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## (12) United States Patent

#### Sampalis

#### (54) NATURAL MARINE SOURCE PHOSPHOLIPIDS COMPRISING POLYUNSATURATED FATTY ACIDS AND THEIR APPLICATIONS

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- (58) **Field of Classification Search** ...... None See application file for complete search history.

#### (56) References Cited

#### U.S. PATENT DOCUMENTS

2003/0083238 A1\* 5/2003 Toda et al. ..... 514/9

#### FOREIGN PATENT DOCUMENTS

EP	0 609 078 A1	8/1994
WO	WO 92 21335 A	12/1992
WO	WO 97 39759 A	10/1997
WO	WO 00 23546 A	4/2000

#### OTHER PUBLICATIONS

ACS Chemical Registry, "4H-1-Benzopyran-4-one, 2-(3,4dihydroxypheny1)-6,8-di-β-D-glucopyranosyl-5,7-dihydroxy-, ", Nov. 16, 1984, 1 page.\*

Aureli, M. et al. Aging brain: effect of acetyl L-carnitine treatment on rat brain energy and phospholipid metabolism. A study by <sup>31</sup>P and <sup>1</sup>H NMR spectroscopy. *Brain Research*. 1990; 526(1): 108-112.

Barak, Y. et al. Inositol treatment of Alzheimer's disease : a double blind, cross-over placebo controlled trial. *Prog. Neuropsychopharmacol. Biol. Psychiatry* 1996; 20: 729-735. Bast, A. et al. Interlay between lipoic acid and glutathione in the

## (10) Patent No.:US 8,030,348 B2(45) Date of Patent:Oct. 4, 2011

Bell, M.V. et al. Molecular Species Composition of the Major Diacyl Glycerophospholipids from Muscle, Liver, Retina and Brain of Cod (*Gadus morhua*). Lipids 1991: 26(8): 563-73.

Benjamin, J. et al. Double-blind, placebo-controlled, crossover trial of inositol treatment for panic disorders. *Am. J. Psychiatry* 1995; 15: 1084-1086.

Birchall, J. et al. Aluminum, chemical physiology, and Alzheimer's disease. *Lancet* 1988; 29:1008-1010.

Caprioli, A. et al. Age-dependent deficits in radial maze performance in the rats: effect of chronic treatment with acetyl L-carnitine. *Prog. In Neuropsychopharmacol. Biol. Psychiatr.* 1990; 14(3): 3 59-369.

Cheng, D. et al. A novel promising acetylcholinesterase inhibitor. *Neuroreport* 1996; 8: 97-101.

Devasagayam, T.P. et al., Prevention of Singlet Oxygen-Induced DNA Damage by Lipoate. *Chemical Biological Interactions* 1993; 86 : 79-92.

Ghirardi, O. et al. Effects of acetyl L-carnitine chronic treatment on discrimination models in aged rats. *Pysiol. Behav.* 1988; 44(6): 769-773.

Gill, D.L. et al. Calcium signalling mechanisms in endoplasmic reticulum activated by inositol 1, 4, 5 triphosphate and GTP. *Cell Calcium* 1989; 10: 363-374.

Henderson, R.J. et al. Lipid Composition fo the Pineal Organ from Rainbow Trout (*Oncorhynchus mykiss*). *Lipids* 1994; 29(5): 311-17. Hosokawa, M. et al., Conversion to Docosahexaenoic Acid-Containing Phosphatidylserine from Squid Skin Lecithin by Phospholipase D-Mediated Transphosphataidylation. *Journal of Agricultural and Food Chemistry* 20000; 48(10): 4550-54.

Imperato, A. et al. L-carnitine enhances acetylcholine release in the striatum and hippocampus of awake freely moving rats. *Neuroscience Letters*. 1989: 107(1-3): 251-255.

Kagan, V.E. et al. Dihydrolipoic acid: A universal antioxidant both in the membrane and in the aqueous phase. *Biochem. Pharmacol.* 1992; 44: 1637-1649.

Kawakami, Y. et al. The rationale for E2020 as a potent acetylcholinesterase inhibitor. *Bioorg. Med. Chem.* 1996; 4: 1429-1446.

Kitamura, H. et al. Inhibition of myo-inositol transport causes acute renal failure with selective medullary injury in the rat. *Kidney Int.* 1998; 53: 146-153.

Knopman, D. et al. Long term tacrine (Cognex) treatment: effects on nursing home placement and mortality, tacrine study group. *Neurology* 1996; 47: 166-167.

Levine, J. et al. Double-blind, controlled trial of inositol treatment of depression. *Am. J. Psychiatry* 1995; 152: 792-794 (Abstract Only). Levine, J. et al. Inositol treatment raises CSF inositol levels. *Brain* 

Research 1993; 627 : 168-169. Levine, J. Controlled trials of inositol in psychiatry. *Eur. Neuropsychopharmacol.* 1997; 7: 147-155.

Colodny, L. et al. Altern. Med. Rev. 1998; 3(6): 432-447.

Mohr, E. et al. Treatment of Alzheimer's disease with sabeluzole :

functional and structural correlates. *Clin. Neuropharmacol.* 1997; 20: 338-345 (Abstract Only).

