UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

PERKINELMER, INC., and NTD LABORATORIES, INC.,	)	
Plaintiffs/Counterclaim-Defendants,	)	**Civil Action No. 09-10176-FDS**
v.	)	
INTEMA LIMITED,	)	
Defendant/Counterclaim-Plaintiff.	)	

MEMORANDUM AND ORDER ON MOTIONS FOR SUMMARY JUDGMENT AND DEFENDANT'S MOTION TO STRIKE

SAYLOR, J.

This is a patent dispute arising out of a method for detecting fetal Down syndrome.[1] The patent, U.S. Patent No. 6,573,103, is held by defendant Intema Limited. Plaintiffs PerkinElmer, Inc. and NTD Laboratories, Inc. brought this action for a declaratory judgment contending that the '103 patent is invalid and that plaintiffs have not infringed it. Separately, Intema filed suit against plaintiffs for patent infringement in the Eastern District of New York. After that court transferred the second suit to the District of Massachusetts, the cases were consolidated.

On July 1, 2010, this Court (Gertner, J.) issued an order construing disputed terms in the patent, pursuant to *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970-71 (Fed. Cir. 1995) ("[T]he interpretation and construction of patent claims, which define the scope of the patentee's rights under the patent, is a matter of law exclusively for the court."). The parties then filed a

[1] The syndrome is referred to both as "Down" and "Down's." This memorandum and order will use the former except when quoting other sources.

number of potentially dispositive motions, which are the subject of this memorandum and order.

For the following reasons, the Court will decline to reconsider its earlier claim construction, as requested by plaintiffs in their motion for summary judgment of non-infringement. The Court also concludes that although the subject matter at issue in this case is patentable under 35 U.S.C. § 101, it is nevertheless invalid because the relevant claims are either anticipated or obvious under 35 U.S.C. §§ 102 and 103. Accordingly, the Court will deny plaintiffs' motion for summary judgment of non-infringement; grant defendant's motion for summary judgment that the '103 patent discloses patentable subject matter (and denying plaintiffs' corresponding motion); grant plaintiffs' motion for summary judgment that '103 patent claims 1-8, 11, 12, 15, and 20 are invalid as anticipated and obvious (and denying defendant's corresponding motion); and deny the remaining motions as moot.

I. Background

The following facts are undisputed.[2]

A. Introduction to the Method Disclosed in the Patent

For many years, physicians have conducted prenatal screening to determine the chance that newborns will have Down syndrome. Scientists worked to develop increasingly accurate screening methods because the two available diagnostic tests that can definitively confirm that the baby will have this condition—chorionic villus sampling in the first trimester and amniocentesis in the second trimester—carry significant risks of miscarriage. Physicians therefore recommend these relatively dangerous tests only if the screening method indicates a high risk of Down syndrome. Initially, the screening methods involved examining maternal age and certain

[2] Many of these facts are drawn directly from the Court's claim construction order.

biochemical screening markers from the second trimester of pregnancy. By the 1990s, however, physicians began considering data that they could obtain during the first trimester, including biochemical markers and measurements from ultrasounds. The patent at issue in this suit, resulting from a patent application filed on April 29, 1998, describes screening methods in which physicians estimate the risk of Down syndrome using markers from both the first and second trimesters.

B. The State of the Art at the Time of the Patent's Filing

By early 1998, a number of screening methods for Down syndrome were known to a person of skill in the art.[3] Second-trimester screening, the most common approach, generally measured concentrations of various biochemical markers to calculate a single risk estimate. First-trimester screening generally utilized measured concentrations of biochemical markers or fetal measurements taken using an ultrasound device. In either case, scientists were able to arrive at a single risk estimate by using a combination of ultrasound measurements and/or biochemical markers.[4]

At the time, the scientific community was divided into two camps regarding the appropriate testing approach. The first camp championed a particular type of first-trimester fetal measurement, called "nuchal translucency" ("NT") screening.[5] Especially when combined with

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[3] Plaintiffs assert, and defendant has not disputed, that a person of skill in the art at the time of the invention would have had a (1) medical degree with advanced training in obstetrics and genetic risk assessment, as well as several years experience in the field; or (2) a doctoral degree in genetics, biostatistics, or biochemistry with several years experience in the field.

[4] These testing methods also usually incorporated an additional risk factor associated with the age of the mother.

[5] Nuchal translucency screening measures the size of a translucent area at the back of the fetus's neck. By March 1998, scientists had determined that fetal Down syndrome was positively correlated with a larger

first-trimester biochemical markers, NT screening provided information to mothers early in the pregnancy and yielded results that were comparable to second-trimester techniques. First-trimester screening also gave pregnant women the additional choice of (a) choosing an invasive diagnostic test in the first trimester (i.e. chorionic villus sampling) or (b) waiting to obtain the results of a second-trimester test.

Although the second camp acknowledged the benefits of NT screening, it noted that NT screening was reliable only when conducted by well-trained and skilled ultra-sonographers. Additional concerns included the efficacy of the test when extended beyond high-risk candidates; the possibility that the test might increase premature termination of abnormal pregnancies that would be naturally lost to miscarriage; and the difficulty of counseling patients with conflicting results from multiple tests. Because of these factors, the second camp believed that second-trimester marker screening would and should remain the predominant clinical method.

The coexistence of first and second trimester tests presented an additional problem. The early identification of at-risk women reduced the incidence of Down syndrome in the population presenting for second-trimester testing, increasing the false-positive rate of second-trimester tests.[6] This compromised the ability of the second-trimester screening process to determine the risk of an affected pregnancy.

C. The '103 Patent

The '103 Patent was filed on April 29, 1999, and issued on June 3, 2003. It claims

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translucent area.

[6] The predictive power of a test is assessed according to two characteristics: its detection rate and its false-positive rate. Detection rate represents the number of Down-syndrome fetuses successfully detected by the screening method, while false-positive rate measures the number of normal fetuses incorrectly identified as at-risk for that condition.

priority based on two European patent applications filed on April 29, 1998, and June 26, 1998, respectively. Its independent claims (claims 1 and 20) provide variations on a method of screening pregnant women for fetal Down syndrome. In brief, the patent teaches determining the risk for fetal Down syndrome by combining markers from both stages of pregnancy into a single assessment of risk.

Claim 1, as construed by the Court in its July 2010 order, reads as follows:

> A method of determining whether a pregnant woman is at an increased risk of having a fetus with Down's syndrome, the method comprising the steps of:
>
> > measuring the level of at least one screening marker from a first trimester of pregnancy by:
> >
> > > (i) *detecting and quantifying a biochemical screening marker in* ~~assaying~~ a sample obtained from the pregnant woman at said first trimester of pregnancy for at least one first biochemical screening marker *using a device and reagents designed for such purpose (assaying of a sample changes the composition of a sample)*; and/or
> > >
> > > (ii) measuring at least one first ultrasound screening marker from an ultrasound scan taken at said first trimester of pregnancy;
> >
> > measuring the level of at least one second screening marker from a second trimester of pregnancy *(at least one measured marker from the second trimester must be different from all measured markers in the first trimester; this claim term does not exclude other second screening markers from being the same as first trimester markers)* ~~, the at least one second screening marker from the second trimester of pregnancy being different from the at least one first screening marker from the first trimester of pregnancy~~, by:
> >
> > > (i) *detecting and quantifying a biochemical screening marker in* ~~assaying~~ a sample obtained from the pregnant woman at said second trimester of pregnancy for at least one second biochemical screening marker *using a device and reagents designed for such purpose (assaying of a sample changes the composition of a sample)*; and/or

(ii) measuring at least one second ultrasound screening marker from an ultrasound scan taken at said second trimester of pregnancy; and

determining the risk of Down's syndrome by comparing the measured levels of *at least one screening marker from the first trimester of pregnancy and at least one marker from the second trimester of pregnancy (the claim does not require that all measured marker levels be used to determine the recited risk estimate) with distributions* ~~both the at least one first screening marker from the first trimester of pregnancy and the at least one second screening marker from the second trimester of pregnancy with observed relative frequency distributions~~ of marker levels in Down's syndrome pregnancies and ~~in~~ unaffected pregnancies *by a calculation using measurements from both trimesters; this limitation does not exclude or require providing a separate risk determination based only on information obtained in the first trimester*.

U.S. Patent No. 6,573,103 at col. 13 ll. 57-67; col. 14 ll. 1-19 (filed Apr. 29, 1999) (strikeout and italics indicate disputed language in the patent and the Court's July 2010 construction of that language, respectively).

