UNITED STATES DISTRICT COURT
DISTRICT OF CONNECTICUT

ENZO BIOCHEM, INC., ENZO LIFE SCIENCES, INC. and YALE UNIVERSITY, *Plaintiffs*, *v.* APPLERA CORP. and TROPIX, INC., *Defendants*.	Civil No. 3:04cv929 (JBA) August 1, 2013

RULING ON POST-TRIAL MOTIONS

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Following a seven-day jury trial, the jury returned a verdict finding that Defendants Applera Corp. and Tropix, Inc.'s (collectively, "Defendants" or "ABI") accused BigDye and dRhodamine dye-terminator products directly infringed, and induced customers to infringe, claims 1, 8, 67, 68, and 70 of Enzo's U.S. Patent No. 5,587,767 (the '767 patent) by ABI's manufacture, use, or sale of their reagent products and sales of DNA sequencing instruments. The jury rejected ABI's invalidity defenses of lack of written description, lack of enablement, and anticipation, and issued two advisory findings that (1) Enzo had not unreasonably delayed in filing suit, and (2) ABI was not materially prejudiced by the delay in filing this lawsuit. The jury awarded Enzo $48,587,500.00 in reasonable royalty damages. (*See* Jury Verdict [Doc. # 476].)

The parties move on several grounds for judgment as a matter of law and for a new trial: Enzo moves [Doc. # 498] for a new trial limited to damages for the infringing sales of instruments; ABI moves [Doc. # 503] for judgment as a matter of law or a new trial on all of its invalidity defenses (written description, enablement, anticipation, and obviousness), and requests [Doc. # 502] judgment in ABI's favor on their defenses of equitable estoppel and/or laches.

For the reasons that follow, Plaintiff's motion for a new trial is denied, Defendant's request for a judgment of laches and/or equitable estoppel is denied; and Defendant's motion for judgment as a matter of law or a new trial is denied. The jury's verdict remains undisturbed.

I. Legal Standards

Judgment as a matter of law may not properly be granted under Federal Rule of Civil Procedure 50 unless the evidence, viewed in the light most favorable to the opposing party, is insufficient to permit a reasonable juror to find in its favor. *Galdieri-Ambrosini v. Nat'l Realty & Dev. Corp.*, 136 F.3d 276, 289 (2d Cir. 1998). The court must "give deference to all credibility determinations and reasonable inferences of the jury, . . . and it may not itself weigh the credibility of witnesses or consider the weight of the evidence." Thus, judgment as a matter of law should not be granted unless:

> (1) there is such a complete absence of evidence supporting the verdict that the jury's findings could only have been the result of sheer surmise and conjecture, or (2) there is such an overwhelming amount of evidence in favor of the movant that reasonable and fair minded [persons] could not arrive at a verdict against [it].

Id.

Motions for judgment as a matter of law ("JMOL") "should not be granted if reasonable persons could differ as to the conclusions to be drawn from the evidence, and a trial court does not err when it denies a motion for JMOL if there is 'substantial evidence—more than a mere scintilla of evidence—to support a verdict in favor of the party opposing such a motion.'" *Spectralytics, Inc. v. Cordis Corp.*, 649 F.3d 1336, 1341 (Fed. Cir. 2011) (citing *Jackson v. Prudential Ins. Co.*, 736 F.2d 450, 453 (8th Cir. 1984) with approval). For a defendant to prevail on a JMOL motion, "it must establish that the jury's actual or inferred factual findings were not supported by substantial evidence, or that the evidence was not sufficient to support the findings and conclusions necessarily drawn by the jury on the way to its verdict." *Id.* at 1342.

The grant of a new trial is appropriate when, "in the opinion of the district court, the jury has reached a seriously erroneous result or . . . the verdict is a miscarriage of

justice." *DLC Mgmt. Corp. v. Town of Hyde Park*, 163 F.3d 124, 133 (2d Cir. 1998). A new trial may also be granted "when the jury's verdict is against the weight of the evidence." *Id.*

II. Discussion

A. Infringement

The parties begin their post-trial briefing on infringement with what the Court perceives as a dispute raised far too late in the lifetime of this litigation. ABI raised for the first time at the pre-trial conference a non-infringement argument that neither the Court, nor Plaintiffs, had heard before, asserting that claim 1 of the '767 patent claims "an oligo- or polynucleotide containing a nucleotide," and arguing that since ABI's accused products do not make, use, offer to sell, sell, or import oligo- or polynucleotides, ABI is entitled to judgment as a matter of law on noninfringment. In response to this new non-infringement argument, Plaintiffs raised a new construction argument, also for the first time—that all of the language prior to the diagram shown in claim 1 is preamble and thus is not to be considered limiting claim language.

Though ABI asserts that "until one week before trial, this entire case was litigated based on the proposition that 'oligo- or polynucleotide' defined, at least in part, the subject matter of the claims and was to be considered in determining infringement and invalidity" (Def.'s Mem. Supp. [Doc. # 503-1] at 9), ABI had never raised this as the basis of its noninfringement defense. Indeed, in light of the Federal Circuit's 2010 decision finding the '767 claim language not to be indefinite, ABI asked the Court in 2011 if it could move for summary judgment on the basis of the noninfringement of the "no substantial interference" claim limitation, which this Court permitted. The Court denied ABI's motion (*See* Ruling on Cross-Motions for Summ. J. [Doc. # 419]), and several days

later issued, at the parties' request, an agreed-upon order listing the "issues remaining for adjudication at trial" [Doc. # 422], which included "[n]on-infringement of the 'no substantial interference limitations'" as ABI's sole non-infringement argument.

During discovery, in response to Enzo's interrogatories about ABI's noninfringement defenses, ABI never identified this argument as a basis for noninfringement. Further, as this Court noted at the charge conference held on October 23, 2012, ABI's noninfringement argument was also not raised as a basis for summary judgment of noninfringement, even though ABI filed two summary judgment motions, in 2007 and 2011, on the basis of noninfringment, nor was it contained in any of ABI's expert reports. (Charge Conference Tr. [Doc. # 508] at 10–11.) Enzo asks the Court to exercise its discretion and disallow this late-in-the-game noninfringement argument.

It is within the Court's discretion to limit ABI to the non-infringement claims made in its interrogatory answers, *see Medtronic Inc. v. Boston Scientific Corp.*, 695 F.3d 1266, 1274–75 (Fed. Cir. 2012) ("[I]t is within the district court's discretion on remand whether to limit Medtronic to its current interrogatory answer, or to allow Medtronic to amend its interrogatory answer to include any additional noninfringement contentions it may wish to assert."), and the Court concludes that permitting consideration of this defense now—after years of discovery, multiple summary judgment motions, and a trip to the Federal Circuit and back—where ABI failed to raise the issue until the eve of trial, would significantly prejudice Enzo and could potentially render moot the hard work of both parties and the Court in finally bringing this case to trial. Thus, the Court declines to consider ABI's late-raised non-infringement argument, and for the same reasons, declines to address Enzo's preamble claim limitation and construction argument. *Cf. Bettcher Indus., Inc. v. Bunzl USA, Inc.*, 661 F.3d 629, 641 (Fed. Cir. 2011) ("Under the

circumstances of this case, the district court did not abuse its discretion in holding that Bunzl could not add new claim construction theories on the eve of trial.").

1. Direct Infringement

The jury found that ABI's accused d-Rhodamine and BigDye directly infringed claims 1, 8, 67, 68, and 70 of the '767 patent. As infringement is a question of fact, it is reviewed for substantial evidence. *i4i Ltd. P'ship v. Microsoft Corp.*, 598 F.3d 831, 849 (Fed. Cir. 2010), *aff'd*, 131 S. Ct. 2238 (2011) ("Because infringement was tried to a jury, we review the verdict only for substantial evidence.").

In reaching its finding on direct infringement, the jury heard Dr. Richard Sinden, Plaintiff's infringement expert, testify about the chemical structures of the accused products, defining ABI's dye-labeled nucleotides as "a five-member carbon member sugar, phosphate, a base attached to that, a linker group attached to the base, and a dye attached to the linker group." (Tr. Vol. III [Doc. # 483] at 504.) Dr. Sinden went through the asserted claims one by one, and opined that the accused products "lined up perfectly well" against the '767 patent.

Specifically, the jury heard evidence that as to independent claim 1, "the BigDye and the dRhodamine terminators, . . . line up perfectly well in that we have a sugar, a base, and a dye with the linker" (*id.* at 507), and that the accused products

> have a pyrimidine base, it's attached to the C1 position of the carbon—the sugar. The N1 position of the pyrimidine, the purine is attached to the N9 position of the purine, and also attached to the C1 position of the carbon—of the sugar, C1 carbon of the sugar.

(*id.* at 508; *see also* PTX 315), which permitted him to conclude that the "second criteria of claim 1 is met" (Tr. Vol. III at 509). He opined that the accused products have more than three carbon atoms and the dye is detectable (*id.*), that the base and the dye are

covalently attached through a linkage group (*id.* at 510–11), and thus that those criteria are met. He opined that the accused products have linkage groups attached to the base at the "Ward positions," i.e., "if B is the base is a 7-deazapurine, the A—the linkage group attaching the A is attached to the 7 position of that, and that if B is a pyrimidine, the six member ring, it's attached to the 5 position of that base" (*id.* at 511–12), and that the accused products have "a phosphate group on the 5'-end where we can have phosphate which makes the nucleotide, and then hydrogens at both of these positions, the 2' and the 3' position of the sugar which makes them dideoxys. So, again, they meet the criteria of that part of the claim" (*id.* at 513).

The jury also heard Dr. Sinden testify, after providing an overview of how, in his opinion, the structure of the accused products mapped onto claim 1, that it was his understanding "that ABI agrees that their products meet all of these claim limitations. I believe that their only dispute is the substantial interference function aspect." (*Id.* at 514.)[1] He then explained how the dye terminators are able to hybridize as required in claim 1, and also that, once synthesis is done, "we make a series of molecules of increasing length . . . [and] [t]hese four products are labeled with a different dye so you can detect them." (*Id.* at 524.) Dr. Sinden reasoned that "[i]f they interfered with hybridization . . . if you modified a base, . . . it's not going to work in the reaction. It's not going to come in here, it's not going to hybridize, it's not going to get coupled. So, if there was any interference at all with this being able to form a stable structure and pair up with another base, it's not going to work." (*Id.*) Dr. Sinden further testified that ABI's own product documents

[1] Dr. Sinden's testimony on this subject, in addition to the expert reports he prepared during discovery and for trial, demonstrates the substantial disruption which would result if ABI's oligo-/polynucleotide noninfringement argument were so belatedly permitted.

guarantee to customers that the dye terminators in the accused products will work, and the products "have to hybridize" in order to work. (*Id.* at 530–31; *see also* PTX 1160; PTX 1165.) Dr. Menchen, on cross-examination, agreed that ABI's own patents for its accused dye products require that "the linkage linking the dye and nucleosides should not interfere with nucleoside target hybridization" (Tr. Vol. III at 455; *see also* '727 patent [PTX 5] col. 28:19–23), and that ABI's patents cite and incorporate by reference the '767 patent.[2]

Dr. Sinden explained further how the linkage groups disclosed in the '767 patent worked so as to not substantially interfere with hybridization or detection (*see* Tr. Vol. III at 537), and opined that the linkage groups in ABI's accused products, which use a triple bond, are "functionally equivalent," in that "[y]ou can't rotate around a double or a triple bond." (*Id.* at 539–40.) ABI's witness Dr. Kricka agreed that "the triple bond is flat anyway," that "it can't rotate," and that the reason a carbon-to-carbon triple bond cannot rotate is exactly the same reason that a double bond cannot rotate. (Tr. Vol. VI [Doc. # 486] at 1198–99.)

