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5 IN THE UNITED STATES DISTRICT COURT
6 FOR THE NORTHERN DISTRICT OF CALIFORNIA
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8 ILLUMINA INC. and SOLEXA, INC.,

No. C -10-05542(EDL)

9 Plaintiff,

**AMENDED ORDER GRANTING
DEFENDANT'S MOTION FOR PARTIAL
SUMMARY JUDGMENT OF
INVALIDITY OF CLAIMS 1, 9, 10, AND
14-19 OF THE '597 PATENT**

10 v.

11 COMPLETE GENOMICS INC.,

12 Defendant.
13 _____/

14 This patent infringement case involves DNA sequencing technology. Plaintiffs Illumina, Inc.
15 and Solexa, Inc., (collectively, "Illumina") accuse Defendant Complete Genomics, Inc. ("CGI") of
16 infringing U.S. Patent No 6,306,597 ("the '597 patent"). On May 31, 2012, CGI moved for
17 summary judgment, arguing that several claims of the '597 patent are invalid as anticipated and
18 obvious. The Court held a hearing on this motion on September 4, 2012. For the reasons stated at
19 the hearing and in this Order, Defendant's motion for partial summary judgment of invalidity is
20 granted. The Court heard Illumina's reconsideration motion on January 29, 2013. The Court has
21 issued a separate order denying that motion, but stated at the hearing that it would amend this
22 summary judgment order to correct two minor errors that do not affect the merits.
23
24

25 **I. BACKGROUND**

26 **A. The Instant Action**
27

28 Illumina filed this patent infringement action against CGI in the District Court for the
District of Delaware on August 3, 2010. The parties are competitors in the field of DNA

1 sequencing. Illumina designs, manufactures, and sells several platforms for high-throughput DNA
2 sequencing, including its Genome Analyzer and HiSeq sequencing instruments. CGI offers DNA
3 sequencing services to its customers through its Complete Genomics Analysis Service (“CGA™
4 Service”). In performing its CGA™ Service, CGI employs its Complete Genomics Analysis
5 Platform (“CGA™ Platform”), which includes its Combinatorial Probe-Anchor Ligation
6 (“cPAL™”) read technology, among other technologies.

7 Illumina alleges that through CGI’s use of its CGA™ Platform to perform DNA sequencing
8 services, CGI infringes three Illumina patents, specifically U.S. Patent No. 6,306,597 (“the ‘597
9 patent”), U.S. Patent No. 7,232,656 (“the ‘656 patent”), and U.S. Patent No. 7,598,035 (“the ‘035
10 patent”) (collectively “the Illumina Patents”).

11 CGI denies that it infringes any of the Illumina Patents. CGI further alleges that all of the
12 Illumina Patents are invalid; this motion is specific to the ‘597 patent.

13 By order dated November 9, 2010, the court granted CGI’s motion to transfer venue to the
14 Northern District of California. Judge Alsup denied CGI’s motion to consider whether this action is
15 related to an earlier filed action, Applera Corp. - Applied Biosystems Group v. Illumina, et al., No.
16 C 07-02845 WHA (“Applera”). Docket No. 42. Upon consent of the parties, this action was
17 reassigned to this Court by Judge Breyer. The parties stipulated to dismissal without prejudice of all
18 claims and counterclaims related to the ‘656 and ‘035 patents. Docket No. 75.

19
20 **B. Prior Litigation of the ‘597 Patent and Stipulation to the Invalidity of**
21 **Claim 1**

22 In Applera, Applied Biosystems (“AB”) filed suit against Illumina for ownership of the ‘597
23 patent and 2 related patents (U.S. Patent Nos. 5,750,341 and 5,969,119). AB alleged that the
24 inventor, Dr. Stephen Macevicz, invented the subject matter of the patents while he was in-house
25 patent counsel for AB and breached the terms of an Invention Agreement by, among other things,
26 failing to disclose inventions to AB, applying for patents on the inventions in his own name, and
27 purporting to assign the inventions and patents to Lynx, a spinoff corporation of AB, which
28 subsequently merged with Solexa. AB alleged that Macevicz’s conduct, as well as Illumina and

1 Solexa’s conduct, gave rise to claims for interference with contract, breach of fiduciary duty,
2 constructive fraud, conversion, imposition of constructive trust, and unfair competition. Illumina
3 countersued AB for infringement.

4 Judge Alsup issued a claim construction order on February 21, 2008, which construed terms
5 from one of the ’597 patent’s sibling patents, some of which also appear in the ’597 patent. See
6 Applera, Case No. 07-2845 WHA, Docket No. 133. Judge Alsup issued a supplemental claim
7 construction on terms from Claim 1 of the ’597 patent and the parties stipulated that AB infringed
8 Claim 1 and that the Southern prior art reference rendered Claim 1 invalid. Applera, Docket Nos.
9 383-1, 384-1, 402 (order on stipulation re infringement and invalidity). The parties agreed before
10 the claim construction hearing that Judge Alsup’s construction of the terms applied to the ’597
11 patent.

12 Following a jury trial, on February 3, 2008, Judge Alsup entered judgment for Illumina on
13 AB’s claim of ownership of the Macevicz patents and entered judgment for AB on Illumina’s claim
14 that AB infringed the ’119 patent.

15 On March 25, 2010, the Federal Circuit affirmed Judge Alsup’s claim construction of the
16 terms that were appealed and stated: “Because the district court properly construed the terms of
17 claim 1 of the ’597 patent, we affirm the court’s judgment of noninfringement with respect to
18 Applera’s accused products, and the court’s order, entered pursuant to stipulation, concerning
19 invalidity.” Mot. Ex. 13, at 8.

20
21 **C. Reexamination**

22 On June 30, 2008, AB filed a request for reexamination of the ’597 patent. Three months
23 after the jury trial before Judge Alsup, on May 28, 2009, the PTO issued a non-final Office Action
24 rejecting claim 1 of the ’597 patent as being anticipated by several prior art references, including
25 Martinelli (U.S. Patent No. 5,800,994) and either Landegren (U.S. Patent No. 4,988,617) or
26 Whiteley (U.S. Patent No. 4,883,750) taken in view of Martinelli. Mot. Ex. 14.

27 On June 22, 2009, Illumina filed an information disclosure statement (“IDS”) with the PTO
28 regarding the ongoing litigation. Mot. Ex. 15. Illumina attached many litigation-related documents

1 to the IDS, including the stipulation. In the text of the IDS, Illumina noted that a jury had returned a
2 verdict finding that claim 1 of the '119 patent (the '597 patent's sibling patent) was not invalid for
3 obviousness, but the only mention of the stipulation was that "As a result of the district court's claim
4 construction ruling, the parties entered into a stipulation regarding infringement and invalidity of
5 claim 1 of the '597 patent." Mot. Ex. 15 at 2, 3.

6 Illumina held an interview with the examiner on July 13, 2009, and filed a response to the
7 office action on August 6, 2009, which included amendments to the claims. Declaration of John
8 Labbe in Support of Illumina's Claim Construction Brief ("Labbe Claim Const. Decl.") Exs. 9, 10.
9 The examiner's interview summary indicates that he and Illumina discussed whether the "Martinelli
10 patent is 'repeating' steps a and b within the meaning of claim 1." Labbe Decl., Ex. 10. In its
11 response to the PTO's Office Action, Illumina summarized the interview as follows:

12 It was discussed that Martinelli did not disclose repeating steps (a) and
13 (b) on the same polynucleotide that was operated on in the first cycle
14 of the claimed method. It was discussed that claim 1 recites a method
15 that is limited to repeating steps (a) and (b) on the same
16 polynucleotide that was operated on in the first cycle of the method. It
17 was agreed that an unequivocal statement by the Applicant that step
18 (c) of claim 1 of the '597 patent requires repeating steps (a) and (b) on
19 the same polynucleotide acted upon in the first cycle of the recited
20 method would overcome the rejections based on Martinelli.

21 Labbe Claim Const. Decl., Ex. 9 at 11 (8/6/2009 Suppl. Amendment). According to Illumina,
22 "Martinelli described its version of [oligonucleotide ligation assay] as a 'hybridization-ligation
23 methodology (HLM),'"
24 which involves binding two probes to a DNA sample to detect whether a
25 mutation is present. *Id.* at 15; Opening Claim Constr. Br. at 8. Under the Martinelli patent,
26 according to Illumina, "[i]f the two probes can be ligated, the identity of the nucleotide at the site in
27 the sample where the two probes attach to each other can be determined, because ligation could only
28 occur if the mutation is present." Opening Claim Constr. Br. at 8.

29 In response to the rejection of claim 1 as anticipated by Martinelli and obvious over
30 Landegren and Whiteley in view of Martinelli, Illumina distinguished Martinelli on the ground that
31 Martinelli "did not disclose repeating the steps of its 'HLM' method . . . [and] expressly taught that
32 the HLM reaction was intended to be performed for only one cycle." Labbe Claim Const. Decl., Ex.
33 9 at 15. In its amendment to Claim 1, Illumina made the following narrowing statement:

1 As discussed at the interview, the “repeating” step in the claimed
2 method, step (c), requires the repetition of steps (a) and (b) on the
3 same polynucleotide sequence that was acted upon in the first cycle of
4 the recited method. Step (a) of claim 1 recites “extending an
5 initializing oligonucleotide along the polynucleotide.” When step (a)
6 is repeated as required by step (c), a (new) initializing oligonucleotide
7 is extended along the same polynucleotide as was acted upon in the
8 first cycle of the recited method (“the polynucleotide”).

9 Labbe Claim Const. Decl., Ex. 9 at 15.

10 As part of the reexamination, Illumina also submitted an ex parte declaration of Dr. Stephen
11 Macevicz pursuant to 37 C.F.R. § 1.131. Mot. Ex. 16. The declaration said that “[f]rom at least just
12 before February 9, 1995, until April 17, 1995, I spent a number of evenings and weekend days
13 working on the preparation and filing of the ‘663 application.” *Id.* at 4. This declaration seems to
14 be the first attempt by Illumina to antedate the Southern reference; during the course of the Applera
15 litigation, there had been no attempt to show that Macevicz’s earlier conception date (memorialized
16 in his lab notebook) combined with an actual reduction to practice or due diligence, as is required to
17 antedate or swear behind a reference. Mot. Ex. 9, at 2. The Examiner found that Macevicz had
18 exercised reasonable diligence, and withdrew the anticipation rejection of claim 1 by Southern.
19 Mot. Ex. 17.

20 By Office Action dated September 30, 2009, the examiner withdrew the claim rejections
21 based on Martinelli (and based on Landegren or Whiteley in view of Martinelli):

22 Patent Owner has provided an unequivocal statement that “repeating”
23 steps (a) and (b) of the claimed method means that the steps are
24 performed on the same nucleic acid sequence in each cycle (response
25 of August 3, 2009, p. 15). In Martinelli, repetition is performed on
26 different portions of the target nucleic acid (col. 4, lines 56-61).
27 Therefore Martinelli does not anticipate the claim and the rejection is
28 **withdrawn.**

Labbe Claim Const. Decl., Ex. 12 at 5. The PTO confirmed that for the reasons detailed in that
Office Action, claim 1 is patentable. Labbe Claim Const. Decl., Ex. 13 at 3 (12/22/09 Office
Action). An Ex Parte Reexamination Certificate with regard to the ’597 patent was issued on March
2, 2010. Labbe Claim Const. Decl., Ex. 3.

D. Claim Construction

1 **1. Claim 1**

2
3 This Court issued a claim construction order on February 8, 2012. Illumina had previously
4 stipulated that Claim 1 was invalid and did not assert it; however, because subsequent claims were
5 dependent from Claim 1, the Court construed it. See Docket No. 122, at 7.

