Expert Q&A on Patent Eligibility of Life Sciences Inventions

PRACTICAL LAW INTELLECTUAL PROPERTY & TECHNOLOGY

An expert Q&A with Charles T. Collins-Chase and Sara A. Leiman, Ph.D. of Finnegan, Henderson, Farabow, Garrett & Dunner, LLP on the patent eligibility of life sciences inventions. The Q&A addresses patent subject matter eligibility, global patent strategies for protecting life sciences inventions, and other legal and regulatory mechanisms to protect life sciences inventions.

Some experts have called the standards for determining patent eligibility under Section 101 of the Patent Act incoherent. This "incoherence" is particularly challenging for the life sciences industry where certain diagnostic inventions are now unpatentable.

Practical Law asked Charles T. Collins-Chase and Sara A. Leiman, Ph.D. of Finnegan, Henderson, Farabow, Garrett & Dunner, LLP to discuss the effects of current patent subject matter eligibility law on innovative companies in the life sciences industry and steps they may take to protect their inventions. Charles is a partner at the firm and focuses on district court patent litigation and appeals before the US Court of Appeals for the Federal Circuit (Federal Circuit), where he served as a clerk. He uses his chemical engineering background to help clients protect innovations in pharmaceuticals and biotechnology, energy and renewables, and chemical products. He has assisted numerous clients in litigation involving Abbreviated New Drug Applications (ANDA) under the Hatch-Waxman Act. Sara is an associate at the firm and focuses her practice on US and foreign patent prosecution, strategic counseling for global patent portfolios, and due diligence in the biotechnology and pharmaceutical areas.

For more information on patent subject matter eligibility generally, see Practice Note, Patent-Eligible Subject Matter: Overview (1-525-8503).

PLEASE DESCRIBE THE DIFFERENT TYPES OF INVENTIONS LIFE SCIENCES COMPANIES TYPICALLY SEEK TO PATENT.

Broadly speaking, life sciences companies typically seek to patent:

- Drug products and related compositions, formulations, devices, and methods of making and using the product. A drug product often may be an antibody, a vaccine, a recombinant or fusion protein, a nucleic acid, a gene therapy vector, a gene editing tool, a liposome, a small molecule, or conjugates, combinations, or kits of these types of products.
- Non-drug inventions, such as assays, CRISPR technology, delivery devices, next-generation sequencing platforms, cytometry, biofuels, and renewable materials.

The methods or processes that life sciences companies seek to patent come in many forms, such as:

- Synthesizing a molecule or peptide.
- Purification.
- Detecting a biomarker.
- Diagnosis.
- Selecting a drug candidate.
- Pairing a treatment regimen with a patient subpopulation.
- Predicting or assessing drug efficacy.
- Preventing a disease.
- Treating or alleviating disease symptoms.

WHAT ARE THE KEY PATENTING ISSUES FACING COMPANIES DEVELOPING LIFE SCIENCES TECHNOLOGY?

Life sciences companies are facing many patenting issues now. Companies are considering how broader technology trends are likely to affect their industry. One example is artificial intelligence, which life sciences companies are already using to generate valuable new inventions, but which can have somewhat uncertain patenting implications.

Perhaps the biggest recent patenting trend is the increased difficulty in obtaining and enforcing life sciences patents. The US Patent and Trademark Office (USPTO) is applying increasingly rigorous

standards when considering patent applications, including for written description and enablement. As a result, applicants may be forced to choose between narrowing claim scope and making arguments that may lead the USPTO broadly to apply potentially invalidating prior art. At the same time, life sciences companies now routinely face post-grant challenges before the Patent Trial and Appeal Board (PTAB) to patents they assert in district court. Those challenges have been remarkably effective at invalidating patents. The USPTO's statistics indicate that *inter partes* review and post-grant review have a 59% institution rate for challenges to bio/pharma patents. Based on our firm's analysis, more than 53% of those challenged patent claims are canceled. For more information concerning these PTAB trials, see Practice Note, Understanding PTAB Trials: Key Milestones in IPR, PGR, and CBM Proceedings (3-578-8846).

It also appears that USPTO examiners are issuing obviousness-type double patenting (ODP) rejections more frequently. These rejections often reach into the specification of one or more references and may overlook material differences between claim sets. Companies should carefully consider whether an ODP rejection is best resolved with a terminal disclaimer or with an argument explaining why the examiner misapplied the law. For more information concerning double patenting, see Practice Note, Double Patenting (W-010-7017).