The jury heard Dr. Sinden conclude, based on ABI's accused products and the patents disclosing them, that "[t]hey're functionally equivalent, and that language, the criteria for that, the stipulations of what you must have for the thing to be able to

[2] In its post-trial briefing, ABI raises the same argument that this Court considered, and rejected, in its 2012 Ruling on Cross-Motions for Summary Judgment related to the "no substantial interference limitations." Defendant believed that the Federal Circuit's conclusion that the '767 patent was not indefinite hinged in part on Enzo showing, through experimentation, the specific degree to which the accused products do or do not interfere. (Def.'s Mem. Supp. at 24–26; Reply [Doc. # 517] at 11.) Contrary to ABI's contention, however, neither the Federal Circuit nor this Court held that a particular showing of the degree of interference was required in order to prove infringement. (*See* 2012 Ruling on Cross-Motions for Summ. J. at 16–17.)

hybridize, to be able to be incorporated into the DNA, is the same language as found in the Ward patent, these other patents as well." (Tr. Vol. III at 542.) Dr. Sinden also opined that the asserted independent claims—8, 67, 68, and 70—were met by the accused products. (*See id.* at 543–45.)

On cross-examination, Dr. Sinden agreed that the accused products were "modified nucleotides," and was asked to explain how he interpreted the "oligo- or polynucleotide containing a nucleotide having the structure" requirement of claim 1, to which he responded,

> A. [Claim 1] talks about the structural characteristics of the component, and the function of this is for incorporation in the polynucleotide.
> Q. The BigDye and dRhodamine molecules that are in those vials that you put up on the screen, those are not oligo or polynucleotides, correct?
> A. Not until they get incorporated. *Then they're a component of a polynucleotide*.

(Tr. Vol. III at 554 (emphasis added).)

On the basis of the ample evidence of direct infringement provided by Plaintiff's infringement expert, and corroborated in part by ABI's own witnesses, the Court concludes that the jury's finding of direct infringement as to all of the asserted claims is supported by substantial evidence. That ABI contends that other evidence could support a finding of noninfringement is not the issue that is before the Court at this post-trial stage. Giving deference to all credibility determinations and reasonable inferences of the jury, the Court denies ABI's motion for judgment as a matter of law. Furthermore, concluding that the jury's verdict is not against the weight of the evidence, the Court also denies ABI's request for a new trial on this basis.

2. Indirect/Induced Infringement

ABI also challenges the jury's verdict finding that Enzo had proved that ABI induces its customers to infringe all asserted claims of the '767 patent by selling DNA sequencing instruments.

To prove inducement, the patentee must show direct infringement, and that the alleged infringer "knowingly induced infringement and possessed specific intent to encourage another's infringement." *i4i*, 598 F.3d at 851 (citing *MEMC Elec. Materials, Inc. v. Mitsubishi Materials Silicon Corp.*, 420 F.3d 1369, 1378 (Fed. Cir. 2005)); 35 U.S.C. § 271(b)).

As the Court concludes that the jury's finding as to direct infringement was supported by substantial evidence, the remaining issue is whether the jury's finding that ABI "knowingly induced infringement" through the sale of DNA sequencing instruments is supported by substantial evidence.

The jury had evidence, in the form of Dr. Macevicz's letter, that ABI knew about the '767 patent, and knew that claim 1 "covers fluorescently labeled DNA sequencing fragments . . . a key component in all presently and forseeable automated DNA sequencing procedures and instruments." (Mar. 7, 1995 Ltr. from Macevicz to Goffney ("Macevicz Letter") [PTX 59].) Drawing all reasonable inferences in Enzo's favor at this post-verdict stage, the jury could have concluded that this letter evinced an understanding that claim 1 of the '767 patent could "cover" the technology that ABI was working on and developing. The jury also heard evidence that when ABI "became aware of some patents owned by Enzo" in 1996 and 1997, ABI's scientists wanted "to explore technologies that would be *outside the scope* of Enzo's patents," a decision which ABI's former employee Dr. Jonathan Cassel described as "minimizing risk to our business by

working outside of the structures that we saw in those patents." (Tr. Vol. II [Doc. # 482] at 250 (emphasis added).) Dr. Cassel testified that "quite a few" ABI scientists were working on this "3' fluoro terminator project" for about a year, but that it was never commercialized (*id.* at 250–51, 253).

The jury also had evidence that ABI encouraged its customers to use its own reagent kits, that is, the accused products, in its own line of sequencing instruments, because "the instruments were designed to work well with those reagents." (*See id.* at 261.) Thus, although ABI contends that there was no evidence that any of ABI's customers actually used ABI's sequencing instruments, there was testimony from Dr. Cassel that ABI not only sold sequencing instruments, but provided technical support, field service engineers, and software written that "assum[ed] the BigDye chemistry would be used in the instrument." (*Id.* at 262.) The jury was permitted to infer, given this evidence that ABI desired for its customers to use the reagent kits in its own sequencing instruments, and facilitated such use though instruments sales, software, technical support, and advertising, that its customers did, in fact, use the infringing reagent kits in conjunction with ABI's sequencing. Since "[d]irect evidence of infringement, as opposed to circumstantial evidence, is not necessary," *Symantec Corp. v. Computer Assocs. Int'l, Inc.*, 522 F.3d 1279, 1293 (Fed. Cir. 2008), such circumstantial evidence of ABI's sale of sequencing instruments to facilitate the use of their reagent kits is sufficient for the jury's verdict of induced infringement.

Although the jury found that Enzo met its burden of proving induced infringement, the jury did not find that there was sufficient evidence to support an additional damages award to separately compensate for the induced infringement from sales of ABI's DNA sequencing instruments, as reflected in its award to Enzo of $0 for

induced infringement, awarding damages only for the direct acts of infringement as a result of the customers' use of the reagent kits, *see infra* at 29. The Court concludes that the jury's verdict finding induced infringement is supported by substantial evidence, and the Court disagrees with ABI that the jury reached "a seriously erroneous result" in making this decision, and therefore denies ABI's motions for judgment as a matter of law and for a new trial on this ground.

B. Invalidity

ABI moves for judgment as a matter of law and/or a new trial on each of its invalidity defenses: written description, enablement, anticipation, and obviousness. As discussed below, ABI's motions as to each of its invalidity defenses will be denied.

1. Written Description

The written description requirement contained in 35 U.S.C. § 112 is satisfied if "the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). "A determination that a patent is invalid for failure to meet the written description requirements of 35 U.S.C. § 112, ¶ 1 is a question of fact," which is reviewed for substantial evidence. *See id.* at 1355 (citing *PIN/NIP, Inc. v. Platte Chem. Co.*, 304 F.3d 1235, 1243 (Fed. Cir. 2002)).

ABI contends that it is entitled to judgment as a matter of law or a new trial on its defense of a lack of written description on two grounds: (1) the patent specification does not support claims of direct detection, and (2) the patent specification does not describe the production of DNA sequencing fragments. (Def.'s Mem. Supp. at 35, 42.)

With few exceptions, the Federal Circuit applies "the rule that disclosure of a species may be sufficient written description support for a later claimed genus including that species." *Bilstad v. Wakalopulos*, 386 F.3d 1116, 1124 (Fed. Cir. 2004). These exceptions are where "unpredictability in the particular field may warrant closer scrutiny of whether disclosure of a species is sufficient to describe a genus," *id.* at 1125, where the specification "touts the advantages" of the disclosed species and specifically distinguishes alternatives, *id.* (citing *Tronzo v. Biomet, Inc.,* 156 F.3d 1154 (Fed. Cir. 1998)), and where "claims to a functionally defined genus, will not satisfy the written description requirement without a disclosure showing that the applicant had invented species sufficient to support the claim," *Crown Pkg. Tech., Inc. v. Ball Metal Bev. Cont'r Corp.*, 635 F.3d 1373, 1381 (Fed. Cir. 2011). Though ABI asserts that the '767 patent is invalid for lack of written description, it does not argue that the general rule from *Bilstad* should not apply in this case, where the '767 patent claims a genus of labeled, modified nucleotides including DNA, RNA and dideoxynucleotides, nor why any of *Bilstad*'s listed exceptions to the rule should apply here.

The "disclosure of the application" for the '767 patent, dated April 16, 1981 and entitled "Modified Nucleotides and Methods of Preparing and Using Same" (Disclosure [DTX 152]), disclosed an invention "to circumvent the limitations of radioactively labeled probes or previously utilized chemical and biological probes," and described "a series of novel nucleotide derivatives that contain biotin, iminobiotin, lipoic acid, and other determinants attached covalently to the pyrimidine or purine ring." (Disclosure at DTX 152.007.)

The parties' specific dispute at this post-trial stage is whether there is substantial evidence that the original 1981 patent application filed in 1981 disclosed a method of direct labeling or detection, and DNA sequencing.

a) Direct Detection[3]

In reaching its conclusion that ABI had not proved by clear and convincing evidence that the '767 patent was invalid for lack of written description for failure to disclose direct detection in its original application, the jury had the following evidence before it.

ABI's witness Dr. Kricka conceded on cross-examination that at several points in the original application there were mentions of labels that are directly detectable. (*See, e.g.*, Tr. Vol. VI at 1207–09, 1210–11.) For example, the original application discusses "covalently bound mercury atoms into the 5-position of the pyrimidine ring, the C-8 position of the purine ring or the C-7 position of a 7-deazapurine ring, both in nucleotides and polynucleotides" (Disclosure at 152.006), "32P-labeled, biotin-substituted, pBR-DNA" (*id.* at 152.032), and the "preferred A moieties" of "biotin and iminobiotin" (*id.* at 152.015), and benzamides, each of which Dr. Kricka conceded were directly detectable.

[3] The Court construed the claims of the '767 patent to include both direct and indirect detection. (*See* Claim Construction Ruling [Doc. # 137] at 7.) As Defendant notes, the Southern District of New York came to the opposite conclusion and held that the '767 patent claims do not cover direct detection. (*See* Claim Construction Ruling at 34 ("[T]he Court certifies the foregoing ruling for immediate appeal to the Federal Circuit, recognizing that its construction of the disputed claims in the Ward Patents . . . conflicts with the construction of the same patents issued recently by the Southern District of New York."); *see also* Def.'s Mem. Supp. at 37 n.4.) The Federal Circuit declined to take this issue up on an interlocutory basis. *Enzo Biochem, Inc. v. Applera Corp.*, 213 F. App'x 974, 2006 WL 3922678 (Fed. Cir. 2006).

