[CLAIMS]

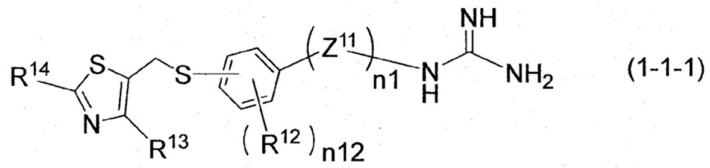
[Claim 1]

A PPARδ activator comprising a guanidine derivative as an active ingredient, wherein

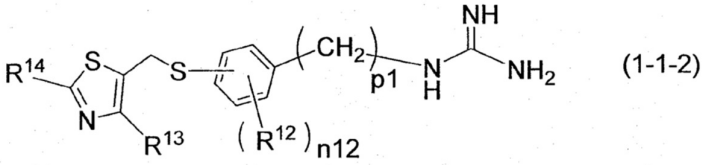
the PPARδ activator activates transcriptional activity of PPARδ (peroxisome proliferator-activated receptor δ),

the guanidine derivative is a compound represented by any one of the following general formulas (1-1-1) to (1-1-4),

[Chemical formula 1]



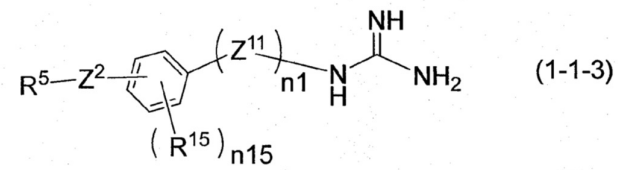
(1-1-1)



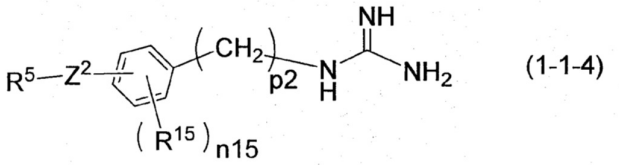
(1-1-2)

[in formulas (1-1-1) and (1-1-2), Z^{11} represents an oxygen atom or a sulfur atom, n1 represents 0 or 1, R^{12} represents an aliphatic hydrocarbon group having 1 to 6 carbon atoms, n12 represents an integer of 0 to 2, R^{13} represents a hydrogen atom or an aliphatic hydrocarbon group having 1 to 6 carbon atoms, R^{14} represents an optionally substituted aromatic hydrocarbon group, and p1 represents an integer of 1 to 6],

[Chemical formula 2]



(1-1-3)



(1-1-4)

[in formulas (1-1-3) and (1-1-4), Z^{11} represents an oxygen atom or a sulfur atom, n1 represents 0 or 1; R^{15} represents an aliphatic hydrocarbon group having 1 to 6 carbon atoms or an alkoxy group having 1 to 6 carbon atoms; n15 represents an integer of 0 to 2; Z^2 represents $-(CH_2)_2-$、$-(CH_2)_3-$、$-O-CH_2-$、$-CH_2-O-$、$-CH_2-O-CH_2-$、$-S-CH_2-$、$-CH_2-S-$、$-CH_2-S-CH_2-$、$-NH-CH_2-$、$-CH_2-NH-$, or $-CH_2-NH-CH_2-$; R^5 represents an optionally substituted aromatic hydrocarbon group or an optionally substituted cyclic hydrocarbon group; p2 represents an integer of 1 to 6].

