2018-1295

United States Court of Appeals for the Federal Circuit

NATURAL ALTERNATIVES INTERNATIONAL, INC.,

Plaintiff – Appellant,

v.

CREATIVE COMPOUNDS, LLC,

Defendant – Appellee,

DOES 1-100, CORE SUPPLEMENT TECHNOLOGIES, INC., HONEY BADGER, LLC, MYOPHARMA, INC.,

Defendants.

Appeal from the United States District Court for the Southern District of California in Case No. 3:16-cv-02146-H-AGS, Marilyn L. Huff, Judge

BRIEF FOR APPELLANT

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CERTIFICATE OF INTEREST

Counsel for Appellant Natural Alternatives International, Inc. certifies that:

(1) The full name of every party or amicus represented by us is:

Natural Alternatives International, Inc.

(2) The name of the real party in interest represented by us is:

Natural Alternatives International, Inc.

(3) All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus represented by us are: None.

(4) The names of all law firms and the parties or associates that appeared for the party or amicus now represented by us in the trial court or agency or are expected to appear in the court are:

PORZIO, BROMBERG & NEWMAN P.C.: Scott A.M. Chambers, Kevin M. Bell, Richard J. Oparil, B. Dell Chism, Caroline C. Maxwell, Matthew D. Zapadka and WILSON TURNER KOSMO LLP: Frederick W. Kosmo Jr. and Hubert Kim.

(5) The title and number of any case known to counsel to be pending in this or any other court or agency that will directly affect or be directly affected by this court's decision in the pending appeal:

Natural Alternatives Intl., Inc. v. Hi-Tech Pharmaceuticals, Inc., doing business as ALR Industries, APS Nutrition, Innovative Laboratories, Formutech

Nutrition, LG Sciences, and Sports 1; and DOES 1-100 Case No. 3:16-cv-02343-H-AGS, pending in the United States District Court for the Southern District of California.

Date: April 13, 2018

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Dietary Supplement Health and Education Act of 1994	**DSHEA**
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STATEMENT OF RELATED CASES

This appeal arises from the judgment entered by the U.S. District Court for the District of Southern California in *Natural Alternatives, Intl., Inc., v. Creative Compounds, LLC, Core Supplement Technologies, Inc., Honey Badger LLC, Myopharma, Inc., and DOES 1-100*, Case No. 3:16-cv-02146-H-AGS.

Regarding judicial proceedings, Appellant discloses the following:

1) *Natural Alternatives Intl., Inc. v. Allmax Nutrition Inc., HBS Intl., Corp. and DOES 1-100*, Case No. 3:16-cv-01764-H-AGS (S.D. Cal.). Disposition – settled.

2) *Natural Alternatives Intl., Inc. v. Hi-Tech Pharmaceuticals, Inc., doing business as ALR Industries, APS Nutrition, Innovative Laboratories, Formutech Nutrition, LG Sciences, and Sports 1; and DOES 1-100* Case No. 3:16-cv-02343-H-AGS (S.D. Cal.). Disposition – stayed.

JURISDICTIONAL STATEMENT

The District Court had jurisdiction over this patent infringement action pursuant to 28 U.S.C. §§ 1331 and 1338. On September 5, 2017, the District Court granted Creative's motion for judgment on the pleadings, finding the Patents on Appeal invalid, and on November 29, 2017, the District Court entered Final Judgment in favor of the defendants. On December 8, 2017, Appellant timely filed its notice of appeal. This Court has jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

STATEMENT OF ISSUES

1. Whether the District Court erred by granting judgment on the pleadings and finding the Patents on Appeal invalid under 35 U.S.C. § 101.

STATEMENT OF THE CASE

Appellant, Natural Alternatives International, Inc. ("NAI"), a publicly traded company, is the assignee of the Patents on Appeal. It sells a patented product called Carnosyn®. On August 24, 2016, NAI filed a Complaint against Creative, its competitor, alleging claims for patent infringement, among other allegations. Appx1. On March 20, 2017, NAI filed its First Amended Complaint (FAC) alleging the same claims and adding additional patents and parties. Appx0027-0396.

In a related case including some of the same patents in the same court, Allmax Nutrition, Inc. moved to dismiss the complaint in that case and for judgment on the pleadings that the '596 , '376, '084, '865, and the '947 patents were invalid under 35 U.S.C. § 101. Appx0009-0010. On June 26, 2017, the District Court granted the motions, dismissing all patent claims with prejudice. Appx1215-1237. NAI filed a motion for partial reconsideration of that decision. Appx0845-0847. On July 19, 2017, after the District Court's decision in *Allmax*, Creative filed a motion for judgment on the pleadings as to NAI's patent infringement claims

against Creative. Appx0516-0533.[1] On August 14, 2017, NAI opposed Creative's motion (Appx0538-0594) and on August 21, 2017, Creative filed a reply in support of its motion (Appx0595-0606). On September 5, 2017, the District Court heard oral arguments on the motion. Appx0608-0627. As with the *Allmax* case, the District Court granted the motion a few hours after the oral argument. Appx0003-0026.[2] On November 29, 2017, the District Court entered Final Judgment in favor of Creative (Appx0001-0002), and NAI timely filed its notice of appeal.

STATEMENT OF THE FACTS

I. The Asserted Patents' Background Sections Show the Invention Was Not an Application of Only Routine and Conventional Elements.

This case involves patents issued to a renowned and innovative inventor in the sports nutrition industry, Dr. Roger Harris. *See* Appx1128-1141. Dr. Harris's invention addressed a long-felt desire to improve athletes' endurance. *See id*. To pursue his invention, he not only had to go against the common understanding in the field, but had to even go against the teachings and experience of his own mentor, Dr. Eric Hoffman. *See* Appx0905-0918; Appx1128-1141. The Patents on Appeal are generally directed toward human dietary supplements and methods of administering those dietary supplements that result in an unnatural increase in

[1] Creative moved for judgment on the pleadings and copied the motion for judgment filed by another party in another case, including typographical errors.
[2] In the *Allmax* case, oral arguments were held on June 26, 2017 and the motion was granted a few hours after the oral argument.

levels of a particular dipeptide in muscles beyond that which could ever be achieved through a natural diet. Appx907-909; Appx661-662 at Col. 9, l. 64-Col. 11, l. 45.

Amino acids are organic compounds containing both an amine ($-NH_2$) and an acidic carboxyl group (-COOH). Each amino acid has a side chain that is specific to the amino acid. There are 20 different amino acids that typically are combined to form proteins, referred to as proteogenic amino acids, although hundreds of naturally occurring amino acids are known. Beta-alanine is an amino acid that may occur naturally in very low levels in animals, but is not one of the common 20 amino acids found in proteins. Appx886-887; Appx909 (referring to beta-alanine as a non-proteogenic amino acid). When two amino acids are covalently linked together through a chemical reaction of the amine and carboxyl group, they form a dipeptide. Beta-alanine, as part of a dipeptide, exists in the muscles of humans and other vertebrates. Appx657 at Col. 1, ll. 59-63. Beta-alanine can be enzymatically linked to the amino acid histidine to form beta-alanyl-L-histidine, which is also called carnosine. Appx657 at Col. 1, ll. 59-60.

The invention disclosed in the Patents on Appeal involved the experimentally-driven finding that, while adding histidine to the diet was not useful to increase the buffering capacity of the muscle tissue, administering extremely high amounts of beta-alanine over an extended period of time could

affect the buffering capacity of the muscle by increasing the carnosine content in the muscle. Appx909, Appx911 ¶ 11. Prior to the invention, there was no known way to increase the carnosine content in the muscle, thus increasing the buffering capacity of muscles. Appx908-909 ¶ 7, Appx1130 ¶ 8, Appx1145. Those of ordinary skill believed that human muscle tissue had a fixed level of buffering capacity that was maintained by homeostasis as a result of the fixed amount of carnosine, which could not be overridden by administration of beta-alanine. Appx1133-1134.

The Patents on Appeal share a similar disclosure, particularly as it relates to the background and functionality of beta-alanine to overcome fatigue. For example, they disclose that anaerobic activity, *e.g.*, exercise, leads to the accumulation of lactate and hydronium ions and this can lead to acidification of the intracellular environment. Appx657 at Col. 1, ll. 22-30, Col. 1, ll. 51-54. Also, specific dipeptides of beta alanine, including carnosine, contribute to hydronium ion buffering capacity. *Id*. at Col. 1, l. 59-Col. 2, l. 13. By administering large amounts of beta-alanine as a dietary supplement to an organism for a long period of time, an unnaturally high level of carnosine can be temporarily achieved in the organism, particularly in the muscle tissue. *See, e.g.*, Appx657 at Col. 1, l. 50 – Col. 2, l. 14. Administering the human dietary supplement containing beta-alanine, causes the synthesis of beta-alanyl-L-histidine (*i.e.*, carnosine) to be increased

above the metabolic breakdown level of carnosine and to increase the total amount of carnosine above that which the organism normally maintains (*i.e.*, the homeostatic amount). Appx657 at Col. 2, ll. 16-29; Appx908 ¶ 7. High levels of carnosine are desirable and beneficial because carnosine contains an imidazole ring that buffers muscle intracellular pH. Appx658-659 at Col. 4, l. 58-Col. 5, l. 3, Appx441-0442, Appx911. Under normal conditions, this is so because the accumulation of hydronium ions formed during anaerobic metabolism can reduce intracellular pH, which can compromise the function of the creatine-phosphorylcreatine system and other cellular functions, thereby reducing athletic performance and decreasing endurance. Appx657 at Col. 1, ll. 50-58. These dipeptides, including carnosine, are involved in regulating intracellular pH levels during muscle contraction. *Id.* This regulation is achieved through the imidazole ring of the histidine component of carnosine. Appx658-659 at Col. 4, l. 58-Col. 5, l. 3. In accord with the invention, this buffering capacity in muscle cells is accomplished through the imidazole ring of the amino acid histidine in carnosine after these levels have been unnaturally and unexpectedly boosted by administering a precursor of carnosine (*i.e.*, beta-alanine). Appx441-442.

