

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 34

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TUNG M. FONG, RUEY-RUEY C. HUANG,
and CATHERINE D. STRADER

Appeal No. 1996-1204
Application No. 08/090,369

HEARD: January 13, 2000

Before WINTERS, GRON, and ROBINSON, Administrative Patent Judges.
ROBINSON, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 25-30, which are all of the claims pending in the case.

Claims 25, 26, and 27 are representative of the claims on appeal, a copy of which are attached as an appendix to this decision.

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The references relied upon by the examiner are:

Shigemoto et al. (Shigemoto), "Cloning and Expression of a Rat Neuromedin K Receptor cDNA," Journal of Biological Chemistry, Vol. 265(2), pp. 623-628 (1990).

Hopkins et al. (Hopkins), "Isolation and Characterization of the Human Lung NK-1 Receptor cDNA," Biochemical and Biophysical Research Communications, Vol. 180(2), pp. 1110-1117 (1991).

Gerard et al. (Gerard), "The Human Neurokinin A (Substance K) Receptor," Journal of Biological Chemistry, Vol. 265(33), pp. 20455-20462 (1990).

Fraser et al. (Fraser), "Cloning, Sequence Analysis, and Permanent Expression of a Human α_2 -Adrenergic Receptor in Chinese Hamster Ovary Cells," Journal of Biological Chemistry, vol. 264(20), pp. 11754-11761 (1989).

A reference relied upon by appellants:

Dietl et al. (Dietl), "Phylogeny of Tachykinin Receptor Localization in the Vertebrate Central Nervous System: Apparent Absence of Neurokinin-2 and Neurokinin-3 Binding Sites in the Human Brain," Brain Research, Vol. 539, pp. 211-222 (1991).

Grounds of Rejection

Claims 25-28 and 30 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Shigemoto, Hopkins, and Gerard.

Claim 29 stands rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Shigemoto, Hopkins, Gerard, and Fraser.

We reverse.

BACKGROUND

The applicants' invention, as described at pages 1-4 of the specification, is directed to a cloned human neurokinin-3 receptor (NK-3) peptide and a recombinant DNA molecule which encodes the receptor. The human NK-3 is described as useful in an assay for the presence of neurokinin B, which binds preferentially to NK-3, as well as in conjunction with diagnosis to determine the body fluid concentration of neurokinin-B related substances in patients. Neurokinin B is a naturally occurring peptide belonging to the neurokinin family of peptides, is known in the art, and has been implicated in the pathophysiology of numerous diseases.

DISCUSSION

The rejections under 35 U.S.C. § 103

Obviousness is a legal conclusion based on the underlying facts. Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966); Continental Can Co. USA, Inc. v. Monsanto Co., 948 F.2d 1264, 1270, 20 USPQ2d 1746, 1750 (Fed. Cir. 1991); Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1566-68, 1 USPQ2d 1593, 1595-97 (Fed. Cir. 1987). Here, the examiner has cited Shigemoto as describing (Answer, page 4-5):

an isolated cDNA encoding the rat homologue of the encoded human NK-3 (neuromedin K) receptor (Figure 1, page 625) of the instant invention. Further disclosed by this reference was a plasmid containing that DNA and a COS cell transformed with that plasmid (first full paragraph in the left column on page 624). Figure 2 of this reference disclosed that the rat NK-3 (neuromedin K), NK-2 (substance K) and NK-1 (substance P) receptors, all of which are G protein-coupled receptors for tachykinins, have substantial sequence similarity which is greatest in the transmembrane domains.

The examiner acknowledges that (Answer, page 5):

[t]his reference did not describe an isolated DNA encoding a human NK-3 receptor or the protein encoded thereby.

Hopkins is cited (Answer, page 5) as describing “the isolation of a DNA encoding a human NK-1 receptor by screening a human DNA library with a DNA encoding a rat NK-1 receptor” and disclosing that “the open reading frame from this human cDNA shared 89% sequence homology with a cDNA encoding a rat NK-1 receptor with the two sequences being most divergent at the two ends.” Similarly, Gerard is cited (Answer, page 6) as describing “the isolation of a DNA encoding a human NK-2 (substance K) receptor based upon its anticipated sequence similarity to a DNA encoding a bovine NK-2 receptor” and additionally disclosing “the substantial sequence similarity between the human, bovine and rat NK-2 receptors with the three sequences being most divergent at the two ends.”

