor Kevin Murphy, is both highly credentialed and lays out a persuasive case for ST's

monopoly power if one assumes a distinct market for "sexed semen processing services."[9] As Professor Murphy points out, there is no dispute that ST has a nearly 100% share of sexed semen processing services in the U.S. Moreover, over the course of ten years, ST appears to have locked in all of the major U.S. bull studs (representing 96% of the downstream market) to long term supply contracts for increasingly lengthy terms (moving generally from 1 to 2 years, to 4 to 5 years), while enjoying remarkably steady variable margins that would seem to be the envy of most industries in the United States.

The complete lack of a competitor for these services operating in the United States, and the acknowledged need for processing services to be provided locally to be effective, provides substantial support for Professor Murphy's conclusion that a meaningful analysis as to the cross demand or price elasticity is unnecessary here.[10] As for the downstream market for conventional vs. sexed bull semen, that market no doubt does play some role in constraining the apparently steady, supra-competitive margins that ST appears to enjoy regularly for its sexed semen processing in the United States.

Certainly, Professor Murphy's opinions can be criticized for failing to do any cross-elasticity analyses as to the substitutability of conventional and sexed semen in the downstream market in the U.S., and indeed overseas. This is hardly a case like *Virginia Vermiculite*, however, where there was not only evidence of the interchangeability of different grades of vermiculite, but also between vermiculite and other non-vermiculite

[9] Professor Murphy is the Jury Stiler Professor of Economics in the Booth School of Business and Department of Economics at the University of Chicago, which is also where he earned his doctorate.

[10] Of course, the court will continue to consider whether the evidence as a whole at trial supports such a finding.

substitutes. In that case, *defense* experts actually conducted their own, basic cross-elasticity analysis of these substitutes, concluding both that although these substitutes did not cover all of the potential uses of vermiculite, "[t]he existence of a variety of substitutes in a variety of applications indicates that even a hypothetical monopolist supplier of vermiculite would be unable to profitably increase price.'" 108 F. Supp. 2d at 587 (quoting defense experts' report).

Regardless, as Professor Murphy points out, the evidence supports a finding that the price ST charges for sexed semen processing is not at a competitive level, meaning that a more rigorous cross-elasticity analysis of the downstream products would have been of limited usefulness. *See Va. Vermiculite*, 108 F. Supp. 2d at 578 ("[C]ross-elasticity of demand helps establish whether two products are close substitutes only when both are sold at competitive prices.") (citing Donald F. Turner, *Antitrust Policy and the Cellophane Case*, 70 Harv. L. Rev. 281, 308-10 (1956)); *see also* Philip Areeda, et al., *Antitrust Law: An Analysis of Antitrust Principles and Their Application*, Vol. IIB, ¶ 507, p. 131 (4th ed. 2014) ("At different prices, elasticities differ."). This also distinguishes the Seventh Circuit's *Reifert* and Federal Circuit's *DSM* decisions suggesting that a cross-elasticity analysis is crucial, since both concern substitutability at the same level of competition as the challenged product, rather than downstream products.

Moreover, ABS has presented enough evidence to sufficiently create an issue of fact as to whether the relevant geographic market is the United States, rather than the world. ST does not even attempt to dispute that there are significant barriers to obtaining sexed semen processing services overseas. Indeed, the evidence suggests it is

simply impractical to perform these services far from the bulls themselves, and there are enough unique characteristics to the population of U.S. prized bulls to make foreign suppliers of finished downstream sexed semen from overseas bulls insufficient for U.S. bull studs. Based on the record on summary judgment, therefore, the court cannot resolve the market definition issue in either parties favor. Indeed, while certainly open to dispute at trial, ABS has so far done the more persuasive job of establishing sexed semen processing services in the U.S. as the relevant product and geographic market. Accordingly, ST's motion for summary judgment based on a failure to prove the alleged market under § 2 will be denied.

B. Anticompetitive Conduct

Next, ST seeks to avoid antitrust liability by moving for summary judgment on the grounds that ABS cannot demonstrate that its conduct was anticompetitive. To prevail on a § 2 claim, "[t]he mere possession of monopoly power, and the concomitant charging of monopoly prices is not only not unlawful, it is an important element of the free-market system." *Verizon Commc'ns, Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398, 407 (2004). "Under § 2, intent to obtain a monopoly is unlawful only where an entity seeks to maintain or achieve monopoly power by anticompetitive means." *Endsley v. City of Chicago*, 230 F.3d 276, 283 (7th Cir. 2000). Moreover, to show that ST's conduct was exclusionary, ABS must do more than show that ST improved its opportunity to compete, but rather show that ST "has been attempting to exclude rivals on some basis other than efficiency." *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585, 605 (1985) (internal quotation marks omitted). Here, ABS claims that ST

engaged in exclusionary conduct in violation of the Sherman Act by (1) use of long-term, take-or-pay contracts and (2) acquisition of patents.

1. Contracting Practices

With respect to the contracts into which ST entered with the four major bull studs, ABS's position is that several characteristics of those contracts unlawfully prevented potential competitors from entering the U.S. market for sexed semen processing services, including in particular their increasingly long terms, minimum annual purchase commitments, research and development restrictions, non-compete provisions, evergreen provisions, and liquidated damages provisions. Similar to the parties' dispute concerning the definition of the relevant market, however, the record is not so one-sided as to permit the court to enter summary judgment in ST's favor. Indeed, ST's obvious aggressively negotiated, restrictive contract terms, while not *per se* illegal, open it up to possible antitrust liability if found to be a monopolist under § 2.

As to the length of the contracts, ABS points out that as of late 2012, all of the major bull studs in the U.S. were under contract with ST through at least late 2014. Besides its own five-year contract, ABS provides as an example ST's 2011 contract with Select Sires that had a four-year term and a minimum purchase requirement of 800,000 straws per year. (Pl.'s Opp'n Br. (dkt. #324) at 37.) ST does not dispute the length of the contracts.

Beyond pointing out that Select Sires and it have both been subjected to minimum purchase commitments, ABS offers a hypothetical example to establish that these commitments are anticompetitive. According to Professor Murphy, a firm owning

a technology with a similar cost structure to that arguably available to ABS using its GSS technology, who wanted to supply sexed semen to Select Sires in 2012 (at which time, three years remained on its contract with ST) would have needed to charge less than $4 per straw to be competitive given its minimum purchase at a $12.40 per straw price guaranteed to ST. (Murphy Am. Rpt. (dkt. #298) at 35-36, Ex. 14a.) By Murphy's calculation, only seven months of Select Sires' four-year contract with ST would remain before a hopeful competitor could profitably compete at that price. Finally, to establish that ST intentionally crafted the Sorting Agreements to impede competition, ABS points to the observation of one of ST's directors that "[o]ur contracts will slow adoption for a new provider." (Horowitz Decl. Ex. (dkt. #329-4).)

Even so, ST's position is that: (1) the Sorting Agreements have not restricted market entry; and (2) the agreements actually have multiple procompetitive aspects. First, ST points out that ABS and two other companies (Microbix and CRI) have continued to research and develop technology to compete with ST's technology, although ABS disputes any suggestion that Microbix or CRI are prepared to launch competing technology. (*See* Def.'s Reply PFOF (dkt. #373) ¶ 123.) Additionally, while ABS acknowledges that it has been able to develop its own GSS technology, ABS contends that it is not financially feasible. Again, relying on Professor Murphy's calculations, ABS contends that even assuming it could launch its GSS technology during the term of its contract with ST, ABS would still have found it more profitable to continue paying ST's price for processing, despite much lower costs associated with the technology, due to the minimum purchase requirement in their contract. (Pl.'s Opp'n Br. (dkt. #324) at 37;

Murphy Am. Rpt. (dkt. #298) at 36, Ex. 14b.)

