

Internal distribution code:

- (A) Publication in OJ
(B) To Chairmen and Members
(C) To Chairmen
(D) No distribution

**Datasheet for the decision
of 27 March 2012**

Case Number: T 0181/11 - 3.3.09

Application Number: 06728307.7

Publication Number: 1898722

IPC: A23L 1/29, A23J 7/00,
A61P 25/28, C07F 9/10

Language of the proceedings: EN

Title of invention:
Polar lipid mixtures, their preparation and uses

Applicant:
Enzymotec Ltd.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56, 123(2)

Keyword:
"Main request (added subject-matter - yes)"
"Auxiliary request (inventive step - yes)"

Decisions cited:
-

Catchword:
-



Case Number: T 0181/11 - 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 27 March 2012

Appellant: Enzymotec Ltd.
(Applicant) Ramat-Gavriel Industrial Park
P.O. Box 6
Migdal Haemek 23106 (IL)

Representative: Kraak, Hajo
Vereenigde
Johan de Wittlaan 7
Postbus 87930
NL-2517 JR Den Haag (NL)

Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted 30 July 2010
refusing European patent application
No. 06728307.7 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman: W. Sieber
Members: J. Jardón Álvarez
K. Garnett

Summary of Facts and Submissions

- I. This appeal lies from the decision of the examining division dated 30 July 2010, refusing European patent application No. 06 728 307.7.
- II. The decision was based on a set of 27 claims filed during the oral proceedings on 16 June 2010 before the examining division as main (sole) request. This set of claims includes two claims with the number 16. In the following, the second claim with the number 16 will be referred to as 16bis.

The subject-matter of the then pending independent claims was directed to a (man-made) lipid preparation (claims 1 and 16bis), a process for the preparation of a lipid preparation (claim 14), a dietary supplement comprising a lipid preparation (claim 18), a method for preparing a dietary supplement (claim 21), a food article and an infant formula comprising the dietary supplement (claims 25 and 26).

The examining division refused the application because in its opinion the subject-matter of the independent claims did not meet the requirements of inventive step.

The examining division based its objections on the disclosures of the following documents:

D1: US 2004/0022922 A1;

D2: A. Sala Vila *et al.*, "High-performance liquid chromatography with evaporative light-scattering detection for the determination of phospholipid

classes in human milk, infant formulas and phospholipid sources of long-chain polyunsaturated fatty acids." Journal of Chromatography A, 1008 (2003) pages 73-80; and

D3: PATENT ABSTRACTS OF JAPAN vol. 015, no. 189 (C-0831), 15 May 1991 & JP 03 047192 A

The examining division held that the skilled person would have arrived at the claimed lipid preparations by combining the teaching of the closest prior art document, D1, with documents D2 and D3. Concerning the process for the preparation of the lipid composition, claim 14, the examining division noted that this claim indicated the problem to be solved, namely the avoidance of transphosphatidylolation, without providing the means to solve it.

III. On 27 September 2010 the applicant (appellant) filed a notice of appeal, paying the appeal fee on the same day. The statement setting out the grounds of appeal was filed on 9 December 2010 including a set of 20 claims.

The appellant requested that the decision under appeal be set aside and that a patent be granted based on this set of claims.

IV. On 28 November 2011 the board dispatched a summons to oral proceedings scheduled to take place on 30 March 2012. In the annexed communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal, the board indicated the points to be discussed during the oral proceedings and expressed its preliminary opinion on the case. In particular, the

board noted that no inventive step could be seen for the subject-matter of claims directed to man-made lipid preparations. The board also raised objections under Articles 123(2) and 84 EPC to the process of claim 1.

- V. With its letter dated 15 February 2012, the appellant filed a set of amended claims. All product claims were deleted.