The examiner concludes (Answer, page 5):

An artisan of ordinary skill, . . . would have found the isolation of a DNA encoding the human homologue of the rat NK-3 receptor described in the Shigemoto et. al. reference by screening a human DNA library with a DNA encoding that rat receptor in a manner directly analogous to the one described for the isolation of the DNA encoding the human NK-1 receptor in the Hopkins et. al. reference, to have been prima facie obvious at the time of the instant invention.

The initial burden of presenting a prima facie case of obviousness rests on the examiner. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). On this record, the examiner has pointed to no evidence or facts which would reasonably establish that the presently claimed human NK-3, or the DNA which encodes it, were

known at the time of the invention. We find no mention in Shigemoto of the human counterpart to the rat NK-3. Hopkins, at page 1111, makes a general reference to NK-1, NK-2, and NK-3, but does not state the source of the listed receptors. Similarly, Gerard only mentions NK3 at page 20455, column 2, second paragraph, and does not specify the source of the NK-3 receptor described.

In rebuttal to the examiner's position, appellants cite Dietl (Principal Brief, page 15) as providing information regarding the level of knowledge in the art regarding human NK-3 receptors. In describing Dietl, appellants urge that (Principal Brief, page 16):

because Dietl et al. suggest that the NK-3 receptor is not present in human brain tissue, there would not have been a reasonable likelihood of success that one of ordinary skill in the art would have been able to isolate the gene encoding the human NK-3 receptor, even if they employed the cDNA encoding the rat NK-3 receptor. Moreover, Dietl et al. actually teach away from the successful isolation of the human NK-3 receptor by suggesting that such an attempt would have been futile.

The examiner criticizes the Dietl disclosure (Answer, pages 13-14) urging that in assaying for "eledoisin", a mollusk neuropeptide, it was unlikely that a mammalian NK receptor would have been expected to bind and "an artisan would have had no expectations regarding the ability of the human homologue of the NK-3 receptor of Shigemoto et al. to bind any non-native ligand." Yet, this is the only evidence, before us, which speaks to the question of whether the human NK-3 receptor or the DNA which encodes it, was known at the time of the invention. We do not agree that it would have

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been obvious to use the methodology of Hopkins and Gerard to isolate, identify and characterize a protein not demonstrated to be known at the time of the invention. The examiner's reliance (Answer, page 14) on the concluding statements of both Hopkins and Gerard concerning further studies relating to the neurokinin receptor genes is too general in nature reasonably to point those of ordinary skill in this art toward the isolation and characterization of the claimed human NK-3 receptor and DNA encoding the receptor, when read in context of the teaching of the articles as a whole. On these facts, the examiner has failed to establish a prima facie case of unpatentability as to the claimed subject matter.

Where the examiner fails to establish a prima facie case, the rejection is improper and will be overturned. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir.1988). Therefore the rejection of claim 25-28 and 30 under 35 U.S.C. § 103 is reversed.

In separately rejecting claim 29 under 35 U.S.C. § 103 the examiner has relied on Fraser in addition to Shigemoto, Hopkins and Gerard. However, Fraser does not provide that which we have determined to be missing in the previously discussed rejection.

Therefore, this rejection is also reversed.

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SUMMARY

To summarize, the decision of the examiner to reject claims 25-30 under 35 U.S.C. § 103 is reversed.

REVERSED

SHERMAN D. WINTERS)	
Administrative Patent Judge)	
)	
)	
)	
TEDDY S. GRON)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	
)	
DOUGLAS W. ROBINSON)	
Administrative Patent Judge)	