ABI asserts that each of these four examples do not support the jury's finding of written description, because "nothing in the Examples in the patent disclose novel methods of direct detection using any of these compounds, let alone direct detection for DNA sequencing." (Def.'s Mem. Supp. at 39.) However, the legal requirement for written description is not that the claimed subject matter need be described *in haec verba*, *see In re Smith*, 481 F.2d 910, 914 (C.C.P.A. 1973), only that the claimed invention must be described so that "one skilled in the art can recognize what is claimed." *Univ. of Rochester v. G.D. Searle & Co.*, 358 F.3d 916, 923 (Fed. Cir. 2004). In *Rochester*, the Federal Circuit concluded that the patent was invalid for lack of written description where "[i]n this case, there is no language here, generalized or otherwise, that describes compounds that achieve the claimed effect." *Id.* Here, the original specification contains descriptions of compounds that "achieve the claimed effect" of direct detection, even if direct detection is not the method highlighted in the specification and in the '767 patent. *See also Ariad*, 598 F.3d at 1357–58 ("The #516 patent discloses no working or even prophetic examples of methods that reduce NF-eB activity, and no completed syntheses of any of the molecules prophesized to be capable of reducing [such] activity. The state of the art at the time of filing was primitive and uncertain, leaving Ariad with an insufficient supply of prior knowledge with which to fill the gaping holes in its disclosure."). While the jury had evidence of lack of written description for direct detection, the jury was entitled to credit Dr. Kricka's testimony that several parts of the original application disclosed compounds that allowed for direct detection, and on the basis of that substantial evidence, conclude that ABI had failed to meet its heightened burden of proof.

b) DNA Sequencing

Defendant maintains that the asserted claims are also invalid because the specification does not disclose DNA sequencing, specifically the dideoxynucleotide terminators or the triple-bond linkage groups.

Rebutting ABI's assertion that the specification does not disclose dideoxynucleotides, Plaintiff introduced evidence at trial that the original application did include a dideoxynucleotide (*see* Disclosure at 152.54), and Ronald Fedus, Enzo's Patent Counsel, on cross-examination testified that claims that covered a dideoxyribonucleotide were presented "with the first filing of the application" (*see* Tr. Vol. IV [Doc. # 484] at 794). Plaintiff also presented evidence that in his 1995 letter to the Patent Office, Dr. Macevitz referred to "Claim 195" of the original patent application—eventually claim 1 of the '767 patent—and noted that "[i]t is only in Claim 195 that Y suddenly appears in a formula for a polynucleotide of the invention with a species that can be H, thereby permitting coverage of DNA sequencing fragments." (Macevicz Letter at 2.) Thus, the jury's conclusion that dideoxynucleotides were included and contemplated in the original specification, and that Defendant's written description defense failed on this basis, was supported by substantial evidence.

Further, the Court is unpersuaded by Defendant's argument that it is entitled to judgment as a matter of law on the basis of lack of written description because of the specification's failure to specifically disclose DNA sequencing or the triple-bond linker groups, because the requirements for written description are that "possession of the *claimed subject matter*" be "shown in the disclosure" as of the original filing date. *See Ariad*, 598 F.3d at 1351 (emphasis added). The inquiry is whether "from the perspective of a person of ordinary skill in the art" the specification shows that "the investor actually

invented the invention claimed." *Id.* Enzo does not claim to have invented DNA sequencing—indeed, plenty of evidence was introduced by both parties that the Sanger approach to DNA sequencing was known well before Enzo's patent application was filed. Rather, Enzo's claim is that it invented modified, labeled nucleotides that were useful for DNA sequencing, among other applications. The jury had ample evidence to conclude that Enzo's original application described the invention of its modified nucleotides, that is, that Enzo and Drs. Waldrop, Langer, and Ward had actually invented the invention claimed, including Enzo's expert Dr. Sherman's opinion testimony, after describing the benefits of the '767 patent's invention, that the claims "were adequately described." (Tr. Vol. VII at 1429.) Because it finds the jury's verdict rejecting Defendant's defense to have been supported by substantial evidence, the Court denies ABI's motion for judgment as a matter of law on its written description defense. Finding no reason for concern that the jury reached a seriously erroneous result the Court also declines to grant a new trial on this defense.

2. Enablement

The "enablement" requirement that a patent set forth in "full, clear, concise and exact terms as to enable any person skilled in the art . . . to make and use the [invention]," 35 U.S.C. § 112, ¶ 1, is a question of law, and is met if "the description enables any mode of making and using the invention." *Johns Hopkins Univ. v. CellPro, Inc.*, 152 F.3d 1342, 1361 (Fed. Cir. 1998). A jury's underlying factual determinations related to enablement must be supported by substantial evidence. *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1321 (Fed. Cir. 2003).

ABI asserts that the '767 patent fails to satisfy the enablement requirement because the specification (1) does not teach about making or using DNA sequencing

fragments and (2) does not disclose the "specially designed enzymes that are needed to incorporate dideoxynucleotide terminators into a growing strand of DNA. (Def.'s Mem. Supp. at 46.)

Defendant's assertion that the specification did not teach how to use DNA sequencing fragments reads the enablement requirement too narrowly, as there was substantial evidence introduced at trial that the '767 patent describes in detail how to make biotin-labeled nucleotides and use them as probes. (*See, e.g.*, Tr. Vol. VII at 1429 (Dr. Sherman's expert testimony that the '767 patent "very clearly" teaches someone of skill in the art how to form the modified nucleotides that are claimed).) This evidence supports a finding that the '767 patent is sufficiently enabling as a matter of law, as "[e]nablement does not require the inventor to foresee every means of implementing an invention at pains of losing his patent franchise." *Invitrogen Corp. v. Clontech Laboratories, Inc.*, 429 F.3d 1052, 1071 (Fed. Cir. 2005) ("In this case Invitrogen's teaching regarding deletion mutation is sufficient to satisfy its part of the patent bargain, as it fully teaches a mode of making the claimed invention."); *see also Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1335 (Fed. Cir. 2003) ("[T]he law makes clear that the specification need teach only one mode of making and using a claimed composition." (internal citations omitted)).

ABI argues that the '767 patent does not teach the "specially designed enzymes" and that the "undue experimentation" required demonstrates insufficient enablement. ABI focuses on the trial testimony showing that "trial and error" was necessary to get an enzyme to incorporate a fluorescently-labeled nucleotide, and that it "took a lot of work to develop an enzyme after the patent was filed," as well as Dr. Sinden's concession on cross-examination that working with fluorescent dyes could "upset the enzyme," and that

"[s]ome intelligent planning, looking at three-dimensional structures, but yes, ultimately trial and error is necessary to show that you can get it to work. You have to do the experiments to get it to work." (*See* Tr. Vol. V [Doc. # 485] at 565.)

"That some experimentation is required to practice the claimed invention is permissible, so long as it is not undue." *Moba*, 325 F.3d at 1321. Proof of undue experimentation requires evidence on numerous factors:

> (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

In re Wands, 858 F.2d 731, 737 (Fed. Cir. 1988). While ABI's witness Dr. Menchen testified about ABI's development of their "new really bright dye construct that we found that we could put on terminators and get that to incorporate" (Tr. Vol. VII at 1376–77), and Dr. Kricka testified that the patent does not disclose enzymes that would "accept" ABI's big dye terminators (Tr. Vol. VI at 1130), this is not evidence of the "quantity of experimentation necessary" to develop the enzymes ABI ultimately used in its BigDye Terminators. *See Moba*, 325 F.3d at 1321 ("FPS presented no record evidence recounting the amount of experimentation one of skill in the art would require to develop the conveyor lifting system of the Moba Omnia in view of the ′505 patent disclosure. Rather, FPS asked the jury and asks this court to draw the inference of undue experimentation based on limited general testimony.").

On the second and third *Wands* factors—the amount of direction or guidance presented and the presence or absence of working examples—there was substantial trial evidence that that the '767 patent discloses multiple enzymes that are DNA and RNA polymerases. (*See* Tr. Vol VI at 1131; *see also* '767 patent, col. 17:45–55.) Although Dr.

Kricka opined that the '767 patent provided "no guidance" in terms of which of the disclosed enzymes would work for *DNA sequencing*, his testimony was not focused on whether the disclosed enzymes provided sufficient guidance to make the claimed modified nucleotides described as the invention of the '767 patent, which is all that is required for enablement.

The jury was also presented with evidence that ABI's own patents for the accused fluorescent dye linker technology referred to and incorporated the '767 patent in describing a process of nucleoside labeling. When asked specifically about ABI's '727 patent (Patent 5,863,727 ("'727 patent") [PTX 5]), Dr. Kricka conceded "nucleoside-labeling" was "done to make a BigDye terminator," and that to make the BigDye and dRhodamine reagent products, linkage groups were necessary. (Tr. Vol. VI at 1167–68). The jury further heard Dr. Kricka's testimony that each of ABI's patents credited the '767 patent method of nucleoside labeling as a "suitable base-labeling procedure":

> Q: They say that the dyes are covalently linked, and then they give several positions, and that suitable base-labeling procedures have been reported that can be used with the invention, and the very last one they list is the one in the . . . in the '767 patent, correct?
> A. Yeah. That looks familiar, the one on the bottom.
> Q. After saying, do you know what, if you want to make this stuff, use [known] linkage groups that don't interfere with hybridization, ['727 patent inventors] Drs. Spurgeon, Lee and Rosenblum immediately refer you straight to the '767 patent, and they not only do that, they incorporate it by reference, right?
> A. I think if it is specifically cited then it's incorporated, yes.

(*Id.* at 1169 (citing '727 patent, col. 28).)[4] The jury was entitled to consider this evidence in reaching its conclusion that ABI had not met is burden of proving its enablement defense by clear and convincing evidence.

ABI's assertions that the '767 patent does not sufficiently describe how one skilled in the art would use the invention for the purposes of DNA sequences (and how to make enzymes suitable for DNA sequencing), is based on a misstatement of the enablement requirement, which is that a patent disclose "*one* mode of making and using a claimed composition," *Amgen*, 314 F.3d at 1335 (emphasis added); *see also Invitrogen*, 429 F.3d at 1071. ("Were it otherwise, claimed inventions would not include improved modes of practicing those inventions. Such narrow patent rights would rapidly become worthless as new modes of practicing the invention developed, and the inventor would lose the benefit of the patent bargain."). ABI's argument that it created an "even better enzyme . . . to make DNA sequencing with dye-labeled terminators commercially viable" (Def.'s Mem. Supp. at 51), does not address how the specific, claimed invention of the '767 patent, i.e., a method of labeling nucleotides, lacks enablement, such that Enzo should lose the benefit of its patent bargain as soon as new, improved methods of practicing the invention were developed. *Invitrogen*, 429 F.3d at 1071. Viewing the evidence in the light most favorable to Enzo, the jury's verdict that ABI had failed to prove by clear and convincing evidence its enablement defense was supported by substantial evidence, and the jury did not reach a "seriously erroneous result" as to enablement. Thus, the Court will not overturn this verdict or grant ABI a new trial on enablement.