Amounts of beta-alanine ingested in a normal diet are insufficient to achieve the results achieved by the claims and cannot be achieved without unnaturally supplementing a diet with the claimed compositions in the claimed manner.

Appx659 at Col. 5, ll. 3-8; Appx514-515; Appx1130-1131. In general, ingestion of any substance—natural or synthetic—would not mean that same substance would accumulate in the cell or result in the increase of any metabolic product of that substance. Appx1130 ¶ 7. For instance, as discussed by Dr. Harris, an applied physiologist, "feeding humans carbon, nitrogen, and phosphorous does not cause people to make more DNA precursors than they would make in their normal diet, even though the precursors are made from carbon, nitrogen, oxygen and phosphorous." *Id*. This is because the body maintains a condition of homeostasis, which is generally only altered when unnatural conditions are presented. Appx1130-1131 ¶¶ 7-9. The evidence presented by Dr. Hoffman is unrebutted.

The claimed compositions and methods are uniquely and particularly arranged to achieve objectives. The Patents on Appeal all explain that ingestion of very high levels of beta-alanine over an extended period (*e.g.*, 28-30 days) leads to an increase in the dipeptide carnosine to levels impossible to achieve naturally to increase total muscle buffering capacity. Appx661 at Col. 9, ll. 35-38. The disclosures further provide ranges and amounts for small animals up through large animals of over 1,000 pounds. Appx658 at Col. 3, l. 52-57.

Although the human liver is capable of synthesizing very low amounts of beta-alanine, the body can also obtain beta-alanine through the dipeptide carnosine that may be present in low amounts in the diet. Appx886-887 ¶ 10; Appx909. Prior

to the invention, it was not known how to increase carnosine synthesis or quantity in the muscle. Appx909. There was and is no scientific basis to expect these inventions' carnosine increases could be achieved from a normal diet. Appx907-909; Appx661-662 at Col. 9, l. 64-Col. 11, l. 45. The Patents on Appeal, and the claims in particular, are not directed to merely providing natural amounts of beta-alanine or the normal amounts of naturally synthesized dipeptides. Instead, claims of the Patents on Appeal are directed to "effectively"—as that term is defined in the disclosure and prosecution history—increasing carnosine content in the muscle using human dietary supplements, *i.e.*, artificial conditions that do not occur in nature. The Patents on Appeal teach that the effective increase is only achieved by supplying supplements produced through human intervention at high levels and for an extended period of time at those high levels. The patent claims are not directed to a law of nature or natural phenomenon: they are directed to an **unnatural** state achieved by the disclosed invention.

Dr. Harris, one of the named inventors, at least one of skill in the art, submitted a declaration during the reexaminations of related patents regarding the science underlying the inventions. Appx1128-1141. In his declaration, Dr. Harris states that the body maintains itself in a stable state of homeostasis. Additionally, he explains that muscle cells are bounded by membranes, which guard against passive movement of metabolites and precursors such as beta-alanine into and out

of the muscle cells. Appx1132 ¶ 14. The uptake of amino acids and other compounds is regulated in the body by transporters, such that the homeostasis in the muscle cells is maintained. *Id*. Indeed, cells are designed to maintain homeostasis because fluctuations of metabolites such as amino acids in the muscle tissue could be detrimental. *Id*. The inventions' manipulation of homeostasis is a departure from a natural state. Although it had the opportunity to do so, Creative filed no evidence rebutting Dr. Harris's sworn testimony.

Dr. Harris went on to explain that supplementation with many substances does not cause an increase in the muscle cell concentration of the substances. Appx1132-1133 ¶¶ 15-17. He also states that beta-alanine is synthesized in the liver, but prior to studies disclosed in the Patents on Appeal, there was no evidence that supplementing the diet with beta-alanine would lead to increased carnosine synthesis in the muscle. Appx1133-1134 ¶ 19; *see also* Appx871-877.

Claims of the Patents on Appeal include such terms as "human dietary supplement" and "effective to increase . . . synthesis," which were disclosed in the specifications as well as the prosecution histories of the Patents on Appeal and constitute specific limitations to those of skill in the art. *See, e.g.*, Appx663-664, Claim 1, Appx732, Claim 1, Appx802, Claim 1. Claim 34 of the '947 patent also requires administering a human dietary supplement containing beta-alanine, which does not contain histidine. Appx836 at Col. 16, ll. 1-22. The '610 patent addressed

manufacturing a human dietary supplement with beta-alanine in a manner to increase the beta-alanyl-L-histidine levels in muscle tissue. Appx802-803 at Col. 22, l. 24 – Col. 23, l. 5.

Additionally, the Patents on Appeal disclose that the inventive concept is to unnaturally supplement the normal/natural levels of beta-alanine in animals, over time, to override muscle tissue homeostasis to achieve an unnaturally high level of carnosine synthesis. *See, e.g.*, Appx908-909 ¶ 7. This transformative result was not attainable prior to the invention. *Id*. One of at least ordinary skill in the art, Dr. Hoffman, has sworn that:

> Only after Dr. Harris' groundbreaking research did the use of beta-alanine as a human dietary supplement start to become acknowledged as an accepted product used in methods of increasing the anaerobic working capacity of muscles. His results in this regard were highly unexpected by those of ordinary skill in the art at the time of his invention. This invention and associated treatments and uses do not merely encompass natural methods of exposing beta-alanine to human tissue because natural methods of exposure have not been shown to increase the carnosine content in the tissue. His method requires such high levels of beta-alanine over such an extended period of time that it would not be found in nature, even for an obligate carnivore (*i.e.*, an animal whose diet consists primarily of meat). I would characterize such methods as distinctly unnatural.

Appx907-908 ¶ 6; *see also* Appx872 ("Only when the body has **excess** beta-alanine (**via supplementation**) does it yield elevated muscle carnosine levels. Hence, the main rationale to supplementing with beta-alanine is to increase the concentrations of carnosine in muscle tissue.") (emphasis added).

It would be impossible for a person to achieve the benefits of the invention by consuming a natural and normal diet. *See* Appx913-914. Dr. Hoffman has calculated that a person would have to eat the meat of 109 Big Macs every day for weeks (in addition to eating a normal diet to supplement her normal diet) to theoretically obtain the amount of beta-alanine of the human dietary supplement invention with no evidence to show that this would achieve the claimed benefit. Appx913-914 ¶¶ 15-16. This new method of treatment claimed in the Patents on Appeal is outside of a natural law or phenomena. *Id*. Dr. Hoffman's evidence is unrebutted.

II. Without Considering the Evidence, the District Court Determined the Invention was Directed to a "Natural Phenomenon" and Administration of Massive Amounts of Beta-Alanine for Many Weeks Was Routine and Conventional.

Creative did not cite or rely on any scientific evidence in the record, instead relying entirely on attorney argument. NAI directly challenged the assertion of what was well-understood, routine, and conventional. Appx837-864; *see also* Appx1131-1134. NAI explained that in addressing the second step of the test defined in *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014) and *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66 (2012) (the "*Alice*/*Mayo* test"), a determination based on the factual record had to be made as to what was well-understood, routine, conventional activity that was previously

engaged in by researchers in the field. Appx550-562, Appx845-864. NAI also pointed out that:

> in this instance it wasn't well known, routine and conventional and previously engaged in by researchers in the field to provide just one component of a dipeptide to get the dipeptide [synthesis to] increase. There is no evidence in the record to show that. It's something that is beyond even a 102 or 103 analysis, which would require some evidence of what was known and previously engaged in by researchers in the field . . . it's probably more suitable after the record has been developed more, certainly bordering on what experts could testify as to what was previously engaged in by researchers in the field.

Appx505-506. NAI further argued that the Patents on Appeal disclose that the enzyme that combines beta-alanine and histidine has a low affinity for beta-alanine and that it is the imidazole ring of the histidine component that regulates the pH, not the added beta alanine. Appx503-504; Appx1059-1060. Because of this low affinity, there was no expectation before the invention that solely administering beta-alanine would result in effective increases of muscle carnosine because carnosine's imidazole ring—not beta-alanine—accounts for the buffering capability. Appx503-0506, Appx911 ¶ 11. Beta-alanine by itself lacks this imidazole ring and lacks this buffering capability, so prior to the invention, there was no expectation that administering beta-alanine would increase the intracellular buffering capacity. *See* Appx911 ¶ 11, Appx1130. Furthermore, beta-alanine is only a precursor component of carnosine and there was no expectation prior to the invention that administrating beta-alanine would result in carnosine increases that

increase this buffering. *Id*. Thus, the invention is directed to creating an unnatural environment in the body for the enzyme to combine the beta-alanine and histidine thereby transforming the body's natural processes to artificially manufacture an unnatural outcome. Appx503-506. NAI cited specific examples from the Patents on Appeal. *Id*. (citing Appx658-659 at Col. 4, l. 58-Col. 5). The Patents on Appeal explain the unnatural invention but the District Court ignored those facts and arguments. *See* Appx3-26.