Finally, a key issue is subject matter eligibility under 35 U.S.C. § 101, which is increasingly making it difficult for life sciences companies to obtain and assert patents. This is particularly true for methods that involve natural correlations, such as diagnostic or prognostic methods. Subject matter eligibility poses challenges for life sciences companies not only because it arguably disqualifies whole genres of inventions from patentability, but also because it has been so effective in invalidating patents and so inconsistently applied both by USPTO examiners and the courts.

WHAT IS THE CURRENT STATE OF PATENT LAW CONCERNING PATENT SUBJECT MATTER ELIGIBILITY FOR LIFE SCIENCES INVENTIONS? IS RECENT CASE LAW CONSISTENT WITH SUPREME COURT PRECEDENT?

The Supreme Court's decisions in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66 (2012) and *Alice Corp. Pty. Ltd. v. CLS Bank International*, 573 U.S. 208 (2014) set out the two-part test that courts apply for determining subject matter eligibility. Courts first ask whether a claim is directed to a patent-ineligible concept, an abstract idea, a law of nature, or a natural phenomenon. If it is, the courts must then analyze whether the claim adds an "inventive concept" sufficient to transform the claim into a patent-eligible application of the underlying concept.

Although the *Mayo/Alice* framework has led to numerous life sciences patents being invalidated as directed to no more than a law of nature or natural phenomenon, some recent decisions by the Federal Circuit have held method of treatment claims to be patent-eligible. *Vanda Pharmaceuticals Inc. v. West-Ward Pharmaceuticals International Ltd.*, 887 F.3d 1117 (Fed. Cir. 2018), *Natural Alternatives International, Inc. v. Creative Compounds, LLC*, 918 F.3d 1338 (Fed. Cir. 2019), and *Endo Pharmaceuticals Inc. v. Teva Pharms USA, Inc.*, 919 F.3d 1347 (Fed. Cir. 2019), all involved method of treatment claims the Federal Circuit held are eligible for patent protection. The Court distinguished each of these cases from *Mayo*, finding that while the claims in *Mayo* were directed to determining, but not necessarily using, an improved treatment, the claims in these later cases required an active treatment step. The decisions in both *Natural Alternatives* and *Endo* relied heavily on analogies to the claims held patent-eligible in *Vanda*, for which a Supreme Court *certiorari* petition is currently pending.

The Federal Circuit has also ruled recently on the patent eligibility of purported natural product claims. In *Roche Molecular Systems, Inc. v. Cepheid*, 905 F.3d 1363 (Fed. Cir. 2018), the Federal Circuit held that claims to a DNA primer exhibiting typical hybridization activity are not patent-eligible, consistent with the Supreme Court's analysis and holding in *Association for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 580 (2013) ("[A] naturally occurring DNA segment is a product of nature and not patent eligible merely because it has been isolated").

By contrast, the Federal Circuit reversed a district court decision holding the dietary supplement claims at issue in *Natural Alternatives* to be patent-ineligible because the claims as construed required the supplements to be administered in unnatural quantities and to alter a subject's physiology from its natural state. This decision expressly addressed the Supreme Court's holding in *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127 (1948), explaining that combinations of natural products may still constitute patent-eligible subject matter if they improve the natural product's usual function or have synergistic effects.

In line with the Supreme Court's holding in *Mayo*, the Federal Circuit has consistently found diagnostic claims and method of detection claims invalid as drawn to patent-ineligible subject matter. For example, in *Roche*, the Federal Circuit held claims to detecting bacteria using polymerase chain reaction ("PCR") to be patent-ineligible because they merely combined naturally occurring DNA, a routine and conventional methodology, and a mental "detecting" step. *Id.* at 1371. For similar reasons, the Federal Circuit found the diagnostic claims at issue in *Athena Diagnostics, Inc. v. Mayo Collaborative Servs., LLC*, 915 F.3d 743 (Fed. Cir. 2019), to be patent-ineligible.

In particular, the Federal Circuit held that detecting naturally occurring autoantibodies using a standard radiolabeled molecule and correlating that detection to a disease state fell under judicial exceptions to patentable subject matter. *Id.* at 750, 754-755. The Federal Circuit extended the logic from *Athena* to their nonprecedential decision in *Cleveland Clinic Foundation v. True Health Diagnostics LLC*, 760 Fed. App'x 1013 (Fed. Cir. 2019), in which they found claims reciting a method of detecting elevated myeloperoxidase using conventional means to be patent-ineligible.