The only independent claim read as follows:

"1. A process for the preparation of a lipid preparation which comprises a mixture of glycerophospholipids being phosphatidyl-choline (PC), phosphatidylethanolamine (PE), phosphatidyl-serine (PS) and phosphatidylinositol (PI), and sphingomyelin (SM), wherein the ratio between said polar lipids is $SM \geq PC > PE > PS > PI$, comprising the steps of:

(a) providing a natural non-brain animal lipid source which has a substantially low content of polar lipids, having a ratio $PC > PE > SM > PS > PI$;

(b) removing non-lipid material from said lipid source, dispersing the lipids, preferably with agitation, in a suitable organic solvent or a mixture of organic solvents, wherein said suitable organic solvent is a mixture of a polar organic solvent and a non-polar solvent and wherein said suitable organic solvent optionally contains water;

(c) separating the dissolved lipid fraction obtained in step (b) and removing the organic solvent therefrom to give a lipid fraction;

(d) de-oiling said lipid fraction obtained in step (c) at least once to remove any non-polar lipids; and

(e) filtering and drying said polar lipids obtained in step (d), wherein the natural non-brain animal lipid source is derived from bovine milk and contains 0.1-10%w/w PC, 0.1-5%w/w SM, 0.1-5%w/w PE, 0.1-5%w/w PS, and 0.1-5%w/w PI."

VI. By communication dated 12 March 2012, the appellant was informed that, in the preliminary opinion of the board, the subject-matter of claim 1 of the newly filed request did not fulfil the requirements of Article 123(2) EPC.

VII. With its letter of 13 March 2012 the appellant filed a clean version of the claims filed with the letter of 15 February 2012, now its main request, and a set of amended claims for an auxiliary request. The appellant also withdrew its request for oral proceedings.

Claim 1 of the auxiliary request read as follows:

"1. A process for the preparation of a lipid preparation which comprises a mixture of glycerophospholipids being phosphatidyl-choline (PC), phosphatidylethanolamine (PE), phosphatidyl-serine (PS) and phosphatidylinositol (PI), and sphingomyelin (SM), wherein the ratio between said polar lipids is $SM \geq PC > PE > PS > PI$, comprising the steps of:

(a) providing a natural non-brain animal lipid source which has a substantially low content of polar lipids, having a ratio $PC > PE > SM > PS > PI$;

(b) removing non-lipid material from said lipid source, dispersing the lipids, preferably with agitation, in a suitable organic solvent or a mixture of organic solvents, wherein said suitable organic

solvent is a mixture of a polar organic solvent and a non-polar solvent and wherein said suitable organic solvent optionally contains water;

(c) separating the dissolved lipid fraction obtained in step (b) and removing the organic solvent therefrom to give a lipid fraction;

(d) de-oiling said lipid fraction obtained in step (c) at least once to remove any non-polar lipids; and

(e) filtering and drying said polar lipids obtained in step (d), wherein the natural non-brain animal lipid source is derived from bovine milk and contains 2.6%w/w SM, 4%w/w PC, 3.2%w/w PE, 1.6%w/w PS, and 0.9%w/w PI."

Claims 2 to 8 were dependent claims.

VIII. By communication dated 20 March 2012 the oral proceedings were cancelled.

IX. The relevant arguments presented by the appellant may be summarised as follows:

The amendments made to the main request were supported by the application as filed. The first full paragraph on page 15 giving the ranges for the various lipids was not to be read in isolation but in context. In the previous paragraph, the natural lipid source was defined more precisely as being derived from bovine milk. It would be immediately clear to the skilled person that the specific embodiment on page 15 was within the definition of the preference indicated in the preceding paragraph.

Moreover, even if the skilled person would consider that the defined ranges might come from any source, he would still appreciate that the lipids in the application were disclosed to be preferably sourced from bovine milk. There was no reason why this should not hold for the embodiment of page 15, first full paragraph.

Concerning inventive step, the claimed process allowed the preparation of lipid compositions having the lipid ratio of human milk fat starting from a specific phospholipid source derived from bovine milk and without a transphosphatidylation step. The claimed process could not be derived from D1, the composition of D1 lacking sphingomyelin and having a different ratio of lipids. Moreover, D1 actually taught away from the use of animal sources as starting material.

The skilled person would also not arrive at the claimed process when combining D1 with either D2 or D3 because these documents neither suggested the use of the specific source defined in claim 1 nor the process steps necessary to obtain a lipid preparation.

- X. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the main or the auxiliary request, both filed with the letter of 13 March 2012.

