Sequenom Back Again: This time Patent Eligible

Illumina, Inc. and Sequenom, Inc. v. Ariosa Diagnostics, Inc. (Fed. Cir. 2020)

These parties were before the Court back in 2015 in a case that ended with a big holding that Illumina & Sequenom's patents were invalid as directed to an unpatentable natural phenomenon. The discovery here is super interesting — a pregnant mother has the baby's DNA floating around in her plasma. Turns out that there is lots of DNA floating around in a human body: mother DNA; baby DNA; bacterial DNA; viruses; mitochondrial; etc. The researchers here used a smart way to find the baby-DNA in the mess that relies on the fact (i.e., natural phenom) that baby-DNA is part mother and part father. The researchers got a sample of paternal DNA (from the father) and then looked for DNA in the mother's plasma that included segments that matched the father's DNA. Prior to this breakthrough some parents agonized over whether to collect some baby DNA by sticking a big needle into the amniotic sac. That approach had the problem of causing death in a small number of cases. In any event, the 2015 Federal Circuit held the patent claims ineligible and the Supreme Court denied certiorari.

The present case involves two additional patents that use the same natural phenomena to solve the same problems. An important added element here is that the inventors also found that baby-DNA fragments in the plasma tend to be shorter than the mother-DNA in the plasma. Both patents here take advantage of this phenomenon to claim methods of preparing DNA for testing. The patent document explains this finding as follows:

> *[S]urprisingly, the majority of the circulatory extracellular fetal DNA has a relatively small size of approximately 500 base pairs or less, whereas the majority of circulatory extracellular maternal DNA in maternal plasma has a size greater than approximately 500 base pairs. . . . This surprising finding forms the basis of the present invention according to which separation of circulatory extracellular DNA fragments which are smaller than approximately 500 base pairs provides a possibility to enrich for fetal DNA sequences from the vast bulk of circulato ry extracellular maternal DNA.*

'751 Specification.

The district court ruled the asserted claims ineligible. On appeal here, however, the Federal Circuit has reversed — *holding that these claims are directed at a technical solution that crosses the threshold into a patent eligible invention.*

> *We conclude that the claims are not directed to that natural phenomenon but rather to a patent-eligible method that utilizes it.*

This is a split decision with Judge Lourie explaining why the claims are patent eligible and Judge Reyna dissenting. Judge Moore signed-on with the Louri opinion making the result 2-1.

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The patents here both relate to preparing sample to be tested. U.S. Patent 9,580,751 claims a method of "preparing a DNA fraction from a pregnant human female." Claim 1 includes three steps:

> *(a) extracting DNA from pregnant mother's blood plasma [this should include both fetal and maternal DNA fragments];*
>
> *(b) using "size discrimination" to remove DNA fragments greater than ~500 bp; [This results in what the claims call a "fraction of the DNA".]*
>
> *(c) analyzing a genetic locus in the fraction of DNA produced in (b). [Although not stated, this analysis could discern whether the DNA is fetal and the presence of genotypic abnormalities.]*

U.S. Patent 9,580,751 Claim 1. The '931 patent is almost identical — it removes DNA fragments < 300 bp instead of 500 bp.

Note here that prior to the invention researchers already knew how to do all of these steps individually. However, there was no reason to separate-out the <500 bp fragments prior to the discovery of the phenomenon that most of those would be fetal DNA. This is what lead Judge Reyna to reject the claims as ineligible:

> *The patents' only claimed advance is the discovery of that natural phenomenon. The claims, the written description, and the legal precedent applicable to this case all support the conclusion that the patents are ineligible. . . .*
>
> *The inventors discovered a natural phenomenon: that cff-DNA tends to be shorter than cell-free maternal DNA in a mother's blood. . . . Other than the surprising discovery, nothing else in the specification or the record before us indicates there was anything new or useful about the claimed invention.*

Bottom line, researchers discovered that most of the fetal DNA in the plasma is <500 bp and the resulting invention directly applies that and broadly claims fractioning-out DNA from the plasma that is <500 bp.

The majority agreed that "the inventors were not entitled to patent the natural phenomenon that cell-free fetal DNA tends to be shorter than cell-free maternal DNA." Here, however, the majority concludes that the claimed method merely takes advantage of that phenomenon "by employing
physical process steps to selectively remove larger fragments of cell-free DNA and thus enrich a mixture in cellfree fetal DNA."

In prior cases the Federal Circuit has distinguished between unpatentable diagnostic methods and patent eligible methods of treatments. In this case, the court places the inventions at issue in a third category: method of preparation.

> *This is not a diagnostic case. And it is not a method of treatment case. It is a method of preparation case.*

This line allows the court to distinguish the case from the prior Ariosa decisions and find the claims patent eligible.