United States Court of Appeals for the Federal Circuit

PROMEGA CORPORATION,
Plaintiff-Cross-Appellant,

AND

MAX-PLANCK-GESELLSCHAFT ZUR FORDERUNG DER WISSENSCHAFTEN E.V.,
Plaintiff,

v.

LIFE TECHNOLOGIES CORPORATION, INVITROGEN IP HOLDINGS, INC., AND APPLIED BIOSYSTEMS, LLC,
Defendants-Appellants.

2013-1011, -1029, -1376

Appeals from the United States District Court for the Western District of Wisconsin in No. 10-CV-0281, Chief Judge Barbara B. Crabb.

Decided: December 15, 2014

SETH P. WAXMAN, Wilmer Cutler Pickering Hale and Dorr LLP, of Washington, DC, argued for plaintiff-cross-appellant. With him on the brief were THOMAS G. SAUNDERS and DINA B. MISHRA; and MARK C. FLEMING,

PROSHANTO MUKHERJI and ERIC F. FLETCHER, of Boston, Massachusetts. Of counsel was SUSAN R. PODOLSKY, Law Office of Susan R. Podolsky, of Alexandria, Virginia.

EDWARD REINES, Weil, Gotshal & Manges LLP, of Redwood Shores, California, argued for defendants-appellants. With him on the brief was DEREK C. WALTER. Of counsel on the brief was CARTER G. PHILLIPS, Sidley Austin LLP, of Washington, DC.

Before PROST, *Chief Judge,* MAYER and CHEN, *Circuit Judges.*

Opinion for the court filed by *Circuit Judge* CHEN.

Dissenting-in-part opinion filed by *Chief Judge* PROST.

CHEN, *Circuit Judge.*

Life Technologies, Applied Biosystems, LLC, and Invitrogen IP Holdings, Inc. (collectively, LifeTech) appeal from the district court's grant of a motion for summary judgment that the asserted claims of United States Patent Nos. 5,843,660 ('660 patent), 6,221,598 ('598 patent), 6,479,235 ('235 patent), and 7,008,771 ('771 patent) (collectively, the Promega patents) are not invalid for lack of enablement and obviousness. Promega Corp. and Max-Planck-Gesellschaft zur Förderung der Wissenschaften E.V. (collectively, Promega) appeal from a grant of a motion for judgment as a matter of law (JMOL) that LifeTech's accused products do not infringe either the Promega patents or U.S. Patent No. RE 37,984 (the Tautz patent), a motion that resulted in the vacatur of a jury's verdict of damages and willful infringement. Finally, LifeTech appeals from the district court's oral ruling that it is not licensed for all uses of the asserted patents under a license agreement with Promega (2006 Cross License).

For the reasons discussed herein, we conclude that the asserted claims of the Promega patents are invalid for lack of enablement. We also find substantial evidence that LifeTech is liable for infringement of the Tautz patent under both 35 U.S.C. § 271(a) and 35 U.S.C. § 271(f)(1). Finally, we affirm the district court's finding that the 2006 Cross License does not cover all of LifeTech's sales of the accused products. We therefore reverse the grant of LifeTech's motion for JMOL and remand to the district court for a determination of damages based on LifeTech's infringement of the Tautz patent.

I. BACKGROUND

DNA is a double-stranded molecule that encodes genetic instructions for living organisms. It consists essentially of two complementary strands of nucleotides. Particular nucleotide sequences may be repeated within a region of a DNA strand. For example, the DNA sequence ATT (adenine-thymine-thymine) may be repeated ten times in a row in a particular location. Such repeating sequences are called "short tandem repeats" (STR), and the region of the DNA strand in which they occur is called an STR "locus."

STR loci occur frequently in the human genome. The number of repeated sequences within an STR locus varies highly from person to person. For example, one individual's DNA may have eleven ATT repeats at a given STR locus, while another individual may have fourteen at the same locus. These variations are referred to as "alleles," or markers, of the particular locus. Alleles are responsible for "polymorphism," or genetic differences between individuals.

No one allele varies enough to differentiate one person from another to a statistically significant degree. A particular set of alleles at multiple loci within an individual's DNA, however, can be used to create a DNA "fingerprint" unique to that individual. This method of

identification is called "STR profiling" and is useful in many fields, including forensic science.

STR profiling may require making copies of the loci of interest in order to obtain a detectable amount of DNA for analysis. This process is called "amplification," and can be accomplished with polymerase chain reaction (PCR). In PCR, a pair of "primers" effectively "flanks," or marks the start and finish of, the locus to be copied. Strands of DNA are then replicated between the primer pair by a DNA polymerase. This process is repeated until a sufficient number of copies of the desired STR locus are generated.

It is highly beneficial to amplify multiple STR loci simultaneously, creating a "multiplex" reaction or a co-amplification. Joint Appendix (J.A.) 1381. Multiplexing, however, is more complicated than performing a series of individual, or "monoplex," amplifications. J.A. 1371. This is because a successful multiplex reaction depends on the selection of a set of primer pairs for which each primer pair not only flanks its respective target locus, but does not overlap—and thus interfere—with primer pairs for other targeted loci. *Id.* at 1372.

Identification of STR loci sets and primer pairs that successfully co-amplify is a trial and error process. In the early 1990s—the time of invention of the patents-in-suit—it is undisputed that scientists could not predict with any certainty, absent a preexisting publication or teaching, whether a given set of loci would successfully co-amplify. *Id.* This was true even when adding a new locus to an already successful multiplex, as skilled artisans could not predict "how the loci would interact with each other or how effectively and efficiently the primers would work in a single reaction [multiplex] environment." *Id.* It is also *undisputed* that the greater the number of STR loci sought to be amplified in a single reaction, the more complicated the process of creating a successful multiplex

for that loci set. *Id.* For example, adding an eighth locus to a seven-loci multiplex (7-plex) was "more complicated" than adding a seventh locus to a six-loci multiplex (6-plex). *Id.* This was because in order to determine whether the loci would co-amplify successfully, it was necessary to "develop primer pairs that would co-amplify together and not interfere with each other[,] avoid undesirable results such as nonspecific amplification or primer-dimer formation[,] and adjust a number of reaction parameters such as temperature, the number of amplification cycles, and the concentration of primers, enzyme, buffer, dNTP, etc." *Id.* at 1372–73.

A. Patents-in-Suit

This case involves five patents that relate to multiplex amplification of STR loci. Promega owns the four Promega patents outright and is the exclusive licensee of the Tautz patent. The Promega patents claim methods or kits for simultaneously determining the alleles present in a set of STR loci from DNA samples, comprising: (a) obtaining a DNA sample; (b) selecting a set of loci of the DNA sample to amplify, including at least the specific loci recited in the claim; (c) co-amplifying the selected loci in a multiplex amplification reaction; and (d) evaluating the amplified alleles to determine the number of STR that are present at each loci. *See, e.g.*, '660 patent, claim 5; '235 patent, claim 1; '598 patent, claim 23; '771 patent, claim 5.

Each of the asserted claims[1] in the Promega patents includes a limitation that recites the phrase "a set of . . .

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[1] Promega asserted infringement of claims 25, 27–31 of the '660 patent, claims 18–19 and 21–23 of the '235 patent, 10, 23–24, 27, and claim 33 of the '598 patent, claim 5 of the '771 patent, and claim 42 of the Tautz

loci" followed by a list of particular STR loci multiplexes of varying complexity, ranging from a 3-plex to a 14-plex. During claim construction, the district court construed the asserted claims with the transitional phrase "a set of . . . loci . . . consisting of" in the relevant limitation as "limited to products that use no loci other than those listed in the claims" (i.e., "closed loci set" claims),[2] and

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patent. *Promega Corp. v. Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V.*, No. 10-cv-0281-bbc, ECF No. 345, slip op. at 32 (W.D. Wis. Nov. 29, 2011) (hereinafter, *Promega I*).