Reasons for the Decision

1. The appeal is admissible.

MAIN REQUEST

2. *Amendments (Article 123(2) EPC)*

2.1 Claim 1 of the main request is based on the process of claim 20 as filed (see also page 13, line 25 to page 14, line 8 of the application as filed) including the further features of claim 23 as filed (the ratio between the polar lipids of the obtained lipid preparation being SM \geq PC>PE>PS>PI) and claim 24 as filed (the organic solvent being a mixture of a polar organic solvent and a non-polar solvent, optionally containing water).

Thus these amendments are clearly supported by the application as filed.

2.2 Additionally, the natural non-brain animal lipid source is specified as:

- (i) being derived from bovine milk;
- (ii) containing 0.1-10%w/w PC, 0.1-5%w/w SM, 0.1-5%w/w PE, 0.1-5%w/w PS, and 0.1-5%w/w PI"; and
- (iii) having a ratio (of lipids) PC>PE>SM>PS>PI.

2.3 As regards the amendments (i) and (iii), page 14, line 36 of the application discloses that the natural lipid source is preferably derived from bovine milk and the last sentence on page 19 mentions that the lipid ratio in the raw bovine milk-derived starting mixture is PC>PE>SM>PS>PI. Amendment (ii) is disclosed in the first full paragraph on page 15 where it is stated that "in a specific embodiment the natural lipid source contains about 0.1-10%w/w PC, about 0.1-5%w/w PE, about 0.1-5%w/w PS, and about 0.1-5%w/w PI and optionally

contains sphingomyelin, preferably at a level of about 0.1-5%w/w."

- 2.4 However, there is no support for the claimed combination of features. In particular there is no clear and unambiguous indication in the relevant paragraph at page 15 that the lipid amounts, *i.e.* those of amendment (ii), relate to bovine milk, having the specified ratio of lipids, as lipid source. In fact, the only lipid amounts disclosed in the context of bovine milk are disclosed in table 2 on page 19 of the application as filed. These amounts are very specific and only one value is given for each lipid.
- 2.5 The board cannot accept the argument of the appellant that the skilled person would read the lipid amounts in the first full paragraph on page 15 as a further narrowing down of the disclosure of the previous paragraph.
- 2.5.1 Firstly, the paragraph at page 15 simply states: "In a specific embodiment the natural liquid source contains about ... ". There is no explicit reference to bovine milk.
- 2.5.2 Secondly, if one examines the claim structure of the claims as filed the board notes that claims 28 to 30 as filed define the natural lipid source as being derived "preferably from a marine source, more preferably from an animal origin, most preferably from bovine milk fat or from poultry eggs" (claim 28), "from bovine milk" (claim 29) and by reference to the amount of phospholipids (claim 30), which are identical to the amounts in the paragraph at page 15 and in

amendment (ii). In this context the board also notes that claim 30 refers back to the process of claims 17 to 27 but not to the process of claims 28 and/or 29, which relate to bovine milk. This indicates that the amounts of lipids defined in claim 30 as filed (and consequently in the first full paragraph at page 15) relate to a lipid source in general and not specifically to a bovine milk source as argued by the appellant.

2.6 In summary, the amendments with respect to the use of a lipid source derived from bovine milk containing 0.1-10%w/w PC, 0.1-5%w/w SM, 0.1-5%w/w PE, 0.1-5%w/w PS, and 0.1-5%w/w PI in a ratio of PC>PE>SM>PS>PI are not clearly and unambiguously derivable from the application as filed.

2.7 Claim 1 of the main request therefore does not fulfil the requirements of Article 123(2) EPC.

AUXILIARY REQUEST

3. *Amendments (Article 123(2) EPC)*

3.1 In claim 1 of the auxiliary request the lipid source is defined as disclosed for the commercial bovine milk preparation used in the example of the patent (see page 19, table 2 and page 34, Example 1) containing 2.6%w/w SM, 4%w/w PC, 3.2%w/w PE, 1.6%w/w PS, and 0.9%w/w PI and having a ratio of lipids of PC>PE>SM>PS>PI (see page 19, last line).

Thus, claim 1 of the auxiliary request is supported by the disclosure of the application as originally filed.