6 Claim 1 teaches the following method:

7 1. A method for identifying a sequence of nucleotides in a polynucleotide, the
8 method comprising the steps of:

- 9 a) extending an initializing oligonucleotide along the polynucleotide by
10 ligating an oligonucleotide probe thereto to form an extended duplex;
11 b) identifying one or more nucleotides of the polynucleotide; and
12 c) repeating steps a) and b) until the sequence of nucleotides is determined.

13 The parties asked the Court to construe the following terms of Claim 1: step a) (“extending
14 an initializing oligonucleotide along the polynucleotide by ligating an oligonucleotide probe thereto
15 to form an extended duplex”); step c) (“repeating steps a) and b) until the sequence of nucleotides is
16 determined”); “initializing oligonucleotide”; and “oligonucleotide probe.”

17 The Court construed step a), “extending an initializing oligonucleotide along the
18 polynucleotide by ligating an oligonucleotide probe thereto to form an extended duplex,” to mean
19 “ligating an oligonucleotide probe to an initializing oligonucleotide to form an extended duplex.”
20 Docket No. 122 at 26.

21 The Court construed step c), “repeating steps a) and b) until the sequence of nucleotides is
22 determined,” to mean

23 either (1) ligating an additional probe to the extended duplex by subsequent cycles of ligation
24 until the sequence of nucleotides is determined or (2) ligating a new probe to a new
25 initializing oligonucleotide, either by extending different sequence initializing
26 oligonucleotides, each out of register by one or more nucleotides, or by extending new
27 initializing oligonucleotides with the same sequence as the initializing oligonucleotide used
28 in the first cycle along the identical polynucleotide sequence as was acted upon in the first
cycle of the recited method, until the sequence of nucleotides is determined. There is no
need for repetition if the sequence of the polynucleotide has been fully determined in the first
cycle.

Docket No. 122 at 26-27.

1 The Court construed “initializing oligonucleotide” to mean “an oligonucleotide that forms a
2 highly stable duplex with the binding region of the polynucleotide that remains intact during any
3 washing steps of the extension cycles.” Docket No. 122 at 31.

4 The Court construed “oligonucleotide probe” to mean “a nucleic acid that can bind to the
5 polynucleotide, and, when bound to the polynucleotide, can be ligated to the initializing
6 oligonucleotide or to a previously extended duplex. An oligonucleotide probe that has been
7 successfully ligated either contains, or is associated with, a label.” Id. at 35.

8
9 **2. Dependent Claims 9 and 10**

10
11 Claim 9 reads as follows:

12 “9. The method of claim 1, wherein the polynucleotide comprises a binding region
13 and a target polynucleotide.”

14 Claim 10 reads as follows:

15 “10. The method of claim 9, wherein the binding region comprises a known
16 sequence and the target polynucleotide comprises an unknown sequence; and wherein in step (a) the
17 initializing oligonucleotide is hybridized to the binding region on the polynucleotide.”

18 The Court construed “binding region” to mean “a known sequence of the polynucleotide to
19 which the initializing oligonucleotide binds.” Docket No. 122 at 49.

20 The Court construed “target polynucleotide” to mean “a polynucleotide having a portion to
21 be sequenced.” Docket No. 122 at 51.

22
23 **3. Claim 14**

24
25 Claim 14 reads as follows:

26 “14. The method of claim 1, wherein the oligonucleotide probe comprises a label
27 which results in a spectrally resolvable fluorescent signal.”

28 The Court construed “spectrally resolvable fluorescent signal” to mean “a light signal

1 generated by fluorescence which can be distinguished based on its spectral characteristics (e.g., its
2 color).” Docket No. 122 at 53.

3
4 **II. MOTION FOR SUMMARY JUDGMENT**

5
6 **A. LEGAL STANDARD**

7
8 **1. Summary Judgment**

9
10 A court may grant summary judgment when there is no genuine issue as to any material fact
11 and the movant is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(a). Material facts are
12 those which may affect the outcome of the case. See Anderson v. Liberty Lobby, Inc., 477 U.S. 242,
13 248 (1986). A dispute as to a material fact is genuine where there is sufficient evidence for a
14 reasonable jury to return a verdict for the nonmoving party. Id. The court must view the facts in
15 the light most favorable to the nonmoving party and give it the benefit of all reasonable inferences to
16 be drawn from those facts. Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S. 574, 587
17 (1986).

18 A party seeking summary judgment bears the initial burden of informing the court of the
19 basis for its motion, and of identifying those portions of the pleadings and discovery responses that
20 demonstrate the absence of a genuine issue of material fact. Celotex Corp. v. Catrett, 477 U.S. 317,
21 323 (1986). Where the moving party will have the burden of proof at trial, it must affirmatively
22 demonstrate that no reasonable trier of fact could find other than for the moving party. However, on
23 an issue where the nonmoving party bears the burden of proof at trial, the moving party can prevail
24 simply by pointing out to the court that there is an absence of evidence to support the nonmoving
25 party’s case. Id. If the moving party meets its initial burden, the nonmoving party “may not rely
26 merely on allegations or denial in its own pleading;” rather, it must set forth “specific facts showing
27 a genuine issue for trial.” See Fed. R. Civ. P. 56(e)(2); Anderson, 477 U.S. at 250. If the
28 nonmoving party fails to show that there is a genuine issue for trial, “the moving party is entitled to

1 judgment as a matter of law.” Celotex, 477 U.S. at 323.

2
3 **2. Invalidity**

4
5 Under 35 U.S.C. § 282, a patent is presumed valid, and a party asserting invalidity as a
6 defense to infringement must present “clear and convincing evidence that the patent is invalid.”
7 Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings, 370 F.3d 1354, 1365 (Fed. Cir. 2004). A
8 patent may be invalidated on summary judgment for anticipation or obviousness.

9
10 **a. Anticipation**

11
12 A patent claim is invalid for anticipation if “the invention was patent or described in a
13 printed publication in this or a foreign country or in public use or on sale in this country, more than
14 one year prior to the date of the application for patent in the United States, . . .” 35 U.S.C. § 102(b).
15 To anticipate under section 102(b), a prior art reference must disclose and enable each and every
16 element of the claimed invention, either explicitly or inherently. In re Gleave, 560 F.3d 1331, 1334
17 (Fed. Cir. 2009); Schering Corp. v. Geneva Pharms., Inc., 339 F.3d 1373, 1377 (Fed. Cir. 2003)
18 (“Moreover, a prior art reference may anticipate without disclosing a feature of the claimed
19 invention if that missing characteristic is necessarily present, or inherent, in the single anticipating
20 reference.”).

21
22 **b. Obviousness**

23
24 A patent claim is invalid for obviousness if the differences between the subject matter of the
25 claims and the prior art would have been obvious to a person having ordinary skill in the art at the
26 time of the claimed invention. 35 U.S.C. § 103; KSR Int’l Co. v. Teleflex, Inc., 550 U.S. 398, 406
27 (2007). In evaluating obviousness, “a court must ask whether the improvement is more than the
28 predictable use of prior art elements according to their established functions.” Id. “The question is

1 not whether the combination was obvious to the patentee but whether the combination was obvious
2 to a person with ordinary skill in the art. Under the correct analysis, any need or problem known in
3 the field of endeavor at the time of invention and addressed by the patent can provide a reason for
4 combining the elements in the manner claimed.” Id. at 420. In addition, “[c]ommon sense teaches,
5 however, that familiar items may have obvious uses beyond their primary purposes, and in many
6 cases a person of ordinary skill will be able to fit the teachings of multiple patents together like
7 pieces of a puzzle.” Id.

8 Obviousness under 35 U.S.C. § 103 is a question of law based on underlying facts, including
9 the scope and content of the prior art, differences between the prior art and the claimed invention,
10 the level of ordinary skill in the art, and any relevant secondary considerations. See Graham v. John
11 Deere, 383 U.S. 1, 17-18 (1966); Power-One v. Artesyn Techs., 599 F.3d 1343, 1351-52 (Fed. Cir.
12 2010); Muniauction, Inc. v. Thomson Corp., 532 F.3d 1318, 1324 (Fed. Cir. 2008). When the
13 underlying facts are not in dispute, summary judgment is appropriate. See KSR, 550 U.S. at 427
14 (“Where, as here, the content of the prior art, the scope of the patent claim, and the level of ordinary
15 skill in the art are not in material dispute, and the obviousness of the claim is apparent in light of
16 these factors, summary judgment is appropriate.”).

17 18 **c. Diligence**

19
20 A court may also grant summary judgment where a patentee seeking to antedate a prior art
21 reference fails to present adequate evidence of reasonable diligence during the period from a date
22 prior to the other party’s conception until the date of reduction to practice. See Creative
23 Compounds, LLC v. Starmark Labs., 651 F.3d 1303, 1312-13 (Fed. Cir. 2011); Monsanto Co. v.
24 Mycogen Plant Sci., Inc., 261 F.3d 1356, 1363 (Fed. Cir. 2001). The burden is on the moving party
25 to prove by clear and convincing evidence that there is prior art and that the patentee did not invent
26 prior to the publication of the prior art because “1) he did not conceive and reduce his invention to
27 practice before the publication date and 2) he did not conceive and thereafter proceed with
28 reasonable diligence as required to his filing date.” Mahurkar v. C.R. Bard, Inc., 79 F.3d 1572, 1578

1 (Fed. Cir. 1996).

2 The Federal Circuit defines “reasonable diligence” as continuous activity toward reduction to
3 practice so that the invention’s conception and reduction to practice are substantially one continuous
4 act. Id. at 1577. Assertions of diligence must be specific and corroborated. See Loral Fairchild
5 Corp. v. Victor Co. of Japan, Ltd., 931 F. Supp. 1014, 1030-31 (E.D.N.Y. 1996) (“An inventor must
6 provide specific details on activity during the critical period. General testimony that the inventor
7 worked continuously and diligently will not suffice. Moreover, the inventor must corroborate
8 evidence of reasonable diligence.”). In addition, an inventor must account for the entire critical
9 period. 3 D. Chisum, Patents § 10.07 at 10-120 (1986).

10
11 **B. DISCUSSION**

12
13 CGI has moved for summary judgment on claims 1, 9, 10, and 14-19 of the ‘597 patent. It
14 argues that PCT Application No. WP 95/04160 (PCT/GB94/01675) (hereafter “Southern”) discloses
15 all elements of the ‘597 patent, and invalidates the patent because Dr. Macevicz did not act with
16 reasonable diligence after conceiving his invention and before filing the patent application, and
17 therefore he cannot swear behind Southern. CGI also claims that under the Court’s claim
18 construction, several other prior art references anticipate or make the ‘597 patent obvious, and
19 therefore invalidate, all the claims at issue. These references are: U.S. Patent No. 4,88,750
20 (hereafter “Whiteley”); U.S. Patent No. 5,800,994 (hereafter “Martinelli”); and U.S. Patent No.
21 5,522,278 (hereafter “Brenner”).

22 Illumina contends that Dr. Macevicz was diligent and that the ‘597 patent therefore antedates
23 Southern. It also points to the reexamination of the patent by the PTO, during which the Examiners
24 considered all of the references raised by CGI and withdrew their objections to some of the claims,
25 including claim 1. See Declaration of John Labbe in Support of Illumina’s Opposition to CGI’s
26 Motion for Summary Judgment (“Labbe Decl.”) Ex. 20 at 4. Illumina rejects the references that
27 CGI argues invalidate various claims of the ‘597 patent, and maintains that there are genuine issues
28 of material fact regarding the invalidity of the claims that must be heard by a jury.

