Claim

[Claim 1]

An osteogenesis acceleration agent having as active ingredient a substance which inhibits binding of semaphorin 4D and plexin B1.

[Claim 2]

An osteogenesis acceleration agent as described in Claim 1 characteristic in that the binding inhibition substance is an anti-semaphorin 4D antibody.

[Claim 3]

An osteogenesis acceleration agent as described in Claim 1 characteristic in that the binding inhibition substance is an anti-plexin B1 antibody or a protein containing plexin B1 extracellular regions.

[Claim 4]

An agent for prevention and treatment of bone diseases having as active ingredient a substance which inhibits binding of semaphorin 4D and plexin B1.

[Claim 5]

An agent for prevention and treatment of bone diseases as described in Claim 4 characteristic in that the binding inhibition substance is an anti-semaphorin 4D antibody.

[Claim 6]

An agent for prevention and treatment of bone diseases as described in Claim 4 characteristic in that the binding inhibition substance is an anti-plexin B1 antibody or a protein containing plexin B1 extracellular regions.

[Claim 7]

An agent for prevention and treatment of bone diseases as described in any of Claims 4 through 6 characteristic in that the bone diseases are selected from bone fracture, bone deficiency, osteoporosis, osteomalacia, osteopenia, lumbar pain, Paget's disease of bone, tonic myelitis, articular rheumatism and deformative arthrosis.

[Claim 8]

A method used to determine a candidate active ingredient for an osteogenesis acceleration agent wherein it is determined whether a substance being studied is a substance which inhibits binding between semaphorin 4D and plexin B1, and if the abovementioned substance being studied is the abovementioned substance which inhibits binding, the abovementioned substance being studied is determined to be a candidate active ingredient for an osteogenesis acceleration agent.

[Claim.9]

A method as described in Claim 8 characteristic in that the method used to determine whether a substance being studied is a substance which inhibits binding between semaphorin 4D and plexin B1 consists of the following steps (A) through (D):

(A) a step wherein semaphorin 4D and plexin B1are brought in contact with one another in the presence of the substance being studied;

(B) a step wherein the degree of binding between semaphorin 4D and plexin B1 is measured;

(C) a step wherein the degree measured in step (B) above is compared with the degree when not in the presence of the substance being studied;

(D) a step wherein the substance being studied is determined to be a substance which inhibits binding between semaphorin 4D and plexin B1 when the degree measured in step (B) above is lower than the degree when not in the presence of the substance being studied.

[Claim 10]

A method of screening for a candidate active ingredient for an osteogenesis acceleration agent characteristic in that the methods described in Claims 8 or 9 are used to search substances being studied for a candidate active ingredient for an osteogenesis acceleration agent.

Claims

Claim 1 An osteogenesis promoter which has a semaphorin 4D and plexin B1 binding inhibitor as an effective ingredient.

Claim 2 An osteogenesis promoter in accordance with Claim 1, characterized in that the binding inhibitor is an anti-semaphorin 4D antibody.

Claim 3 An osteogenesis promoter in accordance with Claim 1, characterized in that the binding inhibitor is an anti-plexin B1 antibody or a protein which contains an extracellular domain of plexin B1.

Claim 4 A prophylactic and therapeutic agent of bone diseases which has a semaphorin 4D and plexin B1 binding inhibitor as an effective ingredient.

Claim 5 A prophylactic and therapeutic agent of bone diseases in accordance with Claim 4 which is an anti-semaphorin 4D antibody.

Claim 6 A prophylactic and therapeutic agent of bone diseases in accordance with Claim 4, characterized in that the binding inhibitor is an anti-plexin B1 antibody or a protein which contains an extracellular domain of plexin B1.

Claim 7 A prophylactic and therapeutic agent of bone diseases in accordance with any of Claims 4–6, characterized in that the bone diseases are selected from bone fractures, bone deficiency, osteoporosis, osteomalacia, osteopenia, lumbago and back pain, Paget's disease of bone, ankylosing spondylitis, rheumatoid arthritis, and osteoarthritis.

Claim 8 A method of judging candidate substances for effective ingredients of osteogenesis promoters, characterized in that it is judged whether the substance being tested is a semaphorin 4D and plexin B1 binding inhibitor, and if said substance being tested is a binding inhibitor it is judged that said substance being tested is an effective ingredient of ossification promotors.

Claim 9 A method of judging in accordance with Claim 8, characterized in that a method for judging whether a substance being tested is a semaphorin 4D and plexin B1 binding inhibitor has the following steps (A)–(D):

(A) a step in which semaphorin 4D and plexin B1 are brought into contact in the presence of the substance being tested;

(B) a step in which the degree of binding of semaphorin 4D and plexin B1 is measured;

(C) a step in which the degree measured in step (B) is compared with that step in the absence of the substance being tested; and

(D) a step in which, if the degree measured in step (B) is lower than the degree in the absence of the substance being tested, this substance being tested is judged to be a semaphorin 4D and plexin B1 binding inhibitor.

Claim 10 A method of screening candidate substances for effective ingredients of osteogenesis promoters, characterized in that candidate substances for effective ingredients of ossification promoters are sought among substances being tested by using a decision method in accordance with Claim 8 or Claim 9.