Although the Federal Circuit denied rehearing en banc in *Athena*, its per curium order was accompanied by four separate dissents from the denial and four separate concurring opinions, several of which expressly requested further Supreme Court guidance on subject matter eligibility (*Athena Diagnostics, Inc. v. Mayo Collaborative Servs.*, LLC, 927 F.3d 1333 (Fed. Cir. 2019)). These opinions reveal not only disagreement within the Federal Circuit about how to apply the *Mayo/Alice* test, but also the challenge that patentees face when defending diagnostic claims. For example, Judge Moore's dissent (joined by Judges O'Malley, Wallach, and

Stoll) states that "[n]one of my colleagues defend the conclusion that claims to diagnostic kits and diagnostic techniques, like those at issue, should be ineligible" and that, instead, the only difference between the judges is whether Mayo requires the Court to hold the claims ineligible (927 F.3d at 1352).

HAVE PATENTING STRATEGIES CHANGED BECAUSE OF THE STATE OF PATENT SUBJECT MATTER ELIGIBILITY LAW? WHAT CAN PATENT COUNSEL DO TO PLACE APPLICATIONS IN THE BEST POSITION TO OBTAIN ALLOWABLE AND COMMERCIALLY VALUABLE CLAIMS?

Yes. Patenting strategies have evolved over the past ten years in response to new Section 101 case law. Patent counsel should keep up with how the law is changing and should apply the following general principles to place applications in the best position for allowance:

- Draft applications to focus on *practical applications* of any underlying law of nature or natural phenomenon. For inventions involving a natural phenomenon, for example, it is important to draft claims that apply the phenomenon in a specific or unconventional manner to achieve some practical result. In *Vanda*, the claims were held to be patent eligible because they recited *administering a specific dose* of a drug to a patient based on the patient's genotype. This contrasts with the claims in *Athena*, which were held ineligible because they recited using a standard assay to observe a natural phenomenon (a biomarker of disease), then drawing a conclusion from that observation to reach a diagnosis.
- Ensure that the patent specification clearly discloses how the claimed invention improves on prior-art methods or products and overcomes a particular scientific challenge. The Federal Circuit recently held in *Berkheimer v. HP*, 881 F.3d 1360 (Fed. Cir. 2018) and *Aatrix Software v. Green Shades Software*, 882 F.3d 1121 (Fed. Cir. 2018) that the patent-eligibility inquiry under Section 101 has underlying fact issues, including whether a patent improves on conventional or prior-art methods or products. When a patent specification expressly discloses these improvements, it can:
  - help convince the USPTO to allow claims in the patent application; and
  - make it harder to challenge that patent in litigation using a motion to dismiss or motion for summary judgment.
- Seek various types of claims directed to different aspects of the invention. This includes seeking both method and product claims and claims covering different types of methods, for example, claims directed to methods of treatment, method of diagnosis, and methods of detection. In addition to putting an application in the best possible shape to survive a Section 101 challenge, filing an application with claims in a variety of invention categories may also help applicants maximize their patent term by triggering a restriction requirement among the different claim types, which then avoids terminal disclaimers in later-filed divisional applications. For more information concerning patent terms, see Practice Note, Patent Term Adjustment (W-004-6574).

To more quickly secure patent rights, companies may first pursue subject matter with more certain patent eligibility, such as method of treatment claims or method of diagnosis plus treatment claims, consistent with *Vanda* and *Endo*. Applicants may then pursue more challenging subject matter, such as diagnostic or detection method claims, using later divisional applications.

While it remains to be seen if patent legislation or new Supreme Court case law will make it easier to obtain and enforce patents on diagnostic or detection methods, these strategies still give life sciences companies the best chance to build a valuable patent portfolio that is likely to survive whatever comes next from Congress and the courts.

IS PATENT ELIGIBILITY A CHALLENGE FACING COMPANIES MANAGING A GLOBAL LIFE SCIENCES PATENT PORTFOLIO? IF SO, WHAT STRATEGIES CAN COMPANIES EMPLOY TO ADDRESS THESE CHALLENGES?

Absolutely. Patent eligibility is a global concern. As an example, we can compare the practices of two major non-US jurisdictions, Europe and Japan, which both limit the patentability of life sciences inventions, but provide a path to obtaining patentable subject matter for diagnostic inventions.