1 The Court will address each prior art reference as it relates to the ‘597 patent.

2
3 **1. Southern**

4
5 CGI argues that the Southern prior art reference anticipates or makes obvious claims 1, 9, 10,
6 14, 15, and 17-19 of the ‘597 patent. Illumina contests only claims 14 and 15 as not anticipated or
7 made obvious by Southern. Opp. at 13-16. During the Applera litigation, Illumina stipulated to “a
8 finding that the Southern reference . . . renders Claim 1 of the ‘597 patent invalid.” Mot. Ex. 12, at
9 2. Neither party claims that this stipulation has a preclusive effect.

10 Illumina argues that Dr. Macevicz was diligent in reducing his invention to practice, and
11 therefore the ‘597 patent antedates Southern, which would eliminate Southern as prior art. Opp. at
12 1-2. Therefore, the Court must first address the issue of Dr. Macevicz’s diligence following his
13 conception of the invention claimed in the ‘597 patent.

14
15 **a. Diligence**

16
17 Dr. Southern’s patent for a method of sequencing by ligation was published on February 9,
18 1995, just over two months before Dr. Macevicz filed his application for the ‘663¹ patent. Mot. at 5.
19 However, it is undisputed that Dr. Macevicz conceived the sequencing-by-ligation method claimed
20 in the ‘597 patent months earlier, in July of 1994, as evidenced by several notebook pages, signed
21 and witnessed by a colleague. Opp. at 4; Supplemental Declaration of Stephen Macevicz in Support
22 of Illumina’s Opposition (“Suppl. Macevicz. Decl.”) ¶ 9 & Ex. A.

23 Under 35 U.S.C. § 102(a), only references published “before the invention” are considered
24 prior art; a reference is not prior art if the inventor conceived the invention before the reference’s
25 publication date, and was diligent in preparing her application for filing, starting from just before the
26 publication date through the date of the filing of the application. Sandt Tech., Ltd. v. Resco Metal &

27
28 ¹ Although the ‘597 patent is at issue here, the ‘663 patent is a sibling patent to the ‘597
patent and was the first application leading to the ‘597 patent. There is no dispute among the parties
that the ‘597 patent receives the priority date of the ‘663 patent.

1 Plastics Corp., 264 F.3d 1344, 1350 (Fed. Cir. 2001). At issue, therefore, is only Dr. Macevicz’s
2 diligence during the period between February 9, 1995 and the filing date of the ‘663 patent
3 application on April 17, 1995.

4 Illumina made no argument in the Applera litigation that Dr. Macevicz could antedate the
5 Southern reference through prior conception and diligence. During the charging conference before
6 Judge Alsup, counsel for Illumina stated that “there is no challenge to swearing behind or diligence
7 or any of that sort of stuff.” Mot. Ex. 10, at 2352. However, during the reexamination of the ‘597
8 patent, Dr. Macevicz submitted a Rule 131 declaration to the PTO describing his work on the
9 application during the spring of 1995 and arguing that his work should antedate Southern: “From at
10 least just before February 9, 1995, until April 17, 1995, I spent a number of evenings and weekend
11 days working on the preparation and filing of the ‘663 application.” Mot. Ex. 16, at 4. The
12 Examiner withdrew the anticipation rejection of claim 1 by Southern. Mot. Ex. 17.

13 In this case, Dr. Macevicz has submitted a declaration describing both his work on the patent
14 application during the relevant two-month period and how busy he was with other obligations.
15 During the relevant period, Dr. Macevicz worked full-time as Senior Patent Counsel at Applied
16 Biosystems, and could only work on the patent application at home during available time on nights
17 and weekends. He describes this period as a “particularly demanding” one at his job, involving
18 preparing, filing, and prosecuting Applied Biosystems’s patent applications, negotiating licensing
19 deals, and supervising in-house and outside attorneys. Opp. at 5, Suppl. Macevicz Decl. ¶¶ 12-15.
20 In addition, Dr. Macevicz was also working as patent counsel to Lynx Therapeutics under a
21 Corporate Services Agreement between Applied Bioystems and Lynx. Id.

22 Dr. Macevicz’s evenings and weekends were not entirely free to work on the ‘663 patent
23 application. He spent much of the critical period drafting and prosecuting patent applications for Dr.
24 Sydney Brenner. Id. ¶ 19. He was the sole patent attorney responsible for preparing and filing five
25 patent applications for Dr. Brenner between July 1994 and April 1995, and he could work on these
26 applications only in the evenings and on weekends, as part of his employment agreement with
27 Applied Biosystems. Id. ¶¶ 20-26. In his declaration, Dr. Macevicz states:

28 My work on Dr. Brenner’s patent portfolio was separate from my work for AB and
Lynx, and just as for my work on my own patent application during this period, I

1 could only work on Dr. Brenner’s patent portfolio in the evening and on weekends.
2 Moreover, during this period, I was obligated to give priority to my work on Dr.
Brenner’s patent portfolio over working on my own patent application.²

3 Id. ¶ 19. Dr. Macevicz also notes that one of the Brenner applications attached as an exhibit to his
4 declaration includes a copy of a personal check for the filing fee, “which indicates that I performed
5 all of my work for Dr. Brenner on my own time and advanced the filing fees from my own funds.”

6 Id. ¶ 23.

7 During the remaining time, Dr. Macevicz claims to have worked diligently on his own patent
8 application. (He also had a wife and two school-age children during this period.) Id. ¶ 27. Dr.
9 Macevicz’s supplemental declaration contains one piece of new information beyond the simple
10 description of evening and weekend work that he submitted to the PTO: metadata from the
11 electronic file containing the draft ‘663 patent application, derived from a Zip disk that Dr.
12 Macevicz had in his personal files. A screenshot of the metadata statistics appears at page 7 of the
13 Opposition. It shows that the file was created on November 6, 1994, and last modified on April 16,
14 1995. Opp. at 7. In addition, the screenshot shows a “revision number” of 71 and a “total editing
15 time” of 2145 minutes, or approximately 35 hours. Id.

16 After a review of this metadata, Dr. Macevicz said that it confirmed his recollection that he
17 “*would* have done the bulk of the work” on the application during the spring of 1995 (emphasis
18 added):

19 This evidence showing that I worked on my application for more than 35 hours is consistent
20 with my recollection of the time that I had available to work on my application. Because I
21 was only permitted to work on my application during available nights and weekends, I can
22 say that I spent most of my available time at night and on the weekends for the two months
preceding the filing date, April 17, 1995 (i.e., the available time on nights and weekends that
I was not working on Dr. Brenner’s patent portfolio) preparing my ‘663 patent application
for filing.

23 Suppl. Macevicz Decl. ¶ 30.

24
25 ² At oral argument, counsel for Illumina argued for the first time that Dr. Macevicz’s work
26 for Dr. Brenner should be considered an “obligation” like his work for Applied Biosystems and Lynx.
27 Counsel stated that Dr. Macevicz was working on the Brenner applications for “Newco,” a company
28 formed to commercialize Dr. Brenner’s inventions, which would become Spectragen, a spinoff of Lynx.
As the Court noted at the hearing, the summary judgment record does not reflect that level of obligation.
Indeed, as cited above, Dr. Macevicz himself described his work as “separate from my work for AB and
Lynx” and stated “I did all of the work on these applications in my spare time (in the evenings and on
weekends) outside of my work for Applied Biosystems.” Suppl. Macevicz Decl. ¶¶ 19, 26.

1 There are several areas requiring analysis here. First: what does the metadata mean about
2 when and how the patent application was worked on, and is it proper corroboration for Dr.
3 Maceviciz’s testimony? Does it show continuous and diligent work during the critical period?
4 Second, what are the implications of Dr. Maceviciz’s workload, both with his two employers and
5 with his contract work with Dr. Brenner, during the critical period?
6

7 **i. Metadata**
8

9 The metadata extracted from the draft patent application file shows that the file was created
10 on November 6, 1994, last modified on April 16, 1995, accessed on September 15, 2000, and printed
11 on April 16, 1995. Opp. at 7. In addition, the screenshot shows a “revision number” of 71 and a
12 “total editing time” of 2145 minutes, or approximately 35 hours. Id. The critical period during
13 which Dr. Maceviciz must have been continuously diligent is from before February 9, 1995 to April
14 17, 1995.

15 Although Illumina maintains that the metadata means that Dr. Maceviciz worked on the
16 application for 35 hours, that is not necessarily accurate; rather, it means that the file was open for
17 approximately 35 hours. Similarly, the number of times it was revised, 71, may include non-
18 substantive revisions such as a date change or adding an extra space. Most importantly, the file was
19 created on November 6, 1994 and last modified on April 16, 1995. In his declaration Dr. Maceviciz
20 says that “*would have* done the bulk of this work in drafting and revising my application during the
21 two-month period preceding the filing of the application,” Suppl. Maceviciz Decl. ¶ 30 (emphasis
22 added). However, the metadata does not necessarily corroborate this statement; it could be that most
23 of the work was done between November 1994 and February 1995, rather than February 1995 and
24 April 1995.

25 The metadata is very specific in some ways but very general in others. There is a record of
26 the date of the creation of the file and the dates it was last modified, accessed, and printed, but
27 nothing in between. And Dr. Maceviciz’s testimony – that he *would have* done the bulk of the work
28 during the critical period – is quite speculative. While it is understandable that Dr. Maceviciz did not

1 testify about exactly when he performed the majority of his work on the application, given the
2 amount of time that has elapsed, the ambiguity of his “would have done” statement means that the
3 metadata is not closely tied to the specific dates at issue. The diligence inquiry depends on
4 particularity of evidence and continuity of effort. For example, in Gould v. Schawlow, the court
5 noted that the inventor had not identified particular activity with particular times during the critical
6 period. Simply stating that there was no time during that period when he did not work on his
7 invention was not enough, without supporting facts, to establish diligence. 363 F.2d 908, 918
8 (C.C.P.A. 1966). The testimony did “not set forth adequate facts to support a finding of that
9 continuity of activity which constitutes reasonable diligence.” Id. The inventor in Gould testified
10 that he took certain days off from his job in order to work on his invention (6.5 days in July, 2 days
11 in August, 3 days in September) but the court called on him establish more precisely “what was
12 done and when it was done;” that he took time off from his regular job did not lead to an inference
13 that he was working on his invention during that time off. Id. at 919. Nor did the testimony of his
14 wife and son supply the necessary details to adequately corroborate diligence: “Their evidence,
15 which was not specific as to dates and facts, does not constitute the kind of corroboratory evidence
16 required to establish [the inventor’s] diligence during the critical period.” Id. at 920. “We may
17 surmise that appellant was probably diligent but mere surmise cannot take the place of proof.” Id. at
18 919 (citing Ireland v. Smith, 97 F.2d 95 (C.C.P.A. 1938)).

19 In D’Amico v. Koike, the Court of Customs and Patent Appeals again declined to draw
20 inferences as to how diligently an inventor worked on a patent application during a period with
21 relatively little record evidence. 347 F.2d 867 (C.C.P.A. 1965). D’Amico has a similar fact pattern
22 to this case, with a 2-month period between an undisputed date of conception and constructive
23 reduction to practice via the filing of the patent application, as well as a sparse record on diligence.
24 Similar too is the speculation of what *would* have happened in the normal course of things (the
25 attorney in charge of the application *would* normally have prepared the finished application and
26 done a final check):

27 The gist of appellant’s arguments seems to be that, notwithstanding failure of the record to
28 show specific acts to have been done by named persons on known days, the record does
establish reasonable diligence for a period of two months by reason of its showing that work
remained to be done on the application on September 23, and that somebody obviously did it

1 and extra side jobs and busy lives and still be considered diligent on their own inventions are mostly
2 “excuse” and “hardship” cases that do not support Illumina’s claim of diligence here.