ST further argues that the Sorting Agreements are actually procompetitive because they: (1) are designed to guarantee ST enough future sales to offset the upfront costs associated with installing laboratory equipment at each bull stud facility; (2) include terms guaranteeing quality; (3) protect against price increases; and (4) promote efficiency and lower prices by avoiding the need for bull studs to submit purchase orders. (Def.'s Opening Br. (dkt. #275) at 53.) As evidence of the efficiencies generated by its contracts, ST points to the decline in price of its semen sorting services over the time period relevant to this lawsuit.

Not surprisingly, ABS challenges each of these asserted justifications, pointing to ST's installation of laboratory equipment at Select Sires' facility under a fourteen month contract to argue that long-term contracts were not necessary to justify its upfront installation costs. (Pl.'s Opp'n Br. (dkt. #324) at 42.) ABS also argues "ST could have earned a positive return on its investments with shorter contracts that included lower minimum purchase requirements," given that "ST was earning more than $10 million per year after 2010 on sales to the larger bull studs, and those profits were much higher than ST's lab investment costs of setting up labs at those bull studs." (*Id.* at 40.) Using ST's 2012 contract with ABS as an example, while ST spent $2.5 to $3 million installing laboratory equipment, the minimum purchase requirement guaranteed ST enough profit to cover those costs within the first six months of the five-year Agreement.

Viewed in isolation, each of the examples of anticompetitive contract provisions ABS asserts would likely not be sufficiently strong to survive summary judgment. As the

Seventh Circuit instructs, however, "[i]t is the mix of various ingredients . . . in a monopoly broth that produces the unsavory flavor." *City of Mishawaka, Ind. v. Am. Elec. Power Co.*, 616 F.2d 976, 986 (7th Cir. 1980); *see also Aspen Highlands Skiing Corp. v. Aspen Skiing Co.*, 738 F.2d 1509, 1522 n.18 (10th Cir. 1984) (Each of the 'six things' [on which plaintiff relied to demonstrate that it was deliberately excluded from the destination skier market] viewed in isolation need not be supported by sufficient evidence to amount to a § 2 violation. It is enough that taken together they are sufficient to prove the monopolization claim.").

Several other disputed facts bar ST's request for summary judgment as to whether the Sorting Agreements are anticompetitive. Despite ST's insistence that this district court grant of summary judgment on § 2 claims based on *Digene Corp. v. Third Wave Technologies, Inc.*, 536 F. Supp. 2d 996 (W.D. Wis. 2008), that decision actually dictates otherwise. In *Digene*, the court considered evidence establishing that the defendant developer "had a natural, but short-lived dominant position in the market for high risk HPC testing because it was the first to market a test for this purpose and the first (and still the only company) to secure FDA approval[.]" *Id.* at 999. The evidence further established that the competitor asserting the § 2 claims in *Digene* had "a gradually increasing share of [the HPV testing] market and the clear prospect of obtaining a greater share once it secures FDA approval." *Id.* Further distinguishing the contract at issue in this case, the developer in *Digene* had "not been able to impose termination fees and minimum purchase commitments on its biggest customers and [was] forced to offer them multi-year fixed price contracts." *Id.* at 1006. Finally, both "the availability of

substitutes" and price constraints imposed by Medicaid's and insurance companies' ceilings on reimbursement for medical tests limited the ability of the developer to extract favorable price and contract terms from its customers. *Id.*

In contrast to the developer in *Digene*, ST has failed to demonstrate that competitive forces in the relevant market, or even the downstream market, have limited its ability to demand seemingly aggressive contract concessions from all its customers that are favorable to it alone, aside from the limited "safe harbor" provision for existing research and development that ABS was able to negotiate in its contract. On this record, the court cannot even find as a matter of law that ST's long-term contracts are procompetitive as a matter of law. *See, e.g., Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 45 (1984) (O'Connor, J., concurring) ("In determining whether an exclusive-dealing contract is unreasonable, the proper focus is on the structure of the market for the products or services in question -- . . . . [e]xclusive dealing is an unreasonable restraint on trade only when a significant fraction of buyers or sellers are frozen out of a market by the exclusive deal."); *ZF Meritor, LLC v. Eaton Corp.*, 696 F.3d 254, 286-89 (3rd Cir. 2012) (holding that a jury could find five year *de facto* exclusive dealing agreements with provisions making termination difficult are anticompetitive in practice in violation of § 2); *Roland Mach. Co. v. Dresser Indus., Inc.*, 749 F.2d 380, 395 (7th Cir. 1984) ("Exclusive-dealing contracts terminable in less than a year are presumptively lawful under section 3 [of the Clayton Act]."); *Pro Search Plus, LLC v. VFM Leonardo, Inc.,* No. SACV 12-2102 JST (ANx), 2013 WL 3936394 (C.D. Cal. July 30, 2013) (finding that contracts, including one with a duration of five years and

terminable upon 12 months' notice, did not support a Sherman Act claim, at least alone, because they were "of relatively short duration and, crucially, [could] be terminated upon short notice[.]"); *cf.* XI Phillip E. Areeda, et al., *Antitrust Law* § 1802g2 (3rd ed. 2011) ("The significance of any particular contract duration is a function of both the number of such contracts and the market share covered by the exclusive-dealing contracts."). Given the possibility that a reasonable jury could find that ST had a near total monopoly on sexed semen processing market in the U.S., questions related to the cumulative anticompetitive impact of these varied contract restrictions also remain for the jury.

2. Patent Acquisitions

Finally, the court turns to ABS's additional claim that ST's acquisition of patents related to sexed semen sorting technology is anticompetitive under § 2 of the Sherman Act as a matter of law. Both parties move for summary judgment on this issue. Any § 2 claim based on the acquisition of patents presents an "obvious tension between the patent laws and antitrust laws. One body of law creates and protects monopoly while the other seeks to proscribe it." *United States v. Westinghouse Elec. Corp.*, 648 F.2d 642, 646 (9th Cir. 1981). Indeed, acquiring and asserting valid patents is absolutely protected by the patent laws "in the absence of monopoly but, because of their tendency to foreclose competitors from access to markets or customers or some other inherently anticompetitive tendency, they are unlawful under § 2 if done by a monopolist[.]" *City of Mishawaka, Ind.*, 616 F.2d at 986 (quoting *Sargent-Welch Sci. Co. v. Vernon Corp.*, 567 F.2d 701, 711-12 (7th Cir. 1977)).