[2] The district court granted LifeTech's motion for summary judgment of noninfringement of the "closed loci set" claims (claims 25 and 27–31 of the '660 patent), a decision that Promega did not appeal. *Promega I*, slip op. at 22. Representative claim 25 of the '660 patent recites:

> 25. A kit for simultaneously analyzing short tandem repeat sequences in at least three loci, comprising a container which has oligonucleotide primers for co-amplifying *a set of* at least three short tandem repeat *loci*, wherein the set of loci are selected from the sets of loci *consisting of*:
>
> D3S1539, D19S253, D13S317;
>
> D10S1239, D9S930, D20S481;
>
> . . .
>
> D16S539, D7S820, D13S317, D5S818, HUMCSF1PO, HUMTPOX, HUMTH01, HUMvWFA31; and
>
> D16S539, D7S820, D13S317, D5S818, HUMF13A01, HUMFESFPS, HUMBFXIII, HUMLIPOL.

other claims with the transitional phrase "a set of . . . loci . . . comprising" in the relevant limitation as not so limited (i.e., "open loci set" claims). *Promega I*, slip op. at 2–3. Claim 23 of the '598 patent is one such claim with an "open loci set" limitation:

> 23. A kit for simultaneously analyzing short tandem repeat sequences in a set of short tandem repeat loci from one or more DNA samples, comprising:
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> A single container containing oligonucleotide primers for each locus in *a set of* short tandem repeat *loci* which can be co-amplified, *comprising* HUMCSF1PO, HUMTPOX, and HUMTH01.

'598 patent, 40:22–28 (emphasis added).

This claim recites an STR profiling kit with primers that can successfully co-amplify a set of three specific STR loci. Both parties agree that the claim requires successful co-amplification of every locus in the claimed "a set of . . . loci." Because Promega used the word "comprising" in the "a set of . . . loci" limitation, the district court concluded that claim 23 covers not only the three loci recited in the claim, but also any other loci combination containing those three recited loci—whether that combination includes 13, 1,300 or 13,000 STR loci. *Promega I*, slip op. at 27. The district court's construction of the "a set of . . . loci" limitation in claim 23 and the other asserted claims is not disputed on appeal.

The Tautz patent is likewise directed to a process for examining polymorphism in DNA samples. For example, the Tautz patent claims a kit for testing at least one STR locus that contains: (1) a mixture of primers; (2) a poly-

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'660 patent, 67:35–68:13 (emphasis added).

merizing enzyme such as *Taq* polymerase; (3) nucleotides for forming replicated strands of DNA; (4) a buffer solution for the amplification; and (5) control DNA. Claim 42 of the Tautz patent recites:

> 42. A kit for analyzing polymorphism in at least one locus in a DNA sample, comprising:
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> a) at least one vessel containing a mixture of primers constituting between 1 and 50 of said primer pairs;
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> b) a vessel containing a polymerizing enzyme suitable for performing a primer-directed polymerase chain reaction;
>
> c) a vessel containing the deoxynucleotide triphosphates adenosine, guanine, cytosine and thymidine;
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> d) a vessel containing a buffer solution for performing a polymerase chain reaction;
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> e) a vessel containing a template DNA comprising i) a simple or cryptically simple nucleotide sequence having a repeat motif length of 3 to 10 nucleotides and ii) nucleotide sequences flanking said simple or cryptically simple nucleotide sequence that are effective for annealing at least one pair of said primers, for assaying positive performance of the method.

Tautz patent, 16:43–61.

B. Accused Products

LifeTech manufactures genetic testing kits that provide components for carrying out a multiplex amplification of STR loci from DNA samples. The kits contain a number of components, including: (1) a primer mix; (2) *Taq* polymerase; (3) PCR reaction mix including nucleotides; (4) a buffer solution; and (5) control DNA. Each of

these kits is designed to successfully co-amplify STR loci combinations that include the recited loci listed in the asserted claims of the Promega patents as well as loci that are not listed in the claims. J.A. 1233–36. LifeTech manufactures one component of its kits in the United States, the *Taq* polymerase, which it ships overseas to a LifeTech manufacturing facility in the United Kingdom. J.A. 6288. This offshore facility assembles and sells the kits worldwide. Relevant here, LifeTech's STR kits are used by law enforcement agencies for forensic identification, and by clinical and research institutions for purposes such as analyzing cancer cells. J.A. 2265–66.

C. 2006 Cross License

In 2006, Promega and defendant Applied Biosystems[3] entered into a non-exclusive cross license agreement that granted Applied Biosystems the right to use the alleged inventions in the Promega patents and the Tautz patent for "Forensics and Human Identity Applications."[4] The 2006 Cross License limited Applied Biosystems' use of the patents-in-suit to, *inter alia*, activities relating to legal proceedings. J.A. 1868–69.

D. Procedural History

In 2010, Promega sued LifeTech for infringement of the Promega and the Tautz patents, alleging that LifeTech sold STR testing kits not covered by the 2006 Cross License. LifeTech responded that it was licensed to practice all of the patents-in-suit and filed counterclaims

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[3] Applied Biosystems was then part of Applera Corporation, but is now a wholly owned subsidiary of LifeTech.

[4] The actual language of the 2006 Cross License is confidential and subject to a protective order, so we refer to the agreement only in broad terms.

that the asserted claims of the Promega patents were invalid. In September 2011, both parties cross-moved for summary judgment on infringement and invalidity. The district court rejected LifeTech's license defense to direct infringement, orally ruling that the license was limited to use in live forensic investigations conducted by police officers, and thus LifeTech's sales outside this field of use were infringing. *See* J.A. 1792.

The district court also ruled on summary judgment that LifeTech's sales of its STR kits for uses other than live forensic investigations conducted by police officers directly infringed claim 42 of the Tautz patent and the claims of the Promega patents containing the "open loci set" limitation. *Promega I*, slip op. at 32. In addition, the district court rejected LifeTech's enablement and obviousness challenges to the Promega patents. LifeTech did not challenge the validity of the Tautz patent. *Id.* at 30–32.

The case proceeded to a jury trial on willfulness and damages. During the trial, both parties stipulated that LifeTech grossed $707,618,247 in worldwide sales of its accused STR kits during the relevant five-and-a-half year period of infringement. J.A. 5478; 202. At the close of Promega's case-in-chief, a dispute arose between the parties about what Promega was required to prove during trial. Promega believed the issue of infringement was decided and it merely needed the jury to determine an appropriate amount of damages. LifeTech contended that Promega had confused the stipulated worldwide sales amount with actual damages available under the Patent Act, and that Promega had failed to satisfy its burden of proof as to which products and sales were eligible for damages under 35 U.S.C. § 271(a).[5] J.A. 5735–36. The

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[5] 35 U.S.C. § 271(a) states: "Except as otherwise provided in this title, whoever without authority makes,

district court acknowledged that there had been "a miscommunication between counsel, and that included me." J.A. 6190. It determined that although Promega "thought that it didn't have to put in any more [evidence about damages] than it already had," Promega's belief was "not correct." *Id.* However, it allowed Promega to present additional evidence in its rebuttal case in order to attempt to correct this deficiency. *Id.*

Following the close of evidence, the district court asked the jury to answer the question: "[W]hat is the total dollar amount of Defendant's sales of STR kits that were United States sales as that term has been defined for you in the instructions?" J.A. 189. Over LifeTech's objection, the district court asked the jury to consider liability for both § 271(a) and § 271(f)(1), explaining that "United States sales" included "all kits made, used, offered for sale, sold within the United States or imported into the United States, as well as kits made outside the United States where a substantial portion of the components are supplied from the United States." *Id.* LifeTech challenged the inclusion of the § 271(f)(1) language and argued that that an alleged patent infringer (*i.e.*, LifeTech and its foreign manufacturing facility) could not induce itself within the meaning of the statute.