Claim 20, as construed, provides:

A method of determining whether a pregnant woman is at an increased risk of having a fetus with Down's syndrome, the method comprising the steps of:

measuring the level of at least one first screening marker from a first trimester of pregnancy by:

(i) *detecting and quantifying a biochemical screening marker in* ~~assaying~~ a sample obtained from the pregnant woman at said first trimester of pregnancy for at least one first biochemical screening marker *using a device and reagents designed for such purpose (assaying of a sample changes the composition of a sample)*; and/or

(ii) measuring at least one first ultrasound screening marker from an ultrasound scan taken at said first trimester of pregnancy;

determining a first risk estimate of Down's syndrome by comparing the measured level of the at least one first screening marker level from the first

trimester of pregnancy with observed relative frequency distributions of marker levels in Down's syndrome pregnancies and in unaffected pregnancies;

comparing the first risk estimate with a predetermined cut-off level to initially classify the pregnant woman as screen-positive or screen-negative based on the comparison; and

if the pregnant woman is initially classified as screen-negative *(the following steps are performed only if the pregnant woman is initially classified as "screen-negative," and not performed if the pregnant woman is initially classified as "screen positive")*:

measuring the level of at least one second screening marker from a second trimester of pregnancy *(at least one measured marker from the second trimester must be different from all measured markers in the first trimester; this claim term does not exclude other second screening markers from being the same as first trimester markers)* ~~, the at least one second screening marker from the second trimester of pregnancy being different from the at least one first screening marker from the first trimester of pregnancy~~, by:

(i) *detecting and quantifying a biochemical screening marker in* ~~assaying~~ a sample obtained from the pregnant woman at said second trimester of pregnancy for at least one second biochemical screening marker *using a device and reagents designed for such purpose (assaying of a sample changes the composition of a sample)*; and/or

(ii) measuring at least one second ultrasound screening marker from an ultrasound scan taken during said second trimester of pregnancy; and

determining the risk of Down's syndrome by comparing the measured levels of *at least one screening marker from the first trimester of pregnancy and at least one marker from the second trimester of pregnancy (the claim does not require that all measured marker levels be used to determine the recited risk estimate) with distributions* ~~both the at least one first screening marker from the first trimester of pregnancy and the at least one second screening marker from second trimester of pregnancy with observed relative frequency distributions~~ of marker levels in Down's syndrome pregnancies and ~~in~~ unaffected pregnancies *by a calculation using measurements from both trimesters; this limitation does not exclude or*

require providing a separate risk determination based only on information obtained in the first trimester.

Id. at col. 16 ll. 15-58 (formatting same as claim 1 above).[7]

Together, claims 1 and 20 cover all procedures in which physicians might determine the risk of Down syndrome using measurements obtained in both the first and second trimesters. For example, a physician could take measurements during the first trimester and put them aside; after taking additional measurements during the second trimester, the physician would then compute a risk estimate using both sets of data. Alternately, a physician could use the first trimester measurements to calculate a preliminary risk, which may trigger a diagnostic test; if the physician does not conduct a diagnostic test (or if the woman elects not to do one), then he or she would take measurements in the second trimester, and use data from both trimesters to calculate an integrated estimate.

As construed by the Court, the key distinction between claims 1 and 20 is the requirement in claim 20 that women be classified as "screen positive" or "screen negative," and that screen-positive women be excluded from second-trimester testing. Under claim 1, in contrast, all women would be eligible for testing in the second trimester, regardless of whether testing in the first trimester revealed a high risk of Down syndrome.[8]

D. Response to the '103 Patent

Tests that integrate first and second-trimester data into a single calculation of risk (an

[7] The Court also construed disputed terms in several other claims. Those claims need not be recited for present purposes.

[8] Thus, claim 1 does not exclude testing methods where risk is determined and disclosed to women in the first trimester; the key difference is that women would not be classified as "screen positive" and excluded from further testing in the second trimester.

"integrated assessment") are now generally recognized as having a higher detection rate and lower false-positive rate than any test using data from a single trimester only.[9] According to a 2007 Practice Bulletin by the American College of Obstetricians and Gynecologists ("ACOG"), both the "integrated test" (where results are not disclosed to a woman until after second-trimester testing) and the "stepwise sequential test" (where women receive a risk result in the first trimester, followed by an integrated assessment in the second trimester) have a detection rate of approximately 95% and a false-positive rate of 5%. (McFarlane Decl. Ex. 6 at 2).

As a result, testing that incorporates an integrated assessment has been widely adopted. The method disclosed by the '103 patent has been licensed to a number of entities, including the major testing companies Laboratory Corporation of America Holdings (LabCorp) and Quest Diagnostics Incorporated. (*Id.* Ex. 19). Each year thousands of integrated assessments are conducted under licenses of the '103 patent.

E. The Development of Alternate Tests by NTD and PerkinElmer

According to Intema, PerkinElmer and NTD have employed several Down-syndrome tests that infringe on this patent. In two tests allegedly employed by NTD, physicians measure one or more screening markers in the first trimester and one or more screening markers in the second trimester, where at least one of the second trimester markers was not tested in the first trimester. Physicians may provide an immediate risk assessment to the patient after first- trimester screening, but if they perform second-trimester screening, they give the patient an integrated estimate of risk

[9] "Integrated assessment," as used throughout this opinion, refers to the method of producing a risk calculation using data from the first and second trimesters, regardless of whether a first-trimester risk estimate is also provided to the patient. This should not be confused with the "integrated test," in which results are reported only after both the first and second-trimester screening tests have been completed. (*See* McFarlane Decl. Ex. 6 at 5).

based on data from both sets of screenings. Intema also alleges that PerkinElmer supplies first and second-trimester screening kits to the State of California, thereby inducing infringement of the patent.

II. Analysis

The parties have filed multiple motions in the wake of the claim construction ruling. They are summarized in the following table:

Plaintiffs' Motion	**Defendant's Motion**	**Subject Matter**
Summary Judgment of Non-Infringement	Summary Judgment of Direct Infringement	Whether the Court should reconsider its claim construction, and whether plaintiffs have infringed the '103 patent
Summary Judgment of Invalidity for Claiming Unpatentable Subject Matter	Summary Judgment That the '103 Patent Claims Patentable Subject Matter	Whether the patent is valid under 35 U.S.C. § 101
Summary Judgment that '103 Patent Claims is Invalid as Anticipated and Obvious	Summary Judgment that the '103 Patent Claims Are Neither Anticipated Nor Obvious	Whether the patent is valid under 35 U.S.C. §§ 102 and 103
	Summary Judgment That the '103 Patent Claims Are Adequately Described	Whether the patent is valid under 35 U.S.C. § 112, first paragraph
Partial Summary Judgment of No Willful Infringement	Summary Judgment of Willful Infringement	Whether infringement, if found, supports enhanced damages under 35 U.S.C. §§ 284-285
Partial Summary Judgment of No Inducement or Infringement		Whether PerkinElmer induced the California Department of Public Health to infringe the '103 patent

	Motion to Strike Plaintiffs' Expert Reports	Whether two of plaintiffs' expert reports should be struck as untimely

The Court will address these motions in the order presented above. As noted, because the Court determines that the '103 patent is invalid, a number of these motions will be rendered moot.

A. Plaintiffs' Motion for Summary Judgment of Non-Infringement

Before proceeding to the key validity contentions, the Court must address a preliminary issue raised by plaintiffs in the motion for summary judgment of non-infringement. Although nominally related to infringement, plaintiffs' motion is, in substance, a request that the Court reconsider its July 1, 2010 claim construction order.[10] Because claim terms must be construed before taking up validity or infringement contentions, *see Nazomi Commc'ns, Inc. v. Arm Holdings, PLC*, 403 F.3d 1364, 1369 (Fed. Cir. 2005), the Court will address this request first.

1. Standard of Review

A motion to reconsider a claim construction order is guided by the same rules that apply to motions for reconsideration generally. *See, e.g.*, *Ball Aerosol & Specialty Container, Inc. v. Ltd. Brands, Inc.*, 553 F. Supp. 2d 939, 944 (N.D. Ill. 2008). "[M]otions for reconsideration are appropriate only in a limited number of circumstances: if the moving party presents newly discovered evidence, if there has been an intervening change in the law, or if the movant can demonstrate that the original decision was based on a manifest error of law or was clearly unjust." *United States v. Allen*, 573 F.3d 42, 53 (1st Cir. 2009).

[10] Plaintiffs do not contest defendant's assertions that their activities directly infringe the '103 patent under the Court's present claim construction. However, the Court does not reach the question of infringement because it finds that the patent is invalid.

