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THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 32

UNITED STATES PATENT AND TRADEMARK OFFICE

MAILED

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

MAY - 8 1995

PAT.&T.M. OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ANNIE De BAETSELIER, STEVEN ROSENBERG,
and JACQUES D. V. HANOTIER

Appeal No. 94-1770
Application 07/684,470¹

HEARD: January 9, 1995

Before McKELVEY, Chief Administrative Patent Judge, and WINTERS
and WILLIAM F. SMITH, Administrative Patent Judges.

WINTERS, Administrative Patent Judge.

¹ Application for patent filed April 11, 1991. According to appellants, the application is a continuation of Application 07/249,413, filed September 26, 1988, now abandoned.

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DECISION ON APPEAL

This appeal is from the examiner's decision refusing to allow claims 4 through 6, 8 through 17, 21 through 23, 25 through 36, 38 through 41, 43 through 45, and 48 through 55, which are all of the claims remaining in the application.

THE CLAIMS

Claims 35 and 51 are representative:

35. A synthetic gene for human lysozyme comprising the following sequence

AAGGTTTTCGAAAGATGTGAGCTAGCTAGAACTTTGAAGAGATTGGGTATGGACGGTTACAG
TTCCAAAAGCTTTCTACACTCGATCGATCTTGAACTTCTCTAACCCATACCTGCCAATGTC
AGGTATCTCCTTGGCTAACTGGATGTGTTTGGCCAAGTGGGAATCTGGTTACAACACCAGAG
TCCATAGAGGAACCGATTGACCTACACAAACCGGTTCACCCCTTAGACCAATGTTGTGGTCTC
CTACCAACTACAACGCTGGTGACAGATCTACCGACTACGGTATCTTCCAAATCAACTCCAGA
GATGGTTGATGTTGCGACCACTGTCTAGATGGCTGATGCCATAGAAGGTTTAGTTGAGGTCT
TACTGGTGTAACGACGGTAAGACCCCAGGTGCTGTAAACGCTTGTCAGTGTCTGTTCTGC
ATGACCACATTGCTGCCATTCTGGGGTCCACGACAATTGCGAACAGTGAACAGGACAAGACC
TTTGTGCAAGACAACATCGCTGACGCTGTGCGCTGTGCTAAGAGAGTTGTTAGAGACCCAC
AAACAACGTTCTGTTGTAGCGACTGCGACAGCGGACACGATTCTCTCAACAATCTCTGGGTG
AAGGTATCAGAGCTTGGGTTGCTTGGAGAAACAGATGTCAAAACAGAGACGTTAGACAATAC
TTCCATAGTCTCGAACCAACGAACCTCTTTGTCTACAGTTTTGTCTCTGCAATCTGTTATG
GTCCAAGGTTGTGGTGTT
CAGGTTCCAACACCACAA.

51. A process for producing human lysozyme from Saccharomyces yeast cells whose DNA has been genetically engineered to include a segment coding for human lysozyme, the human lysozyme impairing the growth of the yeast cells comprising the steps of:

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contacting growing Saccharomyces yeast cells whose DNA has been genetically engineered to include a segment coding for human lysozyme, wherein the human lysozyme impairs the growth of the yeast cells, with a culture medium,

growing the contacted yeast cells up to the stationary yeast cell phase, and

then inducing said yeast cells to synthesize and secrete human lysozyme.

THE REFERENCES

The references relied on by the examiner are:

Zinder et al. (Zinder)	4,595,658	Jun. 17, 1986
Horikoshi et al. (Horikoshi)	4,624,922	Nov. 25, 1986
Minkley et al. (Minkley)	4,767,708	Aug. 30, 1988
Burke et al. (Burke)	4,880,734	Nov. 14, 1989

Baetselier et al. (Baetselier) (Belgium)	903,626	Nov. 13, 1986
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Ikehara et al. (Ikehara) (European Patent Application) 0 181 634		May 21, 1986
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Yoshifumi Jigami et al. (Jigami), "Expression of synthetic human-lysozyme gene in Saccharomyces cerevisiae: use of a synthetic chicken-lysozyme signal sequence for secretion and processing," Gene 43(1986): 273-79.

Lawrence S. Cousens et al. (Cousens), "High level expression of proinsulin in the yeast, Saccharomyces cerevisiae" Gene 61 (1987): 265-75.

Izumi Kumagai et al. (Kumagai), "Conversion of Trp 62 of Hen Egg-White Lysozyme to Tyr by Site-Directed Mutagenesis," Journal of Biochemistry 102, no. 4(1987): 733-40.

Koji Yoshimura et al. (Yoshimura), "Differences Between Saccharomyces Cerevisiae and Bacillus Subtilis in Secretion of Human Lysozyme," Biochemical and Biophysical Research Communications 145, no. 2(1987): 712-18.

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Yoshio Taniyama et al. (Taniyama), "Role of Disulfide Bonds in Folding and Secretion of Human Lysozyme in Saccharomyces Cerevisiae," Biochemical and Biophysical Research Communications 152, no 3(May 1988): 962-67.

THE REJECTIONS

In the Examiner's Answer, Paper No. 24, the examiner sets forth a series of rejections under 35 U.S.C. § 112, first and second paragraphs. It is clear from the first Supplemental Answer, however, that all rejections under 35 U.S.C. § 112, first and second paragraphs, have been withdrawn and that "the only issues which remain in the application are the rejections under section 103." See the first Supplemental Answer, Paper No. 27, page 3.