3 In Courson v. O’Connor, another case with a two-month critical period, the court noted that
4 the inventor’s regular job had slowed his work on the application and that the “circumstances
5 surrounding the inventor must be taken into account.” 227 F. 890, 894 (7th Cir. 1915). Those
6 circumstances included supervising nearly 3000 men at a railroad shop and being able to devote only
7 his spare time, rather than his employer’s time, to his inventions. Id. Dr. Macevicz also had
8 pressing job duties. However, the Courson court seems to have been convinced more by the
9 hardship required by travel to consult patent attorneys than by the inventor’s schedule. The Courson
10 inventor had hired patent attorneys fifteen miles away and had a hard time finding the time to meet
11 with them; travel of fifteen miles in 1908 - 09 was a significant hardship. Id. Further, his patent
12 attorneys were delayed and the draftsman he used to do the drawings was competent but
13 inexperienced, and the drawings took longer than expected. These factors go beyond an inventor
14 having a lot on his plate.

15 There are a number of cases where courts have accepted excuses to the diligence
16 requirement, and a number that show “that courts may consider the reasonable everyday problems
17 and limitations encountered by an inventor.” Griffith v. Kanamaru, 816 F.2d 624, 626 (Fed. Cir.
18 1987). Such everyday problems include: a delay of three weeks following the illness of the
19 inventor’s father (Reed v. Tornqvist, 436 F.2d 501 (C.C.P.A. 1971)); a delay in filing to produce an
20 appropriate receiver to test a component for a color television (Keizer v. Bradley, 270 F.2d 396
21 (C.C.P.A. 1959)); and confusion related to World War II (Texas Co. v. Globe Oil & Refining Co.,
22 112 F. Supp. 455 (N.D. Ill. 1953)). Indeed, job demands can be an element of excusable delay. See
23 Courson, 227 F. 890, 894 (“The exercise of reasonable diligence in preparing and filing his
24 application does not require an inventor to devote his entire time thereto, or to abandon his ordinary
25 means of livelihood.”). However, CGI argues persuasively that the implications of Dr. Macevicz’s
26 busy professional life are quite different: by prioritizing other work over the ‘663 patent application,
27 particularly his contract work for Dr. Brenner, Dr. Macevicz did not act diligently, but instead
28 voluntarily set aside his own work in favor of someone else’s, outside of the bounds of his normal

1 professional obligations. Reply at 7-8. CGI cites Griffith v. Kanamaru, in which an inventor
2 acknowledged that he frequently put his work on the invention aside in order to work on other
3 experiments, at the request of his employer. 816 F.2d 624, 626-29 (Fed. Cir. 1987). The court held
4 that the invention was “second and often third priority” for the inventor, and therefore he could
5 establish neither diligence nor a sufficient excuse for his lack of activity. Id. at 629.

6 Other cases also hold that an inventor’s other obligations do not provide sufficient excuse for
7 a lack of diligence. In Morway, Beerbower, & Zimmer v. Bondi, the court notes that the inventors
8 and members of their research team “had many other projects and duties. . . . When the party first to
9 conceive voluntarily lays aside his inventive concept because he is engrossed in pursuit of other
10 projects, this is generally not an acceptable excuse for failure to act diligently in reducing to
11 practice.” 97 U.S.P.Q. 318, 323 (C.C.P.A. 1953). Dr. Macevicz was certainly engrossed in pursuit
12 of other projects, notably for his employer and for Lynx, but also for Dr. Brenner. In Feinberg v.
13 Cowen, the inventor of a clamp for holding glass plates said that he was so busy earning a living as a
14 plate glass salesman and opening several music schools that he didn’t have time to work on the
15 invention. 1907 WL 19764, at *1 (App. D.C. Feb. 5, 1907). The court noted that the inventor had
16 borrowed the substantial sum of \$3,000 to start a new business, the music schools, but that he
17 refused to pay a nominal amount to have samples of his invention fabricated. The court concluded
18 that the inventor’s lack of diligence “throws some light on his subsequent conduct, and leads to the
19 conclusion that until late in 1904 he did not regard his invention as of sufficient importance to
20 warrant the expenditure of either time or money.” Id. Dr. Macevicz’s professional activities were
21 not so varied as those of the plate glass salesman/music school manager in Feinberg, but his
22 prioritization of several other professional projects over his own invention is similar. Dr.
23 Macevicz’s own invention was at the bottom of his priority list, and as Feinberg makes clear, that
24 cannot support a finding of diligence.

25 Illumina argues that the “reasonable diligence” requirement does not extend to the entire
26 two-month period in the spring of 1995, but rather to Dr. Macevicz’s “available time on nights and
27 weekends during those two months.” Opp. at 9. Illumina cites no authority for this proposition, and
28 it seems inconceivable that such a statement of the rule could be accurate. If an inventor could chip

1 away at the time during the critical period in which he had to establish diligence, eliminating those
2 times when he was at work or in class or at a baseball game, the exceptions would swallow the rule.
3 The inquiry already takes into account that inventors have jobs and families, and must eat and sleep,
4 but to take on “moonlighting” and prioritize that above one’s own invention seems a bridge too far.
5 See Creative Compounds, LLC v. Starmark Labs, 651 F.3d 1303, 1312-13 (Fed. Cir. 2011) (“Merely
6 asserting diligence is not enough; a party must account for the entire period during which diligence
7 is required.”) (internal quotations omitted). It would be a strange diligence analysis that allowed as
8 an excuse for delay or lack of diligence the fact that the invention was the last professional priority
9 of the inventor. To the extent that Dr. Macevicz simply had a demanding regular full-time job, that
10 would be a sufficient excuse to get past the summary judgment stage. But his decision to take on the
11 work from Dr. Brenner and specifically prioritize it over his own patent work during the rare times
12 when he had time to devote to non-Applied Biosystems, non-Lynx projects belies his diligence
13 arguments.

14 Illumina cites Boston Scientific Corp. v. Cordis Corp. to support its argument that the Court
15 should not deal with the diligence issue at the summary judgment stage: “In Boston Scientific . . .
16 this Court denied summary judgment in similar circumstances because the diligence issue is
17 'concerned with whether a party exercised reasonable diligence, and such reasonableness
18 determinations are [a] standard task for the trier of fact.’” Opp. at 11 (quoting 422 F. Supp. 2d 1102,
19 1113-14 (N.D. Cal. 2006)). In that case, plaintiffs sued defendants for infringement of patents on
20 methods and devices used for treating aneurysms. The court had granted plaintiffs’ motion for
21 summary judgment of literal infringement of the '415 patent, and later denied defendants' motion for
22 summary judgment of invalidity of that same patent. Plaintiffs moved for summary judgment of
23 validity. 422 F. Supp. 2d at 1104. The court addressed whether defendant was entitled to an
24 affirmative defense of invalidity based on priority of inventorship, requiring defendant to provide
25 clear and convincing evidence that: a) defendant conceived the idea at issue, the date of that
26 conception, and that the date preceded plaintiffs' conception; b) that defendant reduced its invention
27 to practice and the date it did so; and c) that the period of time between conception and reduction to
28 practice was reasonable. Defendant presented a series of memos, meeting agendas, letters, and a

1 privilege log showing work on the patent applications as early as April of 1995, before plaintiffs
2 conceived of their device. Id. at 1113. The court found that defendant could, if believed by a trier
3 of fact, prove by clear and convincing evidence the earlier conception date. Id.

4 The court then addressed diligent reduction to practice. Plaintiffs argued that the testimony
5 of the researchers and the memoranda cited above were insufficiently specific to establish diligence,
6 particularly because of an absence of lab notebooks (the lab notebooks were the property of
7 University of California and could not be obtained). Id. Having found a material dispute as to the
8 date of conception, the court declined to reach the issue of diligence, noting that “the diligence
9 inquiry is concerned with whether a party exercised reasonable diligence, and such reasonableness
10 determinations are standard task for the trier of fact.” Id. at 1113-14.

11 By contrast to Boston Scientific, where the threshold issue, the date of conception, was in
12 dispute, here there is no such dispute. And while diligence may at times turn on matters of disputed
13 fact that should be decided by a jury, here the undisputed facts do not support the requisite diligence
14 on the part of Dr. Macevicz under the correct legal standard. The evidence does not show the
15 continuity of activity needed for diligence, because the testimony is so vague and the metadata from
16 the application file does not provide sufficient support. The specificity of some of the information
17 (number of hours the file was open; number of times the file was revised) does not correspond to the
18 kind of specificity called for in a diligence inquiry (specific acts at specific times). The caselaw
19 does not support Dr. Macevicz’s decision to prioritize work for another inventor (not his regular
20 full-time employer) above his own during nights and weekends.

21 Because the court has found that Dr. Macevicz was not diligent in pursuing his patent
22 application, the ‘597 patent does not antedate Southern, and Southern is prior art. Therefore, the
23 Court must determine whether Southern anticipates or makes obvious the claims of the ‘597 patent.

24
25 **b. Anticipation and Obviousness of the ‘597 Patent by Southern**

26
27 Because the Court has concluded that Dr. Macevicz did not act with reasonable diligence in
28 pursuing his patent application, the Southern reference, published on February 8, 1995, is prior art.

1 The parties do not dispute that Southern anticipates or makes obvious many of the claims of the '597
2 patent, including claim 1, the method claim, as well as claims 9, 10, and 17-19. Opp. at 13-14;
3 Reply at 10. The Court will briefly discuss Southern's anticipation of claim 1 before proceeding to
4 the analysis of claims 14 and 15, which depend from claim 1 and which are in dispute. As discussed
5 above, Claim 1 of the '597 patent is separated into a preamble and three separate steps:

- 6
- 7 1. A method for identifying a sequence of nucleotides in a polynucleotide, the method
8 comprising the steps of:
- 9 a) extending an initializing oligonucleotide along the polynucleotide by ligating an
10 oligonucleotide probe thereto to form an extended duplex;
 - 11 b) identifying one or more nucleotides of the polynucleotide; and
 - 12 c) repeating steps a) and b) until the sequence of nucleotides is determined.
- 13

14 Southern discloses a method for identifying a sequence of nucleotides in a polynucleotide, as
15 required by the preamble to Claim 1 of the '597 patent. Metzker Decl. ¶ 31. It discloses ligating an
16 oligonucleotide probe to an initializing oligonucleotide to form an extended duplex, as described in
17 step (a). Southern, 14:31-15:10. It discloses removing the label of the ligated nucleotide probe and
18 analyzing it to determine the sequence of bases in that probe, which anticipates step (b). Southern,
19 15:11-13; Metzker Decl. ¶¶ 38-40. Finally, Southern discloses a repeating step that encompasses
20 successive ligation, one of the forms of repeating included by the Court in its claim construction
21 order. Southern, 19:20-24; Metzker Decl. ¶¶ 41-43.

22 Illumina disputes CGI's claim that Southern anticipates or makes obvious claims 14 and 15,
23 which relate to fluorescent labels. Claim 14 states "The method of claim 1, wherein the
24 oligonucleotide probe comprises a label which results in a spectrally resolvable fluorescent signal."
25 The Court construed "spectrally resolvable fluorescent signal" to mean "a light signal generated by
26 fluorescence which can be detected based on its spectral characteristics (e.g., its color)." Docket No.
27 122 at 53. Claim 15 states: "The method of claim 14, wherein the identity of one or more
28 nucleotides of the polynucleotide is correlated to a distinct color of the spectrally resolvable

1 fluorescent signal.” Id.

