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As Gevo, Inc. (the Company) has previously disclosed, on June 19, 2012, the United States District Court for the District of Delaware in a memorandum opinion, attached hereto as Exhibit 99.1, denied the request of Butamax Advanced Biofuels (Butamax) for a preliminary injunction in their pending patent infringement lawsuit against the Company. As is normal and customary in patent infringement actions of this nature, Butamax has filed a notice of appeal. In connection with their appeal, Butamax has also filed related motions with the United States District Court for the District of Delaware seeking to overturn or change the decision of the court with respect to the preliminary injunction. The presiding judge has scheduled a hearing on these motions for July 3, 2012.

As previously announced, the Company is conducting a public offering of shares of its common stock and convertible senior notes due 2022, in each case pursuant to a prospectus supplement. The foregoing information related to Butamax should be read in conjunction with the risk factors related to the litigation with Butamax as set forth in the prospectus supplements.

Exhibit 99.1

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

BUTAMAX ADVANCED BIOFUELS LLC,	)	
	)	
Plaintiff,	)	
	)	
v.	)	Civ. No. 11-54-SLR
	)	
GEVO, INC.,	)	
	)	
Defendant.	)	

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MEMORANDUM OPINION

Dated: June 19, 2012

Wilmington, Delaware

I. **INTRODUCTION**

On January 14, 2011, Butamax Advanced Biofuels LLC (plaintiff or Butamax) filed suit in this district against Gevo, Inc. (defendant or Gevo alleging infringement of United States Patent No. 7,851,188 (the 188 patent). (D.I. 1) The 188 patent discloses and claims a recombinant microorganism having an engineered isobutanol biosynthetic pathway that may be used for the commercial production of isobutanol. (188 patent, col. 2:3-6) Defendant answered plaintiff s complaint on March 25, 2011. (D.I. 10) On August 11, 2011, plaintiff filed an amended complaint. (D.I. 41) The amended complaint added a count of infringement; specifically, plaintiff alleged that defendant also infringed United States Patent No. 7,993,889 (the 889 patent). (D.I. 41) The 899 patent was filed as a divisional application from the 188 patent and also claims a method for isobutanol production using recombinant microorganisms with an engineered biosynthetic pathway. (899 patent, col. 2:3-6) Defendant answered the amended complaint on September 13, 2011. (D.I. 52)

On September 22, 2011, plaintiff filed a motion for preliminary injunction which sought to enjoin defendant from infringing the 899 patent. (D.I. 61) A discovery and briefing schedule was stipulated to by the parties. (D. I. 106) Following the exchange of discovery and the completion of briefing, the court held an evidentiary hearing on the matter. The hearing occurred on March 1-2, 2012. The parties filed opposing post-hearing briefs on March 16, 2012. (D.I. 233, 234)

Presently before the court are the following: plaintiffs motion for a preliminary

injunction (D.I. 61); defendant s motion for leave to file a sur-reply and declaration[1] (D.I. 217); defendant s motion to supplement the record[2] (D.I. 232); and defendant s amended motion to supplement the record[3] (D.I. 283). The court has jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a). For the reasons discussed more fully below, the court denies plaintiff s motion for a preliminary injunction.

II. BACKGROUND

A. Parties

Plaintiff is a limited liability corporation organized and existing under the laws of the State of Delaware, with its principal place of business in Wilmington, Delaware. (D.I. 41 at ¶ 1) Plaintiff develops methods of making biofuels such as biobutanol, a product which may be used as a fuel or as a feed-stock chemical in the production of various plastics, fibers and other products. (*Id*.) In particular, plaintiff has developed a biological method of producing isobutanol, a type of biobutanol. (*Id*.)

Defendant is a corporation organized and existing under the laws of the State of Delaware, with its principal place of business in Englewood, Colorado. *(Id.* at ¶ 2) Defendant is also involved in the commercial-scale production of isobutanol using biological methods. *(Id.* at ¶ 11; D.I. 154 at 3)

B. Technology

lsobutanol is an industrial chemical that may be blended with gasoline-based

[1] The motion is granted.
[2] The motion is denied.
[3] The motion is denied.

fuels as an alternative to ethanol, the current dominant biofuel in gasoline blends. (D. I. 62 at 2; 889 patent at col. 6:38-40; *see also* D.l. 41 at ¶ 15) lsobutanol is preferred over ethanol because it has a higher energy content and is less corrosive. (D.I. 62 at 2; 889 patent at col. 6:33-40) Plaintiff proposes a method of producing isobutanol using genetically-engineered yeast microorganisms that promises to facilitate the transition to renewable transportation fuels and reduce greenhouse gas emissions. (D.I. 41 at ¶ 1)

This improved method for producing isobutanol is achieved by introducing engineered deoxyribonucleic acid (DNA) into microorganisms in order to stimulate isobutanol production. *(Id.* at ¶ 12; 889 patent at col. 17:9-19) Microorganisms such as yeast and bacteria are capable of producing isobutanol through a five-step pathway consisting of the following five chemical conversions: (1) pyruvate to acetolactate; (2) acetolactate to 2,3-dihydroxyisovalerate; (3) 2,3-dihydroxyisovalerate to a-ketoisovalerate; (4) a-ketoisovalerate to isobutyraldehyde; and (5) isobutyraldehyde to isobutanol. (D.I. 41 at ¶ 12; 889 patent at col. 325:19-30) The engineered DNA constructs encode enzymes that catalyze, or increase the chemical reaction rate, of the five steps in the isobutanol biosynthesis pathway. (D.I. 41 at ¶ 12; 889 patent at col. 325:32-42) Introducing these enzyme-coding DNA constructs into the microorganism stimulates the biosynthetic pathway and increases overall isobutanol production. (D. I. 41 at ¶ 12; 889 patent at col. 44:28-32)

