Questions for David Spetzler

1. Can you briefly share the story of your company?

RESPONSE:

Caris Life Sciences was founded by David D. Halbert, a Texas-based businessman with a strong entrepreneurial track record in the energy, financial and healthcare industries. Mr. Halbert was tremendously influenced by his mother's passing due to multiple myeloma, a type of blood cancer with few effective treatment options. Unfortunately, she had been misdiagnosed three times, thereby unnecessarily delaying access to treatment. Mr. Halbert used his personal resources to form Caris, which initially provided anatomic pathology services aimed at improving cancer diagnosis. In 2008, Caris acquired the Molecular Profiling Institute (MPI) based in Phoenix, Arizona, which was in the process of developing a complementary service of comprehensive tumor molecular profiling to inform personalized cancer treatment decisions.

In conventional medical practice, a physician treating a cancer patient typically selects from a defined list of therapy options associated with the patient's observable clinical factors, such as type and stage of cancer. As a result, cancer patients with the same type and stage of cancer are generally given similar treatments, and the efficacy of such treatments is determined through trial and error because patients often respond differently to the same therapy. Moreover, when patients no longer respond to such standard treatments, a physician's choice of treatment is left to anecdotal evidence at best. Dr. Daniel Von Hoff and colleagues at MPI were dissatisfied with this "one-size-fits-all" approach to treating cancer patients. Dr. Von Hoff recognized the limitations of making treatment decisions based primarily on clinical observation and tumor lineage and believed effective treatment options were unidentified and overlooked because of these limitations. Dr. Von Hoff and colleagues invented a novel system of performing molecular profiling of tumors to identify treatment options based on molecular profiling independently of a specific type of cancer. This invention formed the basis for the first commercial precision medicine product in the United States.

For more than a decade, Caris has continued to innovate our molecular profiling technology in order to refine our personalized cancer treatment technologies. To date, Caris has profiled tumors from over 160,000 cancer patients. We have shown that patients experience better outcomes when treating physicians choose treatments identified by our molecular profiling. In addition, we have developed a novel platform to enable new diagnostic testing, including blood-based cancer diagnostics. Still, we believe we are on brink of a new era in our ability to innovate and inform treatment decision for cancer patients. These include, among other things, improvements in the accuracy of precision medicine, earlier and better diagnostic tools, and the development of blood-based diagnostic testing for cancer. We believe that the future is very exciting but will require adequate protection of our intellectual property.

2. Under the current patent eligibility jurisprudence, could your company have ever come to market and thrived?

RESPONSE:

Caris has come to market and is doing well, but we are in an unusual position. Mr. Halbert has used his personal resources to found and support Caris due to his belief that more precise and individualized information will lead to dramatic improvements in the quality of care patients receive. There are not many individuals who can provide such resources to advance healthcare, or, for that matter, any other endeavor.

However, even with that private funding, Caris has experienced difficulties because of the current law. Under the current state of the subject matter jurisprudence, competitors have been emboldened to copy our innovations, disregard our patents, and then challenge the validity of those patents in court based on subject matter eligibility. Our ability to thrive and provide further innovations to cancer treatment is hampered by such copying without just compensation. We also believe it is difficult for a new company formed today to attract venture capital or similar investment vehicles based on the value of intellectual property covering new innovations when there is no guarantee that others will not immediately copy those innovations.

3. If we don't reform the current state of patent eligibility law, what is the impact going to be on companies like yours? In other words, how many new, innovative, and dynamic companies won't come to market?

RESPONSE:

It cannot be overstated that biology is complex. Innovation in the healthcare sector is an expensive, time consuming and risky endeavor. We have a commercial molecular profiling product that is used by treating physicians to inform the care of thousands of cancer patients a month. This product is able, in part, to support our on-going innovations. Thus, the inventive activities of an established company may be curtailed but not completely eliminated.

However, imagine a not uncommon scenario wherein an academic researcher develops a new and innovative diagnostic assay, for example, a blood-based assay for cancer detection. Under the current state of patent eligibility law, it may be very difficult to obtain meaningful patent protection on the assay. For example, consider the researcher obtains a patent claim to protect the assay by using a new antibody that is not "well-known," "routine," or "conventional" and is therefore considered eligible. Once the researcher publishes the assay, others could use the publication as a road-map to develop competing assays that use different antibodies. Without patent protection for the assay, we believe it would be very difficult to court venture capital and thus the company would likely not come to market.

New, innovative, and dynamic companies help drive innovation in the life sciences. Lack of incentive to bring such companies to market under the current state of patent eligibility law ultimately delays improvements in health care to the detriment of patients. It is difficult to estimate the number of companies affected because the law hinders an entire segment of the market.