The Patents on Appeal explain the unnatural invention and confirm that the inventive concept is not supplementing the diet to make up for reduced levels of beta-alanine in the diet, but to unnaturally supplement the typical levels of beta-alanine in the diet of an individual over time to override the natural homeostasis of the individual's muscle tissue to achieve an unnatural high level of carnosine synthesis. Appx856 (citing Appx657 at Col. 1, lines 6-8, 17-21; Appx662-0663, Col. 12, l. 45 – Col. 14, l. 64). The District Court failed to accept these unrebutted facts as true, as it was required to do in deciding Creative's motion for judgment on the pleadings. The District Court erred in this regard and this Court should consider the evidence presented or remand to the District Court with instructions to do so.

Ignoring the record, the District Court held that the '084, '947, '376 and '596 patents were invalid under 35 U.S.C. § 101 for claiming ineligible subject matter.

The District Court held that the principle that beta-alanine will increase the carnosine concentration in tissue is a law of nature. Appx22. It subsequently incorporated by reference the analysis set forth in the June 26, 2017 and August 28, 2017 Orders in the *Allmax* case. Appx10. The Court then stated that the first step in the *Alice* inquiry is to determine if the claims at issue are directed to a judicial exception, which requires courts to look at the focus of the claimed invention and the advance over the prior art. Appx10-11. The District Court then cited to portions of the specification of the Patents on Appeal to allege that the chemical beta-alanine is a naturally occurring phenomenon. Appx11. The District Court also stated that step one of the *Alice* inquiry requires a court look at what the claim is directed to rather than look at the overall claimed invention. Appx12. The District Court stated that the inventive concept described by NAI, *i.e.*, unnaturally over-supplementing the natural level of beta-alanine in the diet over a long period of time to force the muscle tissue to achieve an unnatural high level of carnosine synthesis, is still only describing a natural law, *i.e.*, a relationship between beta-alanine in the diet with the carnosine synthesis that occurs in the muscle tissue. Appx14-15.

While the District Court admitted that the claims of the '610 patent are "drafted as a method of manufacturing a dietary supplement," this was not

considered persuasive.[3] Appx25. The Court ruled that the claimed advance over the prior art disclosed in the '610 patent "is the discovery of the natural law that ingesting certain levels of beta-alanine, a natural phenomenon, will increase the carnosine concentration in human tissue" and so concluded that under step one of the *Alice* inquiry, the claims of the '610 patent were directed to excluded subject matter. Appx25. The District Court did not address how the unexpected results achieved by the claimed method could have been routine and conventional where they produced unexpected results. *See id.*; *see also* Appx907-918. The Court's conclusion is belied by this unrebutted scientific evidence.

III. NAI Explained to the District Court how the PTO Guidance Was Directly Pertinent to Certain Claims.

The PTO has set forth analysis to be used in determining patent eligibility. Appx1167-1214. This analysis provides significant commentary on the types of claims that are eligible along with the analysis given to them by the agency. *Id*. For instance, the method of using a nature-based product to treat a particular disease would be deemed eligible because "analysis of the claim as a whole indicates the claim is focused on a process of practically applying the product to treat a particular disease…and not on the product *per se*." Appx1171. The PTO provides

[3] For example, claim 1 of the '610 patent is directed to the "[u]se of beta-alanine in manufacturing a human dietary supplement for oral consumption." Appx802 at Col. 22, ll. 24-25.

this Guidance for a number of compositions considered to be "nature-based products", which includes things such as food, cells, proteins, and antibodies. Appx1167-1183.

In opposing Creative's motion, NAI pointed out that the PTO Guidance on patent eligibility had method claims very similar to those before the District Court. Appx861-863. The PTO Guidance explained that even if a claim recites a nature-based product (in this case, beta-alanine), the claim is patent-eligible when the "analysis of the claim as a whole indicates the claim is focused on a process of practically applying the product to treat" a particular condition (in this case, to treat an athlete by raising the amount of carnosine in the muscles). Appx1171. Although the PTO regularly examines and construes claims in view of § 101, the District Court elected not to consider the PTO's reasoned analyses and even incorrectly questioned their accuracy. Appx17 n. 9.

SUMMARY OF THE ARGUMENT

The District Court erred in granting Creative's motion for judgment on the pleadings, finding the Patents on Appeal invalid under § 101. NAI presented unrebutted evidence that the claims of the Patents on Appeal passed the two-step analysis under the *Alice*/*Mayo* test, are directed to patent eligible subject matter, and are not invalid. NAI provided the District Court with declaration testimony and other publications that demonstrate how the Patents on Appeal are not simply

natural products and not simply natural phenomena (and if they are how the claims as a whole add significantly more to those) as unrebutted evidence. Appx884-1142. The PTO has also set forth facts and analysis to address application of § 101 eligibility under the Supreme Court case law, but the District Court refused to be influenced by the experienced agency analysis. The claims at issue are directed to products, methods of use, and methods of manufacture, which do not stand or fall together. The District Court ignored the facts and evidence to find the claims of the Patents on Appeal invalid under § 101; therefore, the District Court's decision should be reversed.

STANDARD OF REVIEW

This Court reviews procedural questions not unique to patent law under the law of the regional circuit, which in this case is the Ninth Circuit. *See Secured Mail Sols. LLC v. Universal Wilde, Inc.*, 873 F.3d 905, 909 (Fed. Cir. 2017); *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1311 (Fed. Cir. 2016). The Ninth Circuit reviews dismissal for failure to state a claim under Rule 12(b)(6) and grant of judgment under Rule 12(c) *de novo*. *Id.*

The Federal Circuit reviews a district court's determination of patent eligibility *de novo*. *See, e.g.*, *In re TLI Commc'ns LLC Patent Litig.*, 823 F.3d 607, 610 (Fed. Cir. 2016); *OIP Techs., Inc. v. Amazon.com, Inc.,* 788 F.3d 1359, 1362 (Fed. Cir. 2015). This Court reviews the district court's determination of patent

eligibility under § 101 without deference, as a question of law. *See, e.g.*, *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1293 (Fed. Cir. 2016); *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1255 (Fed. Cir. 2014). Thus, while the ultimate determination of eligibility under § 101 is a question of law, there are frequently subsidiary fact questions which must be resolved before the legal question can be decided. The second step of the *Alice/Mayo* test requires examining "the elements of the claim to determine whether it contains an 'inventive concept' sufficient to 'transform' the claimed abstract idea into a patent-eligible application." *Alice*, 134 S. Ct. at 2357 (quoting *Mayo*, 566 U.S. at 72, 79). If the elements involve "well-understood, routine, [and] conventional activity previously engaged in by researchers in the field," they may not constitute an "inventive concept." *Mayo*, 566 U.S. at 73. This Court has held that the second step of the *Alice/Mayo* test is satisfied when the claim limitations "involve more than performance of 'well-understood, routine, [and] conventional activities previously known to the industry.'" *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass'n*, 776 F.3d 1343, 1347-48 (Fed. Cir. 2014) (citing *Alice*, 134 S. Ct. at 2359) (insertion in original); *see also Mayo*, 566 U.S. at 79-80; *Bascom Global Internet Servs. v. AT&T Mobility LCC*, 827 F.3d 1341, 1350 (Fed. Cir. 2016) ("[I]t is of course now standard for a § 101 inquiry to consider whether various claim elements simply recite 'well-understood, routine, conventional activit[ies].'"

(quoting *Alice*, 134 S. Ct. at 2359)). Whether the claim elements or the claimed combination are well-understood, routine, and conventional is a question of fact. *Aatrix Software, Inc. v. 12 Green Shades Software, Inc*., 882 F.3d 1121 (Fed. Cir. 2018). That question should not be answered adversely to the patentee based on a motion to dismiss, unless the complaint, the patent, and materials subject to judicial notice require it. *Id* at 1128.

ARGUMENT

I. Had the District Court Properly Applied the Claim Construction Supplied by NAI, it Would Have Found the Claims Eligible Under § 101.

NAI supplied particular claim constructions that, when properly adopted, would have led to the conclusion that the Patents on Appeal were eligible under § 101. For the purposes of Creative's Rule 12(c) motion, the parties agreed to apply NAI's proposed constructions because Creative alleged that the Patents on Appeal were ineligible even when applying NAI's proposed constructions. Appx8-9, n. 3. Despite this agreement, the District Court failed to apply NAI's proposed construction. The District Court compounded its erroneous finding of ineligibility by ignoring the agreed-upon constructions, and applying its own constructions without engaging the proper fact-finding and procedures set forth by this Court. *See Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370 (1996).

For example, agreed-upon construction of "human dietary supplement" construed this term to mean "an addition to the human diet, ingested as a pill, capsule, powder or liquid, which is **not a natural or conventional food**, meat or food flavoring extract, or pharmaceutical product which **effectively** increases the function of a tissue when administered to the human over a period of time." Appx14, n. 8 (emphasis added); Appx568-582. The District Court did not apply this construction, but instead, asserted that the patent claims were nothing more than "employing a dietary supplement to administer beta-alanine – a natural phenomenon – to achieve a high level of carnosine synthesis in a human – applying a natural law." Appx13. It is plain to see that the District Court ignored the express language of the agreed-upon constructions that defined the claimed human dietary supplement as neither "natural" or "conventional." Appx14, n. 8.

