# Pharmaceutical compound for the prevention and treatment of a cognitive, neurodegenerative or neuronal disorder or disease

The present invention relates to a chemical compound according to claim 1, a pharmaceutical compound for use as a medicament according to claim 2 and a pharmaceutical compound for use in the treatment of a cognitive disorder or disease according to claim 3, a pharmaceutical composition according to claim 5, and a method of preparing a pharmaceutical composition according to claim 15. The compound of the present invention may be used in particular for treating the Alzheimer Disease.

## Description – Background:

Alzheimer's disease (AD) is the most common form of dementia. Most often, it is diagnosed in people over 65 years of age, although the less-prevalent early-onset Alzheimer's can occur much earlier. In 2006, there were 26.6 million sufferers worldwide. Alzheimer's is predicted to affect 1 in 85 people globally by 2050. The earliest observable symptoms are often mistakenly thought to be 'age-related' concerns, or manifestations of stress. In the early stages, the most commonly recognised symptom is inability to acquire new memories, such as difficulty in recalling recently observed facts.

As the disease advances, gradually, bodily functions are lost, ultimately leading to death. Individual prognosis is difficult to assess, as the duration of the disease varies. AD develops for an indeterminate period of time before becoming fully apparent, and it can progress undiagnosed for years. The mean life expectancy following stage 2 diagnosis is approximately seven years. Fewer than three percent of individuals live more than fourteen years after diagnosis. In developed countries, AD is one of the most costly diseases to society.

A 2004 study tried to explain the causes of the AD and found that deposition of amyloid plaques does not correlate well with neuron loss. This observation supports the tau hypothesis, the idea that tau protein abnormalities initiate the disease cascade.

Another cause, on which most currently available drug therapies are based, is the cholinergic hypothesis, which proposes that AD is caused by reduced synthesis of the neurotransmitter acetylcholine. The cholinergic hypothesis has not maintained widespread support, largely because medications intended to treat acetylcholine deficiency have not been very effective. Other cholinergic effects have also been proposed, for example, initiation of large-scale aggregation of amyloid, leading to generalised neuroinflammation.

Four medications are currently approved by regulatory agencies such as the U.S. Food and Drug Administration (FDA) and the European Medicines Agency (EMA) to treat the cognitive manifestations of AD: three are acetylcholinesterase inhibitors and the other is memantine, an NMDA receptor antagonist. No drug has an indication for delaying or halting the progression of the disease.

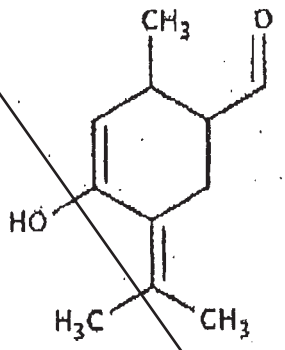
At present, there is no definitive evidence to support that any particular measure is effective in preventing AD.

The journal “Food chemistry” 116 (2009), pages 470 to 479, relates to the antioxidant, anticholinesterase and antimicrobial constituents from the essential oil and ethanol extract of Salvia potentillifolia.

The journal “Food chemistry” 108 (2008), pages 663 to 668, relates to the inhibitory effect of Turkish Rosmarinus officinalis L. on acetylcholinesterase and butyrylcholinesterase enzymes.

CLAIMS

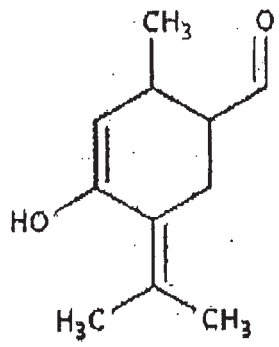
1. Compound having the Formula (1):




Formula (1)

the compound being the CIS isomer and the TRANS isomer.

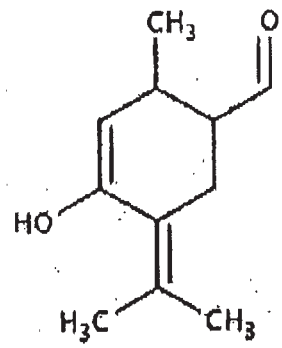
2. A pharmaceutical compound having the Formula (1), the pharmaceutical compound being the CIS isomer and the TRANS isomer:




Formula (1)

or a pharmaceutically acceptable salt thereof for use as a medicament.