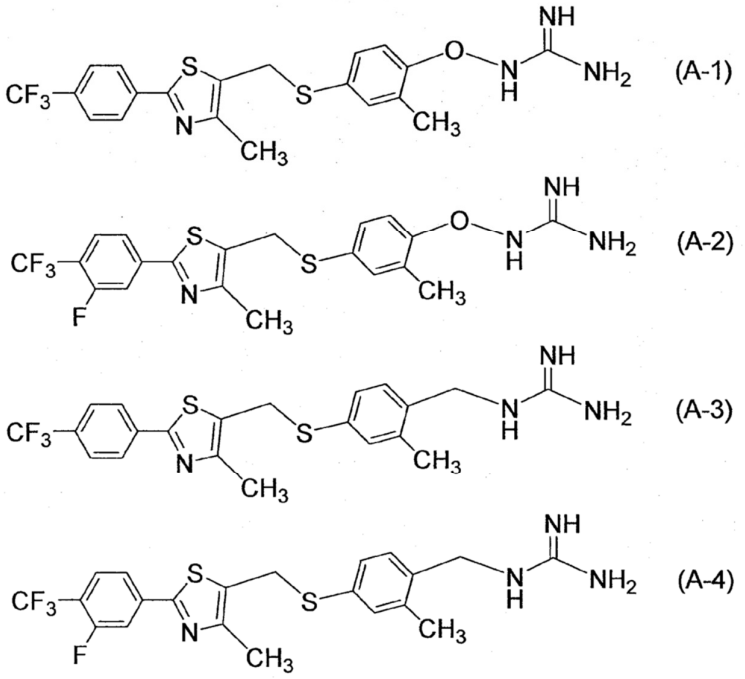
[Claim 2]

A PPARδ activator comprising a guanidine derivative as an active ingredient, wherein

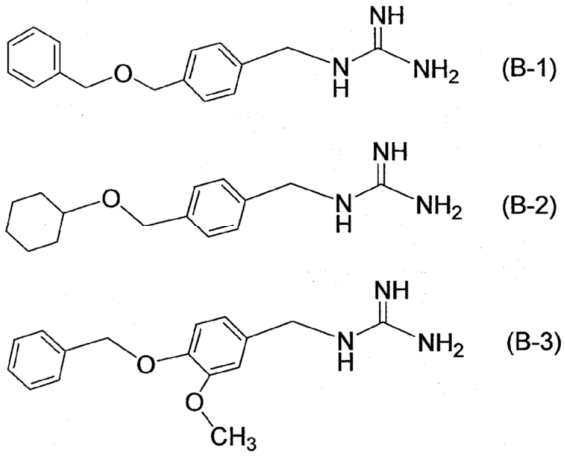
the PPARδ activator activates transcriptional activity of PPARδ (peroxisome proliferator-activated receptor δ),

the guanidine derivative is a compound represented by any of the following formulas (A-1) to (A-4), (B-1) to (B-3).

[Chemical formula 3]



[Chemical formula 4]



[Claim 3]

The PPARδ activator according to Claim 1 or 2,

wherein the guanidine derivative is capable of fitting within a ligand binding pocket of PPARδ, in a state where a guanidino group form a hydrogen bond with amino

acid residues corresponding to each of the 413th histidine, 287th histidine, 253rd threonine and the 437th tyrosine of human PPARδ, among amino acid residues constituting an interior surface of the ligand binding pocket.

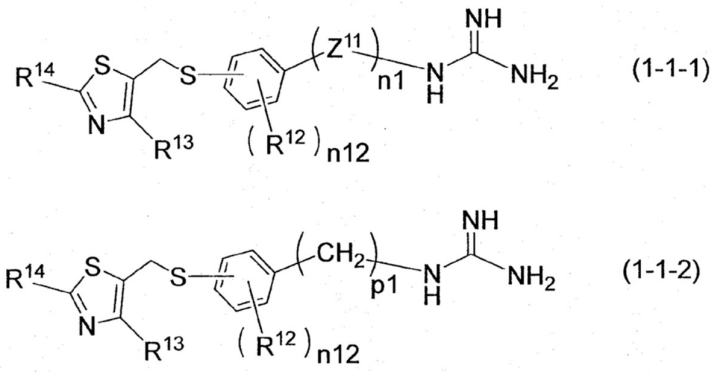
[Claim 4]

An exercise tolerance-improving agent comprising a guanidine derivative as an active ingredient, wherein

the PPARδ activator activates transcriptional activity of PPARδ (peroxisome proliferator-activated receptor δ),

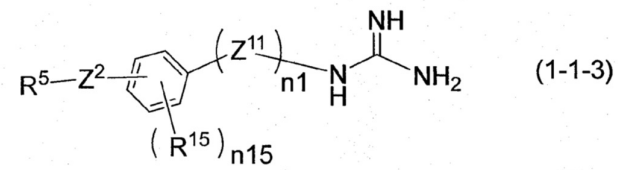
the guanidine derivative is a compound represented by any one of the following general formulas (1-1-1) to (1-1-4),