The District Court's critical error highlights the importance of either adopting the agreed-upon constructions or by conducting claim construction proceedings, which are often a necessity. *Bancorp Services, L.L.C. v. Sun Life Assur. Co. of Canada (U.S.)*, 687 F.3d 1266 (Fed. Cir. 2012) ("[I]t will ordinarily be desirable – and often necessary – to resolve claim construction disputes prior to a § 101 analysis, for the determination of patent eligibility requires a full understanding of the basic character of the claimed subject matter."). Instead, the District Court relied upon its own construction, which ignored the scientific

evidence presented to it. Had it relied on that scientific evidence, it would have understood that the Patents on Appeal produce an unnatural departure from homeostasis (Appx908-910), which was an unexpected outcome achieved by administering definitively unnatural amounts of the claimed human dietary supplement. Appx909-917. The District Court's independent assessment of the technology at issue does not construe the claims as one of skill in the art would, which is required for a proper claim analysis. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005). This analysis unsurprisingly resulted in a deficient analysis of the claims, which was untethered from the meaning that would be ascribed by the skilled artisan, resulting in the inevitable conclusion that the claims are directed to a natural phenomenon. *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1337 (Fed. Cir. 2016) ("[D]escribing the claims at such a high level of abstraction and untethered from the language of the claims all but ensures that the exceptions to § 101 swallow the rule"). This Court should properly adopt the agreed-upon constructions or remand the case back to the District Court to engage in the proper procedure dictated by *Markman*.

II. The Claims are Patent-Eligible Under the *Alice*/*Mayo* Test.

The Supreme Court decisions in *Mayo* and *Alice* set forth a threshold question followed by a two-step process for analyzing patent eligibility under § 101. In determining § 101 eligibility, a court first looks to the broad mandate of

patent-eligible subject matter in the Constitution and statute to decide if the subject matter is "any" new and useful "process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor." 35 U.S.C. § 101. Here, the claims of the Patents on Appeal are directed to processes or methods as well as compositions of matter.

The Supreme Court has repeatedly ruled that the patent statute was intended to be widely applicable to technology. *Diamond v. Diehr*, 450 U.S. 175, 182 (1981) (commenting on Congressional intent by saying "the Committee Reports accompanying the 1952 Act which inform us that Congress intended statutory subject matter to 'include anything under the sun that is made by man.'") Given a broad constitutional and congressional mandate and the Supreme Court's explanation of the breadth of patent-eligibility under § 101, courts should presume eligibility of an issued U.S. patent and grant PTO determinations in this area a clear and convincing standard of review. *Id*. at 182-83.

Importantly, the Supreme Court cautioned courts to make sure they are only rejecting claims that actually "claim laws of nature, natural phenomena, and abstract ideas [and separating them] from those that claim patent-eligible applications of those concepts." *Alice*, 134 S. Ct. at 2355 (citing *Mayo*, 566 U.S. at 75-79). The two-step process of the *Alice*/*Mayo* test asks a court to determine if the claims at issue are directed to one of three exceptions to the broad category of

those that are eligible, *i.e.*, "anything under the sun that is made by man." *Mayo*, 566 U.S. at 89. These patent-ineligible concepts are articulated only to make sure the claims do not take "the basic tools of scientific and technological work", *i.e.*, preempt the field. *Id.* at 86. Thus, a court should be able to show the claims would preempt the field if the *Alice/Mayo* test is properly implemented. If the answer is "no" and the tools are not preempted, the analysis is over and the claim is patent-eligible. *Rapid Litig. Mgmt. Ltd. v. CellzDirect, Inc.*, 827 F.3d 1042, 1047 (Fed. Cir. 2016). The Federal Circuit has also emphasized that "the first step of the inquiry is a meaningful one" and that "a substantial class of claims are *not* directed to a patent-ineligible concept." *Enfish*, 822 F.3d at 1335 (emphasis in original). The Patents on Appeal are directed to an application of the hydronium ion buffering capacity of the histidine molecule using the beta-alanine molecule and methods to increase and improve that buffering capacity using a particular amount and way of administering beta-alanine. As a result, they do not fit into any of the judicial exceptions to § 101.

A. The Patents on Appeal are patent-eligible under step one of the *Alice*/*Mayo* test.

The Supreme Court has cautioned that "an invention is not rendered ineligible for patent simply because it involves" one of the patent-ineligible concepts. *Alice*, 134 S.Ct. at 2354. The step one analysis, therefore, requires more than merely identifying a patent-ineligible concept that is somehow connected to

the claim, it requires that the claim is "directed to" the patent-ineligible concept. *Rapid Litig. Mgmt.*, 827 F.3d at 1047.

Determining whether a claim is directed to patentable subject matter is a question of law. *In re Bilski*, 545 F.3d 943, 951 (Fed. Cir. 2008). "This legal conclusion may contain underlying factual issues", however. *Accenture Glob. Servs., GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1341 (Fed. Cir. 2013). Where factual issues exist regarding the validity of the claims of the patents-in-suit, a defendant must prove such facts with "clear and convincing evidence," given the presumption of validity afforded to issued patents. *See Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238, 2242 (2011). The patent statute places "[t]he burden of establishing invalidity of a patent or any claim thereof" on the "party asserting such invalidity" and further mandates that "[e]ach claim of a patent . . . shall be presumed valid independently of the validity of other claims." 35 U.S.C. § 282. Factual considerations are a part of a legal analysis of patent-eligibility and Creative failed to provide any rebuttal evidence and the District Court failed to consider NAI's unrebutted evidence when it arrived at its decision.

The District Court erred in finding the Patents on Appeal are directed toward natural phenomena. By way of initial example, the claims of the '084, '376 and '947 patents are directed to dietary supplement compositions, and the District Court asserted that under *Myriad*, the claims are directed to a natural phenomenon.

Appx0012 n. 7 (citing *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, (2013)). *Myriad,* however, held that DNA sequences are informational molecules, and the information character of DNA is not altered by isolating it. 569 U.S. at 595 ("We merely hold that genes and the information they encode are not patent-eligible under § 101 simply because they have been isolated from the surrounding genetic material."). This holding furthered the purpose of § 101, which is not to impede "the flow of information." *Id.* at 2116. Moreover, this Court has noted that DNA sequences and amino acid sequences of the proteins encoded by DNA are not the same. *See Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501 (Fed. Cir. 1997) ("Although a close relationship exists between a DNA construct and the protein it encodes, the two are not equal."). Dipeptides and amino acids have never been determined by this Court to be informational molecules. Here, the beta-alanine that is not part of the dipeptide carnosine does not contain the "information" of the DNA sequences at issue in *Myriad*—it is more functional. In addition, when isolated from the dipeptide carnosine, beta-alanine has entirely different properties than carnosine, for example, it cannot buffer pH in the way that carnosine buffers pH.

B. The Patents on Appeal are patent-eligible under step two of the *Alice*/*Mayo* test.

Even if a court determines that the claims at issue actually are directed to one of the patent-ineligible exceptions, it must then "consider the elements of each

claim both individually and as an ordered combination to determine whether the additional elements transform the nature of the claim into a patent-eligible application." *Alice*, 134 S. Ct. at 2355 (internal quotations omitted). The Supreme Court specifically indicated in *Mayo* that its opinion on ineligibility was not broadly applicable and also specifically refused to decide whether the steps of the claims were unconventional, such steps would make seemingly ineligible subject matter eligible for patent protection. *Mayo*, 566 U.S. at 86-87. Similarly, the Supreme Court indicated that its narrowly articulated ruling was not like a typical patent directed to a new way of using an existing chemical, which would be patentable. *Id*.

The District Court erred in effectively refusing to apply NAI's construction of the claims of the Patents on Appeal. If the District Court had applied NAI's construction, it could not have concluded that giving massive amounts of a compound for several weeks to provide unexpected results, was routine or conventional. The District Court's failure to adopt and apply NAI's proposed claim constructions, which render the claims patent eligible, constitutes reversible error.

C. The District Court failed to properly investigate the factual underpinning of the claims.

Here, NAI is the only party that supplied the District Court with relevant scientific evidence. As set forth in the FAC, the Patents on Appeal, the opposition to the *Allmax* motion, and the motion for partial reconsideration in the *Allmax* case,

the inventive concept of the patents are not **simply** supplementing the diet to make up for low levels of beta-alanine in the diet. Appx909-910 ¶ 7. The inventive concept is to unnaturally over-supplement the normal/natural levels of beta-alanine in persons, over time, to force an override of the homeostatic nature of muscle tissue to achieve an **unnaturally high** level of carnosine synthesis along with sustaining a level above the homeostatic level. This transformative result was not attainable prior to the invention. *Id*. One of ordinary skill in the art, Dr. Hoffman, set forth these unrebutted facts indicating this activity was not routine and conventional. *See supra* at pages 5-15.

It would be impossible for a person to achieve the benefits of the invention by consuming a natural and normal diet. Appx907-908 ¶ 6. Dr. Hoffman's calculation that a person would have to eat the meat of 109 Big Macs every day for weeks (in addition to eating a normal diet) to theoretically obtain the benefit of the patented beta-alanine human dietary supplement invention is not challenged. Appx913-914 ¶¶ 15-16. The new method of treatment disclosed in the Patents on Appeal is outside of a natural law or phenomena. *Id*.

The District Court rejected NAI's scientific evidence and arguments of what was well-understood, conventional, and routine, finding the steps of supplementing to unnaturally high levels for many days to be routine and conventional. In *Mayo*, the Supreme Court found that "a process that focuses upon the use of a natural law

[must] also contain other elements or a combination of elements, sometimes referred to as an 'inventive concept,' sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself." *Mayo*, 566 U.S. at 72-73. When patent claims are directed to a natural law, or natural phenomenon, and involve merely well-understood, routine, conventional activity previously engaged in by researchers in the field, the claims may be patent-ineligible. *Id*.

The District Court also completely misconstrued the claims of the '610 patent to craft a twisted analysis to find the subject matter patent ineligible. The '610 patent is clearly directed to a method of manufacturing, which is in no way, shape, or form, a natural phenomenon.

D. Claims challenged under § 101 must be analyzed "as a whole" to assure the individual claim terms are not construed as the invention.

