

BIOTECHNOLOGY

The written description requirement

Federal Circuit may be recognizing that biotechnology is not amenable to the same rules as chemistry.

By Robert M. Schulman, Laurence H. Posorske and David A. Kelly

SPECIAL TO THE NATIONAL LAW JOURNAL

WRITING RECENTLY in the *New York Times*, Thomas L. Friedman recounted his discussions with a couple from Bangalore, India, about one of the greatest of all American fears—the outsourcing of high-skilled technology jobs to India. Friedman, however, found the fear groundless. In his view, “America need not fear outsourcing to India” for the simple reason that “America is so much more innovative a place than any other country,” especially regarding “innovations that spark entirely new markets.”

Yet, at the very time when our economic health depends more and more on pioneering innovation and less on incremental improvements, many in both industry and academia have grown increasingly concerned that the patent system is failing to keep pace with changes in technology, particularly in biotechnology. The concern is that the U.S. Court of Appeals for the Federal Circuit is reading the statute so as to reward only incremental advancements at the expense of more basic groundbreaking technology.

Robert M. Schulman and Laurence H. Posorske are partners in the Washington office of Hunton & Williams. David A. Kelly is an associate at the firm.



Robert M. Schulman

Laurence H. Posorske

David A. Kelly

This issue is particularly acute in the area of written description. 35 U.S.C. 112, ¶ 1 of the patent statute states: “The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art...to make and use the same.”

Since 1991, the Federal Circuit has applied the law as developed for written description of chemical inventions to the area of molecular biology. That body of law generally limits an applicant to compounds that have either been actually made, or, at the very least, fully described so as to distinguish them from other compounds.

There is a fundamental difference between chemical molecules and biological molecules. The properties of chemical molecules are highly dependent on the three-dimensional arrangement and elec-

trical properties of the atoms such that replacing even a single atom can completely change the molecule’s arrangement and properties. Biological macromolecules, while large and complex, nonetheless generally fall into one of several classes of well-characterized polymers (i.e., proteins, nucleic acids, polysaccharides) having familiar three-dimensional structural motifs (e.g., alpha-helix for protein, double-helix for nucleic acid, etc.). Consequently, many chemical properties of biological macromolecules are not highly variable.

Another fundamental difference relates to the fact that biological molecules, by definition, are made by a living organism. Therefore, by biological design, they will be reactive with other biological molecules and find corresponding molecules in other species. Accordingly, whereas possession of a synthetic chemical molecule having a given property does not generally provide one

with the means to obtain predictably a whole host of other molecules of similar function, possession of a biological molecule often provides the key to finding a whole host of other biologically relevant molecules in a predictable fashion. This makes biology more akin to information technology.

For example, the properties of software inventions depend on binary logic to define relationships between information (e.g., same/different; more/less; on/off). An algorithm for manipulating information via binary logic has the mechanical certainty of

Federal Circuit looked to chemistry in its 1991 ‘Amgen’ ruling.

mathematics. Because the basic chemical properties of biological macromolecules fall within a fairly narrow range—with all variation appearing as subtle fluctuations within that range—biological manipulation of macromolecules is typically much more predictable than the chemical manipulation of small molecules. Accordingly, biological manipulation of different macromolecules made up of strings of different residues may be as predictable as manipulation of data collections by software algorithms in a software invention.

Starting in 1991, the Federal Circuit had to address a fundamental question: How does one provide a sufficient written description of a biological molecule, such as a novel protein, DNA or antibody? With no precedent on point, the court in *Amgen v. Chugai Pharm.*, 927 F.2d 1200 (Fed. Cir. 1991), looked to cases addressing the closest thing it could find to biotechnology—those involving chemical inventions—and made the fateful decision to apply principles of chemical inventions to biological inventions. Noting that a “gene is a chemical compound, albeit a complex one,” the court established a rather short menu based on principles in

chemistry for showing conception of a gene, namely by providing “the detailed constitution of the gene so as to distinguish it from other materials” or by actually reducing the gene to practice, i.e., physically isolating it. *Id.* at 1206.