Plaintiffs do not contend that there has been any intervening change in the law. Thus, plaintiffs must show that the Court's decision should be changed in light of newly discovered evidence, was based on a manifest error of law, or was clearly unjust. The granting of such a motion is "an extraordinary remedy which should be used sparingly." *Palmer v. Champion Mortg.*, 465 F.3d 24, 30 (1st Cir. 2006); *see also Christianson v. Colt Indus. Operating Corp.*, 486 U.S. 800, 817 (1988) ("A court has the power to revisit prior decisions of its own . . . although as a rule courts should be loathe to do so in the absence of extraordinary circumstances such as where the initial decision was clearly erroneous and would work a manifest injustice."). "Unless the court has misapprehended some material fact or point of law, such a motion is normally not a promising vehicle for revisiting a party's case and rearguing theories previously advanced and rejected." *Palmer*, 465 F.3d at 30.[11]

This case provides an additional wrinkle because the present judge is different from the one who issued the initial claim construction order. In such cases, the First Circuit has counseled particular caution in overturning prior rulings. *Ellis v. United States*, 313 F.3d 636, 646 (1st Cir. 2002) (reconsideration of orders within a single proceeding by a successor judge, while not altogether prohibited, is "frown[ed] upon"). In particular, the First Circuit has cautioned against overturning decisions for manifest errors of law, even where they are "arguably erroneous." *Id.* at 648. "[N]either doubt about the correctness of a predecessor judge's rulings nor a belief that the

[11] Citing *Sofamor Danek Group, Inc. v. DePuy-Motech*, 74 F.3d 1216, 1221 (Fed. Cir. 1996), plaintiffs state that reconsideration of claim construction issues are appropriate throughout the course of a patent infringement proceeding. *Sofamor*, however, addressed the finality of a claim construction adopted during a preliminary injunction proceeding. In such a context, the Federal Circuit stated that "[a] trial court may exercise its discretion to interpret the claims at a time when the parties have presented a full picture of the claimed invention and prior art." *Id.* This case does not involve a claim construction adopted in a preliminary injunction proceeding; to the contrary, the parties have had a full opportunity to present relevant evidence and to argue the meaning of disputed claim terms. *Sofamor* is thus inapplicable.

litigant may be able to make a more convincing argument the second time around will suffice to justify reconsideration." *Id.* Instead, the error of law must be "unreasonable" and "pave[] the way for a manifestly unjust result." *Id.*

2. Discussion

This is the second time that plaintiffs have asked the Court to revisit its claim construction. Following the initial order, plaintiffs filed a motion to reconsider the construction of the phrase "determining the risk of Down's syndrome by comparing the measured levels of both the at least one first screening marker from the first trimester of pregnancy and the at least one second screening marker from the second trimester of pregnancy with observed relative frequency distributions of marker levels in Down's syndrome pregnancies and in unaffected pregnancies," which is found in claims 1 and 20. After revisiting the claim construction analysis, Judge Gertner reaffirmed her original ruling and denied the motion. (*See* Court's Order of Sep. 1, 2010). Judge Gertner concluded by stating, "Nevertheless, the Court is open to reconsideration of claim constructions after summary judgment (perhaps at trial), once the record has been further developed." (*Id.*).

Although dispositive motions are still pending, plaintiffs nevertheless contend that the Court should revisit its claim construction ruling because "the record has been further developed" by additional expert and deposition testimony. Such evidence, however, is insufficient to justify reconsideration for several reasons.

First, evidence is not "new" simply because it was obtained after the initial decision has been made. Here, the testimony identified by plaintiffs could have and should have been marshaled during the *Markman* phase of the proceedings, and plaintiffs' failure to do so does not

justify this Court's reconsideration of previously-construed terms. *See Iverson v. City of Boston*, 452 F.3d 94, 104 (1st Cir. 2006) (a motion for reconsideration "does not provide a vehicle for a party to undo its own procedural failures or allow a party to advance arguments that could and should have been presented" at an earlier stage in the proceedings).

Second, the "new" evidence presented by plaintiffs is wholly extrinsic to the patent. Such evidence suffers generally from a number of defects, including its independence from the patent, potential bias, and varying relevance. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1318-19 (Fed. Cir. 2005) (*en banc*). Extrinsic evidence is therefore "unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence," and courts may consider, or reject, such evidence at their discretion. *Id.* at 1319. This Court fully considered the intrinsic evidence of term meaning (that is, the claims, specification, and prosecution history) in its claim construction order. Plaintiffs' new extrinsic evidence has very little evidentiary weight under the circumstances and is insufficient to overturn the Court's existing analysis.

Accordingly, the Court declines to reconsider its prior ruling on the basis of newly acquired testimony.

In the absence of newly-discovered evidence, plaintiffs' motion for reconsideration reduces to the argument the Court committed legal error in arriving at its construction of two disputed terms. As discussed below, however, the Court's existing construction is not "unreasonable," nor does it lead to a "manifestly unjust" result.

Plaintiffs first dispute the Court's construction of the term "determining the risk . . . ." As noted, Judge Gertner construed this term, which appears in claims 1 and 20, as not excluding methods where the results of first-trimester testing are disclosed to the woman during the first

trimester. Repeating an argument that they made at the original *Markman* hearing and in their first motion to reconsider, plaintiffs contend that the prosecution history exhibits a clear disavowal of such methods.[12]

Judge Gertner examined the prosecution history twice and found no clear disavowal of claim scope. Examining the prosecution history once again, this Court does not find the previous claim construction to be unreasonable. The prosecution history exhibits no clear disavowal of claim scope. Although it could be read as plaintiffs suggest, the Court's construction is at the very least equally colorable. That is enough to preclude reconsideration. *Cf. Seachange Int'l, Inc. v. C-COR, Inc.*, 413 F.3d 1361 (Fed. Cir. 2005) (finding disavowal of claim scope "because [prosecution history] is not suitable to multiple interpretations"); *Northern Telecom Ltd. v. Samsung Elecs. Co.*, 215 F.3d 1281, 1294 (Fed. Cir. 2000) (no disavowal where prosecution history suitable to multiple interpretations).

Plaintiffs present even less of a case for reconsidering the Court's construction of a second disputed term. They assert that the Court misconstrued the term "the at least one second screening marker from the second trimester of pregnancy being different from the at least one first screening marker from the first trimester of pregnancy" when it found that only one marker in the second trimester had to be different from markers used in the first trimester. Plaintiffs contend that this scope was also disavowed during the prosecution history. Aside from merely requoting a

[12] The Federal Circuit has cautioned against limiting patent scope based on the prosecution history where such disavowal is not clear and unambiguous. "[B]ecause the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes." *Phillips*, 415 F.3d at 1317. As a result, courts generally require that "a patent applicant [] clearly and unambiguously express surrender of subject matter" to disavow claim scope during prosecution. *Voda v. Cordis Corp.*, 536 F.3d 1311, 1321 (Fed. Cir. 2008)(quoting *Sorensen v. International Trade Comm'n*, 427 F.3d 1375, 1378 (Fed. Cir. 2005)).

passage, the plaintiffs' contention rests chiefly on newly acquired extrinsic evidence. There is thus nothing in the motion that can justify overturning the Court's reasonable claim construction order.

Plaintiffs' assertion of non-infringement is contingent on the Court's reconsideration of these disputed terms. Because the Court declines to do so, plaintiffs' motion for summary judgment as to non-infringement will be denied.

B. Cross-Motions for Summary Judgment as to Patentability

The parties have cross-moved for summary judgment as to whether the '103 patent meets the conditions of patentability under 35 U.S.C. § 101.

1. Standard of Review

Summary judgment is appropriate when the pleadings, the discovery and disclosure materials on file, and any affidavits show that "there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(a). "Essentially, Rule 56[] mandates the entry of summary judgment 'against a party who fails to make a showing sufficient to establish the existence of an element essential to that party's case, and on which that party will bear the burden of proof at trial.'" *Coll v. PB Diagnostic Sys.*, 50 F.3d 1115, 1121 (1st Cir. 1995) (quoting *Celotex Corp. v. Catrett*, 477 U.S. 317, 322 (1986)). In making this determination, the Court views "the record in the light most favorable to the nonmovant, drawing reasonable inferences in his favor." *Noonan v. Staples, Inc.*, 556 F.3d 20, 25 (1st Cir. 2009).

"Cross motions for summary judgment neither alter the basic Rule 56 standard, nor warrant the grant of summary judgment per se. Cross motions simply require us to determine whether either of the parties deserves judgment as a matter of law on facts that are not disputed. As always, we resolve all factual disputes and any competing, rational inferences in the light most

favorable to the party against whom summary judgment has entered." *Wightman v. Springfield Terminal Ry.*, 100 F.3d 228, 230 (1st Cir. 1996) (internal citations omitted).

A patent is presumed to be valid. 35 U.S.C. § 282. The party asserting invalidity bears the burden of persuasion and must demonstrate such invalidity by clear and convincing evidence. *Research Corp. Techs. v. Microsoft Corp.*, 627 F.3d 859, 870 (Fed. Cir. 2010).