Here, ABS has shown enough to suggest that ST's acquisition of patents may qualify as unlawful under the Sherman Act. *See SCM Corp. v. Xerox Corp.*, 645 F.2d 1195, 1205 (2d Cir. 1981) ("Surely, a § 2 violation will have occurred where, for example, the dominant competitor in a market acquires a patent covering a substantial share of the same market that he knows when added to his existing share will afford him monopoly power."); *L.G. Balfour v. F.T.C.*, 442 F.2d 1, 15 (7th Cir. 1971) (disagreeing with the petitioners that the cases they cited "[stood] for the proposition that the accumulation of patents . . . may never constitute a violation of the antitrust laws"). Specifically, ABS identifies several facts that may expose ST's relatively recent, aggressive patent acquisitions to § 2 liability. First, ST acquired all four of the original patents-in-suit -- two (the '920 and '425 patents) when ST purchased XY as a wholly-owned subsidiary and the others (the '987 and '092 patents) when it bought Monsanto's pending patent applications concerning sexed semen processing services in early 2008. Second, despite acquiring it in 2008, ST has still not made use of the "laser-kill" technology described in one of those patents, the '987 patent. Third, "ST (through XY) also sued another potential competitor, Trans Ova Genetics, LC, on those same two acquired patents -- along with nine others." (Pl.'s Opening Br. (dkt. #270) at 91.) Fourth, ST secured an exclusive license in 2009, comprising 46 U.S. patents relating to "sexed bovine semen processing" from Cytonome, Inc., resulting in "ST now either own[ing] or ha[ving] exclusive rights to a portfolio of 136 U.S. patents related to sexed semen processing, together with additional foreign counterpart patents." (*Id.* at 87.)

Relying largely on Areeda's *Antitrust Law* treatise, ABS asserts that these actions constitute *per se* unlawful behavior under § 2. Actually, Areeda only concludes that "[a]cquisition by a monopolist of exclusive rights in related patents should *presumptively* be a § 2 'exclusionary practice.'" III Phillip E. Areeda, et al, *Antitrust Law* § 707 (4th ed. 2015). Regardless, ST maintains that its accumulation of patents related to sexed semen technology is actually procompetitive. Indeed, ST asserts that the patents it acquired *complimented* its own portfolio, allowing ST to "develop[] and combine[] the Monsanto and Cytonome technologies with the XY sexing technology." (Def.'s Opening Br. (dkt. #275) at 58.) Whether this is so presents a classic issue of disputed fact. Moreover, the parties present a dispute of fact as to whether ST could have secured a nonexclusive license from Monsanto, a practice Areeda describes as presumptively lawful.[11] *Antitrust Law* § 707.

However, ST's argument that its patent acquisitions cannot constitute anticompetitive conduct as a matter of law, because it did not *increase* its market power completely misses the mark, especially since ST already controlled 100% of the relevant market, at least as defined by plaintiffs. The case law instructs that the relevant question here is *not* whether the patent acquisitions actually enhanced ST's market power, but rather whether they reflect ST's intent to *maintain* monopoly power through

[11] The court will deny ABS's motion to strike Cynthia Ludwig's declaration that Monsanto was uninterested in licensing, rather than selling its patent technology. (Dkt. #368.) At least for summary judgment, ST sufficiently established that Ludwig had adequate personal knowledge based on her participation in meetings from which she could describe the understanding as to whether the patents ST acquired from Monsanto were available for licensing. (Dkt. #374.)

anticompetitive means.[12] *See Ford Motor Co. v. United States*, 405 U.S. 562, 576 n.11 (1972) ("Even constitutionally protected property rights such as patents may not be used as levers for obtaining objectives proscribed by the antitrust laws."); *Kearney & Trecker Corp. v. Giddings & Lewis, Inc.*, 452 F.2d 579, 599 (7th Cir. 1971) ("[A]lthough the acquisition of one or two dominating patents by the owner of the other has not been held to constitute a violation of the antitrust laws, plaintiff's acquisition of [the Morgan patent] may be taken as evidence of an intent to restrain competition.") (citing *United States v. Singer Mfg. Co.*, 374 U.S. 174 (1963)).[13]

Another leading antitrust treatise explains the standard as follows:

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[12] ST's arguments that the "failing company defense" and the *Noerr-Pennington* doctrine save its patent acquisitions from § 2 scrutiny are likewise easily dismissed as applying to claims falling under § 7 of the Clayton Act. Contrary to ST's assertion, ABS could, as it did, elect to challenge ST's patent accumulation under § 2 of the Sherman Act, and ST fails to demonstrate that the failing company defense is applicable to a § 2 claim. With respect to the *Noerr-Pennington* doctrine, the Seventh Circuit has refused to immunize a party's conduct when litigation is used as a vehicle for eliminating competition regardless of the outcome of the suit. *See Winterland Concessions Co. v. Trela*, 735 F.2d 257, 263-64 (7th Cir. 1984) ("As this court has previously noted, 'it has long been thought that litigation could be used for improper purposes even where there is probable cause for the litigation; and if the improper purpose is to use litigation as a tool for suppressing competition in the antitrust sense . . . it becomes a matter for antitrust concern.'") (quoting *Grip-Pak, Inc. v. Ill. Tool Works, Inc.*, 694 F.2d 466, 472 (7th Cir. 1982)). Since ABS accuses ST of accumulating and asserting patents for the purpose of restricting competition in violation of § 2, among other anticompetitive behavior, the court declines to apply the *Noerr-Pennington* doctrine to protect the challenged conduct.

[13] *See also Kobe, Inc. v. Dempsey Pump Co.*, 198 F.2d 416, 422 (10th Cir. 1952) ("Ordinarily patent pools when created for legitimate purposes are not illegal in themselves. Agreements which require licensees to assign future inventions or patents are not in themselves illegal. Such agreements, however, which effect a restraint of trade or create monopolies, if designed for that purpose, are violations of the law.") (internal citations omitted); *Id.* at 425 ("The facts . . . are sufficient to support a finding that although Kobe believed that some of its patents were infringed, the real purpose of the infringement action and the incidental activities of Kobe's representatives was to further the existing monopoly and eliminate Dempsey as a competitor. The infringement action and the related activities, of course, in themselves were not unlawful, but when considered with the entire monopolistic scheme which preceded them, we think, as the trial court did, that they may be considered as having been done to give effect to the unlawful scheme.").

> As a general rule, the acquisition of patent rights through government grant does not violate the antitrust laws. "Mere procurement of a patent, whatever the conduct of the applicant in the procurement, cannot without more affect the welfare of the consumer and cannot in itself violate the antitrust laws." Moreover, it is quite well established that, absent bad faith, an accumulation of patents by a single party is not inherently illegal.
>
> Nevertheless, it is equally well established that patent acquisition may violate the antitrust laws if such is accompanied by an illegitimate purpose or anticompetitive consequences beyond those encompassed by the patent grant in question. . . . Similarly, courts have held that aggressive accumulation, nonuse, and enforcement of "every important patent" in a particular competitive market for purposes of foreclosing competition in that market can give rise to antitrust liability. In general, as would be expected, accumulation of patents as part of a larger scheme to monopolize (beyond the scope of the patents themselves) might also be found unlawful, assuming all other requisites of a Sherman Act (or Clayton Act) violation have been met.

2 Julian O. von Kalinowksi, *Antitrust Laws and Trade Regulation* § 7A.03 (2d ed. 2015).

When viewed in light of the other allegedly anticompetitive contract terms asserted by ABS, a reasonable jury could find that ST's accumulation of patents related to sexed semen sorting technology was part of an unlawful effort to maintain its monopoly in violation of § 2 of the Sherman Act. Accordingly the court will deny both parties' motions for summary judgment on ABS's Sherman Act claims.