Few would argue that merely naming a DNA encoding a desired protein, without more, would entitle one to a patent for that DNA. On the other hand, few would argue that one who has actually obtained and characterized a DNA should be denied a patent for that DNA. One question that remained, however, was whether the court would recognize that, unlike the case in chemistry, biological molecules such as DNA are often so closely interrelated that obtaining one such molecule enables one of skill in the art to obtain many other biological molecules of interest.

The Federal Circuit addressed this question in *University of California v. Eli Lilly*, 119 F.3d 1559 (Fed. Cir. 1997). In *Lilly*, the university physically isolated and provided in its patent the sequence for the cDNA encoding rat insulin but provided only a constructive example for obtaining the human insulin cDNA, using the rat insulin cDNA as a probe. The Federal Circuit noted that the university had provided no distinguishing description of human insulin cDNA, only its name and a proposed method to isolate it. Acknowledging that the rat cDNA would have allowed the university to obtain the corresponding human cDNA, the court nevertheless held that an adequate description “requires a kind of specificity usually achieved by means of recitation of the sequence of nucleotides that make up the cDNA.” *Id.* at 1569.

The *Lilly* case represented a major paradigm shift in the law, as it was the first Federal Circuit case to reject, under the written-description requirement, a claim to a DNA that had been both named and enabled by the originally filed application. Thus, it is not enough to say you have it and to enable a person skilled in the art to have it—you must further provide a dis-

tinguishing description of it, such as a “precise definition” of its structure.

Again relying on precedent largely derived from chemical practice, the Federal Circuit took *Lilly* one step further in *Enzo Biochem v. Gen-Probe (Enzo I)*, 285 F.3d 1013 (Fed. Cir. 2002), holding initially that a distinguishing description of a DNA molecule based on its physical and chemical properties (ability to hybridize to another known molecule based on known complementary relationships) was no better than the university’s reliance in *Lilly* on the function of the gene (encoding insulin): “[A] description of genetic material by what it does—such as hybridizing to *N. gonorrhoeae*—is insufficient to satisfy §112, ¶ 1, regardless of whether the described property is chemical or functional.” *Id.* at 1018. Thus, the court appeared to be saying that only a structural description would suffice under the written-description requirement.

After the filing of a request for reconsideration by Enzo, and the rather extraordinary measure of the filing of an amicus brief by the U.S. Department of Justice, the Federal Circuit in *Enzo Biochem v. Gen-Probe (Enzo II)*, 296 F.3d 1316 (Fed. Cir. 2002), recanted its earlier holding and held that an applicant may rely on chemical properties such as hybridization to pro-

Chemistry approach was used in ‘Lilly’ and ‘Enzo I’ rulings.

vide a distinguishing description of the invention. In so doing, the Federal Circuit acknowledged, for the first time, that there are well-established relationships among biological molecules that permit the describing of one to describe others: “Because the claimed nucleotide sequences preferentially bind to the genomic DNA of the deposited strains of *N. gonorrhoeae* and have a complementa-

ry structural relationship to that DNA, those sequences, under the PTO Guidelines, may also be adequately described." *Id.* at 1328.

After the *Enzo I* and *II* decisions, it became clearer that treatment of biological inventions using chemical principles under the guise of the written-description requirement was causing concern among those in the industry that biotechnology was being subjected to a higher standard of review than other areas of technology. The most dramatic manifestation of this was in *Moba B.V. v. Diamond Automation Inc.*, 325 F.3d 1306 (Fed. Cir. 2003), where Judge Randall Rader in his concurring opinion raised two important points. First, Rader criticized the court's application of the written-description requirement to biotech inventions as having no basis in the statute. His position was that the written-description requirement was subsumed within the enablement requirement, whereby any disclosure that enables one to make and use the invention necessarily implicates possession of the invention for written-description purposes.