2. Discussion

Whether a claimed invention is patentable under 35 U.S.C. § 101 is a question of law. *Prometheus Labs., Inc. v. Mayo Collaborative Servs.*, 628 F.3d 1347, 1353 (Fed. Cir. 2010). The statute provides:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

35 U.S.C. § 101. In *Bilski v. Kappos*, 130 S. Ct. 3218 (2010) ("*Bilski II*"), the Supreme Court underscored the need to interpret this provision broadly. "In choosing such expansive terms . . . modified by the comprehensive 'any,' Congress plainly contemplated that the patent laws would be given wide scope." *Bilski II*, 130 S. Ct. at 3225 (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980)). There are three specific exceptions to this broad principle of patentability: "laws of nature, physical phenomena, and abstract ideas." *Id.* (quoting *Chakrabarty*, 447 U.S. at 309); *see also Gottschalk v. Benson*, 409 U.S. 63, 67 (1972) ("Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.").

The section 101 patentability requirement is a "threshold condition." *Bilski II*, 130 S. Ct. at 3236 (Stevens, J., concurring); *accord Research Corp.*, 627 F.3d at 868. As a result, it should

not be confused with the other "conditions and requirements of [title 35]," to which § 101 itself explicitly refers: 35 U.S.C. § 102, which addresses novelty, and § 103, which addresses obviousness. *Bilski II*, 130 S. Ct. at 3238 (Stevens, J., concurring); *Research Corp.*, 627 F.3d at 868. When analyzing patentability, therefore, "a claim must be considered as a whole; it is 'inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis.'" *Prometheus*, 628 F.3d at 1354 (quoting *Bilski*, 130 S. Ct. at 3230). Abstract ideas or laws of nature may thus be patentable when part of a larger, patentable process. *Bilski II*, 130 S. Ct. at 3230; *Prometheus*, 628 F.3d at 1354. "Nonetheless, a scientific principle cannot be made patentable by limiting its use to a particular technological environment or by adding insignificant post-solution activity." *Prometheus*, 628 F.3d at 1354 (citing *Diamond v. Diehr*, 450 U.S. 175, 191-92 (1981)).

The patent at issue here discloses a "process" within the meaning of 35 U.S.C. §§ 100-101.[13] Therefore, the Court's analysis focuses on whether the disclosed method falls within one of the three exceptions to § 101. The parties agree that the '103 patent does not disclose a mental process or a phenomenon of nature, so the principal question is whether the disclosed method amounts to an unpatentable abstract idea.

Plaintiffs' principal contention is that the '103 patent seeks to claim an unpatentable algorithm for calculating the risk of Down syndrome. In plaintiffs' view, the methods in the patent may be all be divided into two steps: (1) a "data-gathering" step, wherein blood samples and/or ultrasound measurements are gathered from the first and second trimesters; and (2) a

[13] 35 U.S.C. § 100 defines "process" as "process, art, or method, [including] a new use of a known process, machine, manufacture, composition of matter, or material." Section 100 has been criticized for defining "process" by using the term "process." *See Bilski II*, 130 S. Ct. at 3237 (Stevens, J., concurring).

"determining" step, wherein this "data" is plugged into an equation that yields a likelihood that a fetus has Down syndrome. The "determining" step, plaintiffs assert, is the focus of the patent, and this step consists of nothing more than an unpatentable mathematical formula.

It is well-settled that mathematical algorithms, by themselves, are unpatentable abstract ideas under 35 U.S.C. § 101. *Benson*, 409 U.S. at 71 (formula for converting numerals to pure binary numerals was unpatentable); *accord Bilski II*, 130 S. Ct. at 3231; *Prometheus*, 628 F.3d at 1358; *In re Grams*, 888 F.2d 835, 839-41 (Fed. Cir. 1989). Morever, where the only physical step involves "merely gathering data for the algorithm," courts have held that a method remains unpatentable. *Grams*, 888 F.2d at 839; *see In re Sarkar*, 588 F.2d 1330, 1335 (C.C.P.A. 1978) ("If the steps of gathering and substituting values were alone sufficient, every mathematical equation, formula, or algorithm having any practical use would be per se subject to patenting as a 'process' under § 101."). In *Grams*, on which plaintiffs principally rely, the patentee claimed a method for detecting abnormalities in a variety of complex systems. 888 F.2d at 837. The method involved (1) performing clinical laboratory tests on an individual and (2) analyzing the gathered data according to an algorithm disclosed in the patent. *Id.* at 837. The Court held that the patent was directed to unpatentable subject matter under § 101, finding that "patentability here is precluded by the fact that physical step [1] merely provides data for the algorithm." *Id.* at 840. Plaintiffs contend that the method disclosed by the '103 patent is analogous and likewise unpatentable.

Grams, however, is distinguishable. The Court there declared the patent invalid partly because it "focuse[d] on the algorithm itself" and provided very little description of the "clinical laboratory tests" disclosed in step 1:

> The sole physical process step in Grams' claim 1 is step [1], *i.e.*, performing clinical tests on individuals to obtain data. The specification does not bulge with disclosure on those tests. To the contrary, it focuses on the algorithm itself, although it briefly refers to, without describing, the clinical tests that provide data. . . . The specification also states that "[t]he invention is applicable to any complex system, whether it be electrical, mechanical, chemical, or biological, or combinations thereof." From the specification and the claim, it is clear to us that applicants are, in essence, claiming the mathematical algorithm, which they cannot do . . . .

Id. at 840. Here, the algorithm used in the "determining" step is part of the prior art and unremarkable in itself. *See* '103 Patent at col. 5 ll. 18-19 ("The estimation of risk is conducted using standard statistical techniques."). Instead, the specification focuses on the process and effect of using data from both the first and second trimesters to calculate Down syndrome risk. It provides a detailed description of the types of screening markers that are to be combined into the integrated assessment (providing a number of preferred embodiments), as well as an extensive analysis of the effectiveness of the integrated assessment as compared to traditional testing methods. Thus, unlike *Gram*, the '103 patent is not focused on the algorithm in "step 2" of the process, but rather on the data-gathering method disclosed in "step 1."

The '103 patent thus is more like the patent discussed in *In re Abele*, 684 F.2d 902 (C.C.P.A. 1982), which *Gram* distinguishes. The patent in *Abele* involved a method for improving CAT scans that consisted of (1) production of x-rays, as well as the detection and display of x-ray data; and (2) a mathematical algorithm. *See id.* at 903-04.[14] The Federal Circuit determined that the method was patentable under § 101 because the production, detection, and display steps were not mere data-gathering in service of an algorithm:

[14] The term "CAT scan" refers to "x-ray computed tomography," a method for generating a three-dimensional image of the inside of an object. It has a wide range of diagnostic medical applications.

> [P]roduction and detection cannot be considered mere antecedent steps to obtain values for solving the algorithm . . . . Indeed, [the method] presents data gathering steps not dictated by the algorithm but by other limitations which require certain antecedent steps. It is these antecedent steps that dictate what type of data must be obtained . . . . [W]e view the production, detection, and display steps as manifestly statutory subject matter and are not swayed from this conclusion by the presence of an algorithm in the claimed method.

Id. at 908. The method disclosed by the '103 patent is analogous in all pertinent respects. As in *Abele*, the method of gathering data from the first and second trimesters is dictated not by the algorithm (which can just as easily render a result based on data from one trimester), but by the theory that data from two trimesters will yield a more accurate prediction of Down syndrome. The data-gathering step is thus a focus of the claimed method, not a mere antecedent step. Moreover, the process of gathering data by taking blood samples and measuring ultrasounds is manifestly statutory subject matter, and the presence of an algorithm in the method does not alter this fact.[15]

In addition, both *Grams* and *Abele* were decided prior to the Supreme Court's *Bilski II* decision, which emphasized a broad construction of § 101. *Bilski II*, 130 S. Ct. at 3225 ("Congress plainly contemplated that the patent laws would be given wide scope . . . [taking] a permissive approach to patent eligibility."). *Bilski II* also underscored that there is no rigid formula for abstractness. 130 S. Ct. at 3231 (faulting the Federal Circuit for applying a specific test for determining patentability of abstract ideas); *accord Research Corp.*, 627 F.3d at 868.

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[15] Plaintiffs point repeatedly to the fact that each individual data-gathering method, as well as the disclosed algorithms, were well-known in the art at the time of the patent's filing. (*See, e.g.*, Pl. § 101 Mot. at 9) ("[T]he sole claim of novelty is the idea of using data from the first and second trimesters in the algorithm for calculating risk."). In doing so, plaintiffs confuse the § 101 determination with the determinations of novelty and obviousness under §§ 102 and 103. This is improper. *Prometheus*, 628 F.3d at 1354 ("In making [a § 101] determination, . . . it is 'inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis.'") (quoting *Bilski II*, 130 S. Ct. at 3230).

Following *Bilski II*, the Federal Circuit has taken a more expansive approach to method patents. *See Research Corp.*, 627 F.3d at 869 ("[T]his court also will not presume to define 'abstract' beyond the recognition that this disqualifying characteristic should exhibit itself so manifestly as to override the broad statutory categories of eligible subject matter and the statutory context that directs primary attention on the patentability criteria of the rest of the Patent Act."); *see also Prometheus*, 628 F.3d at 1353.

