selenoneine, and have completed this invention upon finding that ingestion of a selenium compound-containing composition has effects of alleviating stress to protect against brain damage resulting from cerebral ischemia, and of preventing stress-induced damage.

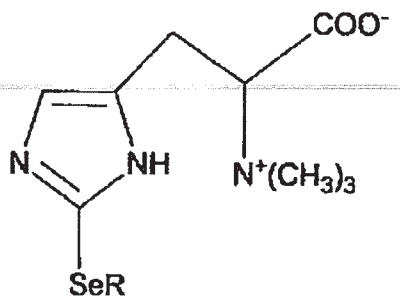
[0008]

Specifically, the present invention provides the following.

[1] A composition for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation, the composition comprising an organic selenium compound represented by formula I:

[0009]

[Chemical Formula 1]



I

[0010]

wherein

R is hydrogen or an ergothionyl, glutathionyl or cysteinyl group,

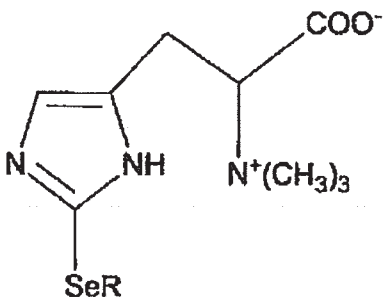
as an active ingredient.

[0010a]

[1a] Use of a composition comprising an organic selenium compound represented by formula I as an active ingredient in the manufacture of a medicament for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder,

improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation; wherein formula I is

[Chemical Formula 1]



I

wherein

R is hydrogen or an ergothionyl, glutathionyl or cysteinyl group.

[0011]

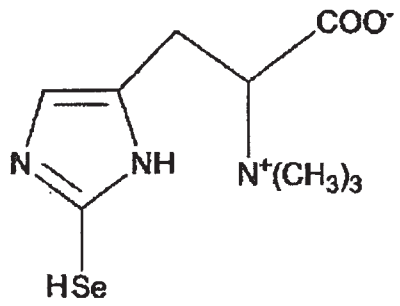
[2] The composition according to [1] above, wherein the organic selenium compound is 3-(2-hydroseleno-1H-imidazol-5-yl)-2-(trimethylammonio)propanoate,

[0012]

wherein the compound is represented by formula II:

[0013]

[Chemical Formula 2]



II

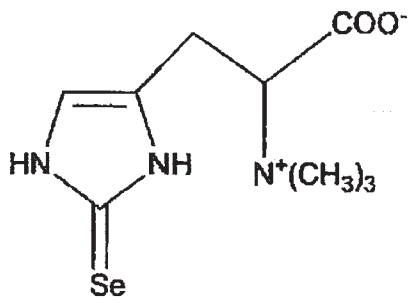
[0014]

[3] A composition for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of

arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation, the composition comprising an organic selenium compound represented by formula III:

[0015]

[Chemical Formula 3]



III

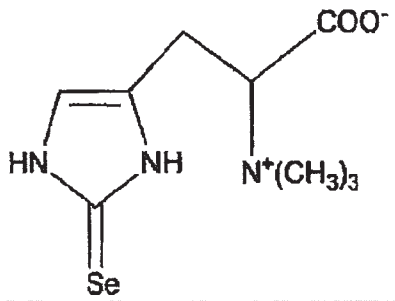
[0016]

as an active ingredient.

[0016a]

[3a] Use of a composition comprising an organic selenium compound represented by formula III as an active ingredient in the manufacture of a medicament for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation; wherein formula III is

[Chemical Formula 3]



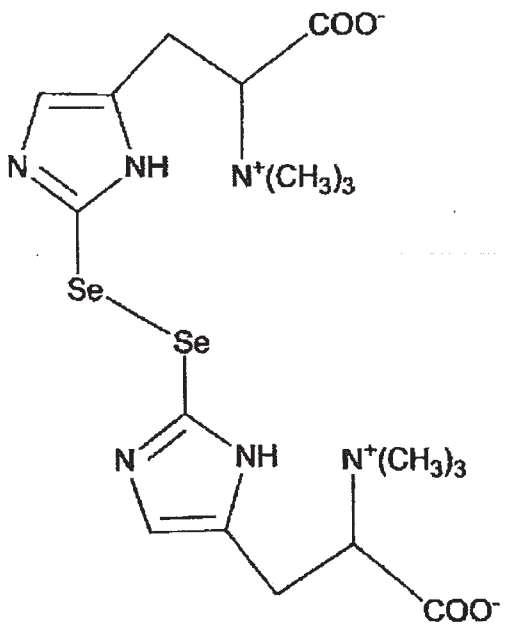
III

[0017]