EUROPE

Article 52 of the European Patent Convention (EPC) declares several broad categories of invention to be ineligible for patent protection. Possibly the most pertinent to life sciences inventions are the ineligible categories of discoveries and rules for performing mental acts. Even more directly, Article 53 of the EPC disallows claims covering "methods for treatment of the human or animal body by surgery or therapy and diagnostic methods practiced on the human or animal body." However, Article 53 continues: "this provision shall not apply to products, in particular substances or compositions, for use in any of these methods." Therefore, similar to current US law, the European Patent Office (EPO) deems a diagnostic method claim patent-ineligible. Unlike the US, however, the EPO never grants a "method of treatment" claim, *per se*, although under Article 54, the EPO may deem patentable a claim reciting a substance "for use" in a diagnostic or therapeutic method, provided the claim is inventive over the prior art.

JAPAN

Japan applies similar restrictions on patent eligibility as Europe, permitting composition for use claim formats but not permitting claims that recite treatment or diagnostic methods practiced on the human body. Japanese Patent Office examination guidelines advise that an *in vitro* detection claim should be patent-eligible and should not be characterized as a patent-ineligible diagnostic method claim if the claim does not include a step in which a medical doctor evaluates a human's condition.

Many other jurisdictions apply similar rules to those in Europe and Japan, although claim formatting requirements may differ from one country to another. One notable exception is India, where treatment and diagnostic claims are either prohibited or their patent eligibility status is unreliable. However, it is generally advisable to draft applications with support for various uses, such as for treatment, manufacturing a medicament, diagnosis, *in vitro* detection, and then adapt the claims according to local practice and with the advice of local counsel.

ARE THERE OTHER FORMS OF INTELLECTUAL PROPERTY OR DIFFERENT REGULATORY OR MARKETING STRATEGIES AVAILABLE FOR PROTECTING LIFE SCIENCES INVENTIONS? WHAT ARE THE BENEFITS AND SHORTCOMINGS OF EACH?

Absolutely. It is critical for life sciences companies to build a valuable patent portfolio to safeguard their innovations, but they also should not ignore other options, such as trade secret protection and regulatory exclusivity. Patents offer valuable protection, but they can be difficult to obtain for certain types of inventions, such as those that are likely to be held ineligible under Section 101. Patents also only protect inventions for a limited duration. Although 20 years from the date of filing may seem like a long time, companies must weigh patent term against the 10 to 15 years it typically takes to bring a new drug to market. In this context, companies should carefully consider whether any patent term extension may be available as a result of any delays in obtaining Food and Drug Administration (FDA) approval, which can potentially extend patent life by up to five years.

Another option for companies developing new drugs is to seek FDA regulatory exclusivities. During the exclusivity period, the FDA does not approve generic versions of an innovator drug. Different types of exclusivity may be available for different drug products. For example, new chemical entity exclusivity offers five years of protection for a drug that contains an active moiety the FDA has not previously approved. Exclusivity can also be available for:

- Orphan drugs, which treat rare diseases or conditions.
- Drugs for which the FDA requested pediatric studies.
- Drugs for which new clinical studies are required to obtain approval.

Companies can use regulatory exclusivity in conjunction with patents to build a more robust wall around their pharmaceutical inventions. For more information concerning FDA regulatory issues and patents, see Practice Note, Hatch-Waxman: Overview (9-523-2397).

Life sciences companies may also wish to protect certain inventions as trade secrets rather than seeking a patent. A trade secret can provide tremendous value because if the underlying innovation remains secret and has independent economic value, trade secret protection can last indefinitely.

Trade secrets also carry some risks, however. Unlike a patent, trade secret protection is lost if a competitor reverse engineers or independently creates the same invention or if the trade secret is somehow disclosed. Inventions that are easy to reverse engineer therefore are not good candidates for trade secret protection. Companies should instead consider trade secrets for technology a competitor is unlikely to access, such as manufacturing process innovations. Companies must also ensure to use reasonable measures to protect their trade secrets to prevent misappropriation.

WHAT IS THE STATUS OF FEDERAL LEGISLATION TO MODIFY THE CURRENT STATE OF THE LAW CONCERNING PATENT SUBJECT MATTER ELIGIBILITY FOR LIFE SCIENCES INVENTIONS? HOW SHOULD LIFE SCIENCES COMPANIES PROCEED IN THE FACE OF POSSIBLE LEGISLATIVE REFORM?

Federal legislation on patent eligibility has stalled somewhat. Senators Thom Tillis (R-NC) and Chris Coons (D-DE) proposed draft bill language in May 2019 intending to replace the existing *Mayo/Alice* two-part test for patent eligibility by eliminating the judicially created exceptions for abstract ideas, laws of nature, and natural phenomenon. The bill spurred debate, with some praising its elimination of these judicial exceptions and some criticizing the bill for being too broad and potentially allowing claims that preempt natural phenomenon or laws of nature, and therefore harm innovation.