C. The Patent

The 889 patent, entitled Fermentive Production of Four Carbon Alcohols, was filed on January 23, 2008 and issued on August 9, 2011. The 889 patent is a divisional of the 188 patent which was filed on October 25, 2006. The 188 patent claims priority from provision application No. 60/730,290 which was filed on October 26, 2005. Both the 889 patent and the 188 patent are assigned to plaintiff. *(Id.* at ¶¶ 6, 9)

The specification of the 889 patent admits that isobutanol may be chemically synthesized from starting materials derived from petrochemicals, but this method of synthesis is expensive and bad for the environment. (889 patent at col. 1:33-35) The inventors assert that using yeast or other comparable microorganisms to produce isobutanol would reduce green house gas emissions and, therefore, would be a desirable alternative to chemical synthesis. *(Id.* at col. 1:36-38)

Yeast naturally produce low levels of isobutanol as a by-product of fermentation. *(Id.* at col. 1:39-49) More specifically, isobutanol is produced from the catabolism, or metabolic breakdown, of the amino acid L-valine. (*Id.*) However, use of L-valine on an industrial scale as a feed-stock for yeast fermentation is prohibitively expensive. *(Id.* at col. 1:57) The inventors claim a more cost-efficient method of producing isobutanol directly from pyruvate, a product of sugar digestion, in lieu of L-valine. *(Id.* at col. 325:15-18) The transformation of pyruvate to isobutanol is achieved through one of four multi-step biosynthetic pathways. *(Id.* at col. 11:40-43)

In the claimed biosynthetic pathway, all of the necessary reaction substrates are components of well-characterized pathways that are naturally present in yeast. *(Id.* at col. 11:57-61) The inventors assert that stimulating this pathway through the introduction of DNA constructs coding for enzymes specific to pathway steps yields increased isobutanol production. *(Id.; Id.* at col. 17:9-19; *Id.* at col. 44:28-32) Although the enzymes are introduced via genetic manipulation, the enzymes also exist in yeast

or other microorganisms as naturally-occurring components of the well-characterized enzymatic pathways. *(Id.* at col. 11:58-12:32) Independent claim 1, reproduced below, describes the preferred biosynthetic pathway and identifies which enzymes catalyze each step of the claimed pathway:

1. A method for producing isobutanol comprising;

a. providing a fermentation media comprising carbon substrate; and

b. contacting said media with a recombinant yeast microorganism expressing an engineered isobutanol biosynthetic pathway wherein said pathway comprises the following substrate to product conversions;

i. pyruvate to acetolactate (pathway step a);

ii. acetolactate to 2,3-dihydroxyisovalerate (pathway step b);

iii. 2,3-dihydroxyisovalerate to a-ketoisovalerate (pathway step c);

iv. a-ketoisovalerate to isobutyraldehyde (pathway step d); and

v. isobutyraldehyde to isobutanol (pathway step e);

and wherein

a) the substrate to product conversion of step (i) is performed by an acetolactate synthase enzyme;

b) the substrate to product conversion of step (ii) is performed by an acetohydroxy acid isomeroreductase enzyme;

c) the substrate to product conversion of step (iii) is performed by an acetohydroxy acid dehydralase enzyme;

d) the substrate to product conversion of step (iv) is performed by a decarboxylase enzyme; and

e) the substrate to product conversion of step (v) is performed by an alcohol dehydrogenase enzyme;

whereby isobutanol is produced.

Dependent claims 13 and 14 are also at issue in the present preliminary injunction action. (D.I. 62 at 6) Claim 13 depends from claim 12, which in turn depends from claim 1. Claims 12 and 13 are reproduced below:

12. The recombinant yeast microorganism of claim 1 wherein the said microorganism further comprises inactivated genes thereby reducing yield loss from competing pathways for carbon flow.

13. The recombinant yeast microorganism of claim 12, wherein said inactivated genes reduce pyruvate decarboxylase activity.

Claim 14 depends only from claim 1 and reads as follows:

14. The method of claim 1, wherein one or more enzymes of said engineered isobutanol biosynthetic pathway uses NADH as an electron donor.

Ill. STANDARD OF REVIEW

Traditional rules of equity apply to requests for injunctive relief. *See eBay, Inc. v. MercExchange, L.L.C.,* 547 U.S. 388, 391 (2006). The decision to grant or deny injunctive relief is an act of equitable discretion by the district court. *Id.* The grant of a preliminary injunction is considered an extraordinary remedy that should be granted only in limited circumstances. *See Kos Pharm., Inc. v. Andrx Corp.,* 369 F.3d 700, 708 (3d Cir. 2004) (citation omitted).

The moving party for injunctive relief must establish: (1) a likelihood of success on the merits; (2) that it will suffer irreparable harm if the injunction is denied; (3) that granting preliminary relief will not result in even greater harm to the nonmoving party; and (4) that the public interest favors such relief. *Id.* (citation omitted). The burden lies with the movant to establish every element in its favor or the grant of a preliminary injunction is inappropriate. *See P.C. Yonkers, Inc. v. Celebrations, the Party and Seasonal Superstore, LLC,* 428 F.3d 504, 508 (3d Cir. 2005). If either or both of the fundamental requirements likelihood of success on the merits and probability of

irreparable harm if relief is not granted are absent, an injunction cannot issue. *See McKeesport Hosp. v. Accreditation Council for Graduate Med. Educ.,* 24 F.3d 519, 523 (3d Cir. 1994).

