

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte TIMOTHY P. TULLY
and JERRY CHI-PING YIN

Appeal No. 2003-0835
Application No. 09/419,371

ON BRIEF

Before MILLS, GRIMES and GREEN, Administrative Patent Judges.

GREEN, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 9-20 and 39-50. Claims 9, 15 and 33 are representative of the subject matter on appeal, and read as follows:

9. A method for assessing the effect of a drug on long term memory formation comprising:

a) administering said drug to an animal; and

b) determining the functional level of activator and repressor in said animal relative to the functional level of activator and repressor in a control animal to which said drug has not been administered, wherein said activator is a CREB/CREM/ATF-1 subfamily member associated with potentiation of long tem memory

and said repressor is a CREB/CREM/ATF-1 subfamily member associated with blocking of long term memory.

15. A method for assessing the effect of a drug on long term memory formation comprising:

a) administering said drug to an animal; and

b) determining the functional level of activator or repressor in said animal relative to the functional level of activator or repressor, respectively, in a control animal to which said drug has not been administered, wherein said activator is a CREB/CREM/ATF-1 subfamily member associated with potentiation of long term memory and said repressor is a CREB/CREM/ATF-1 subfamily member associated with blocking of long term memory.

33. A method for assessing the effect of a drug on long term memory formation comprising:

a) administering said drug to an animal; and

b) determining the functional level of a homodimer of a repressor relative to the functional level of said homodimer present in a control animal to which said drug has not been administered, wherein said repressor is an antagonist of a CREB/CREM/ATF-1 subfamily member and is associated with blocking of long term memory.

Claims 9-20 and 39-50 stand rejected under 35 U.S.C. § 112, second paragraph. In addition, claims 9-20 and 39-50 stand rejected under 35 U.S.C. § 112, first paragraph, for lack of adequate written description. Finally, claims 9-20 and 39-50 stand rejected under 35 U.S.C. § 112, first paragraph, on the basis of lack of enablement. After careful review of the record and consideration of the issues before us, we reverse all of the rejections of record.

BACKGROUND

According to the specification:

The present invention is based on Applicants' discovery of the dCREB1 and dCREB2 genes. The present invention is further based on Applicants' discovery that the Drosophila CREB2 gene codes for proteins of opposite functions. One isoform (e.g., dCEB2-a) encodes a cyclic 3', 5'-adenosine monophosphate (cAMP)-responsive transcriptional activator. Another isoform (e.g., dCREB2-b) codes for an antagonist which blocks the activity of the activator.

When the blocking form is placed under the control of the heat-shock promoter, and transgenic flies are made, a brief shift in temperature induces the synthesis of the blocker in the transgenic fly. This induction of the blocker (also referred to herein as the repressor) specifically disrupts long-term, protein synthesis dependent memory of an odor-avoidance behavioral paradigm.

Specification, page 2.

The specification teaches further that:

A further embodiment of the invention relates to an assay of pharmaceutical agents for their property as facilitators or hinderers of long term memory in animals. The assay is performed by administering the pharmaceutical agent to Drosophila prior to subjecting the Drosophila to a Pavlovian olfactory learning regimen. This regimen assesses the long term memory capabilities of the Drosophila by subjecting the flies to a massed and/or spaced training schedule. Transgenic lines of these flies containing altered dCREB2 genes can be used to further elucidate the long term memory facilitation or hindering property of the pharmaceutical agent. The assay provides data regarding the acquisition of long term memory by the Drosophila after exposure to the pharmaceutical agent. These data are compared to long term memory acquisition data from Drosophila that have not been exposed to the pharmaceutical agent. If the exposed flies display faster or better retained long term memory acquisition than the unexposed flies, the pharmaceutical agent can be considered a facilitator of long term memory. Conversely, if the exposed flies display slower or less retained long term memory acquisition than the unexposed flies, the pharmaceutical agent can be considered a hinderer of long term memory. Since the genetic locus for this long term memory assay in Drosophila resides in the dCREB2 gene, the results from this assay can be directly applied to other animals that have homologous genetic loci (CREB2 or CREM genes).