The District Court ignored the requirement from the *Alice* Court that "we consider the elements of each claim both individually and ‘as an ordered combination.'" *Alice*, 134 S. Ct. at 2355 (quoting *Mayo*,566 U.S. at 79-80). This determination to look at claim elements individually and as a whole is not something that is intended to be taken in the alternative, *i.e.*, both analyses are required. Indeed, the idea of looking at the claim as a whole and avoiding the sin of dismantling the claim into individual components existed long before *Mayo* and

Alice. *See Diehr*, 450 U.S. at 182-83 ("In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis."). When the Supreme Court states the elements are to be considered individually, this is only the initial step and if the individual elements are not clearly a natural process, there is no need to go any farther in the *Alice/Mayo* test. In considering NAI's specific claims as "an ordered combination," *id.*, it is clear the claims are directed to patent-eligible compositions containing unnatural amounts of beta-alanine and methods for administering such unnaturally high amounts of beta-alanine. Every chemical and chemical process will **always** be governed by scientific and physical laws, which is a characteristic that should not categorically cause claims to be ineligible. *See Alice*, 134 S. Ct. at 2354-55 ("At some level, 'all inventions ... embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.'" (quoting *Mayo*, 566 U.S., at 70-73)). The Supreme Court provided this caution because it was aware that "we tread carefully in construing this exclusionary principle lest it swallow all of patent law." *Id.*

The District Court did not analyze the claims as a whole. For instance, when analyzing the '947 patent, the District Court determined that the individual components of the claim were natural phenomena. Appx18. The Court determined

that beta-alanine "is a naturally occurring phenomenon", creatine is "also a naturally occurring phenomenon" and "a carbohydrate is also a naturally occurring phenomenon", so entire claim was allegedly "directed to excluded subject matter, specifically the natural phenomena of beta-alanine, creatine, and carbohydrates." Appx18. The District Court erroneously analyzed only the individual parts of the claim in finding that the entire claim was ineligible. *Id*. Following such an analysis would render nearly all organic molecules ineligible for patent protection because organic molecules are necessarily composed of the same building blocks (*e.g.*, carbon, hydrogen, oxygen, and nitrogen).

The District Court then propped up its arguments that were contradicted by the scientific evidence provided by NAI by citing *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130-31 (1948). It contorted and expanded the holding of that case, saying that "mixing different natural phenomena together – specifically, in that case different bacterial species – is insufficient to render an invention patent eligible even though it was not previously known that the substances could be mixed together, and that the combination provided certain advantages." Appx18. That is not what the Supreme Court said in that case, however. *Funk Brothers* found the claimed mixture ineligible because it had "the same effect it always had." 333 U.S. at 131. Not only has there been no showing the combined elements having the claimed dosage existed in nature as an ordered

combination but, perhaps even more critical, the combination did not have the same effect it always had. NAI provided evidence and arguments to the District Court to show that these combined elements at the claimed dosage administered for the claimed times (for at least 14 days in the case of claim 34 of the '947 patent) did not perform as it always had because no one had ever administered an unnatural amount of these components for a long period of time to create an unnatural override of homeostasis.

Had the District Court considered the claims as an ordered combination, *i.e.* as a whole, it would have rightfully determined the claims are eligible subject matter under § 101. When the District Court analyzed each claim limitation individually, it essentially embarked on an analysis under 35 U.S.C. § 103, instead of one under § 101, and did so without considering any factual evidence. Appx18-20. Considering the claim limitations one-by-one does not satisfy a full § 101 analysis, but instead is a literal § 103 analysis. The Court compounded its error by not citing or referencing any scientific evidence presented by NAI. *Id.* That determination ignored the proper viewpoint: that of the ordinarily skilled artisan at the time of the invention, which is the only viewpoint from which to analyze claims. *Phillips*, 415 F.3d at 1313 ("the ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, *i.e.*, as of the effective filing date of the

patent application"). This Court has instructed lower courts that they are not to substitute an improper § 103 analysis for the proper threshold analysis under § 101. *Bascom*, 827 F.3d at 1345 ("The district court's analysis in this case, however, looks similar to an obviousness analysis under 35 U.S.C. § 103, except lacking an explanation of a reason to combine the limitations as claimed").[4] Here, the District Court ignored that instruction. Allowing the § 101 analysis to mimic an abbreviated § 103 analysis that is devoid of expert input, claim construction, factual conclusions, and proper presumptions assuredly causes the exceptions to § 101 to swallow the rule.

The District Court's interpretation has the effect of rendering unnatural inventions patent-ineligible. For example, under its analysis, even if an inventor discovered that massive amounts of beta-alanine or some other natural product cured Alzheimer's or some other disease, the invention would still not be eligible for patent protection. Moreover, the eligibility determinations here were made in view of a motion for judgement on the pleadings, which was made before development of a factual record and a proper analysis under §§ 102 and 103.

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[4] *Funk Bros.* is a case that is often improperly relied upon in eligibility analyses under § 101. The *Funk Bros.* opinion, however, is one that was issued before § 101 was included in the Patent Act, and that opinion relates to obviousness, not subject-matter eligibility. *See* Matthew Siegal and Etan Chatylnne, *In Myriad, Did Supreme Court Confuse Its Own Precedent?*, Law360 (Aug. 5, 2013), at https://www.law360.com/articles/459177.

Additionally, determining that claims directed to new uses of natural products is contrary to what the Supreme Court has said (*Myriad.*, 569 U.S. at 595-96) and contrary to how the PTO interprets claims and determines their § 101 eligibility (Appx1167-1214). The District Court's analysis—that a chemical will have an effect on some aspect of an organism and that effect is a "law of nature"—effectively means that the use of chemicals to treat diseases is not eligible for patent protection because the body will always have a natural reaction to whatever is administered to it. Appx1234. The District Court's conclusions should be rejected by this Court.

Another example of the District Court's failure to consider the facts and the technology was where it stated that "the '865 patent discloses that placing a natural substance into a dietary supplement to increase the function of tissues when consumed is conventional activity." Appx23 (citing Appx757 at Col. 1, ll. 9-12). Notably, the District Court did not quote the '865 patent, but instead, provided an erroneous characterization of the disclosure.[5] The '596 patent recites that "[n]atural food supplements are typically designed to compensate for reduced levels of nutrients in the modern human and animal diet." Appx657 at Col. 1, ll. 9-12. That

[5] While the District Court states that it is citing the '865 patent in this instance, the cited lines of the patent are actually the cross-reference to related application section of the '865 patent. It appears the District Court was actually referring to Col. 1, l. 9-12 of the '596 patent. Appx23.

statement comports with what the skilled artisan might have believed prior to the invention. For example, one might expect that taking vitamin C might cause the body to have more vitamin C. That would not have been case with respect to beta-alanine as discussed by Dr. Harris because there would have been no expectation that administering beta-alanine (a precursor to carnosine) without histidine (a necessary component of carnosine) would result in an increase in carnosine. Appx1129-1130 ¶¶ 6-8. The District Court's misrepresentation of the Patents on Appeal highlights the error and lack of consideration of the evidence in front of it.

The Patents on Appeal share a similar disclosure in the specification, particularly as it relates to the background. For example, the Patents on Appeal disclose that anaerobic activity leads to the accumulation of lactate and hydronium ions and this can lead to acidification of the intracellular environment. Appx657 at Col. 1, ll. 22-30; Col. 1, ll. 51-54. Also, dipeptides of beta-alanine, including carnosine, are found in the muscles of many animals, including humans, and carnosine contributes to hydronium ion buffering capacity. *Id*. at Col. 1, l. 59-Col. 2, l. 13. Furthermore, these dipeptides, including carnosine, are involved in regulating intracellular pH levels during muscle contraction, which is achieved through the imidazole ring of the histidine component of the dipeptide. *Id*. at Col. 4, l. 58-Col. 5, l. 3. Low levels of the dipeptides, including carnosine, are synthesized inside the body from beta-alanine and histidine, which can be made

available from the diet through the breakdown of the dipeptides found in meat. *Id*. at Col. 5, ll. 3-8. The enzyme in the body that combines the beta-alanine with the histidine, however, has a low affinity for the beta-alanine. *Id*. at Col. 5, ll. 15-18.

To the extent a natural law, or natural phenomenon, is disclosed by the Patents on Appeal, that law is only that buffering capacity in muscle cells during activity is accomplished by carnosine in the muscle cells. The next step, that the carnosine can be increased to unnatural levels from massive administrations of an amino acid with no physiological buffering capacity itself is simply not a natural law but is an invention eligible for protection under § 101. Appx907-917. The patent claims are not directed to a law of nature or natural phenomenon; they are directed to a distinctly unnatural invention.

We will next show how the District Court erred with respect to claims of each of the Patents on Appeal.

1. The '596 Patent.

Claim 1 of the '596 patent is directed to a method of regulating hydronium ion concentrations in a human tissue by providing the amino acid beta-alanine and thereby effectively increasing the carnosine content in the tissue. Appx663-664 at Col. 14, l. 65 - Col. 15, l. 6. This is only achieved through a non-natural process of dramatically overriding the body's natural homeostasis. As discussed above, this is not directed to the natural law. The patent instructs an ordinarily skilled artisan to

achieve a new and useful process by recognizing that carnosine acts to buffer ions in the muscle and then disclosing that carnosine can be increased in a non-natural manner. The claim, therefore, passes the first step of the analysis, *i.e.*, it is not directed to patent-ineligible concept. *Rapid Litig. Mgmt.*, 827 F.3d at 1047.