2 Southern discusses fluorescence twice. First, in discussing the advantages of mass
3 spectrometry as a detection system, Southern notes that "mass-labeling combines advantages of
4 radioactivity and fluorescence and has additional attributes which suggest novel applications."
5 Southern at 3:22-24. Later, Southern discusses the drawbacks of existing array-based detection
6 methods, stating that “Of present detection methods, radioactivity has high sensitivity but poor
7 resolution, fluorescence has low sensitivity and high resolution; both are relatively slow. The
8 proposal to use mass spectrometry could improve resolution, speed and sensitivity, as well as adding
9 the potential to read the sequences of tags.” Southern at 23:4-11.

10 CGI argues that while Southern teaches that mass labels are the preferred method of labeling,
11 it also discloses the use of a single tag and fluorescently labeled oligonucleotide probes. Southern,
12 3:22-24, 23:5-11; Metzker Decl. ¶ 46. The Southern abstract states: “The tag moiety consists of *one*
13 *or more reporter groups* distinguishable by mass and thus capable of being analysed by mass
14 spectrometry.” Southern, 2:33-35 (emphasis added). Southern also states that “a tag moiety
15 comprising one or more reporter groups” can determine the “analyte residue” as part of a reagent.
16 Southern, 1:23-33. CGI further argues in the alternative that Southern’s disclosure of a single tag, in
17 combination with the Brenner reference’s use of fluorescent labels with colors tied to particular
18 nucleotides, makes the use of fluorescence in claims 14 and 15 obvious. Reply at 11. It is
19 undisputed that Brenner discloses fluorescent labels; claim 14 of the ‘597 patent is identical to the
20 relevant portion of the Brenner patent. See Metzker Decl. ¶ 82; Brenner 15:63-16:9.

21 Illumina counters that Southern’s method requires “mass tags” and teaches away from using
22 fluorescence because Southern only disclosed its disadvantages. It cites In re Gurley for the
23 proposition that when a prior-art reference “suggests that the line of development flowing from the
24 reference’s disclosure is unlikely to be productive of the result sought by the applicant,” that
25 reference teaches away from the invention. 27 F.3d 551, 553 (Fed. Cir. 1994). In addition, “[a]n
26 inference of nonobviousness is especially strong where the prior art’s teachings undermine the very
27 reason being proffered as to why a person of ordinary skill would have combined the known
28 elements.” DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc., 567 F.3d 1314, 1326 (Fed. Cir.

1 2009). Illumina also objects to CGI’s contention that because fluorescent labels were extremely
2 common and usually directly correlated to a particular nucleotide, they were obvious for purposes of
3 an invalidity analysis. Opp. at 15-16. Further, Illumina points out that there is no evidence that
4 Brenner’s detection method, which focuses on enzyme cleavage, could be used in Southern’s very
5 different mass-tag method, or vice versa. Opp. at 16-17, Backman Decl. ¶ 36.

6 As discussed above, a reference anticipates a patent claim under section 102(b) if it discloses
7 and enables each and every element of the claimed invention, either explicitly or inherently. In re
8 Gleave, 560 F.3d 1331, 1334 (Fed. Cir. 2009), Schering Corp. v. Geneva Pharms., Inc., 339 F.3d
9 1373, 1377 (Fed. Cir. 2003) (“Moreover, a prior art reference may anticipate without disclosing a
10 feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in
11 the single anticipating reference.”). Because the Court can resolve the issue of invalidity based on
12 obviousness, the Court need not reach the issue of anticipation.

13
14 **i. Obviousness of Claims 14 and 15 of the ‘597 Patent from**
15 **Prior Art References Southern and Brenner**
16

17 As discussed above, the standard for obviousness is whether the differences between the
18 subject matter sought to be patented and the prior art are such that the subject matter as a whole
19 would have been obvious at the time the invention was made to a person having ordinary skill in the
20 art. KSR Int’l Co. v. Teleflex, Inc., 550 U.S. 398, 405 (2007). Obviousness under 35 U.S.C. § 103
21 is a question of law based on underlying facts, including the scope and content of the prior art,
22 differences between the prior art and the claimed invention, the level of ordinary skill in the art, and
23 any relevant secondary considerations. See Kinetic Concepts, Inc. v. Smith & Nephew, 688 F.3d
24 1342, 1360 (Fed. Cir. 2012); Power-One v. Artesyn Techs., 599 F.3d 1343, 1351-52 (Fed. Cir.
25 2010). When the underlying facts are not in dispute, summary judgment is appropriate. See KSR,
26 550 U.S. at 427 (“Where, as here, the content of the prior art, the scope of the patent claim, and the
27 level of ordinary skill in the art are not in material dispute, and the obviousness of the claim is
28 apparent in light of these factors, summary judgment is appropriate.”).

1 The two prior art references at issue here are Southern and Brenner. The Court will address
2 the factors underlying the obviousness analysis below, in particular the scope and content of the
3 Southern reference and whether Southern “teaches away” from the fluorescence of the ‘597 patent,
4 as well as whether Brenner and Southern can be combined to make claims 14 and 15 of the ‘597
5 patent obvious. There is no dispute as to the scope and content of the Brenner reference as it
6 pertains to Claims 14 and 15: the relevant claim in Brenner is virtually identical to claim 15 of the
7 ‘597 patent. Opp. at 15-16. In addition, the parties acknowledged at oral argument that there was
8 no dispute as to the level of ordinary skill in the art.

9

10 **A. Teaching Away and the Scope and Content of Southern**

11

12 If a prior art reference "teaches away" from an invention, that invention is not made obvious
13 by the prior art. 2-5 Chisum on Patents § 5.03. "A reference may be said to teach away when a
14 person of ordinary skill, upon reading the reference, would be discouraged from following the path
15 set out in the reference, or would be led in a direction divergent from the path that was taken by the
16 applicant. . . . [I]n general, a reference will teach away if it suggests that the line of development
17 flowing from the reference's disclosure is unlikely to be productive of the result sought by the
18 applicant." In re Gurley, 27 F.3d 551, 553 (Fed. Cir. 1994). Prior art references often include
19 observations about particular techniques or inventions, whether positive, neutral, or negative. As
20 those observations get more negative, courts are more likely to find that the reference teaches away.

21

22 The standard for how discouraging and negative a reference must be about an invention for
23 the reference to teach away is quite high, as illustrated by DePuy Spine, Inc. v. Medtronic Sofamor
24 Danek, Inc., 567 F.3d 1314 (Fed. Cir. 2009). That case dealt with polyaxial pedicle screws
25 used for spinal surgeries. Id. The defendant produced two references that it argued rendered the
26 claim obvious. The plaintiff countered that one of those references taught away from the rigid screw
27 embodied in the claim, because that reference, Puno, warned that rigidity increases the likelihood
28 that the screw would fail inside the body, making the device inoperative for its intended purpose.
567 F.3d at 1326-27. The appeals court concluded that:

1 Puno *does not merely express a general preference* for pedicle screws having a ‘shock
2 absorber’ effect. Rather, Puno *expresses concern for failure* and states that the shock
3 absorber feature ‘decreas[es] the chance of failure of the screw or the bone-screw interface.’

4 Id. at 1327 (emphasis added) (internal citations omitted). This warning of complete device failure
5 prompted the court to affirm the district court’s holding that Puno taught away from the rigid pedicle
6 screw in the claim, such that a person of ordinary skill would have been deterred from combining
7 Puno and the other reference. *Id.* at 1328. In another case, the Federal Circuit affirmed that claims
8 were not obvious where a jury heard expert testimony that prior art taught away from the claimed
9 structure by describing features of the structure as “potentially harmful.” Cordis Corp. v. Boston
10 Scientific Corp., 561 F.3d 1319, 1332 (Fed. Cir. 2009). Southern’s teaching that mass tags are
11 superior to fluorescent tags is a far cry from the warning of complete device failure in DePuy or
12 potential harm in Cordis Corp.

13 By contrast, when a reference explores several alternatives, courts generally do not find that
14 the reference teaches away from an invention that uses one of the alternatives. For example, in
15 Bayer Schering Pharma AG v. Barr Labs., Inc., the plaintiff argued that the prior art taught away
16 from using a micronized form of contraceptive medication in a tablet, while the defendant argued
17 that the prior art taught away from using an enteric coating for the tablet. 575 F.3d 1341, 1349 (Fed.
18 Cir. 2009). The Federal Circuit concluded that in presenting these offsetting “teach away”
19 arguments, the parties presented the options available to a pharmaceutical formulator having
20 ordinary skill to solve the problem: “[A] person having ordinary skill in the art has reached a
21 crossroads where he must choose between two known options.” *Id.* at 1350. The court held that the
22 invention would have been obvious.

23 The analysis becomes more nuanced when a reference makes a somewhat negative statement
24 about an invention or technique, but falls short of warning against its use as completely ineffective
25 or dangerous. A reference that recognizes deficiencies in a technique, or even states that a
26 technique is inferior but usable, does not necessarily teach away from that technique. In re Gurley,
27 27 F.3d 551 (Fed. Cir. 1994). In that case, the applicant claimed a bendable epoxy-based printed
28 circuit material that maintained its shape, and the PTO rejected the claim as obvious in view of
 Yamaguchi. The material claimed in Yamaguchi was similar, but Yamaguchi used a different resin

1 than the claimed epoxy resin. Yamaguchi indicated that epoxy "had relatively acceptable
2 dimensional stability" and "some degree of flexibility," but that epoxy was inferior to his resin
3 boards. Id. at 553. After the PTO rejected the claim, the applicant argued that Yamaguchi taught
4 away from using the epoxy resin, and therefore could not be used to show this his claim was
5 obvious. The court rejected his argument:

6 We share [applicant's] view that a person seeking to prove the art of flexible circuit boards,
7 on learning from Yamaguchi that epoxy was inferior to polyester-imide resins, might well be
8 led to search beyond epoxy for improved products. However, Yamaguchi also teaches that
9 epoxy is usable and has been used for [applicant's] purpose. The Board recognized
10 Yamaguchi's teaching of the deficiencies of epoxy-impregnated material, but observed that
11 [applicant] did not distinguish his epoxy product from the product described by Yamaguchi. .
12 . . . *Even reading Yamaguchi's description as discouraging use of epoxy for this purpose,*
13 *[applicant] asserted no discovery beyond what was known to the art."*

14 Id. at 553 (emphasis added).

15 The situation here with fluorescent labels is somewhat similar. Southern teaches that
16 fluorescent tags are inferior to mass tags, because fluorescence has low sensitivity and is relatively
17 slow, but also that fluorescent tags are usable and have been used for the applicant's purpose.
18 Southern specifically refers to fluorescence as a "present detection method." Southern at 23:4.
19 Even if Southern discouraged the use of fluorescent tags for this purpose, claims 14 and 15 of the
20 '597 patent, which disclose fluorescent tags, do not appear to go "beyond what was known to the
21 art," in the words of the Gurley court. It is undisputed that Brenner, which was filed in July of 1994,
22 before the '597 patent, disclosed fluorescent tags (using the same language that Dr. Macevicz used
23 in claims 14 and 15). Mot. at 23. It is clear that fluorescent tags were "known to the art" at the time
24 of the '597 patent.