III. Patent Claims

Although four patents were originally named in this lawsuit, two -- the '920 Patent, which is entitled the "Collection Systems for Cytometer Sorting of Sperm," and the '425 Patent, entitled "Method of Cryopreserving Selected Sperm Cells" -- are

currently undergoing invalidity challenges before PTAB and no longer before this court. This leaves in suit the '987 and '092 Patents. The '987 Patent is titled "Photo-Damage Method for Sorting Particles," and is directed to methods of selectively "photo-damaging" sperm that lack a desired characteristic, such as a female-producing X-chromosome. ST claims that the GSS technology infringed claims 1-10 of the '987 Patent. The '092 Patent is titled "Digital Sampling Apparatus and Methods for Sorting Particles," and it is directed at a sorting method of analysis and classification that uses digital signals, rather than analog signals that had been previously used. ST claims that ABS and Genus infringe numerous claims of the '092 Patent. Only certain claims under the patents in suit are the subject of the parties' motions for construction and summary judgment. Those are addressed below.

A. '987 Patent Claims 1, 7 and 8 and '092 Patent Claims 40-46

The '987 patent discloses a "laser-kill" technology that can be used for eliminating sperm cells to produce a population of semen of the desired sex. More specifically, the process described in the '987 patent uses a laser to kill sperm cells of the undesired sex, which are identified by the difference in light emitted by X-bearing and Y-bearing sperm cells, creating a semen population of the desired sex in a single container.

While ABS contends that the '987 patent does not describe "'sorting' in the conventional sense," in that the technology does not physical separate the male and female sperm into different containers, ABS acknowledges that the '987 patent expressly states that "'sorting' for the purposes of the patent includes photo-damaging unwanted cells, even if the cells are not then separated into discrete populations." (Pl.'s Opening

Br. (dkt. #270) at 28); *see CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) ("[T]he claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history."). For the purposes of the present motions, ABS similarly accepts this definition of "sorting" for the '092 patent, which concerns technology for sorting particles, including sperm cells, using a digital processor to analyze and classify particles instead of using analog signals. (Robinson Report (dkt. #295) ¶ 43.)

As a result, ABS/Genus does not oppose ST's partial motion for summary judgment on infringement of claims 1, 7 and 8 of the '987 patent, as well as claims 40-46 of the '092 patent, even though ABS maintains that both patents are invalid in light of prior art for purposes of trial.

B. Other Claims of the '987 Patent

1. Claim Construction

a. "sort strategy"

The parties dispute the proper construction of four terms or phrases in the '987 patent. "It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips v. AWH Corp.*, 415 F.3d 1302, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). The interpretation of a patent claim is exclusively a matter of law for the court. *Markman v. Westview*

Instruments, Inc., 517 U.S. 370, 372 (1996). In construing a claim, the court starts with the claim language itself. *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed. Cir. 1998). The ordinary meaning of the claim language generally controls interpretation. *See Phillips*, 415 F.3d at 1312 ("We have frequently stated that the words of the claim 'are generally given their ordinary and customary meaning.'") (quoting *Vitrionics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *Digital Biometrics, Inc. v. Identix, Inc.*, 149 F.3d 1335, 1344 (Fed. Cir. 1998) ("The actual words of the claim are the controlling focus.").

In addition, "the specification is always highly relevant to the claim construction analysis" and is usually "the single best guide to the meaning of a disputed term." *Phillips*, 415 F.3d at 1315. The baseline inquiry is how a person of ordinary skill in the art, who "is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification," would understand a claim term at the time of invention.[14] *Id.* at 1313. That said, the court must avoid the "fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification." *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 904 (Fed. Cir. 2004) (quoting *Comark Commc'ns*, 156 F.3d at 1186-87.

[14] The parties' experts generally agree that a person of ordinary skill in the art would have at least an undergraduate degree in the biological sciences, engineering or chemistry, as well as at least three years of experience with cell sorting or sperm cells. (Robinson Report (dkt. #294) ¶ 11; Ludwig Report (dkt. #296) ¶ 24; Nolan Report (dkt. #297) ¶ 25.) The differences among the characteristics of the person of ordinary skill in the art proposed by the parties' experts are not material for the purposes of the present motions.

First, the parties dispute the proper construction of "sort strategy," which appears in claims 2 and 3 of the '987 patent:

"sort strategy"	
Plaintiffs ABS and Genus's Proposed Construction	**Defendant ST's Proposed Construction**
"a decision process for determining whether two sperm that arrive together will be photo-damaged"	"decision process for determining how particles or groups of particles are to be sorted"

The language of independent claim 1, as well as dependent claims 2 and 3, reads as follows:

> 1. A method of sorting a mixture of stained sperm cells having either characteristic A or characteristic B into at least one population, the method comprising the steps of:
>
> a. flowing a fluid stream containing stained sperm cells through a flow path at a fluid delivery rate;
>
> b. exciting fluorescence emissions from the stained sperm cells having characteristic A and the stained sperm cells having characteristic B flowing in the flow path;
>
> c. detecting the fluorescence emissions from the excited sperm cells;
>
> d. classifying the stained sperm cells as either having characteristic A or having characteristic B based upon the fluorescence emissions;
>
> e. selecting stained sperm cells in the flow path based on their classification; and
>
> f. photo-damaging the selected sperm cells to produce an enriched population of sperm with respect to either characteristic A or characteristic B.
>
> 2. A method of sorting a mixture of stained sperm cells according to claim 1 wherein the step of selecting stained

> sperm cells in the flow path to photo-damage further comprises the step of photo-damaging sperm cells based upon a *sort strategy*.
>
> 3. A method of sorting a mixture of stained sperm cells according to claim 2 further comprising the step of varying the *sort strategy* as a function of at least one of the following:
>
> a. the purity of the said at least one population with respect to either characteristic A sperm cells or characteristic B sperm cells; and
>
> b. the quantity of undamaged characteristic A sperm cells or undamaged characteristic B sperm cells in the said at least one population relative to the total quantity of characteristic A sperm cells or characteristic B sperm cells in the fluid stream.

(Horowitz Decl. Ex. 22 (dkt. #261) [hereinafter "'987 patent"] at 212:58-213:25 (emphasis added)).

The parties essentially disagree whether a "sort strategy" as limited by claims 2 and 3 can be applied to a single sperm cell that arrives at the point at which a decision whether to fire the kill laser must be made (ST's construction) or must be applied only to "coincident cells" that arrive closely together (ABS's construction). ABS admits that its proposed construction of "sort strategy" is narrow, but argues that it is nevertheless urged in light of the specification, as well as the interaction between claim 1 and claim 2. Specifically, ABS argues that the step of "photo-damaging the selected sperm cells to produce an enriched population of sperm with respect to either characteristic A or characteristic B" described in claim 1 necessarily implies the application of a "decision process for determining how particles or groups of particles are to be sorted." In other words, ABS argues that ST's construction of "sort strategy" would give claim 1 and claim

2 the same scope, rendering the latter meaningless in violation of the presumption under the doctrine of claim differentiation. *See World Class Tech. Corp. v. Ormco Corp.*, 769 F.3d 1120, 1125 (Fed. Cir. 2014) ("The doctrine of claim differentiation creates a presumption that distinct claims, particularly an independent claim and its dependent claim, have different scopes."). With respect to the specification, ABS argues that every reference to a "sorting strategy" in the specification concerns how to deal with coincident cells. (Pl.'s Opening Br. (dkt. #270) at 30 (citing '987 patent at 74:49-57, 74:67-75:5, 76:54-56).)