Prometheus is instructive. In that case, the Federal Circuit upheld the patentability of a method for optimizing drug-treatment dosage. The disclosed method provided four steps: (1) "administering" a specific drug to a subject; (2) "determining" the levels of metabolites produced by the drug; (3) "comparing" these to pre-existing levels of metabolites in the body; and (4) providing the results to physicians. *Id.* at 1352. If post-administration metabolite levels were too high or too low, this served as a "warning" to physicians that they needed to change the dosage of the drug. *Id.* at 1352. Importantly, the method did not require any actual change in dosage. In addition, the warning resulted from a "natural correlation[]" between the change in metabolite levels and the efficacity and toxicity of the administered drug. *Id.* at 1355. The Federal Circuit held that the method was patentable, stating that the patent disclosed "specific treatment steps" and "a particular application of [] natural correlations" that were patentable under § 101. *Id.* at 1355.[16] It distinguished *Grams*, reasoning as follows:

> While it is true that the administering and determining steps gather useful data, it is also clear that the presence of those two steps in the claimed processes is not "merely" for the purpose of gathering data. Instead, the administering and determining steps are part of a treatment protocol . . . .

[16] The Federal Circuit also rested its decision, in the alternative, on the application of the "machine-or-transformation" test, discussed in more detail below. *See id.* at 1355.

Id. at 1357. The court went on to describe this treatment protocol as "therapeutic methods that determine the optimal dosage level for a course of treatment." *Id.* at 1359.

As in *Prometheus*, the '103 patent also discloses a method for determining an optimal course of treatment. The method quantifies a likelihood that a fetus has Down syndrome. This, in turn, informs the choice of whether to undergo invasive and dangerous testing, and ultimately whether to terminate the pregnancy. The result also undoubtedly bears on many other choices that arise over the course of prenatal care. Like *Prometheus*, the data-gathering steps are central to the method, as the sequencing and types of testing bear directly on the method's goal of achieving a highly-accurate result. These considerations thus indicate that the methods disclosed in the '103 patent should be patentable under § 101.

This outcome is confirmed by the "machine-or-transformation" test. This test, although not necessarily determinative, is nevertheless "a useful and important clue, an investigative tool, for determining whether some claimed inventions are processes under § 101." *Bilski II*, 130 S. Ct. at 3227 ("[T]here are reasons to doubt whether the [machine-or-transformation] test should be the sole criterion for determining the patentability of inventions in the Information Age . . . [, such as] advanced diagnostic medicine techniques . . . ."). Under the test, a claimed method is patentable under § 101 if "(1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing." *In re Bilski*, 545 F.3d 943, 954 (Fed. Cir. 2008) ("*Bilski I*"). Further, "the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity." *Id.* at 961-62. The purpose of the machine-or-transformation test is to "determine whether a process claim is tailored narrowly enough to encompass only a particular application of a fundamental principle rather than to pre-

empt the principle itself." *Id.* at 954.

The parties agree that the machine-or-transformation test can only be met by the data-gathering steps—that is, "detecting and quantifying a biochemical screening marker" in a blood sample, and "measuring [an] ultrasound screening marker." These steps, when taken together, are not mere "insignificant extra-solution activity." As discussed above, the data-gathering process is central to the claimed method; this process necessarily incorporates the physical activity of measuring biochemical markers and/or ultrasound scans.[17]

"Detecting and quantifying a biochemical screening marker" clearly meets the "transformation" prong of the test. As construed by the Court, this step necessarily "changes the composition of a sample;" this is all that is required to meet the prong. Furthermore, the Federal Circuit has held that such tests are transformative. *See Prometheus*, 628 F.3d at 1357 (blood sample tests were transformative because "some . . . modification of the substances to be measured[] is necessary to extract the metabolites from a bodily sample and determine their concentration.").[18]

The "measuring an ultrasound scan" step less clearly satisfies the test. Taking an ultrasound scan is clearly transformative. *Bilski I*, 545 F.3d at 963 (citing *Abele*, 684 F.2d at

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[17] Plaintiffs suggest that neither claim is central to the method because they are alternatives to each other. (Pl. § 101 Reply at 10) ("[A]ssaying a sample and measuring an ultrasound scan are claimed in the alternative. Thus, one need not ever assay a sample in performing the claimed method."). This is incorrect. Although neither step need be practiced, at least one of them must be. Thus, together they are central to the method. Plaintiffs nevertheless correctly note that all methods claimed by the patent must satisfy the test; thus, both data-gathering steps must involve a machine or transformation.

[18] Contrary to plaintiffs' assertion, the fact that this step does not require a *specific* type of testing method does not foreclose satisfaction of the transformation prong. *See id.* at 1357 (claim for "determining the level" of a molecule in the body was transformative because it necessarily implied "[s]ome form of manipulation" that would transform a tested sample).

909). Plaintiffs, however, contend that "measuring an ultrasound" does not require actually taking an ultrasound. This appears to be correct. In particular, claim 12 (which depends from claim 1) requires the additional step of "taking" an ultrasound scan. This suggests that "measuring" an ultrasound scan, as required by claims 1 and 20, does not include the "taking" of an ultrasound scan. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (*en banc*) ("[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.").

Nor is it clear that "measuring" an ultrasound scan requires a machine. Plaintiffs point to the deposition testimony of their expert, Dr. Caniff, to support the proposition that an ultrasound scan can be measured manually. (*See* Jantzi Decl. Ex. 33 at 226-227). However, an examination of the cited testimony reveals that Dr. Caniff equivocates on this point:

> Q: Can you measure NT from a printout of the ultrasound scan?
>
> A: I'm not qualified to say that. Can you—is someone able to put a ruler on a picture? Yes. But I don't think that would be the appropriate way it would be done. but you'd have to ask somebody skilled in the profession.

(*Id.* Ex. 33 at 226:21-227:3). The Court concludes that the claimed step is sufficiently "tied" to an ultrasound device to pass muster under the machine-or-transformation test, regardless of whether "measuring" an ultrasound scan requires a machine. Because an ultrasound scan (presumably taken by an ultrasound device) is required to perform the method, this step "is tailored narrowly enough to encompass only a particular application of a fundamental principle rather than to pre-empt the principle itself," fulfilling the purpose of the test. *See Bilski I*, 545

F.3d at 954.[19]

For the foregoing reasons, the Court finds that plaintiffs have failed to meet their burden of showing unpatentability by clear and convincing evidence. Accordingly, the patent is presumed to be valid under 35 U.S.C. § 101, and the Court will grant defendant's motion and deny plaintiffs' motion.

C. Cross-Motions for Summary Judgment as to Anticipation and Obviousness

The next set of motions concern whether various claims of the '103 patent are anticipated or obvious under 35 U.S.C. §§ 102 and 103, respectively.

1. Standard of Review

As with § 101, summary judgment under §§ 102 and 103 is appropriate where "there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(a).

While the proponent must still prove invalidity by clear and convincing evidence, however, "if the PTO [Patent and Trademark Office] did not have all material facts before it, its considered judgment may lose significant force. And, concomitantly, the challenger's burden to persuade [the decision-maker] of its invalidity defense by clear and convincing evidence may be easier to sustain." *Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238, 2251 (2011) (internal citations omitted); *WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1355 (Fed. Cir. 1999) ("[T]he burden on the [proponent] . . . is more easily carried when the references on which the assertion is

[19] Moreover, *Bilski II* concluded that the machine-or-transformation test should not be exclusive in part because an "Information-Age" patent would not fall easily within its parameters. *See Bilski II*, 130 S. Ct. at 3227 ("[T]here are reasons to doubt whether the [machine-or-transformation] test should be the sole criterion for determining the patentability of inventions in the Information Age . . . [, such as] advanced diagnostic medicine techniques . . . ."). *Bilski II* thus also points away from invalidating the '103 patent on these grounds.

based were not directly considered by the examiner during prosecution."); *see also KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 426 (2007) (noting, without reaching the issue, that "the rationale underlying the presumption [of validity]—that the PTO, in its expertise, has approved the claim—seems much diminished" where a reference was not considered by the examiner).

2. Anticipation

Section 102 "embodies the concept of novelty—if a device or process has been previously invented (and disclosed to the public), then it is not new, and therefore the claimed invention is 'anticipated' by the prior invention." *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). The statute provides in relevant part:

> A person shall be entitled to a patent unless–
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

35 U.S.C. §102(a).

Whether a patent claim is anticipated (and thus invalid) under 35 U.S.C. § 102 is a question of fact. *3M v. Chemque, Inc.*, 303 F.3d 1294, 1301 (Fed. Cir. 2002). "To be anticipatory, the [prior art reference] must [] describe, either expressly or inherently, each and every claim limitation and enable one of skill in the art to practice an embodiment of the claimed invention without undue experimentation." *Iovate Health Scis., Inc. v. Bio-Engineered Supplements & Nutrition, Inc.*, 586 F.3d 1376, 1380 (Fed. Cir. 2009).[20] Moreover, the claim

[20] Anticipation by inherent disclosure "is appropriate only when the reference discloses prior art that must *necessarily* include the unstated limitation." *Therasense v. Becton, Dickinson & Co.*, 593 F.3d 1325, 1332 (Fed. Cir. 2010). "Inherency . . . may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient." *Id.*

limitations disclosed by the prior-art reference must be "arranged or combined in the same way as recited in" the contested patent claim. *Net MoneyIN*, 545 F.3d at 1370-71 ("[For example], a reference that discloses all of the claimed ingredients, but not in the order claimed, would not anticipate, because the reference would be missing any disclosure of the limitations of the claimed invention 'arranged as in the claim.'").