25 Also informative is In re Inland Steel Co., where the Federal Circuit held that a reference that
26 taught a variation to achieve an optimal result did not teach away from the claimed invention. 265
27 F.3d 1354 (Fed. Cir. 2001). The applicant's claims related to the production of cold-rolled electrical
28 steel. The claim required the addition of antimony and the avoidance of annealing during a "hot
band" period of processing, in order to avoid a problem in prior art methods. Two prior art
references showed aspects of the claims: one primary reference showed all the claimed steps except
for the antimony, while a secondary reference, Irie, showed the addition of antimony to improve
electrical properties. Id. at 1358. The patent owner argued that the secondary reference taught the

1 use of antimony only in combination with hot-band annealing, which his patent specifically rejected.

2 The court affirmed the PTO's rejection of the claims as obvious.

3 The fact that Irie teaches that annealing in addition to adding antimony produces optimal
4 results does not negate Irie's additional teaching that adding antimony is effective even in
5 non-annealed steel. See In re Boe, 355 F.2d 961, 965 (C.C.P.A. 1966) (all of the disclosures
6 in a reference, including non-preferred embodiments, "must be evaluated for what they fairly
7 teach one of ordinary skill in the art"); Merck & Co. v. Biocraft Labs., 874 F.2d 804, 807
8 (Fed. Cir. 1989) ("The fact that a specific [embodiment] is taught to be preferred is not
controlling, since all disclosures of the prior art, including unpreferred embodiments, must be
considered") (quoting In re Lamberti, 545 F.2d 747, 750 (C.C.P.A. 1976)). *The absence of a
further advantage that Irie associates with annealing is not a 'disadvantage,'* as [the
applicant] suggests, and therefore Irie cannot be regarded as teaching away from the use of
antimony in non-annealed steel. 265 F.3d 1354, 1361 (Fed. Cir. 2001).

9 Id. at 1361 (emphasis added).

10 In this case, Southern does not cite fluorescence and radiation as preferred embodiments.

11 Fluorescence and radiation are, however, disclosed in the patent. As the Inland Steel court noted,
12 quoting In re Lamberti, all disclosures of the prior art must be considered in an obviousness
13 analysis. 265 F.3d at 1361. Disclosed examples and preferred embodiments do not constitute a
14 teaching away from a broader disclosure or nonpreferred embodiments. In re Susi, 440 F.2d 442
15 (C.C.P.A. 1971). "A known or obvious composition does not become patentable simply because it
16 has been described as somewhat inferior to some other product for the same use." In re Gurley, 27
17 F.3d 551, 554 (Fed. Cir. 1994). Similarly, here, fluorescent tags have only been described as
18 "somewhat inferior" to another product, mass tags, for the same use, DNA sequencing.

19 As discussed above, Dr. Backman also emphasizes that mass tags add the ability to obtain
20 "sequence reads" from the tags – the ability to read multiple bases at once, not just a single base, as
21 is possible with fluorescent tags. Backman Decl. ¶ 29. It is undisputed that Southern says that mass
22 tags are better. Southern discusses sequence reads in the context of the improvements that mass tags
23 make on currently used detection technologies, including fluorescence and radiation. One of those
24 improvements is being able to read multiple bases at once. But a statement that a new technique
25 would be an improvement on a currently existing technique does not teach away from the use of that
26 existing technique without a more profound criticism. See, e.g., In re Fulton, 391 F.3d 1195, 1201
27 (Fed. Cir. 2004) (A reference does not teach away if it merely expresses a general preference for an
28 alternative invention but does not "criticize, discredit, or otherwise discourage" investigation into

1 the invention claimed.)

2 Here, it is undisputed that the scope and content of Southern includes fluorescence. Southern
3 refers to fluorescence as a “present detection method. Southern at 23:4. Dr. Backman’s assertion
4 that Southern teaches away from fluorescence fails as a matter of law, because as discussed above, a
5 statement that one disclosed method is preferred to another is not sufficient to teach away. In
6 addition, Southern’s preference for mass tags over fluorescent tags does not rise even close to the
7 level of criticism held to constitute “teaching away” in DePuy and Cordis. In the next section, the
8 Court will discuss whether Southern can be combined with the specific fluorescent tags disclosed in
9 Brenner to make claims 14 and 15 of the ‘597 patent obvious, or whether the combination would be
10 inoperable.

11
12 **B. Motivation to Combine the Southern and**
13 **Brenner References**
14

15 Although Southern addresses fluorescent tags as part of the current state of the art, that
16 general discussion is arguably not enough, at the summary judgment stage, to completely anticipate
17 claims 14 and 15 of the ‘597 patent. The Court need not decide this issue, however, because it can
18 resolve invalidity based on obviousness. CGI contends that Southern’s disclosure of a single tag, in
19 combination with the Brenner reference’s use of fluorescent labels with colors tied to particular
20 nucleotides, makes the use of fluorescence in claims 14 and 15 obvious. Reply at 11. It is
21 undisputed that Brenner discloses fluorescent labels; claim 14 of the ‘597 patent is identical to the
22 relevant portion of the Brenner patent, see Metzker Decl. ¶ 82; Brenner 15:63-16:9. To combine
23 references for a finding of obviousness, a court considers whether the prior art references are in the
24 same field of endeavor, whether there is a motivation to combine the references, and whether any
25 secondary considerations of nonobviousness exist and are significant. Wyers v. Master Lock Co.,
26 616 F.3d 1231 (Fed. Cir. 2010). The Wyers court held that even in the absence of expert testimony
27 about motivation to combine references, courts can make a common-sense determination to combine
28 the prior art to find patent claims obvious. Id. at 1239-40 (“[T]he legal determination of

1 obviousness may include recourse to logic, judgment, and common sense, in lieu of expert
2 testimony.”). This is in line with the Supreme Court’s directive in KSR Int’l Co. v. Teleflex, Inc. to
3 take a more “expansive and flexible approach” in determining obviousness. 550 U.S. 398, 415
4 (2007). While motivation to combine is still a question of fact, it “may nonetheless be addressed on
5 summary judgment or JMOL in appropriate circumstances.” Wyers, 616 F.3d at 1239.

6 Here, it cannot be disputed that Brenner and Southern are in the same field of endeavor,
7 DNA sequencing, and there are no significant secondary considerations of nonobviousness. The
8 main issue, therefore, is whether there is a motivation to combine the references. The parties focus
9 their arguments on whether a combination of Brenner and Southern would yield an inoperable
10 device, and therefore teach away from the invention of the ‘597 patent. See In re Lucas S. Gordon,
11 733 F.2d 900, 902 (Fed. Cir. 1984) (reversing the PTO’s rejection of claims where the PTO found
12 that turning the prior art reference upside down would render the claim obvious; the prior art
13 reference disclosed a strainer that required gravity to separate dirt and water from gasoline and
14 therefore could not be operated upside down). Illumina argues that combining Southern with
15 Brenner’s fluorescent tags would create an inoperable device, and therefore teaches away from the
16 invention. However, the ability to physically combine references is not the heart of the inquiry.
17 Indeed, courts have consistently held that the test for combining references is not whether the
18 features of one may be “bodily incorporated” into the other, but rather, whether the combined
19 teaching renders the claim at issue obvious. Application of Wood, 599 F.2d 1032, 1036-37
20 (C.C.P.A. 1979); In re Billingsley, 279 F.2d 689 (C.C.P.A. 1960) (“[I]t is not necessary in
21 combining references that it should be possible to substitute features of one physically in the
22 structure of the other. It is sufficient if, taken together, the references would suggest doing what the
23 applicant has done.”)

24 Illumina cites In re Sponnoble, 405 F.2d 578, 587 (C.C.P.A. 1969), dealing with center seal
25 plugs. In that case, the prior art reference disclosed a frictionally induced rolling action that would
26 have been incapable of serving the applicant's purpose, which was to have the center seal slide
27 against the glass. As the court observed, unlike the frictional properties in the prior art, “a sliding
28 engagement is absolutely essential to operability of appellant’s center seal plug.” Id. In addition,

1 the material would have been nearly impossible to seat in the appellant's design. Id. The court
2 concluded that the invention was not obvious in light of the prior art, noting that the inoperability of
3 the suggested combination was bolstered by evidence of commercial success and the failure of other
4 inventions in the field to solve the longstanding problem addressed by the inventor. Id. However,
5 as the dissent correctly noted, it is "not necessary in a combination rejection that the structure of one
6 reference be substituted bodily in that of the reference with which it is combined," citing In re
7 Billingsley, 279 F.2d 689 (C.C.P.A. 1960). Id. at 588.

8 Sponnoble stands for the proposition that if the prior art combines with the current invention
9 to make an inoperable device, the prior art teaches away, and can support non-obviousness,
10 especially if combined with other evidence such as successful commercialization of the invention
11 (absent here). However, the obviousness inquiry does not depend on whether the inventions are
12 identical or every piece would work perfectly with every other piece. The inquiry is whether, to a
13 person of ordinary skill in the art, it would be obvious to take a certain step. For example, in In re
14 Keller, the court upheld a Board decision that it would have been obvious to include a digital timing
15 circuit in a cardiac pacemaker, despite the patentholder's argument that one of the prior art
16 references taught the use of digital timing circuits and other references used R-C-type timing
17 circuits. 642 F.2d 413, 425 (C.C.P.A. 1981). The court stated:

18 To justify combining reference teachings in support of a rejection it is not necessary that a
19 device shown in one reference can be physically inserted into the device shown in the other.
20 The test for obviousness is not whether the features of a secondary reference may be bodily
21 incorporated into the structure of the primary reference; nor is it that the claimed invention
22 must be expressly suggested in any one or all of the references. Rather, the test is what the
23 combined teachings of the references would have suggested to those of ordinary skill in the
24 art.

25 Id.

26 For example, in Application of Wood, the court upheld the rejection of an application for a
27 variable venturi apparatus for mixing and modulating fuel and air for an internal combustion engine.
28 599 F.2d 1032 (C.C.P.A. 1979). The Board had affirmed the examiner's determination that the
invention was obvious, because teachings of subsonic variable venturi carburetors concerning
alternative mechanisms for varying flow area in the throat of the venturi could be combined with a
prior art reference that concerned pollution reduction. Id. at 1036. The applicant argued that the
two references could not be combined because it was impossible to physically combine them: one

1 involved subsonic speeds and the other involved sonic speeds. Id. The court held that this argument
2 was irrelevant, because the “test for obviousness is not whether the features of one reference may be
3 bodily incorporated into another reference. Rather, we look to see whether combined Teachings
4 render the claimed subject matter obvious.” Id. at 1036-37.

5 Dr. Backman, Plaintiff’s expert, argues that the combination of Southern with a fluorescent
6 label would render Southern inoperable because a fluorescent label is only capable of identifying
7 one base at a time, and Southern’s method using mass tags can identify up to six bases at a time by
8 reading a single tag by mass spectroscopy. Opp. at 16; Backman Decl. ¶¶ 29-36. It is undisputed
9 that Southern discloses mass spectrometry, and taking all inferences in favor of Illumina as the non-
10 moving party, the Court will assume that the mass spectrometer used in Southern cannot be used to
11 read fluorescent tags. However, that fact does not by itself render claims 14 and 15 of the ‘597
12 patent non-obvious. Obviousness is a question of law with factual underpinnings, and Dr.
13 Backman’s conclusion that Southern would be inoperable if used with fluorescent labels is premised
14 on an error of law – the assumption that it must be possible to physically combine and incorporate
15 all elements from multiple references. As Billingsley, Wood, and Keller instruct, the features of one
16 invention need not be “bodily incorporated” into the other for the references to make a claim
17 obvious. In determining whether Southern, or Southern in combination with Brenner, makes
18 obvious claims 14 and 15 of the ‘597 patent, the inquiry is not whether fluorescent tags can be run
19 through a mass spectrometer. Rather, the questions is whether a person of ordinary skill in the art,
20 reviewing a method that discusses fluorescent tags as one aspect of the current state of the art of
21 DNA sequencing, or looking at that reference in combination with a reference that disclosed
22 fluorescent tags, would find claims disclosing fluorescent tags in DNA sequencing obvious.