Id. at 6.

DISCUSSION

1. Rejection under 35 U.S.C. § 112, second paragraph

Claims 9-20 and 39-50 stand rejected under 35 U.S.C. § 112, second paragraph.

According to the rejection, “the metes and bounds of ‘dcreb2, activators, repressors, CREB/CREM/ATF-1 subfamily members, activator isoforms and repressor isoforms’ remain indefinite as the metes and bounds of the terms cannot be readily discerned by the skilled artisan as claimed.” Examiner’s Answer, page 4.

“The test for definiteness is whether one skilled in the art would understand the bounds of the claim when read in light of the specification.” Miles Laboratories, Inc. v. Shandon, Inc., 997 F.2d 870, 875, 27 USPQ2d 1123, 1126 (Fed. Cir. 1993). Claims are in compliance with 35 U.S.C. § 112, second paragraph, if “the claims, read in light of the specification, reasonably apprise those skilled in the art and are as precise as the subject matter permits.” Hybritech, Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1385, 231 USPQ 81, 94-95 (Fed. Cir. 1987).

Appellants argue, and we agree, that the terms dcreb2, activators, repressors, CREB/CREM/ATF-1 subfamily members, activator isoforms and repressor isoforms, are definite when read in light of the specification. See Appeal Brief, page 7. The examiner argues that “neither the metes nor the bounds of the claims are clear or established without reading the specification into the claims.” The test for definiteness is, however, is whether one skilled in

the art would understand the bounds of the claim when read in light of the specification, and here, the examiner is apparently acknowledging that the terms are definite when read in light of the specification. Thus, the rejection of claims 9-20 and 39-50 under 35 U.S.C. § 112, second paragraph, is reversed.

2. Rejection under 35 U.S.C. § 112, first paragraph, lack of adequate written description

Claims 9-20 and 39-50 stand rejected under 36 U.S.C. § 112, first paragraph, as lacking adequate written description.

According to the rejection, “[t]he structural and functional characteristics for CREB/CREM/ATF-1 subfamily members is undisclosed and it is unclear as to what structural or functional activity applicants are claiming.” Examiner’s Answer, page 5. The rejection cites Quinn¹, Masquillier² and Brindle³ to support the proposition that known CREB and CREM proteins show little homology (approximately 18%) with dCREBa, SEQ ID NO:2. See id. That evidence demonstrates, the rejection asserts, “the deficiency in the specification in the description of CREB/CREM/ATF-1 subfamily members for which the specification fails to teach those specific residues which are required to describe the family or which provide any particular function.” Id.

¹ Quinn et al. (Quinn), “Cyclic AMP-Dependent Protein Kinase Regulates Transcription of the Phosphoenolpyruvate Carboxykinase Gene but Not Binding of Nuclear Factors to the Cyclic AMP Regulatory Element,” Molecular and Cellular Biology, Vol. 10, pp. 3357-3364 (1990).

² Masquillier et al. (Masquillier), “Human CREM Gene: Evolutionary Conservation, Chromosomal Localization, and Inducibility of the Transcript,” Cell Growth & Differentiation, Vol. 4, pp. 931-937 (1993).

³ Brindle et al. (Brindle), “Protein-kinase-A-dependent activator In transcription factor CREB reveals new role for CREM repressors,” Nature, Vol. 364, pp. 821-824 (1993).

The rejection also contends that “description of the instantly claimed invention appears to also require not only the structure of the CREB/CREM/ATF-1 family members but a description of those family members which are associated with blocking of long term memory. Other than those limited descriptions of dCREBa and dCREBb as activators and repressors, respectively, the specification fails to provide the structural components of a CREM/CREB/ATF-1 family member which provides any functional activity with respect to learning and memory.” Id. at 5-6.