[4] A composition for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation, the composition comprising an organic selenium compound represented by formula IV:

[0018]

[Chemical Formula 4]



IV

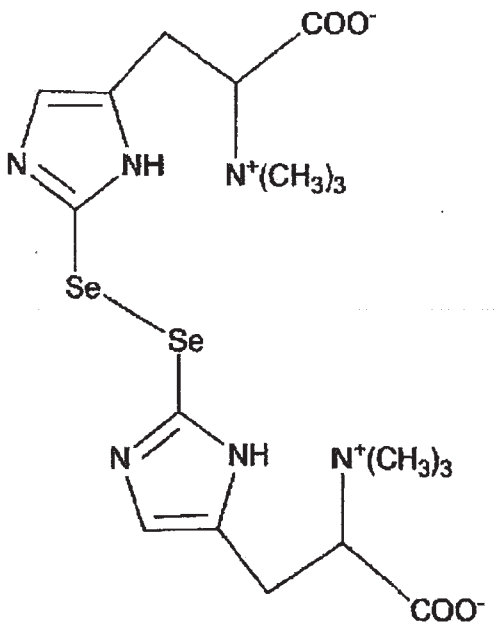
[0019]

as an active ingredient.

[0019a]

[4a] Use of a composition comprising an organic selenium compound represented by formula IV as an active ingredient in the manufacture of a medicament for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation; wherein formula IV is

[Chemical Formula 4]



IV

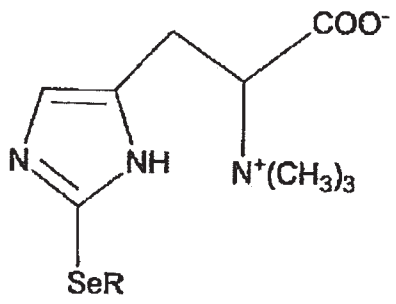
[0020]

[5] A food composition for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation, containing a composition according to any one of [1] to [4] above.

[0020a]

[5a] Use of a food composition comprising an organic selenium compound represented by formula I or formula III or formula IV as an active ingredient in the manufacture of a medicament for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation; wherein formula I is

[Chemical Formula 1]



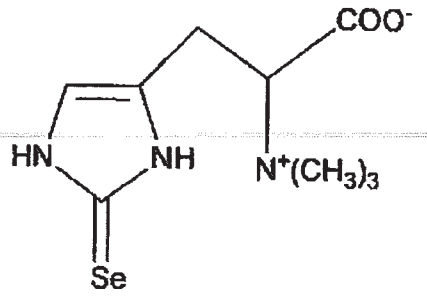
I

wherein

R is hydrogen or an ergothionyl, glutathionyl or cysteinyl group;

wherein formula III is

[Chemical Formula 3]

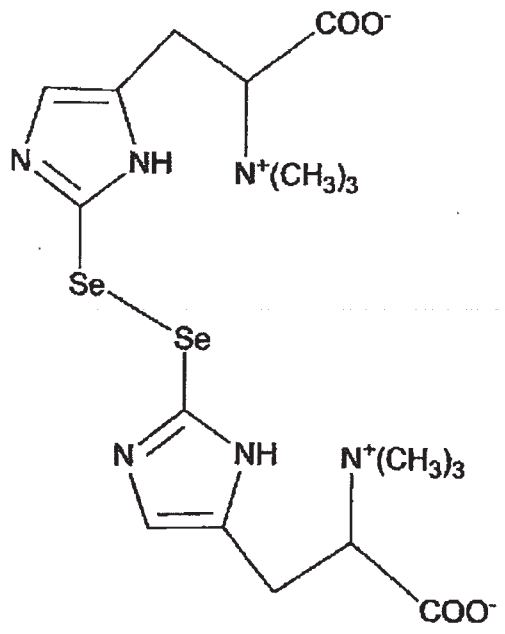


III

;

and wherein formula IV is

[Chemical Formula 4]