IV. DISCUSSION

A. Likelihood of Success on the Merits

1. Infringement

a. Standard of review

Claim construction is a matter of law. *Phillips v. AWH Corp.,* 415 F .3d 1303, 1330 (Fed. Cir. 2005) (en banc). Claim construction focuses on intrinsic evidence- the claims, specification and prosecution history because intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language. *Vitronics Corp. v. Conceptronic, Inc.,* 90 F.3d 1576, 1582 (Fed. Cir. 1996); *Markman v. Westview Instruments, Inc.,* 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), *aff d,* 517 U.S. 370 (1996). Claims must be interpreted from the perspective of one of ordinary skill in the relevant art at the time of the invention. *Phillips,* 415 F.3d at 1313.

Claim construction starts with the claims, *id.* at 1312, and remains centered on the words of the claims throughout. *Interactive Gift Express, Inc. v. Compuserve, Inc.,* 256 F.3d 1323, 1331 (Fed. Cir. 2001). In the absence of an express intent to impart different meaning to claim terms, the terms are presumed to have their ordinary meaning. *Id.* Claims, however, must be read in view of the specification and prosecution history. Indeed, the specification is often the single best guide to the meaning of a disputed term. *Phillips,* 415 F.3d at 1315.

A patent is infringed when a person without authority makes, uses or sells any patented invention, within the United States ... during the term of the patent. 35 U.S.C. § 271(a). A two-step analysis is employed in making an infringement determination. *See Markman,* 52 F.3d at 976. First, the court must construe the asserted claims to ascertain their meaning and scope. *See id.* Construction of the claims is a question of law subject to de novo review. *See Cybor Corp. v. FAS Techs.,* 138 F.3d 1448, 1454 (Fed. Cir. 1998). The trier of fact must then compare the properly construed claims with the accused infringing product. *See Markman,* 52 F.3d at 976. This second step is a question of fact. *See Bai v. L & L Wings, Inc.,* 160 F .3d 1350, 1353 (Fed. Cir. 1998).

Direct infringement requires a party to perform each and every step or element of a claimed method or product. *BMC* Res., *Inc. v. Paymentech, L.P.,* 498 F.3d 1373, 1378 (Fed. Cir. 2007). If any claim limitation is absent from the accused device, there is no literal infringement as a matter of law. *Bayer AG v. Elan Pharm. Research Corp.,* 212 F.3d 1241, 1247 (Fed. Cir. 2000). If an accused product does not infringe an independent claim, it also does not infringe any claim depending thereon. *See Wahpeton Canvas* Co. *v. Frontier, Inc.,* 870 F.2d 1546, 1553 (Fed. Cir. 1989). However, [o]ne may infringe an independent claim and not infringe a claim dependent on that claim. *Monsanto* Co. *v. Syngenta Seeds, Inc.,* 503 F.3d 1352, 1359 (Fed. Cir. 2007) (quoting *Wahpeton Canvas,* 870 F.2d at 1552) (internal quotations omitted). A product that does not literally infringe a patent claim may still infringe under the doctrine of equivalents if the differences between an individual limitation of the claimed invention

and an element of the accused product are insubstantial. *See Wamer-Jenkinson* Co. *v. Hilton Davis Chern.* Co., 520 U.S. 17, 24, 117 S. Ct. 1040, 137 L. Ed. 2d 146 (1997). The patent owner has the burden of proving infringement and must meet its burden by a preponderance of the evidence. *See Smith Kline Diagnostics, Inc. v. Helena Lab. Corp.,* 859 F.2d 878, 889 (Fed. Cir. 1988) (citations omitted).

b. Discussion

The parties infringement dispute is, essentially, one of claim construction. The parties dispute the meaning of the term acetohydroxy acid isomeroreductase enzyme, also known as a KARI,[4] the enzyme utilized in step two of claim 1. Specifically at issue is whether a KARI is defined with respect to NADPH or NADH cofactors, i.e., the electron donors that enable it to catalyze a reaction.[5] (D.I. 157 at ¶ 20; D.l. 196 at ¶ 28, n. 12)

The patent explicitly defines acetohydroxy acid isomeroreductase as an enzyme that catalyzes the conversion of acetolactate to 2,3-dihydroxyisovalerate **using NADPH** (reduced nicotinamide adenine dinucleotide phosphate) as **an electron donor.** (899 patent, col. 7:8-13) (emphasis added) Plaintiff argues that, despite this definition, the term should be given its plain and ordinary meaning, which would be an enzyme that utilizes NADPH and/or NADH as a cofactor. (D. I. 195 at 4-5) [T]o read-in a limitation

4 The enzyme acetohydroxy acid isomeroreductase is more widely known by its alternative name keto-acid (or ketol-acid) reductoisomrase, commonly abbreviated KARI (D.I. 154 (citing D.l. 157 at ¶ 19)); a KARI is an art-recognized term for acetohydroxy acid isomeroreductase. (D. I. 195 at 4)

5 Put differently, the KARI catalyzing step two of the claimed biosynthetic pathway requires an electron donor and that electron donor, either NADPH or NADH, is called a cofactor.

requiring the preferential use of NADPH, plaintiff argues, would be error. (*Id.*) Defendant argues that plaintiff has clearly defined the KARI by reference to its cofactor and this reference prevents a finding of infringement. (D.I. 154 at 12-15) In other words, because the KARI is explicitly defined as being exclusively NADPH-dependent and defendant utilizes a primarily NADH-dependent enzyme, no infringement exists. (*Id.*)

The Federal Circuit has recently reiterated that it will only interpret a claim term more narrowly than its ordinary meaning under two circumstances: 1) when a patentee sets out a definition and acts as [its] own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution. *Aventis Pharma S.A. v. Hospira, Inc.,* 675 F.3d 1324, 1330 (Fed. Cir. 2012) (quoting *Thorner v. Sony Computer Entertainment America* L.L.C, 669 F.3d 1362, 1365 (Fed. Cir. 2012)). In the case at bar, the first exception applies. The patent contains a definitions section and explains that the following definitions ... are to be used for the interpretation of the claims and the specification. (899 patent, col. 6:52-53) Accordingly, the court interprets the term acetohydroxy acid isomeroreductase in the manner in which plaintiff defined it, namely, as an enzyme that is solely NADPH-dependent (as opposed to NADH-dependent or NADH and NADPH-dependent).