3. A pharmaceutical compound having the Formula (1), the pharmaceutical compound being the CIS isomer and the TRANS isomer:




Formula (1)

or a pharmaceutically acceptable salt thereof,

for use in the prevention or treatment of the **Alzheimer's disease.**

4. A pharmaceutical composition comprising the compound of claim 1 and a pharmaceutically acceptable carrier.

5. The pharmaceutical composition of claim 5 wherein the pharmaceutically acceptable carrier is a base oil selected from the group consisting in :
acai oil, almond oil, amaranth oil, apple seed oil, apricot oil, argan oil, artichoke oil, avocado oil, babassu oil, ben oil, blackcurrant seed oil, borage seed oil, borneo tallow nut oil, bottle gourd oil, buffalo gourd oil, butternut squash seed oil, cape chestnut oil, carob pod oil, carob seed pods oil, cashew oil, cassia oil, castor oil, cocklebur oil, cocoa butter, coconut oil, cohune oil, coriander seed oil, corn oil, cotton seed oil, dika oil, evening primrose oil, false flax oil, flax seed oil, grape seed oil, hazelnut oil, hemp oil, kapok seed oil, kenaf Seed oil, lallemantia oil, macadamia oil, marula oil, meadowfoam seed oil, mongongo nut oil (or manketti oil), mustard oil, nutmeg butter, oils from melon and gourd seeds, okra seed oil, olive oil, palm oil, papaya oil, peanut oil, pecan oil, pequi oil, perilla seed oil, pine nut oil, pine nut oil, pistachio oil, poppyseed oil, prune kernel oil, pumpkin seed oil, quinoa oil, radish oil, ramtil oil, rapeseed oil, rice bran oil, royle oil, sacha inchi, safflower oil, salicornia oil, sesame oil, soybean oil, sunflower oil, tea seed oil, thistle oil, tigernut oil, tomato seed oil, tung oil, walnut oil, watermelon seed oil, wheat germ oil.

6. The pharmaceutical composition of claim 6, wherein the base oil is a fatty acid selected from the group consisting in: lauric acid, myristic acid, palmitic acid, caprylic acid, capric acid, stearic acid, caprioc acid, oleic acid, linoleic acid, arachidic acid, behenic acid, lignoceric acid, palmitoeic acid, linoleic acid, sapienic acid, alpha-liolenic acid, arachidonic acid, erusapentaenoic acid, erucic acid, docosahexaunoic acid, cerotic acid.

7. The pharmaceutical composition of claim 5, wherein the pharmaceutically acceptable carrier is selected from the base oil of claim 6 or water or sugar or glycerol or a combination of the base oil of claim 6 and water and sugar and/or glycerol.

8. The pharmaceutical compound for use of claim 2, the pharmaceutical compound for use of claim 3, wherein an effective amount from 0,1 mg to 50 mg per kilogram body weight is to be taken by a human being daily.

9. The pharmaceutical compound for use of claim 2, the pharmaceutical compound for use of claim 3, wherein an effective amount from 1 mg to 40 mg per kilogram body weight is to be taken by a human being daily.

10. The pharmaceutical compound for use of claim 2, the pharmaceutical compound for use of claim 3, wherein an effective amount from 5 mg to 30 mg per kilogram body weight is to be taken by a human being daily.

11. The pharmaceutical compound for use of claim 2, the pharmaceutical compound for use of claim 3, wherein an effective amount from 7 mg to 25 mg per kilogram body weight is to be taken by a human being daily.

12. The pharmaceutical compound for use of claim 2, the pharmaceutical compound for use of claim 3, wherein an effective amount from 8 mg to 20 mg per kilogram body weight, or from 9 mg to 15 mg per kilogram body weight is to be taken by a human being daily.

13. The pharmaceutical compound for use of claim 2, the pharmaceutical compound for use of claim 3, wherein said effective amount is administered orally or topically or parentally or by rectal route or by intra dermal injection or by inhalation or by a patch.

14. A method of preparing a pharmaceutical composition comprising:
- blending the pharmaceutical compound of formula (1) of claim 1 with a base oil at a rate of 5% to 20% by weight,
- operating at a temperature comprised between 5°C and 15°C;
- obtaining a mixture;
wherein said pharmaceutical compound of formula (1) is present in the composition in an amount effective for treatment and prevention of a cognitive, neurodegenerative or neuronal disorder or disease, said disorder or disease being Alzheimer's disease.