The jury returned a verdict of willful infringement and found that: (1) all of LifeTech's worldwide sales were attributable to infringing acts in the United States; (2) ten percent of those sales were for unlicensed uses; and (3) Promega was entitled to $52 million in lost profits. *See* J.A. 202–03. After the entry of judgment, Life-

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uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor, infringes the patent."

Tech moved for JMOL on the ground that Promega "failed to prove the applicable damages for patent infringement." *Id.* at 2296. The district court granted LifeTech's motion, finding that Promega failed to present sufficient evidence to sustain a jury verdict under § 271(a) and § 271(f)(1). The district court vacated the prior finding of infringement and denied Promega's motion for reconsideration, or in the alternative, a new trial.

Both parties appealed. Promega challenges the district court's vacatur of the jury's verdict of willful infringement and award of damages, and in the alternative, the denial of its motion for a new trial. LifeTech challenges the district court's finding that the Promega patents are both enabled and nonobvious. LifeTech also challenges the district court's finding that it is not licensed to practice the patents-in-suit under the 2006 Cross License. We have jurisdiction under 28 U.S.C. § 1295(a)(1).

II. ANALYSIS

A. Standards of Review

Under the Seventh Circuit's standard, we review a grant of summary judgment *de novo*. *Dempsey v. Atchison, Topeka & Santa Fe Ry. Co.*, 16 F.3d 832, 836 (7th Cir. 1994). Summary judgment is only proper when there are no disputed issues of material fact, even after viewing all reasonable inferences drawn from the record in the light most favorable to the non-movant. *Id.* at 836.

Whether a claim satisfies the enablement requirement of 35 U.S.C. § 112, ¶ 1 is a question of law reviewed *de novo*.[6] *AK Steel Corp. v. Sollac*, 344 F.3d 1234, 1238–

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[6] Paragraph 1 of 35 U.S.C. § 112 was replaced with newly designated § 112(a) when § 4(c) of the America

39 (Fed. Cir. 2003). Any facts underlying the enablement determination are reviewed for clear error. *Id.* A party must prove invalidity based on non-enablement by clear and convincing evidence. *Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238, 2242 (2011).

We review motions for JMOL and for a new trial under regional circuit law. *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1202 (Fed. Cir. 2010). In the Seventh Circuit, a grant of JMOL is reviewed "without deference, while viewing all the evidence in the light most favorable to the nonmoving party." *Trading Techs. Int'l v. eSpeed, Inc.*, 595 F.3d 1340, 1357 (Fed. Cir. 2010) (citing *Harper v. Albert*, 400 F.3d 1052, 1061 (7th Cir. 2005)). Denial of a motion for a new trial is reviewed for the abuse of discretion. *Huff v. Sheahan*, 493 F.3d 893, 899 (7th Cir. 2007).

Finally, the licensing issues on appeal are governed by California law, pursuant to the choice of law clause in the 2006 Cross License. Under California law, interpretation of a contract is a judicial function reviewed *de novo*. *Cachil Dehe Band of Wintun Indians v. California*, 618 F.3d 1066, 1073, 1075 (9th Cir. 2010).

B. Enablement of the Promega patents

The district court construed the asserted claims in the Promega patents with the "open loci set" limitation broadly, finding that the language of the claims "makes it clear that they are not limited to the recited loci because they all use the word 'comprising' when listing the loci." *Promega I*, slip op. at 21. Thus, the district court conclud-

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Invents Act, Pub. L. No. 112-29, took effect on September 16, 2012. Because the applications resulting in the patents at issue in this case were filed before that date, we will refer to the pre-AIA version of § 112.

ed that "all of the asserted [open loci set] claims allow for unrecited loci." *Id*.

For example, claim 23 of the '598 patent recites an STR loci combination that *comprises* three specific loci. Under the district court's construction, claim 23 encompasses not only the 3-plex co-amplification recited in the claims, but it also encompasses *any other larger, more complex multiplex reaction*, so long as it includes the three recited loci. Based on this construction—which is not disputed on appeal—LifeTech moved for summary judgment of invalidity of the asserted claims of the Promega patents for lack of enablement under § 112, ¶ 1. The district court denied LifeTech's motion, concluding that the asserted claims need not enable "unrecited elements." *Promega I*, slip op. at 21, 28.

The enablement requirement is set forth in 35 U.S.C. § 112, ¶ 1:

> The specification shall contain a written description of the invention, and the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same.

The enablement requirement ensures that "the public knowledge is enriched by the patent specification to a degree at least commensurate with the scope of the claims." *Nat'l Recovery Techs., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1195–96 (Fed. Cir. 1999). The scope of the claims must be "less than or equal to the scope of enablement." *Id.* at 1196.

Here, we disagree with Promega's characterization that unrecited STR loci combinations in the "open loci set" limitation of the asserted claims are merely "unrecited elements"; under the undisputed claim construction, they are part of the claim scope. In this field of technology,

introducing even a single STR locus to an existing loci multiplex significantly alters the chemistry of, and has an unpredictable effect on, whether the resulting multiplex will successfully co-amplify.

There is no genuine dispute that identifying STR loci multiplexes that will successfully co-amplify is a complex and unpredictable challenge, and as a result, undue experimentation may be required to identify a successfully co-amplifying multiplex that adds even a single new locus to an existing loci combination. To illustrate, Promega repeatedly argued to the United States Patent and Trademark Office (Patent Office) during prosecution that its then-pending claims were patentable because the prior art did not disclose "methods for selecting, co-amplifying, and evaluating the *specific sets* of short tandem repeat loci" recited in the claims. J.A. 1012 (emphasis added).[7] According to Promega, this lack of disclosure was critical, as the state of the art in this technology area "d[id] not disclose or suggest that any arbitrary combination of loci can be co-amplified without undue experimentation." J.A. 1225. Promega also stated that "multiplex amplification" of specific STR loci combinations disclosed in the prior art "cannot be extended to predict the success of multiplexing unrelated combinations of loci." *Id.* at 1224. Promega explained that this was because the prior art "clearly indicate[d] that each individual [STR] locus responds differently when subjected to the PCR using locus-specific primers." *Id.* at 1226. As a result, Promega stated that the prior art could not "provide any direction as to which of many possible [STR loci combination] choices is likely to be successful." *Id.*

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[7] LifeTech collected over seventy similar representations to the Patent Office made by Promega during prosecution of the Promega patents. J.A. 1223–31.