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APPENDIX

552 530 532 540
 LYL VSL MSL PLO EYL APL TPL LEL CLZ PHE VSL EJU TLP PLO EJU EYL

 510 512 550
 ILE LEL VLA PHE LEL LEL VLA PHE PLO EJU CLZ LEL IYL ZEL LYL TPL

 102 500 502
 PLO APL LEL ZEL VLA TPL VLA TPL LYL ILE VSL ILE EYL ZEL ILE TLP

 180 182 180
 TPL VLA ILE VLA VSL AZP APL IYL MSL VLA ILE ILE AZP PLO LEL LYL

 102 110 112
 EJU ASL PHE PHE PLO ILE TPL VLA VSL PHE VLA ZEL ILE IYL ZEL MSL

 142 120 122 100
 IYL VLA LEL HIZ ZEL EJU TLP IYL PHE EYL VLA ASL IYL CLZ APL PHE

 130 132 140
 PHE ZEL AZP VLA ZEL MSL VLA VLA PHE ASL TPL LEL VSL ASL PHE ILE

 112 150 152
 HIZ LYL APL MSL TPL VSL TPL ASL IYL PHE LEL VSL ASL LEL VLA

 100 102 110
 VLA VSL VLA VSL LEL EYL ASL LEL LEL ILE VSL ILE TLP ILE ILE LEL VLA

 82 80 82
 PLO ZEL TLP APL ILE VLA LEL TLP ZEL LEL VLA IYL EYL VSL VSL VSL

 02 10 12 80
 PLO VLA PLO ZEL EJU PLO TLP VLA ASL LEL TPL ASL ASL EJU PHE VSL EJU

 20 22 00
 EYL ASL LEL ZEL ZEL ZEL PLO ZEL VLA LEL EYL LEL PLO VSL VLA ZEL

 32 40 42
 VLA TPL EYL VLA VSL EJU TPL EYL TLP LEL EJU LEL LEL AZP EJU VLA

 50 52 30
 VSL EYL VLA AZP VLA VSL ASL LEL TPL VLA ZEL LEL VLA VLA EYL VLA

 1 2 10 12
 MSL VLA TPL LEL PLO VLA VLA EJU TPL TLP ILE AZP EYL EYL EYL EYL

the amino acid sequence (SEQ ID NO:1) which is:
 52. A human neurokinin-3 receptor protein comprising

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Pro Lys Gln His Phe Thr Tyr His Ile Ile Val Ile Ile Leu Val Tyr
245 250 255

Cys Phe Pro Leu Leu Ile Met Gly Ile Thr Tyr Thr Ile Val Gly Ile
260 265 270

Thr Leu Trp Gly Gly Glu Ile Pro Gly Asp Thr Cys Asp Lys Tyr His
275 280 285

Glu Gln Leu Lys Ala Lys Arg Lys Val Val Lys Met Met Ile Ile Val
290 295 300

Val Met Thr Phe Ala Ile Cys Trp Leu Pro Tyr His Ile Tyr Phe Ile
305 310 315 320

Leu Thr Ala Ile Tyr Gln Gln Leu Asn Arg Trp Lys Tyr Ile Gln Gln
325 330 335

Val Tyr Leu Ala Ser Phe Trp Leu Ala Met Ser Ser Thr Met Tyr Asn
340 345 350

Pro Ile Ile Tyr Cys Cys Leu Asn Lys Arg Phe Arg Ala Gly Phe Lys
355 360 365

Arg Ala Phe Arg Trp Cys Pro Phe Ile Lys Val Ser Ser Tyr Asp Glu
370 375 380

Leu Glu Leu Lys Thr Thr Arg Phe His Pro Asn Arg Gln Ser Ser Met
385 390 395 400

Tyr Thr Val Thr Arg Met Glu Ser Met Thr Val Val Phe Asp Pro Asn
405 410 415

Asp Ala Asp Thr Thr Arg Ser Ser Arg Lys Lys Arg Ala Thr Pro Arg
420 425 430

Asp Pro Ser Phe Asn Gly Cys Ser Arg Arg Asn Ser Lys Ser Ala Ser
435 440 445

Ala Thr Ser Ser Phe Ile Ser Ser Pro Tyr Thr Ser Val Asp Glu Tyr
450 455 460

Ser
465

the receptor protein being free of other human
receptor proteins.