3. Anticipation

[4] The jury also heard Dr. Waldrop, one of the inventors of the '767 patent, testify that the '767 patent had been cited sixty-one times by ABI in its own patents. (Tr. Vol. I [Doc. # 481] at 86.)

Anticipation is a question of fact that is reviewed for substantial evidence when tried to a jury. *See Orion IP, LLC v. Hyundai Motor Am.*, 605 F.3d 967, 974 (Fed. Cir. 2010). Under 35 U.S.C. § 102(b), a patent is invalid as anticipated if "the invention was patented or described in a printed publication in this or a foreign country . . . more than one year prior to the date of the application for patent in the United States." The anticipation inquiry proceeds on a claim-by-claim basis. *Orion IP, LLC*, 605 F.3d at 974 (citing *Hakim v. Cannon Avent Group, PLC*, 479 F.3d 1313, 1319 (Fed. Cir. 2007)). In its motion for judgment as a matter of law and/or a new trial, ABI contends that Bauman and Kasai are invalidating prior art to the '767 patent.

a) Bauman[5]

ABI asserts that the Bauman thesis anticipates the '767 patent, and that this finding has already been "conclusively established" by prior decisions of this Court and the Federal Circuit—that is, the Court's 2007 Summary Judgment Ruling and the Federal Circuit's 2010 decision affirming the Court's holding that ABI was entitled to summary judgment on the basis of Bauman's anticipation of the '928 patent. ABI's contention is based on the fact that Bauman was held to be invalidating prior art as to the '928 patent, a different Ward patent sharing a priority date with the '767 patent. For the following

[5] The Court is aware that the Patent and Trademark Office ("PTO") has been engaged in ex parte reexamination proceedings, requested by ABI, on the precise issue of whether the asserted claims of the '767 patent are anticipated by Bauman. ABI has apprised the Court, by letter dated July 1, 2013, that in a Non-Final Action on June 12, 2013, the PTO rejected all five of the asserted claims as invalid in view of Bauman. For the purposes of this post-trial ruling, however, the Court will not consider any evidence or news of the PTO's Non-Final Action. This evidence was not before the jury, and the burdens of proof are different: ABI's burden to prove its anticipation defense by clear and convincing evidence to the jury, is inapplicable in the PTO's reexamination proceeding.

reasons, the Court upholds the jury's finding that Bauman does not anticipate the asserted claims of the '767 patent.

As an initial matter, the Court rejects ABI's assertion that the '767 patent must be found to be anticipated by Bauman on the basis of prior judicial decisions focused on another patent. The Court's 2007 Summary Judgment ruling, affirmed by the Federal Circuit, focused exclusively on ABI's claim that the *'928 patent* was anticipated by Bauman. *See* 599 F.3d 1325, 1340. The Federal Circuit was completely silent as to Bauman's relationship to the '767 patent, and importantly, the Federal Circuit's analysis focused on the "not interfering substantially with detection" language in the '928 patent. (Patent No. 5,476,928 ("'928 patent"), claim 1.) Noting that the '928 patent "is silent as to hybridization," *see id.*, the Federal Circuit concluded that anticipation was shown because, "[a]ll that is required of this particular linkage group is that it not substantially interfere with the ability of A to be detected. Enzo does not dispute that Bauman discloses a linkage group that does not substantially interfere with the ability of A to be detected." *Id.*

In contrast, the "not interfering substantially" language of claim 1 of the '767 patent specifically requires that it not interfere substantially with "the characteristic ability of the oligo or polynucleotide to *hybridize* with a nucleic acid and [also] does not substantially interfere with formation of the signaling moiety or detection of the detectable signal." ('767 patent, claim 1, col. 31.3–7 (emphasis added).) Because there was no prior judicial finding as to Bauman and "no substantial interference with hybridization," ABI's argument on this basis lacks merit, and this prior art issue related to Bauman was properly presented to the jury.

(1) Substantial Interference with Hybridization

At trial, the jury heard evidence that a linkage group with mercury (Hg) causes substantial interference with hybridization. At the very beginning of trial, Dr. Waldrop testified that he was interested in working with mercurated nucleotides as a method of tagging or labeling DNA or RNA (*see* Tr. Vol. I at 68), but that "there was a problem . . . [with] the instability of . . . the bond between the mercury and the ligand X" (*id.* at 72). It was Dr. Waldrop's idea to replace the mercury with a carbon-carbon bond. (*Id.* at 73.)

On cross-examination, Dr. Kricka also testified to the instability of the mercury linkage group, discussing a 1986 paper in the journal *Histochemistry* which noted that "[c]hromatographic analysis of mercurated polynucleotide-ligand complexes," i.e., the complexes discussed in Bauman's dissertation, "revealed . . . an unexpected lability[6] of the mercury-sulfhydryl bond." (Tr. Vol. VI at 1180; *Histochemistry* Article [PTX 1250] at 1.) Dr. Kricka agreed that this meant that the mercury linkage group disclosed in Bauman was "unstable." (Tr. Vol. VI at 1180.) The jury also had evidence that, later in the *Histochemistry* paper, "[t]he decomplexing methods described by Dale and Bauman were inadequate for the preparation of small quantities of mercurated probes." (*Histochemistry* Article at 174.) Another article in the same journal [PTX 1251] was even more blunt in its description of the instability of the mercury linkage groups, and related that in the particular experiment performed with Bauman's linkage group, "[d]ue to the instability of the bond between mercury and a negatively charged sulfhydryl-hapten ligand . . . the in situ formed hybrid could not be detected." (Tr. at 1182; "A New Hybridocytochemical

[6] "Thermal labile," in Dr. Bauman's own words via video deposition, means that "if you increase the temperature above a certain temperature,, that above this temperature the molecules or chemichal[] bonds are disrupted. . . . Which, in our words, means *unstable*." (Tr. Vol. VII at 1411 (emphasis added).)

Method Based on Mercurated Nucleic Acid Probes and Sulhydylhapten Ligands," *Histochemistry* [PTX 1251].) Finally, the jury heard Dr. Bauman admit that the mercury-sulphur bond is unstable. (Tr. Vol. VII at 1411.)

The jury also heard Dr. David Sherman, Plaintiff's anticipation expert, testify that in a case of a "weak bond and a weak linker," as with the mercury-sulfur bond disclosed in Bauman, hybridization would be blocked, because it "enables significant movement with the base and the linker and the detectable signal resulting in interference." (*Id.* at 1426.) Dr. Sherman noted that the mercury bond, "if you heat them up or if you perform electrophoresis, if you expose them to certain chemicals, it just falls apart," that is "[i]t will not work." (*Id.* at 1440.) Dr. Sherman explained that in order to perform most molecular biology manipulations, one needs to have high temperatures, and that Dr. Bauman's invention would not work at such high temperatures; indeed, Bauman himself used the term "thermal labile" or "thermal instability." (*Id.* at 1441–42.) Dr. Sherman described for the jury how the Bauman molecule would actually work, opining: "the trinitrophenyl group can literally fall right over on top of the base. . . It . . . would block the ability of the signal to be detected and also block the ability of the DNA to hybridize." (*Id.* at 1440.)[7]

[7] ABI contends that the Federal Circuit's 2010 decision rejected the "instability at high temperatures" argument in affirming the Court's 2007 Summary Judgment ruling finding the '928 patent anticipated by Bauman. However, as discussed *supra* at 22, the Federal Circuit's opinion was limited, as was this Court's 2007 Summary Judgment Ruling, to the '928 patent and Bauman's "no substantial interference with *detection*." ABI did not offer evidence at trial as to any similarity between "not interfering substantially with detection" and "not interfering substantially with hybridization and detection," which is required in claim 1 of the '767 patent, and thus, this issue was never before the jury or the Court.

Dr. Sherman further testified that if one were to introduce the '767 patent to Bauman's "weak linker," "I think we could solve the problem. We'd simply introduce a double to triple bond that would rigidify the base, it would hold that detectable signal right where we want it to be. There would be no interference." (*Id.* at 1441.) In sum, Dr. Sherman concluded that "Bauman clearly does not anticipate. It is a failed method. And Ward solved the problem, and that's what the '767 patent is all about." (*Id.*)

As described above, because there was substantial evidence introduced to show that Bauman's linkage group substantially interferes with hybridization, Bauman cannot meet each asserted claim of the '767 patent, and accordingly, the jury had substantial evidence with which to support its finding of no anticipation as to the Bauman thesis.

(2) Obviousness

Though Defendant acknowledges that it did not ask the jury to decide this issue at trial (Def.'s Reply at 30), it contends that Bauman "at least" renders the asserted '767 patent claims obvious, and asks the Court to make an obviousness finding as a matter of law. The Court declines to do so, as a finding of obviousness is "based on factual underpinnings," *i4i Ltd. P'ship*, 598 F.3d at 845, which the jury was not asked to make. Further, the Federal Circuit has held in similar circumstances that "it would be constitutionally impermissible for the district court to re-examine the jury's verdict and to enter JMOL on grounds not raised in the pre-verdict JMOL." *Duro-Last, Inc. v. Custom Seal, Inc.*, 321 F.3d 1098, 1107 (Fed. Cir. 2003). ABI likens the posture of this obviousness issue to the summary judgment stage, or to removing the legal question from the jury before jury deliberations. The Court disagrees both in light of Seventh Amendment concerns and the reality that the parties have been at this litigation for years and have had the opportunity to present their disputed factual issues in a full jury trial. The fact that

ABI did not submit facts to support its obviousness defense in light of Bauman leads the Court to the conclusion that this issue has been waived for post-trial consideration.

b) Kasai

(1) Anticipation

The jury heard testimony from Dr. Sherman that although the Kasai reference [DTX 45] has a linker, it is a weak linker that would have "an interfering type of modified base that would enable significant motion." (Tr. Vol. VII at 1431.) On cross-examination Dr. Sherman explained further that a "[w]eak linker means we'll have a lot of interference, a lot of blocking." (*Id.* at 1476.)

The jury also heard evidence that Kasai was only a drawing, and that there was no evidence in the paper that Kasai's drawing of its invention had ever been actually put into practice. (*Id.* at 1430.) Dr. Sherman described Dr. Ward's invention in the '767 patent as "something different" that was not previously done. (*Id.* at 1435.)

On cross-examination, Dr. Kricka confirmed that Kasai's linker group has only a single-bond in the linker group, rather than a triple or double bond (Tr. Vol. VI at 1199), and that the '767 patent "generally preferred" a chemical linkage group that includes an olefinic bond, and "even more preferred" that the chemical linkage group be "derived from a primary amine" having the structure CH2 and H (*id.* at 1202), which is not contained in Kasai.

While other evidence could have supported a finding of anticipation, the jury was entitled to base its verdict on the substantial evidence it had that Kasai did not meet each claim limitation of the '767 patent. At this post-trial stage, viewing the evidence in light most favorable to Enzo, the Court concludes that the jury's verdict of no anticipation was supported by substantial evidence, and ABI's motion for judgment as a matter of law is

denied. Concluding that there has been no manifest injustice to ABI on this ground, the Court declines to grant ABI a new trial on the basis of this invalidity defense.