The rejection thus concludes that “the skilled artisan could not readily recognize applicant’s possession of the claimed subject matter in particular as the specification fails to describe any other family member or functional activity other than for dCREB2a and dCREB2b. The single species cannot describe the breadth of that described as a family member.” Id. at 6.

The examiner bears the burden of showing that the claims are not adequately described. See In re Alton, 76 F.3d 1168, 1175, 37 USPQ2d 1578, 1583 (Fed. Cir. 1996). The disclosure as originally filed need not provide “in haec verba support for the claimed subject matter at issue,” rather, the disclosure should convey to one skilled in the art that the inventor had possession of the invention at the time of filing. Purdue Pharma L.P. v. Faulding Pharmaceutical Co., 230 F.3d 1320, 1323, 56 USPQ2d 1481, 1483 (Fed. Cir. 2000) (citations omitted). We find that the examiner has not met the burden of demonstrating that the claims are not adequately described.

Appellants argue that “the phrase ‘CREB/CREM/ATF-1 subfamily member’ is a term routinely used by the skilled artisan to refer to CREB, CREM and ATF-1 proteins” which “have been shown . . . to be functionally related.” See Appeal Brief, page 10. Appellants argue further that “the specification teaches that CREB/CREM/ATF-1 subfamily members include mammalian CREB, mammalian CREM and mammalian ATF-1.” Id. at 10-11.

In response, the examiner argues that “the specification has not adequately described these genera in sufficient form that the artisan can readily identify and/or describe the genus members, as . . . no definitive or functional features are delineated.” Examiner’s Answer, page 12. The examiner also asserts that “only specific teachings of dCREBa activation and dCREB2b repression have been shown to affect learning and memory in *Drosophila*.” Id.

On page 16 of the specification, appellants discuss the mammalian CREB/ATF family of protein, citing numerous references. In addition, the specification teaches, again citing several references, that the mammalian CREB and CREM genes are remarkably similar to one another, see id. at 14, and also teaches that dCREB2 is a member of the cAMP-responsive CREB/CREM/ATF-1 subfamily of the CREB/ATF family, see id. at 12. The specification thus demonstrates, as argued by appellants, that the phrase “CREB/CREM/ATF-1 subfamily member” is a term routinely used by the skilled artisan to refer to CREB/CREM and ATF-1 proteins. The specification thus provides adequate written description support for the phrase CREB/CREM/ATF-1 subfamily

members, and the rejection of claims 9-20 and 39-50 under 36 U.S.C. § 112, first paragraph, as lacking adequate written description, is reversed.

3. Rejection under 35 U.S.C. § 112, first paragraph, lack of enablement

Claims 9-20 and 39-50 stand rejected under 35 U.S.C. § 112, first paragraph, on the grounds that the specification, “while being enabling for assessing the effect of a drug on particular species of dCREB2 activators and repressors as disclosed in the specification, see in particular pp. 2-12, etc., does not reasonably provide enablement for the claimed invention as drawn to a genus and subfamily of molecules. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.” Paper No. 10, page 5.

According to the rejection,

the specification fails to teach a mammalian assay for assessing the effect of a drug on long term memory formation, a mammalian method for screening a pharmaceutical agent for its ability to modulate long term memory and fails to teach a mammalian assay for determining the relative levels of mammalian dCREB2, activators, repressors, CREB/CREM/ATF-1 subfamily members, activator isoforms, repressor isoforms and antagonists. The specification only discloses Drosophila activators as set forth, see in particular dCREB2a, dCREB2b, dCREB2c, etc. One skilled in the art recognizes that although different species often possess homologous proteins, the skilled artisan is unable to predict with any measure of certainty the function of structurally divergent molecules [citing Skolnick⁴, abstract and Box 2]. Thus, for those divergent peptide structures between Drosophila as disclosed and mammalian as claimed, the skilled artisan would be required to perform further undue experimentation to discover those peptides

⁴ Skolnick et al. (Skolnick), “From genes to protein structure and function: novel applications of computational approaches in the genomic era,” TIBTECH, Vol. 18, pp. 34-39 (2000).

which possess the properties claimed, an assay for determining such levels and a mammalian testing paradigm for the assessment of such effects on long term memory.