# 4-HYDROXY-2-METHYL-5-(PROPAN-2-YLIDENE)CYCLOHEX-3-ENECARBALDEHYDE FOR THE PREVENTION AND TREATMENT OF A COGNITIVE, NEURODEGENERATIVE OR NEURONAL DISEASE

The present invention relates to a chemical compound according to claim 1, a pharmaceutical composition according to claim 2, and a method of preparing a pharmaceutical composition according to claim 6. The compound of the present invention may be used in particular for treating the Alzheimer Disease.

**Description – Background:**

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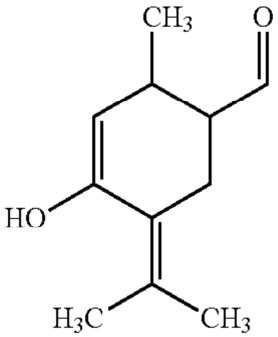
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CLAIMS

The invention claimed is:

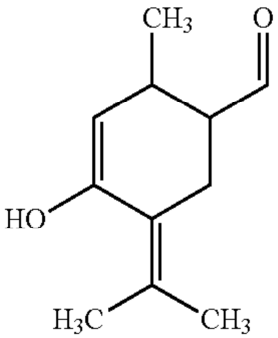
1. A compound of the Formula (1):

Formula (1)




2. A pharmaceutical composition comprising an effective amount of a compound of the Formula (1):

Formula (1)




or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier.

3. The pharmaceutical composition of claim 2, wherein the pharmaceutically acceptable carrier is a base oil selected from the group consisting of:
acai oil, almond oil, amaranth oil, apple seed oil, apricot oil, argan oil, artichoke oil, avocado oil, babassu oil, ben oil, blackcurrant seed oil, borage seed oil, borneo tallow nut oil, bottle gourd oil, buffalo gourd oil, butternut squash seed oil, cape chestnut oil, carob pod oil, carob seed pods oil, cashew oil, cassia oil, castor oil, cocklebur oil, cocoa butter, coconut oil, cohune oil, coriander seed oil, corn oil, cotton seed oil, dika oil, evening primrose oil, false flax oil, flax seed oil, grape seed oil, hazelnut oil, hemp oil, kapok seed oil, kenaf Seed oil, lallemantia oil, macadamia oil, marula oil, meadowfoam seed oil, mongongo nut oil (or manketti oil), mustard oil, nutmeg butter, oils from melon and gourd seeds, okra seed oil, olive oil, palm oil, papaya oil, peanut oil, pecan oil, pequi oil, perilla seed oil, pine nut oil, pine nut oil, pistachio oil, poppyseed oil, prune kernel oil, pumpkin

seed oil, quinoa oil, radish oil, ramtil oil, rapeseed oil, rice bran oil, royle oil, sacha Inchi, safflower oil, salicornia oil, sesame oil, soybean oil, sunflower oil, tea seed oil, thistle oil, tigernut oil, tomato seed oil, tung oil, walnut oil, watermelon seed oil, and wheat germ oil.

4. The pharmaceutical composition of claim 3, wherein the base oil comprising a fatty acid selected from the group consisting in of: lauric acid, myristic acid, palmitic acid, caprylic acid, capric acid, stearic acid, caprioc acid, oleic acid, linoleic acid, arachidic acid, behenic acid, lignoceric acid, palmitoeic acid, linoleic acid, sapienic acid, alpha-liolenic acid, arachidonic acid, erusapentaenoic acid, erucic acid, docosahexaunoic acid, and cerotic acid.

5. The pharmaceutical composition of claim 2, wherein the pharmaceutically acceptable carrier is selected from the base oil of claim 3 or water or sugar or glycerol or a combination of the base oil of claim 3 and water and sugar and/or glycerol.

6. A method of preparing the pharmaceutical composition of claim 2 comprising:
blending the compound of formula (1) of claim 2 with a base oil at a rate of 5% to 20% by weight at a temperature between 5° C. and 15° C.;

obtaining a mixture;

wherein said compound of formula (1) is present in the pharmaceutical composition in an amount effective for treatment of Alzheimer's disease.