On the face of the language of claim 1 itself, step (f) does not require the use of a "sort strategy" to produce a population of sperm of the desired sex. Instead, claim 1 indicates that the cells that are "selected" based on their classification at step (e) are photo-damaged at step (f), and so it appears that the most relevant question to address the parties' disputed construction of "sort strategy" is whether the "selection" of cells described in claim 1 is also a "sort strategy." That the drafter did not use the term "sort strategy" to describe the selection of the desired characteristic at step (e) suggests that the answer might be "no." If so, this would lend support to ST's proposed construction that a sort strategy could apply to individual and coincident cells, since there would be no arguable claim differentiation problem.

The specification, however, leaves the answer unclear, at least based on apparently inconsistent language relied on by each party. For example, ST cites excerpts from the following passage from the specification in support of its argument that a sorting strategy can apply to individual, as well as coincident, cells:

> In general, the microprocessor 131 is programmed to implement control and sorting strategies which are intended to optimize the efficiency of the system 1 in terms of throughput and/or loss of desirable particles to meet any cost requirements of the sorted product. This may involve, for example, balancing the need for high purity of at least one collected population and the need to recover at least a minimum percentage of desirable particles from the sample being sorted. Achieving such a balance is important, particularly in the context of commercial applications where cost and profitability are important considerations.
>
> To this end, the microprocessor 131 implements a control strategy which is a series of instructions and/or algorithms that control system variables such as fluid delivery rate and/or sort parameters. The microprocessor also implements a sorting strategy which defines the decision process for determining how each particle or group of particles is sorted. Each particular control strategy may employ one or more sort strategies. Various sorting strategies may be used upon such factors as the selected control strategy, the particle detection system and/or information relating to the particle distribution in the fluid stream.

('987 patent, 79:27-48.)

ST asserts that among the "various sorting strategies" to which the above passage refers are "high purity," "high recovery" and "constant flow rate," which, it explains, can apply to individual as well as coincident cells. If true, that would appear to resolve the parties' claim construction dispute with respect to "sort strategy."[15]

As ABS points out, however, a chart in the specification that includes those strategies lists them as *control*, rather than sorting, strategies. (*Id.* at 85). Indeed, the same chart names under each of the control strategies any applicable sorting strategies -- respectively, "coincident accept, coincident reject and variable coincident accept." (*Id.*)

[15] The parties identify no difference between "sort strategies" and "sorting strategies," nor do there appear to be any material differences between the two terms.

Accordingly, the chart appears to support ABS's construction of sort strategy more than it does ST's.

Based on the language of the patent generally and arguments presented by the parties, the court is nevertheless persuaded by ST's proposed construction. First, given that the process of "selecting" sperm cells based upon their classification at step (e) of claim 1 does not necessarily require the application of a sort strategy, something required in both claims 2 and 3, the doctrine of claim differentiation supports ST's proposed construction. Second, although ABS is correct to point out that a chart in the specification describes the three strategies ST lists as "control," rather than "sorting" strategies, it is at best unclear whether the three strategies listed in the chart are intended to describe the full range of sorting strategies claimed by the invention, especially since the terms are not mutually exclusive and the passage in the specification quoted above mentions the possible utilization of "various" -- not just three -- sorting strategies.[16] Finally, the same passage goes on to explain that a sorting strategy "defines the decision process for determining how *each particle or group of particles* is sorted," which suggests that a sorting strategy can apply to a single sperm cell as well as coincident cells. ('987

[16] This overlap finds further support in the specification: 80:41-48 ("In general, as will be pointed out below, there are many control strategies which may be employed to maximize particle throughput and *there are many sorting strategies* that may be employed with each particular control strategy."); 86:23-26 ("Thus, as discussed earlier, particles such as sperm cells may be accepted or rejected for sorting into a population of desired cells based on the probability that such particles belong in the usable population"). Further descriptions abound. *See* 127:18-21 ("Different control sorting strategies can be employed in a photo-damage system, including the 'high recovery' and 'high purity' sorting strategies discussed above in the context of a droplet sorter."); 127:46-51 ("It should be noted that multiple particles in a first series or multiple particles in a second series could be 'closely spaced,' but since the particles in any such series have the same characteristic (A or B), they are treated as a single-particle series, at least for sorting strategy purposes.")

patent, 79:42-43.) Accordingly, the court adopts ST's proposed construction of "sort strategy."

b. "further comprises the step of photo-damaging sperm cells based upon a sort strategy"

Next, the parties dispute the construction of a phrase in claim 2 of the '987 patent:

"wherein the step of selecting stained sperm cells in the flow path to photo-damage further comprises the step of photo-damaging sperm cells based upon a sort strategy"	
Plaintiffs ABS and Genus's Proposed Construction	**Defendant ST's Proposed Construction**
"wherein the step of selecting stained sperm cells in the flow path to photo-damage includes a step of photo-damaging sperm cells based upon a sort strategy (in addition to the photo-damaging step of subpart 'f' of claim 1)"	"No construction necessary. In the alternative, 'wherein the step of selecting stained sperm cells in the flow path to photo-damage further comprises applying a sort strategy."

ABS argues that claim 2 contains a drafting error, since the quoted phrase requires two different lasers to perform two different "laser-kill" steps. ABS again acknowledges that its proposed construction is harsh, since the two laser requirement would not only be "pointless" but also, in the words of ST's expert, would serve no "beneficial purpose, and may even cause collateral damage to the desired cells." (Pl.'s Opening Br. (dkt. #270) at 33.) Still, ABS claims adoption of its proposed construction is necessary, because despite containing an error, the court must construe claim 2 as it was actually drafted. *See Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004)

("Thus, in accord with our settled practice, we construe the claim as written, not as the patentees wish they had written it.")

In response, ST argues that re-drafting claim 2 is not necessary because it first requires selection of the cells based upon the sort strategy, then the actual photo-damaging of those cells, and not two photo-damaging steps. ST's explanation, however, does not dispense completely with ABS's concern regarding step (f) in claim 1, which discloses "photo-damaging the selected sperm cells," meaning that claim 1 also requires both a selecting step and a photo-damaging step. Even so, it does not appear that ABS advances the proper construction of the language of claim 2.

The central difference between claims 1 and 2 again appears to hinge on the apparent difference between "selecting" the desired characteristic of sperm cell to be photo-damaged and photo-damaging based on a "sort strategy." The claim language appears to require the two terms to be interpreted differently, with the application of a sort strategy being a more narrow method by which cells to be photo-damaged are identified.

Thus, although perhaps inartfully explained, ST's interpretation of claim 2 is the better one for a person of ordinary skill in the art's understanding of the claim, particularly in light of its language and the specification, and especially since ABS concedes that applying two laser-kill steps would be counter-productive. *See Ortho-McNeil Pharma, Inc. v. Mylan Labs., Inc.*, 520 F.3d 1358, 1363 (Fed. Cir. 2008) (applying the interpretation that it appeared the patentees intended, distinguishing *Chef America* as a case in which "the only possible interpretation of the claim led to a

nonsensical result"). Based on its language, claim 2 limits the photo-damaging of cells selected based on their classification in claim 1 to photo-damaging selected cells that are further identified for damaging by a sort strategy, and two lasers carrying out two laser-kill steps are not necessary. Therefore, the court adopts ST's proposed construction, "wherein the step of selecting stained sperm cells in the flow path to photo-damage further comprises applying a sort strategy," and ABS's motion for summary judgment of non-infringement on claims 2, 3 and 4 will be denied.

c. "varying the sort strategy"

Turning again to claims 3 and 4 of the '987 patent, the parties also propose different constructions for a similar phrase appearing in both claims:

"varying the sort strategy [or the fluid delivery rate] as a function of"	
Plaintiffs ABS and Genus's Proposed Construction	**Defendant ST's Proposed Construction**
"changing the sort strategy [or fluid delivery rate] based upon"	"selecting a sort strategy [or a fluid delivery rate] based upon"

The parties' different interpretations turn on whether claims 3 and 4 require merely selecting the sort strategy "either at the beginning of or during the semen processing" (Def.'s Opp'n Br. (dkt. #334) at 25) (ST's construction) or changing it while sexed semen processing is underway (ABS's construction). ABS proposes the better interpretation.