4. How do you think the current jurisprudence has impacted and hindered the diagnostic and life-sciences industry as a whole?

RESPONSE:

As noted, innovation in the healthcare sector is an expensive, time consuming and risky endeavor. Developments in the precision medicine space may require expensive laboratory equipment, teams of scientists and physicians, access to human cancer samples, and follow up data including years of patient treatment regimens and outcomes. Weak patents do not facilitate such activities. Under the current jurisprudence, there is less incentive for investment where one knows that others are emboldened to copy without compensation.

Even more importantly, the patent system is built on the concept of sharing information in exchange for a time-limited ability to exclude others from copying it. But under the current regime, the industry is incentivized to keep secrets. Industrial researchers, as well as their governmental and academic counterparts, cannot build on the work of others that they do not know about.

5. What is the public policy value in encouraging investment, research, development and innovation in life sciences and precision medicine? In other words, can you explain to this committee in layman's terms why precision medicine is the future?

RESPONSE:

In the arena of late stage cancer, upwards of 70% of patients do not receive clinical benefit from the anti-cancer drugs they are prescribed. For these individuals, ineffective treatments lead to unnecessary side effects, potential delay in effective treatment, and reduced survival. In addition, ineffective treatments create economic burdens that affect all of society. Precision medicine is the pursuit of identification of treatment options that will benefit these patients and decrease unnecessary expenditure. Precision medicine is about getting the right drug for the right patient at the right time.

We believe that one day cancer patients will receive only personalized medical treatments based on molecular profiling regardless of the stage and type of their cancer. It is widely believed that precision medicine will improve outcomes and reduce healthcare costs across the board.

6. Some have claimed we want to allow the patenting of human genes as they exist in the body. That's false. However, I do think there's value in promoting researchers and innovators to isolate human genes and apply that isolation to personalized treatment. Can you explain why that's valuable? In other words, what advancements in treatment occur because of such innovation?

RESPONSE:

As noted above, precision medicine is about getting the right drug for the right patient at the right time. Precision medicine queries the state of genes and products of those genes in individual patients to identify treatments that are of likely or unlikely benefit to those individuals, so the advancement of precision medicine is dependent in part on those new genetic discoveries. Consequently, identifying such applications of human genes to personalized treatment are exactly the sort of thing we should be incentivizing to strengthen the ability of precision medicine to solve more patients' health problems.

From an economic perspective, strengthening precision medicine has the potential to decrease healthcare costs while delivering better health outcomes to patients. We believe that improving incentives to advance precision medicine, and thereby avoid costs associated with ineffective treatments, is a promising approach to control drug spend. And, at the same time, precision medicine leads to improved outcomes and reduced side effects at the level of individual patients.

7. Looking forward ten to fifteen years, if we don't correct the current state of patent eligibility what is the negative impact that American patients will experience?

RESPONSE:

Simply stated, the risk of failing to correct the current state of patent eligibility will be that cancer patients that could be helped will not be helped. By failing to provide incentives for innovation in the healthcare industry, the current state of patent eligibility is slowing down progress towards improved treatment and cure for cancer.

Questions for the Record for David Spetzler
From Senator Mazie K. Hirono

1. Last year, Judge Alan Lourie and Judge Pauline Newman of the Federal Circuit issued a concurring opinion to the court's denial of *en banc* rehearing in *Berkheimer v. HP Inc.*, in which they stated that "the law needs clarification by higher authority, perhaps by Congress, to work its way out of what so many in the innovation field consider are § 101 problems."

   Do you agree with Judges Lourie and Newman? Does § 101 require a Congressional fix or should we let the courts continue to work things out?

Response

We agree with Judges Lourie and Newman. The Supreme Court has created an untenable test for subject matter eligibility that conflates issues that are better resolved under other requirements of the patent laws. For example, whether something is "well-known," "routine" or "conventional" are inquiries that lie at the heart of novelty and obviousness. However, the Supreme Court's *Mayo*/*Alice* also considers such items, which requires that patentable subject matter changes over time. We believe that the novelty and obviousness requirements of patentability are more suited to consider temporal elements, such as what is well-known, routine or conventional, as they have for over 200 years.

