[DESCRIPTION]

[Title of Invention] INHIBITOR FOR RETINOCHOROIDAL DISORDERS

[Technical Field]

[0001]

The present invention relates to an inhibitor of retinochoroidal disorder comprising (E)-4-(2-{3-[(1H-pyrazol-1-yl)methyl]-5,5,8,8-tetramethyl-5,6,7,8-tetrahydronaphthalene-2-yl}vinyl)benzoic acid, an ester thereof or a salt thereof as an effective ingredient.

[Background Art]

[0002]

In Japan where the society has an aging population, the ratio of vitreoretinal diseases such as diabetic retinopathy, retinal detachment, and age-related macular degeneration is expected to continue to increase as a cause of blindness. Prognosis of such diseases, which resulted in blindness in the past, is improving by the development of vitreoretinal operation and introduction of biopharmaceuticals, such as anti-VERF intraocular injections. However, aside from initial symptoms, the prognosis of visual functions in severe cases, where symptoms were left untreated for a long period of time or are recurring, is still not favorable. Even if retinopexy is attained by an operation or intraocular neovascularity can be devised to disappear with a pharmaceutical agent, photoreceptor functions would decrease if retinal cells have already suffered an irreversible secondary damage. Eyes are organs, for which healing of injury would be completely meaningless if photoreceptor functions are lost. Thus, in order to maintain normal retinal functions, it is important how an ophthalmic inflammation and the following secondary reaction can be controlled with the least amount of damage.

[0003]

Along with the calming or progression of an ophthalmic inflammation, a retinochoroidal fibrotic scar is often formed in epiretinal, intraretinal, or subretinal tissue and in some cases leads to a disorder in photoreceptor cell functions.

Collagen, which is one of the components of the stroma and retinal pigment epithelial cells, particularly type I collagen, is known as a representative cell component constituting a retinochoroidal fibrotic scar. Retinochoroidal dysfunction occurs due to the formation and atrophy of a retinochoroidal fibrotic scar. In this regard, it is considered effective against retinochoroidal disorders to inhibit atrophy of collagen, particularly type I collagen, of retinal pigment epithelial cells or the like to prevent deformation or disintegration of a tissue structure.

[0004]

To date, a medicament for the prevention and/or treatment of diabetic retinopathy or age-related macular degeneration having an agonist of a retinoic acid receptor (hereinafter, also referred to as "RAR"), all-trans retinoic acid or 4-[(5,6,7,8-tetrahydro-5,5,8,8-tetramethyl-2-naphthalenyl) carbamoyl]benzoic acid, as an effective ingredient (for example, see Patent Literature 1). However, since such an effective ingredient does not have selectivity with respect to RAR subtypes RARα and RARβ, the contribution of each RAR subtype to improvement in the retinal function is unknown. Meanwhile, RAR is involved in various effects such as growth, morphogenesis, and differentiation in many cells such as inflammatory cells, immune cells, and structural cells. Further, it is verified that there is a difference in the distribution of RAR subtypes depending on the tissue or organ of a mammal. Some of the effects of RAR are undesirable, such as increase in triglyceride due to RARα. Thus, the specificity or selectivity with respect to subtypes in compounds with RAR agonist activity is expected to lead to reduction in risk of side effects. For the above reasons, there is a demand for RAR agonists, which have a strong effect of inhibiting retinochoroidal disorders and are highly safe based on subtype selectivity.

[0005]

(E)-4-(2-{3-[(1H-pyrazole-1-yl)methyl]-5,5,8,8-tetramethyl-5,6,7,8-tetrahydronaphthalene-2-yl}vinyl)

benzoic acid is disclosed to be useful as a RARγ selective agonist against pulmonary emphysema, cancer, and dermatosis (for example, see Patent Literature 2) and against neurological pain (for example, see Patent Literature 3). However, there is no study that has examined the pharmacological effect of (E)-4-(2-{3-[(1H-pyrazole-1-yl)methyl]-5,5,8,8-tetramethyl-5,6,7,8-tetrahydronaphthalene-2-yl}vinyl)benzoic acid, an ester thereof, or a salt thereof on retinochoroidal disorders, particularly the formation and atrophy of a retinochoroidal scar, or a document suggesting such an effect.

