

Patents

The PTO Wants to Know . . .

—About Electronic Submission of Structural Data

WASHINGTON, D.C. 6/21/05—Should the U.S. Patent and Trademark Office require all chemical and biological-structure data to be submitted in electronic form and, if so, which format(s) should be required?

Those are the questions posed today by the PTO, which hopes to improve the processing and examination of patent applications and the distribution of structural data to public databases by requiring electronic submission (Acceptance, Processing, Use, and Dissemination of Chemical and Three-Dimensional Biological Structural Data in Electronic Format [70 FR 35573–35577 June 21, 2005]) (for text, see the documents section of this issue). Comments must be received no later than August 22, 2005.

The PTO begins by noting that the amount of structural data being submitted is already large and likely to become even more so and that the demand for these data by public and private repositories is rising. The PTO wants to be ready and is planning to work with patent offices in other countries on new standards for data submission.

The PTO notes that some formats, such as the Crystallographic Information File (CIF) and its variants, SMILES, ChemDraw, and ChemWindow, are already in wide use. Some of these are proprietary, and “no single, publicly available, software . . . has been accepted as the standard for this type of drawings.” There also is the option of a standardized text format such as Chemical Markup Language or the IUPAC-NIST Chemical Identifier. What to do?

The Office poses a series of questions, such as:

- What benefits and disadvantages do you foresee for the applicant if electronic filing is adopted?
- What types of three-dimensional data would be best submitted electronically?
- Should electronic submission of three-dimensional data be mandatory, optional, or manda-

tory for some types (such as files greater than a certain size) and optional for others?

- If electronic submission is mandatory, should all three-dimensional information, including prior art, cited in the application be required to be submitted in electronic format, or only the new data?
- Have most of the three-dimensional data in patent applications already been submitted for publication or to a database? Would the requirements of these recipients create difficulties for prosecution of patent applications?
- If electronic submission is required, should this be mandatory at the time the application is filed, or could it be delayed?
- Should any statement that comes with an electronic file outline the authoring tool and certify the use of a validation tool?
- What databases should be investigated for a PTO export arrangement?
- Should all three-dimensional files be posted on the PTO’s Publication Site for Issued and Published Sequences?
- Would it be a hardship for applicants if the PTO required drawings in a proprietary software format or in a text format that is not yet supported by the major drawing software tools?
- How well known are the CML and INChI formats?

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“cDNA Sequences Are Not Naturally Occurring”

—Board Overturns Examiner’s Finding That Sequences Are Not Adequately Described or Enabled But Rejects Claim for Indefiniteness

WASHINGTON, D.C. 6/14/05—**Administrative Patent Judges William F. Smith, Eric Grimes, and Lora M. Green** of the Board of Patent Appeals and Interferences have handed down an opinion in a closely watched case concerning writ-

ten description and enablement of nucleotide and polypeptide sequences.

The judges overturned the Examiner's rejection under 35 USC §112 ¶1 but rejected one claim under ¶2. A critical element in the decision was that, as noted by Judge Green, "cDNA sequences are not naturally occurring" (*Ex parte Olga Bandman, Neil C. Corley, and Purvi Shah* [Appeal No. 2004-2319]).

The opinion, which is provided in the documents section of this issue, was not written for publication and is not binding precedent.

THE APPLICATION AND THE EXAMINER'S DECISION

Application No. 09/915,694 claims a series of polynucleotide and polypeptide sequences related to malate dehydrogenase, a mitochondrial and cytosolic enzyme active in the synthesis of glucose. All of those in the rejected claims are either depicted in the application or are described as "naturally occurring" and at least 95% identical to the depicted sequences. The are representative of the rejected claims:

3. An isolated polynucleotide encoding a polypeptide selected from the group consisting of:
 - a) a polypeptide comprising the amino acid sequence of SEQ ID NO: 1; and
 - b) a polypeptide comprising a naturally occurring amino acid sequence at least 95% identical to the amino acid sequence of SEQ ID NO: 1.
12. An isolated polynucleotide selected from the group consisting of:
 - a) a polynucleotide comprising the polynucleotide sequence of SEQ ID NO: 2,
 - b) a polynucleotide comprising a naturally occurring polynucleotide sequence at least 95% identical to the polynucleotide sequence of SEQ ID NO: 2,
 - c) a polynucleotide having a sequence complementary to a polynucleotide of a),
 - d) a polynucleotide having a sequence complementary to a polynucleotide of b) and
 - e) an RNA equivalent of a)-d).

The examiner rejected these claims, along with the similar claims 6, 7, and 9 on the grounds that they did not satisfy the written description requirement and were not enabled. The examiner noted that the specification provides only a single species and contained "no disclosure of any particular structure to function/activity relationship in the single disclosed species."

The enablement rejection took a similar tack: the specification "does not teach the specific structural/catalytic amino acids and the structural motifs essential for protein activity/function which cannot be altered." Moreover, "[t]he amount of experimentation needed to make the claimed polynucleotide is enormous and undue." Thusm the claims are not enabled.

THE BOARD'S DECISION ON THE EXAMINER'S REJECTION

"The written description requirement . . . does not require a description of the complete structure of every species within a chemical genus," the Board noted, citing *Utter v. Hiraga* (845 F.2d 993, 998, 6 USPQ2 1709, 1714 [Fed. Cir. 1988]) and *Enzo Biochem, Inc. v. Gen-Probe Inc.* (296 F.3d 1316, 63 USPQ2d 1602 [Fed. Cir. 2002]). In the latter case (which also is discussed elsewhere in this issue), the Court of Appeals for the Federal Circuit said that hybridization to a known nucleotide sequence may be sufficient if hybridization takes place "if under highly stringent conditions . . . because such conditions dictate that all species within the genus will be structurally similar."