[Chemical formula 5]

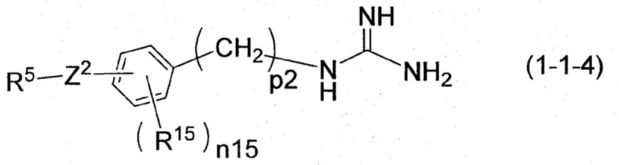


[in formulas (1-1-1) and (1-1-2), Z^{11} represents an oxygen atom or a sulfur atom, n1 represents 0 or 1, R^{12} represents an aliphatic hydrocarbon group having 1 to 6 carbon atoms, n12 represents an integer of 0 to 2, R^{13} represents a hydrogen atom or an aliphatic hydrocarbon group having 1 to 6 carbon atoms, R^{14} represents an optionally substituted aromatic hydrocarbon group, and p1 represents an integer of 1 to 6],

[Chemical formula 6]



(1-1-3)



(1-1-4)

[in formulas (1-1-3) and (1-1-4), Z^{11} represents an oxygen atom or a sulfur atom, n1 represents 0 or 1; R^{15} represents an aliphatic hydrocarbon group having 1 to 6 carbon atoms or an alkoxy group having 1 to 6 carbon atoms; n15 represents an integer of 0 to 2; Z^2 represents $-(CH_2)_2-$、$-(CH_2)_3-$、$-O-CH_2-$、$-CH_2-O-$、$-CH_2-O-CH_2-$、$-S-CH_2-$、$-CH_2-S-$、$-CH_2-S-CH_2-$、$-NH-CH_2-$、$-CH_2-NH-$, or $-CH_2-NH-CH_2-$; R^5 represents an optionally substituted aromatic hydrocarbon group or an optionally substituted cyclic hydrocarbon group; p2 represents an integer of 1 to 6].

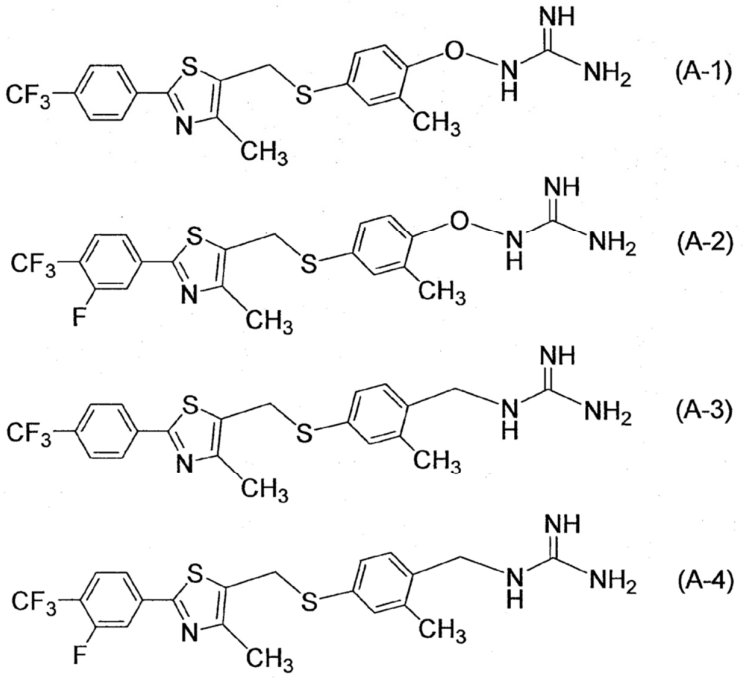
[Claim 5]

An exercise tolerance-improving agent comprising a guanidine derivative as an active ingredient, wherein

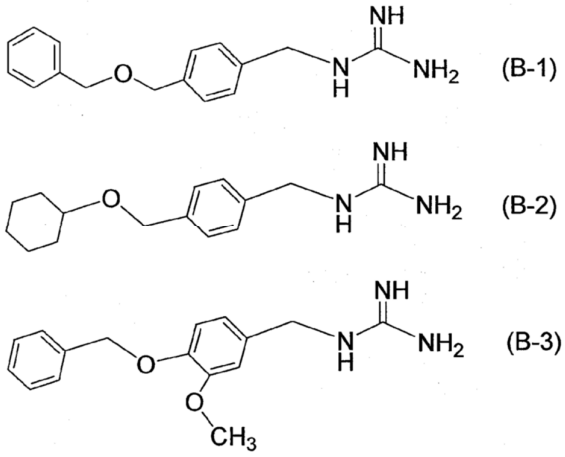
the PPARδ activator activates transcriptional activity of PPARδ (peroxisome proliferator-activated receptor δ),

the guanidine derivative is a compound represented by any of the following formulas (A-1) to (A-4), (B-1) to (B-3).