Anticipation, however, requires neither reduction to practice, *Schering Corp. v. Geneva Pharms.*, 339 F.3d 1373, 1380 (Fed. Cir. 2003), nor endorsement of the disclosed method. *Celeritas Techs. v. Rockwell Int'l Corp.*, 150 F.3d 1354, 1361 (Fed. Cir. 1998) ("A reference is no less anticipatory if, after disclosing the invention, the reference then disparages it. Thus, the question whether a reference 'teaches away' from the invention is inapplicable to an anticipation analysis."); *accord Seachange Int'l, Inc. v. C-COR, Inc.*, 413 F.3d 1361, 1380 (Fed. Cir. 2005) ("Teaching away is irrelevant to anticipation."). Moreover, a reference need only disclose one embodiment of the patented claim to anticipate it. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 782 (Fed. Cir. 1985) ("[W]hen, as by a recitation of ranges or otherwise, a claim covers several compositions, the claim is 'anticipated' if one of them is in the prior art."); *see King Pharms., Inc. v. Eon Labs., Inc.*, 616 F.3d 1267, 1277 (Fed. Cir. 2010) (citing *Titanium Metals* for this proposition).

Plaintiffs contend that the claims of the '103 patent were anticipated by an article by R.A. Kadir and D.L. Economides ("Kadir"). (Jantzi Decl. Ex. 15).[21] Defendant does not dispute that Kadir was published prior to March 1998, the earliest invention date claimed by the patentee. (*See* Jantzi Decl. Ex. 46 at 83-84). Thus, Kadir qualifies as prior art under 35 U.S.C. § 102(a).

[21] Because the Court finds that all relevant claims were either anticipated or rendered obvious by Kadir, it does not reach the other references cited by plaintiffs.

The Kadir reference, titled "The effect of nuchal translucency measurement on second-trimester biochemical screening for Down's syndrome," was accepted for publication in the journal ULTRASOUND OBSTETRICS AND GYNECOLOGY in early 1997. Kadir was not directly considered by the patent examiner during the prosecution of the '103 patent.[22]

Kadir disclosed a method for determining a pregnant woman's risk of having a fetus with Down syndrome. In particular, Kadir studied the effect of introducing a first-trimester NT measurement on second-trimester biochemical-marker screening. In that study, researchers conducted a first-trimester NT ultrasound measurement on pregnant women and calculated a risk of Down syndrome.[23] Women with the highest risk were offered invasive testing during the first trimester. The remaining population was offered second-trimester biochemical screening, and a second risk was thereafter calculated. The study also disclosed calculating detection rates and false-positive rates for (1) the second-trimester marker test alone, (2) the first-trimester NT test alone, and (3) the second-trimester test after introduction of the NT test into the same population. The article concluded that first-trimester NT measurement is an effective means of detecting Down syndrome, but that introducing it has negative implications for the accuracy and cost-effectiveness of second-trimester screening.

It is undisputed that the first-trimester NT measurement disclosed by Kadir constitutes a

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[22] Defendant contends that the examiner considered Kadir because other examined references cited to that article. "Consideration," however, requires that the examiner directly examine the article in question. *See In re NTP, Inc.*, 2011 WL 3250466, at *9 (Fed. Cir. Aug. 1, 2011) (rejecting the argument that an examiner's consideration of an issue can be implied from the prosecution history) (citing *WMS Gaming*, 184 F.3d at 1355, for the proposition that "[t]he burden on the party asserting obviousness is more easily carried when the references on which the assertion is based were not directly considered by the examiner during prosecution.").

[23] At a later point, the reference also discusses calculating a first-trimester risk by combining NT with first-trimester biochemical-marker levels.

"first ultrasound screening marker from an ultrasound scan taken at said first trimester of pregnancy" within the meaning of claims 1 and 20 of the '103 patent. It is undisputed that the second-trimester biochemical-marker screening constitutes "detecting and quantifying a biochemical screening marker in a sample obtained from the pregnant woman at said second trimester of pregnancy" within the meaning of those claims. It is undisputed that Kadir discloses using different screening markers in the second trimester than in the first trimester. Finally, the parties do not appear to dispute that Kadir discloses the first-trimester screen-positive/screen-negative sorting method disclosed by claim 20, and the Court agrees. Thus, the question of whether Kadir anticipates claims 1 and 20 of the '103 patent turns on whether it discloses the remaining two claim limitations:

(1) "determining" the risk of Down syndrome by comparing distributions of marker levels in Down's syndrome pregnancies, and in unaffected pregnancies, and

(2) combining screening markers from the first and second trimesters into a single risk calculation.

Defendant contends that Kadir fails to teach the first of those claim limitations because it does not disclose "comparing distributions of marker levels in Down syndrome pregnancies and unaffected pregnancies."[24] Defendant is correct that Kadir does not expressly mention this calculation. However, a reference may inherently disclose a claim limitation "when the reference

[24] Defendant makes three further arguments that are easily dismissed. First, it asserts that Kadir fails to disclose the "observed relative frequency distributions of marker levels" recited in claims 1 and 20. The inclusion of this particular phrase, however, is irrelevant because the Court's construction of the "determining" step does not require "observed relative frequency distributions." (*See* Cl. Constr. at 23). Second, defendant contends that Kadir does not anticipate because it teaches away from employing the "determining" step. This argument has no merit because "[t]eaching away is irrelevant to anticipation." *Seachange Int'l*, 413 F.3d at 1380. Finally, defendant appears to contend that the '103-patent claims require a reduced-false positive rate and increased detection rate, which Kadir does not disclose. However, claims 1 and 20 make no mention or false-positive rates or detection rates.

discloses prior art that must *necessarily* include the unstated limitation." *Therasense*, 593 F.3d at 1332.

After considering the evidence, the Court finds that such is the case here. Kadir's study was conducted in the clinical setting of a hospital and derived its data from the screening of actual pregnancies over a number of years. Kadir describes using first- and second-trimester marker levels to counsel clients as to their Down syndrome risk, including classifying women as "screen positive" during the first trimester and using biochemical markers to create a patient-specific risk for Down syndrome during the second trimester:

> Since 1995, all patients undergoing first-trimester scanning have been counseled and offered nuchal translucency screening. When the nuchal translucency measurement is more than the 99th percentile, irrespective of maternal age, invasive testing by chorionic villus biopsy is offered. The rest of the patients . . . are offered [second]-trimester biochemical screening . . . . The α-fetoprotein and free β-hCG multiples of the median (MoM) were used to adjust the age-related risk for [Down syndrome].

(Jantzi Decl. Ex. 15 at 244-45). As defendant's own expert and the prior art indicate, Kadir's method inherently requires a comparison of distributions in unaffected and Down syndrome pregnancies to calculate patient-specific risk.[25]

As a matter of logic, Kadir's method of testing and counseling patients using screening markers necessarily requires *some* calculation of patient-specific risk; indeed, such a risk is specifically alluded to during the brief discussion of the treatment protocol discussed above. It also appears undisputed that such a calculation would have involved comparing distributions of marker levels in Down syndrome pregnancies and in unaffected pregnancies. (*See* Jantzi Decl.

[25] Defendant asserts that Kadir does not disclose or suggest the calculation of a patient-specific risk during the first trimester because the 99th-percentile is "an absolute measurement cut off, and not a risk or odds." (*See* Def. Opp'n at 11). Even assuming that this is true, it is clear that Kadir does disclose calculating such a patient-specific risk with regard to the second-trimester biochemical markers.

Ex. Ex. 33 at 181:23-182:12, 183:13-21 (Dr. Canick's testimony stating that the standard calculation of patient-specific risk at the time used comparisons with unaffected and affected pregnancies to calculate an MoM and patient-specific risk)) (Pl. Exhibits (Docket 163, Binder # 2) Ex. 6 (1989 article titled "The mathematical basis of multivariate risk screening . . ." describing patient-specific risk as a calculation involving comparing distributions in unaffected and affected pregnancies)).[26] Indeed, Kadir's failure to describe this process in more detail only underscores the conclusion that he expected that his readers understood the calculation it was describing, and that this calculation was the standard method described by both Dr. Canick and the '103 patent specification. In his declaration in opposition to plaintiffs' motion, defendant's own expert, Dr. Canick, stated as much:

> The hallmark of the individual . . . calculation described in the '103 patent [is] the overlapping distributions of screening marker levels for affected and unaffected pregnancies, such that for a specific multiple of the median (MoM) screening marker measurement in a patient, the affected versus unaffected probabilities can be calculated to determine a risk. . . . [T]he calculations and conclusions in Kadir [related to the effect of introducing NT screening on the overall accuracy of second-trimester testing] do not directly require individual measurements of Down syndrome screening markers in a patient, *although such measurements would have been used to originally identify those patients called screen-positive in the first place*.