This interpretation is supported by an examination of the specification. In particular, the court notes that other enzymes in the patent are specifically identified as using NADH **and/or** NADPH as an electron donor. (e.g. 899 patent, col. 7:54-56; col. 8:17-20) (emphasis added) This confirms that plaintiff, who was aware of NADH-

dependent KARIs,[6] intended to limit the term acetohydroxy acid isomeroreductase to an exclusively NADPH-dependent enzyme. As the Federal Circuit explained in *Abbott Laboratories v. Sandoz, Inc.,* 566 F.3d 1282, 1288-91; 1298-90 (Fed. Cir. 2009), when a patentee knows of the existence of two specific compounds (or in this case two specific cofactors) and nevertheless defines a term without reference to one, the failure to reference that compound evidences a clear intent to limit the term, i.e., to exclude it from the claim scope. In short, because plaintiff knew of the existence of NADH-dependency and knew how to define a term by reference to an NADH cofactor, the term acetohydroxy acid isomeroreductase is properly construed as excluding an enzyme that is in any way NADH-dependent.

The court s opinion is not changed by the fact that one of the preferred acetohydroxy acid isomeroreductases listed in the specification may use NADH as a cofactor (D. I. 196 at ¶ 31; D. I. 366 at 183-84), since the specification clearly defined the term. *Renishaw PLC v. Marposs Societa per Azioni,* 158 F.3d 1243, 1249 (Fed. Cir. 1998) (noting that when a patent applicant has elected to be a lexicographer by providing an explicit definition in the specification for a claim term...the definition selected by the patent applicant controls). And while plaintiff suggests, based on the doctrine of claim differentiation, that the inclusion of claim 14 necessarily requires the KARI in claim 1 to be NADPH and/or NADH dependent (D. I. 195 at 5), the doctrine is rebuttable if a contrary construction is dictated by the written description. *Regents of*

[6] Plaintiff acknowledges that one of ordinary skill in the art, as of 2005, would have known that the KARI could use either NADPH or **NADH** as a cofactor (D. I. 366 235-39; D. I. 196 at ¶ 30)

Univ. of Cal. v. Dakocytomation Cal., Inc., 517 F.3d 1364, 1375 (Fed. Cir. 2008). Moreover, because another enzyme in the five step process is explicitly defined as using NADPH and/or NADH, it is unnecessary to expand the term acetohydroxy acid isomeroreductase to include NADPH and NADH-dependent enzymes. (899 patent , col. 7:49-57)

In light of the court s construction, and the fact that defendant uses an NADH-dependent enzyme to catalyze its step two reaction, the court finds it unlikely that plaintiff will prevail on its claim of infringement. The court recognizes in this regard that some ancillary NADPH usage by defendant s enzyme may be unavoidable. (D. I. 366 at 185) Nevertheless, by defining the KARI as exclusively NADPH-dependent, plaintiff has placed defendant s use of an NADH-dependent, or primarily NADH-dependent enzyme, outside the scope of claim 1.Accordingly, the court finds plaintiff unlikely to succeed on its claim of infringement. [8] Allegations of equivalent infringement are also unlikely to succeed since [a]pplication of the doctrine of equivalents to recapture subject matter deliberately left unclaimed would conflict with the primacy of the claims in defining the scope of the patentee s exclusive right. *Johnson & Johnston Associates Inc. v. R.E. Service* Co., *Inc.*, 285 F.3d 1046, 1054 (Fed. Cir. 2002) (citations and quotations omitted); *SciMed Life Sys., Inc. v. Advanced Cardiovascular*

[7] While plaintiff spends a good deal of time arguing that defendant s enzyme is simply a KARI (as evidenced by its structure and function) and thus infringes, because the plaintiff has specifically defined its KARI by reference to cofactors, the court resolves this issue by reference to cofactors.

[8] Because the court finds plaintiff unlikely to prevail on an allegation of infringement of independent claim 1, the court need not address dependent claims 13 and 14.

Sys., Inc., 242 F.3d 1337, 1345-47 (Fed. Cir. 2001) (discussing cases where, by defining the claim in a way that clearly excluded certain subject matter, the patent implicitly disclaimed the subject matter that was excluded and thereby barred the patentee from asserting infringement under the doctrine of equivalents).

2. Validity

a. Standard of review

Under 35 U.S.C. § 102(a), a person shall be entitled to a patent unless 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 application for patent. If each and every limitation is found either expressly or inherently in a single prior art reference, then a claim is invalid under § 102 for anticipation. *Plasmart, Inc. v. Kappas,* 2012 WL 1850650, at *5 (Fed. Cir. May 22, 2012) (quoting *Sanofi Synthelabo v. Apotex, Inc.,* 470 F.3d 1368, 1375 (Fed. Cir. 2006)). In order for a single prior art reference to anticipate by inherent (as opposed to explicit) disclosure, it must be demonstrated that one of ordinary skill in the art would have understood each and every claim limitation to have been disclosed inherently in the reference. *Continental Can* Co. *USA, Inc. v. Monsanto* Co., 948 F .2d 1264, 1268 (Fed. Cir. 1991). The Federal Circuit has explained that an inherent limitation is one that is necessarily present and not one that may be established by probabilities or possibilities. *Id.* That is, the mere fact that a certain thing may result from a given set of circumstances is not sufficient. *Id.* The Federal Circuit has further observed that inherency operates to anticipate entire inventions as well as single limitations within an invention. *Schering Corp. v. Geneva Pharms. Inc.,* 339 F.3d 1373, 1380 (Fed. Cir. 2003). Recognition of an inherent limitation by a person of ordinary skill in the art before the critical date is not required to establish inherent anticipation. *Id.* at 1377.