IV

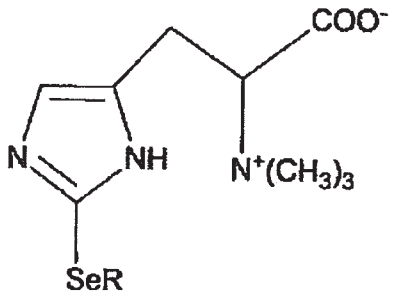
[6] A food containing a composition according to any one of [1] to [4] above.

[0020b]

[6a] A food containing a composition comprising an organic selenium compound represented by formula I or formula III or formula IV;

wherein formula I is

[Chemical Formula 1]



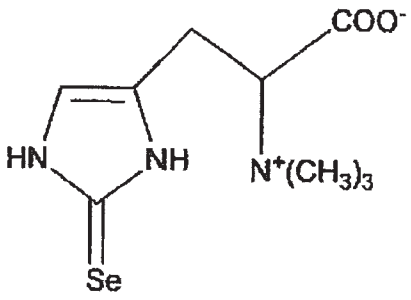
I

wherein

R is hydrogen or an ergothionyl, glutathionyl or cysteinyl group;

wherein formula III is

[Chemical Formula 3]

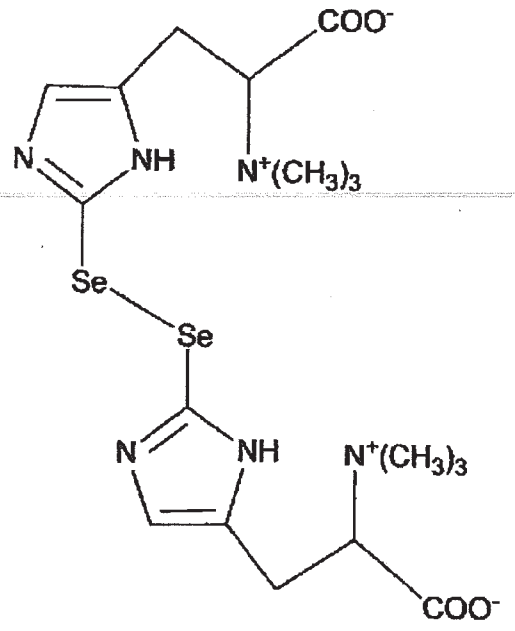


III

;

and wherein formula IV is

[Chemical Formula 4]



IV

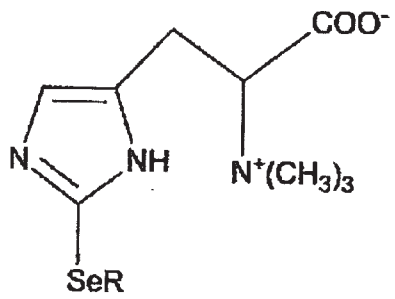
5

[0021]

[7] A medical composition for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation, the medical composition comprising an organic selenium compound represented by formula I:

[0022]

[Chemical Formula 5]



I

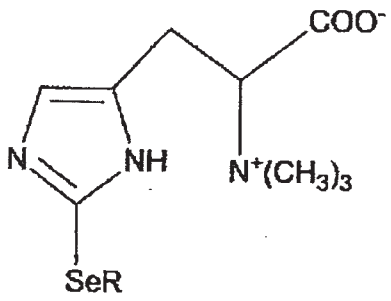
[0023]

[wherein R is hydrogen or an ergothionyl, glutathionyl or cysteinyl group], as an active ingredient.

[0023a]

[7a] Use of a medical composition comprising an organic selenium compound represented by formula I as an active ingredient in the manufacture of a medicament for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation; wherein formula I is:

[Chemical Formula 5]



I

wherein

R is hydrogen or an ergothionyl, glutathionyl or cysteinyl group.