Paradies, G. et al. Carnitine-acylcarnitine translocase activity in cardiac mitochondria from aged rats: the effect of acetyl-L-carnitine. *Mech. of Aging and Develop.* 1995; 84(2): 103-112.

Parthasarathy, L. et al. Biochemical and molecular properties of lithium-sensitive myo-inositol monophosphatase. *Life Sci.* 1994; 54: 1127-1142.

(Continued)

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#### (57) **ABSTRACT**

A phospholipid extract from a marine or aquatic biomass possesses therapeutic properties. The phospholipid extract comprises a variety of phospholipids, fatty acid, metals and a novel flavonoid.

#### OTHER PUBLICATIONS

Rogers, S. et al. The efficacy and safety of donepezil in patients with Alzheimer's disease: results of a US multicentre, randomized, double-blind, placebo-controlled trial. The donepezil study group. *Dementia* 1996; 7: 293-303 (Abstract Only).

Schneider, L. et al. Potential role for estrogen replacement in the treatment of Alzheimer's dementia. *Am. J. Med.* 1997; 103: 46S-50S. Seidman, M. Polyunsaturated Phosphatidylcholine in NT Factor<sup>™</sup> Improves Mitochondrial Function, Auditory Sensitivity and May Slow Some Aspects of the Aging Processes. *Anti-Aging Medical News*, Winter 2001.

Suzuki, Y.J. et al. Aipha-lipoic acid is a potent inhibitor of NFKb activation in human Tcells. *Biochem. Biophys. Res. Commun.* 1992; 189: 1709-1715 (Abstract Only).

Van Dyck, C. et al. The acetylcholine releaser linopiridine increases pariental regional cerebral blood flow in Alzheimer's disease. *Psychopharmacology* 1997; 132: 217-226.

Wiegand, R. et al. Phospholipid Molecular Species of Frog Rod Outer Segment Membranes. *Exp. Eye Res.* 1983; 37(2): 159-73.

\* cited by examiner

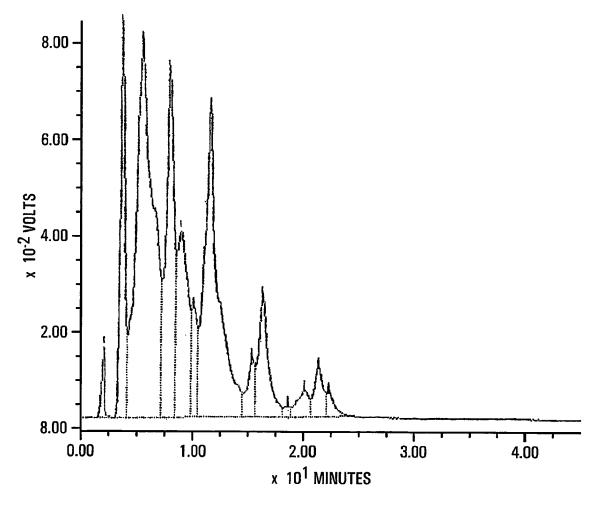
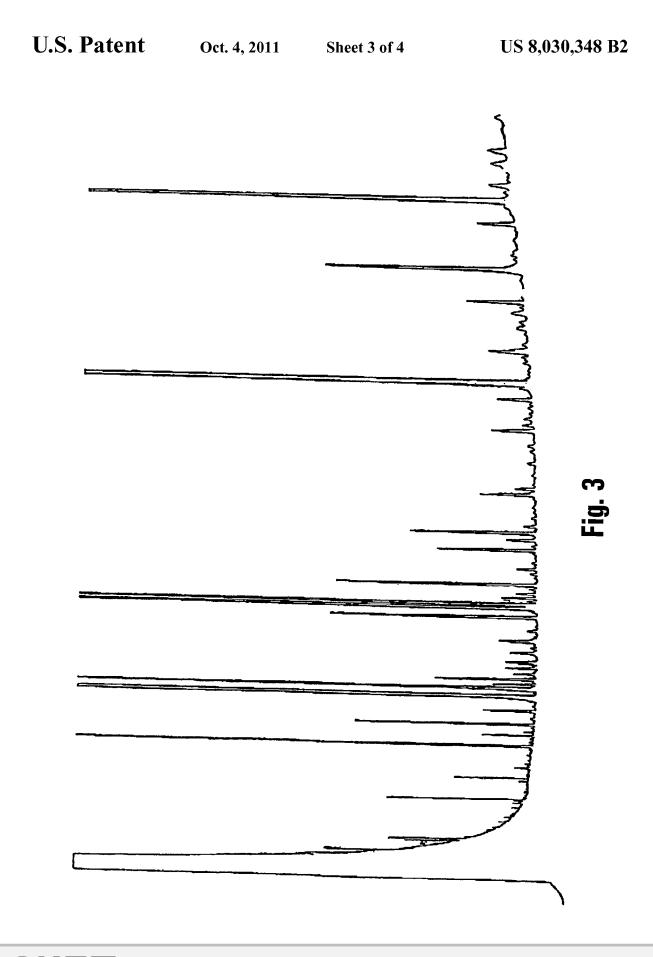


Fig. 1



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