ST asserts that ABS's proposed construction "would exclude instances disclosed in the specification where the sort-strategy may remain static throughout the sorting process," but it ignores claim 2, which calls for the application of a sort strategy without

any mention of "varying" it. (*Id.*) In contrast, claims 3 and 4 disclose sorting cells according to claim 2, but then further varying the sort strategy or fluid delivery rate "as a function of" the desired purity or quantity of cells of the desired characteristic.

Thus, under a plain reading of the language of claims 3 in 4 in relation to claim 2, claims 3 and 4 disclose a process by which the selected sort strategy or fluid delivery rate selected consistent with claim 2 (either before or during processing) changes in real-time depending on the purity or quantity of the population of sperm cells of the desired characteristic. ST's alternative construction would render superfluous the claim elements "varying" and "as a function of," and indeed claims 3 and 4 in violation of the doctrine of differentiation. Accordingly, the court will adopt ABS's proposed construction "changing the sort strategy [or fluid delivery rate] based upon."

Having adopted ABS's proposed construction, the court will grant summary judgment of non-infringement to ABS on claims 3 and 4, since ST offers no evidence to contradict its assertions that the GSS technology does not change the sort strategy or fluid delivery rate based upon the sperm population being collected. *See Joy Techs., Inc. v. Flakt, Inc.*, 6 F.3d 770, 775 (Fed. Cir. 1993) ("A method claim is *directly* infringed only by one practicing the patented method.") (alteration in original).

d. "desired purity" and "an acceptable quantity"

The parties also propose different constructions for two claim terms in claims 9 and 10 of the '987 patent.[17]

[17] Although ST has the better of the argument on the construction of these terms, ABS does not infringe claims 9 and 10 for reasons unrelated to this claim construction dispute as set forth

"desired purity" [Claim 9] and "an acceptable quantity" [Claim 10]	
Plaintiffs ABS and Genus's Proposed Construction	**Defendant ST's Proposed Construction**
"Indefinite. "Desired" and "acceptable" are purely subjective.	Not indefinite. Refers to the purity desired by the operator [or the quantity acceptable to the operator] as demonstrated by the examples [or quantities] set forth in the specification.

In pertinent part, claim 9 discloses a method of sorting cells according to claim 1 and further comprising the step of adjusting the fluid delivery rate when the purity of the sperm cell population is "greater than a desired purity" or "less than the desired purity." Similarly, claim 10 discloses a method of adjusting the fluid delivery rate depending on the "acceptable quantity" of undamaged sperm cells of the desired characteristic in the population.

ABS contends that because the specification does not describe how to determine the "desired purity" or "an acceptable quantity," or limit the range of purity or quantity claimed, claims 9 and 10 are "fatally indefinite." *See Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1374 (Fed. Cir. 2014) (invalidating claims depending on a phrase that "when viewed in light of the specification and prosecution history, fail[ed] to 'inform those skilled in the art about the scope of the invention with reasonable certainty.'") (quoting *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. ___, 134 S. Ct. 2120, 2130 (2014)); *see also Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311 (Fed. Cir. 2012) ("Whether a claim complies with the definiteness requirement of 35 U.S.C. § 112 ¶ 2 is a matter of claim construction[.]").

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below.

As a starting point, claims which include terms of degree are not "inherently indefinite." *Interval Licensing LLC*, 766 F.3d at 1370. Rather, "[c]laim language employing terms of degree has long been found definite where it provided enough certainty to one skilled in the art when read in the context of the invention." *Id.* (citing *Eibel Process Co. v. Minn. & Ont. Paper Co.*, 261 U.S. 45, 65-66 (1923)).

ST does not dispute that neither the language of claims 9 and 10, nor the specification limit the range of the desired purity or acceptable quantity to any particular values. Instead, it argues that "[t]he manipulation of the sorting strategy is being claimed, not the purity level," adding that a person of ordinary skill in the art would understand that claims 9 and 10 disclose a balancing procedure to reach the desired purity or acceptable quantity.

The court agrees. The language of claims 9 and 10 discloses a procedure for achieving a certain purity or quantity, and while the specifics of that purity or quantity are left undefined, ABS offers nothing to suggest that the terms must be further defined to be understandable to a person of ordinary skill in the art. Indeed, the level of desired purity or acceptable quantity depends completely on the demands of the machine operator, driven in turn by the particular demands of a downstream customer, which is only underscored by ABS's argument that "two individuals could do the exact same thing on the exact same machine, and an operator who was satisfied with low purity would infringe claim 9, while a more demanding, dissatisfied operator would not." (Pl.'s Opening Br. (dkt. #270) at 37.)

Claims 9 and 10 are unlike the claim invalidated by the Federal Circuit in *Interval Licensing LLC*, which disclosed a method for a "content display system" to "selectively display, in an unobtrusive manner . . . an image or images." In that case, the "unobtrusive manner" language in the claim "offer[ed] no objective indication of the manner in which content images [were] to be displayed to the user." *Id.* at 1368, 1371. Unlike in *Interval Licensing LLC*, the subjective terms here do not concern any indefinites as to the operation of the claimed invention. Rather, claims 9 and 10 merely disclose a method by which the operator *can* achieve *his or her* intended results. Accordingly, the court agrees with ST that claims 9 and 10 are not invalid as indefinite because the terms desired purity and acceptable quantity are subjective.

2. '987 Patent claims 5 and 6

ABS moves for summary judgment of non-infringement on claims 5 and 6 of the '987 patent on the basis that its GSS technology does not deal with "closely spaced" sperm cells in the same manner as does ST's technology. The relevant claims provide:

> 5. A method of sorting a mixture of stained sperm cells according to claim 1, wherein the method further includes the step of forming the fluid into a stream containing sperm cells following generally one after another in a series which includes sequential sets of sperm cells, including:
>
> a. first particle sets each including one or more sperm cells having characteristic A;
>
> b. second particle sets each including one or more sperm cells having characteristic B; and

> c. third particle sets each including two or more *closely spaced* sperm cells at least one of which has characteristic A and at least one of which has characteristic B.
>
> 6. A method of sorting a mixture of stained sperm cells according to claim 5, the method further includes the step of either photo-damaging the second particles sets and not the first and third particle sets or photo-damaging the second and third particle sets and not the first particle sets.

('987 patent, 213:37-214:14 (emphasis added).)