[0024]

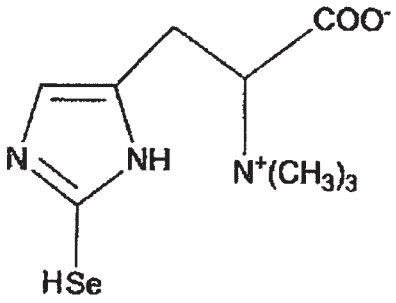
[8] The medical composition according to claim 7, wherein the organic selenium compound is 3-(2-hydroseleno-1H-imidazol-5-yl)-2-(trimethylammonio)propanoate,

[0025]

wherein the compound is represented by formula II:

[0026]

[Chemical Formula 6]



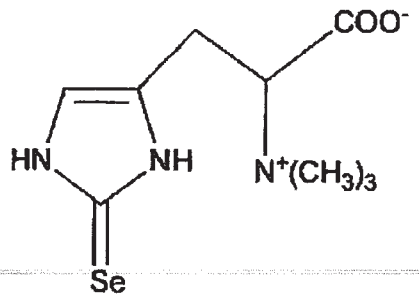
II

[0027]

[9] A medical composition for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation, the medical composition comprising an organic selenium compound represented by formula III:

[0028]

[Chemical Formula 7]



III

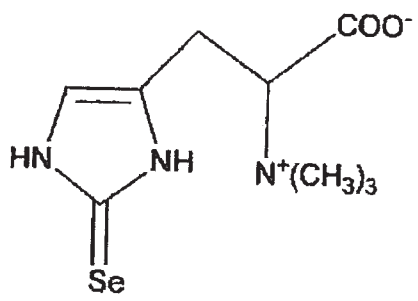
[0029]

as an active ingredient.

[0029a]

[9a] Use of a medical composition comprising an organic selenium compound represented by formula III as an active ingredient in the manufacture of a medicament for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation; wherein formula III is:

[Chemical Formula 7]



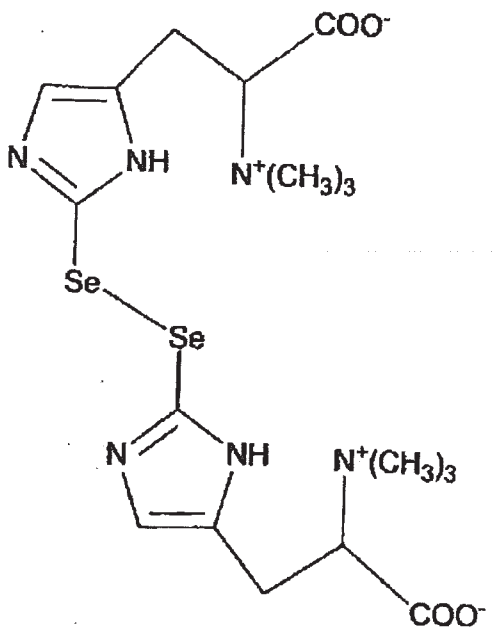
III

[0030]

[10] A medical composition for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation, the composition comprising an organic selenium compound represented by formula IV:

[0031]

[Chemical Formula 8]



IV

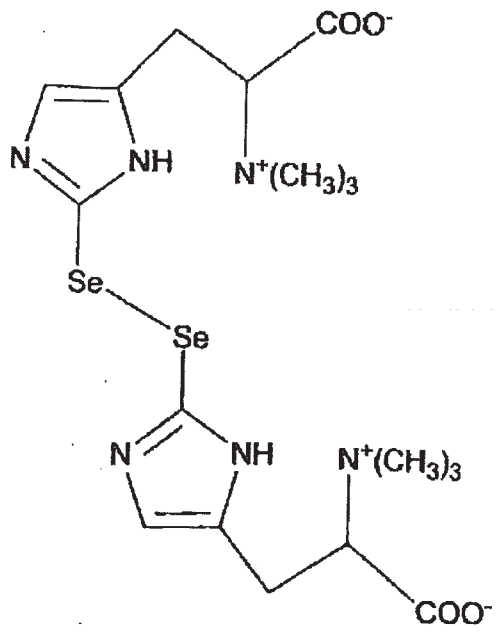
[0032]

as an active ingredient.