(Canick Decl., Docket 240, ¶¶ 13-14) (emphasis added).

Considering all of the evidence, the Court concludes that, when Kadir discussed calculating patient-specific risk and counseling patients, a person of ordinary skill in the art would

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[26] The '103 patent also suggests that all of the "known statistical methods" required comparison of distributions in Down syndrome pregnancies and unaffected pregnancies:

> Calculation of risk from the measured marker levels is based on the observed relative frequency distribution of marker level in (a) Down's syndrome and (b) unaffected pregnancies. Any of the known statistical methods may be used.

'103 Patent at col. 6 ll. 19-23.

have understood it to be employing the "standard" method in the art for calculating such risk, a method that involved comparison to unaffected and affected pregnancies.[27] There is thus no triable issue of fact as to whether Kadir disclosed the first claim limitation.

Defendant also contests the assertion that the second claim limitation is disclosed by Kadir. Kadir contains the following sentence:

> As nuchal translucency thickness and maternal serum α-fetoprotein and free β-hCG are independent variables, it is possible to combine these in estimating an individual risk for each pregnancy and keeping the false-positive rate to a minimum.

(Jantzi Decl. Ex. 15 at 246). Plaintiffs contend that this statement clearly discloses combining markers from the first trimester ("nuchal translucency thickness") and the second trimester (α-fetoprotein and free β-hCG) in creating a single, "individual risk."

Relying principally on the testimony of its expert, Dr. Canick, defendant contends that the statement is merely a "throw-away sentence" that fails to disclose or enable the claim limitation. The contention that Kadir fails to disclose the second claim limitation is again without merit. It is clear that Dr. Canick believed that the disputed phrase disclosed the second claim limitation:

> Q: I'm sorry, yes, that [Kadir] suggests combining a first-trimester marker and two second-trimester markers in an individual risk?
>
> A: That's essentially what it does say, yes.
>
> Q: Why, then, Dr. Canick, do you believe that Kadir does not disclose claim one of the '103 patent []?
>
> A: I feel that nothing in the whole paper, except this one line, says anything about combining first and second-trimester markers. It doesn't describe how you do it. It doesn't say—it's like a throwaway. It's very odd.

[27] The prosecution history supports the conclusion that these methods were well-known. The patentee himself stated that "the various mathematical techniques for the derivation of risk from plural marker levels are in themselves routine for the person ordinarily skilled in the art[]." (Jantzi Decl. Ex. 5 at 5-6).

(Jantzi Decl. Ex. 33 at 194:23-195:13). Dr. Canick's assertion that the sentence is a "throwaway" is irrelevant. The authors are clearly speculating about a method of producing a single risk estimate using data from the first and second trimesters. Although the article does not reduce this method to practice, that is not required for a reference to be anticipatory. *Schering Corp.*, 339 F.3d at 1380.

Moreover, speculation about alternative methods can constitute disclosure of a claim limitation. *Hewlett-Packard Co. v. Mustek Sys.*, 340 F.3d 1314, 1324 n.6 (Fed. Cir. 2003) ("The anticipation analysis asks solely whether the prior art reference discloses and enables the claimed invention, and not how the prior art characterizes that disclosure or whether alternatives are also disclosed."); *accord Seachange Int'l*, 413 F.3d at 1380. In *Seachange Int'l*, the Federal Circuit found that a reference could be anticipatory on the basis of an alternative embodiment suggested in a single paragraph of the reference. The patent at issue in that case involved combining two types of computer devices, a "client" and a "server," into one machine. 413 F.3d at 1379. The anticipating reference focused on a system in which "clients" and "servers" were located on separate machines. However, the reference speculated that, "[a]lthough such a 'combined' configuration could have potential drawbacks, it is of course possible to have a media client . . . and media server executing on the same machine." *Id.* at 1379-80. The Federal Circuit held that this mere suggestion of an alternative embodiment, combined with the disclosure of other claim limitations in the reference, could be anticipatory. *Id.* at 1380. It vacated the district court's ruling that the reference was not anticipatory and remanded the case. *Id.* at 1381.

Defendant's second objection is that Kadir does not enable a person of ordinary skill in the

art to practice the invention without undue experimentation. Again, the patentee's own admission to the contrary undercuts defendant's argument. During the prosecution, the patentee submitted a Rule 132 Declaration that stated the following:

> [P]rior to being informed of the Integrated [Assessment] described in the above-identified application, *the only barrier to implementing the method was the absence of the description of using marker levels from both the first and second trimesters*, which is present in the above-identified application. *Once this idea is known*, as taught in the above-identified application, *there is no difficulty in implementing it*, because the nature of the statistical calculation remains unchanged. Thus, the above-indicated method can be implemented by applying the calculation to a new set of parameters from both the first and second trimesters *which is a matter of routine work.*

(Jantzi Decl. Ex. 6 ¶ 33) (emphasis added).[28] By the patentee's own admission, then, the disclosure of the idea of combining first and second-trimester markers into a single risk calculation was all that was needed to enable one of skill in the art to implement the invention. Combined with Kadir's disclosure of every other claim limitation in claims 1 and 20, the statement that "it is possible to combine [first and second-trimester screening markers] in estimating an individual risk for each pregnancy" is enough to enable the invention.[29] The Court therefore finds there is no

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[28] The patentee reinforced this statement during another part of the prosecution:

> [T]he Examiner is urged to appreciate that the present applicant does not claim any novelty in the mathematical techniques themselves. The fact of the matter is that the various mathematical techniques for the derivation of risk from plural marker levels are in themselves routine for the person ordinarily skilled in the art[] . . . . The difference from the prior art is the data fed into the calculation, not the calculation itself.

(Jantzi Decl. Ex. 5 at 5-6).

[29] The Court's conclusions are further supported by the rule that a reference enables when "a person of skill in the art, combining his or her knowledge of the art with the [reference]'s suggestions, would have considered the [disclosure] to be enabled." *Iovate*, 586 F.3d at 1383 (drug advertisement was enabling, although it did not disclose amounts of various ingredients, because numerous publications known to a person of skill in the art already taught acceptable dosage levels). The patentee himself made clear during the prosecution of the patent that nearly everything about the method was well-known and routine to those with skill in the art in March 1998. (*See* Jantzi Decl. Exs. 5, 6).

triable issue of fact as to whether Kadir discloses the second claim limitation.

Finally, plaintiffs contend that Kadir anticipates dependent claims 5, 6, 12, and 15 of the '103 patent. The Court agrees. Because defendant makes no objection to these contentions, the Court finds that there is no triable issue of fact as to whether Kadir anticipates these dependent claims.

In conclusion, the Court finds that Kadir clearly meets all of the claim limitations of claims 1, 5, 6, 12, 15, and 20 of the '103 patent. Plaintiffs have rebutted the presumption of validity by clear and convincing evidence, and the claims are therefore invalid under 35 U.S.C. § 102.

3. Obviousness

"[A] patent for a combination which only unites old elements with no change in their respective functions obviously withdraws what already is known into the field of its monopoly and diminishes the resources available to skillful men." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-16 (2007) (quoting *Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp.*, 340 U.S. 147, 152-53 (1950)) (internal textual alterations omitted). To guard against this, Congress enacted 35 U.S.C. § 103, which provides as follows:

> (a) A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

35 U.S.C. § 103(a). In *Graham v. John Deere Co.*, 383 U.S. 1 (1966), the Supreme Court laid out the framework for conducting an obviousness analysis under § 103:

> [T]he scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary

> considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

Id. at 17-18; *accord KSR*, 550 U.S. at 406 (quoting *Graham*). Obviousness is a question of law based upon these underlying factual analyses. *W. Union Co. v. MoneyGram Payment Sys., Inc.*, 626 F.3d 1361, 1369 (Fed. Cir. 2010). "If a court, or patent examiner, conducts this analysis and concludes the claimed subject matter was obvious, the claim is invalid under § 103." *KSR*, 550 U.S. at 407.

The obviousness analysis is a flexible one. "Throughout this Court's engagement with the question of obviousness, our cases have set forth an expansive and flexible approach." *KSR*, 550 U.S. at 415. It is also objective. "[N]either the particular motivation nor the avowed purpose of the patentee controls. . . . What matters is the objective reach of the claim." *Id.* at 419.