23 Further, the ‘597 patent does not have to be operationally identical to Southern or Brenner in
24 terms of the apparatus used for the DNA sequencing for the prior art references to make a particular
25 claim of the ‘597 patent obvious. In In re ICON Health & Fitness, the patent at issue concerned a
26 treadmill with a folding base. The PTO found, and the court affirmed, that the claim would have
27 been obvious in light of a combination of two prior art references, one of which showed a folding
28 treadmill with all the claim limitations apart from a gas spring, and the other which showed a spring

1 mechanism for a folding bed. 496 F.3d 1374, 1382 (Fed. Cir. 2007). The patent owner argued that
2 the folding bed reference taught away from his claim because the spring would overpower the
3 treadmill mechanism, rendering it inoperable, but the court held that a person skilled in the art would
4 make appropriate modifications to the device. Id. That a folding bed can be prior art for a folding
5 treadmill shows that a prior art reference can look very different or have a different focus from an
6 invention and still make that invention obvious.

7 Dr. Backman also discusses Southern's ability to read multiple bases at a time, what he calls
8 "sequence reads." Backman Decl. ¶ 28. In one of the passages in which it discusses fluorescence,
9 Southern notes that its proposal to use mass spectrometry could improve on present detection
10 methods, "as well as adding the potential to read the sequences of tags." Id. Dr. Backman states that
11 because of these sequence reads, which are impossible to obtain using fluorescence, Southern
12 teaches away from fluorescence. Id. ¶¶ 29-31. At the summary judgment stage, the Court assumes
13 that Dr. Backman is correct that fluorescent tags cannot be used to read sequences of bases.
14 However, as discussed above, that does not mean that Southern teaches away from fluorescent tags
15 or that it cannot make the '597 patent obvious. While it is true that fluorescent labels cannot be used
16 to determine more than one base at a time, Southern itself says that its method can be used on a
17 single base at a time. It is undisputed that Southern anticipates claim 1 of the '597 patent, including
18 step (b) "identifying one or more nucleotides of the polynucleotide." See Metzker Decl. ¶¶ 37-38.
19 The "one or more nucleotides" means single or multiple bases.

20 Dr. Backman focuses on the improvements that Southern made in the state of the art -- using
21 mass spectrometry, being able to read multiple bases at once -- but those improvements do not mean
22 that Southern cannot make obvious, either by itself or in combination with another reference, claims
23 14 and 15 of the '597 patent. Although Dr. Backman may be correct in his observation that the
24 fluorescent labels of the '597 patent would not physically work in the mass spectrometer
25 contemplated by Southern, the obviousness inquiry does not, as a matter of law, founder there.

26 The Court holds that Southern, in combination with Brenner, makes claims 14 and 15 of the
27 '597 patent obvious: the differences between the subject sought to be patented and the prior art are
28 such that the subject matter as a whole would have been obvious at the time that the invention was

1 made to a person having ordinary skill in the art. 35 U.S.C. § 103(a). The motivation to combine
2 the two references is readily apparent, given Southern’s discussion of fluorescence as the current
3 state of the art and Brenner’s disclosure of fluorescent tags. Hindsight bias, which can be a problem
4 in a motivation-to-combine analysis, is not an issue here. See Kinetic Concepts, Inc. v. Smith &
5 Nephew, 688 F.3d 1342, 1370 (Fed. Cir. 2012) (noting that once a problem and a solution appear
6 together in a patent disclosure, the combination can seem self-evident). In resolving questions of
7 obviousness, courts presume full knowledge by the inventor of all prior art in the field of his
8 endeavor. See Application of Wood, 599 F.2d 1032, 1036 (C.C.P.A. 1979). Fluorescent tags were
9 part of the current state of the art in Dr. Macevicz’s field of endeavor. Brenner’s single-base
10 fluorescent tag, together with Southern’s general discussion of fluorescence, make the ‘597 patent’s
11 use of fluorescent tags obvious. The disputes raised by Illumina’s expert about teaching away and
12 inoperability are issues of law, rather than disputes of fact; Southern itself discloses the use of
13 fluorescence, and its preference for another method does not rise to the level of “teaching away”
14 required by the Federal Circuit. In addition, Dr. Backman’s conclusory statements about
15 inoperability misapprehend the standard set forth in Billingsley and Wood.

16 Illumina does not contest that Southern anticipates the other claims CGI raised in its Motion
17 for Summary Judgment (claims 1, 9, 10, and 17-19). Therefore Southern and Brenner together
18 invalidate claims 1, 9, 10, 14, 15, and 17-19. Next, the Court will discuss the Whiteley reference
19 and whether it anticipates those same claims of the ‘597 patent.

21 2. Whiteley

22
23 U.S. Patent No. 4,88,750 (“Whiteley”) was filed on December 13, 1984 and issued on
24 November 28, 1989, before the earliest filing date of the ‘597 patent. See Labarre Decl. Ex. 4. It
25 allows for the detection of a single-base difference – a mutation – from the standard sequence of
26 nucleotides in a single gene. In Whiteley, there are two probes (a diagnostic probe and a continuous
27 probe) that are each designed to hybridize to the target sequence so that their ends meet at the
28 particular nucleotide that is being tested. The probes hybridize to a DNA sequence that is known,

1 except at the nucleotide to be tested, where the probes meet. After ligation, the presence or absence
2 of a label in the sample indicates which probes bound and whether the gene has a single-base
3 mutation. See Opp. at 18-19.

4 CGI argues that Whiteley anticipates or makes obvious claims 1, 9, 10, 14, 15, and 17-19 of
5 the '597 patent. Illumina counters that Whiteley did not disclose identifying more than a single base
6 on the target polynucleotide, and did not disclose repeating the cycle of hybridizing probes, ligating,
7 and identifying to determine a previously unknown sequence. Opp. at 19. In addition, Illumina
8 points to the Examiners' consideration of Whiteley during the reexamination process. Id. at 17.
9 Before discussing the substantive dispute, the Court will address Illumina's argument that assignor
10 estoppel precludes CGI relying on a 2006 statement by Dr. Macevicz regarding the possible
11 anticipation of the '597 patent by Whiteley.

12
13 **a. Assignor Estoppel and Dr. Macevicz's Opinion**
14 **Regarding Whiteley**
15

16 Dr. Macevicz invented the '597 patent on his own, during the period when he worked at
17 Applied Biosystems in the mid-1990s. Dr. Macevicz assigned the '597 patent to Lynx, a spin-off
18 corporation of Applied Biosystems. Lynx then merged with Solexa, which along with Illumina is a
19 plaintiff in the current action. Docket No. 122 at 2.

20 Later, in 2006, CGI engaged Dr. Macevicz to provide it with legal advice. Mot. at 16.
21 During the course of that engagement, he provided CGI with a "clearance opinion" on numerous
22 patents, including the '597 patent. Mot. at 16 & Ex. 7. A patent attorney's clearance opinion
23 evaluates whether a particular process or product might infringe any claims of issued patents or
24 pending patent applications. Dr. Macevicz's clearance opinion regarding the '597 patent consists of
25 a quotation of the claims of the patent and then a comment regarding the patent's potential invalidity
26 if claim 1 were construed not to require repetition of cycles:

27 Claim 1 describes a process in which an initializing oligonucleotide is successively extended
28 along a template in cycles of ligation and identification. Step (c) indicates that such cycles
must be carried out more than one time. In [sic] this were not the case, then the claim would
appear to 'read' on Whiteley's (4,883,750) disclosure and therefore be invalid.

1
2 Ex. 7 at 34-35. The Court’s claim construction does not limit step (c) of claim 1 to successive
3 ligation (carrying out the cycles more than one time). Docket No. 122, at 26-27. CGI argues,
4 therefore, that Dr. Macevicz has admitted that Claim 1 of the ‘597 patent is invalid over Whiteley.
5 Mot. at 17.

6 Illumina argues that under the doctrine of assignor estoppel, the Court may not consider Dr.
7 Macevicz’s opinion. Under assignor estoppel, “an assignor and parties in privity with the assignor
8 are estopped or barred from asserting invalidity defenses.” Pandrol USA, LP v. Airboss Ry. Prods.,
9 Inc., 424 F.3d 1161, 1167 (Fed. Cir. 2005). In Pandrol, the accused infringer submitted the
10 inventor’s testimony to support its invalidity claims. The Federal Circuit affirmed the district
11 court’s exclusion of the inventor’s statements on the grounds that an assignor should not be
12 permitted to receive value for a patent and then later assert that the patent is worthless, to the
13 detriment of the assignee. 424 F.3d at 1167. See also Diamond Scientific Co. v. Ambico, Inc., 848
14 F.2d 1220, 1224. CGI argues that assignor estoppel only prevents the inventor, and those in privity
15 with the inventor, from challenging the validity of a patent. QG Prods. v. Shorty, Inc., 992 F.2d
16 1211, 1212-14 (Fed. Cir. 1993). While Illumina relies on Pandrol, there, the inventor was an
17 employee of the accused infringer at the time of the lawsuit, whereas Dr. Macevicz is not an
18 employee of CGI.

19 CGI is correct that assignor estoppel does not bar it from
20 challenging the validity of the ‘597 patent.³ However, CGI’s argument about the privity requirement
21 does not touch on Dr. Macevicz himself; assignor estoppel bars the inventor from asserting
22 invalidity once he has assigned the patent, whatever his relationship with any other organization.
23 An employer or other corporation would be barred only if it were in privity with the inventor. See
24 QG Prods., 992 F.2d at 1212. Dr. Macevicz received valuable consideration for his patent when he
25 assigned it to Lynx, so he is barred from asserting its invalidity.

26 More fundamentally, however, Dr. Macevicz did not actually assert the ‘597 patent’s

27 ³ Although Illumina includes a footnote purporting to reserve the right to assert that CGI
28 should be banned from asserting invalidity claims because of Dr. Macevicz’s past relationship with CGI,
this argument is not affirmatively made in the motion, and the Court need not address it. Opp. at 19
n.86.

1 invalidity when he provided the clearance opinion to CGI. Rather, Dr. Macevicz was giving his
2 interpretation of step (c) of claim 1 as having to be carried out more than one time; only if step (c)
3 were construed not to require repetition would “the claim. . . appear to ‘read’ on Whiteley’s . . .
4 disclosure and therefore be invalid.” Mot. Ex. 7 at 35. His statement is conditional: *if* the step (c)
5 cycles of ligation and identification are not repeated, contrary to his own interpretation, *then* the
6 claim would likely read on Whiteley. Such a conditional statement cannot be an assertion of
7 invalidity under the doctrine of assignor estoppel; for an individual’s observation to have such
8 profound legal effect based on equity, the statement cannot be equivocal. Indeed, the assignor
9 estoppel cases highlight the affirmative nature of an assertion of invalidity on the part of the patent’s
10 assignor. In Diamond Scientific, the inventor who had assigned the patent to the plaintiff had gone
11 to work for the defendant and started selling a very similar product. 848 F.2d at 1222. When
12 infringement was claimed, the defendant raised invalidity as a defense. The court noted: “Assignor
13 estoppel is an equitable doctrine that prevents one who has assigned the rights to a patent (or patent
14 application) from later contending that what was assigned is a nullity.” Id. at 1224. Here, Dr.
15 Macevicz was not asserting that what he assigned to Lynx was a nullity; rather, he was pointing out
16 a condition precedent to its validity. Indeed, Dr. Macevicz specifically did not say that the ‘597
17 patent was invalid; rather, he pointed out a potential interpretation, contrary to his own, that could
18 call the patent’s validity into question. Only later did the courts disagree with his interpretation of
19 step (c), opening the door to invalidity based on a broader construction. Significantly, Dr. Macevicz
20 was not engaging in the inequitable conduct that the equitable doctrine of assignor estoppel seeks to
21 prevent, which is to get value unfairly from the assignment of a patent and then turn around and
22 diminish that value to the assignee. His confidential, proprietary opinion provided to another
23 company regarding its own projects was never meant to be public or to be shared with the assignee.
24 There is no evidence to suggest that his work for CGI involved any strategy to invalidate the
25 assignment he had earlier made to Lynx/Solexa.