The appealed claims stand rejected as follows: (1) claims 4 through 6, 9, 21 through 23, 25, 26, 35, 36, 38 through 41, 44, 45, and 51 through 55 under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Minkley, Burke, Ikehara, Jigami, and Yoshimura; (2) claims 8, 25, and 43 under 35 U.S.C. § 103 as unpatentable over the same combination of references applied in rejection (1), further taken in view of Cousens; (3) claims 10 through 17 and 27 through 34 under 35 U.S.C. § 103 as unpatentable over the same combination of references applied in rejection (1), further taken in view of "Zinder et al. and

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Horikoshi et al. or, alternatively, further in view of Baetselier et al.;" and (4) claims 48 through 50 under 35 U.S.C. § 103 as unpatentable over the same combination of references applied in rejection (1), further taken in view of Kumagai and Taniyama.

DISCUSSION

Our deliberations in this matter have included evaluation and review of the following materials: (1) the instant specification, including Figures 1 through 10, and all of the claims on appeal; (2) appellants' main Brief, Reply Brief, and Supplemental Reply Brief before the Board; (3) the Examiner's Answer, first Supplemental Answer, and second Supplemental Answer; and (4) the prior art references cited and relied on by the examiner.

Having carefully considered those materials, we agree with appellants that the subject matter sought to be patented would not have been obvious at the time the invention was made to a person having ordinary skill in the art based on the combined disclosures of the above-cited references. Accordingly, we reverse rejections (1), (2), (3), and (4). Essentially, we agree with the position well stated by appellants in their Reply Brief and Supplemental Reply Brief before the Board. We shall

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therefore adopt that position as our own, adding the following remarks for emphasis only.

With respect to claim 35, and all product claims depending directly or indirectly therefrom, the examiner places heavy reliance on Ikehara's European Patent Application entitled "Synthetic Gene for Human Lysozyme." According to the examiner, Ikehara discloses the amino acid sequence of human lysozyme and further discloses a synthetic human lysozyme cDNA sequence "substantially the same as" the instantly claimed sequence. The examiner characterizes the difference between the cDNA sequences of Ikehara and appellants as a "slight difference" or a difference of only a "few nucleotides." See the first Supplemental Examiner's Answer, page 5.

Conspicuous by its absence from the examiner's statement of rejection, however, is a traditional analysis setting forth (1) the difference or differences in the claimed subject matter over the applied references, (2) the proposed modification of the applied references necessary to arrive at the claimed subject matter, and (3) an explanation why such proposed modification would have been obvious. The examiner has not explained, on this record, how the cited prior art provides any suggestion which would have led a person having ordinary skill from "here

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to there," i.e., from the cDNA sequence disclosed by Ikehara to the sequence recited in appellants' claims. We have no doubt that the prior art could be modified in such manner to arrive at appellants' claimed synthetic gene for human lysozyme. The mere fact, however, that the prior art could be so modified would not have made the modification obvious unless the prior art suggests the desirability of the modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). That is not the case here. Nor does the examiner establish prima facie obviousness by dismissing appellants' contribution as a mere matter of "experimental design choice." See the first Supplemental Answer, page 6. The examiner has not established that a person having ordinary skill in the art, given the "standards" or "conditions" referred to in the Ikehara reference, page 3, would have been led toward the synthetic gene for human lysozyme defined in claim 35 on appeal. Accordingly, we reverse the § 103 rejections of the product claims before us.

With respect to process claims 51 and 52, and all claims depending directly or indirectly therefrom, it would appear that the examiner's § 103 rejections are based on the premise that human lysozyme is detrimental to growing Saccharomyces yeast cells but not to resting cells and that such knowledge

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would have been recognized and understood by persons having ordinary skill in the art at the time the invention was made. The premise is incorrect and, accordingly, the rejections must fall.

More specifically, the latter part of the premise is incorrect. As described in the instant specification, pages 9 through 11, human lysozyme is detrimental to growing Saccharomyces yeast cells but not to resting cells. On this record, however, that fact has not been established as prior art knowledge, recognized and understood by persons having ordinary skill in the art. On the contrary, appellants describe the behavior of human lysozyme in this regard as "unexpected" and unlike the behavior of the closely related chicken lysozyme. See the specification, page 10, and see appellants' Reply Brief before the Board, page 5. As stated in the Reply Brief, page 10, "nothing in the prior art allows one to predict that human lysozyme is toxic for growing yeast" [emphasis added]. Again, in the Supplemental Reply Brief, page 2, appellants correctly state that "[n]one of the references cited...discuss the deleterious effect of human lysozyme on the Saccharomyces yeast host."

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As stated in In re Sponnoble, 405 F.2d 578, 585, 160 USPQ
237, 243 (CCPA 1969),

[A] patentable invention may lie in the discovery of
the source of a problem even though the remedy may be
obvious once the source of the problem is identified.
This is part of the 'subject matter as a whole' which
should always be considered in determining the
obviousness of an invention under 35 U.S.C. 103
[citations omitted].

Here, the record reflects that human lysozyme is detrimental
to growing Saccharomyces yeast cells. The references relied on
by the examiner do not disclose or suggest that such problem was
known at the time the invention was made. On the contrary, the
only reasonable interpretation which the facts permit is that
appellants discovered the source of the problem. In view of
prior art references such as Minkley and Burke, it well may be
that appellants' remedy or solution to the problem would have
been obvious "once the source of the problem is identified."
The source of the problem and the problem, however, are described
as part of appellants' contribution in the specification. They
are not described in the cited prior art. The teachings of the
prior art, in and of themselves and without the benefit of
appellants' disclosure, would not have made the claimed invention
as a whole obvious. Again, see In re Sponnoble, 405 F.2d at 585,
160 USPQ at 243.

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