[Citation List]

[Patent Literature]

[0006]

[PTL 1] Domestic Publication of PCT International Publication No. 2007/037188

[PTL 2] International Publication No. WO 2002/028810 pamphlet

[PTL 3] International Publication No. WO 2008/057930 pamphlet

[Summary of Invention]

[Technical Problem]

[0007]

The objective of the present invention is to provide an inhibitor for a retinochoroidal disorder, particularly an inhibitor for the formation and atrophy of a retinochoroidal scar in epiretinal, intraretinal, or subretinal tissue.

[Solution to Problem]

[0008]

The search for a drug that is effective against ophthalmic diseases, particularly retinochoroidal disorders in vitreoretinal diseases, is an objective that is important and of interest in the field of ophthalmology. After diligent research to find a drug that is effective in inhibiting retinochoroidal disorders, particularly the formation and atrophy of a retinochoroidal scar, the inventors discovered that the RARγ selective agonist (E)-4-(2-{3-[(1H-pyrazole-1-yl)methyl]-5,5,8,8-tetramethyl-5,6,7,8-tetrahydronaphthalene-2-yl}vinyl)benzoic acid exerts

an excellent effect of amelioration in inhibiting the formation and atrophy of a retinochoroidal scar by pharmacological tests using murine retinal pigment epithelial cells, wherein the above-described benzoic acid exhibited an effect of inhibiting collagen atrophy and an effect of inhibiting the formation and atrophy of subretinal scars in mice to complete the present invention.

[0009]

Specifically, the present invention is directed to [1] an inhibitor for a retinochoroidal disorder comprising (E)-4-(2-{3-[(1H-pyrazole-1-yl)methyl]-5,5,8,8-tetramethyl-5,6,7,8-tetrahydronaphthalene-2-yl}vinyl)benzoic acid, an ester thereof, or a salt thereof as an effective ingredient, [2] the inhibitor for a retinochoroidal disorder of the above-described [1], wherein the (E)-4-(2-{3-[(1H-pyrazole-1-yl)methyl]-5,5,8,8-tetramethyl-5,6,7,8-tetrahydronaphthalene-2-yl}vinyl)benzoic acid, the ester thereof, or the salt thereof is (E)-4-(2-{3-[(1H-pyrazole-1-yl)methyl]-5,5,8,8-tetramethyl-5,6,7,8-tetrahydronaphthalene-2-yl}vinyl)benzoic acid or a salt thereof, [3] the inhibitor for a retinochoroidal disorder of the above-described [1] or [2], wherein the retinochoroidal disorder is formation or atrophy of a retinochoroidal scar in epiretinal, intraretinal, or subretinal tissue, [4] the inhibitor for a retinochoroidal disorder according to any one of the above-described [1]-[3], wherein a form of administration is instillative administration or oral administration, and [5] the inhibitor for a retinochoroidal disorder accordingly to any one of the above-described [1]-[4], wherein a dosage form is an instillation, an ophthalmic ointment, an injection, a tablet, a granule, a fine granule, a powder or a capsule.

[Advantageous Effects of Invention]

[0010]

(E)-4-(2-{3-[(1H-pyrazole-1-yl)methyl]-5,5,8,8-tetramethyl-5,6,7,8-tetrahydronaphthalene-2-yl}vinyl) benzoic acid, an ester thereof, or a salt thereof, which is an

effective ingredient of the inhibitor for a retinochoroidal disorder of the present invention, is useful as an inhibitor for retinochoroidal disorders, particularly as an inhibitor for the formation and atrophy of a retinochoroidal scar, by inhibiting collagen atrophy of a retinal pigment epithelial cell, fibroblast, glial cell or the like.

[Brief Description of Drawings]

[0011]

[Figure 1] Figure **1** is a graph showing the relationship between the concentration (μM) of (E)-4-(2-{3-[(1H-pyrazole-1-yl)methyl]-5,5,8,8-tetramethyl-5,6,7,8-tetrahydronaphthalene-2-yl}vinyl)benzoic acid (hereinafter, also referred to as "benzoic acid of the invention") and collagen atrophy (diameter (mm) of collagen gel in the dish) when using murine retinal pigment epithelial cells, wherein "*" indicates the presence of a statistically significant difference ($p < 0.05$).