The statutory basis for the enablement and written description requirements, § 112 ¶ 1, provides in relevant part:

The specification shall contain a written description of the invention, and of 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 written description must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed. *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 201 0) (en banc) (citation and quotations omitted). In other words, the test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date. *Id*. (citations omitted). The level of detail required to satisfy the written description requirement depends, in large part, on the nature of the claims and the complexity of the technology. *Streck, Inc. v. Research & Diagnostic Systems, Inc.*, 665 F.3d 1269, 1285 (Fed. Cir. 2012) (citing *Ariad,* 598 F.3d at 1351). Neither examples nor actual reduction to practice is required; a constructive reduction to practice that in a definite way identifies the claimed invention can satisfy the written description requirement. *Id.* (citing *Ariad,* 598 F.3d at 1352).

An invalidity inquiry involves two steps. First, the court must construe the claims of the patent in suit as a matter of law. Second, the finder of fact must compare the construed claims against the prior art to determine whether the prior art discloses the

claimed invention. *See Key Pharms. v. Hereon Lab. Corp.,* 161 F.3d 709, 714 (Fed. Cir. 1998). Because patents are presumed to be valid, see 35 U.S.C. § 282, an alleged infringer seeking to invalidate a patent must establish its invalidity defenses by clear and convincing evidence. *See Union Carbide Chemicals & Plastics Tech. Corp. v. Shell Oil* Co., 308 F.3d 1167,1188 (Fed. Cir. 2002).

b. The parties contentions

Defendant argues in opposition to the imposition of a preliminary injunction that plaintiff cannot demonstrate a likelihood of success on the merits when, upon reexamination, claims 1 and 14 of the 889 patent have been rejected as anticipated under 35 U.S.C. § 102(b), and claim 1 has been rejected as obvious under 35 U.S.C. § 103.[9] More specifically, by office action dated November 25, 2011, Examiner Railey, inter alia: (1) rejected claim 1 as being anticipated by Larroy I (as evidenced by Boulton, Dickinson and lshige);[10] (2) rejected claims 1 and 14 as being anticipated by Bekkaoul (as evidenced by Boulton, Dickinson, and Larroy II);[11] (3) rejected claims 1 and 14 as being anticipated by Elischweski (as evidenced by Boulton, Dickinson, and

[9] Because the parties focus on anticipation and the court has resolved this issue on that ground, the court will not addresses issues relating to obviousness.

[10] Larroy I is Larroy et al. (2003), Chemica-Biological Interactions 143-144: 229-238; Boulton is Boulton et al. (2001), *Brewing Yeast & Fermentation,* Chapter 3, first ed., Blaskwell Science Ltd., Oxford, United Kingdom, pp. 69-142; Dickinson is Dickinson et al. (1998), J. Biol. Chem. 273(40): 25751-25756; lshige is lshige, et al. (2005), Current Opinion in Chemical Biology 9: 174-180.

[11] Bekkaoui is Bekkaoui et al. (1993), Current Genetics 24:544-547; Larroy II is Larroy et al. (2002), Biochem. J. 361:161-172.

Larroy II);[12] and (4) rejected claims 1 and 14 as being anticipated by Yocum (as evidenced by Boulton, Dickinson, and Larroy II)[13] (D. I. 155, ex. B) The Examiner based his rejections of claim 1 on the fact that yeast converting pyruvate to isobutanol inherently possess the enzymes capable of carrying out the isobutanol synthetic pathway reactions found in claim 1.[14] *(Id.* at 6, 7, 8 and 10) As further explained by defendant s expert, it was well known in the art that the anabolic pathway recited in claim 1 of the 889 patent is inherently present in yeast; thus, the prior art references identified above (which disclose over-expressing one or more of the claimed pyruvate-to-isobutanol pathway genes) are inherently anticipatory. (*See* D.l. 366 at 51-52, 61-63, 78-80; D.l. 219, ex. A at 256-57, 366-67; D.l. 161 (DX004) ¶¶ 8-19, 22, 24-25,27-28, 30-31, 43-44) With respect to dependent claim 14, the Examiner concluded that the reaction disclosed in claim 14 (the enzymes of the pathway use NADH as an electron donor) is inherent in the yeast cells of the prior art references. (D.I. 155, ex. B at 7-11)

Plaintiff responds that none of these references describes all of the required enzymes identified in the five-step biosynthetic pathway disclosed in claim 1. Moreover, there is no evidence that yeast in general, or in the prior art references,

[12] Elischweski is Elischweski et al., U.S. Patent No. 6,787,334, issued September 7, 2004.

[13] Yocum is Yocum et al., U.S. Patent Application Publication No. 2004/0146996 A 1, published July 29, 2004.