26 Accordingly, assignor estoppel does not apply.

27
28 **b. Claim 1**

1 It is undisputed that Whiteley discloses a sequencing method that includes steps (a) and (b)
2 of claim 1 of the '597 patent, extending an initializing oligonucleotide by ligation and identifying
3 bases. Illumina contests whether Whiteley discloses "repeating" in the manner that the Court
4 construed the term, but not that Whiteley discloses steps (a) and (b). According to CGI, Whiteley
5 performs in one step what the '597 patent does in multiple steps:

6 In one aspect, the invention relates to a method for determining the presence or absence of a
7 target sequence in a sample of denatured nucleic acid which entails hybridizing the sample
8 with a probe complementary to a diagnostic portion of the target sequence (the diagnostic
9 probe), and with a probe complementary to a nucleotide sequence contiguous with the
10 diagnostic portion (the contiguous probe), under conditions wherein the diagnostic probe
remains bound substantially only to the sample nucleic acid containing the target sequence.
The diagnostic probe and contiguous probe are then covalently attached to yield a target
probe which is complementary to the target sequence, and the probes which are not attached
are removed.

11 Whiteley, 3:41-54.

12 The purpose of Whiteley differs from that of the '597 patent. Whiteley specifically looks for
13 the presence or absence of one particular base, a mutation. The '597 patent seeks to determine the
14 sequence of a longer series of bases (a larger segment of the DNA sequence). There are two
15 disputes as to Whiteley. The first, regarding claim 1 of the '597 patent, is whether Whiteley
16 discloses "repeating," as the Court construed it in the claim construction order. The second,
17 regarding claim 10 of the '597 patent, is whether Whiteley discloses a target polynucleotide that
18 comprises an unknown sequence.

19
20 **i. Repeating and Identifying a Sequence of Nucleotides (Claim 1)**

21
22 CGI argues that Whiteley discloses multiple forms of repeating embodied in the Court's
23 construction. First, CGI contends, Whiteley teaches "conditional repeating"/"no repeating," where
24 no repeating is necessary if the sequence of the polynucleotide has been fully determined in the first
25 cycle. See Docket No. 122, at 27. Aimed at detecting genetic mutations, Whiteley contemplates
26 determining the polynucleotide sequence in the first cycle. It states "use of only one diagnostic
27 probe, preferably specific to the mutated sequence of interest is also possible." Whiteley 4:25-26. If
28 the probe that targets a mutation has been successfully ligated during the first cycle, then the

1 sequence has been fully determined and it is not necessary to repeat the cycle. Metzker Decl. ¶ 61.

2
3 **A. Conditional Repeating**
4

5 Whiteley teaches that there can be no repetition if the probe has been successfully ligated
6 during the first cycle. As Illumina points out, the PTO’s Examiners did not consider Whiteley to
7 suggest repetition: “Landegren and Whiteley each disclose hybridization-ligation methods for
8 obtaining information regarding the sequence of a target nucleic acid. . . . [E]ach method meets the
9 limitations of steps (a) and (b) of the claim Neither Landegren nor Whiteley suggest repeating
10 their method to obtain additional information.” Opp. at 21; Labbe Decl. Ex. 19 at 6. The question
11 of repetition, therefore, comes down to the Court’s claim construction. Step (c) of claim 1 is
12 “repeating steps (a) and (b) until the sequence of nucleotides is determined.” Docket No. 122 at 11.
13 In the Applera litigation, Judge Alsup determined that the repeating step “is conditional, meaning
14 that there is no need for repetition *if* the sequence of the polynucleotide has been fully determined in
15 the first cycle.” Id. at 12 (emphasis in original). The Federal Circuit affirmed Judge Alsup’s
16 construction. Id. at 13, 25 (“To meet the limitations of claim 1, one must repeat steps (a) and (b)
17 until the sequence of nucleotides is determined. There is no need for repetition once the sequence of
18 the polynucleotide has been fully determined.”).

19 During claim construction in this case, Illumina argued that because it had relied on an
20 unequivocal statement that repeating was required during reexamination before the PTO in order to
21 overcome rejections based on Martinelli, it would be improper to construe the repeating step as
22 conditional. Id. at 13, 25. Illumina made the same argument at the hearing on this motion, saying
23 that it was illogical to use the very thing that it disavowed during reexamination to invalidate the
24 claims at issue. This Court held in its claim construction order that Illumina did not effectively
25 disavow successive ligation during the reexamination process: the disclaimer was not related to the
26 conditional aspect of step (c), and did not unconditionally require repetition of steps (a) and (b) even
27 if the sequence of the polynucleotide has been fully determined in the first cycle. Id. at 25. Rather,
28 the disclaimer distinguished Martinelli as carrying out its method on different (non-overlapping and

1 noncontiguous) portions of the polynucleotide. Therefore, this Court held, there was no reason to
2 revisit the previous constructions of the term as conditional. Id. at 26. This construction is broad,
3 but it is the construction initially decided upon by Judge Alsup, specifically affirmed by the Federal
4 Circuit, and recognized by this Court in its claim construction order. Illumina’s objections here are
5 based not on factual disputes as to what Whiteley discloses, but rather on questions of law related to
6 claim construction, questions that have already been resolved to the contrary. In light of the
7 construction of “repeating,” Whiteley anticipates claim 1 of the ‘597 patent.

8
9 **B. Same-Sequence Initializing Oligonucleotide Repeating**

10
11 In addition to its “conditional repeating” argument, CGI contends that Whiteley also teaches
12 “same-sequence initializing oligonucleotide repetition,” as it appears in the Court’s construction.
13 Dr. Metzker, CGI’s expert, states that Whiteley’s two different probes would be used with the same
14 initializing oligonucleotide and could be performed in sequential reactions, satisfying one of the
15 forms of repeating from the Court’s construction, “by extending new initializing oligonucleotides
16 with the same sequence as the initializing oligonucleotide used in the first cycle along the identical
17 polynucleotide sequence as was acted upon in the first cycle of the recited method.” See Metzker
18 Decl. ¶ 59; Docket No. 122 at 26-27. In its opening brief, CGI claims that because the probes are
19 used with the same initializing nucleotide and are carried out independently of one another, that
20 means they can repeat. Illumina contends that because this discloses repeating on the same base that
21 was identified in the first cycle, the method does not “identify a sequence of nucleotides in a
22 polynucleotide;” rather, it re-identifies the same base. Opp. at 22.

23 In Whiteley’s method, a set of diagnostic probes interrogates a target. Only one of those
24 probes has a nucleotide that is complementary to the unknown nucleotide being targeted, and only
25 that probe can successfully ligate. The probe in the other reaction does not have a nucleotide that is
26 complementary to the unknown nucleotide in the target, so it does not ligate. Therefore, there is
27 only a single ligation. For example: there are two probes; Probe 1 has a T, and Probe 2 has a G. T
28 is complementary to A, and G is complementary to C. The unknown base turns out to be a C. Probe

1 1 does not ligate, because T is not complementary to C. Probe 2 does ligate, because G is
2 complementary to C. Thus, there are two probes, but only one ligation step. The key component of
3 the repetition in the claim construction is not the number of probes for the same sequence but the
4 number of ligations. There is only one ligation in Whiteley. However, under the claim construction,
5 only one is needed, because the ligation step need not be repeated if the sequence of nucleotides is
6 determined on the first cycle. As discussed above, Whiteley anticipates claim 1 of the '597 patent.

7
8 **C. Identifying a Sequence of Nucleotides and**
9 **Known/Unknown Sequence**

10
11 Illumina argues that Whiteley does not disclose “identifying a sequence of nucleotides in a
12 polynucleotide” because only one of the bases is unknown. Opp. at 21. It is true that most of the
13 sequence is known, so the only “unknown” is the presence or absence of the particular base. CGI
14 responds that just because a sequence is expected to be found, it may still be identified through the
15 process described in the patent. For example, if the probes bind at adjacent positions on the target,
16 that identifies the target sequence, even if that sequence is “identified” as contemplated. Reply at
17 12. If the probes do not bind as expected, that too may identify the sequence. Reading it literally,
18 Whiteley discloses “identifying a sequence of nucleotides,” even when there is only one unknown
19 base.

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21 **ii. Unknown Sequence (Claim 10)**

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23 Claim 10 of the '597 patent requires that the target polynucleotide be unknown. Illumina
24 argues that in Whiteley, all of the nucleotides in the target are known, except for one, which is being
25 tested for a potential mutation. Opp. at 23. Illumina maintains that because Whiteley seeks to
26 identify a single base, and the '597 patent seeks to identify a series of nucleotides in unknown DNA,
27 that Whiteley cannot anticipate claim 10 or render it obvious. *Id.* CGI argues that Whiteley
28 comprises a diagnostic probe, complementary to an unknown sequence, and a contiguous probe,

1 complementary to a known sequence. Before the experiment, the identify of the target is unknown;
2 after the experiment is run, if ligation occurs, then the full sequence is known. Reply at 12. There
3 would be no reason to run the experiment without an unknown sequence.

4 Illumina is correct that only one nucleotide is unknown, and that most of the target sequence
5 is known. However, under a literal reading of the claim, one unknown base does make the target
6 sequence unknown. Even if the experiment is run to confirm an anticipated result, before the
7 experiment, the sequence is unknown. Whiteley therefore anticipates Claim 10 of the '597 patent.

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9 **3. Brenner**

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11 U.S. Patent No. 5,522,278 ("Brenner") was filed on July 25, 1994 and issued on September
12 3, 1996. It is directed toward DNA sequencing by ligation, and is available as prior art under 35
13 U.S.C. § 102(e) because it was filed before the earliest filing date of the '597 patent. Dr. Macevicz
14 filed and prosecuted the patent. CGI argues that Brenner makes obvious claims 1, 9, 10, and 14-19
15 of the '597 patent. Illumina contests claims 1, 9, and 10, but not claims 14-19. The Court need not
16 address Brenner in detail beyond the discussion above regarding Brenner's combination with
17 Southern to make obvious claims 14 and 15. The Court notes that it is undisputed that claim 16 of
18 the '597 patent is anticipated by Brenner, and not by any of the other prior art references cited by
19 CGI. Opp. at 28-30; Mot. at 25.

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21 **4. Martinelli**

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23 Because the Court has already addressed all of the contested claims at issue it need not
24 address the Martinelli reference.

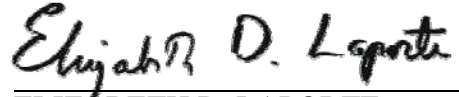
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27 **III. Conclusion**

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The Court hereby grants summary judgment of invalidity as to claims 1,9, 10, 14, 15, and 16-19 of the '597 patent.

IT IS SO ORDERED.

Dated: March 26, 2013



ELIZABETH D. LAPORTE
United States Chief Magistrate Judge