[Figure 2] Figure **2** is a graph showing the results of studying the effect of inhibiting subretinal scar formation when the benzoic acid of the invention is injected in murine subretinal scar model production. Figure **2A** shows the results of subretinal observation after 7 days from the injection of 50 μg of the benzoic acid of the present invention and macrophages. Figure **2B** shows the results of measuring a subretinal scar region after 7 days from injection when injecting 1 μg, 5μg, or 50μg of the benzoic acid of the invention and macrophages, wherein "*" indicates the presence of a statistically significant difference ($p < 0.05$).

[Description of Embodiments]

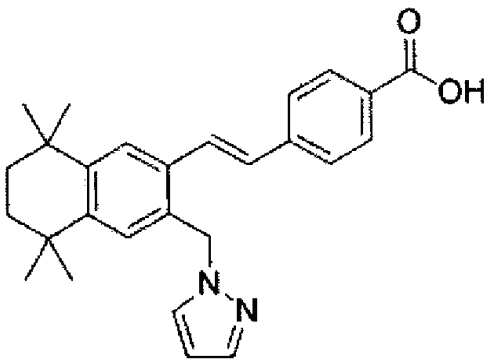
[0012]

The inhibitor for a retinochoroidal disorder of the present invention is not particularly limited and may be any inhibitor having the benzoic acid of the invention represented by the following formula (I), an ester thereof, or a salt thereof as the effective ingredient. However, the benzoic acid of the invention or a salt thereof is preferable as an effective

ingredient. Further, other embodiments of the present invention include: a method of treating a retinochoroidal disorder characterized in administering the benzoic acid of the invention, an ester thereof, or a salt thereof to a subject; the benzoic acid of the invention, an ester thereof, or a salt thereof for use as an inhibitor for a retinochoroidal disorder; and use of the benzoic acid of the invention, an ester thereof, or a salt thereof in the preparation of an inhibitor for a retinochoroidal disorder.

[0013]

[Chemical 1]



(I)

[0014]

In the present invention, a retinochoroidal disorder refers to a condition in which an injury occurs to a photoreceptor cell, ganglion cell, retinal pigment epithelial cell or tissue comprised of each of the above-described cells in the retina or choroid, ultimately leading to cell death or tissue dysfunction to cause disturbance in visual function such as vision or field of vision. A retinochoroidal disorder is suitably exemplified by formation and atrophy of a retinochoroidal scar and vitreoretinal diseases such as diabetic retinopathy, age-related macular degeneration, retinal detachment, proliferative vitreoretinopathy, uveitis, ocular infection, retinopathy of prematurity, neovascular maculopathy, and retinochoroiditis. A retinochoroidal disorder is particularly suitably exemplified by formation and atrophy of a retinochoroidal scar.

[0015]

In the present invention, a retinochoroidal scar is a fibrous connective tissue occurring at an epiretinal, intraretinal, or subretinal injury site with the soothing or progression of an ophthalmic inflammation, preferably a fibrous connective tissue occurring at a subretinal injury site, and is mainly tissue comprised of a retinal pigment epithelial cell, fibroblast, glial cell, or the like with extracellular matrix including collagen. In addition, the above-described epiretinal refers to on a retinal surface, subretinal refers to between the retina and choroid, inside the choroid, and under the choroid. Further, formation of a retinochoroidal scar refers to the formation of a fibrous connective tissue at an epiretinal, intraretinal, or subretinal injury site with the soothing or progression of an ophthalmic inflammation. Atrophy of a retinochoroidal scar refers to the atrophy by a formed retinochoroidal scar pulling tissue in the periphery thereof upon healing. Such formation and atrophy of a retinochoroidal scar occurs in series. It is possible to prevent peripheral tissue and macular area of a retinochoroidal scar from deforming to cause a disorder in the retinochoroidal function by inhibiting the formation and atrophy of the retinochoroidal scar.

[0016]

The benzoic acid of the invention, an ester thereof, or a salt thereof, which is an effective ingredient of the therapeutic agent for a retinochoroidal disorder of the present invention, can be manufactured in accordance with the method described in Patent Literature 2 described above or purchased as a commercially-available product. Examples of such commercially-available products include product name: palovarotene manufactured by Shanghai Haoyuan Chemexpress.