In the Bandman application, the complete structure of one polynucleotide is described, and the claims are limited to *naturally occurring* sequences that are at least 95% identical. Although the examiner said the specification "provides no disclosure of any particular structure to function/activity relationship in the single disclosed species," this assertion is not supported by evidence, nor is its importance explained. Moreover, as the applicants said, natural selection will have determined which amino acid sequences will produce a polypeptide with the desired function, so it is not necessary to specify every conceivable sequence that falls within the 95% limit to provide an adequate written description.

The Board also rejected the finding that the claims were not enabled.

“The examiner bears the initial burden of showing nonenablement. . . . [S]ome experimentation, even a considerable amount, is not ‘undue’ if, e.g., it is merely routine, or if the specification provides a reasonable amount of guidance as to the direction in which the experimentation should proceed.” That was the decision in *In re Wands* (858 F.2d 731, 737, 8 USPQ2d 1400, 1404 [Fed. Cir. 1988]).

APPLICANTS STILL DO NOT GET WHAT THEY WANT

If Bandman *et alia* were hopeful of receiving the patent after the Board overruled the examiner, they were doomed to be disappointed. The Board found Claim 12 indefinite under 35 USC §112 ¶2.

The word “polynucleotide” could refer to either DNA or RNA, the Board noted, but SEQ ID NO:2 clearly is DNA, as it contains thymidine. The corresponding RNA would contain uracil instead: are thymidine and uracil to be considered identical in determining whether another sequence is “95% identical”? If both DNA and RNA are to be covered by Claim 12, part (e) is “entirely superfluous.”

“These factors suggest that claim 12 uses the term ‘polynucleotide’ as a synonym for DNA . . . However, construing part (b) of the claim [in this way] presents its own problems.” If part (b) is construed as encompassing only naturally occurring DNA sequences that are at least 95% identical to the sequence of SEQ ID NO:2, it probably “define a compound that does not exist.” cDNA sequences are laboratory constructs. They do not occur naturally. The only naturally occurring DNA sequences that encode the protein of SEQ ID NO:1 are genomic, and human genes contain introns. Only if introns make up less than 5% of the sequence would it conform to the claim, and it is unlikely that such genes exist. Thus, “it would appear that there is no naturally occurring DNA sequence that is 95% identical to SEQ ID NO:2.”

The Board also found difficulty with the fact that claim 12 is directed to an “isolated” polynucleotide, but the specification provides no guidance on how to isolate the mRNA that corresponds to SEQ ID NO:2 in order to create the cDNA.

Even if one overlooks these problems, the Board continued, the scope of the claims is unclear. “The specification provides no guidance that would allow those skilled in the art to determine, with a reasonable degree of confidence, whether any of the sequences that are at least 95% identical to SEQ ID NO:2 occur naturally and, if so, which they would be. The only way to definitely fix the scope of the claims would be to compare SEQ ID NO:2 to all naturally occurring sequences, clearly an impossible task.”

Under 37 CFR §41.50(b), the applicants have 2 months to either reopen the prosecution with appropriately amended claims or new evidence or to request a rehearing.

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Brazil, Abbott Reach Tentative Deal on Kaletra

—*Threat to Suspend Antiretroviral Patents in Abeyance for Now*

BRASILIA, BRAZIL, and ABBOTT PARK, ILL. 7/5/05—The Brazilian government and Abbott Laboratories have reached a tentative agreement that will allow the South American nation to treat more of its HIV-infected citizens with lopinavir/ritonavir (Kaletra), Abbott’s widely used antiretroviral drug combination, with no increase in cost. The deal will save Brazil an estimated \$250 million over 6 years. Brazil also has been negotiating with Gilead Sciences, another leading maker of antiretroviral drugs.

On June 1, the lower house of the Brazilian legislature approved a bill that would allow local pharmaceutical companies to produce generic versions of drugs used to treat HIV infection. All patents on such drugs were suspended.

According to Roberto Gouveia, a deputy from the governing Workers’ Party, “patents have to be suspended if they’re harming public health.”

The government argued that the action was permitted under Trade Related Aspects of Intellectual Property (TRIPS) Treaty, which contains a provision (the Doha Declaration) authorizing developing countries to suspend patents temporarily in the face of a “health emergency.” However, only 0.6% of the Brazilian population is believed to be infected with HIV, of whom about 180,000 are being treated.

Some commentators suggested that the real goal of the bill was to boost the Brazilian pharmaceutical industry, including a state-owned laboratory that has said it can manufacture Kaletra for about 60% of what the government is paying Abbott.

Brazilians infected with HIV receive all antiviral drugs free.

A report by the Institute for Trade, Standards, and Sustainable Development concluded that Brazil's action would violate TRIPS. The ITSSD and other specialists in patents have called Brazil "by far the worst abuser of intellectual property rights in the Americas" and estimated that its actions are costing American businesses almost \$1 billion annually. Besides makers of anti-HIV drugs, another firm that has suffered significantly is Monsanto, whose genetically engineered crops are widely planted by farmers who bought pirated seed.

Copies of the Institute report are available at www.itssd.org/

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Embryonic Human Cells Cause Another Problem

*—Europe Agrees to Allow Different Patent Laws
for Biotechnology Inventions*

BRUSSELS, BELGIUM 7/1905—The European Commission has decided to allow the members of the European Union to write their own laws governing which genetic engineering and other biotechnology inventions will be patentable.

The principal motivator was disagreement over what research will be allowed on human embryonic stem cells. The United Kingdom, Sweden, and Belgium have few restrictions on such research, whereas Poland, Ireland, and Italy ban it. Some countries have opposed patents on human gene sequences, whereas others permit them for only a specific use and others freely allow them.

Biotechnology firms were distressed at the prospect of an array of different laws.

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