[0032a]

[10a] Use of a medical composition comprising an organic selenium compound represented by formula IV as an active ingredient in the manufacture of a medicament for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation; wherein formula IV is:

[Chemical Formula 8]



IV

ADVANTAGEOUS EFFECTS OF INVENTION

[0033]

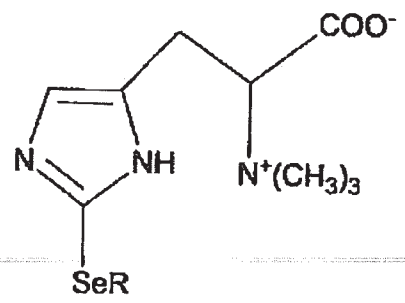
The organic selenium compound of the invention is already known to have antioxidant activity that inhibits generation of peroxides and radicals, functioning as an antioxidant based on free radical-eliminating activity, but verification of its effectiveness when used in mammalian bodies has not yet been published. The continuing verification of its anticancer and antiarteriosclerotic effects by effectiveness testing by administration to human cells and living organisms allows its utilization for novel purposes such as preventing and improving lifestyle diseases and aging-associated diseases.

CLAIMS

[Claim 1]

Use of a composition comprising an organic selenium compound represented by formula I as an active ingredient in the manufacture of a medicament for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation; wherein formula I is

[Chemical Formula 1]



I

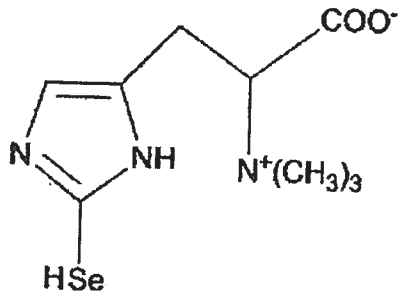
wherein

R is hydrogen or an ergothionyl, glutathionyl or cysteinyl group.

[Claim 2]

The use of claim 1, wherein the organic selenium compound is 3-(2-hydroseleno-1H-imidazol-5-yl)-2-(trimethylammonio)propanoate represented by formula II:

[Chemical Formula 2]

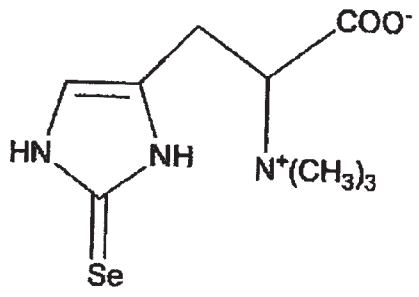


II

[Claim 3]

Use of a composition comprising an organic selenium compound represented by formula III as an active ingredient in the manufacture of a medicament for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation; wherein formula III is

[Chemical Formula 3]



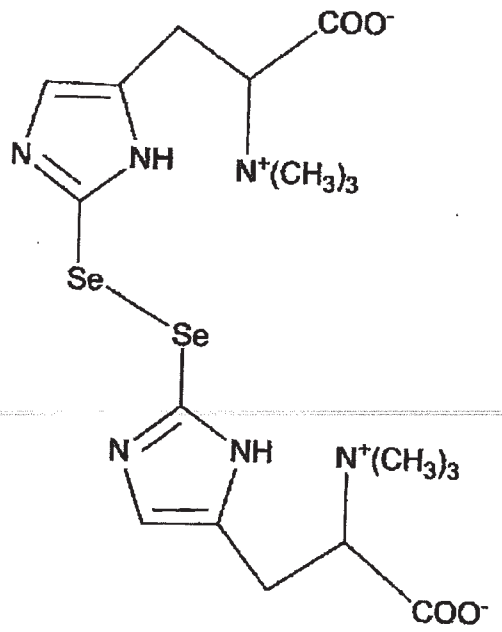
III

[Claim 4]

Use of a composition comprising an organic selenium compound represented by formula

IV as an active ingredient in the manufacture of a medicament for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation; wherein formula IV is

[Chemical Formula 4]