[Chemical formula 7]



[Chemical formula 8]



[Claim 6]

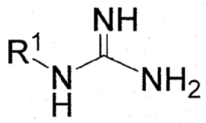
An exercise tolerance-improving agent comprising a guanidine derivative or a biguanidine derivative as an active ingredient, wherein

the PPARδ activator activates transcriptional activity of PPARδ (peroxisome

proliferator-activated receptor δ),

the guanidine derivative is a compound represented by the following general formula (1)

[Chemical formula 9]

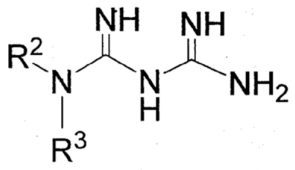


(1)

[in formula (1), R^1 represents -(Z^1)-R^4, a carboxyl group, nitro group, cyanide group, hydroxy group, or amino group; the Z^1 represents a single bond, oxygen atom, sulfur atom, -NH-, -N=CH-, -CO-, -CO-O-, -O-CO-, -CO-NH-, or -NH-CO-; the R^4 represents an aliphatic hydrocarbon group, an aromatic hydrocarbon group, or a heterocyclic group],

the biguanidine derivative is a compound represented by the following general formula (2),

[Chemical formula 10]



(2)

[in formula (2), R^2 and R^3 independently represent a hydrogen atom-(Z^1)-R^4, a carboxyl group, nitro group, cyanide group, hydroxy group, or amino group; the Z^1 represents a single bond, oxygen atom, sulfur atom, -NH-, -N=CH-, -CO-, -CO-O-, -O-

CO-, -CO-NH-, or -NH-CO-; the R^4 represents an aliphatic hydrocarbon group, an aromatic hydrocarbon group, or a heterocyclic group; when both R^2 and R^3 are monovalent organic groups, they may be linked to form a ring structure].

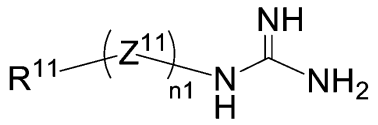
[Claim 7]

An exercise tolerance-improving agent comprising a guanidine derivative as an active ingredient, wherein

the PPARδ activator activates transcriptional activity of PPARδ (peroxisome proliferator-activated receptor δ),

the guanidine derivative is a compound represented by the following general formula (1-1) (excluding L-arginine)

[Chemical formula 11]



(1-1)

[in formula (1-1), Z^{11} represents an oxygen atom or a sulfur atom; n1 represents 0 or 1; R^{11} represents an optionally substituted aliphatic hydrocarbon group having 1 to 6 carbon atoms, an optionally substituted aromatic hydrocarbon group, or an optionally substituted multi-ring linking group].

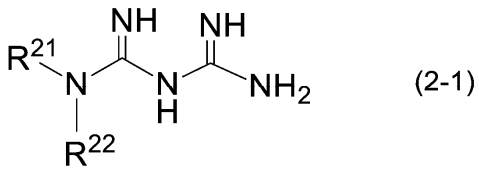
[Claim 8]

An exercise tolerance-improving agent comprising a biguanidine derivative as an active ingredient, wherein

the PPARδ activator activates transcriptional activity of PPARδ (peroxisome proliferator-activated receptor δ),

the biguanidine derivative is a compound represented by the following general formula (2-1),

[Chemical formula 12]



(2-1)

[in formula (2-1), R^{21} and R^{22} independently represent a hydrogen atom or an optionally substituted aliphatic hydrocarbon group having 1 to 6 carbon atoms].

[Claim 9]

An exercise tolerance-improving agent comprising one or more PPARδ activators selected from the group consisting of metformin, phenformin, and buformin as an active ingredient.