Even if the Court were to determine, however, that the claim is directed to or touches on a patent-ineligible concept, the claim recites additional elements that transform it into a patent-eligible application. *Alice*, 134 S. Ct. at 2355. Moreover, the use of a natural law does not preclude patentability because such a standard would "eviscerate patent law." *Mayo*, 566 U.S. at 71. As noted above, the Patents on Appeal disclose that it is the imidazole ring of the histidine of the carnosine that buffers the intracellular pH and that only low levels of carnosine could be obtained through a meat diet. Appx658-659 at Col. 4, l. 58-Col. 5, l. 8 Furthermore, the enzyme that synthesizes these dipeptides has a low affinity for beta-alanine, so it would not have been well-understood, routine, or conventional to administer beta-alanine with the expectation that it would lead to increased carnosine in the muscles. *Id*. at Col. 5, ll. 15-18; Appx907-917. It was, therefore, not conventional, routine, or well-understood that providing the amino acid beta-alanine would result in the accumulation of these dipeptides in human tissue. Moreover, the claimed invention of providing the amino acid beta-alanine in effective amounts for an extended period of time does not preempt the natural law of regulating hydronium

ion concentration in a human tissue as others can provide the dipeptides, for example, carnosine, without infringing the claims. The step of providing the amino acid beta-alanine, instead of the dipeptide carnosine, is therefore an inventive concept that transforms the patent-ineligible natural law into the patent-eligible narrow application of the natural law in a specific process.

2. The '376 Patent.

Claim 6 of the '376 patent is directed to a dietary supplement comprising glycine and beta-alanine. Appx697 at Col. 22 ll. 26-36. In relation to step one of the analysis, a dietary supplement with glycine and beta-alanine is not a natural phenomenon. The claims, therefore, are directed to patent-eligible subject matter. Moreover, in relation to step two, even if the Court determined that the claims were directed to a natural phenomenon, the additional elements that the invention be a dietary supplement as that term should be construed provides the inventive concept that would transform a patent-ineligible exception to a patent-eligible concept. In particular, NAI asserts that the term "dietary supplement" is a claim limitation that means "an addition to the human diet, ingested as a pill, capsule, powder or liquid, which is not a natural or conventional food, meat or food flavoring or extract, or pharmaceutical product which **effectively** increases the function of a tissue when administered to the human over a period of time." Appx574 (emphasis added).

3. The '947 Patent.

Claim 34 of the '947 patent is directed to a human dietary supplement comprising creatine, carbohydrate and beta-alanine with no L-histidine, with 0.4 to 16 g of beta-alanine per daily dose and formulated with one or more doses per day for 14 days. Appx0836 at Col. 16, ll. 1-22. As discussed above, a human dietary supplement meeting these limitations is not a natural phenomenon. There is no record evidence provided that beta alanine is naturally found in sufficient amounts in the absence of L-histidine (its common partner in carnosine) to be an effective human dietary supplement. The claims, therefore, are directed to patent-eligible subject matter. Moreover, in relation to step two, even if the Court determined that the claims were directed to a natural phenomenon, the additional elements that the invention be a human dietary supplement comprising creatine, carbohydrate and beta-alanine with no L-histidine, with 0.4 to 16 g of beta-alanine per daily dose and formulated with one or more doses per day for 14 days was not well-understood, routine, or conventional because there was no expectation that such a formulation would have any ability to increase human muscle tissue strength as claimed. *See* Appx907-917; Appx1130-1131.

In addition, there is no evidence that the claims violate the Supreme Court's main "concern that drives this exclusionary principal [from § 101 as] one of pre-emption" of the field. *Alice*, 134 S. Ct. at 2345. The claims of the '947 patent

exclude histidine in the dietary supplement—histidine is always present in carnosine. Thus, obtaining carnosine naturally from meat—if the dipeptide were somehow broken into component parts in the natural diet—would not provide the necessary high levels of beta-alanine without histidine. Accordingly, such claims are far from conventional, normal, or anything a human body would ever encounter. The '947 patent was issued by the PTO nearly two years after the Supreme Court's *Alice* decision: if § 101 had been a real issue, the PTO would have raised the issue as a rejection, especially considering that the PTO applies the broadest reasonable interpretation to the claims, making them even more susceptible to § 101 scrutiny than after they issue as a patent. *See Phillips*, 415 F.3d at 1316.

4. The '084 Patent.

Claim 1 of the '084 patent is directed to a human dietary supplement comprising 0.4 to 16 grams per unit dosage of beta-alanine. Appx732 at Col. 22, ll. 25-30. In relation to step one of the analysis, a human dietary supplement with a unit dosage of beta-alanine is not a natural phenomenon. The claims, therefore, are directed to patent-eligible subject matter. Moreover, in relation to step two, even if the Court determined that the claims were directed to a natural phenomenon, the additional elements that the invention be a human dietary supplement in a unit

dosage form provides the inventive concept that transforms the patent-ineligible exception to a patent-eligible concept.

5. The '865 Patent.

Claim 1 of the '865 patent reads is a method of increasing anaerobic working capacity in a human subject beyond what is normally found under natural conditions. Appx767-768 at Col. 22, l. 56 – Col. 23, l. 5. If the District Court had actually adopted and applied NAI's claim construction, this would have rendered the '865 patent valid. Appx580-581. NAI proposed that "increasing anaerobic working capacity" in the claims should be construed to mean "increasing the amount of work performed by a muscle under lactate producing conditions." Appx554-559, Appx580. The term "effective to increase beta-alanylhistidine dipeptide synthesis in the tissue" in the claims should have been construed as "elevates beta-alanine above natural levels to cause an increase in the synthesis of beta-alanylhistidine dipeptide in the tissue." Appx554-559, Appx580-581. The "human dietary supplement" claim limitation should have been construed to incorporate the limitation of "effective" when taken over a period of time. *See, e.g.*, Appx581. This was given no weight by the District Court. Appx554, Appx22-23.

The District Court failed to adequately consider the functional claim term "effective" when it found the '865 patent ineligible under § 101. Appx22-23. Functional limitations must be evaluated and considered, just like all limitations of

the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. *See Geneva Pharms., Inc. v. GlaxoSmithKline PLC*, 349 F.3d 1373, 1383-84 (Fed. Cir. 2003) (pointing out that "effective amount" is a common and generally acceptable claim term). A proper claim construction incorporates as functional limitations the claim steps or limitations that the beta-alanine is provided in massive amounts that would not conventionally, naturally, or routinely be encountered. Appx906-907 ¶ 3, Appx907-908 ¶ 6. The claims also incorporate the steps or limitations that the massive amounts of beta-alanine be provided for many weeks, which certainly would not have been well-understood, routine, or conventional before the invention. Appx907-917 ¶¶ 6, 16-20, 22. The claims' functional language given above provided unexpected results, such as the ability to buffer hydronium ions in muscle tissue. *Id*. Although unexpected results are viewed as indicia with regard to an obviousness analysis under § 103, the fact that the ordinarily skilled artisan would not have expected the outcome of the patents demonstrates that the claim does not contain well-understood, routine, or conventional aspects. *See id*; *cf Mayo*, 566 U.S. at 90 ("We recognize that, in evaluating the significance of additional steps, the § 101 patent-eligibility inquiry and, say, the § 102 novelty inquiry might sometimes overlap.").

The District Court erred by stating that it would adopt NAI's proposed construction, but then not applying it and finding the patent invalid. Appx8-9 n. 3. The Court could have only done this by ignoring the factual evidence presented by NAI, which it cannot do at such an early stage of the litigation. *See Microsoft Corp.* 131 S. Ct. at 2242.

The District Court concluded that claim 1 of the '865 patent "is directed to a law of nature, specifically the principle that ingesting certain levels of beta-alanine, a natural substance, will increase the carnosine concentration in human tissue and, thereby, increase the anaerobic working capacity in a human." Appx22. As explained above, increases in carnosine do not occur naturally because it is dependent on both the amount of beta-alanine as well as the period of time spent maintaining excessive amounts of beta-alanine. Accordingly, the body needs **unnatural** levels of beta-alanine through **supplementation** over a long period of time to increase the dipeptide in the muscle. *See, e.g.*, Appx846 (Appx871-882); *see also* Appx847 (citing Appx905-918 ("His method requires such high levels of beta-alanine over such an extended period of time that it would not be found in nature, even for an obligate carnivore (*i.e.*, an animal whose diet consists primarily of meat). I would characterize such methods as distinctly unnatural.")). The District Court's transformation of unnaturally high dosing for extended time periods into a natural law is error and not what the Supreme Court intended of its

limited exception to patent eligibility. The District Court's position really means that any molecule—because the human body will always use natural enzymatic functions to metabolize it—cannot be the basis of a composition patent or a method of use patent because the natural animal physiology will always use inherent physiological pathways to create an end-result.

Additionally, during prosecution of the '947 patent, Dr. Hoffman submitted a declaration in which he averred that "[b]eta-alanine is an amino acid that is synthesized in the liver and to some extent stored in the liver. Its synthetic pathway requires the breakdown of uracil and it is metabolized into malonic dialdehyde." Appx886-887 ¶ 10; *see also* Appx891 ¶ 22 (stating references cited by the Examiner "show no more than that giving a single dose of beta-alanine can increase the beta-alanine concentration in the blood and that this is rapidly followed by excretion of beta-alanine by the kidneys. Now we know that the vast majority of beta-alanine is converted by oxidation into malonic dialdehyde."). This shows that, while a small amount of beta-alanine may be synthesized in the body, the beta-alanine does not naturally, or inevitably, result in increased carnosine content in the muscle. Rather, the natural law, if any, is that beta-alanine in the blood is excreted via the kidneys and metabolized into malonic dialdehyde, which is distinct from the results of the Patents on Appeal that administer beta-alanine to

increase muscle carnosine content and increasing athletic performance using carnosine's imidazole ring.

