# Now May Not be the Best Time to Enforce Your Diagnostic Method Patent

by Charles Meeker

*Athena Diagnostics, Inc. v. Mayo Collaborative Services*, LLC (Fed. Cir. 2019).

In the wake of the Federal Circuit's decision to affirm the District Court's (D. Mass.) holding of claims 6-9 of U.S. Patent No. 7,267,820 invalid under 35 U.S.C. § 101, owners of diagnostic method patents may be feeling a bit like software patent owners following *Alice*. Indeed, while some prognostic patent practitioners and academics seemed to read the tea leaves of *Mayo v. Prometheus*, 566 U.S. 66 (2012) and brace for the crushing blow of the other shoe dropping in *Alice Corp. v. CLS Bank Int'l* (2014), others were blind-sided by the case that set a new standard for the patent ineligibility of certain computer-implemented method claims. Similarly, whether through intuition or tarot cards, some have predicted a pendulum sway for diagnostic method claims, while others were taken completely by surprise on February 6, 2019 when the Federal Circuit noted that Supreme Court precedent left "no room for a different outcome" with regards to Athena's diagnostic method claims.

The claims at issue recited methods for diagnosing a neurological disorder. At the heart of the invention was the discovery that 20% of patients with *Myasthenia gravis* (MB) – a chronic autoimmune neuromuscular disease – generated antibodies to MuSK instead of the usual antibodies to acetylcholine receptor produced by most MB patients. By detecting the presence of these MuSK antibodies, a patient can be diagnosed with *Myasthenia gravis*. Rather than a new way of detecting the presence of these MuSK antibodies, the claims recited conventional detection methods. In fact, independent claim 1, though not at issue on appeal, simply recited "the step of detecting" the MuSk antibodies as a diagnostic method:

1. A method for diagnosing neurotransmission or developmental disorders related to muscle specific tyrosine kinase (MuSK) in a mammal comprising the step of detecting in a bodily fluid of said mammal autoantibodies to an epitope of muscle specific tyrosine kinase (MuSK).

Dependent claim 2 recited what is arguably the most well-known / conventional way of detecting an antibody in a bodily fluid – using the antibody's natural binding target (i.e., the MuSK protein itself) to complex the antibody and then detecting the complex:

2. A method according to claim 1 wherein said method comprises the steps of:

a) contacting said bodily fluid with muscle specific tyrosine kinase (MuSK) or an antigenic determinant thereof; and
b) detecting any antibody-antigen complexes formed between said receptor tyrosine kinase or an antigenic fragment thereof and antibodies present in said bodily fluid, wherein the presence of said complexes is indicative of said mammal suffering from said neurotransmission or developmental disorders.

Further dependent claims 3 specifies a particular, albeit conventional means of detecting the complex – using a "labeled" antibody that binds other antibodies and produces a detectable signal that can be qualitatively- and even quantitatively-measured.

3. A method according to claim 2 wherein said antibody-antigen complex is detected using an anti-IgG antibody tagged or labeled with a reporter molecule.

Finally, dependent claim 6 recites the quantitative capability of the assay design:

6. A method according to claim 3 whereby the intensity of the signal from the anti-human IgG antibody is indicative of the relative amount of the anti-MuSK autoantibody in the bodily fluid when compared to a positive and negative control reading.

Dependent claim 7 recites an alternative, but convention detection mechanism – using a "labeled" MuSK protein (instead of a labeled antibody) for direct detection of the complex:

7. A method according to claim 1, comprising contacting MuSK or an epitope or antigenic determinant thereof having a suitable label thereon, with said bodily fluid, immunoprecipitating any antibody/MuSK complex or antibody/MuSK epitope or antigenic determinant complex from said bodily fluid and monitoring for said label on any of said antibody/MuSK complex or antibody/MuSK epitope or antigen determinant complex, wherein the presence of said label is indicative of said mammal is suffering

> from said neurotransmission or developmental disorder related to muscle specific tyrosine kinase (MuSK).

Commonly, these protein labels are detectably radioactive, as recited in further dependent claim 8:

> 8. A method according to claim 7 wherein said label is a radioactive label.

Finally, dependent claim 9 recited the well-known radioactive label, Iodine-125:

> 9. A method according to claim 8 wherein said label is 125I.

Essentially, these claims recite conventional, well-established, and widely-adopted methods for observing the natural interaction between MuSk antibodies and its natural target – the MuSK protein. Even assuming, *arguendo*, that the inventors on the '820 patent were the first ever to realize that MuSK antibody is produced by some MB patients and the first ever to use the presence of MuSK antibody in bodily fluid as a diagnostic determinant for MB, the invention as claimed is nothing more than using routine procedures to observe a natural event and inferring the natural cause of that event. The Federal Circuit panel majority determined that "the claims are directed to a natural law," which "is the correlation between the presence of naturally-occurring MuSK autoantibodies in bodily fluid and MuSK related neurological diseases like MG." The court went on to clarify that the "use of a man-made molecule in a method claim employing standard techniques to detect or observe a natural law may still leave the claim directed to a natural law." Those familiar with the caselaw see the application of step one of the *Mayo*/*Alice* test in the above analysis.

Turning to step two of the *Mayo/Alice* test, the panel majority determined that "the steps of the claims not drawn to ineligible subject matter, whether viewed individually or as an ordered combination, only require standard techniques to be applied in a standard way." The panel majority also countered Athena's argument that the steps were unconventional because they were the first to discover the correlation between MuSK autoantibodies and MG

and then apply this correlation diagnostically, by concluding that "we cannot hold that performing standard techniques in a standard way to observe a newly discovered natural law provides an inventive concept." This position was supported by the specification of the '820, which, the majority said, "defines the individual immunoprecipitation and iodination steps and the overall radioimmunoassay as conventional techniques."

Many questions remain about the underlying eligibility of diagnostic methods that relate to a newly discovered natural phenomenon. The "coulda, woulda, shoulda" of 20/20 hindsight is haunting some and exciting others. Regardless, there are now additional considerations when drafting diagnostic patent applications and claims. And, like *Alice*, we may find ourselves falling further down the rabbit hole if we do not learn from the past and meet our destiny of repeating it. But, like *Alice*, one swing of the pendulum is often followed by another. Where *Enfish* pushed back on the ineligibility of software claims, a future Federal Circuit or Supreme Court case may be in our future to bring the tide back in.

In the meantime, if your claims are directed to a natural law or natural phenomenon, such as the correlation between the presence of naturally-occurring markers and a related disease, even if you use of man-made molecules in a method claim employing standard techniques to detect or observe the natural law, now may not be the best time to enforce your diagnostic method patent.