Although the Tillis-Coons draft bill, if passed, is most likely to make it easier for life sciences patents to survive Section 101, companies may still face challenges obtaining claims to certain inventions, particularly diagnostic methods. It has long been suggested that the rigorous application of Section 101 required under *Mayo* is not needed because many claims do not meet the requirements of other code sections, such as Sections 103 and 112. Diagnostic method claims that employ conventional technologies, which are usually held patent ineligible under Section 101, are also likely to be difficult to show are nonobvious.

Methods that rely on innovative and unconventional technologies may pass Section 101 even under the current law, but they are often rejected by the USPTO under Section 112 for lack of written description or enablement. Therefore, the primary beneficiaries of the Tillis-Coons proposal may be applicants pursuing diagnostic method claims that recite routine steps but boast objective indicia of nonobviousness. For more information concerning objective indicia of nonobviousness, see Practice Note, Patent Litigation: Obviousness Defense: Secondary Considerations of Nonobviousness (7-586-0265).

It is important to remember that:

- The Tillis-Coons proposal is likely to change before being introduced as a bill.
- Congress may consider several other avenues for reform.

Life science companies should monitor the development of subject matter eligibility legislation while pursuing the invention protection strategies discussed above to guard against the present (and possibly future) uncertainty in the field.

HOW DOES THE US PATENT AND TRADEMARK OFFICE'S 2019 REVISED PATENT SUBJECT MATTER ELIGIBILITY GUIDANCE AFFECT PATENTING OF LIFE SCIENCES INVENTIONS?

The USPTO issued Section 101 guidance in January 2019 addressing how to assess whether a claim is "directed to" an abstract idea, law of nature, or natural phenomenon. It instructs examiners to "evaluate whether the claim as a whole integrates the recited judicial exception into a practical application of the exception." If a claim "integrates" any underlying abstract idea or law of nature into a "practical application" of that underlying idea, the claim "will apply, rely on, or use the judicial exception in a manner that imposes a meaningful limit on the judicial exception." The guidance instructs examiners to find that these claims **are not** directed to a judicial exception under step one of the *Mayo/Alice* test.

The USPTO issued new Section 101 guidance on October 17, 2019, which accounts for recent case law and adds four new hypothetical examples. For example, it distinguishes between a patent-ineligible method of treatment claim that instructs someone merely to

"apply" a natural law without specifying what the treatment is and a patent-eligible method of treatment claim that, like the claims in *Vanda* and *Endo*, recites a particular therapy. The guidance identifies three factors for determining whether a claim reciting a method of treatment or prophylaxis is patent-eligible, as in *Vanda*:

- "[T]he particularity or generality of the treatment or prophylaxis".
- "[W]hether the limitation(s) have more than a nominal or insignificant relationship to the [judicial] exception(s)".
- "[W]hether the limitation(s) are merely extra-solution activity or a field of use".

The first factor requires a method of treatment or prophylaxis claim to recite a "particular" administration step, for example limiting the drug and dose administered to a patient. The second factor requires that the drug administered be relevant to the treatment or prophylaxis sought by the claim. The third factor requires that the treatment or prophylaxis step(s) impose a meaningful limitation on the use of the recited natural phenomenon and the USPTO reiterates that a mental process does not satisfy this criterion.

The guidance also elaborates on several aspects of the USPTO's subject matter eligibility analysis:

- Clarifying what it means for a claim to "recite" a judicial exception.
- Explaining how patent examiners should apply the *Mayo/Alice* test to determine whether various invention types are "directed to" a judicial exception.
- Reiterating the requirements for establishing a *prima facie* case of patent ineligibility.

In some instances, following or analogizing to the USPTO's guidance and examples may make it easier for applicants to obtain a patent. Discrepancies between the USPTO guidance and case law remain, however, and patentees may find that relying too heavily on USPTO guidance without sufficiently considering case law may result in a patent that is difficult to assert or defend. Indeed, in *Cleveland Clinic,* the Federal Circuit declined to follow the USPTO's guidance, explaining that the Court is not bound by the guidance and that disregarding the guidance was necessary "for consistent application" of Federal Circuit law. Although *Cleveland Clinic* was a nonprecedential decision, it appears that courts are unlikely to defer to USPTO guidance in the future. Applicants should therefore use the guidance to help draft claims the USPTO is more likely to allow but should expect the courts to perform their own patent eligibility analysis rather than relying on the USPTO guidance.

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