In *KSR*, the Supreme Court underscored the need for "caution in granting a patent based on the combination of elements found in the prior art." *Id.* at 415. "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* at 416. This is because the government should avoid granting monopolies over technologies that would have been invented anyway. *Id.* at 419. To that end, the Court should consider "demands known to the design community or present in the marketplace[,] the background knowledge possessed by a person having ordinary skill in the art", "known problem[s]" in the art, and "inferences and creative steps that a person of ordinary skill in the art would employ"—all in order to determine whether there was both reason and ability to combine elements in the fashion claimed by the patent at issue. *Id.* at 418, 420. Thus, *KSR* makes clear that, for the purposes of the obviousness analysis at least, the "person of ordinary skill" is

also a person "facing the wide range of needs created by developments in the field of endeavor" and motivated to "pursue the known options within his or her technical grasp." *Id.* at 421, 424.

With that in mind, the Court turns to the merits, beginning with the first three factual analyses. The scope and content of the prior art, the differences between the prior art and the claims at issue, and the level of ordinary skill in the art have been discussed at length in the previous sections, and there is no need to recapitulate them here. In brief, as noted, and as the patentee asserted in the specification and during prosecution, a person of ordinary skill in the art would have known how to perform all the elements of the '103 patent, aside from the step of combining first and second-trimester markers into a single calculation. (*See* Jantzi Decl. Exs. 1, 5, 6). Also as noted, Kadir discloses the step of combining first and second-trimester markers into a single calculation.

The Court next turns to secondary considerations. Such considerations "provide evidence of how the patented device is viewed by the interested public: not the inventor, but persons concerned with the product in the objective arena of the marketplace." *Arkie Lures, Inc. v. Gene Larew Tackle, Inc.*, 119 F.3d 953, 957 (Fed. Cir. 1997). These may include commercial success, long-felt-but-unsolved needs, failure of others, copying, unexpected superior results over prior art, praise for the invention, and acceptance of licenses because of the claimed invention's merits. *KSR*, 550 U.S. at 406 (commercial success, long-felt-but-unsolved needs, failure of others); *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 894 (Fed. Cir. 1984) (copying, unexpected results); *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1556-57 (Fed. Cir. 1983) (praise); *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1539 (Fed. Cir. 1983) (licensing). Secondary considerations are an essential part of the obviousness analysis.

Transocean Offshore Deepwater Drilling, Inc. v. Maersk Contractors USA, Inc., 617 F.3d 1296, 1305 (Fed. Cir. 2010) ("[A] district court must *always* consider any objective evidence of nonobviousness presented in a case.") (emphasis original); *Stratoflex*, 713 F.2d at 1538-39 ("[E]vidence of secondary considerations may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have been obvious in light of the prior art was not. It is to be considered as part of all the evidence, not just when the decisionmaker remains in doubt after reviewing the art.").

Strong secondary evidence can, by itself, justify a finding of nonobviousness, particularly when prior-art evidence is not strong. *See Computervision*, 732 F.2d at 895, 899 (affirming district court's finding of nonobviousness where "[n]othing in the prior art . . . would have suggested[] the inventions claimed in the [] patents" and "[t]he objective evidence is strong"). However, "secondary considerations of nonobviousness . . . simply cannot overcome a strong prima facie case of obviousness." *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010).

Here, defendant has presented strong secondary evidence. The integrated assessment has been validated and recognized by those in the field as one of the most accurate tests available. The methods of the '103 patent have been licensed by major national laboratories, including Quest Diagnostics and LabCorp, as well as numerous smaller entities. Furthermore, defendant asserts without opposition that NTD and the State of California incorporate the integrated assessment into their Down-syndrome screening methodologies. Defendant further asserts without opposition that California conducted more than 200,000 such tests between April 2009 and September 2010. It is also undisputed that those in the art recognized a need for more accurate

screening tests and sought them out by searching for new screening markers and experimenting with new combinations of old ones, as well as a need to account for populations that were undergoing both first and second-trimester testing. (*See, e.g.*, Jantzi Decl. Ex. 15).

Defendant also points to the fact that others in the art had failed to practice the disclosed method. It notes that many experts believed that first-trimester screening would ultimately be adopted as the standard of care in the United States. Defendant also points to the mixed reaction to the patentee's disclosure of the integrated test in a 1999 article. In particular, critics appear to have faulted the test on ethical and cost-effectiveness grounds.[30] Teaching away is relevant to the obviousness analysis. *See KSR*, 550 U.S. at 416. However, ethical concerns and the like have less to do with the difficulty of *inventing* the method and more to do with the *advisability of adopting* such a method. In fact, experts repeated these concerns even after the methods of the '103 patent were disclosed. Thus, the Court is inclined to accord them much less weight in the obviousness analysis.

Taking all of the factors into account, the Court concludes that Kadir, when combined with the knowledge of the ordinarily-skilled person in the art at the time of the invention, renders obvious claims 1 and 20 of the '103 patent. Of all the steps disclosed in claims 1 and 20, a person of ordinary skill in the art lacked only the step of combining markers from both trimesters.[31] As

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[30] Defendant also contends that "nothing in the cited prior art predicted that an effective combination of first and second-trimester marker measurements would result in a reduction in false-positive rate." (Def. Facts ¶ 72). This is clearly incorrect, because, as noted, Kadir states that, "As nuchal translucency thickness and maternal serum α-fetoprotein and free β-hCG are independent variables, it is possible to combine these in estimating an individual risk for each pregnancy *and keeping the false-positive rate to a minimum*." (Jantzi Decl. Ex. 15) (emphasis added).

[31] For example, a number of published methods at the time of the invention involved assaying a sample and/or measuring an ultrasound scan during either the first or second trimester; plugging the resulting number into a risk calculation that compared distributions of marker levels in Down syndrome pregnancies and in unaffected

discussed, Kadir discloses that missing step. Moreover, a person of skill in the art would have been highly motivated to try new combinations of known screening markers in order to increase the accuracy of the test and reduce the number of normal pregnancies subjected to invasive testing. So motivated, it seems likely that a person of skill in the art in March 1998, armed with Kadir, could have used his or her "ordinary creativity" to try the combination disclosed by the '103 patent. *See KSR*, 550 U.S. at 421 ("When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp."). Thus, there is a strong *prima facie* case of obviousness. The secondary considerations, in the final analysis, are not enough to overcome this. As discussed, the evidence of failure is weak. The evidence of praise and commercial success, by themselves, are outweighed by the other factors. *See Wyers*, 616 F.3d at 1246 ("Secondary considerations of nonobviousness . . . simply cannot overcome a strong prima facie case of obviousness.").

Accordingly, the Court finds, as a matter of law, that claims 1 and 20 of the '103 patent are obvious in light of Kadir and the knowledge of a person ordinarily skilled in the art in March 1998.

Plaintiffs also contend that claims 2-8, 11, 12, and 15 are obvious. The Court agrees. Because defendant makes no objection to these contentions, the Court finds as a matter of law that claims 2-8, 11, 12, and 15 of the '103 patent are obvious in light of Kadir and the knowledge

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pregnancies; and/or using the resulting risk estimate to designate women "screen-positive" in the manner disclosed by claim 20. (*See* Jantzi Decl. Ex. 7)(*See, e.g.*, Pl. Exhibits, Docket 163, Binder # 2 Exs. 15, 45, 68, 69 (Kadir; a 1996 ACOG Practice Bulletin; a 1996 article titled "First-trimester Down syndrome screening: Free β-human chorionic gonadotropin and pregnancy-associated plasma protein A"; and a 1994 article titled "First-Trimester Fetal Nuchal Translucency Thickness and Risk for Trisomies," respectively)).

of a person of ordinary skill in the art in March 1998.

D. Remaining Motions

Defendant alleges infringement of claims 1-4, 6-8, and 11 of the '103 patent. Because these claims have been invalidated, plaintiffs' activities cannot infringe the '103 patent as a matter of law. Accordingly, the remaining motions for summary judgment will be denied as moot.

Finally, defendant's motion to strike will be denied as moot because the Court did not consider the contested expert reports in its analysis.

III. Conclusion

For the foregoing reasons:

(1) plaintiffs' motion for summary judgment of non-infringement is DENIED;

(2) defendant's motion for summary judgment that the '103 patent claims patentable subject matter is GRANTED, and plaintiffs' motion for summary judgment of invalidity for claiming unpatentable subject matter is DENIED;

(3) plaintiffs' motion for summary judgment that the '103 patent claims are invalid as anticipated and obvious is GRANTED, and defendant's motion for summary judgment the '103 patent claims are neither anticipated nor obvious is DENIED;

(4) defendant's motion to strike is DENIED as moot; and

(5) the remaining motions for summary judgment are DENIED as moot.

So Ordered.

/s/ F. Dennis Saylor
F. Dennis Saylor IV
United States District Judge

Dated: August 12, 2011