More specifically, Promega represented to the Patent Office that the addition of even a single locus to an existing loci combination rendered that new loci combination patentable. *See, e.g.*, J.A. 1226 (arguing a claim was patentable because "[o]ne of those four loci [disclosed in the prior art] is not included in the list of loci of claim 1 [of the '660 patent]."). For example, Promega argued that a claim reciting a 3-plex loci combination was patentable over prior art that disclosed only two of the three loci. J.A. 1230 ("No more than two of the STR loci disclosed in the [prior art reference] are included in any of the sets of at least three loci listed in step (b) of claim 21 [of the '598 and '235 patents] as amended."); *see also* J.A. 1227 ("[The prior art reference] fails to disclose the suitability of more than two of the loci listed in claim 1 [of the '660 patent]."). Thus, Promega argued that "the disclosure of some of the individual loci in the various [recited] sets of loci co-amplified" was insufficient to render a claim unpatentable. *See id.*

Promega pressed the same position when defending the validity of the Promega patents in this action. In particular, Promega argued that the loci multiplexes recited in its claims were new inventions even though they "comprised" prior art loci combinations that are subsets of its claimed STR loci. Promega justified its position by repeatedly describing the identification of new successfully co-amplifying STR loci combinations as "unpredictable." *E.g.*, Cross Appellant's Br. 8; 25, 61–62. In addition, Promega's expert opined that at the time of filing the parent application to the '598 patent, "any new STR multiplex . . . was inventive, even where one added a single new locus to a pre-existing multiplex (e.g. adding a new locus to a multiplex of two loci to make a triplex; adding a new locus to a multiplex of three loci to make a quadruplex, etc.)." J.A. 715. Thus, Promega explained that without a preexisting publication or teaching, a skilled artisan "could not predict with any certainty . . .

whether a given set of loci would co-amplify successfully together." J.A. 1358. Promega urged that "[t]he lack of these novel and unobvious locus combinations in the prior art, together with the unpredictable nature of this art, is fatal to [LifeTech's] obviousness arguments." *Id.* at 1360.

But when describing the scope of its claims for purposes of infringement, Promega sings a different tune. Despite the overwhelming evidence that the addition of a single locus to an existing loci combination can fundamentally transform the character of the resulting multiplex reaction, Promega argues that LifeTech's STR kits infringe its claims because *any and all* co-amplifying loci combinations that include the STR loci recited in the claims are encompassed by the claims. Promega has chosen broad claim language "at the peril of losing any claim that cannot be enabled across its full scope of coverage." *MagSil Corp. v. Hitachi Global Storage Techs., Inc.*, 687 F.3d 1377, 1381 (Fed. Cir. 2012). Our previous decisions in *MagSil* and *Wyeth & Cordis Corp. v. Abbott Labs.*, 720 F.3d 1380 (Fed. Cir. 2013), are instructive.

In *MagSil*, a patentee asserted infringement of a claim directed to a device used in computer hard drive disks that required a "change in resistance by at least 10%" between two electrodes on the device. 687 F.3d at 1379–80. The specification disclosed information sufficient to enable a skilled artisan to achieve a change in resistance of 11.8%, and at the time of the invention, those in the field aspired to achieve changes in resistance of around 24%. *Id.* at 1381, 1383. Instead of tying the key claim limitation to what the specification enabled, the patentee sought to extend its scope in order to cover later-invented devices that achieved greater than 600% changes in resistance. *Id.* at 1383. To do so, the patentee contended that its claims encompassed the entire range of changes in resistance from 10% up to infinity because it had used standard "open claim" language that "d[id] not exclude additional, unrecited elements." *Id.* We rejected

the patentee's argument because the specification of the patent "d[id] not contain sufficient disclosure to present even a remote possibility that an ordinarily skilled artisan could have achieved the modern dimensions of this art." *Id.* at 1382. We determined that "the specification enabled a marginal advance over the prior art," but did not support the infinite range of resistive changes encompassed by this claim limitation. *Id.*

Although the Promega patents recite specific sets of STR loci instead of an open-ended range as in *MagSil*, the claims at issue here are similar in that they cover the successful co-amplification of a virtually unlimited number of STR loci combinations (so long as they include the recited loci) through recitation of the "open loci set" limitation. And as in *MagSil*, we need not delineate the precise boundary at which Promega's claims are no longer enabled. It is sufficient to conclude, based on Promega's own statements, that the teachings of Promega's patents would not have enabled a skilled artisan at the time of filing to identify significantly more complicated sets of STR loci combinations that would successfully co-amplify—such as those found in LifeTech's STR kits—without undue experimentation. Thus, like the patentee in *MagSil*, Promega's "difficulty in enabling the asserted claims is a problem of its own making." 687 F.3d at 1384.

In *Wyeth*, the patentee asserted infringement of claims covering a broad class of drug compounds with certain structures and properties. 720 F.3d at 1384–85. Although the specification disclosed only one species of the compound having these particular characteristics, the patentee nevertheless contended that its claims encompassed tens of thousands of other species within the genus that were not disclosed by the patent. *Id.* at 1382, 1384–85. The undisputed evidence, however, was that a skilled artisan could not determine whether a particular compound would exhibit the claimed properties without

synthesizing and screening that compound, a "laborious" and "iterative" testing process. *Id.* at 1385.

Even if this testing process for any *one* compound would have been routine to a skilled artisan, we determined that practicing the *full scope* of the claims required "more than routine experimentation" because the specification disclosed "only a starting point for further iterative research in an unpredictable and poorly understood field." *Id.* at 1385–86. In particular, we noted that the specification was "silent" as to how to modify the disclosed compound "in a way that would preserve the recited utility." *Id.* at 1385. Further, even the patentee conceded that because of the unpredictable nature of the art, practicing the full scope of the claims would require testing each of the tens of thousands of potential species within the claimed genus. *Id.* As a result, we concluded that undue experimentation would have been required in order to practice the full scope of the claims and thus the claims were invalid for lack of enablement. *Id.* at 1386.

While the claims of the Promega patents are not directed to a genus of compounds as in *Wyeth*, the claims at issue here similarly cover potentially thousands of undisclosed embodiments in an unpredictable field. And similar to *Wyeth*, the specification of the Promega patents provides only a starting point—specific STR loci combinations that successfully co-amplify—with no disclosure that would have allowed a skilled artisan, absent laborious testing, to add new loci to these recited STR loci combinations that would still successfully co-amplify. Undue experimentation is a matter of degree, and even "a considerable amount of experimentation is permissible," so long as it is "merely routine" or the specification "provides a reasonable amount of guidance" regarding the direction of experimentation. *Johns Hopkins Univ. v. CellPro, Inc.*, 152 F.3d 1342, 1360–61 (Fed. Cir. 1998) (internal quotation omitted). But permissible routine experimentation "is not without bounds." *Wyeth*, 720 F.3d at 1386 (citation

omitted). As the extensive evidence here demonstrates, undue experimentation would have been required in order to enable the full scope of coverage sought by Promega—the successful co-amplification of potentially thousands of unrecited STR loci combinations.

Promega argues that its "open loci set" limitations "permit" its claims to encompass a potentially limitless number of primers and multiplex reactions that are not enabled by the specification. Cross Appellant's Br. 55. Promega then seeks to shift the focus away from the particular facts of this case by contending that nearly every claim using the transitional phrase "comprising" would be invalidated if we were to reject its position and agree with LifeTech. These fears are unfounded.

It is true that when used in the preamble of a claim, the term "comprising" permits the inclusion of other steps, elements, or materials in addition to the elements or components specified in the claims. *See In re Baxter*, 656 F.2d 679, 686 (CCPA 1981). As we stated in *Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1371 (Fed. Cir. 2005), open claims "embrace technology that may add features to devices *otherwise within the claim definition*" (emphasis added). But the relevant usage of "comprising" here is not the one recited in the preamble. Rather, it is within the specific claim limitation that lists combinations of successfully co-amplifying STR loci, combinations whose identification and discovery Promega itself asserts is a complex and unpredictable endeavor. While the term "comprising" in a claim preamble may create a presumption that a list of claim elements is nonexclusive, it "does not reach into each [limitation] to render every word and phrase therein open-ended." *See Dippin' Dots, Inc. v. Mosey*, 476 F.3d 1337, 1343 (Fed. Cir. 2007). Promega's claims differ from customary "open-ended" claims in that Promega's usage of "comprising" in its "open loci set" limitation, as construed, expands the claims at a key limitation in order to cover what are

indisputably advances in this unpredictable art. Under the circumstances here, the numerous embodiments covered by Promega's claims cannot be merely regarded as "unrecited elements" in a standard "open-ended" claim.