(2) Obviousness

ABI also claims that the jury's finding of non-obviousness, based on Kasai and Pingoud, was not supported by substantial evidence.[8] While the Pingoud reference was never introduced into evidence as an exhibit (*see* Tr. Vol. VI at 1083–84), Dr. Kricka testified that the addition of the Pingoud phosphate group would have been obvious to one skilled in the art. (*Id.* at 1149–50.) In reaching its conclusion that ABI had not proved obviousness (based on Kasai, "in light of" Pingoud), the jury was entitled to consider that Dr. Kricka had not performed any tests to confirm his opinions on obviousness (*id.* at 1192), and to credit Dr. Sherman's opinion that even if Kasai had disclosed the CH2/NH, "you have to have a rigid [strong] linker," and that the strong linker claimed in the '767 patent was not obvious in light of Kasai and Pingoud.

Though obviousness is a question of law, a finding of obviousness or non-obviousness is based on underlying factual findings which were made by a jury. The Court will not substitute its view of the evidence for the jury's. *See Spectralytics, Inc. v. Cordis Corp.*, 649 F.3d 1336, 1342 (Fed. Cir. 2011) ("We first presume that the jury resolved the underlying factual disputes in favor of the verdict winner and leave those presumed findings undisturbed if they are supported by substantial evidence." (internal citations omitted)). While "[t]he combination of familiar elements according to known

[8] As Enzo points out (Pl.'s Mem. Opp'n [Doc. # 513] at 57), ABI did not raise its obviousness argument as to claim 70 during trial or at the Rule 50(a) stage. (*See* ABI's Revised Summary of R. 50(a) Mot. JMOL [Doc. # 469] at 6 ("All of the elements of the asserted claims of the '767 (*other than Claim 70*) are rendered obvious by the Kasais reference in conjunction with the Pingoud reference." (emphasis added)).) Thus, ABI has waived its argument that claim 70 is obvious in light of Kasai/Pingoud.

methods is likely to be obvious when it does no more than yield predictable results," *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007), the jury was entitled to credit Dr. Sherman's opinion testimony on obviousness that the "strong linkers" disclosed in the '767 patent were a novel and important invention that was not "predictable." Further, the jury could have considered Dr. Macevicz's letter acknowledging the significance of the '767 invention in making its determination that ABI had not proved obviousness in light of Kasai/Pingoud by clear and convincing evidence. As there was substantial evidence to support this finding, the Court will not disturb the jury's verdict on obviousness.

C. Damages

Both parties take issue with different parts of the jury's damages award. To set aside a jury's damages award, the Court must determine that it is, "in view of all the evidence, either so outrageously high or so outrageously low as to be unsupportable as an estimation of a reasonable royalty." *Rite-Hite Corp. w. Kelley Co.*, 56 F.3d 1538, 1554 (Fed. Cir. 1995) (citing *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 895 F.2d 1403, 1406 (Fed. Cir. 1990)).

1. Plaintiff's Motion for a New Trial on Damages for Infringing Sales of Instruments [Doc. # 498]

As discussed *supra* at Part II.A., the jury found that Enzo proved that ABI directly infringed the asserted claims of the '767 patent through its sale of accused reagent products and indirectly infringed by inducing its customers to infringe through the sale of DNA sequencing instruments. (*See* Jury Verdict at 1–2.) The jury awarded $48,587,500.00 in reasonable royalty damages for direct infringement, and $0 in reasonable royalty damages for indirect infringement. (*See id.* at 9.) Plaintiff moves for a new trial pursuant to Federal Rule of Civil Procedure 59 to determine damages for ABI's

induced infringement by its sales of instruments. ABI opposes this motion, on the grounds that the jury's finding of infringement as to ABI's sale of reagents precludes an additional damages award for ABI's sale of instruments because a patentee may not receive double compensation for the same acts of infringement.

Plaintiff's theory of infringement as to the sale of instruments was a murky issue leading up to, and continuing throughout, the trial. During the pre-trial conference, Enzo clarified that its theory as to the sale of DNA sequencing instruments was that "when you tell your customers, go use an invention, that's inducing the infringement. The infringement being the use of the invention" (Pre-Trial Tr. Vol. II [Doc. # 445] at 214), and at trial, maintained that "the sale of instruments encourages an infringing use of reagents" (*Id.* at 1740).

During jury deliberation, the jurors sought clarification as to the indirect/induced infringement question, and the relationship between the use of reagent products and the sale of DNA sequencing instruments that use the reagent products where there was no claim that the instruments themselves infringed. (*See* Oct. 31, 2012 Juror Note [Court Ex. F].) Counsel and the Court developed the following responsive instruction:

> [I]nducement of infringement is posed to be either or both of two ways. One, by selling instruments to customers, and that's (a)(i) and 2, by selling reagents to customers, and that's (a)(ii) on your verdict form. The plaintiff claims that—and I'm just going to talk to you about (a)(i) because that's what you've inquired about—that *while the instruments on their own don't infringe, it is only the sale of the instruments that induces the use of the reagents that it claimed to induce infringement*. The defendant claims that because the plaintiff admits the instruments don't infringe there can be no separate inducement by the sale of the instruments beyond the sale of the reagents that you are asked about in (a)(ii).

(Tr. Vol. IX [Doc. # 489] at 1742–43 (emphasis added).)

"[W]hen a patentee receives full compensation from a manufacturer for the infringing activities of the manufacturer and its customers, the patentee cannot collect further payment from a party alleged to contribute to the same infringing activities." *Glenayre Electronics, Inc. v. Jackson*, 443 F.3d 851, 872 (Fed. Cir. 2006). "Indeed, in most cases damages assessed for indirect infringement will be equal to damages assessed for the underlying direct infringement." *Glenayre Electronics*, 443 F.3d at 859.

The Court finds no reason to disturb the jury's $0 damage award as to DNA sequencing instruments here, particularly as Enzo is asking for additional damages premised on the same acts of direct infringement.[9] *See U.S. Fidelity & Guar. v. Star Tech., Inc.* 935 F. Supp. 1110, 1115 (D. Or. 1996) ("Generally speaking, a direct infringer cannot also be liable as an inducer to infringe based on the same act. As several courts have pointed out, the act of encouraging someone to purchase a product is necessarily subsumed by the actual sale of that product.") (collecting cases).

Further, the Court concludes that ample evidence was presented at trial to support the jury's $0 award. The jury had evidence, presented through Enzo's damages expert Dr. Gregory Bell, that there were several noninfringing uses of the sequencing instruments, including the use of an instrument with another company's reagents (i.e., not ABI's accused reagent products), the use of the instrument with ABI's non-infringing dye-

[9] Indeed, at the charge conference, and prior to providing the jury with the supplemental instructions discussed *supra* at 30, the Court and the parties had discussed the possibility that if the jury were to award monetary damages for both direct and induced infringement, this could provide a basis for ABI to move to set aside the verdict on double-dipping grounds. The Court noted, "we actually have done about as much as we can to tee up the double damages issue." (Tr. Vol IX at 1745.) The jury's verdict awarding $0 for induced infringement on the basis of sequencing instruments, drawing all inferences in favor of ABI, reflects the jury's decision not to award any additional recovery for the same acts of infringement found.

labeled primer reagents, and the use of the instrument for purposes other than DNA sequencing. (*See* Tr. Vol. IV at 704–09.) Dr. Bell admitted that his $736 royalty base did not "differentiate among any of those four categories . . . [and that he] simply included all instruments together." (*Id.* at 710.) Dr. Bell testified that he considered the noninfringing uses all together to constitute a "somewhat insubstantial use." (*Id.* at 710–11.) The jury also heard, and was entitled to credit, ABI's damages expert Brian Napper's testimony that "it's my opinion that the rate would be reflected on the rate that's applied to the research kits as the payment in—I described yesterday the food chain . . . therefore, Enzo would be compensated for that and *there wouldn't be a royalty on the sequencing instruments*. (Tr. Vol. VII at 1331 (emphasis added).)

Viewing this evidence in the light most favorable to ABI, this verdict is supported by a finding that payments for kits more than once in the "food chain" double counts, that there are substantial noninfringing uses for ABI's instruments as described by Dr. Bell and Mr. Napper, and that Dr. Bell's proposed 4.5% royalty rate for instruments, derived from license agreements for CalTech patents that actually directly cover DNA sequencing instruments, was inappropriate.

When a "reasonable royalty" is the measure of damages, "the amount may . . . be considered a factual inference from the evidence, yet there is room for exercise of a common-sense estimation of what the evidence shows would be a 'reasonable' award." *Lindemann*, 895 F.2d at 1406 (Fed. Cir. 1990). The Court finds that the jury's damages award is supported by common-sense and substantial evidence and accordingly, Enzo's motion for a new trial is denied.

2. Reasonable Royalty Rate

ABI contends that a new trial on damages is warranted because the "jury awarded damages on the entire market value of ABI's kits." (Def.'s Mem. Supp. at 76.) ABI also disputes the jury's award of a six percent royalty rate, which it asserts "exceeds the 3% kit rate that Enzo may charge sublicensees under the Yale-Enzo license." (*Id.*)

Plaintiff points out that Brian Napper, ABI's damages expert, testified that in performing his own damages analysis, he applied his rate to a base that included kit sales. (*See* Tr. Vol. VII at 1329.) Plaintiff also contends that the jury had substantial evidence that the sales of the kits established the base to which a reasonable royalty would be applied to determine damages. (Pl.'s Opp'n at 60.)

a) ABI's Kits

In deciding to award reasonable royalty damages based on the value of ABI's kits, the jury was entitled to consider the fact that both experts used the same "base"—the "845 million" royalty base that includes the entire value of the kits—when applying each of their respective proposed rates. When asked about the base he used in making his damages calculation, Mr. Napper testified on cross-examination that the number came from ABI's financial records, and "Dr. Bell and I agree with that." (Tr. Vol. VII at 1329; *see also* Tr. Vol. IV at 672 (Dr. Bell agreeing that he and Mr. Napper started with the same base, and that "we're in pretty much total agreement").)

Further, Dr. Bell explained his opinion as to why a kit adjustment was not appropriate, as "the Ward patents enable the DNA sequencing which is the *raison d'être* of the kit. In other words, access to the labeled nucleotides and polynucleotides covered by the Ward patents is expected to be the significant determinant of demand for the kits." (*Id.*) The jury also had heard Dr. Sinden describe the accused reagents in the kits as "a

critical key component. Without these modified nucleotides that were described in the Ward patent, you don't have the ABI DNA sequencing." (Tr. Vol. III at 516.) There was also much testimony about, and the jury was able to read for itself, the Macevicz letter in which claim 1 ultimately of the '767 patent was described "as a key component in all presently and foreseeably available automated DNA sequencing procedures and instruments—that is a fundamental technology upon which all genome sequencing projects rely." (Macevicz Letter.)