3.2 Claim 2 is based on claim 21 as filed, claims 3 to 6 are based respectively on claims 24-27 as filed, and claims 7 and 8 are based on claim 29 as filed.

3.3 The amended claims therefore comply with the requirements of Article 123(2) EPC.

4. *Novelty*

No novelty objection was raised by the examining division with regard to the process claim. The board is also satisfied that the process of claim 1 of the auxiliary request is novel over the cited documents.

5. *Inventive step (Article 56 EPC)*

5.1 The invention as now claimed relates to a method for the preparation of a phospholipid composition comprising phosphatidylcholine (PC), phosphatidylethanolamine (PE), phosphatidylserine (PS) and phosphatidylinositol (PI), and sphingomyelin (SM) in a ratio similar to the ratio found in human milk fat.

5.2 The decision under appeal and the appellant considered D1 as representing the closest prior-art and the board sees no reason to differ.

5.3 D1 discloses an infant formula in a powder or solution form, which formula is similar to human milk. The infant formula is supplemented with glycerophospholipids and more particularly with phosphatidylserine (see paragraphs [0001] and [0016])). The phosphatidylserine is produced by enzymatic

reaction with phospholipase-D using as the substrate soy bean lecithin, rapeseed lecithin or egg yolk lecithin (see [0015]). The infant formulas disclosed in D1 include a phospholipid supplement which is a mixture of phosphatidylcholine, phosphatidylethanolamine, phosphatidylserine, phosphatidylinositol and phosphatidic acid (see Tables 1 and 2). The infant formulas of D1 do not include sphingomyelin.

5.4 Having regard to the disclosure of this document, the technical problem underlying the present application is to be seen in the provision of an alternative method for the preparation of a lipid preparation mimicking the polar lipid content of human milk fat.

5.5 As a solution to this problem the application proposes the claimed process using a natural non-brain animal lipid source derived from bovine milk as starting material which is then fractionated and de-oiled to obtain a lipid composition having the ratio of lipids found in human milk fat.

The board is satisfied that this problem has been credibly solved by the claimed process. Example 1 in the specification shows that a lipid preparation having the lipid profile of human milk can be obtained by the claimed process starting from bovine milk (see also Tables 2 and 3).

5.6 It remains to be decided whether, in view of the available prior-art documents, it would have been obvious for the skilled person to solve the technical problem identified above by the means claimed.

5.7 There is no hint to this solution in the prior art cited in the appealed decision. The compositions of D1 do not include sphingomyelin and have a different ratio of phosphatidylcholine to phosphatidylethanolamine. Moreover, the phosphatidylserine added is obtained by a different process using transphosphatidylation. Finally, D1 discourages the use of animal sources for infant formulations (see paragraph [0006]).

5.8 There is also no hint to the claimed process in documents D2 or D3, neither of these documents dealing with a process for the preparation of a lipid preparation.

Thus, D2 aims to develop a method for the determination of phospholipids in human milk, infant formulas and phospholipidic sources of long chain polyunsaturated fatty acids by high performance liquid chromatography with evaporative light-scattering detection (see Abstract). It contains no suggestion of how to treat a bovine milk-derived mixture to obtain the desired lipid composition.

Finally, D3 describes a method for fractionating and purifying phospholipids by centrifugal liquid-liquid partition chromatography. It does not give any hint of how to prepare the claimed lipid preparation.

5.9 The examining division did not acknowledge an inventive step for the then pending product claims essentially because it considered that it would have been obvious for the skilled person to improve the similarity between the phospholipid compositions to that of human milk. Concerning the then pending process claim, the

examining division indicated that the claim only stated the problem to be solved without providing the means required to come to a solution.

These arguments no longer apply in view of the amendments made to the claims. Thus, the present set of claims does not include any product claim and the process claim has been amended to include the process steps which ensure that the desired lipid preparation is obtained.

- 5.10 For these reasons, the board considers that the subject-matter of claim 1 and, by the same token, of dependent claims 2 to 8 involves an inventive step within the meaning of Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the examining division with the order to grant a patent on the basis of claims 1 to 8 of the auxiliary request filed with the letter dated 13 March 2012, after any necessary consequential adaptation of the description.

The Registrar:

The Chairman:

G. Röhn

W. Sieber