Since the Promega patents do not enable a skilled artisan to practice the full breadth of this claim scope without undue experimentation, the challenged claims of the Promega patents are invalid for lack of enablement. Accordingly, we reverse the district court's denial of LifeTech's motion for summary judgment of invalidity of the four Promega patents for lack of enablement under § 112, ¶ 1 and vacate the district court's grant of Promega's motion for summary judgment of infringement for the Promega patents.[8]

C. Infringement under 35 U.S.C. § 271(f)(1)

Since the four Promega patents are invalid for lack of enablement, we need only address the district court's grant of LifeTech's motion for JMOL of noninfringement of the Tautz patent. As mentioned *supra*, LifeTech's accused genetic testing kits include a primer mix, a PCR reaction mix, a buffer solution, control DNA, and a polymerase (*Taq*), which is necessary for the PCR amplification. LifeTech manufactures this *Taq* polymerase component in the United States. LifeTech then ships this component to its facility in the United Kingdom for incorporation into its accused genetic testing kits, which are sold worldwide, including in the United States. *See* J.A. 2265–67.

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[8] Because the asserted claims of the Promega patents are invalid for lack of enablement, adjudication of LifeTech's obviousness challenge under 35 U.S.C. § 103 is unnecessary.

As discussed *infra*, LifeTech admits that sales of these accused kits in the United States infringe the Tautz patent under 35 U.S.C. § 271(a). At trial, the jury also awarded lost profits to Promega based on *worldwide* sales of LifeTech's accused STR kits under 35 U.S.C. § 271(f)(1). The district court, however, granted LifeTech's motion for JMOL under Rule 50(b) of the Federal Rules of Civil Procedure that Promega failed to prove infringement under § 271(f)(1) as a matter of law. In particular, the district court held that (1) § 271(f)(1) requires the involvement of another, unrelated party to "actively induce the combination of components" and that no other party was involved in LifeTech's assembly of the accused kits, and (2) a "substantial portion of the components" requires at least two components to be supplied from the United States and that LifeTech supplied only a single component—the *Taq* polymerase—from the United States. *Promega Corp. v. Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V.*, No. 10-cv-0281-bbc, ECF No. 684, slip op. at 7–19 (W.D. Wis. Sept. 13, 2012) (hereinafter, *Promega II*). On this narrow issue, we disagree with the district court's reading of § 271(f)(1). Moreover, substantial evidence supports the jury's finding that LifeTech's activities infringe the Tautz patent under a proper understanding of that statutory provision. Therefore, the district court erred in granting LifeTech's motion for JMOL.

Under 35 U.S.C. § 271(f)(1), a party may infringe a patent based on its participation in activity that occurs both inside and outside the United States. Section 271(f)(1) states:

> Whoever without authority supplies or causes to be supplied in or from the United States all or a substantial portion of the components of a patented invention, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such compo-

> nents outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer.

1. "Actively induce the combination"

We first address whether "to actively induce the combination" requires involvement of a third party or merely the specific intent to cause the combination of the components of a patented invention outside the United States. We conclude that no third party is required.

To begin, we acknowledge that the word "induce" can suggest that one is influencing or persuading "another." However, induce also encompasses the more broad concept of "to bring about, to cause." *See Promega II*, slip op. at 16 (citing http://www.merriam–webster.com/dictionary/induce); *see also VII Oxford English Dictionary* 888 (2d ed. 1989) ("[t]o bring about, bring on, produce, cause, give rise to"); *Am. Heritage Coll. Dictionary* 894 (4th ed. 2000) ("[t]o bring about or stimulate the occurrence of; cause"). The object of the transitive verb "induce" can either be a person or a thing, such as an activity or result. The statute is written such that an activity—"the combination"—is the object of "induce," not a person. Had Congress wanted to limit "induce" to actions completed by two separate parties, it could easily have done so by assigning liability only where one party actively induced *another* "to combine the [patented] components." Yet, "another" is absent from § 271(f)(1).[9] Instead, the focus of the statute

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[9] In this respect, § 271(f)(1) discusses inducement unlike other areas of the law, where statutes describe the inducement of "another person," "any individual," or a third party. *See, e.g.*, statutes involving extortion (NY State Penal Law § 155.05(2)(e) ("A person obtains proper-

is to induce "the combination of the components of the patented invention."

Nor does the concept of a third party appear in the legislative history for the § 271(f) amendment, which focuses on the would-be infringer's action of supplying components overseas. The legislative history explains: "In order to be liable as an infringer under paragraph (f)(1), one must supply or cause to be supplied 'all or a substantial portion' of the components in a manner that would infringe the patent if such combination occurred within the United States." *Section-by-Section Analysis: Patent Law Amendments of 1984*, 130 Cong. Rec. 28,069 (1984) *as reprinted in* 1984 U.S.C.C.A.N. 5827, 5828 (hereinafter, "Legislative History").

Congress enacted § 271(f) in response to a "loophole" brought to its attention by the Supreme Court's decision in *Deepsouth Packing Co. v. Laitram Corp.*, 406 U.S. 518 (1972). Legislative History, 1984 U.S.C.C.A.N. at 5828. In *Deepsouth*, the Fifth Circuit affirmed an injunction barring use of an infringing shrimp deveining machine

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ty by extortion when he compels or *induces another person* to deliver such property to himself or to a third person . . . .") (emphasis added)); pandering (D.C. Code § 22-2705 ("(a) It is unlawful for any person, within the District of Columbia to: (1) Place or cause, *induce*, entice, procure, or compel the placing of *any individual* in the charge or custody of any other person, or in a house of prostitution, with intent that such individual shall engage in prostitution") (emphasis added)); child delinquency (FL Act § 827.04 ("Contributing to the delinquency or dependency of a child; penalty.—(1) Any person who: (b) *Induces or endeavors to induce*, by act, threat, command, or persuasion, *a child* . . . .") (emphasis added)).

within the United States. 406 U.S. at 519. The infringer subsequently began making the parts of its enjoined shrimp deveining machine in the United States, then exported those parts to its foreign buyers, who would ultimately assemble and use the completed machines abroad. *Id.* at 523–24. The Supreme Court found that the unassembled export of the elements of the infringing shrimp deveining machine did not infringe the patent, which required the completed combination of those elements. *Id.* at 528–29. The Court determined that without a "clear and certain signal from Congress," it was not prepared to expand the rights of patent holders to include an "extraterritorial effect." *Id.* at 531.

Congress responded to *Deepsouth* by enacting § 271(f). Section 271(f) closed the *Deepsouth* "loophole" by expanding the reach of the patent statute to capture certain domestic precursors to extraterritorial activity not previously considered as infringing. In terms of its policy goals, § 271(f)(1) sought to "prevent copiers from avoiding United States patents by supplying components of a patented product in this Country so that the assembly of the components may be completed abroad." Legislative History, 1984 U.S.C.C.A.N. at 5828.