Thus, the jury's conclusion that it should apply its reasonable royalty rate to a $845 million royalty base based on the entire value of the kits was supported by substantial evidence, and the testimony of both experts, and the Court declines to grant a new trial on this basis.

b) Six Percent Royalty Rate

To the extent that ABI is asking this Court to conclude that a six percent royalty rate is excessive as a matter of law based on the terms of the Yale-Enzo license [DTX 383], it will not do so. The jury was instructed that it was part of its responsibility to make a determination as to what royalty would have resulted from a hypothetical negotiation between the parties, that is, Enzo and ABI. In reaching its six percent rate, the jury properly could have considered several license agreements in addition to the Yale-Enzo agreement, and credited certain expert testimony focusing on certain license agreements over others, depending on their characteristics and contexts.

Dr. Bell testified that his understanding of the Yale-Enzo agreement is that "they have to pay between three and seven [percent]." (Tr. Vol. IV at 672.) Dr. Bell explained why he thought the three percent rate was too low in the context of the Enzo/ABI hypothetical negotiation:

> [O]ne of the main ideas behind this hypothetical negotiation, remember, is the sense that it's cards on the table. All the information is revealed. And, in fact, the courts have called this the idea of a book of wisdom.
>
> And back in 1981 [the year of the Yale-Enzo license agreement], right, so what, 14 years before the patent actually issued, ten years before ABI ever came out with dye terminators to sequence DNA, yeah, Yale and Enzo struck this deal, seven percent for the reagent products, five percent if they were in a diagnostic kit, three percent if they were in a research kit. But the market developed over time, and what became, I think, painfully apparent is that those reagent products, the ability to label those nucleotides, that's what mattered. That's what allows you to sequence the DNA. And we sort of see that because by the time we get to 1999 and ABI-Shimadzu, there is no different number for just the sale of a bare reagent product. And the reason is because you don't sell bare reagents. They're only sold—you can only buy them as a kit.

(Tr. Vol. IV at 635–36.) Dr. Bell also identified several later agreements between ABI and other companies for the license to ABI's Caltech and DuPont patents, which he noted had higher royalty rates (*see, e.g.*, ABI-Shimadzu License [PTX 1097]), and his opinion is that the '767 patent technology was core to driving up the reasonable royalty rate, as "what's fundamental here is that ability to attach the bases." (Tr. Vol. IV at 638.)

Further although ABI asserts that there is only one way to interpret the Yale-Enzo agreement—i.e., that Enzo "may sublicense under terms and conditions no greater than those acquired by Enzo"—the parties each offered contrasting interpretations of this sublicense language. ABI's position, elicited from Dr. Bickerton, is that Enzo would not be permitted to sublicense its reagent kits at more than 3%:

> Q. Does the limitation on the right to sublicense, which says Enzo has the right to sublicense to third parties under terms and conditions no greater than those acquired by Enzo, does that include the royalty rates that are provided for in this agreement?
>
> A. That's how I would interpret it.

(Tr. Vol. VII at 1358.) On the other hand, the jury also heard Dr. Soderstom, the head of the Office of Cooperative Research at Yale, testify that he could not think of a reason why "one of Yale's partner companies," such as Enzo, would sublicense a technology at a rate that was less than what it was going to have to pay Yale." (Tr. Vol. II at 216–17.) He offered further, that in a typical sublicense situation,

> you are going to charge a rate that's higher which would include the amount that's going to flow to Yale plus the profit from the license for your own technology at the same time. That would be the typical way of doing it. Otherwise you have no incentive to sublicense because it costs you money to sublicense.

(*Id.* at 217.)

Viewing all of the damages evidence in the light most favorable to Enzo, the jury was entitled to credit Dr. Bell's opinion about the rising values of the patented technology, and to consider the Yale-Enzo license agreement as only one among several relevant agreements in arriving at its six percent royalty rate. The Court does not find that the royalty awarded by the jury was "so outrageously high . . . as to be unsupportable as an estimation of a reasonable royalty," *Rite-Hite Corp.*, 56 F.3d at 1554, and accordingly the Court will not overturn the verdict on this basis.

D. Equitable Defenses: Laches and Equitable Estoppel [Doc. # 502]

ABI moves for a finding of laches and/or equitable estoppel. ABI's laches defense was considered earlier at the summary judgment stage, and though the Court found that ABI was entitled to a presumption of unreasonable delay, the Court also concluded that "Plaintiffs' evidence of other litigation on the Ward Patents and of negotiations terminating by June 11, 1998 [wa]s sufficient to 'burst' the laches presumption," such that it was ABI's burden to prove unreasonable delay and prejudice on the totality of the evidence presented at trial. (*See* Ruling on Def.'s Mot. for Summ. J. on Laches [Doc.

418] ("Laches Ruling") at 12–13.) The jury returned an advisory verdict finding that ABI had not proved that Enzo's delay in filing suit was unreasonable and unjustified, and also that ABI had not proved that it was materially prejudiced as a result of any delay in the filing of this suit. (*See* Jury Verdict at 7.)

For the reasons discussed below, because the Court finds that ABI neither met its burden of proof by a preponderance of the evidence that Enzo's delay in filing suit was unreasonable, nor that ABI suffered material prejudice as a result of any delay, it declines to enter judgment of laches on ABI's behalf. The Court also concludes that the standard for equitable estoppel has not been met.

1. Laches

"[L]aches focuses on the reasonableness of the plaintiff's delay in suit. . . . Thus, for laches, the length of delay, the seriousness of prejudice, the reasonableness of excuses, and the defendant's conduct or culpability must be weighed to determine whether the patentee dealt unfairly with the alleged infringer by not promptly bringing suit." *A.C. Aukerman Co. v. R.L. Chaides Const. Co.*, 960 F.2d 1020, 1034 ("*Aukerman*") (Fed. Cir. 1992) (en banc).

In its post-trial motion, ABI reasons that because Enzo introduced no evidence at trial in support of the arguments that "defeated summary judgment" (Def.'s Equities Mem. Supp. [Doc. # 502-1] at 22), the presumption of laches is somehow restored (*id.* at 23). This, however, misstates the legal context for the laches presumption, which the Federal Circuit described in *Auckerman* as operating under the "bursting bubble" theory: "[u]nder this theory, a presumption is not merely rebuttable but *completely vanishes* upon the introduction of evidence sufficient to support a finding of the nonexistence of the presumed fact." 960 F.2d at 1037 (emphasis added) (citing *Texas Dep't of Community*

Affairs v. Burdine, 450 U.S. 248, 254–55 (1980)). The Federal Circuit reasoned that consistent with the "bursting bubble" theory as it is applied in other civil actions,

> a presumption is not evidence. If the patentee presents a sufficiency of evidence which, if believed, would preclude a directed finding in favor of the infringer, the presumption evaporates and the accused infringer is left to its proof. That is, the accused infringer would then have to satisfy its burden of persuasion with actual evidence.

960 F.2d at 1037–38.

Aukerman further explained that the presumption may be eliminated by "offering evidence to show an excuse for the delay or that the delay was reasonable, even if such evidence may ultimately be rejected as not persuasive, and that "[s]uch evidence need only be sufficient to raise a genuine issue respecting the reasonableness of the delay to overcome the presumption." *Id.* at 1038 (internal citations omitted). As this Court held on summary judgment, the presumption of laches was eliminated by Plaintiff's introduction of evidence of the parties' continuing negotiations and of other preoccupying litigation on the Ward patents, and with the presumption of delay and prejudice "burst," it was ABI's burden to establish laches. (Laches Ruling at 12–13.) Thus, even though Enzo chose not to introduce additional evidence of its "pursuing other litigation" theory at trial, ABI is not entitled to a second laches presumption, and it bore the burden of proof as to both (1) unreasonable and unjustified delay and (2) material prejudice.

a) Unreasonable and Unjustified Delay

The '767 patent issued on September 12, 1995, and Enzo filed its complaint with the Court on June 7, 2004, well over eight years later. "The period of delay is measured

from the time the plaintiff knew or reasonably should have known of the defendant's alleged infringing activities to the date of suit." *Aukerman*, 960 F.2d at 1032.

Evidence was introduced at trial that Enzo and ABI entered into communications in September 1994—one year before the issuance of the '767 patent—when Dr. Elazar Rabbani, CEO of Enzo Biochem sent a letter to Dr. Andre Marion, then-President of ABI, expressing an interest in discussing "the possibility of a business relationship in the field of nonradioactive DNA detection." (Tr. Vol. II at 276; Sept. 29, 1994 Ltr. From Rabbani to Marion [PTX 22].) Dr. Rabbani testified that he met with Tony White, Dr. Michael Hunkapiller, who was then ABI's chief scientific officer, and Dr. Macevicz, who was Senior Patent Attorney at ABI. (*Id.* at 276–77.) He described Enzo's interest in ABI as follows:

> Number one, from a long discussion with ABI official, we'd been told that they have difficulties in making proper product that performed well. And since nucleic acid chemistry and nucleic acid genetic analysis was already our expertise, we wanted to know . . . why do they have problem.
>
> The second issue was to find out whether ABI really does meet any patent offense and, if so, we would like a distribution agreement to address that issue in a business manner and resolve it.

(*Id.* at 277.)

In preparation for the first Enzo/ABI meeting in October 1994, Dr. Macevicz sent Dr. Rabbani a letter expressing puzzlement over "Enzo's expression of concern over [ABI's] products," noting that "[n]one of them appear to be particularly relevant to our products." (Oct. 20, 1994 Ltr. From Macevicz to Rabbani [PTX 180].) Dr. Rabbani testified that ABI "systematically stated to us in various occasion[s] that Enzo patent was not relevant to that product." (Tr. Vol. II at 278.) In February 1996, Dr. Rabbani sent a

letter to Joseph Smith, an attorney at ABI, summarizing his understanding as to what ABI had told him about ABI's products and Enzo's patents:

> In previous conversations you and Mike Hunkapiller have told us that your dye terminators are attached to the 5-position of dideoxy nucleotides by a triple bond and have been licensed from Dupont. . . . You and Mike further informed us that these nucleotides are very disruptive to both incorporation and hybridization.
>
> You also told us that the structure, characterization and properties of these terminators are in the product catalog and publicly available literature and that you would send the information to us. We have been unable to find this information in your catalog nor have we received it from you.

(Feb. 5, 1996 Ltr. from Rabbani to Smith [PTX 25].) Asked about this letter, Dr. Rabbani testified that he felt he needed to send it because "there was a fundamental contradiction in [ABI's] assertion," in that "they were using Dr. Ward's position for labeling as an area of interest, but the product[s] were not performing in accordance with Dr. Ward's teaching." (Tr. Vol. II at 280.)