[14] Examiner Railey also rejected claim 1 as being obvious over Hansen (as evidenced by Boulton and Dickinson). Hansen is Hansen et al. (2003), Chapter 5: Brewer s yeast: genetic structure and targets for improvement, *Topics in Current Genetics, Vol. 2,* J.H. de Wide, et.: *Functional Genetics of Industrial Yeasts,* Springer-Verlag, Berline Heidelberg, Germany, pp. 143-170. (D.I. 155, ex. B at 14-15)

necessarily produce isobutanol, let alone through the five-step pathway. (*See* D.I. 367 at 253-55) Indeed, the evidence offered by defendant to show that genetically engineered yeast in the prior art would inherently produce isobutanol through the five-step pathway comes from three references regarding natural, nonrecombinant yeast, a fact that is sufficient to defeat inherency. (*See* D.I. 367 259-69, 298; PX 115; PX 117; PX 119) As explained by plaintiff s expert, even if all the enzymes have been characterized in native yeast, this does not establish that they work together in a five step biosynthetic pathway in recombinant yeast because the enzymes must be expressed properly at the same time and in the same place for this to occur. (D.I. 367 304-05; D.I. 196 at ¶¶ 79-80, 92-94) In sum, plaintiff asserts that the claimed engineered pathway is novel [because it] combines enzymes known to be involved in well-characterized pathways, i.e., an anabolic pathway and a catabolic pathway; enzymes from these two pathways are not naturally expressed at the same time and place in a yeast cell and have not been shown to operate as a single pathway to produce isobutanol. . . . Thus, [defendant s] evidence fails to establish the required showing for inherency. (D.I. 175 at 8-9, quoting from the 889 patent at 11:58-59)[15]

c. Discussion

To defeat a preliminary injunction motion, a defendant must raise a substantial question concerning... invalidity, i.e., the patentee must demonstrate that a

[15] Plaintiff devotes a single paragraph to the issue of obviousness, arguing that Hansen is non-analogous art directed to improving yeast for a beer product and, therefore, cannot be used to show obviousness ... Moreover,... Hansen provides neither motivation to produce the invention of claim 1 nor a reasonable expectation of success in doing so. (D.I. 243 at 10)

defendant s invalidity defense lacks substantial merit. *Amazon.com, Inc. v. Barnesandnoble.com, Inc.,* 239 F.3d 1343, 1350-51 (Fed. Cir. 2001) (quoting *Genentech, Inc. v. Novo Nordisk, A/S,* 108 F.3d 1361, 1364 (Fed. Cir. 1997)). The Federal Circuit has recognized in this regard that an examiner s conclusions on reexamination may be relevant to [the] likelihood of success prong of the preliminary injunction standard. *Proctor & Gamble* Co. *v. Kraft Foods Global, Inc.,* 549 F.3d 842, 847-48 (Fed. Cir. 2008). And, indeed, various courts have found that the rejection of patent claims upon reexamination raises a substantial question of validity which must be rebutted by a patentee when moving for a preliminary injunction. *See Power Integrations, Inc. v. BCD Semiconductor Corp.,* 2008 WL 5069784, at *9 (D. Del. Nov. 19, 2008). *See also Avery Dennison Corp. v. Alien Tech. Corp.,* 626 F. Supp. 2d 694, 703 (N.D. Ohio 2009) (In sum, the courts that have considered this issue have held that the PTO s action on a request for reexamination is directly relevant to the issue of whether the defendant has raised a substantial question of validity, but is not dispositive in and of itself.).

In this case, the Examiner has rejected claim 1, giving the claim the broadest reasonable interpretation consistent with the specification and not reading into the claim limitations in the specification. (D.I. 155, ex. B at 4, citing *In re Yamamoto,* 740 F.2d 1569 (Fed. Cir. 1984)). More specifically, Examiner Railey explained that

[c]laim 1 is drawn to a method for producing isobutanol by a recombinant yeast microorganism in fermentation medium. There is no specific limitation given on the amount of isobutanol produced by the yeast. The claim describes a biosynthetic pathway that is inherently present in yeast strains to produce isobutanol from pyruvate through a series of enzymatic reactions, pathway steps a, b, c, d and e. The enzymes involved are inherently present

in the yeast. Claim 1 only requires that the recombinant yeast is expressing an engineered isobutanol biosynthetic pathway. There is no specific description of where and how this pathway is engineered. Support for the term engineered is found in the patent specification at column 2, lines 3-4. Although a mutase may be engineered as set forth at column 13, lines 57-60, this pathway is not the pathway found in claim 1. The pathway of claim 1 is described at column 11, lines 40-57 but no specific direction is given on the type and extent of engineering of this pathway. There is no requirement in the claim for any specific genetic alteration or introduction of specific nucleic acid sequences. Therefore, any alteration via recombinant means of the genes for the enzymatic reactions of pathway steps a, b, c, d or e will be considered to be applicable to the claims.

(D.I. 155, ex. B at 4)

Although neither party expressly discussed claim construction in the context of the limitation engineered isobutanol pathway, it is apparent that plaintiff s expert, Dr. Klibanov, rejected the broad claim construction adopted in reexamination and embraced by defendant. Dr. Klibanov argues that an anticipating yeast would require the addition of all five of the pathway enzymes to the yeast through recombinant DNA technology; that is, every enzyme in the five-step pathway must be introduced into the cell. (D.I. 367 at 291-92; D.l. 196 at ¶ 93 (DX033))

On the record provided, the court cannot conclude that the limitation engineered isobutanol pathway should be given the narrow construction apparently promoted by plaintiff. As noted by Examiner Railey, there is no specific description in the specification of where and how the pathway of claim 1 is engineered, and there is no requirement in the claim itself for any specific genetic alteration or introduction of specific nucleic acid sequences. Given the broad scope of the intrinsic record, there is no basis for a narrow claim construction.