In addition, the *Mayo*/*Alice* inquiry does not reflect the policy behind the judicial exceptions. The Supreme Court grounded the judicial exclusions to subject matter eligibility on concerns over preemption. *See, e.g., Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014) ("We have described the concern that drives this exclusionary principal as one of pre-emption"). Accordingly, the *Mayo*/*Alice* inquiry is an attempt to guard against patents that may "'inhibit further discovery by improperly tying up the future use of' the[] building blocks of human ingenuity." *Id.* (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 85 (2012)). The Federal Circuit has stated that "[f]or this reason [*i.e.*, improper tying], questions on preemption are inherent in and resolved by the § 101 analysis." *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371 (Fed. Cir. 2015). However, it is not clear that the *Mayo*/*Alice* test takes preemption into account. Tellingly, there is no explicit concept of preemption in the *Mayo*/*Alice* inquiry, and evidence of lack of preemption is disregarded by Federal Circuit. Thus, the Courts have not crafted a test that necessarily addresses the underlying concerns.

Finally, the Federal Circuit's hands are tied by the Supreme Court. For example, in *Ariosa* the Federal Circuit applied the *Mayo* test to invalidate a patent directed to a revolutionary method of analyzing fetal DNA without the use of invasive procedures that present undue risk to the fetus. *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371 (Fed. Cir. 2015). In a separate concurrence, Senior Judge Linn stated that he was "bound by the sweeping language of the test set out in Mayo" and that "[t]his case represents the consequence – perhaps unintended – of that broad language in excluding a meritorious invention from the patent protection it deserves and should have been entitled to retain." *Id.* at 1380. In the Federal Circuit's denial of rehearing *en banc*, several judges concurred in the denial but

wrote separately to express that they felt compelled to do so by the *Mayo* decision. *See Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 809 F.3d 1282 (Fed. Cir. 2015). And Judge Dyk explained that "any further guidance must come from the Supreme Court, not this court." *Id.* at 1287. For its part, the Supreme Court denied the subsequent petition for a writ of certiorari without explanation, as it has continued to do dozens of times since the *Alice* decision. Thus, the court system alone appears unwilling or unable address the current state of the law wherein meritorious innovations are denied patent protection.

We urge Congress to act and adopt the proposal by Senator Tillis and Senator Coons which abrogates the *Mayo*/*Alice* test for subject matter eligibility.

2. The Federal Circuit rejected a "technological arts test" in its *en banc Bilski* opinion. It explained that "the terms 'technological arts' and 'technology' are both ambiguous and ever-changing." The draft legislation includes the requirement that an invention be in a "field of technology."

   a. **Do you consider this a clear, understood term? If so, what does it mean for an invention to be in a "field of technology"?**

   b. **The European Union, China, and many other countries include some sort of "technology" requirement in their patent eligibility statutes. What can we learn from their experiences?**

   c. **Is a claim that describes a method for hedging against the financial risk of price fluctuations—like the one at issue in the *Bilski* case—in a "field of technology"? What if the claim requires performing the method on a computer?**

   d. **What changes to the draft, if any, do you recommend to make the "field of technology" requirement more clear?**

Response

We do not believe that "field of technology" is a clear, understood term. We are concerned that such language will require judicial interpretation and thus create further uncertainty, at least in the foreseeable future. If such language is adopted, we urge Congress to provide examples of items that are within the field of technology, as well as outside the field of technology.

We agree that we may learn from our colleagues in other jurisdictions. The European Patent Convention (EPC) version of the "technology" requirement is set out in Articles 52 and 57 as follows:

> *Article 52:*
>
> *(1) European patents shall be granted for any inventions, in **all fields of technology**, provided that they are new, involve an inventive step and are susceptible of industrial application.*

*(2) The following in particular **shall not be regarded as inventions** within the meaning of paragraph 1:*

(a) discoveries, scientific theories and mathematical methods;

(b) aesthetic creations;

(c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers;

(d) presentations of information.

(3) Paragraph 2 shall exclude the patentability of the subject-matter or activities referred to therein only to the extent to which a European patent application or European patent relates to such subject-matter or activities as such.

Article 57:

An invention shall be considered as susceptible of industrial application if it can be made or used in any kind of industry, including agriculture.

The "all fields of technology" language is similar to language present in the TRIPS agreement. In general, the European Patent Office (EPO) does not object that a claim is not eligible unless the claim falls within one of the exclusions listed in Article 52(2) above. The exclusion for "discoveries" is interpreted narrowly and, for example, a natural substance will not be deemed a mere discovery if it is claimed in a form in which it does not exist in nature, such as in isolated form. Under EPC Article 53, diagnostic methods are only excluded if they are "practised on the human or animal body."

