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District Court Rules DNA Analysis Claims Reciting Mathematical Algorithms Ineligible Under § 101

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By: Thomas W. Landers IV, Matthew George Hartman, Rachel J. Elsby

The Cybergenetics patents at issue—U.S. Patent Nos. 8,898,021 and 9,708,642—describe a variation of a traditional method of identifying an individual based on a DNA sample. The traditional method uses "PCR (polymerase chain reaction) amplification" to transform the DNA sample into data that are unique to an individual and thus can be used to identify that individual. The method is not useful, however, when the sample contains DNA from multiple sources because the transformed data are "mixed" and do not correspond to one individual.

The patents address that problem by employing what they call "deconvolution"—a process that accounts for multiple individuals in a DNA sample by "calculating the variance of the DNA data produced by PCR amplification and accounting for that variance in subsequent probability calculations." The probability calculations "predict the identity of an individual in the sample and calculate the likelihood that the prediction is correct." In other words, the patented methods determine the likelihood that a given individual's DNA is contained in a sample instead of merely identifying one individual.

Cybergenetics asserted several claims of these patents against the Institute of Environmental Science and Research, and NicheVision Inc., based on their alleged use of "deconvolution" technology. The court granted the defendants' motion to dismiss after determining that the asserted claims fail both steps of the *Alice* framework.

Under step one, the court explained that the Cybergenetics claims "recite mathematical algorithms to produce a numerical output as the **entirety** of the method." In particular, the claimed "deconvolution" process "describes the process of calculating a variance (a numerical

result) and then accounting for that variance in subsequent statistical calculations (also numerical results)." The court further explained that the U.S. Supreme Court and Federal Circuit have repeatedly held that mathematical algorithms are examples of abstract ideas. It then found that the use of algorithms is "[t]he only difference between" conventional methods and the claimed methods, further showing that the claims are "directed to" such abstract ideas.

The court rejected Cybergenetics' argument that the asserted claims were akin to those analyzed in the Federal Circuit's *Thales*, *McRO* and *CardioNet* cases in which claims survived *Alice* challenges despite reciting mathematical algorithms. The court explained that the mathematical algorithms in those cases "were used as **part of a non-mathematical process**" (emphasis added). For example, in *Thales,* a mathematical algorithm and its result were used "to track the position and orientation of [an] object." In *McRO*, an algorithm was used to "generate a tangible product, namely a video of a 3-D character speaking [] recorded audio." And in *CardioNet*, the claims improved the operation of a cardiac monitoring machine, albeit through the use of an algorithm. Unlike in those cases, "the numerical result" in the Cybergenetics claims **is** the claimed "improvement," and the numerical result is not used for any "non-mathematical process."

Under step two, the court explained that the Cybergenetics claims fail to recite an "inventive concept" because they do not recite any "elements other than the computation of mathematical algorithms and reporting the numerical results." Specifically, some claims merely recite mathematical algorithms, some recite a generic computer that calculates the mathematical algorithms (or merely display the results of such calculations) and some recite the conventional step of using "PCR amplification" to transform a DNA sample into data. According to the court, all three categories of claims "capture patent-ineligible ideas."

The court rejected the argument that the "inventive concept" is a specific application of a mathematical technique to "computer-based DNA analysis" or to "probabilistic genotyping." As the court explained, "[c]ourts have consistently rejected finding a claim provides an inventive concept simply because it is limited 'to one field of use.'"

Practice Tip: After six years, courts continue to use *Alice* to dismiss patent claims directed to so-called "abstract ideas." The *Cybergenetics* case demonstrates the fine line between claims that are **directed to** a mathematical algorithm—one of the few things the higher courts have specifically identified as an "abstract idea"—and claims that merely **use** them. When possible,

patentees should draft claims (and specifications) in a way that emphasizes tangible improvements even when achieving such improvements requires using a mathematical algorithm. By the same token, defendants should consider attacking any patent claims that rely on a mathematical algorithm, and they should try to characterize that algorithm as the focus of the patent and the claims. The *Cybergenetics* case will certainly be one worth monitoring on appeal (if there is one) to see if the Federal Circuit agrees with the district court's analysis.

Cybergenetics Corp. v. Institute of Environmental Science and Research, 5:19-cv-1197 (N.D. Ohio Sep. 29, 2020) (Lioi, J.)