[0017]

Esters in the benzoic acid of the invention, an ester thereof, or a salt thereof, which is an effective ingredient of the therapeutic agent for a retinochoroidal disorder of the present invention, are not particularly limited and can be any ester

converted to the benzoic acid of the invention in a reaction by an enzyme or the like under physiological conditions in vivo. Examples of such esters include: esters generated by reaction with a primary alcohol, such as methanol, ethanol, propanol, hexanol, dodecanal or the like; esters generated by reaction with a secondary alcohol such as isopropanol, s-butanol, 1-ethylpropanol or the like; esters generated by reaction with a tertiary alcohol such as t-butanol, 1-methyl-1-ethylpropanol or the like; and esters generated by reaction with an amino alcohol such as 2-aminoethanol or the like.

[0018]

The above-described esters can be manufactured by a known method from the benzoic acid of the invention or an intermediate during synthesis thereof.

[0019]

Salts in the benzoic acid of the invention, an ester thereof, or a salt thereof, which is an effective ingredient of the inhibitor for a retinochoroidal disorder of the present invention, are not particularly limited and can be any pharmaceutically acceptable salts. Such salts include (1) as an acid addition salt, inorganic acid salts such as hydrochloride, hydrobromic acid salt, hydro iodic acid salt, nitric acid salt, sulfuric acid salt, phosphoric acid salt and the like; and organic acid salts such as acetic acid salt, trifluoroacetic acid salt, benzoic acid salt, oxalic acid salt, malonic acid salt, succinic acid salt, maleic acid salt, fumaric acid salt, tartaric acid salt, citric acid salt, methanesulfonic acid salt, ethanesulfonic acid salt, trifluoromethanesulfonic acid salt, benzenesulfonic acid salt, p-toluenesulfonic acid salt, glutamic acid salt, aspartic acid salt and the like and (2) as a basic salt, metal salts such as sodium salt, potassium salt, calcium salt, magnesium salt and the like; inorganic salts such as ammonium salt and the like; and organic amine salts such as triethylamine salt, guanidine salt and the like.

[0020]

The inhibitor for a retinochoroidal disorder of the present

invention can be administered orally or parenterally (intravenous administration, intramuscular administration, intraperitoneal administration, percutaneous administration, intratracheal administration, intracutaneous administration, or subcutaneous administration) in a form of an ointment (preferably ophthalmic ointment), injection, tablet, granule, fine granule, powder, capsule, inhalant, syrup, pill, liquid formulation, suspension, emulsion, percutaneous absorption agent, suppository, or lotion manufactured by mixing in a suitable pharmacologically acceptable additive. These formulations are manufactured by a well-known method by using an additive such as an excipient, lubricant, binding agent, disintegrator, emulsifier, stabilizer, flavoring agent or diluent.

[0021]

Examples of excipients include organic excipients and inorganic excipients. Examples of organic excipients include: sugar derivatives such as lactose, sucrose, glucose, mannitol, sorbitol and the like; starch derivatives such as corn starch, potato starch, α-starch, dextrin and the like; cellulose derivatives such as crystalline cellulose and the like; gum arabic; dextran; pullulan and the like. Examples of inorganic excipients include: light anhydrous silicic acid; and sulfuric acid salts such as calcium sulfate and the like.

[0022]

Examples of lubricants include: stearic acid; metal salts of stearic acid such as calcium stearate, magnesium stearate and the like; talc; colloidal silica; wax such as beeswax, spermaceti and the like; boric acid; adipic acid; sulfuric acid salts such as sodium sulfate and the like; glycol; fumaric acid; sodium benzoate; D,L-Leucine, sodium lauryl sulfate; silicic acids such as silica and silicic acid hydrate; and the starch derivatives and the like for the above-described excipients.

[0023]

Examples of binding agents include hydroxypropyl cellulose, hydroxypropyl methylcellulose, polyvinylpyrrolidone, macrogol

and the compounds described above shown for excipients.