Here, this Court must decide if placing beta-alanine into a dietary supplement that is hundreds of times greater than the normal amount the body could ever experience is a conventional activity, if such a massive over-exposure carried out over many weeks is a natural phenomenon, and whether such extreme exposure to beta-alanine is a law of nature. Additionally, this Court must decide if placing one component of a dipeptide into a dietary supplement is well-known, routine and conventional activity previously engaged in by researchers in the field to effect an increase in the dipeptide. These are factual determinations that were in dispute before the District Court, but were not resolved and NAI's evidence remains unrebutted.

In a declaration submitted in support of NAI's request for reconsideration, Dr. Hoffman repeatedly explains why the claims—when construed as proposed by NAI—do not encompass routine and conventional techniques to one of ordinary skill. Appx907-917 ¶¶ 6, 16-20, 22. Dr. Hoffman explains why the claims create unexpected results, which are the antithesis of routine and conventional as discussed above. *See, e.g.*, Appx907-917 ¶¶ 6, 12, 17; *see also* Appx871-882 ("The amount of carnosine that can be formed is dependent on the amount of beta-alanine—not histidine—within the cell. Only when the body has excess beta-

alanine (via supplementation) does it yield elevated muscle carnosine levels. Hence, the main rationale to supplementing with beta-alanine is to increase the concentrations of carnosine in muscle tissue.").

Other evidence demonstrates the claimed invention is drawn to significantly more than the alleged judicial exception. For instance, dipeptides (carnosine, anserine, etc.) are the predominant natural source of dietary beta-alanine, not the single amino acid beta-alanine, as in the claimed inventions. *See, e.g.*, '596 patent at Col. 3, ll. 45-51; Col. 5, ll. 3-5. This means that supplementation of the single amino acid beta-alanine as claimed does not naturally occur and most certainly not naturally achieved in amounts effective to increase carnosine synthesis above the homeostatic level discussed by the scholars and declarants in the sports nutrition field and as claimed. Appx871-882, Appx907-909 ¶¶ 6-8, Appx913-915 ¶¶ 15-17.

The method claims of the '865 patent are eligible subject matter. Section 101 and Supreme Court precedent should not be read to "make all inventions unpatentable because all inventions can be reduced to underlying principles of nature which, once known, make their implementation obvious." *Diamond v. Diehr*, 450 U.S. 175, 189 n.12 (1981). As the Supreme Court has pointed out, "[i]t is now commonplace that an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Id*. at 187-88. Thus, "a new combination of steps in a process may be

patentable even though all the constituents of the combination were well-known and in common use before the combination was made." *Id*. at 188. In *Myriad*, the Court noted that product patents on two genes were invalid under § 101 but that "patents on new applications of knowledge about the BRCA1 and BRCA2 genes" would be eligible. 569 U.S. at 595. Here, the application of the knowledge that massive amounts of beta-alanine would lead to increased buffering capacity by an entirely different amino acid is a new application of knowledge and directed toward patent-eligible subject matter.

In *In re Roslin Institute*, 750 F.3d 1333 (Fed. Cir. 2014), this Court, in discussing *Funk Bros.*, 333 U.S. 127, noted that "while the method of selecting the strains of bacteria might have been patent eligible, the natural organism itself – the mixture of bacteria – was unpatentable." *Id*. at 1336. The claims at issue in *Roslin Institute* were to cloned mammals, but the inventors had already obtained a patent on the method of cloning animals. *Id*. at 1334-1335.

In *Rapid Litig.*, 827 F.3d 1042, this Court found that the inventors "employed their natural discovery to create a new and improved way of preserving hepatocyte cells for later use." *Id*. at 1048. This Court went on to find that the method claims were patent-eligible:

> The end result of the '929 patent claims is not simply an observation or detection of the ability of hepatocytes to survive multiple freeze-thaw cycles. Rather, the claims are directed to a new and useful method of preserving hepatocyte cells. Indeed, the claims

> recite a "*method of producing* a desired preparation of multi-cryopreserved hepatocytes." '929 patent col. 19 l. 56-col. 20 l. 20 (emphasis added). Through the recited steps, the patented invention achieves a better way of preserving hepatocytes. The '929 patent claims are like thousands of others that recite processes to achieve a desired outcome, e.g., methods of producing things, or methods of treating disease. That one way of describing the process is to describe the natural ability of the subject matter to undergo the process does not make the claim "directed to" that natural ability. If that were so, we would find patent-ineligible methods of, say, producing a new compound (as directed to the individual components' ability to combine to form the new compound), treating cancer with chemotherapy (as directed to cancer cells' inability to survive chemotherapy), or treating headaches with aspirin (as directed to the human body's natural response to aspirin).

Id. at 1048-49.

Here, the inventors of the '865 patent created a new and useful method of administering beta-alanine in large doses over time to achieve an unnatural—but desired—result.

6. The '610 Patent.

Unlike any of the other Patents on Appeal in the *Allmax* case or this case, the '610 patent relates to a method of manufacture of a dietary supplement that would be effective in delaying the onset of fatigue when taken over a period of time. Appx802 at Col. 22, ll. 24-37. The District Court stated that the focus of the claims in the '610 patent was beta-alanine and how it performs in the body. Appx24. This statement, however, is incorrect. Claim 1 of the '610 patent states:

> Use of beta-alanine in manufacturing a human dietary supplement for oral consumption; supplying the beta-alanine, which is not part of a

> dipeptide, polypeptide or oligopeptide, as a single ingredient in a manufacturing step of the human dietary supplement or mixing the beta-alanine, which is not part of a dipeptide, polypeptide or oligopeptide, in combination with at least one other ingredient for the manufacture of the human dietary supplement, whereby the manufactured human dietary supplement is for oral consumption of the human dietary supplement in doses over a period of time increases beta-alanyl histidine levels in muscle tissue sufficient to delay the onset of fatigue in the human.

Appx802 at Col. 22, ll. 24-37. Such claims are directed to the manufacture of a dietary supplement. The District Court admitted that the claims of the '610 patent are "drafted as a method of manufacturing a dietary supplement." Appx25. The manufacture of a dietary supplement containing beta-alanine is not a natural phenomenon or a law of nature, especially in light of functional limitations of the claims, as discussed above. Such methods of manufacturing claims are patent-eligible at least under the ruling of *Rapid Litig. Mgmt.*, 827 F.3d 1042. Accordingly, the claims of the '610 patent are not invalid under § 101.

The District Court, after misstating that the claims are directed to ineligible subject matter under § 101, then stated that there is no inventive concept under step two of *Alice*. Appx25. This ignored NAI's proposed construction of the term dietary supplement, the other limitations in the '610 patent for which NAI has provided constructions, the intrinsic evidence, and the scientific evidence, all of which demonstrate that the claims possess an "inventive concept" and, therefore, pass the second step of the *Alice/Mayo* test. Given the factual allegations in the

FAC, the attached exhibits (which must be deemed to be true at such an early stage of the litigation) (*see Retail Prop. Trust v. United Bhd. Of Carpenters & Joiners of Am.*, 768 F.3d 938, 945 (9th Cir. 2014)), and the other factual evidence presented by NAI, Creative failed to establish invalidity by clear and convincing evidence, and the District Court erroneously found the patents ineligible under § 101. As explained above in relation to the '865 patent, determining what was well-understood, routine and conventional at the time of the invention is a complicated factual issue, which requires scientific evidence for the Court to perform a proper two-step analysis under the *Alice/Mayo* test. The District Court's analysis and order ignores the facts and the evidence to support the notion that the '610 patent does not have an inventive concept. On this record, the District Court's order should be reversed.

III. Under the PTO Guidance, Claims of the Patents on Appeal Are Patent Eligible and the PTO Guidance Should be Afforded *Skidmore* Deference.

While the PTO lacks substantive rule making authority as described in *Chevron v Natl. Resources Def. Counsel*, 467 U.S. 837 (1984), it is entitled to *Skidmore* deference to the agency's interpretations of statutory law within its specific sphere of action. *See, e.g.*, *Skidmore v. Swift & Co.*, 323 U.S. 134, 137 (1944). Citing *Skidmore*, this Court has given the PTO deference based on "the thoroughness of its consideration and the validity of its reasoning, *i.e.*, its basic

power to persuade [even] if lacking power to control." *Merck & Co. v. Kessler*, 80 F.3d 1543, 1550 (Fed. Cir. 1996). Here, the PTO has issued guidance for patent eligibility and provided for public comment in an area of patent law that has not been clearly addressed by the Supreme Court. The District Court should have given appropriate deference to the agency's analysis. Its failure to do so was error.

Here, certain claims considered by the PTO, and the resulting analysis in the Guidance, are directly applicable to claims from the Patents on Appeal. In considering claims very similar to the method claims before this Court, the PTO taught that even if the claim recites a nature-based product (in our case, beta-alanine) "analysis of the claim as a whole indicates the claim is focused on a process of practically applying the product to treat" a particular condition (in our own case to treat an athlete to raise the level of beta-alanine to unnaturally high levels in the muscles). Appx1168-1171. The example claim 7 was drawn to:

> A method of treating colon cancer, comprising: administering a daily dose of purified amazonic acid to a patient suffering from colon cancer for a period of time from 10 days to 20 days, wherein said daily dose comprises about 0.75 to about 1.25 teaspoons of amazonic acid.

Appx1169. The claim is for a method of treatment for a period of time from 10 to 20 days at an effective dose. The PTO instructed that claim was patent eligible:

> Although the claim recites a nature-based product (amazonic acid), analysis of the claim as a whole indicates that the claim is focused on a process of practically applying the product to treat a particular disease (colon cancer), and not on the product per se. Thus, it is not

> necessary to apply the markedly different characteristics analysis in order to conclude that the claim is not directed to an exception (Step 2A: NO). The claim qualifies as eligible subject matter.