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нелокјинин-3 ресеџтор оџ слјаш зр' фре див шоеслјес
зр' а див шоеслјес енсоџубе фре рлшан

27. A DNA molecule encoding human neurokinin-3
receptor comprising the nucleotide sequence (SEQ ID NO:2:)
which is:

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CTATTGCAGT ATCTTTCAGC TTCCAGTCTT ATCTGAAGAC CCCGGCACCA AAGTGACCAG      60
GAGGCAGAGA AGAACTTCAG AGGAGTCTCG TCTTGGGCTG CCCGTGGGTG AGTGGGAGGG      120
TCCGGGACTG CAGACCGGTG GCGATGGCCA CTCTCCAGC AGCAGAAACC TGGATAGACG      180
GGGGTGGAGG CGTGGGTGCA GACGCCGTGA ACCTGACCGC CTCGCTAGCT GCCGGGGCGG      240
CCACGGGGGC AGTTGAGACT GGGTGGCTGC AACTGCTGGA CCAAGCTGGC AACCTCTCCT      300
CCTCCCTTC CGCGCTGGGA CTGCCTGTGG CTTCCTCCGC GCCCTCCAG CCCTGGGCCA      360
ACCTACCAA CCAGTTCGTG CAGCCGTCCT GCGCATCGC GCTCTGGTCC CTGGCGTATG      420
GTGTGGTGGT GGCAGTGCCA GTTTTGGGAA ATCTCATCGT CATCTGGATC ATCTGGCCC      480
ACAAGCGCAT GAGGACTGTC ACCAACTACT TCCTTGTA GAA CCTGGCTTTC TCCGACGCCT      540
CCATGGCCGC CTCAACACG TTGGTCAATT TCATCTACGC GCTTCATAGC GAGTGGTACT      600
TTGGCGCCAA CTA CTGCGC TTCCAGAACT TCTTCTAT CACAGCTGTG TTCGCCAGCA      660
TCTACTCCAT GACGGCCATT GCGGTGGACA GGTATATGGC TATTATTGAT CCCTGAAAC      720
CCAGACTGTC TGCTACAGCA ACCAAGATTG TCATTGGAAG TATTTGGATT CTAGCATTTT      780
TACTTGCCTT CCCTCAGTGT CTTTATTCCA AAACCAAAGT CATGCCAGGC CGTACTCTCT      840
GCTTTGTGCA ATGGCCAGAA GGTCCCAAAC AACATTTTAC TTACCATATT ATCGTCATTA      900
TACTGGTGTA CTGTTTCCCA TTGCTCATCA TGGGTATTAC ATACACCATT      950
GTTGGAATTA CTCTCTGGGG AGGAGAAATC CCAGGAGATA CCTGTGACAA GTATCATGAG     1010
CAGCTAAAGG CCAAAGAAA GGTGTGCAAA ATGATGATA TTGTTGTCAT GACATTTGCT     1070
ATCTGCTGGC TGCCCTATCA TATTTACTTC ATTCTCACTG CAATCTATCA ACAACTAAAT     1130
AGATGGAAAT ACATCCAGCA GGTCTACCTG GCTAGCTTTT GGCTGGCAAT GAGCTCAACC     1190
ATGTACAATC CCATCATCTA CTGCTGTCTG AATAAAAGAT TTCGAGCTGG CTTCAAGAGA     1250
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the DNA molecule being free of other human DNA molecules.

CCAAATAAAA ATEEECTTAA AATTI	1122
CAAAATTEAEE AAEETAAETEI AATAATEIEA CAAGAACACTI AATAACAITEI TAECCCTCCAC	1130
TTATCAETCC TEICCAIAT IACCCCTIAG AACAAGAAAC AATTTTTAAEE CAECTATEEI	1140
CTEAEETAAA AEAITTAETEI EAAACCAICA TEETECCAEI CIAEECCCC AITCTCTAT	1150
ACTTCAAEI TCAIAAECTC ACCCTIATACC TCTETEAEIE AATAITCTTA AITCCCTTTC	1160
ACCCCAAAEA ACCCAAEETI CAATEECTEC TCTCECAEEA AITCCAAATC TECCCTCECC	1170
ACAETCEIEI TTECCCCAA CEATECAEAC ACCAACCBEI CCAETCEEA EAAAAAECA	1180
ACCAEETTC AITCCAAACCE ECAAECAEI ATEIACACE TECCCAEAI EEAETCCIE	1190
ECATITTECT EETECCIT IATCAAAETI TCCAECAIE ATEAECAIA ECTCAAAACC	1200