Second, Rader observed that the court's "precise definition" standard for biotechnology inventions is analogous to "requiring disclosure, for a new software invention, of the entire source code, symbol by symbol, including all source code permutations that would not alter the function of the software." *Id.* at 1325. The Federal Circuit, however, has refused to adopt such a stringent standard for software inventions. Thus, according to Rader, despite the technology-neutral language of the Patent Act, the Federal Circuit seems intent on applying a different description requirement for biotechnology than for computer technology. Rader concluded, perhaps prematurely, "Fortunately, the viability of the *Lilly* rule is on the decline." *Id.* at 1326.

Lest anyone conclude from Rader's concurrence in *Moba* that the Federal Circuit was poised to overrule *Lilly*, that notion was put to rest earlier this year in *University of Rochester v. G.D. Searle & Co.*, 358 F.3d

916 (Fed. Cir. 2004), where the Federal Circuit affirmed that there is a written-description requirement separate and apart from the enablement requirement and, as applied to genetic inventions, the written-description requirement requires a distinguishing description as is required with chemical inventions.

However, even while affirming the broad principles of *Lilly*, the Federal Circuit, as it had done in *Enzo II*, acknowledged that molecular biology is different than chemistry and may not require the

In 'Enzo II,' the court noted that molecular biology is different.

same degree of structure in a distinguishing description: "[W]here there might be some basis for finding a written-description requirement to be satisfied in a genetics case based on the complementarity of a nucleic acid and, for example, a protein, that correspondence might be less clear in a non-genetic situation....DNA and RNA are each made up of just four building blocks that interact with each other in a highly predictable manner....Given the sequence of a single strand of DNA or RNA, it may therefore have become a routine matter to envision the precise sequence of a 'complementary' strand that will bind to it. Therefore, disclosure of a DNA sequence might support a claim to the complementary molecules that can hybridize to it. The same is not necessarily true in the chemical arts more generally." *Id.* at 925.

Interestingly, the Federal Circuit seems to have likewise dispensed with the need for a structural description in the area of immunology. In *Noelle v. Lederman*, 355 F.3d 1343 (Fed. Cir. 2004), the court concluded that one could claim an antibody merely by disclosing the antigen used to elicit that antibody, holding that "as

long as an applicant has disclosed a 'fully characterized antigen,' either by its structure, formula, chemical name, or physical properties, or by depositing the protein in a public depository, the applicant can then claim an antibody by its binding affinity to that described antigen." *Id.* at 1349. That's like saying that one who has described a novel lock has likewise adequately described any key that will work in that particular lock.

Enzo II, *Rochester* and *Noelle* demonstrate that while the Federal Circuit is not willing to abandon its broad doctrine of requiring a distinguishing description for biological molecules, the court nonetheless is changing what constitutes a distinguishing description. Certainly, describing an antigen in an application provides no more of a structural description of the antibody elicited by it than providing the sequence of human insulin protein provides a structural description of the cDNA encoding it, as was the case in *Lilly*. To the extent that an antigen is written description of an antibody because the antigen routinely allows one to obtain the antibody, perhaps Rader's view of tying description to enablement is losing the battle but winning the war.

Thus, slowly, the Federal Circuit seems to be recognizing that biotechnology is not amenable to the same rules of description as more traditional chemistry. One can only hope that over the long term, the proper balance is struck between rewarding original innovation on the one hand and not foreclosing promising areas of research on the other. Such a result could validate Thomas Friedman's faith in American innovation in the face of outsourcing.

— ♦ —

This article is reprinted with permission from the May 31, 2004 edition of THE NATIONAL LAW JOURNAL. © 2004 NLP IP Company. All rights reserved. Further duplication without permission is prohibited. For information, contact American Lawyer Media, Reprint Department at 800-888-8300 x6111.#005-06-04-0002



www.hunton.com

ATLANTA AUSTIN BANGKOK BRUSSELS CHARLOTTE DALLAS HONG KONG KNOXVILLE LONDON McLEAN MIAMI NEW YORK NORFOLK RALEIGH RICHMOND SINGAPORE WASHINGTON