[0024]

Examples of disintegrators include: cellulose derivatives such as hydroxypropyl cellulose with a low degree of substitutions, carboxymethyl cellulose, calcium carboxymethyl cellulose, and internally crosslinked calcium carboxymethyl cellulose and the like; crosslinked polyvinylpyrrolidone; and chemically modified starch or cellulose derivatives or the like such as carboxymethyl starch and sodium carboxymethyl starch and the like.

[0025]

Examples of emulsifiers include: colloidal clay such as bentonite and veegum and the like; anionic surfactants such as sodium lauryl sulfate and the like; cationic surfactants such as benzalkonium chloride and the like; and non-ionic surfactants and the like such as polyoxyethylene alkyl ether, polyoxyethylene sorbitan fatty acid ester, and sucrose fatty acid ester and the like.

[0026]

Examples of stabilizers include: para-hydroxybenzoic acid esters such as methylparaben, propylparaben and the like; alcohols such as chlorobutanol, benzyl alcohol, and phenylethyl alcohol and the like; benzalkonium chloride; phenols such as phenol and cresol and the like; thimerosal; acetic anhydride; and sorbic acid.

[0027]

Examples of flavoring agents include: sweeteners such as sodium saccharin and aspartame and the like; acidulants such as citric acid, malic acid, and tartaric acid and the like; and flavors such as menthol, lemon extract and orange extract and the like.

[0028]

Diluents are generally compounds used as a diluent. Examples thereof include lactose, mannitol, glucose, sucrose, calcium sulfate, hydroxypropyl cellulose, microcrystalline cellulose, water, ethanol, polyethylene glycol, propylene glycol, glycerol,

starch, polyvinylpyrrolidone, mixtures thereof and the like.

[0029]

For ointments (preferably ophthalmic ointments), a commonly-used base such as white petrolatum or liquid paraffin or the like can be used for preparation.

[0030]

The inhibitor for a retinochoroidal disorder of the present invention includes those in a form of instillation in addition to the above-described dosage forms. The above-described instillation can be instillatively administered. The agent can be formulated with a well-known method by suitably blending in an isotonizing agent, buffer, pH regulator, solubilizer, thickener, stabilizer, preservative (antiseptic) or the like as an additive. Further, it is also possible to obtain a stable instillation by adding a pH regulator, thickener, dispersant or the like to prepare suspension of a drug.

[0031]

Examples of isotonizing agents include glycerin, propylene glycol, sodium chloride, potassium chloride, sorbitol, mannitol and the like.

[0032]

Examples of buffers include phosphoric acid, phosphate, citric acid, acetic acid, ε-aminocaproic acid and the like.

[0033]

Examples of pH regulators include hydrochloric acid, citric acid, phosphoric acid, acetic acid, sodium hydroxide, potassium hydroxide, boric acid, borax, disodium hydrogen phosphate, sodium dihydrogen phosphate, sodium carbonate, sodium bicarbonate and the like.

[0034]

Examples of solubilizers include polysorbate 80, polyoxylethylene hydrogenated castor oil 60, macrogol 4000 and the like.

[0035]

Examples of thickeners and dispersants include: cellulose polymers such as hydroxypropyl methylcellulose, hydroxypropyl

cellulose and the like; polyvinyl alcohols; polyvinylpyrrolidone and the like. Further, examples of stabilizers include edetic acid, sodium edetate and the like.
[0036]

Examples of preservatives (antiseptics) include commonly-used sorbic acid, potassium sorbate, benzalkonium chloride, benzethonium chloride, methyl parahydroxybenzoate, propyl parahydroxybenzoate, chlorobutanol and the like. It is also possible to use these preservatives in combination.
[0037]

An instillation may have any pH within a range acceptable for an ophthalmic formulation, but the pH is desirably set to 4.0-8.5.
[0038]

The dosage of the inhibitor for a retinochoroidal disorder of the present invention can be appropriately changed in accordance with the dosage form, severity of symptoms of a patient to whom the agent is to be administered, age, weight, judgment of a physician or the like. For oral agents, it is generally possible to administer 0.01-5000 mg, preferably 0.1-2500 mg, and more preferably 0.5-1000 mg per day for an adult in one or several doses. For instillations, it is possible to administer those with an effective ingredient concentration of 0.000001-10% (W/V), preferably 0.00001-3% (W/V), and more preferably 0.0001-1% (W/V), in one or several daily doses. For ophthalmic ointments, it is possible to administer those with an effective ingredient concentration of 0.00001-10% (W/W), preferably 0.0001-3% (W/W), and more preferably 0.001-1% (W/W), in one or several daily doses.
[0039]

Hereinafter, the present invention is illustrated in further detail while providing Examples (Test Examples and Drug Formulation Examples). However, the scope of the present invention is not limited thereto.

