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— of inventorship (Rule 4.17(iv))

Published:

— with international search report (Art. 21(3))

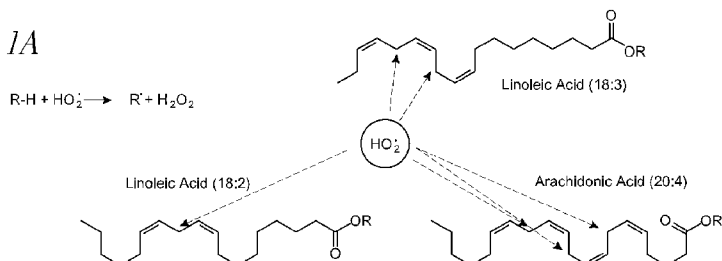
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

31 January 2013

(54) Title: OXIDATIVE RETINAL DISEASES

FIG. 1A



(57) Abstract: Some aspects of the invention provide for a method of treating Wet and/or Dry Age-related Macular Degeneration, Retinitis Pigmentosa, Diabetic Retinopathy, cataracts, and/or Stargardt Disease using polyunsaturated fatty acids which are modified in certain positions to attenuate oxidative damage by Reactive Oxygen Species (ROS) and/or suppress the rate of formation of reactive products and toxic compounds.

A. CLASSIFICATION OF SUBJECT MATTER

A61K 31/20(2006.01)i, A61K 31/202(2006.01)i, A61K 31/122(2006.01)i, A61K 31/375(2006.01)i, A61P 27/02(2006.01)i, A61P 27/00(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61K 31/20; A61K 31/685; A61K 31/201; A23L 1/29; G01N 33/543

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal), Pubmed and Keywords: "polyunsaturated", "fatty acid", "PUFA", "oxidation", "isotope", "deuterium", "coenzyme Q", "antioxidant", "retinal", "macular degeneration", "retinitis pigmentosa", "retinopathy", "sclerosis"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	HILL, S. Isotope-reinforced polyunsaturated fatty acids protect yeast cells from oxidative stress. Free Radical Biology & Medicine, 1 January 2011, Vol. 50, pp. 130-138. See abstract; page 131, left column, paragraph 3 - right column, paragraph 1; page 133, left column, paragraph 2 - right column, paragraph 2; figures 1,4-7; page 137, right column, paragraph 2.	1-15
A	SHCHEPINOV, M. S. et al. Isotope effect, essential diet components, and prospects of aging retardation. Russian Journal of General Chemistry, 2010, Vol. 80, No. 7, pp. 1514-1522 See abstract; page 1514, right column, paragraph 3; figure 2; page 1521, right column, paragraph 1.	1-15
A	US 2009-0215896 A1 (MORSEMAN, J. P. et al.) 27 August 2009 See abstract; paragraph [0010]; claims 1,30.	1-15
A	US 2011-0028434 A1 (DESTAILLATS, F. et al.) 03 February 2011 See abstract; paragraph [0076]; claim 1.	1-15



Further documents are listed in the continuation of Box C.



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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/034836

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009-0215896 A1	27.08.2009	AU 2005-208832 A1 CA 2551882 A1 CN 1933828 A CN 1933828 C0 EP 1713463 A2 EP 1713463 A4 JP 2007-524674 A JP 2007-524674 T WO 2005-072306 A2 WO 2005-072306 A3 WO 2005-072306 A3	11.08.2005 11.08.2005 21.03.2007 21.03.2007 25.10.2006 18.03.2009 30.08.2007 30.08.2007 11.08.2005 09.03.2006 11.08.2005
US 2011-0028434 A1	03.02.2011	CN 102046028 A EP 2110027 A1 EP 2262382 A1 JP 2011-516054 A TW 200946033 A WO 2009-121839 A1	04.05.2011 21.10.2009 22.12.2010 26.05.2011 16.11.2009 08.10.2009