To achieve these goals, Congress chose language for § 271(f)(1) broader than the particular facts of *Deepsouth*. For example, although *Deepsouth* involved the supplying of patented components to unrelated third party customers, Congress did not limit the reach of § 271(f)(1) to "third parties" or "another." In addition, although *Deepsouth* involved the supply of *all* the components of a patented invention, Congress chose to expand liability to the supply of "all or a substantial portion" of the components, discussed *infra*. Given Congress' choice of broadening language—which focuses solely on the activity abroad ("the combination") rather than the actor performing the combination—and acknowledgment of "the need for a legislative solution to close a loophole" identified in

Deepsouth, Legislative History, 1984 U.S.C.C.A.N. at 5828, it is unlikely that Congress intended § 271(f)(1) to hold companies liable for shipping components overseas to third parties, but not for shipping those same components overseas to themselves or their foreign subsidiaries.[10]

LifeTech argues that "to actively induce the combination" requires involvement of a third party based on its interpretation of the phrase "actively induces infringement" in the context of 35 U.S.C. § 271(b). *See, e.g.*, *Global-Tech Appliances, Inc. v. SEB SA*, 131 S. Ct. 2060, 2065 (2011). In *Global-Tech*, the Supreme Court, in deciding a different issue, uses language that assumes the presence of a second person as a direct infringer where there *was* such a person.[11] That assumption is quite natural for induced infringement under § 271(b), since a single party who causes the infringement of a patent would already be strictly liable for infringement under § 271(a). However, because § 271(f)(1) lacks such a strict liability companion statute, comparisons to § 271(b) are of limited value.

2. "Substantial portion of the components of a patented invention"

We next address whether infringement under § 271(f)(1) requires at least two components to be supplied from the United States. Section 271(f)(1) assigns in-

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[10] We are mindful of the fact that the Supreme Court has cautioned against the extraterritorial application of United States laws. *See, e.g.*, *Deepsouth*, 406 U.S. at 531. But in this instance, Congress' chosen language assigns liability to LifeTech's conduct within the United States, based on its extraterritorial effect.

[11] None of the cases cited by the dissent had to confront the question of statutory construction we face here.

fringement to anyone who supplies or causes to be supplied "*all or a substantial portion* of the components of a patented invention." We hold that there are circumstances in which a party may be liable under § 271(f)(1) for supplying or causing to be supplied a single component for combination outside the United States. And based on the facts of this particular case, we conclude that substantial evidence supports the jury's verdict that LifeTech is liable for infringement under § 271(f)(1) for shipping the *Taq* polymerase component of its accused genetic testing kits to its United Kingdom facility.

As with our analysis for "to actively induce the combination," we begin by examining the ordinary meaning of the text of the statute. *See FDIC v. Meyer*, 510 U.S. 471, 476 (1994). The dictionary definition of "substantial" is "important" or "essential." *Webster's Third New Int'l Dictionary* 2280 (2002); *XVII Oxford English Dictionary* 67 (2d ed. 1989) ("essential; material"); *see also Am. Heritage Coll. Dictionary* 1727 (4th ed. 2000) ("considerable in importance . . ."). A "portion" is defined as a "section or quantity within a larger thing; a part of a whole." *Am. Heritage Coll. Dictionary* 1066 (4th ed. 2000); *XII Oxford English Dictionary* 155 (2d ed. 1989) ("[a] part of any whole"). Nothing in the ordinary meaning of "portion" suggests that it necessarily requires a certain quantity or that a single component cannot be a "portion" of a multi-component invention. Rather, the ordinary meaning of "substantial portion" suggests that a single important or essential component can be a "substantial portion of the components" of a patented invention.

None of LifeTech's arguments persuade us otherwise. First, LifeTech contends that the reference to "components" in its plural form in the statute indicates that more than one "component" must be supplied outside the Unit-

ed States for § 271(f)(1) to apply.[12] *Promega II*, slip op. at 10. LifeTech ignores, however, that the statute assigns infringement liability when a party supplies "*all or a substantial portion* of the components of a patented invention"—not merely the "components of a patented invention." Subsequent references within the statute to "such components" are clearly references to "the components of a patented invention," not to what must be "supplied" by the alleged infringer. To illustrate, the statute assigns liability to a party who "actively induce[s] the combination of *such components* outside of the United States *in a manner that would infringe the patent* if such combination occurred within the United States." The term "such components" must refer to the components "of a patented invention," and not to what is "supplied," as only the combination of all "components of a patented invention" results in infringement. In order to reference what must be "supplied" by the alleged infringer within the natural grammatical structure of the statute, Congress would have had to reference "such *all or a substantial portion*," not "such components." In short, LifeTech's reading of "such components" is inconsistent with the grammatical structure of the statute.

LifeTech next compares § 271(f)(1) with § 271(f)(2), arguing that Congress used the plural "components" in subsection (f)(1) and the singular "component" in subsection (f)(2) for a reason.[13] However, these two subsections

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[12] We note that LifeTech's interpretation ignores the Dictionary Act, which instructs that "words importing the plural [can] include the singular." 1 U.S.C. § 1.

[13] Section 271(f)(2) recites: "Whoever without authority supplies or causes to be supplied in or from the United States *any component* of a patented invention that is especially made or especially adapted for use in the

employ the terms in different contexts, and thus the use of "component" in § 271(f)(2) does not control the meaning of "components" in § 271(f)(1). The focus of the infringement inquiry under § 271(f)(1) is whether one or more components supplied by a party constitutes "all or a substantial portion of the components of a patented invention" and if so, whether the alleged infringer "actively induce[d] the combination" of those components. On the other hand, the focus of the infringement inquiry under § 271(f)(2) is whether a party has supplied any component "especially made or especially adapted for use in [a patented] invention" that is not a "staple article or commodity of commerce suitable for substantial noninfringing use."[14]

LifeTech also contends that *Microsoft v. AT&T Corp.*, 550 U.S. 437 (2007), supports its interpretation of § 271(f)(1). In *Microsoft*, an alleged infringer exported the "master version" of its accused operating system software overseas with the intent that the software would be copied by and installed on foreign manufacturers' computers, computers that were eventually sold to foreign customers. 550 U.S. at 445–46. This operating system

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invention and not a staple article or commodity of commerce suitable for substantial noninfringing use, where such component is uncombined in whole or in part, knowing that such component is so made or adapted and intending that such component will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer" (emphasis added).

[14] Promega does not assert infringement under § 271(f)(2) because *Taq* polymerase is "a staple article or commodity of commerce suitable for substantial noninfringing use." *See* J.A. 6289.

software incorporated a speech processing function that allegedly infringed the patentee's claims. *Id.* at 441. On the facts before it, the Supreme Court addressed two specific questions: (1) "when, or in what form, does software qualify as a 'component' under § 271(f)"; and (2) whether "components" of the foreign-made computers were "supplie[d]" from the United States. *Id.* at 447. The Supreme Court held that abstract software code "detached from an activating medium" such as a CD-ROM was not a "component" that could trigger infringement liability under § 271(f) because it was merely an "idea without physical embodiment." *Id.* at 449. The Court also held that the copies of the accused software made by foreign manufacturers outside the United States were not "supplied" from the United States for purposes of § 271(f). *Id.* at 453–54.

LifeTech points to two footnotes of the Supreme Court's opinion comparing the language of § 271(f)(1) with § 271(f)(2). First, the Court observed that the two subsections "differ, among other things, on the quantity of components that must be 'supplie[d] . . . from the United States' in order for liability to attach." *Microsoft*, 550 U.S. at 454 n.16. LifeTech ignores the next two sentences of the Court's opinion, however, which state: "Paragraph (2), *like (1)*, covers only a 'component' amenable to 'combination'" and "Paragraph (2), *like (1)*, encompasses only the 'suppl[y] . . . from the United States' of 'such [a] component' as will itself 'be combined outside of the United States.'" *Id.* (emphases added). This language tends to support the conclusion that § 271(f)(1) may apply when a single "component" is involved.