Example 1
[0040]

(Test on inhibition of three-dimensional collagen gel atrophy in murine retinal pigment epithelial cell)

Murine retinal pigment epithelial cells were used to assess the inhibition effect of a tested compound on three-dimensional collagen gel atrophy in accordance with the method of Nishida et al (Investigative Ophthalmology & Visual Science 42: 1247-1253 (2001)). A subretinal sheet-like pigment epithelial cell comprising a retinal pigment epithelial cell from a mouse eyeball was collected and grown in primary culture. The cultured cell was detached and collected from a culture slide with 0.05% Trypsin-EDTA. After washing twice in a serum free medium (MEM: product number 11095; Gibco), a serum-free medium was added to make a cell suspension. Type I collagen (3 mg/ml: product number 637-00653; Nitta Gelatin Inc.), 10 × MEM, reconstitution buffer (product number 635-00791; Nitta Gelatin Inc.), cell suspension (1.1×10^7 cells/ml in MEM), and water were mixed on ice at the volume ratio of 7:1:1:0.2:1.8. A culture dish coated with 1% BSA was inoculated with the mixture (0.5 ml), which was incubated for one hour at 37°C to make a collagen gel. Then, 0.5 ml each of serum free media, to which 1 ng/ml of TGF-β2 (R&D) and 0, 0.01, 0.1, or 1 μM of the benzoic acid of the invention were added, was added onto collagen gels and incubated at 37°C. The diameter of gels was measured after 24 hours. As a control, 0.5 ml of only a serum-free medium was added and similarly incubated. The results are shown in Figure **1**.

[0041]

(Results)

It can be seen from Figure **1** that the benzoic acid of the invention can inhibit collagen atrophy due to TGF when using murine retinal pigment epithelial cells. This demonstrates that the benzoic acid of the invention contributes to collagen turn over and is effective in inhibiting retinochoroidal disorders and has an effect of inhibiting tissue remodeling that occurs after inflammation, hemorrhage, infection, surgery, or injury in an ophthalmic tissue, i.e., retinal tissue fibrillation, retinochoroidal scar formation, and atrophy.

Example 2

[0042]

(Test on inhibition of murine subretinal scar formation)

A murine subretinal scar model was produced to study whether the benzoic acid of the invention has an effect of inhibiting subretinal scar formation. A subretinal scar model in a mouse was produced by the method shown below in accordance with the method of Young-joon et al (Investigative Ophthalmology & Visual Science, 52, 6089-6095(2001)).

[0043]

(Production of murine subretinal scar model)

First, laser was irradiated (0.05 seconds, 200 mW, 532 nm) onto one location on the posterior pole of fundus of mouse C57BL/6 (purchased from SLC) to destroy the Bruch's membrane, which enabled infiltration of inflammatory cells from the choroid as well as creation of air bubbles subretinally.

[0044]

A 33G needle was then inserted from pars plana. 0.5 μl of 4×10^7 ml thioglycollate elicited peritoneal macrophage and 1 μg, 5 μg, or 50 μg of the benzoic acid of the invention were subretinally injected. For the control, the benzoic acid of the invention was not injected (0 μg).

[0045]

The subretinal area was observed and subretinal scar region was measure 7 days after injection of the macrophage and the benzoic acid of the invention described above. The results are shown in Figure **2**.

[0046]

(Results)

As shown in Figure **2A**, formation of a scar was inhibited when 50 μg of the benzoic acid of the invention was injected in comparison to the control. Further, as shown in Figure **2B**, the scar region (fibrillation region) narrows as the amount of injection of the benzoic acid of the invention increases. Thus, it was revealed that formation and atrophy of subretinal scars can be inhibited by the benzoic acid of the invention.