The court concludes, therefore, that defendant has raised a substantial question

concerning the validity of claims 1 and 14.[16] Although the court does not necessarily endorse the premise that a prior art reference can inherently anticipate through further reference to multiple other prior art references, nevertheless, the fact that the 889 patent has been rejected on reexamination, combined with the finding by the court that plaintiffs likely claim construction is too narrow, demonstrate that defendant s invalidity defenses do not lack substantial merit. In other words, because the court does not construe the term engineered isobutanol pathway to require that all enzymes in the pathway be engineered, and because the prior art references disclose genetically engineering one or more enzymes in the pathway, the court finds that defendant has raised a substantial question regarding the validity of claims 1 and 14.

Even if the engineered isobutanol pathway is anticipated, plaintiff asserts that claim 1 is still valid because the recombinant yeast cited in the prior art do not discolse isobutanol production, another requirement of the claim. (D.I. 233 at 6) Defendant argues in response that production of isobutanol is an inherent property of the recombinant yeast, as evidenced by additional references showing isobutanol production in non-recombinant yeast. (See D.I. 259-69, 298; PX 115, PX 117, PX 119) Examiner Railey also adopts this language of inherency in grounds 2-4 of the rejection, writing in ground 2 that the transformed [yeast] are inherently capable of producing isobutanol as a fermentation by-product. (D.I. 155, ex. B at 7; *see id.* at 8, 10) In the prior art reference in ground 1, however, isobutanol production is not merely

[16] The parties spend little time discussing claim 14. The court nevertheless concludes that its broad claim construction encompasses the inherent reactions (the enzymes of the pathway use NADH as an electron donor) disclosed in the prior art references related to claim 14.

inherently disclosed, but is explicitly disclosed as a product of recombinant yeast fermentation. *(See id.* at 6; *see* Larroy et al. (2003) Chemico-Biological Interactions 143-144:229-238 (2003)). Therefore, the court finds anticipation of the requirement for isobutanol production in the prior art references, and does not further consider arguments pertaining to the sufficiency of isobutanol production by non-recombinant yeast in any additional references.

With respect to claim 13, there is no dispute that the specification of the 889 patent does not specifically disclose the requirement of inactivated genes that reduce pyruvate decarboxylase activity[17] (889 patent, col. 326:35-36; D.I. 367 at 288-291) The dispute lies in whether the portions of the specification cited by plaintiff nevertheless satisfy the written description requirement of § 112 ¶1, that is, are so full, clear, concise, and exact that one of skill in the art would be able to use the same. In this regard, plaintiff points to the teaching of the 889 patent that, [t]o prevent misdirection of pyruvate away from isobutanol production, a decarboxylase with decreased affinity for pyruvate is desired. (Col. 12:15-17) Although the patentee identifies two such enzymes, there is no discussion about gene inactivation or about in that context. (D.I. 366 at 88-89) The 889 patent also provides that [t]he microbial host... has to be manipulated in order to inactivate competing pathways for

[17] Pyruvate decarboxylase (PDC) is a type of decarboxylase enzyme, the category of enzymes responsible for catalyzing step 4 of the claimed biosynthetic pathway. (D.I. 367 at 273; 889 patent, col. 12:13-15) Unlike the preferred decarboxylase enzymes identified in the specification, PDCs promote the production of ethanol at the expense of isobutanol. (889 patent, col. 12:13-22; D.I. 367 at 274-76) Therefore, elimination of PDC enzymes via genetic deletion is beneficial in that it redirects resources from ethanol production to production of isobutanol. (D.I. 367 at 274-76)

carbon flow by deleting various genes. (Col. 16:55-57) However, the generic suggestion to inactivate competing pathways does not teach anything specific about reducing PDC activity by inactivating those genes. (D.I. 366 at 91, 203) Finally, plaintiff argues that the citation to the Dickinson reference (col. 1:46-47), which reference describes yeast strains that have three PDC genes deleted (D.I. 366 at 204), provides a sufficient written description of claim 13. Said reference is neither incorporated by reference, nor is it cited in the 889 patent in the context of deleting PDC genes. The court concludes that defendant has raised a substantial question as to whether the specification of the 889 patent provides a sufficient written description of claim 13.[18]

B. Irreparable Harm [19]

The parties debate three issues with respect to whether irreparable harm exists. First, they debate whether plaintiff will lose the first mover advantage to its direct competitor in this nascent, two-producer market. Second, they dispute whether monetary damages can sufficiently compensate plaintiff for any harm done. Third, they disagree on whether defendant s rushed entry into the automotive biofuel business will jeopardize the future of this emergent market.[20]

[18] The parties experts disagree as to the extent of experimentation it would take to create the PDC-knockout isobutanol-producing yeast of claim 13. Given that defendant was only able to successfully engineer such a yeast for its isobutanol process after what it describes as a significant experimental effort (D.I. 367 at 366-69), the court concludes that defendant has raised a substantial question as to whether claim 13 is enabled.

[19] While the court s finding of invalidity and noninfringement effectively ends the preliminary injunction analysis, the court nevertheless undertakes a brief discussion of the other preliminary injunction factors for the sake of a complete record.

With respect to argument one, the court notes that direct competition in a marketplace weighs heavily in favor of a finding of irreparable injury. *Mass Engineered Design, Inc. v. Ergotron, Inc.,* 633 F. Supp. 2d 361, 393 (E. D. Tex. 2009). Indeed, the principal value of a patent is the right to exclude arch competitors from making, selling and using an infringing product. *Fresenius Med. Care Holdings, Inc. v. Baxter lnt l, Inc.,* 2008 WL 928496, at *3 (N.D. Cal. Apr. 4, 2008). Further, the court notes that damage to reputation (as the innovator), loss of goodwill and loss of business opportunities are all valid grounds for finding irreparable harm. *Celsis In Vitro, Inc. v. CellzDirect, Inc.,* 664 F.3d 922, 930 (Fed. Cir. 2012).