Second, the Supreme Court observed that "§ 271(f)(2) applies to the export of even a single component if it is 'especially made or especially adapted for use in the invention and not a staple article or commodity of commerce suitable for substantial noninfringing use.'" *Microsoft*, 550 U.S. at 454 n.18. LifeTech appears to argue

that the Court's use of the phrase "single component" in § 271(f)(2) by implication means that § 271(f)(1) applies only to multiple components. But LifeTech ignores the preceding sentence of the opinion, in which the Supreme Court observes that, in contrast, "§ 271(f)(1) applies to the supply abroad of 'all or a substantial portion of' a patented invention's components." *Id.* Again, this footnote does not suggest that § 271(f)(1) differs from § 271(f)(2) in that it necessarily requires the export of more than one component.

Moreover, LifeTech's interpretation of these two footnotes is undermined by the very facts of *Microsoft*. In *Microsoft*, the patented invention involved the combination of at least two components: operating system software and a computer. 550 U.S. at 441–42. The alleged infringing activity under § 271(f) was a party's export of a *single* component of this two-component invention—either a "master disk" or an "electronic transmission" containing the accused operating system software. *Id.* at 446. The patentee did not specify which subsection of § 271(f) was triggered by the alleged infringer's activity, and for "clarity's sake," the Supreme Court focused its analysis on the text of § 271(f)(1). *Id.* at 447 n.7. Although the "electronic transmission" was determined not to be a "component," neither party argued—and the Supreme Court never suggested—that liability under § 271(f)(1) did not attach merely because the single component of a master disk or electronic transmission could not be a "substantial portion" of the components of the patented invention. In short, the Supreme Court in *Microsoft* could have decided the patentee's challenge by finding, or at least instructing, that liability under § 271(f)(1) requires the export of more than one component of a patented invention. It did not. In the absence of express guidance by the Supreme Court, we will not contravene the ordinary reading of the statute and categorically exclude the "supply" of a single component of a patented invention from the scope of § 271(f)(1).

Our determination that liability under § 271(f)(1) may attach for export of a single component does not end the inquiry, however. According to the statute, this component must be "a substantial portion" of the components of the patented invention. Here, we find substantial evidence to support the jury's conclusion that the *Taq* polymerase supplied by LifeTech from the United States to its foreign facility is a "substantial portion" of the components of the LifeTech's accused genetic testing kits.

Claim 42 of the Tautz patent recites five components: a primer mix, a polymerizing enzyme (such as *Taq* polymerase), nucleotides, a buffer solution, and control DNA. Tautz patent, 16:43–61. LifeTech's domestic arm supplies[15] the *Taq* polymerase to its facility in the United Kingdom, which both manufactures the remaining four components and assembles all the components into the accused STR kits. J.A. 2265–67, 6288. *Taq* polymerase is an enzyme used to amplify the DNA sequences in order to obtain enough replicated sample for testing. J.A. 6281. Without *Taq* polymerase, the genetic testing kit recited in the Tautz patent would be inoperable because no PCR could occur. LifeTech's own witness admitted that the *Taq* polymerase is one of the "main" and "major" components of the accused kits. J.A. 6290–91. In short, there is evidence in the record to support the jury's finding that a polymerase such as *Taq* is a "substantial portion" of the patented invention.

In sum, we disagree with the district court that a single component supplied from the United States, no matter how important or central to the invention, can never constitute "a substantial portion of the components of a

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[15] LifeTech either purchases *Taq* polymerase from a third-party in the United States or produces *Taq* polymerase itself in an Austin, Texas facility. J.A. 6281–83.

patented invention." The evidence demonstrates that LifeTech supplied a substantial portion of the patented invention—the polymerase—to its overseas facility as a component of its accused genetic testing kits. Further, whether LifeTech exhibited the necessary knowledge and intent to combine the *Taq* polymerase with the remaining components of its genetic testing kit "in a manner that would infringe" the Tautz patent if that combination occurred within the United States is not contested and is presumed. There is substantial evidence in the record to support the jury's finding that LifeTech is liable for infringement under 35 U.S.C. § 271(f)(1).

D. Infringement under 35 U.S.C. § 271(a)

The district court also granted LifeTech's motion for JMOL of noninfringement of the Tautz patent under § 271(a) because it believed Promega did not offer evidence that LifeTech's accused products were made, used, offered for sale, or sold in the United States. Though the district court acknowledged that Promega had introduced evidence that at least some of LifeTech's accused products infringed under § 271(a), it granted LifeTech's motion because Promega had not shown that *all* its sales were infringing. We reverse the district court.

At trial, LifeTech admitted that some of the sales of its accused genetic testing kits in the United States were "technically an infringement" of Promega's patents. J.A. 5127. LifeTech also admitted that Promega was "entitled to be compensated for [LifeTech's] infringement." *Id.* Promega presented evidence to the jury showing sales of LifeTech's accused kits in the United States. *See* J.A. 7031–7170, 7362–7744, 7906–8002 (LifeTech sales records); J.A. 6249–68 (LifeTech testimony explaining the sales records). Based on LifeTech's own admissions, which are supported by evidence in the record, we conclude that LifeTech's kits made, used, or sold in the United States infringe the Tautz patent under 35 U.S.C.

§ 271(a). Because substantial evidence supports the jury's finding that LifeTech's accused kits infringe the Tautz patent under both § 271(a) and § 271(f)(1), we reverse the district court's grant of LifeTech's motion for JMOL of noninfringement of the Tautz patent.

E. 2006 Cross License

The 2006 Cross License is a limited field-of-use license for "Forensics and Human Identity Applications." Appellant's Br. 9. California state law provides: "The language of a contract is to govern its interpretation, if the language is clear and explicit, and does not involve an absurdity." Cal. Civ. Code § 1638. During a hearing before trial, the district court issued an oral ruling that the scope of the 2006 Cross License was limited to sales of LifeTech's STR kits used during "live" forensic investigations conducted by law enforcement agencies, and did not cover sales of the STR kits used for forensic research, education, and training at universities and other non-law enforcement bodies. J.A. 1792.

LifeTech contends that because forensic research, education and training are necessary parts of any "live" forensic investigation by a law enforcement agency, the 2006 Cross License also covers STR kits used by universities and other parties for any purpose related to forensic research, education, and training.[16] For example, LifeTech argues that any educational use of its STR kits is for "Forensics and Human Identity Applications" of law enforcement agencies because "the forensics student is learning specifically how to use the very kits that will be

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[16] In its Reply Brief, LifeTech argued for the first time that it has broader licensing rights to the Tautz patent based on a 1996 agreement. Reply Br. 8. We will not consider this untimely argument.

used for legal proceedings, and *cannot* use those kits in legal proceedings if he or she has not been trained on them." Appellant's Br. 59.

We are not persuaded by LifeTech's creative interpretation of the 2006 Cross License. LifeTech's desire to expand the scope of the license to authorize certain unspecified applications contradicts the express language of the agreement, which grants LifeTech a limited field-of-use license for "forensics and paternity." J.A. 1868–69. The district court correctly determined that the plain language of the 2006 Cross License's "Forensic and Human Identity Applications" field-of-use provision does not extend to research, education, and training. As the district court summarized in its oral ruling, "defendants want [the 2006 Cross License] to apply to every research project going on in the world that had anything to do with genetics, no. No. Doesn't work." *Id.* at 1792.

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We have considered all other arguments presented by the parties and find them unpersuasive.