Example 3

[0047]

[Drug Formulation Example]

(Drug Formulation Example 1) Instillation

In 100 ml

Benzoic acid of the invention	100 mg
Sodium chloride	800 mg
Polysorbate 80	appropriate amount
Disodium hydrogen phosphate	appropriate amount
Sodium dihydrogen phosphate	appropriate amount
Sterile purified water	appropriate amount

The benzoic acid of the invention and the other components described above are added to sterile purified water. The solution is thoroughly mixed to prepare an instillation. It is possible to prepare an instillation with a concentration of 0.05% (W/V), 0.3% (W/V), 0.5% (W/V), or 1% (W/V) by changing the amount of the benzoic acid of the invention or the like that is added.

[0048]

(Drug Formulation Example 2) Ophthalmic Ointment

In 100 g

Benzoic acid of the invention	0.3 g
Liquid paraffin	10.0 g
White petrolatum	appropriate amount

The benzoic acid of the invention is added to homogeneously-melted white petrolatum and liquid paraffin. The mixture is thoroughly mixed and then gradually cooled to prepare an ophthalmic ointment. It is possible to prepare an ophthalmic ointment with a concentration of 0.05% (W/W), 0.1% (W/W), 0.5% (W/W), or 1% (W/W) by changing the amount of the benzoic acid of the invention or the like that is added.

[0049]

(Drug Formulation Example 3) Tablet

In 100 mg

Benzoic acid of the invention	

	1 mg
Lactose	66.4 mg
Corn starch	20 mg
Calcium carboxymethyl cellulose	6 mg
Hydroxypropyl cellulose	6 mg
Magnesium stearate	0.6 mg

The benzoic acid of the invention, corn starch and lactose are mixed in a mixer. Calcium carboxymethyl cellulose and hydroxypropyl cellulose are added to the mixture for granulation. The particle size of the resulting granules is adjusted after drying. Magnesium stearate is added to and mixed with the adjusted granules and the mixture is made into tablets with a tableting machine. Further, it is possible to prepare tablets with the content of 0.1 mg, 10 mg, or 50 mg in 100 mg by changing the amount of the benzoic acid of the invention or the like that is added.

[Industrial Applicability]

[0050]

(E)-4-(2-{3-[(1H-pyrazole-1-yl)methyl]-5,5,8,8-tetramethyl-5,6,7,8-tetrahydronaphthalene-2-yl}vinyl) benzoic acid, an ester thereof, or a salt thereof, which is an effective ingredient of the inhibitor for a retinochoroidal disorder of the present invention, is useful as an inhibitor for retinochoroidal disorders, particularly as an inhibitor for the formation and atrophy of a retinochoroidal scar, by strongly inhibiting collagen contraction in a retinal pigment epithelial cell, fibroblast, glial cell or the like in the retinochoroid.

[Claims]

[Claim 1]

An inhibitor for a retinochoroidal disorder comprising (E)-4-(2-{3-[(1H-pyrazole-1-yl)methyl]-5,5,8,8-tetramethyl-5,6,7,8-tetrahydronaphthalene-2-yl}vinyl)benzoic acid, an ester thereof, or a salt thereof as an effective ingredient.

[Claim 2]

The inhibitor for a retinochoroidal disorder of claim 1, wherein the (E)-4-(2-{3-[(1H-pyrazole-1-yl)methyl]-5,5,8,8-tetramethyl-5,6,7,8-tetrahydronaphthalene-2-yl}vinyl)benzoic acid, the ester thereof, or the salt thereof is (E)-4-(2-{3-[(1H-pyrazole-1-yl)methyl]-5,5,8,8-tetramethyl-5,6,7,8-tetrahydronaphthalene-2-yl}vinyl)benzoic acid or a salt thereof.

[Claim 3]

The inhibitor for a retinochoroidal disorder of claim 1 or 2, wherein the retinochoroidal disorder is formation or atrophy of a retinochoroidal scar in subretinal, intraretinal, or epiretinal tissue.

[Claim 4]

The inhibitor for a retinochoroidal disorder according to any one of claims 1-3, wherein a form of administration is instillative administration or oral administration.

[Claim 5]

The inhibitor for a retinochoroidal disorder accordingly to any one of claims 1-4, wherein a dosage form is an instillation, an ophthalmic ointment, an injection, a tablet, a granule, a fine granule, a powder or a capsule.