All of these bases exist in the case at bar since the parties are direct competitors in an emergent market. Plaintiff seeks to market biobutanol, an advanced biofuel that will provide improved options for increasing energy supplies and facilitate the transition to renewable transportation fuels which lower overall greenhouse gas emissions. (D.I. 41 at ¶ 1) Plaintiff s strategy is to focus initially on the U.S. automotive market which has a large unsatisfied demand for biofuels and is the leading influencer of biofuels policy globally. (D.I. 62 at 3) While defendant claims that it will not jeopardize plaintiff s first mover advantage since it is not producing commercially significant amounts of isobutanol and its initial focus is not the automotive fuel market, the court disagrees. Defendant has acknowledged that entry into the automotive biofuels market

[20] The court can, and does, resolve the issue of irreparable harm without reference to this final point.

is a big part of [Gevo s] future business plan. (D.I 367 at 408) In order to prepare itself to move into this market, defendant is developing relationships with refiners and retailers and plans to perform automotive trials in an effort to show potential customers and investors the advantages of butanol-based gasoline. *(Id.* at 406-09; 414) All this will help defendant secure contracts with refineries to retrofit their plants from ethanol production facilities into isobutanol production facilities. (*Id.* at 414) Defendant has already entered into a letter of intent with Total, a large refining and chemical company, for evaluating the value of isobutantol to them, and [to] understand how to go to market with them, with the butanol gasoline. *(Id.* at 10-411) Moreover, as the first entrant into the marketplace, defendant would have advantages that include working with the best facilities and potential customers and being perceived as an innovator in the field. (D.I. 366 at 133-35) In light of these efforts, which affect plaintiff s reputation, goodwill and business opportunities, the court finds that irreparable harm would exist assuming defendant were infringing.[21] Because, however, the court has concluded that plaintiff does not hold a valid patent, nor would the defendant infringe if it did, this factor is neutral.

C. Balance of Equities

[21] While defendant also argues that plaintiff could be adequately compensated with monetary damages- since plaintiff plans to pursue a licensing business model (D. I. 234 at 14)- defendant s argument ignores that plaintiff s business plan is not solely focused on licensing. Plaintiff intends to have two primary revenue streams. (D. I. 367 at 328) While one stream is focused on licencing, the other is focused on entering into offtake agreements with its licensees and reselling butanol to end users; in this respect, plaintiff aims to seed, i.e., intelligently develop, the market for butanol. *(Id.* at 328-29) In other words, plaintiff and defendant are, and will continue to be, direct competitors in an emerging market.

Defendant notes that years of investment in time and resources would be destroyed and shareholders would lose millions of dollars if an injunction issued. (D. I. 154 at 25) In short, defendant argues that an injunction would have a devastating effect on its business. (D. I. 234 at 15) Plaintiff responds by emphasizing that [o]ne who elects to build a business on a product found to infringe cannot be heard to complain if an injunction against continuing infringement destroys the business so elected. (D.I. 195 at 12 citing *Robert Bosch LLC v. Pylon Mfg. Corp.,* 659 F.3d 1142, 1156 (Fed. Cir. 2011)) Because the court concludes that defendant is not infringing, this factor weighs in favor of defendant.

D. Public Interest

As plaintiff emphasizes, the court has recognized a strong public policy favoring the enforcement of patent rights. (D.I. 62 at 19 citing *Callaway Golf Co. v. Acushnet Co.*, 585 F. Supp. 2d 600, 622 (D. Del. 2008)). However, the court has also noted that the public interest is best served by denying a preliminary injunction when a moving party has failed to establish that the patent is likely valid and infringed. *Girafa.com, Inc. v. Amazon.com, Inc.,* 2008 WL 5155622, at *1 (D. Del. Dec. 9, 2008). Accordingly, this factor weighs in favor of defendant.

V. CONCLUSION

For all the reasons discussed above, the court denies plaintiff s motion for a preliminary injunction[22] (D.I. 61) An appropriate order shall issue.

[22] In light of the court s decision, defendant s request for reconsideration of the status quo order is denied as moot.

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

BUTAMAX ADVANCED BIOFUELS LLC,	)	
	)	
Plaintiff,	)	
	)	
v.	)	Civ. No. 11-54-SLR
	)	
GEVO, INC.,	)	
	)	
Defendant.	)	

ORDER

At Wilmington this 19th day of June, 2012, consistent with the memorandum opinion issued this same date;

IT IS ORDERED that:

1. Plaintiff s motion for a preliminary injunction (D.I. 61) is denied.

2. Defendant s motion for leave to file a sur-reply and declaration (D.I. 217) is granted.

3. Defendant s motion to supplement the record (D. I. 232) and defendant s amended motion to supplement the record (D. I. 283) are denied.

4. Defendant s request for reconsideration of the status quo order (D.I. 368) is denied as moot.

United States District Judge

The Company has filed a shelf registration statement (including a prospectus) with the Securities and Exchange Commission (the SEC) for the offering of the securities referenced in this communication. Before you invest, you should read the base prospectus included in the registration statement, the related preliminary prospectus supplements and the other documents the issuer has filed with the SEC for more complete information about the issuer and the offerings. You may get these documents for free by visiting EDGAR on the SEC website at www.sec.gov. Alternatively, the issuer, the underwriter or any dealer participating in the offerings will arrange to send you the prospectus supplements and accompanying base prospectuses if you request them by calling toll-free (888) 722-9555, extension 19423-2626 or through your usual contact at either UBS Securities LLC or Piper Jaffray & Co.

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