Under EPO practice, one may satisfy the requirements of Article 52 by demonstrating that the claim contains at least one "technical" feature. Thus, if the claim is directed to a computer program, it is possible to meet the requirements of Article 52 by specifying that the program is computer implemented, as a computer is considered to be technical. Although this may seem at odds with the *Alice* holding, the EPO will only consider features that are considered to be technical when deciding whether a claimed method is obvious. As an example, consider a claim to a new business method implemented on a conventional computer. Such a claim would be considered obvious as the new feature (*i.e.*, the business method) is non-technical and cannot be considered for the purposes of obviousness.[1]

In summary, the EPO's requirement for "technology" is relatively easy to meet. However, the EPO will discount features that are not "technical" when assessing obviousness, and this can be where claims involving discoveries or computer programs may fail in Europe: a claim that is considered to be unpatentable subject matter under the *Mayo*/*Alice* test may be considered eligible subject matter under the corresponding provisions on the EPC, but be rejected as obviousness. Thus, obviousness is playing the gating role that we believe it should.

Returning to Senator Tillis and Senator Coons' proposal, as an alternate to striking "fields of technology" from the definition of Section 100(k), or delineating items that are within or outside the "field of technology," we believe that Congress could make clear that the *Mayo*/*Alice* framework is abrogated without disturbing other exceptions to patentable subject

[1] In effort to convince the EPO to consider non-technical features in their obvious analysis, one may argue that technical and non-technical features are closely linked.

matter, *e.g.*, creative works, printed matter, and the like, which are similar to the EPC exclusions.

Financial hedging is not intuitively "technological" in layman's terms, although others may disagree. Performing a non-technological task on a computer may not make such a task fall into the "field of technology." But even if it did, it seems obvious to perform such tasks on a computer and thus patentability may turn on novelty and obviousness within the hedging strategy.

3. Sen. Tillis and Sen. Coons have made clear that genes as they exist in the human body would not be patent eligible under their proposal.

   Are there other things that Congress should make clear are not patent eligible? There are already statutes that prevent patents on tax strategies and human organisms. Are there other categories that should be excluded?

Response

We agree with the concept that products of nature *per se*, such as genes as they exist in the human body, should not be patent eligible. There are certain categories, *e.g.*, creative works, that are not patentable now and we do not advocate change.

4. I have heard complaints that courts do not consistently enforce Section 112 with respect to claims for inventions in the high tech space.

   a. **Are these valid complaints?**

   b. **Do the proposed changes to Section 112 adequately address those complaints and limit the scope of claims to what was actually invented?**

   c. **Are you concerned that the proposed changes will make it too easy for competitors to design around patent claims that use functional language?**

Response

As we operate in the life sciences, we are not in the best position to consider the treatment of Section 112 with respect to claims for inventions in the high tech space. Our colleagues that operate in the high tech space do not necessarily advocate changes to 112, but would welcome clarity around when 112(f) applies.

For our part, we would leave Section 112 unchanged to avoid unintended consequences. We are concerned that any change will lead to judicial interpretation and concomitant uncertainty.

5. There is an intense debate going on right now about what to do about the high cost of prescription drugs. One concern is that pharmaceutical companies are gaming the patent system by extending their patent terms through additional patents on minor changes to their drugs. My understanding is that the doctrine of obviousness-type double patenting is designed to prevent this very thing.

   The Federal Circuit has explained that obviousness-type double patenting "is grounded in the text of the Patent Act" and specifically cited Section 101 for support.

   Would the proposed changes to Section 101 and the additional provision abrogating cases establishing judicial exceptions to Section 101 do away with the doctrine of obviousness-type double patenting? If so, should the doctrine of obvious-type double patenting be codified?

Response

Statutory, or "same invention," double patenting, is grounded in Section 101's language that an inventor "may obtain *a* patent." Non-statutory double patenting is a judicially created doctrine that serves to keep a patentee from unjustly extending patent life by obtaining a later patent which is not patentably distinct from an earlier patent. Obviousness-type double patenting falls into the latter.

Patentable subject matter and double patenting, whether statutory or judicially created, are wholly unrelated concepts based on different policy considerations and different case law. Therefore, we do not believe that the proposed changes to Section 101 would disrupt the doctrine of double patenting.

6. In its *Oil States* decision, the Supreme Court explicitly avoided answering the question of whether a patent is property for purposes of the Due Process Clause or the Takings Clause.

   What are the Due Process and Takings implications of changing Section 101 and applying it retroactively to already-issued patents?

Response

The Takings Clause in the Fifth Amendment states that "private property [shall not] be taken for public use, without just compensation." The *Mayo*/*Alice* test has been used to reject or invalidate numerous patent applications and patents that were or would have been eligible prior to these decisions. In practical effect, the *Mayo*/*Alice* test is what is "taking" intellectual property rights from inventors without compensation. Abrogating the *Mayo*/*Alice* test would restore eligibility to many already-issued patents.

We do believe that retroactive application to restore issued patents that have been invalidated under the *Mayo*/*Alice* test would be a highly problematic task. Unfortunately, such decisions are likely best left undisturbed.