ABS argues that the GSS technology does not infringe claim 6 for two reasons. First, ABS claims that the GSS technology photo-damages *both* first particle and second particle sets, while claim 6 requires no photo-damaging to one or the other. Second, ABS argues that because the GSS technology only photo-damages one cell in a particle set, it does not infringe claim 6, which also "requires photo-damaging the 'third particle sets,' not simply one of the cells in the multi-cell set." (Pl.'s Opening Br. (dkt. #270) at 54.) ABS explains that the GSS technology detects "multi-peak events" when "two or more cells arrive at the detection spot very close together, in which case [it] treats them as a single event." (*Id.* at 53.) ABS further explains that the GSS technology decides whether to fire the kill laser when it encounters multi-peak events by "treat[ing] the highest peak as the cell." (*Id.*)

The court can dispense with ABS's second argument for non-infringement at the outset, since it reads into claims 5 and 6 a requirement that the laser kill *more* than one cell in the third particle sets, an interpretation that is simply not supported by the claim language. In other words, a laser killing only one cell of a third particle set would still

infringe claim 6, since there is nothing to suggest that a laser must damage a set only by damaging the *entire* set, although that may sometimes be the result.

With respect to the first argument, ABS asserts that the GSS technology will photo-damage at least one of the cells whenever it encounters a "doublet" (i.e., two closely-spaced cells of the same sex). But ABS does not explain how to reconcile its assertion that when detecting a doublet, the GSS technology "makes its decision about *whether* to fire the kill laser" (*Id.* at 54 (emphasis added)) with its assertion that "the laser will *always* fire at XX (a first particle set), at YY (a second particle set) and XY (a third particle set)" (Pl.'s Reply Br. (dkt. #349) at 29 (emphasis added)). Still, ST's arguments in response are also underwhelming, as its description of the process by which the operator of the GSS technology draws a "gate" around values on a scatterplot, and then decides whether to kill everything either outside or inside of the gated region, provides examples of configurations under which the GSS technology would infringe claim 6, but *only* if the particle sets were single cell events and not groups of cells.

Put differently, ST offers no explanation how the GSS technology could spare both single-cell and multi-cell sets of the desired sex, while destroying only single-cell and multi-cell sets of the undesired sex *or* those cells of the undesired sex along with multi-cell sets of mixed sex cells, as is required by the language of claim 6. Based on this record then, the court will grant summary judgment of non-infringement to ABS on claim 6.

3. '987 Patent claims 9 and 10

ABS simply argues that the GSS technology does not infringe claims 9 and 10 of the '987 patent because it does not adjust the fluid delivery rate "in response" to either

the desired purity or acceptable quantity of the sperm population collected, but rather holds the fluid delivery rate constant throughout the laser killing process. In response, ST observes that "ABS again does not argue that the GSS system is not *capable* of increasing or decreasing fluid delivery rate based on the purity of a given population of sperm or the acceptable quantity of undamaged sperm cells" (Def.'s Opp'n Br. (dkt. #334) at 40 (emphasis added)), but rather just that by maintaining the fluid delivery rate in fact it is held constant throughout the laser killing process. (Pl.'s Opening Br. (dkt. #270) at 55 (citing Robinson Report (dkt. #295) ¶ [85]).)

ST also argues that a "chart from ABS's own documents" concerning the relationship between event rate and purity "is meant to allow an operator to increase or decrease the flow rate based on the desired purity of the final sample." (Def.'s Opp'n Br. (dkt. #334) at 40-41.) In response to ST's insistence on the importance of that chart, ABS argues that the chart "shows the relationship between 'Interval Length (t, us)' and 'Percentage of Events Occurring in Interval (t)' for various event rates," the relationship between event rate and purity. (Pl.'s Resp. Supp. PFOF (dkt. #350) ¶ 309.) Moreover, ABS emphasizes its expert's conclusions that the operator of the GSS system only makes modifications to pressure for the purpose of maintaining rather than varying the fluid delivery rate and that "[t]he fluid delivery rate is not based on purity of a sample." (*Id.* at 308 (citing Robinson Report (dkt. #295) ¶¶ 82-83, 85).)

On this record, the court agrees with ABS that ST has produced insufficient evidence to establish that the GSS technology adjusts the fluid delivery rate based upon the purity or quantity of the population of collected sperm. Summary judgment of

non-infringement on claims 9 and 10 in ABS's favor is therefore appropriate. *See Joy Techs,* 6 F.3d at 775.

C. '092 Patent Claims 1 and 40 Additional Claim Construction

With respect to the '092 patent, ABS now moves the court to construe additional terms for which the parties did not propose constructions as part of the summary judgment briefing. The court will deny ABS's motion to construe "sampling" in each of the independent claims of the '092 patent as moot, since it appears that ABS only seeks to construe sampling to support its non-infringement arguments with respect to the GSS v1.5 technology, which the court excluded from this case (Def.'s Opp'n Br. (dkt. #412) at 4), and since ST confirms that it "will not distinguish the '092 patent from the asserted prior art on the basis of the 'sampling' limitation" (*id*).

The court will, however, grant ABS's motion for claim construction with respect to a phrase in claim 1 and claim 40 of the '092 patent:

"detecting waveform pulses [Claims 1 and 40]	
Plaintiffs ABS and Genus's Proposed Construction	**Defendant ST's Proposed Construction**
"identifying pulses in waveforms that are present in the time-varying analog output of the photodetector"	"applying logic to distinguish waveform pulses that represent live cells from waveforms that represent noise, debris, or dead cells"

The relevant language in which this phrase appears in claims 1 and 40 reads as follows:

> 1. A system for sorting a mixture of stained particles, including stained particles having characteristic A and stained particles having characteristic B, the system comprising:
>
> . . .
>
> f. an analog to digital converter for sampling a time-varying analog output from the photodetector and providing an output including digital information corresponding to the time-varying analog output wherein the time-varying analog output and the corresponding digital information include a series of waveform pulses, the waveform pulses being indicative of characteristic A or characteristic B; and
>
> g. a digital signal processor for analyzing and classifying the digital information and providing a sorting signal to the sorting system as a function of the analyzed and classified digital information wherein the digital signal processor includes instructions for detecting the waveform pulses corresponding to the digital information, instructions for extracting features in the detected waveform pulses, and instructions for discriminating the detected waveform pulses as a function of their extracted features.
>
> . . . .
>
> 40. A method for sorting a mixture of stained particles including stained particles having a characteristic A and stained particles having a characteristic B, the method including the steps of:
>
> . . .
>
> d. analyzing and classifying the digital information, wherein the step of analyzing and classifying further comprises detecting waveform pulses represented by the digital information, extracting features of the waveform pulses from the digital information, and discriminating the detected waveform pulses as a function of their extracted features[.]

(Horowitz Decl. Ex. 23 (dkt. #261-2) [hereinafter "'092 patent"] 211:64-212:34, 223:17-39.) The specification of the '092 patent defines a waveform pulse as "a

waveform or a portion of a waveform containing one or more pulses or some portion of a pulse. ('092 patent, 52:66-53:1.)

ABS asserts that although a detected pulse typically represents a live cell, dead cells also produce pulses and are therefore sometimes collected in a sample. ABS points to one sentence in the specification it claims explicitly states that "detecting waveform pulses" does not require discriminating between live and dead cells: "In general, as used herein, X cells refer to live X cells, Y cells refer to live Y cells and ~X cells refers to the combination of live Y cells and cells which otherwise produce a detectable fluorescence emission 31 *but which cannot be identified with a reasonable probability as being live X cells*." ('092 patent, 53:12-17 (emphasis added).) Similarly, ABS also points to language in dependent claim 4 of the '092 patent, which provides that "characteristic A is indicative of a live X sperm cell and characteristic B is indicative of other than a live X cell (~X)." ('092 patent, 212:45-47.)