Appx1171. Another relevant claim is example 8:

> A method of treating breast or colon cancer, comprising: administering an effective amount of purified amazonic acid to a patient suffering from breast or colon cancer.

Appx1169. The PTO found this example was also patent eligible:

> Although the claim recites a nature-based product (amazonic acid), analysis of the claim as a whole indicates that the claim is focused on a process of practically applying the product to treat a particular disease (breast or colon cancer), and not on the product per se. Thus, it is not necessary to apply the markedly different characteristics analysis in order to conclude that the claim is not directed to an exception (Step 2A: NO). The claim qualifies as eligible subject matter.

Appx1171.

The evidence presented to the District Court proves that many weeks of unnaturally high beta-alanine supplementation are required to be effective. Appx884-1142. Accordingly, applying the PTO examples to this case means that NAI's Patents on Appeal are not invalid. For example, claim 1 of the '596 patent is to a method of regulating the hydronium ion concentration in human tissue by providing an amount of beta-alanine to the blood or blood plasma **effective** to increase beta-alanylhistidine dipeptide (carnosine) synthesis in the human tissue, exposing the human tissue to the blood or blood plasma and thereby increasing the carnosine in the human tissue. Appx663-664 at Col. 14, l. 65-Col. 15, l. 7. As

explained in the patents and publications of those in the field, to be effective requires long term extremely high exposure to beta alanine. *See, e.g.*, Appx658-659 at Col. 2, l. 16-Col. 3, l. 57, Col. 3., l. 61-Col. 4, l. 56; Appx910 ¶ 10, Appx1024-1045. In other words, that claim recites a nature based product, beta-alanine, with a method or process of practically applying the product to treat a particular condition: to treat an athlete to raise the amount of carnosine in the muscles and improve performance. Applying the PTO's examples means claim 1 of the '596 patent is not invalid. In addition, the District Court's holding is counter to the reasoning of the Patent Trial and Appeal Board's recent ruling in *Ex Parte Hennen*, 2017 WL 2200423 (Patent Tr. & App. Bd. May 10, 2017), which reversed the Examiner's § 101 rejection because the naturally occurring components of the claimed dietary supplements produced significantly more than in their natural state. *Id.* at 4. Here, the unexpected results of the methods and use of the supplement as set forth in the functional language, is something significantly more than the natural state, which was unable to be increased prior to the Patents on Appeal.

Given the PTO Guidance, the Supreme Court's warning not to let that Court's limited exemptions eviscerate patent law as well as the Supreme Court's caution that treatment claims for a "new way of using an existing" chemical is patentable (*Alice*, 134 S.Ct. at 2354; *Mayo*, 566 U.S. at 71, 87), this Court should

reject the District Court's dismissal with prejudice of the claims of multiple patents and its failure to give any substantive consideration to the evidence.

The District Court went further and questioned the Guidance's accuracy regarding preemption as it relates to an eligibility analysis, why claims are "eligible under *Myriad* in light of *Mayo*", and the fact that the District Court believes the Guidance "does not contain any reference at all to the Supreme Court's decision in *Mayo*." Appx17. The District Court's assessment is erroneous because there is no Supreme Court precedent requiring analysis under both *Mayo* and *Myriad*, which is sensible because, as discussed above, *Mayo* only dealt with method claims and *Myriad*'s holding only applied to DNA. In fact, the PTO has recently incorporated aspects of its Guidance regarding the recent Supreme Court precedent in the Manual of Patent Examining Procedure § 2106.05(a), where the PTO cautions patent examiners to show the restraint that the Supreme Court set forth by saying "[u]nless it is clear that the claim recites distinct exceptions, such as a law of nature and an abstract idea, care should be taken not to parse a recited exception into multiple exceptions." The MPEP also cautions that improvements to the functioning of technology are generally considered to be patentable, citing *Alice*, 134 S. Ct. at 2359. Here, many of the claims at issue teach a method to improve the buffering capacity of the muscles working under anaerobic conditions. The District Court's to decision to ignore the Guidance and invalidate such improvement claims

at this early stage of the litigation, when all factual determinations should be made in favor of the non-moving party is reversible error. *Retail Prop. Trust*, 768 F.3d at 945.

IV. The District Court's Position Eviscerates Natural Products Chemistry and Was Not the Intent of the Supreme Court.

The District Court's decisions in the *Allmax* case and this case were the first in the country to invalidate a dietary supplement method of use patent based on § 101. Extending the Supreme Court's precedent to cover the method claims, in particular, of the Patents on Appeal would be a tectonic shift in the law and business models for large sectors of the economy. This is particularly troublesome because patents are presumed valid under 35 U.S.C. § 282.[6]

Another reason the District Court erred by not appropriately considering and applying the specific fact record is the over broad and sweeping scope of the ruling as it affects the market for dietary supplement products. According to the National Institutes of Health, U.S. sales of supplements were an estimated $36.7 billion in 2014. *See, e.g.*, https://ods.od.nih.gov/factsheets/MVMS-HealthProfessional (last visited Apr. 13, 2018). The industry is regulated by the Food and Drug

[6] The Biotechnology Innovation Organization provided a letter regarding its public position on § 101 jurisprudence and the still evolving case law in the life sciences arena and expressed its hope that district courts will render decisions on patent eligibility on a well-developed record to aid in the creation of robust precedent. Appx593-594. This fell on the deaf ears of the District Court.

Administration ("FDA"), primarily under the Dietary Supplement Health and Education Act of 1994 (“DSHEA”), Pub. L. No. 103-417, 108 Stat. 4325. Section 2 of the law declared that "improving the health status of United States citizens ranks at the top of the national priorities of the Federal Government" and that "the importance of nutrition and the benefits of dietary supplements to health promotion and disease prevention have been documented increasingly in scientific studies."[7] Among the regulatory requirements, a supplement manufacturer must have scientific substantiation for any claim made. 21 U.S.C. § 343(r)(6)(B)-(C). Further, a new dietary ingredient is adulterated unless the manufacturer makes a submission to FDA at least 75 days prior to the initial sale. 21 U.S.C. §§ 331(a), 350b. Consequently, companies make substantial investments to research, develop and bring to market new and useful supplements. If companies and inventors cannot recover that investment by protecting and defending their intellectual property, they will not invest in innovative technology in the United States. Senator Hatch, a sponsor of DSHEA, has expressed his concern regarding the District Court's broad decision in this case: "If treatments derived from natural processes cannot be

[7] DSHEA defines a dietary supplement as: "a product (other than tobacco) intended to supplement the diet that bears or contains one or more of the following ingredients: (A) a vitamin; (B) a mineral; (C) an herb or other botanical; (D) an amino acid; (E) a dietary substance for use by man to supplement the diet by increasing the total dietary intake; or (F) a concentrate, metabolite, constituent, extract, or combination of any ingredient described in clause (A), (B), (C), (D), or (E)." 21 U.S.C. § 321(ff).

patented, life sciences companies may find their intellectual property rights sharply curtailed. Already we're seeing lower courts move in this direction, with a recent case out of California casting doubt on the ability of dietary supplement companies to patent any of their products." https://medium.com/@SenOrrinHatch/a-look-forward-on-patent-reform-288942e634f1 (last visited Apr. 13, 2018).

In addition, PTO Director Andrei Iancu spoke at the U.S. Chamber of Commerce Patent Policy Conference on April 11, 2018 and noted the difficulty in consistently applying patent eligibility:

> [O]ur current law surrounding patentable subject matter has created a more unpredictable patent landscape that is hurting innovation and, consequently, investment and job creation. Recent cases from the Supreme Court – Mayo, Myriad, and Alice – have inserted standards into our interpretation of the statute that are difficult to follow. Lower courts applying these cases are struggling to issue consistent results. Patent lawyers trying to advise their clients are, in turn, struggling to predict the outcome with respect to certain patents. And examiners at the USPTO must spend increased amounts of time addressing this challenging issue. The current standards are difficult for all: stakeholders, courts, examiners, practitioners, and investors alike.
>
> System-wide, a significant amount of time is being spent trying to figure out where the lines should be drawn, and what's in and what's out. And multiple people looking at the same patent claims often have trouble agreeing on, and predicting, the outcome. Something must be done. To be sure, we must and will apply Supreme Court law faithfully. This does not mean, however, that more cannot be done to increase clarity and predictability. Of course, given our statutory mandate, there is only so much that the USPTO can do. But within that mandate, we will do everything we can. Currently, we're actively looking for ways to simplify the eligibility determination for our examiners through forward-looking guidance. Through our

> administration of the patent laws, which we are charged to execute, the USPTO can lead, not just react to, every new case the courts issue.

https://www.uspto.gov/about-us/news-updates/remarks-director-andrei-iancu-us-chamber-commerce-patent-policy-conference (last visited Apr. 13, 2018); *see also* Statement of Hon. Paul Michel before House Subcommittee on Courts, Intellectual Property, and the Internet at 3 (July 13, 2017) (available at https://judiciary.house.gov/wp-content/uploads/2017/07/Statement-of-Judge-Paul-Michel-House-IP-Subcomm.-7-13-2017.pdf (last visited Apr. 13, 2018). ("Eligibility law under the *Alice*/*Mayo* regime has become highly uncertain and unpredictable. And results have been as inconsistent as unpredictable.") The District Court's refusal to give the proper deference and choice to ignore unrebutted scientific evidence in the record is in error and the decision should be reversed.

CONCLUSION

For the foregoing reasons, the Court should reverse the District Court's determination that the Patents on Appeal are invalid under 35 U.S.C. § 101.

Respectfully submitted,

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