On April 24, 1997, Mr. Smith sent a letter to Dr. Rabbani in which ABI proposed that Enzo could "enter the manufacturing process . . . in coupling the dye to the nucleotide" or where Enzo would make the dye-labeled terminator in its entirety, and then sell it back to ABI. (Apr. 24, 1997 Ltr. from Smith to Rabbani [PTX 44].) In that same letter, Mr. Smith cautioned that ABI is "likely to change the chemical structures over time as we improve our products." (*Id.*) Dr. Rabbani testified that, upon receiving this letter, "there would have been no way for Enzo to decide or to be confident that we know what is the product that we are supposed to understand to be related to any of Enzo['s] patent[s]." (Tr. Vol. II at 282.) He also reiterated that because ABI never produced the structure of its accused products, "it was impossible" for Enzo to assess whether the products actually infringed. (*Id.* at 284–85, 340.) In contrast, Dr. Hunkapiller

testified that from his perspective, Dr. Rabbani was arguing all along that ABI infringed. (Tr. Vol. V at 948; *see also* Mar. 30, 1995 Ltr. from Rabbani to Hunkapiller [DTX 127] at 004 ("A one-time payment of twenty percent . . . of the abovementioned amount . . . will constitute full consideration for damages of past infringement.").)

Dr. Hunkapiller testified that in August 1997, he received a letter from Dr. Rabbani that appeared to put forward two other Enzo patents as a potential issue for negotiation, neither of which had anything to do with DNA sequencing. (*See* Aug. 18, 1997 Ltr. from Rabbani to Hunkapiller [DTX 117].) Dr. Rabbani's letter referenced scheduling a "meeting in Connecticut" (*id.*), and Dr. Hunkapiller testified that they spoke over the phone sometime after this letter, and

> there was a point at the end where it was pretty clear that we had a completely different view of the world relative to these matters. And I told him in no uncertain terms, you know, we're not getting close to an agreement, we're getting further away and we're just not talking about, you know, reaching a conclusion that would be a good business relationship.

(Tr. Vol. V at 969.) Dr. Hunkapiller testified that he ended the conversation by saying, "[i]f you feel you need to file a patent infringement suit, you know, it's your prerogative to do that, but we were through having discussions," and then he hung up on Dr. Rabbani. (*Id.* at 971.)

In June 1998, six years before suit was commenced, Dr. Rabbani sent a letter to Tony White, the CEO of ABI at the time, in which he noted that it "is unfortunate that ABI terminated negotiations with Enzo relating to ABI's sequencing activities and non-radioactive nucleic acid labeling and detection systems covered by Enzo patent claims." (June 11, 1998 Ltr. from Rabbani to White [PTX 41].) On June 17, 1998, William Sawch of ABI's legal department responded to this letter, indicating that he had asked "Joe Smith [to] . . . review the issues referenced in your letter," and "Joe and his group are familiar

with Enzo's technology, having evaluated it and related prior art on earlier occasions. I trust you agree than an informed consensus on the underlying facts here is more fundamental to resolution of any issue." (June 17, 1998 Ltr. from Sawch to Rabbani [PTX 52].)

ABI offered evidence that the structure of its accused products were publicly available at the time Enzo had entered into negotiations with ABI. For example, in October 1996, ABI presented a paper at the Eighth Annual International Genome Sequencing and Analysis Conference, entitled "New Dye Terminator Molecules Improve Peak Evenness" [DTX 613], which described ABI's new technology. Dr. Rabbani testified that neither he, nor anyone else from Enzo, attended this conference. (Tr. Vol. III at 399–400.) In 1997, in the journal *Nucleic Acids Research*, ABI scientists published an article, colloquially referred to in this lawsuit as the "Rosenblum paper," which described the structure of ABI's products, and identified them by their trade names, BigDye and d-Rhodamine, though it did not identify them as commercial products. (*See* Rosenblum Paper [DTX 91].) Dr. Rabbani clarified that the structures disclosed in the Rosenblum paper were in contradiction with ABI's assurances to Enzo that their compounds "are interfering with incorporation and in to hybridization . . . They were totally misleading." (Tr. Vol. III at 404.) He further explained that even if Enzo had seen the structures disclosed in the paper, and "guessed that that is the structure, [ABI] told us, oh, we are engineering totally new linkages away from it, don't waste your time." (*Id.* at 405.)

ABI also introduced evidence that during the course of Enzo's negotiations with ABI, Enzo inquired of Dupont, a company which shared a license with ABI for triple-bond technology, about certain "concerns" Enzo may have had about "DuPont's patented triple bond technology." (*See* Dec. 18, 1995 Ltr. from Christenbury to Rabbani [DTX 40].)

ABI did not introduce any evidence of Enzo's communications with ABI, but in DuPont's December 1995 letter, clarifies that its patents issued in 1991 and 1992, well before the '767 patent issued in 1995. A second letter, which appears to be from DuPont's counsel, sent via fax two years later to Enzo's counsel, confirms DuPont's opinion that none of its own patents, many issued prior to 1995, were relevant to the '767 patent. (*See* Dec. 18, 1997 Ltr. from Figg to DeLucia [DTX 42].) DuPont's attorney recommended that Enzo take the issue up with ABI "directly" if it wanted to negotiate licensing with ABI. (*Id.* at 005.) Both DuPont letters also discuss "NEN," which Dr. Rabbani explained was the life science division of DuPont, and that Enzo had been "engaged and involved . . . in regard to establishing distribution relationship" with DuPont at the time of both of these correspondences. (Tr. Vol. III at 390.) Dr. Rabbani also clarified that the discussions with DuPont about Enzo's patents were not focused on ABI, but on potential "domination" of one patent by another, which he explained as follows:

> even when Dupont obtains [a] patent, because they have used or they have provided some improvement, or they have added something [in] addition to the fundamental teaching of Dr. Ward's patent, the same product could be covered by more than one patent. In fact, it is very common that one product or one system or one reagent composition may be covered by more than one patent, by many different entities or companies or inventors.

(*Id.* at 421.) He also explained that ultimately DuPont and Enzo reached an agreement, and an understanding that "Dr. Ward['s] patent dominated Dupont patents," and after those discussions there were no further disagreements between Enzo and DuPont. (*Id.* at 422.)

Dr. Rabbani testified that he did not know about ABI's 3'-fluoro project, and had he known that ABI was working to design the 3'-fluoro project in the mid-1990s, he would have been very surprised, because ABI had told Enzo that "Enzo['s] patent[s] were

not relevant. And if they were not relevant, why would [ABI] design around it? That doesn't make any sense." (Tr. Vol. II at 283.)

When asked what ultimately prompted Enzo to file this lawsuit, Dr. Rabbani testified that it was when he first discovered the "famous letter of Dr. Macevicz" [PTX 59], sent to the PTO in 1995, "by accident" in 2003, when he uncovered it in the '767 prosecution file. (Tr. Vol. II at 265, 285.) Dr. Hunkapiller was copied on the Macevicz letter, and when asked about it, testified that he felt that some of Macevicz's claims in the letter were "factually incorrect," and that Macevicz got "carried away" in his arguments to the PTO. (Tr. Vol. V at 950, 952.)

Considering all of the evidence introduced at trial on the issue of unreasonable delay, much of it contradictory, and much of it requiring credibility determinations between the testimony of Drs. Hunkapiller and Rabbani, the Court adopts the jury's advisory finding that ABI had not proved unreasonable delay by a preponderance of the evidence. "Although an advisory verdict is not binding on the trial court, its purpose is "'to enlighten the conscience of the Court.'" *Hine v. Mineta*, 238 F. Supp. 2d 497, 499 (E.D.N.Y. 2003) (internal citations omitted). "[I]t is wholly within the discretion of the trial court whether to accept or reject in whole or in part the verdict of the advisory jury." *Id.* (citing 9 Charles Alan Wright & Arthur R. Miller, Federal Practice and Procedure § 2335 (2d ed. 1995)).

Though the issue of unreasonable delay is a close one, the Court finds there is insufficient evidence to show that it is more likely than not that Enzo knew of ABI's infringing activities as to the '767 patent, and chose to unreasonably and unjustifiably delay in filing suit. Indeed, the majority of the interactions between Enzo and ABI in 1994 and 1995 were focused on other Ward patents, issued prior to the '767 patent. (*See, e.g.*,

Mar. 30, 1995 Ltr. from Rabbani to Hunkapiller (sent prior to issuance of '767 patent and discussing "consideration for damages of past infringement").) Aside from the infamous Macevicz letter and Dr. Rabbani's letter announcing the issuance of the '767 patent, the record evidence was not clear that at any given point the parties were in fact referring specifically to the '767 patent in their negotiations (*see, e.g.*, Tr. Vol. V at 1043), or that the noise made by Dr. Rabbani about possible infringement were more than bluster or bluffing. As to ABI's insinuations that Enzo's discussions with DuPont evinced Enzo's belief that ABI's products infringed the '767 patent, Dr. Rabbani credibly explained that the focus of his correspondence with DuPont was on the relationship between DuPont's patents and Dr. Ward's invention (Tr. Vol. III at 421–22). In addition to Dr. Rabbani's explanation, these two letters are concerned with issues between DuPont and Enzo, and are not particularly probative of the relationship between Enzo and ABI, the actual parties in this litigation.

Further, if Dr. Rabbani's version of events—his serendipitous discovery of the 1995 Macevicz letter in 2003 confirmed for him that ABI had been hiding its infringing activities all along, prompting his decision to file suit—is of only equal credibility to Dr. Hunkapiller's, that Enzo had been accusing ABI of infringement of all of its patents for years and never took action, the Court finds that the evidence educed at trial suggests that ABI's own actions in its negotiations with Enzo were less than fully forthright, and Dr. Hunkapiller's casual dismissal of any infringement discussions likely made it more difficult for Enzo to figure out how ABI's products compared specifically to the '767 patent. "Laches is not *established* by undue delay and prejudice. Those factors merely lay the foundation for the trial court's exercise of discretion." *Aukerman*, 960 F.2d at 1036. "[A]t all times, the defendant bears the ultimate burden of persuasion of the affirmative

defense of laches," and "he who seeks equity must do equity." *Id.* at 1038. Most importantly, as discussed below, even if the delay were to be found unreasonable, ABI has failed to prove the "material prejudice" prong required for a laches defense.

b) Material Prejudice

For laches to apply, "[m]aterial prejudice to adverse parties resulting from the plaintiff's delay is essential." *Aukerman*, 960 F.2d at 1033. A defendant may establish the material prejudice prong by showing economic or evidentiary prejudice as a result of the plaintiff's delay in filing suit.

(1) Economic Prejudice

The Court is unpersuaded that ABI suffered economic prejudice as a result of Enzo waiting to file suit until 2004. Dr. Hunkapiller's testimony was that after 1997, the effort to sequence the entire human genome "ramped up," and the "business grew quite well" (Tr. Vol. V at 972), and did not suggest in any way that ABI considered waiting and seeing if Enzo would sue them prior to investing in the human genome project. He described the Perkin-Elmer [ABI's parent company] investment in a newly formed entity, Celera, as "somewhere around $300 million." (*Id.* at 977.) He also testified about the great success ABI and Celera experienced as a result of these investments, and that "a good part" of the project used the accused dye terminator chemistry. (*Id.* at 1055.)