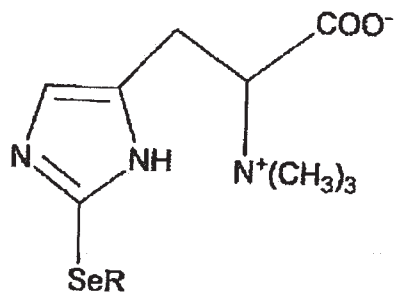
IV

[Claim 5]

Use of a food composition comprising an organic selenium compound represented by formula I or formula III or formula IV as an active ingredient in the manufacture of a medicament for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial

cells, improvement of dry eye or suppression of inflammation; wherein formula I is

[Chemical Formula 1]



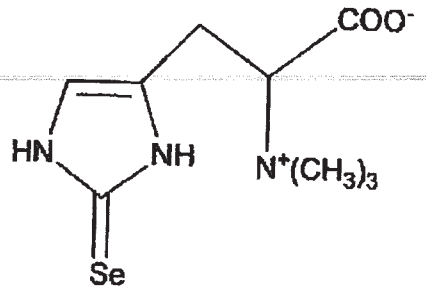
I

wherein

R is hydrogen or an ergothionyl, glutathionyl or cysteinyl group;

wherein formula III is

[Chemical Formula 3]

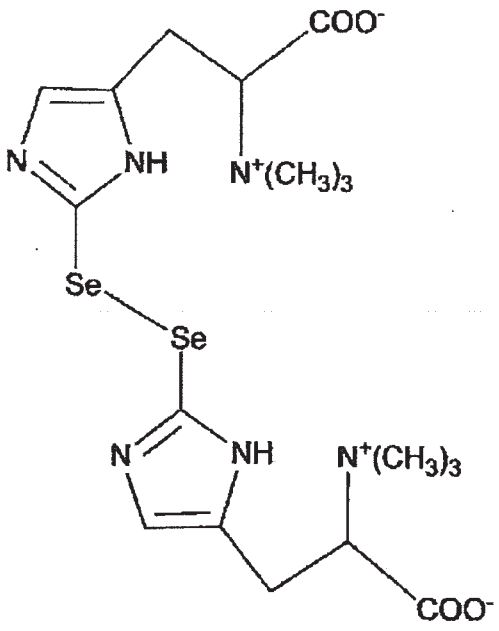


III

;

and wherein formula IV is

[Chemical Formula 4]



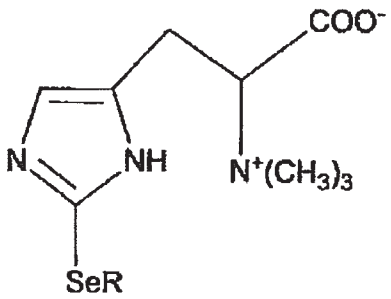
IV

[Claim 6]

A food containing a composition comprising an organic selenium compound represented by formula I or formula III or formula IV;

wherein formula I is

[Chemical Formula 1]



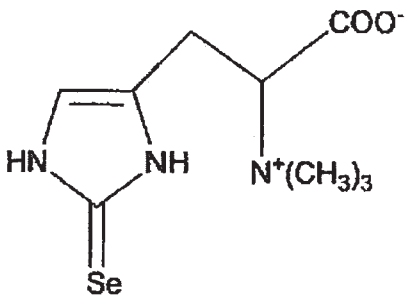
I

wherein

R is hydrogen or an ergothionyl, glutathionyl or cysteinyl group;

wherein formula III is

[Chemical Formula 3]

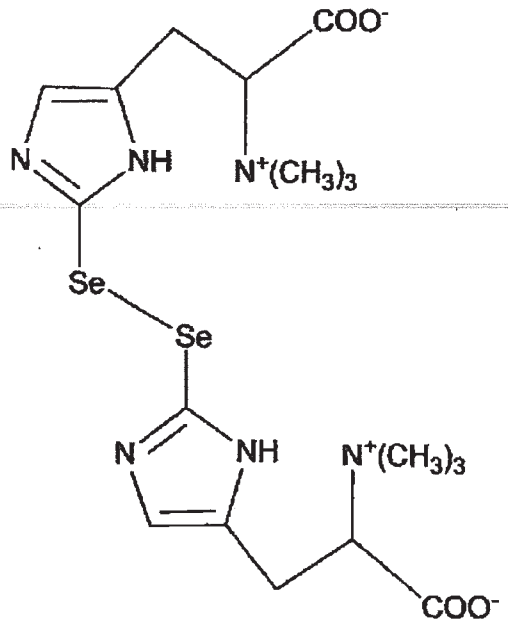


III

;

and wherein formula IV is

[Chemical Formula 4]