III. CONCLUSION

For the foregoing reasons, we conclude that the challenged claims of the four Promega patents are invalid under 35 U.S.C. § 112, ¶ 1 for lack of enablement, and thus reverse the district court's denial of LifeTech's motion for summary judgment of invalidity. Because substantial evidence supports the jury's finding that LifeTech infringed the Tautz patent under both 35 U.S.C. § 271(a) and 35 U.S.C. § 271(f)(1), we reverse the district court's grant of JMOL of noninfringement as to the Tautz patent. We affirm the district court's ruling that certain sales of LifeTech's accused STR kits are not covered by the 2006 Cross License. Since the challenged claims of four of the five asserted patents on which the jury based its damages verdict are invalid, we vacate the jury's damages award.

We also vacate the district court's denial of Promega's motion for a new trial, and we remand to the district court to determine damages due to LifeTech's infringement of the Tautz patent.

AFFIRMED-IN-PART, REVERSED-IN-PART, VACATED-IN-PART, AND REMANDED

COSTS

No costs.

United States Court of Appeals for the Federal Circuit

PROMEGA CORPORATION,
Plaintiff-Cross-Appellant,

AND

MAX-PLANCK-GESELLSCHAFT ZUR FORDERUNG DER WISSENSCHAFTEN E.V.,
Plaintiff,

v.

LIFE TECHNOLOGIES CORPORATION, INVITROGEN IP HOLDINGS, INC., AND APPLIED BIOSYSTEMS, LLC,
Defendants-Appellants.

2013-1011, -1029, -1376

Appeals from the United States District Court for the Western District of Wisconsin in No. 10-CV-0281, Chief Judge Barbara B. Crabb.

PROST, *Chief Judge*, dissenting-in-part.

While I join Sections I–II.B and II.D–II.E of this opinion, I respectfully dissent from Section II.C in which the majority determines that LifeTech can be held liable for infringement of the Tautz patent under 35 U.S.C § 271(f)(1). The opinion concludes that LifeTech "actively induce[d]" itself (i.e., its U.K. subsidiary) to make the

patented combination in the U.K. *See* Majority Op. at 23–26. However, I read § 271(f)(1) and its requirement of active inducement to necessarily mean inducement of *another*. Indeed, we have never before held—in the context of either § 271(f) or § 271(b)—that a party can induce itself to infringe. And for good reason: this conclusion runs counter to unambiguous Supreme Court precedent. Therefore, contrary to the majority, I conclude that LifeTech cannot be held liable for infringing the Tautz patent under § 271(f)(1).[1]

Twice the Supreme Court has held that inducement liability requires a third party. In interpreting the phrase "induces infringement" in § 271(b), the Supreme Court wrote that it requires "that the inducer lead *another*" or "persuade *another*." *Global-Tech Appliances, Inc. v. SEB SA,* 131 S. Ct. 2060, 2065 (2011) (emphases added). Additionally, in *Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd*., a case in the analogous copyright context,[2] the Supreme Court stated that inducement is defined as "entic[ing] or persuad[ing] *another*" to infringe. 545 U.S. 913, 935 (2005) (emphasis added). The majority cannot point to a single case—from the Supreme Court or other-

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[1] Because I find that the district court properly decided that LifeTech is not liable under § 271(f)(1) for active inducement, I would not reach the alternative argument that LifeTech is not liable under § 271(f)(1) because it only supplied a single component.

[2] The Supreme Court has explained it is most appropriate to draw an analogy between copyright cases and patent cases "because of the historic kinship between patent law and copyright law." *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 439 (1984); *see also Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1295 (Fed. Cir. 2011) ("[T]he most analogous area to patent law is copyright.").

wise—that supports its contrary interpretation of inducement.

Our en banc court has also made similar statements regarding inducement under § 271(b). For example, in *DSU Medical Corp. v. JMS Co.*, we ruled that inducement requires proof: (1) "of culpable conduct, directed to encouraging *another's* infringement"; (2) that the defendant "actively and knowingly aid[ed] and abet[ted] *another's* direct infringement"; and (3) "that the alleged infringer knowingly induced infringement and possessed specific intent to encourage *another's* infringement." 471 F.3d 1293, 1305–06 (Fed. Cir. 2006) (en banc) (emphases added). And in *Lucent Technologies, Inc. v. Gateway, Inc.*, we stated that "inducement requires evidence of culpable conduct, directed to encouraging *another's* infringement." 580 F.3d 1301, 1322 (Fed. Cir. 2009) (emphasis added); *see also Wordtech Sys. v. Integrated Networks Solutions*, 609 F.3d 1308, 1315 (Fed. Cir. 2010) (same).

The majority rests its analysis on the legislative history surrounding the enactment of § 271(f). Even assuming that reliance on legislative history is appropriate in this circumstance, the majority ignores the most relevant part of the legislative history: "the term 'actively induce'" in § 271(f)(1) was expressly "drawn from existing subsection 271(b)[.]" 130 Cong. Rec. 28,069 (1984) (statement of Rep. Kastenmeier, inserting a section-by-section analysis of H.R. 6286). It is a "standard principle of statutory construction that identical words and phrases within the same statute should normally be given the same meaning." *Powerex Corp. v. Reliant Energy Servs., Inc.*, 551 U.S. 224, 232 (2007). As Congress expressly based § 271(f)(1) on § 271(b), that principle of statutory construction has special force here.

Further, the majority focuses on the fact that it is illogical to hold companies liable for shipping components to third parties overseas while simultaneously permitting

companies to ship those same components overseas to either itself or its subsidiaries. The majority states that it is "unlikely" that Congress intended this result. *See* Majority Op. at 26. Maybe. Maybe not. More importantly, however, the majority imputes from Congress' supposed intent to close the *Deepsouth* loophole a much broader legislative intent to close all loopholes related to extraterritorial liability. This is improper. Congress replaced *Deepsouth* with the statutory language of § 271(f), not some amorphous "intent." In these circumstances it is hardly our role as judges to surmise or divine what Congress may or may not have foreseen or desired, and to act as its surrogate.

Indeed, the Supreme Court rejected such an aggressive methodology when it resolved *Deepsouth Packing Co. v. Laitram Corp*, 406 U.S. 518 (1972). Facing a loophole in the statutory scheme, the Supreme Court in *Deepsouth* held that no law prohibited an entity from avoiding infringement by shipping components of a patented device for assembly outside the United States. And what happened next? Congress stepped in and superseded *Deepsouth* by enacting § 271(f). *See* 130 Cong. Rec. 28,065–69 (1984).

But I need not even look to *Deepsouth*. I also follow the clear guidance from the Supreme Court in *Limelight Networks, Inc. v. Akamai Technologies, Inc*, 134 S. Ct. 2111 (2014). There, the Court explained that "when Congress wishes to impose liability for inducing activity that does not itself constitute direct infringement, it knows precisely how to do so. The courts should not create liability for inducement of non-infringing conduct where Congress has elected not to extend that concept." *Id.* at 2118.

Finally, the Supreme Court has cautioned against employing a policy-oriented approach to judicial decision making when it would cause law to have extraterritorial

application. Specifically, in *Microsoft Corp. v. AT&T Corp.*, the Supreme Court noted that Congress did not address all gaps when it drafted § 271(f) and, therefore, the Supreme Court chose to "leave in Congress' court" the broader, extraterritorial "patent-protective determination" the patentee sought in that case. 550 U.S. 437, 458 (2007). The Supreme Court warned that "[i]f the patent law is to be adjusted[,] . . . the alteration should be made after focused legislative consideration, and not by the Judiciary forecasting Congress' likely disposition." *Id.* at 458-59. Because we are limited by the language of the statute, Supreme Court precedent, and our own precedent, I respectfully dissent from the portion of the majority's opinion addressing § 271(f)(1).