When asked his opinion as to what the "severity of the impact" on ABI's business would be were Enzo to have sued ABI at that time, Hunkapiller testified that "there was no lasting damage to the business in any stretch of the imagination that I could see." (*Id.* at 1027.) He did not testify that he would have acted differently if Enzo had sued ABI earlier, and conceded that he neither notified his shareholders, nor his board of directors, of a threatened lawsuit or notice of infringement from Enzo, though there is evidence that

the board was notified of these types of threats. (*See* Tr. at 1029, 1053; *see also* Exerpts from ABI's Sept. 25, 1998 Form 10-K Submission [PTX 1122].)

Dr. Hunkapiller described the 3'-fluoro project as ABI's attempt to design around Enzo's patents, as an "insurance policy." He mentioned that the project was put "on hold" at some point, but conceded that placing it on hold was not in response to any communication from Enzo. (Tr. Vol. V at 1049.) Dr. Cassel's notes indicated that, in order for ABI to have pursued the 3'-fluoro version of the terminators in lieu of the accused products, they "would have to be good as current set" (3' Fluoro Terminators [PTX 445] at ABI1293976), which Dr. Menchen testified meant that ABI would not allow customers to "suffer a lapse in performance" with the 3'-fluoro materials (Tr. at 472). The evidence at trial showed that the 3'-fluoro project required three times as much of the 3'-fluoro material to get the same result as the accused BigDyes, which would not have been good for ABI's customers. (*See* 3' Fluoro Terminators at 1293936; Tr. Vol. III at 474.) Dr. Menchen described this as "raising a red flag." (Tr. Vol. III at 475.)

"Economic prejudice is not a simple concept but rather is likely to be a slippery issue to resolve." *Aukerman*, 960 F.2d at 1033. In considering economic prejudice, courts must "look for a *change* in the economic position of the alleged infringer during the period of delay." *Id.* (emphasis in original). Damages or monetary losses "are not merely those attributable to a finding of liability for infringement." *Id.* Here, the Court concludes that there is simply insufficient evidence to support a finding that ABI suffered economic prejudice as a result of the delayed 2004 lawsuit. The evidence does not suggest that ABI would not have invested in Celera and the Human Genome Project in 1998 (only one year after Dr. Hunkapiller hung up on Dr. Rabbani and terminated negotiations with Enzo), as these were decisions that Dr. Hunkapiller was proud of and lauded as incredibly

good business for ABI. Further, ABI's attempt at "non-infringing alternatives" was both short-lived and unsuccessful. It is not credible that as of 1998, a mere three years after the issuance of the '767 patent, and at most one year after negotiations between Hunkapiller and Rabbani terminated, ABI felt confident enough that Enzo would not sue and thus decided to put its 3'-fluoro project on hold and chose to continue investing in, developing, and marketing the infringing products.

(2) Evidentiary Prejudice

The Court is similarly unpersuaded that ABI suffered evidentiary prejudice as a result of the 2004 lawsuit. Evidentiary or 'defense' prejudice may "arise by reason of a defendant's inability to present a full and fair defense on the merits due to the loss of records, the death of a witness, or the unreliability of memories of long past events, thereby undermining the court's ability to judge the facts." *Aukerman*, 960 F.2d at 1033.

Evidence was introduced at trial confirming that certain evidence was lost—Dr. Ward's notebooks are assumed to have been destroyed (*see* Tr. Vol. II at 212), which included the notebooks that Yale's counsel collected as "relevant" from Dr. Ward when he was leaving Yale in 2004. (Tr. Vol. VI at 1232.)

In considering arguments of evidentiary prejudice, the Federal Circuit has noted that "testimonial evidence is frequently critical to invalidity defenses." *Aukerman*, 960 F.2d at 1035. Testimonial evidence was not lost in this case: throughout the course of this litigation: ABI was able to and did depose each of the three inventors of the '767 patent, and at trial defense counsel presented deposition testimony from Dr. Ward, and cross-examined Dr. Waldrop.

Though ABI asserts that it suffered evidentiary prejudice as a result of these lost notebooks, it has not met its burden of showing an inability to present a full and fair

defense on the merits. Defendant's written description defense was based on "the four corners of the specification," *see Ariad*, 598 F.3d at 1351, to which ABI has had access all along. And though ABI argues that is enablement defense suffered from the absence of Ward's notebooks, and that an enablement defense is not limited to the original patent application, ABI's enablement defense is based on arguments that this Court and jury had the opportunity to consider, and reject, at trial, i.e., that the patent did not enable DNA sequencing and that the patent did not enable direct detection.

Finally, as to its argument that its non-infringement defense was prejudiced, the Court concludes that ABI failed to meet its burden of showing why deposing each of the three inventors of the '767 patent would not have been sufficient for a full and fair noninfringement defense, particularly where ABI's contention is that it was prejudiced by an absence of evidence as to the double/triple bond distinction. (*See* Def.'s Resp. to Pl.'s Conclusions Re: Equitable Defenses [Doc. # 511] ¶ 64.) The scope and detail of direct and cross-examination on the double/triple bond issue at trial obviates any claim that ABI's defense was undermined by the lack of the Ward notebooks.

This Court has had the opportunity to observe and appreciate the excellent work of counsel on both sides of this case since 2004. Now, having seen this matter through trial, the Court feels confident that ABI was not hindered or prevented from presenting its defenses on the merits—indeed, as demonstrated by trial presentation, the defenses ABI presented in support of its enablement, written description, anticipation, and non-infringement defenses were clear, though ultimately unsuccessful in the jury's view. Even though the jury concluded that ABI had not met its burden of proof on any of its defenses, the Court's and the jury's ability to adjudicate the facts was not undermined. Accordingly, the Court denies ABI's request to enter a judgment of laches in this case.

2. Equitable Estoppel

"[E]quitable estoppel focuses on what the defendant has been led to reasonably believe from the plaintiff's conduct." *Aukerman*, 960 F.2d at 1034. Where an infringer establishes the defense of equitable estoppel, the patentee's claim may be entirely barred. *Id.* at 1028. There are three elements that must be proved by the defendant for a court to find the equitable estoppel defense appropriate:

> a. The patentee, through misleading conduct, leads the alleged infringer to reasonably infer that the patentee does not intend to enforce its patent against the alleged infringer. "Conduct" may include specific statements, action, inaction, or silence where there was an obligation to speak.
>
> b. The alleged infringer relies on that conduct.
>
> c. Due to its reliance, the alleged infringer will be materially prejudiced if the patentee is allowed to proceed with its claim.

Id. Though equitable estoppel and laches are not identical, *id.* at 1034, and must be addressed and decided separately, the evidence that the Court has considered and discussed above regarding laches is also relevant to ABI's estoppel defense.

As to the first requirement—misleading conduct of the patentee—there was no evidence presented at trial to show that Dr. Rabbani, or anyone else at Enzo, ever actually discussed the specifics of the relationship between the '767 patent and ABI's products with ABI, aside from the letter [PTX 1183] Dr. Rabbani sent to Dr. Hunkapiller when the '767 patent issued. Thus, while ABI contends that it is entitled to equitable estoppel on account of Enzo's misleading inaction and silence, the plaintiff's "inaction must be combined with other facts respecting the relationship or contacts between the parties to give rise to the necessary inference that the claim against the defendant is abandoned." *Aukerman*, 960 F.2d at 1042. Here, where so little of the record of the parties' negotiations

concerns the '767 patent, there is insufficient evidence to support ABI's contention that Enzo, through misleading conduct, led ABI to reasonably infer that Enzo did not intend to enforce the '767 patent against it.

ABI relies on *Scholle Corp. v. Blackhawk Molding Co.*, 133 F.3d 1469, 1471 (Fed. Cir. 1998), in which the Federal Circuit affirmed a district court's determination that equitable estoppel was warranted, where three and a half years of silence manifested an intention not to sue, after the parties had engaged in discussions and the plaintiff had previously accused one of the defendant's products of infringement. (*See* Def.'s Resp. to Pl.'s Prop. Conclusions Re: Equitable Defenses ¶ 9.) In *Scholle Corp.*, however, the Federal Circuit noted that "[m]any of those contacts concerned the '354 patent *which is the subject of this litigation*," 133 F.3d at 1471 (emphasis added), whereas here, there was no, or at best vague, evidence that the specter of Enzo's infringement claim extended to the '767 patent. *See Adelberg Labs., Inc. v. Miles, Inc.*, 921 F.2d 1267, 1274 ("This long [10-year] period of silence by Adelberg and Abbott after first affirmatively asserting patent infringement [based on the patent in suit] suffices to support the conclusion that Adelberg and Abbott reasonably induced Cutter to believe that Adelberg had abandoned its claim.")

Next, if Enzo's long delay constituted "misleading inaction," the evidence introduced at trial does not support ABI's argument that it acted in reliance on this delay. Rather, the evidence showed that ABI continued building and developing its dye-terminator business, focusing on terminators rather than primers, and discarding its "insurance policy" of the 3'-fluoro project after only one year of work because the dye terminator business was more lucrative, and that sequencing the human genome, which utilized dye terminators and not the substance of the 3'-fluoro terminators, was a huge

boon to Celera and ABI. Further, based on ABI's and Dr. Hunkapiller's response to Enzo, Defendant claimed to believe that the '767 patent was invalid. Dr. Hunkapiller testified that "from my perspective, from a science perspective, [Dr. Macevicz] was just wrong in his assessment" that a lawsuit would "severely damage" ABI's business. (Tr. Vol. V at 1027.)

"Even a considerable investment during a delay period is not a result of the delay if it was "a deliberate business decision to ignore [a] warning, and to proceed as if nothing had occurred." *Gasser Chair Co. v. Infanti Chair Mfg. Corp.*, 60 F.3d 770, 776, 777 (Fed. Cir. 1995) ("Infanti ignored Gasser's charges of infringement because he believed the patent was invalid. Thus, Infanti totally failed to show that he acted in reliance on supposed actions of Gasser rather than a business judgment."). ABI's conduct evidenced ABI's own business decisions to grow its company and take advantage of the booming DNA sequencing market in the year immediately after terminating negotiations with Enzo, much more than evidencing reliance on what it thought Enzo would or would not do vis-à-vis enforcing the '767 patent through litigation. *Cf. James River Corp. of Virginia v. Hallmark Cards, Inc.*, 915 F. Supp. 968, 983 (E.D. Wis. 1996) ("There is no indication that Hallmark affirmatively made decisions and took action based on specific inferences from James River's action or inactions.").

Finally, as to the final, prejudice prong, the standard for equitable estoppel and laches is the same. *See Aukerman*, 960 F.2d at 1043. For the reasons discussed above, the Court finds that ABI has not proved that it suffered material prejudice as a result of Enzo's conduct, and thus concludes that the circumstances presented here do not support an equitable estoppel defense.

III. Conclusion

For the foregoing reasons, Enzo's motion for a new trial [Doc. # 498] on damages as to induced infringement is DENIED. ABI's motion [Doc. # 503] for judgment as a matter of law under Rule 50(b) or in the alternative, for a new trial under Rule 59 is also DENIED. Finally, ABI's motion for judgment [Doc. # 502] on its defenses of equitable estoppel and/or laches is DENIED.

IT IS SO ORDERED.

/s/
Janet Bond Arterton, U.S.D.J.

Dated at New Haven, Connecticut this 1st day of August, 2013.