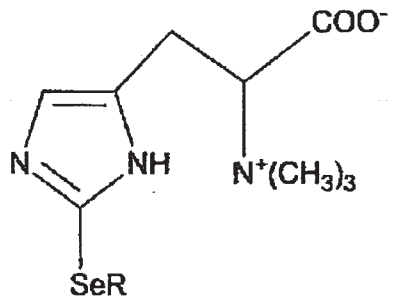
IV

[Claim 7]

Use of a medical composition comprising an organic selenium compound represented by formula I as an active ingredient in the manufacture of a medicament for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression

of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation; wherein formula I is:

[Chemical Formula 5]



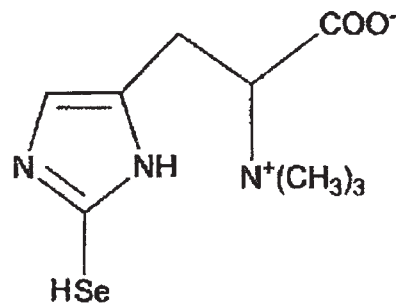
I

wherein

R is hydrogen or an ergothionyl, glutathionyl or cysteinyl group.

[Claim 8] The use according to claim 7, wherein the organic selenium compound is 3-(2-hydroseleno-1H-imidazol-5-yl)-2-(trimethylammonio)propanoate represented by formula II:

[Chemical Formula 6]



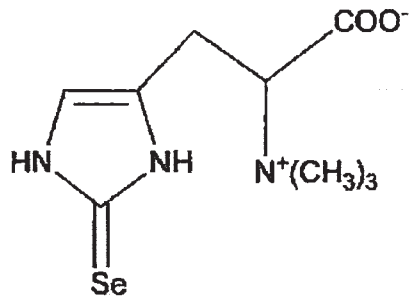
II

[Claim 9]

Use of a medical composition comprising an organic selenium compound represented by formula III as an active ingredient in the manufacture of a medicament for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression

of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation; wherein formula III is:

[Chemical Formula 7]

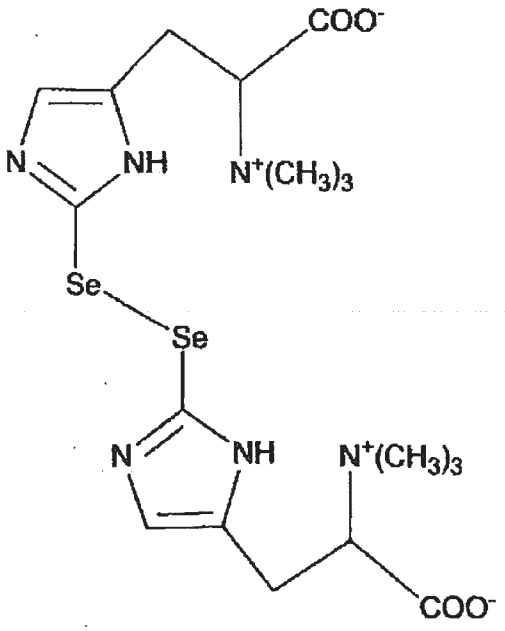


III

[Claim 10]

Use of a medical composition comprising an organic selenium compound represented by formula IV as an active ingredient in the manufacture of a medicament for reduction of oxidative stress, suppression of oxidized lipids, prevention of ischemic disease, improvement of metabolic syndrome, improvement of impaired glucose tolerance, protection from and improvement of damage associated with metabolic syndrome including abnormal lipid metabolism, suppression of carcinogenesis, suppression of general immunity disorders, suppression of vascular endothelial damage, suppression of arteriosclerosis, prevention of cognitive disorder, improvement of brain function, protection of corneal epithelial cells, improvement of dry eye or suppression of inflammation; wherein formula IV is:

[Chemical Formula 8]



IV