Myriad diversifies, fights rearguard action on patents

In February, Salt Lake City, Utah–based Myriad settled a lawsuit brought against diagnostic firm Gene-by-Gene last July, shortly after the US Supreme Court ruled in the case of *Association for Molecular Pathology et al. v. Myriad Genetics, Inc. et al*. The suit alleged Gene by Gene of Houston infringed nine of Myriad's patents covering breast cancer 1 early onset gene (*BRCA1*) and *BRCA2*.

It is one of a flurry of patent infringement suits filed by Myriad against it competitors, including Aliso Viejo, California–based Ambry Genetics; Madison, New Jersey–based Quest Diagnostics; Gaithersburg, Maryland–based Gene Dx; San Francisco–based InVitae; and Burlington, North Carolina–headquartered LabCorp. Several of these companies have filed counter suits.

Experts expect the proceedings to be long and drawn out. "This is going to go on and on," says Kevin Noonan, partner at the Chicago intellectual property law firm McDonnell Boehnen Hulbert & Berghoff.

In June of last year, the Supreme Court ruled that unmodified DNA sequences are a product of nature and therefore ineligible for patenting. But as Myriad executive vice president and general counsel Richard Marsh points out, "They did not say that smaller segments of the gene were patent ineligible, and in particular synthetic DNA, so we're defending our patents on probes, primers and methods. And we expect those to be upheld."

That issue could soon be moot, however, as the technology for detecting mutations evolves. Quest, Noonan notes, charges it is not infringing on Myriad's remaining patents because it employs different methods. Furthermore, Myriad's use and methods claims are fast approaching their expiration dates.

Myriad's competitors say the company's business model is also hitting a wall. Marsh asserts Myriad is defending the type of patents necessary to incentivize innovators. But others say the landscape has changed and so must the patent system. "We are entering a world where you can assay 200 genes for the same price that you used to be able to assay one," says Randy Scott, co-founder and CEO of InVitae. "The whole industry needs to think about completely new business models."

Future gene-based patents, experts say, will mainly involve algorithms. And what makes sense for diagnostic labs is, "A service model where labs compete on the quality of their reporting, customer service, billing and marketing," says GeneDx managing director Sherri Bale, who declined to speak specifically about the lawsuit.

Bale and Scott also believe the public effort (*Nat. Biotechnol.* **31**, 663–665, 2013) to map breast and other cancer variants will soon catch up with Myriad's *BRCA* mutation database, which currently gives the company an edge.

A truly competitive public database would put the company's model further into doubt, but it is unclear exactly when the public effort will catch up. And Myriad's Marsh says public efforts are rarely as efficient and customer centric as private efforts.

Meanwhile, the payback for *BRCA* testing has also shrunk, with the Centers for Medicare & Medicaid Services recently reducing the reimbursement for such tests substantially. Although Myriad is still investing in detecting cancer mutations, the company is also diversifying. It just announced the $270-million acquisition of S. San Francisco, California–based Crescendo Bioscience, which specializes in inflammatory and autoimmune testing. The company's lead product, Vectra DA, is a blood test for 12 protein biomarkers to assess rheumatoid arthritis disease activity.

And how will all the litigation pan out? "Prediction at this point is just guesswork," says John Conley, professor of law of the University of North Carolina School of Law and counsel at law firm Robinson, Bradshaw & Hinson in Charlotte, North Carolina. But he adds that Myriad has less at stake than its rivals, "For Myriad, it is just a matter of keeping their legal monopoly for at least a few years. The smaller companies in this fight will be struggling to survive."

Malorye Allison *Acton, Massachusetts*

Corrected after print 23 May 2014.

IN brief

Microbes unite Novozymes and Monsanto

Novozymes of Copenhagen and Monsanto of St. Louis last December announced a joint global venture, which they are calling the BioAg Alliance, whose purpose is to discover, develop and market microbial enzymes with which farmers can increase yields while reducing inputs, according to the two companies. The joint venture aims to "unleash the transformational opportunity in naturally derived microbial solutions in agriculture," says Novozymes CEO Peder Holk Nielsen. His company reported revenues of about $120 million in the microbiologically-based agricultural biologicals market for 2012. Coincidentally, late last year, the American Academy of Microbiology (AAM) in Washington, DC, released its report, *How Microbes Can Help Feed the World*. It outlines a similar vision for agriculture, one in which microorganisms are seen as leading to "an entirely new approach to enhancing [crop] productivity," according to the AAM report. "Most of this potential, I believe, has yet to be discovered," says Ian Sanders of the University of Lausanne, Switzerland, who chaired the AAM colloquium responsible for that report. In the face of many such products that fail to meet expectations, he says, the BioAg Alliance could advance development with their expertise in field testing and product evaluation. The time frame for development is another big question, he adds. "While Monsanto and Novozymes might have an alliance to develop and sell what they have now, are they going to be doing basic research to find out what's out there that could be used in the future?" he asks. Applying microbial enzymes in agriculture is at such an early stage that much basic research is needed to find out what could be useful. "With respect to the alliance, I don't know how much of the basic biology research will be done by such large companies. But we probably will never know what's out there, if it's kept in the private sector." *Jeffrey L Fox*

IN their words

"Whether we need to know every cancer gene, I'd like to see an argument for how that's going to help the advancement of new therapy." Bruce Stillman of Cold Spring Harbor Laboratory, New York, offers a different perspective on the Cancer Genome Atlas extension. (*The New York Times* 6 February 2014)

"We want anyone, anywhere, at any age, to download this game and play it." Hannah Keartland, leader of a project at Cancer Research UK called "Play to Cure: Genes in Space," in which players analyze genetic data from tumor samples on a smartphone game. (*Reuters* 4 February 2014)

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Erratum: Myriad diversifies, fights rearguard action on patents

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In the version of this article initially published, Crescendo Bioscience's diagnostic test Vectra DA was incorrectly described as testing for 25 biomarkers associated with rheumatoid arthritis. The correct number is 12. The error has been corrected in the HTML and PDF versions of the article.

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