Based on this language, ABS argues, characteristic B and a waveform pulse associated with it *can* include dead X cells. ABS also argues that ST's proposed construction is wrong because steps for further analyzing and classifying the pulses are listed separately from detection, citing step (g) of claim 1, which requires "extracting features in the detected waveform pulses, and instructions for discriminating the detected waveform pulses as a function of their extracted features." ('092 patent, 212: 31-34.)

In response, ST makes a pragmatic argument that a person of ordinary skill in the art would have understood that a waveform pulse is a signal likely to represent a live cell "because such a configuration would reduce the processing load on the system, and

enable efficient sorting." (Def.'s Opp'n Br. (dkt. #412) at 7.) According to ST, further guidance can be found in the patent's description of a "waveform pulse" as a signal likely to represent live cells, while "waveform" refers to signals that likely do not represent live cells. In support of this interpretation, ST also points to a passage in the specification, which it argues similarly distinguishes between these two terms:

> The first processing step is pulse detection performed by pulse detection processor 865 to determine whether a particular waveform is a waveform pulse corresponding to a fluorescence emission of a cell. The processor 865 executes a pulse detection algorithm which identifies sample sets that are likely to represent either particles targeted for sorting into a population or particles targeted to be avoided because they are potential contaminants to a population.

('092 patent, 58:49-56.) In response to ABS's argument, ST also points out that: (1) the separate detection, extraction and discrimination steps perform different functions; and (2) a pulse representing "something other than a live X cell" in claim 4 could include combinations of male and female cells, not just dead cells.

Based on the claim language and the portion of the specification cited by ST, the court agrees that "detecting waveform pulses" in claims 1 and 40 of the '092 patent comprehends the application of some processing logic to distinguish between waveforms and waveform pulses likely to represent live cells. In particular, the specification describes "pulse detection performed by a pulse detection processor" as the "first processing step" to determine whether a waveform is a waveform pulse for the purpose of distinguishing particles for sorting from particles to avoid. This language supports the language in the patent itself, which distinguishes between a waveform and a waveform pulse. The patent and specification similarly treat "pulse detection" as a process by

which the system identifies particles likely to be sorted, suggesting that the step of detecting waveform pulses uses logic to identify live cells from other waveforms. Finally, contrary to ABS's assertion, the subsequent extraction and discrimination steps are not inconsistent with ST's interpretation of the detection step, since the sex of the cell must still be determined, and then the cell must be sorted depending on its sex.

For these reasons, the court adopts ST's proposed construction of "detecting waveform pulses" in claims 1 and 40 of the '092 patent. Since neither side moves for summary judgment of non-infringement based on that construction, however, that issue will await trial.

CONCLUSION

Given the number of claims and cross motions for partial summary judgment (dkts. #235, #246), as well as ABS's Motion Requesting Claims Construction (dkt. #382), the following is an outline of the rulings in this opinion and claims remaining for trial.

I. Contract Claims

A. ABS sought summary judgment on 4 issues:

1. ABS's development and expected commercialization of the GSS technology does not breach the Agreement.

Ruling: GRANTED in part as to development and DENIED in part as to expected commercialization.

2. ST's fraudulent inducement and promissory estoppel claims fail as a matter of law.

Ruling: GRANTED.

3. ABS did not breach the confidentiality provisions of the Agreement.

Ruling: GRANTED in part and DENIED in part. ABS is only entitled to summary judgment as to the second category of information, ST's method for calculating straw fill volumes.

4. The liquidated damages provision of the Agreement is unenforceable.

Ruling: GRANTED.

B. ST sought judgment on two issues:

1. The non-compete clause of the Agreement expressly encompasses the GSS technology.

Ruling: DENIED

2. The Agreement's covenant not to compete is enforceable under Texas law.

Ruling: DENIED

C. Remaining contract claims:

1. The validity of the non-compete clause of the Agreement under Texas law.

2. ST's claim that the GSS technology (a) is covered by Section 18 of the Agreement, and (b) therefore the development of the technology breaches Section 18 of the Agreement.

3. ST's claim that ABS breached Section 16 of the Agreement regarding 3 types of confidential information.

II. Antitrust Claims

A. ST requested summary judgment as to (1) the relevant market and (2) anticompetitive conduct.

Ruling: BOTH DENIED

B. ABS and ST both request judgment as to whether ST's patent acquisitions constitute anticompetitive conduct.

Ruling: DENIED

C. Remaining antitrust claims: All

III. Patent Claims

A. As to '987 patent claims 1, 7 and 8 and '092 patent claims 40-46:

Ruling: ST's motion for infringement GRANTED, but ABS is maintaining that both patents are invalid in light of prior art.

B. '987 claims construction and infringement:

1. Claim 1 "sorting strategy": The court adopted ST's proposed construction ("decision process for determining how particles or groups of particles are to be sorted"). ABS did not seek non-infringement summary judgment.

2. Claims 2 "further comprises the step of photo-damaging sperm cells based upon a sort strategy": The court adopted ST's proposed construction ("No construction necessary. In the alternative, 'wherein the step of selecting stained sperm cells in the flow path to photo damage further comprises applying a sort strategy.").

Ruling: ABS's motion for summary judgment of non-infringement on Claims 2, 3 and 4 is DENIED.

3. Claims 3 and 4 "varying the sort strategy [or the fluid delivery rate] as a function of": The court adopted ABS's proposed construction ("changing the sort strategy [or fluid delivery rate] based upon").

Ruling: ABS's motion for summary judgment of non-infringement on Claims 3 and 4 is GRANTED.

4. Claims 5 and 6.

Ruling: ABS's motion for summary judgment of non-infringement on claims 5 and 6 is GRANTED.

5. Claims 9 and 10 "desired purity" and "an acceptable quantity": The court adopted ST's construction that the terms are not indefinite.

Ruling: ABS's argument that claims 9 and 10 are indefinite is rejected. ABS's request for summary judgment as to non-infringement is GRANTED.

C. '092 claims construction and infringement

1. Claims 1 and 40 "detecting waveform pulses": The court adopted ST's proposed construction ("applying logic to distinguish waveform pulses that

represent live cells from waveforms that represent noise, debris, or dead cells"). Neither side moved for summary judgment related to infringement.

D. Remaining patent claims:

1. '987 Patent

a. ST's claim that ABS infringed claims 1-4.

b. ABS's invalidity defense due to prior art.

2. '092 Patent

a. ST's claim that ABS infringed claims 1-13, 16, 18-19, 21, 26-28, 32, 40, 41-46 and 49.

b. ABS's invalidity defense due to prior art.

IV. Additional Claim Not Addressed At Summary Judgment: XY's trade secret misappropriation claim against ABS. ABS appears to have conceded liability on this claim (see dkt. #480, at MIL #1). If that is correct, this will only be an issue during the damages phase of the trial.

ORDER

IT IS ORDERED THAT:

1. Plaintiff's motion requesting claims construction (dkt. #382) is GRANTED IN PART and DENIED IN PART.

2. Plaintiff's motion for partial summary judgment (dkt. #246) is GRANTED IN PART and DENIED IN PART.

3. Defendants' motion for partial summary judgment (dkt. #235) is GRANTED IN PART and DENIED IN PART.

Dated this 21st day of July, 2016.

BY THE COURT:

/s/

William M. Conley
District Judge