Paper No. 6, pages 8-9.

The rejection also cites Smith⁵ to support the proposition that “several aspects of long-term memory (LTM) as a complex phenomenon wherein the underlying neurochemical/biochemical/genetic substrates are not understood, in particular when compared across species.” Id. at 9. In addition, according to the rejection, Smith discloses that “experimental studies, paradigms and designs for assessing and ‘measuring’ LTM varies widely across species; applicants’ specification fails to provide support for experimental model used to assess LTM in *Drosophila* as valid for assessing LTM in any mammal.” Id.

“[T]he PTO bears an initial burden of setting forth a reasonable explanation as to why it believes that the scope of protection provided by that claim is not adequately enabled by the description of the invention provided in the specification of the application; this includes, of course, providing sufficient reasons for doubting any assertions in the specification as to the scope of enablement.” In re Wright, 999 F.2d 1557, 1561-62, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993). See also In re Armbruster, 512 F.2d 676, 678, 185 USPQ 152, 153 (CCPA 1975) (“Section 112 does not require that a specification convince persons skilled in the art that the assertions therein are correct.”).

⁵ Smith, Elements of Molecular Biology, Second Edition, John Wiley & Sons Ltd., pp. 419-443 (1996).

We find that the examiner has not met the burden of demonstrating that the specification fails to enable one skilled in the art to make and/or use the full scope of the claimed invention. The examiner, as with the previous rejection, appears to be concerned with the breadth of the phrase CREB/CREM/ATF-1 subfamily members, but as discussed above, that phrase would identify a particular family of related proteins to the skilled artisan, and the examiner has not established otherwise.⁶

Skolnick does not support the examiner's position, as that is a general reference discussing sequence-based methods for function prediction. It therefore does not provide support for the proposition that CREB/CREM/ATF-1 subfamily members do not have similar functions in different species. The Smith reference fails to support the examiner's position for the same reason—it is a general reference and again does not support the proposition that CREB/CREM/ATF-1 subfamily members do not have similar functions in different species.

Thus, the rejection of claims 9-20 and 39-50 under 35 U.S.C. § 112, first paragraph, on the grounds that the specification fails to enable the full scope of the claimed subject matter, is reversed.

⁶ We also take note of Hummler et al., "Targeted mutation of the CREB gene: Compensation within the CREB/ATF family of transcription factors," Proc. Nat'l Acad. Sci., USA, Vol. 91, pp. 5647-5651 (1994), cited by appellants, which teaches that "[s]ince the cloning of CREB, a large number of CRE binding proteins have been identified. They all contain a leucine-zipper DNA binding motif and for some members the potential for heterodimerization has been demonstrated in vitro. . . . CREM, ATF1 and CREB are strongly related in sequence and appear to be involved in cAMP signaling to the nucleus." Id. at 5647, Col. 1.

CONCLUSION

The rejections of claims 9-20 and 39-50 under 35 U.S.C. § 112, second paragraph, claims 9-20 and 39-50 under 35 U.S.C. § 112, first paragraph, for lack of adequate written description, and claims 9-20 and 39-50 under 35 U.S.C. § 112, first paragraph, for lack of enablement, are reversed for the reasons set forth supra.

REVERSED

DEMETRA J. MILLS)	
Administrative Patent Judge)	
)	
)	
)	BOARD OF PATENT
ERIC GRIMES)	
Administrative Patent Judge)	APPEALS AND
)	
)	INTERFERENCES
LORA M. GREEN)	
Administrative Patent Judge)	

Appeal No. 2003-0835
Application No. 09/419,371

Page 12

Hamilton, Brook, Smith & Reynolds, P.C.
530 Virginia Road
P.O. Box 9133
Concord, MA 01742-9133